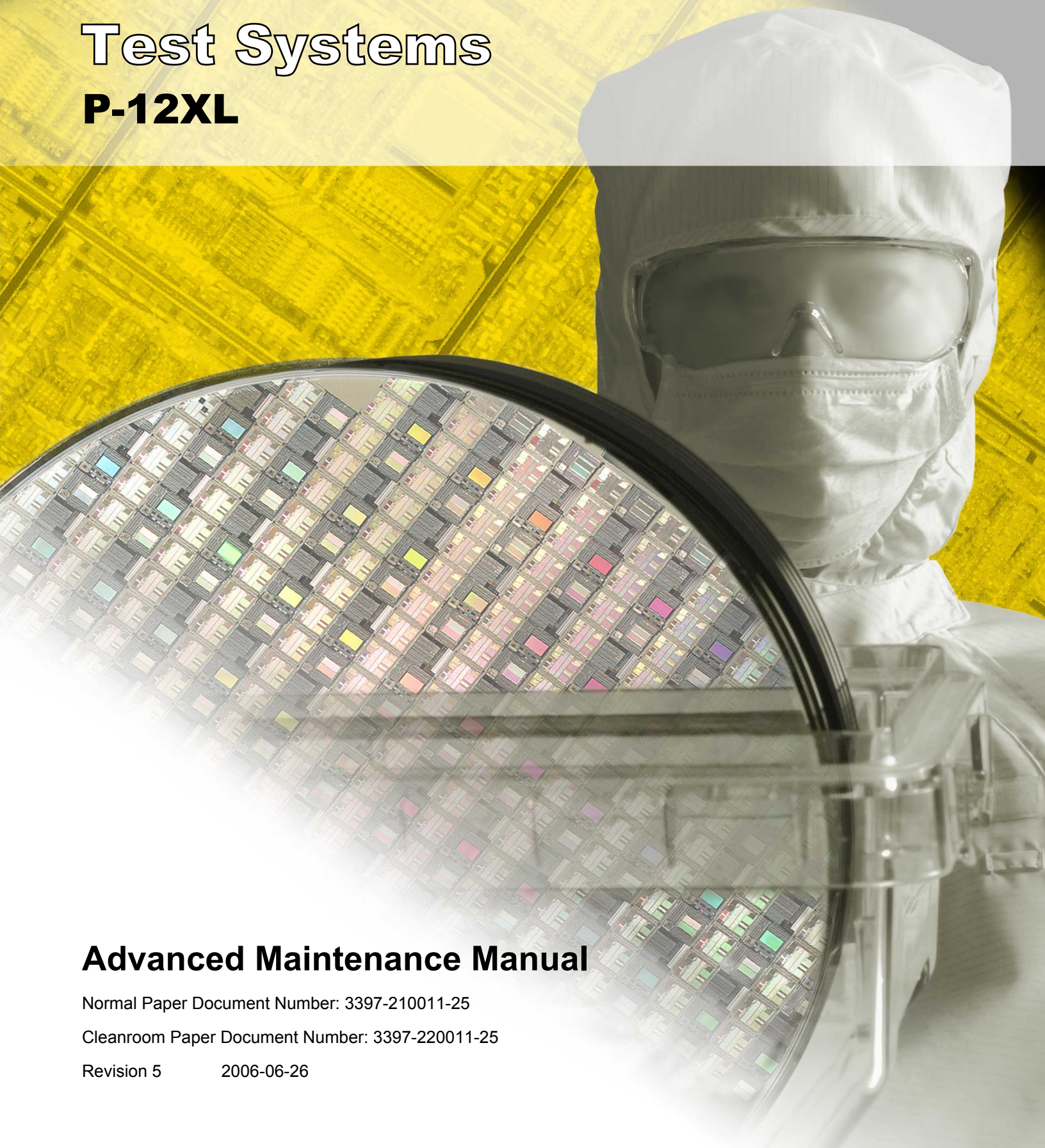
TOKYO ELECTRON

Test Systems

P-12XL



Advanced Maintenance Manual

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Advanced Maintenance Manual

Test Systems
P-12XL

Tokyo Electron Limited

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Export Control exportcontrol.2

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Colophon colophon.1

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- The HyperText Markup Language (HTML) version of the manual was created using Enigma DynaText® Publisher and distributed in compliance with an Annual Distribution License for the Enigma DynaWeb® Viewer.
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CHAPTER 1

Introduction

This chapter contains an overview of this manual, reader notices, and typographical conventions. Additionally, the Introduction includes chapter summaries for each chapter in the **P-12XL Advanced Maintenance Manual** .

1.1 The Objective of this Manual 1389.1

This manual is for test systems P-12XL/XL+ prober technicians who are responsible for the advanced maintenance (spare parts replacement, inspection, and adjustments) of TEL's Fully Automatic Wafer Prober P-12XL/XL+ (called “prober” in this manual). This manual includes steps in which there is the possibility of coming in contact with drive-related parts or electrically energized parts in the prober, and steps where parts in the prober may interfere with other parts. Therefore, only personnel trained on the maintenance of the prober (Advanced Version) and personnel who have a thorough knowledge and are approved to perform maintenance should attempt the work described herein.

1.1.1 Chapter Descriptions 1390.1

The following table includes descriptions for each of the chapters in this manual.

Chapter	Description
1	Chapter 1, the **Introduction** , describes the organization and content of the P-12XL Advanced Maintenance Manual, as well as chapter summaries for each chapter in the manual.
2	Chapter 2, **Hazard Control**, contains procedures for controlling certain hazards on the prober using the lockout and tagout procedures. It also contains descriptions of the levels of hot work that may be encountered while installing, operating or performing maintenance on the prober. For more information on hazards associated with the prober operations and maintenance, refer to the **P-12XL Safety Manual**.
3	Chapter 3, **Prober Characteristics – Maintenance**, explains the general components on the P-12XL prober and provides the preliminary information needed for maintaining the system.
4	Chapter 4, **Preparation for Maintenance** , describes the procedures that need to be performed prior to P-12XL maintenance and the cover removal necessary to begin maintenance.
5	Chapter 5, **Configuring and Performing Running Diagnostics**, describes how to set and use the running test diagnostic.
6	Chapter 6, **Stage Unit Inspections and Adjustments** , provides the procedures for performing advanced stage inspections and adjustments on the prober.
7	Chapter 7, **Loader Unit Inspections and Adjustments** , describes the inspection and adjustment procedures for the loader unit.

1.2 Notices 0003.1

1.2.1 Documentation Numbers Defined 0004.1

There are two document numbers on the cover of this manual. Note that an (N) follows one number, and a (C) follows the other. The number preceding the (N) refers to the normal bond paper documentation number. The number preceding the (C) refers to the clean room paper documentation number.

1.2.2 Software Versions 0005.2

There may be some differences in the prober's specifications because of the continual effort to improve the design and software of the prober. This manual corresponds to system software revision Rzz00-R014.05.

There are menu buttons that appear on the touch screen but are not supported by the current system software. Menu buttons that are not supported by the software will not function. These buttons will be supported in future software versions.

1.2.3 Graphic Images 0006.1

The pictures and drawings in the manual may not depict all stickers. Refer to the descriptions of the hazard label locations, for drawings that accurately depict safety sticker locations. The photographs in the manual are meant to be representative, and stickers may be in different locations on your prober.

The screen captures in the manual do not always depict what appears on the touch screen. Some menus appear on top of other menus. In this manual only the top level menu is shown in the graphic.

1.2.4 Procedure Times 0007.1

The times that are shown in each procedure are representative. The published times are based on the following conditions:

- Required tools, parts, and personnel are readily available.
- Personnel are trained in the appropriate TEA P-12XL class.
- The times do not take local fab policies into account.
- Procedures are completed as written, without omission or revision. Times shown do not account for the time required to complete associated corrective actions referenced in a separate procedure.

Therefore, when the procedure is performed at the local fab site, the actual time to complete the task may be different than shown.

1.3 Typographical Conventions 0008.1

1.3.1 Text Formatting 0009.2

Typographical conventions used in this manual include text formatting for: HARDWARE SWITCHES, SOFTWARE BUTTONS, *screen names*, `screen output`, **important points** , `user input`, and glossary terms.

1.3.2 Numeric Subscripts 0010.2

Each procedure and section title is followed by a subscripted number. The four digits (0010 for this section) before the period make up a unique control number. The number following the period is the revision number for the section or procedure.

1.3.3 Hazard Key Words Used in the Manual 0011.1

Key words for safety warnings are used in this manual and in warning labels posted on the equipment.

Signal words are words that indicate to equipment users and individuals who work near the equipment the magnitude of dangers in the equipment. There are three types of signal words depending on the level of danger.

⚠ DANGER

Danger labels indicate an imminently hazardous situation, that if not avoided, WILL result in death or serious injury. Danger key word panels use white text on a red background as shown.

⚠ WARNING

Warning labels indicate a potentially hazardous situation, that if not avoided, COULD result in death or serious injury. Warning key word panels use white text on an orange background as shown.

There are two types of caution panels, one for personnel, and one for equipment.

⚠ CAUTION

Personnel caution labels indicate a potentially hazardous situation, that if not avoided, MAY result in minor or moderate injury to personnel. Personnel caution key word panels use black text on a yellow background, including the safety alert symbol (an exclamation point inside a triangle) as shown.

CAUTION

Equipment caution labels indicate a potentially hazardous situation, that if not avoided, MAY result in property damage to equipment or product. Equipment caution key word panels use black text on a yellow background. This panel does not include the triangle.

1.4 Contacting Tokyo Electron 1701.2

Contact Tokyo Electron at 1-800-TOKYO50 (1-800-865-9650) for troubleshooting assistance, parts ordering, service requests, or any other reason 24 hours a day, 7 days a week.

To contact Tokyo Electron worldwide sales and service offices directly, locate information in English at **http://www.tel.com/eng/about/locations/locations.htm** or in Japanese at **http://www.tel.com/jpn/about/locations/japan.htm**.

Tokyo Electron has an additional English website at **http://www.telcustomer.com** to provide online services to customers in the United States.

1.4.1 Sales and Service Offices Worldwide 0012.1

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Dallas Office	1651 N. Collins Blvd., Suite 150, Richardson, Texas 75080 U.S.A.	972-705-9234	972-705-9987
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Fishkill Office	20 Corporate Park Drive, Suite A Hopewell Junction, New York 12533 U.S.A.	845-231-0000	845-897-9548
Los Angeles Office	23440 Hawthorne Blvd., Suite 260, Torrance, California 90505 U.S.A.	310-378-7663	310-378-1320

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	2500 Montopolis Drive, Austin, Texas 78741-6404 U.S.A.	512-486-4000	512-486-4001
TOKYO ELECTRON MASSACHUSETTS, LLC			
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TOKYO ELECTRON DEUTSCHLAND GmbH			
Munich Office (Head Office)	Carl-Zeiss-Ring 5, 85737, Ismaning, Germany	89-96278-0	89-96278-111
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Dresden Office	Moritzburger Weg 67, Haus D, 01109 Dresden, Germany	351-885920	351-8859288
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	Collinstown Industrial Park, Leixlip, Co. Kildare, Ireland	1-606-7923	1-606-8944
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Migdal HaEmec Office	2nd Floor, Galai Building, Mada St., Ramat Gabriel Industrial Area, Migdal HaEmek, Israel	4-6040350	4-6440505
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Rousset Office	ST Microelectronics Zone Industrielle de Rousset 13106 ROUSSET cedex France	4-4253-4012	4-4253-2288
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Cheonan Office	129 Block 10 Lot, Seong-jeong-Dong, Cheonan-City, Chungchongnam-Do, Korea	31-260-5194/5195/5196	31-260-5197
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Head Office	30Fl, No. 28 Xinjinquao Road, Puding 201206, China	21-5032-8833	21-5032-8877

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We appreciate all feedback you give us. Your feedback helps us keep our manuals accurate and up-to-date.

C H A P T E R 2

Hazard Control

This chapter contains procedures for controlling certain hazards on the prober using the lockout and tagout procedures. It also contains descriptions of the levels of hot work that may be encountered while installing, operating or performing maintenance on the prober. For more information on hazards associated with the prober operations and maintenance, refer to the **P-12XL Safety Manual**.

2.1 Types of Hot Work 1301.1

SEMI has defined four Hot Work Levels to indicate the type and severity of electrical hazards that are present to personnel while working on a particular piece of equipment. Be sure to read and understand these types before performing any procedure that could expose you to electrical hazards. The following list provides a description of each Hot Work Level:

- Type 1
  Equipment is fully de-energized (electrically cold). This includes all uninterrupted power supplies.
- Type 2
  Equipment is energized. Live circuits are covered or insulated. Work is performed at a remote location to preclude accidental shock.
- Type 3
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Potential exposures are less than 30 VRMS, 42.2 volts peak, 240 volt-amps, and 20 Joules. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.
- Type 4
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Voltage potentials are higher than 30 VRMS, 42.2 volts peak, 240 volt-amps, 20 Joules, or radio frequency (rf) energy is present. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.

2.2 Performing Lockout and Tagout on the Prober 0040.2

Introduction

Purpose:

To perform lockout and tagout on the prober.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	Safety goggles Padlocks and keys for lockout/tagout locks, lockout tags
Parts or Consumables:	None

1 Inform all necessary personnel that the prober will be locked out. Stop any testing that is in process and unload all wafers.

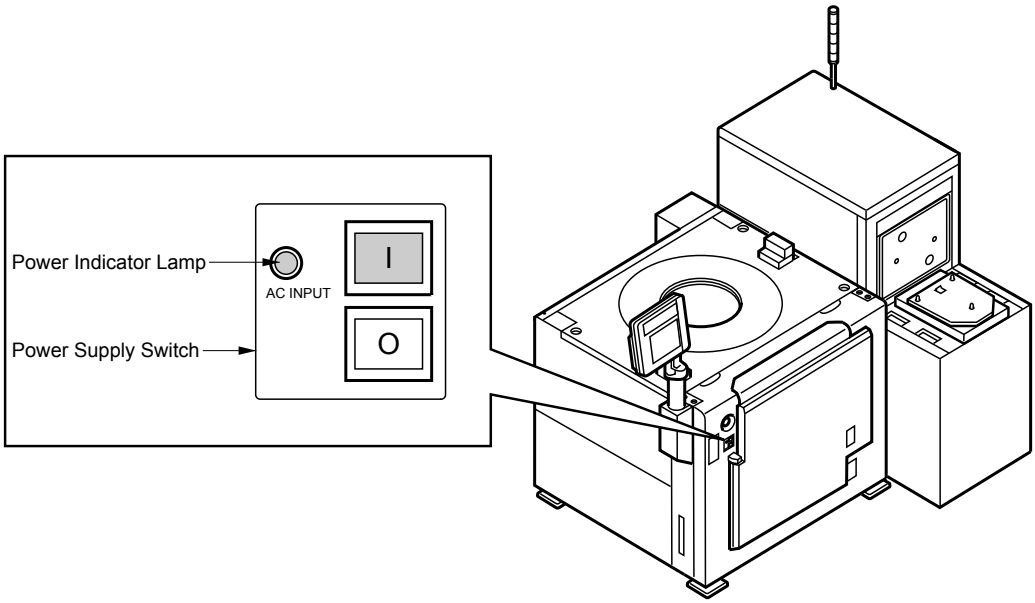
2 Navigate to the `Main Menu` on the touch screen.

3 Press SHUTDOWN on the *Main Menu*. A check menu is displayed asking, `Do you want to shutdown?`.

4 Press YES. The prober stops accessing the hard disk and floppy disk drives, then a message menu is displayed stating, Restart the system.

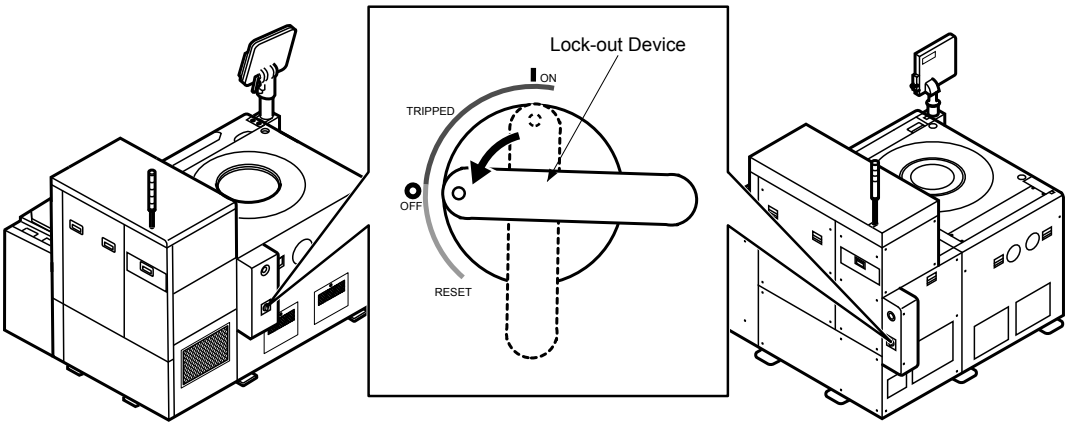
5 Check that the restart message is displayed, then press the power supply switch [O] on the front of the prober to turn off the power supply to the prober.

Power Supply Switch



6 Turn the lockable energy isolation device on the back of the prober to OFF. The supply of power to the prober is stopped.

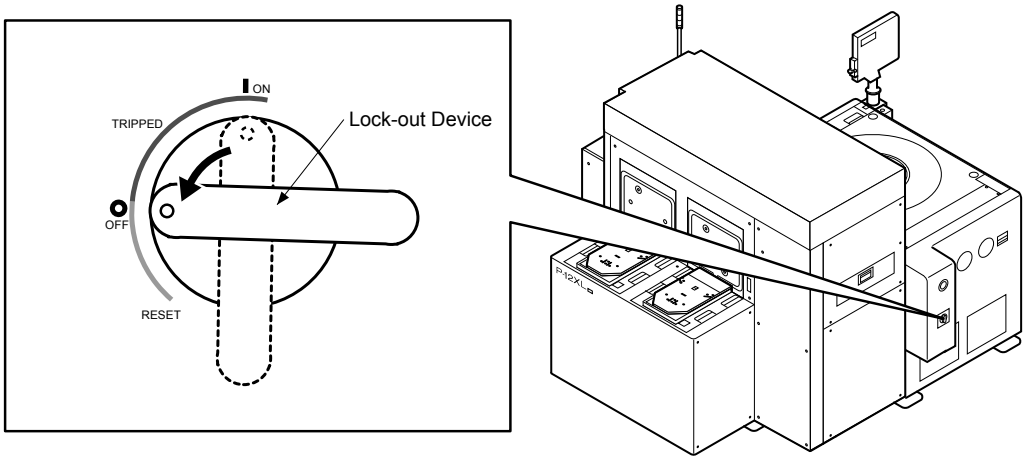
Lockout Device Handle (Single Port)



Single Port Loader Specification

Wide Loader Specification

▼ **Lockout Device Handle (Wide Loader)**



7 Secure the position of the lockable energy isolation device with a padlock and place a lockout tag on the padlock. The tag should include notes or warnings that are required by test floor procedures.

8 Check that the power supply will not turn on even if the [I] switch on the front switch panel of the prober is pressed.

9 Inform others that you are performing maintenance work and that the prober cannot be used.

2.3 Releasing Lockout and Tagout on the Prober 0043.1

Introduction

Purpose:

To release a system from the locked out state.

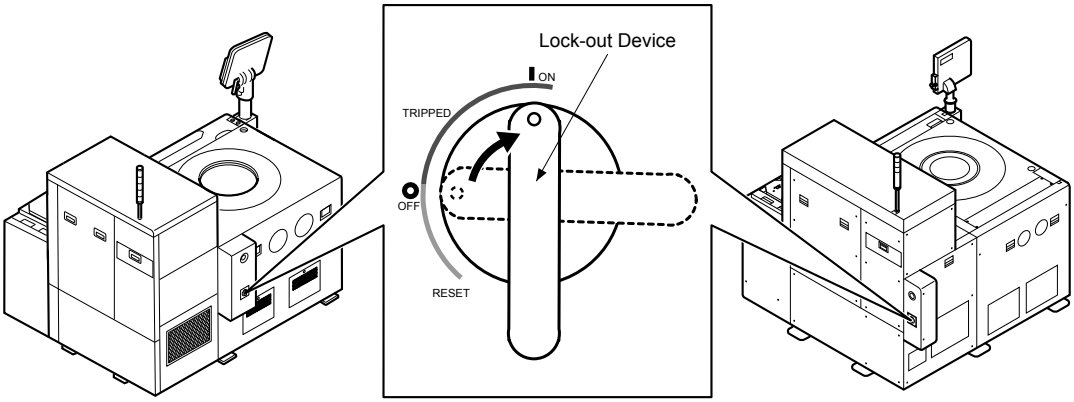
Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	Safety Glasses/Goggles Keys for lockout/tagout locks, lockout tags
Parts or Consumables:	None

1 After finishing maintenance work, replace any covers, close all access doors, close and secure the head plate, and check around the immediate area of the tool for any safety hazards. After checking that the area is safe and that all personnel are clear of the prober, remove the padlock and lockout tag on the lockout handle. Inform local maintenance personnel to remove their locks and lockout tags.

2 Turn the lockable energy isolation device to ON to establish AC input to the power supply of the prober.

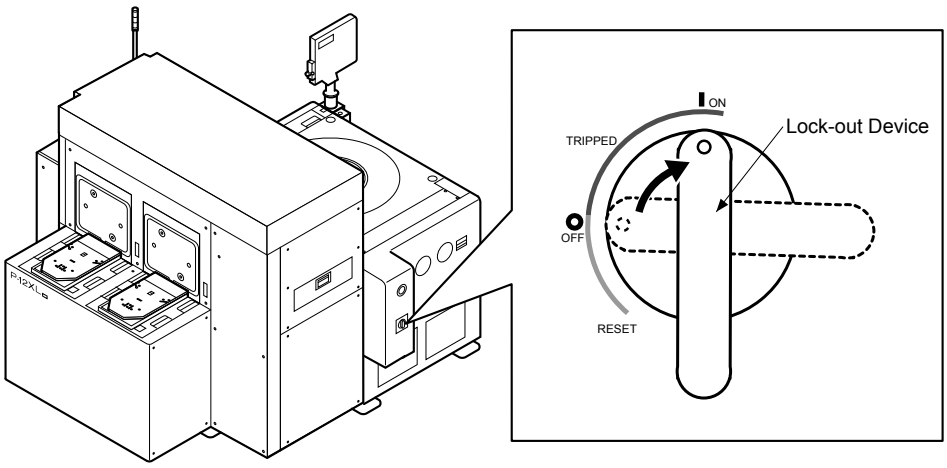
Lockout Device Handle (Single Port)



Single Port Loader Specification

Wide Loader Specification

▼ **Lockout Device Handle (Wide Loader)**

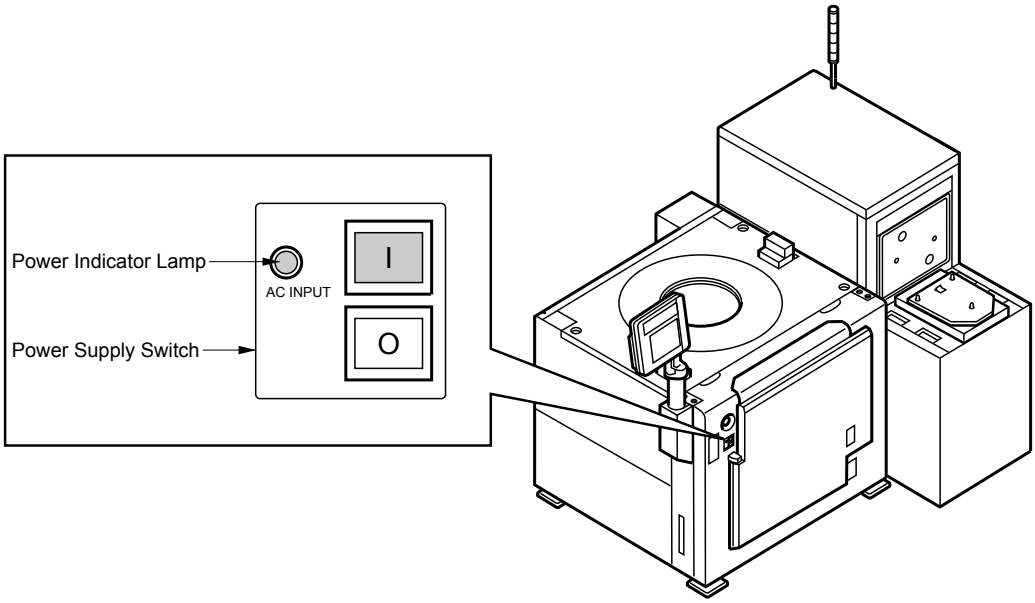


3 Press the power supply switch [I] on the front panel to turn ON the prober.

CAUTION **Property Damage Hazard**

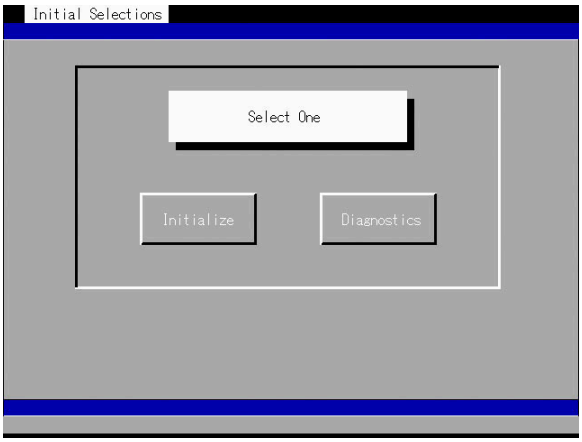
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

▼ **Power Supply Switch**



4 When the prober has completed the boot-up process, press INITIALIZE on the *Initial Selections Menu*. The stage and loader are initialized and the *Main Menu* is displayed.

Initial Selections Menu



5 Inform others that you have completed your maintenance work and that the prober can be used.

C H A P T E R 3

Prober Characteristics - Maintenance

This chapter provides a general description and explanation of each P-12XL/XL+ prober component, as well as procedures for using each component. Each section describes the purpose of the associated procedures and provides the menu path to the appropriate screen for performing them.

3.1 Diagnostic Program Software 0057.1

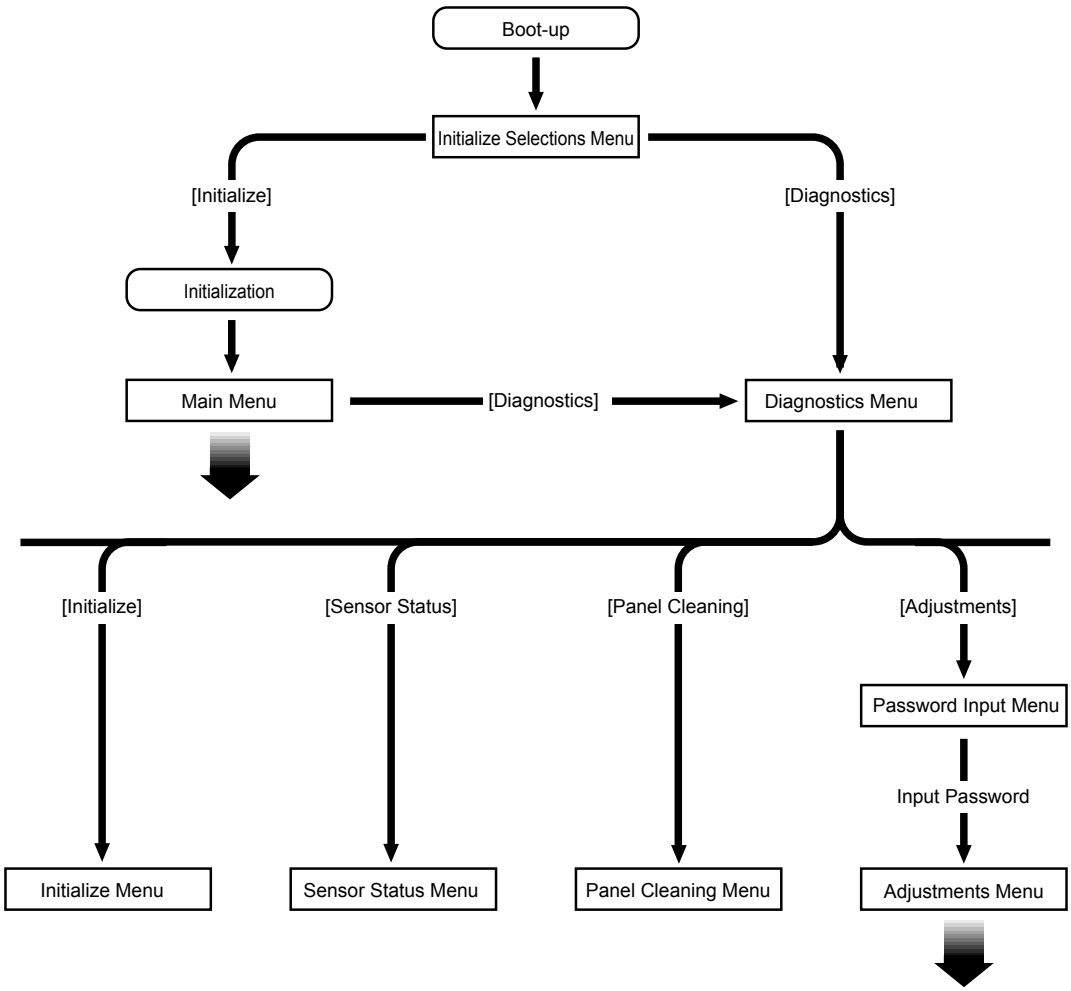
Several diagnostic menus are included in the prober software to facilitate maintenance. Use these menus when performing any inspections, adjustments, or maintenance on the prober. The diagnostics menus are also used to set ambient conditions during prober installation and to change prober operating conditions.

NOTE **Observe basic safety practices and all warning labels located on the prober components when using the diagnostic menus.**

Access the diagnostic menus by pressing DIAGNOSTICS on the touch screen after turning on the prober power. The diagnostic menus are composed of several levels. A user can get to a specific menu level by selecting the items that are currently under inspection as they appear on the touch screen.

A simplified flow of diagnostic menus is outlined in the following graphic.

Menu Flow

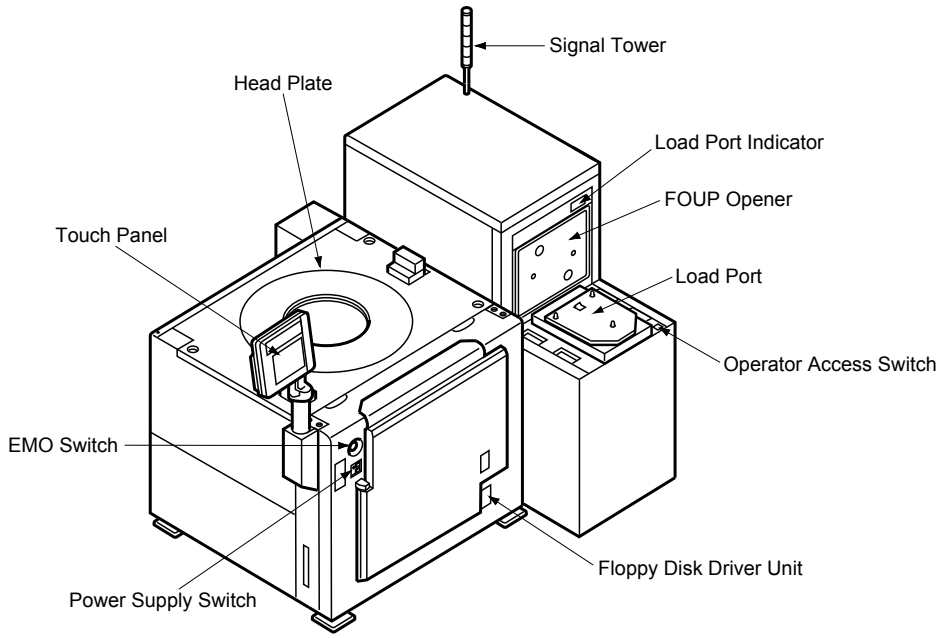


3.2 Prober External Equipment: Names and Locations 0058.1

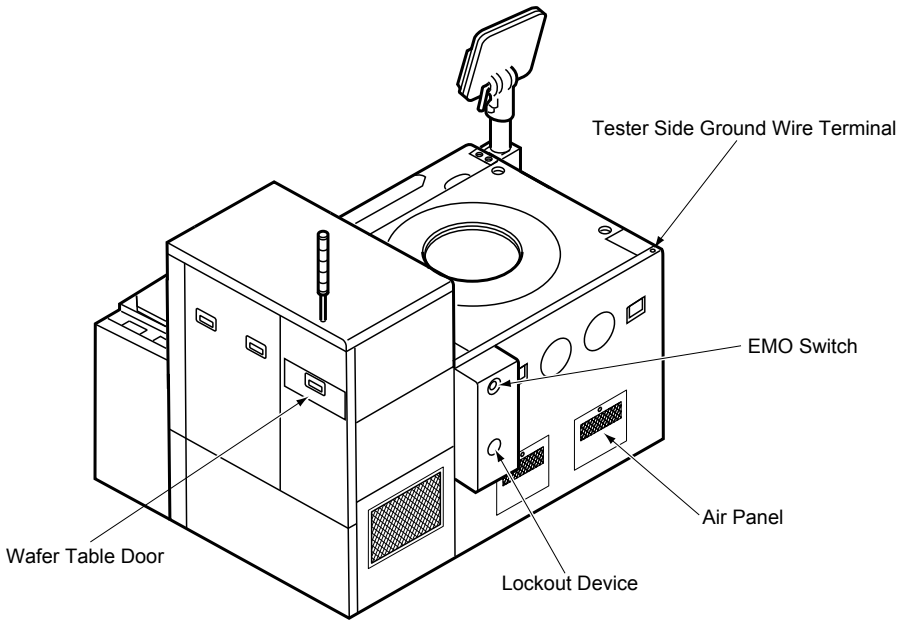
There are several basic external components on the prober. The following sections displays the prober part names and locations of the single port loader prober (standard), the dual port loader prober, and the wide loader prober.

3.2.1 Prober External Equipment (Single Port) 0059.1

Prober Front (Single Port)

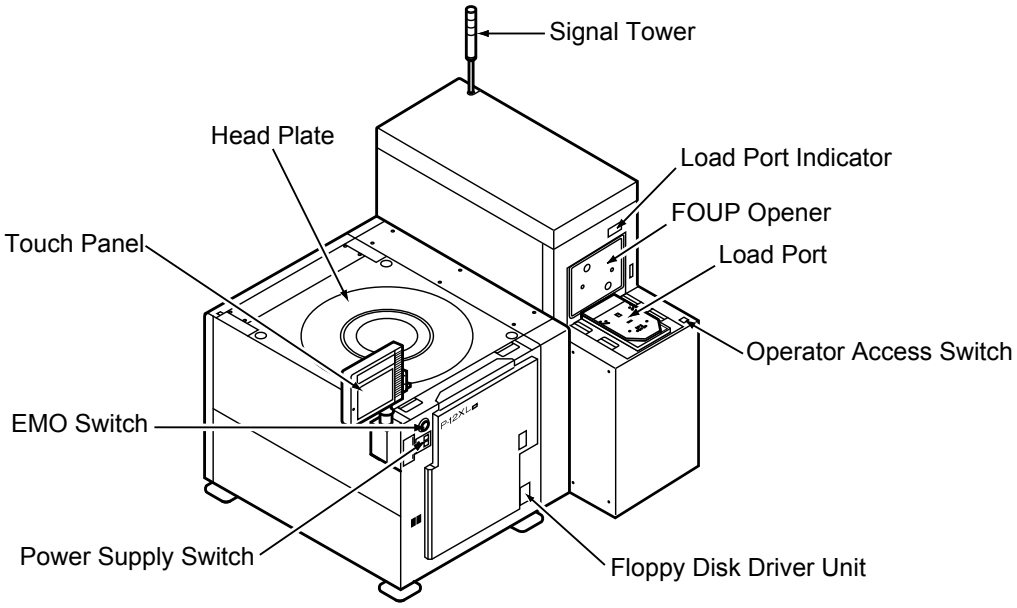


Prober Rear (Single Port)

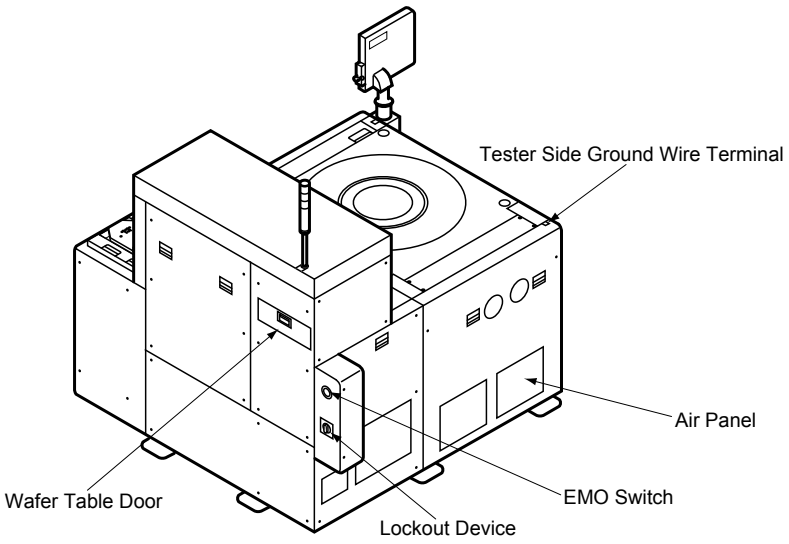


3.2.2 Prober External Equipment (Wide Loader) 1302.1

Prober Front (Wide Loader)

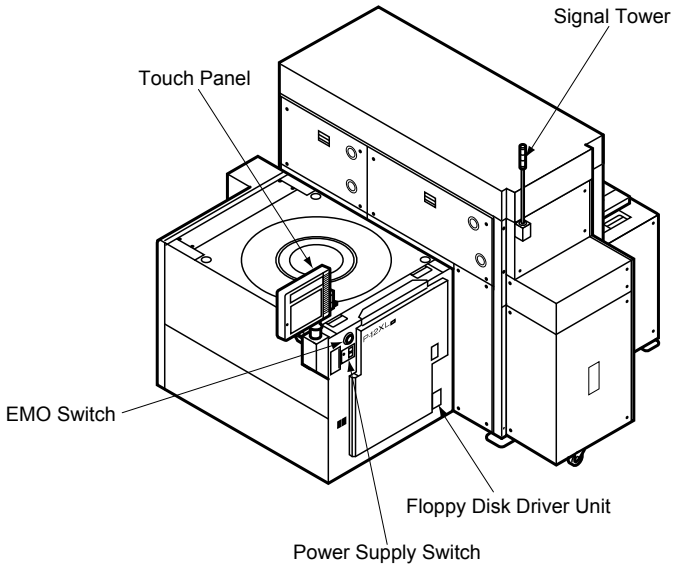


Prober Rear (Wide Loader)

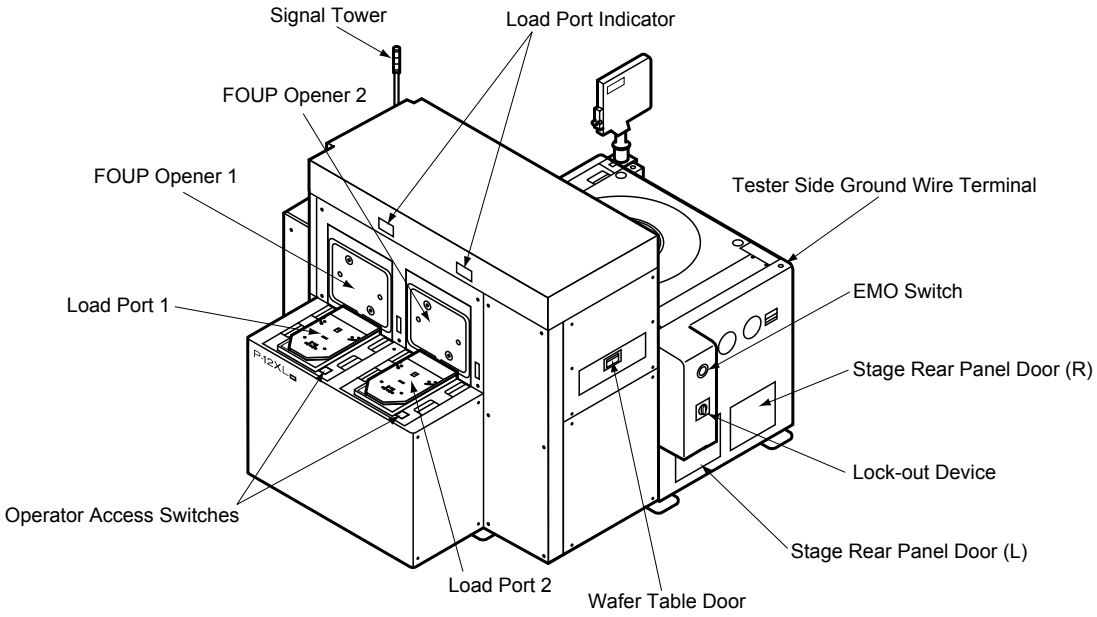


3.2.3 Prober External Equipment (Dual Port) 0060.1

Prober Front, Left Side (Dual Port)



Prober Right, Rear Side (Dual Port)



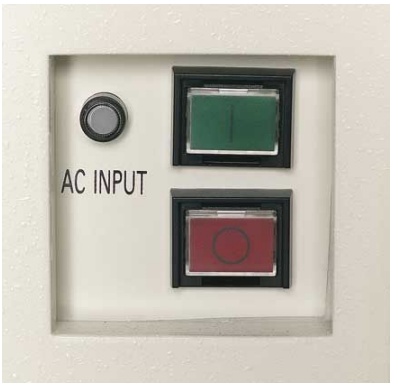
3.3 Prober Part Descriptions 0061.1

3.3.1 Power Supply Switch 0062.1

The power supply switch powers up the prober. The power supply indicator lamp, labeled AC INPUT, illuminates to indicate that the main power supply has been turned ON.

- Pressing the [I] switch starts the power-up process.
- Pressing the [O] switch turns off power to the prober.

Power Supply Switch



3.3.2 Emergency Machine Off Switch 0063.1

To prevent injury and/or damage to the prober, press the EMO SWITCH on either the prober front or rear to stop the prober in an emergency situation. The main power supply is shut off and the prober immediately shuts down.

Do not press the EMO SWITCH to turn off the power for a normal power down; use the [O] switch on the front of the prober.

NOTE Always wait 15 to 30 seconds before turning the prober back on after turning it off. This allows the prober to completely power down before powering up again.

3.3.3 Touch Screen 0064.1

The touch screen is a touch panel used to operate the prober and navigate through the software; it displays menus, parameters, messages, and testing results.

3.3.4 Floppy Disk Drive Unit 0065.1

The floppy disk drive (FDD) unit is used to load or copy wafer parameters, operation parameters, and prober parameters to and from floppy disks. The FDD also copies logs onto floppy disks, or copies control maps

created on an external source onto the prober hard disk. You can use both 1.2 and 1.44 MB formatted floppy disks.

3.3.5 Wafer Table Door 0066.2

The wafer table door is located on the side of the loader. This door must be opened to gain access to the wafer table. The wafer table is used to load or unload an individual test wafer or a polish wafer.

3.3.6 Signal Tower 0067.1

The signal tower has three colored lights that indicate the prober's general operating status. A solid green light indicates normal operation; a flashing yellow light indicates an assist situation; and a flashing red light indicates that the prober requires immediate attention.

NOTE **Lamp lighting sequences vary according to customer specifications.**

3.3.7 Head Plate 0068.2

The head plate is the top cover of the stage unit. It contains the probe card holder and insert ring and is the main point of interface to the test head.

3.3.8 Tester Side Ground Wire Terminal 0070.1

The tester side ground wire terminal is a single axis connector output terminal connected to the surface of the chuck top.

3.3.9 Operator Access Switch 1332.1

This is used when the operator accesses the load port.

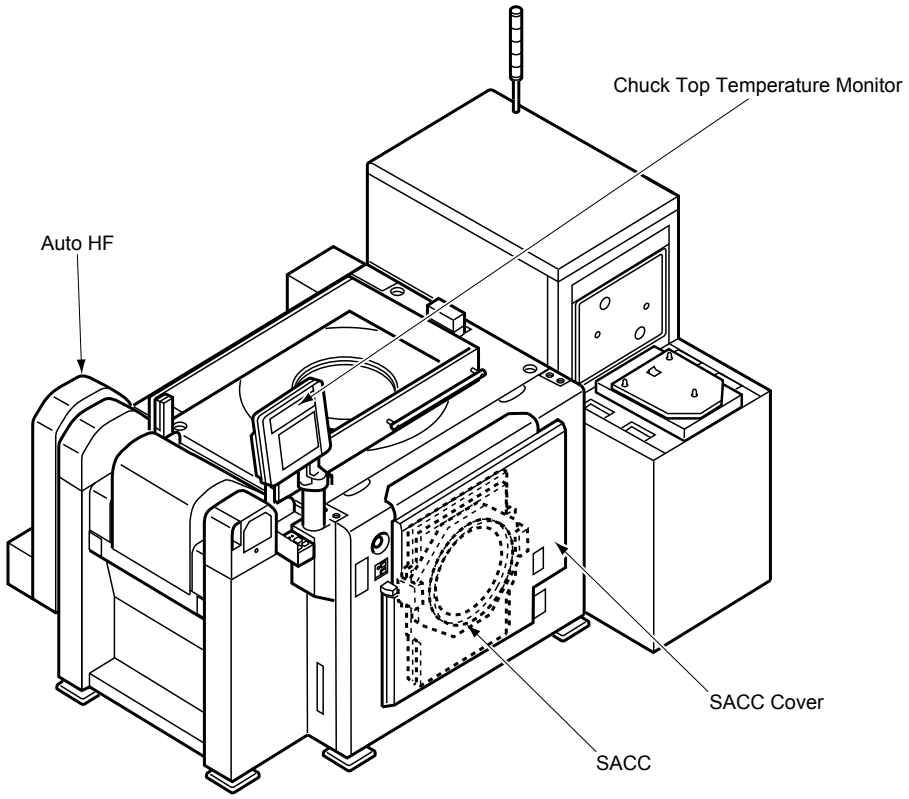
3.3.10 Load Port Indicator 1333.1

This indicates the state of the load port using an LED.

3.4 Optional Units: Names and Positions 0072.1

The optional units available for the prober are shown in the following graphic. Depending on the specification, certain parts may be located in slightly different positions in the prober. Brief explanations of the purpose of each optional unit are provided thereafter.

P-12XL Optional Units



3.4.1 Automatic High Frequency Balancing Unit (Auto HF) 0073.1

This unit holds the test head. Use the Auto HF to retract the test head and gain access to the head plate.

3.4.2 HOT & COLD 1331.1

This unit controls the chuck top temperature. The range of the controllable temperature differs depending on the specifications. The chuck top temperature monitor displays the current chuck top temperature, the temperature settings, and the temperature control status.

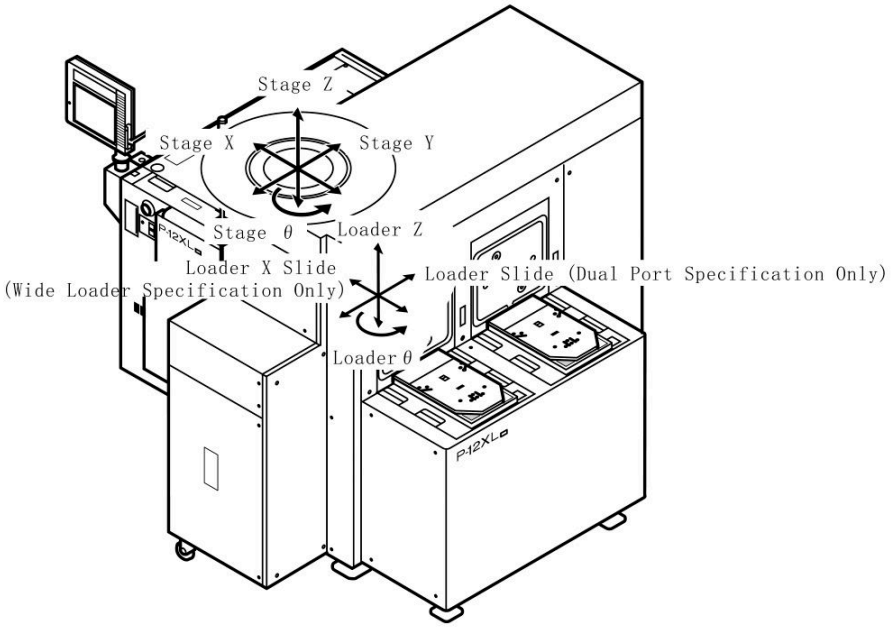
3.4.3 Semiautomatic Card Changer (SACC) 0075.1

This unit changes the probe card semiautomatically. The SACC mechanism automatically transfers a probe card mounted on the card tray to the inside of the prober and mounts it onto the head plate.

3.5 Prober Units: Variations in Axes Movement Directions 0076.1

This figure displays the movable axes of the loader unit and stage unit.

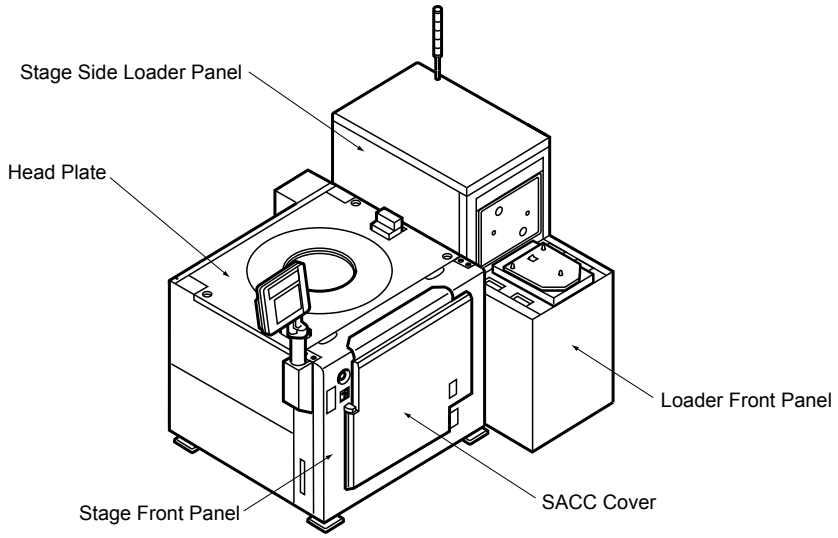
Prober Movable Axis



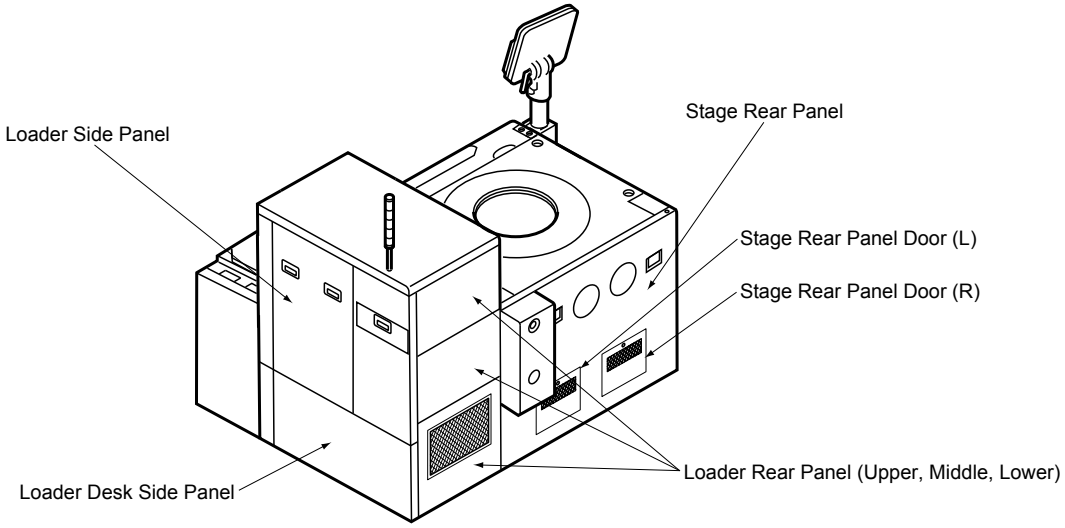
3.6 Covers and Panels: Names and Positions 0077.1

3.6.1 Prober Covers and Panels (Single Port) 0078.1

Front Covers and Panels (Single Port)

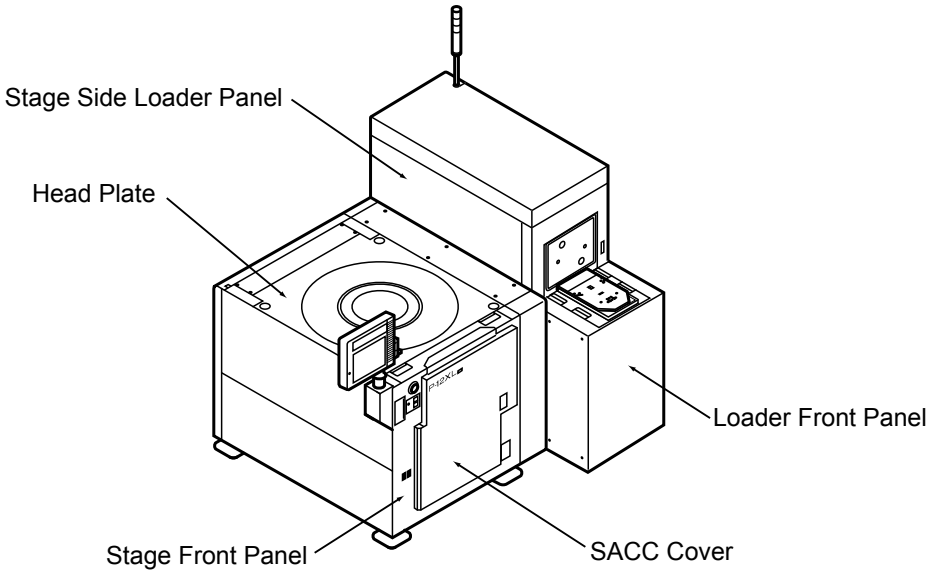


Rear Covers and Panels (Single Port)

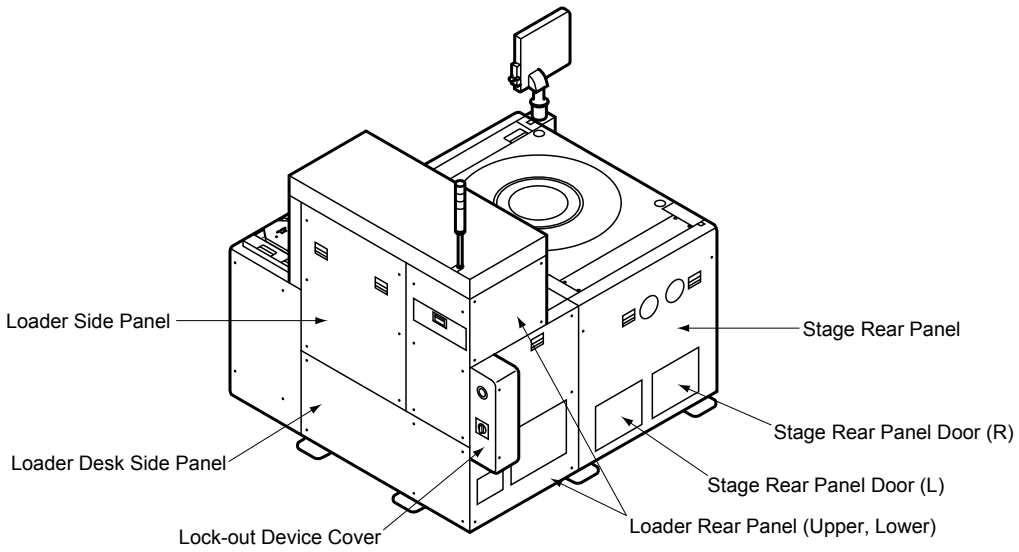


3.6.2 Prober Covers and Panels (Wide Loader) 1303.1

Front Covers and Panels (Wide Loader)

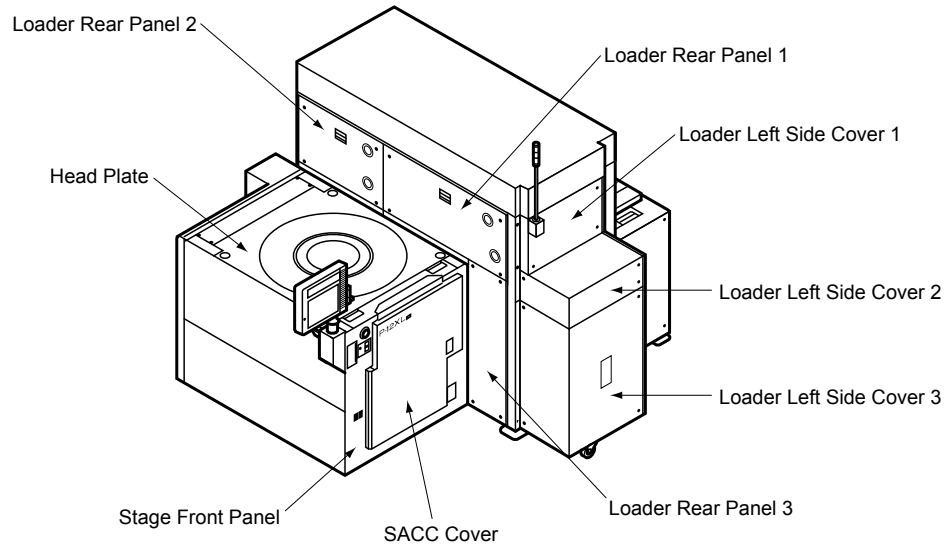


Rear Covers and Panels (Wide Loader)

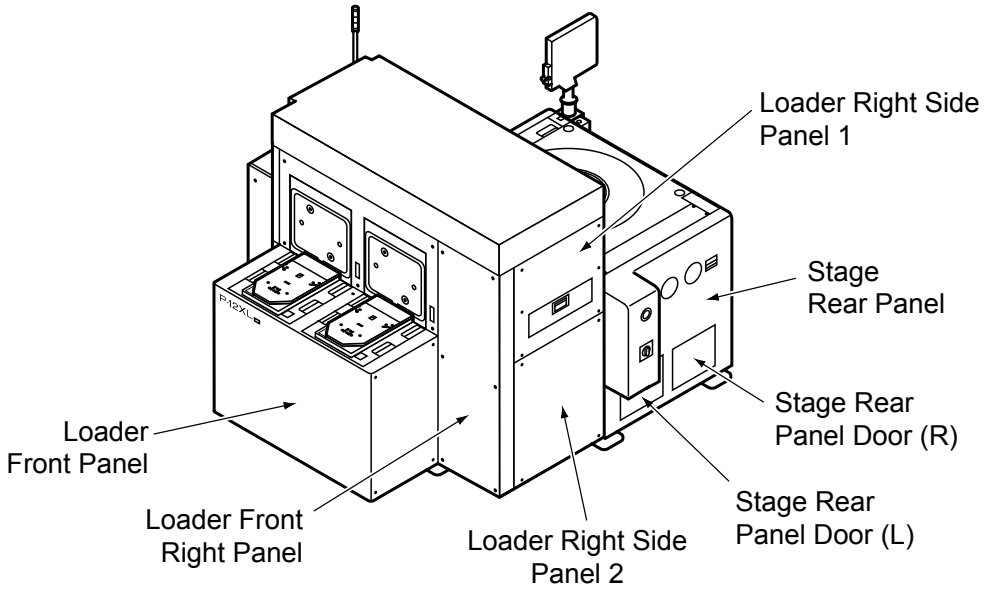


3.6.3 Prober Covers and Panels (Dual Port) 0079.1

Front Covers and Panels (Dual Port)



Rear Covers and Panels (Dual Port)



3.7 Prober Movement-Overview 0080.1

The prober transfers wafers from the FOUP to the stage, then back to the FOUP, after testing. The following sections describe the general prober movements during running test.

3.7.1 Mapping and Probe Alignment 0081.1

The prober saves the wafer positions in the FOUP as FOUP map data. The wafers are inside of the FOUP when they are mapped.

- The loader arm faces the FOUP and moves to a position to start mapping.
- The mapping arm moves forward toward the FOUP. Optical sensors on the tips of the mapping arm detect the presence of wafers stored in the FOUP, measure their approximate thickness, and determine which slots contain wafers.
- After these measurements, the loader arm moves back to its original position.

3.7.2 Wafer Out 0082.1

The wafer is removed from the FOUP and placed onto the upper arm.

- The upper arm moves toward the FOUP and is inserted into the gap between the wafers stored in the FOUP.
- The load arm rises and the wafer is placed on the upper arm. The vacuum is turned ON.
- After the wafer is properly placed, the upper arm returns to its home position.

3.7.3 Wafer In 0083.1

The wafer on the lower arm is placed into the FOUP after testing.

- The lower arm moves toward the FOUP and the vacuum turns OFF as the wafer is inserted into the correct slot.
- The load arm lowers and the wafer is transferred from the lower arm to the FOUP.
- After this transfer is complete, the lower arm moves back to its home position.

3.7.4 Prealignment 0084.1

This section describes how the prober detects the wafer's center position and flat orientation and positions the wafer at the designated angle. The wafer sitting on the upper arm is then transferred to the subchuck, prealigned, then transferred back to the upper arm.

- The subchuck rises and the wafer is moved from the arm to the subchuck.

- The subchuck performs a theta rotation, and optical sensors above and below the wafer detect the wafer's center position and flat orientation. The subchuck then positions the wafer to the designated angle.
- After prealigning the wafer, the subchuck lowers and returns the wafer to the upper arm.

3.7.5 Wafer Loading 0085.1

This section describes how the prober transfers wafers to the main chuck. The wafer sitting on the upper arm is then transferred to the main chuck.

- After prealignment, the entire load arm rotates toward the stage. The stage moves to the wafer hand-over position. The chuck top on the stage unit moves to the wafer hand-over position. For wide loader specification, the entire arm unit moves after rotating to the stage.
- The upper arm is positioned over the main chuck. The upper arm vacuum is turned OFF.
- The loader Z lowers the wafer.
- The main chuck rises with the 3-pins protruding. The wafer is removed from the upper arm.
- After transferring the wafer, the upper arm moves back to its home position.
- After the upper arm moves, the 3-pins lower, and the wafer is held securely to the main chuck surface by a vacuum.

3.7.6 Wafer Unloading 0086.1

This section describes how the prober moves the wafer from the main chuck to the arm. The wafer is moved from the main chuck to the lower arm.

- The main chuck moves to the wafer hand-over position. The 3-pins protrude from the chuck top.
- The lower arm is inserted between the wafer and the chuck top.
- The lower arm lifts the wafer off 3-pins.
- The 3-pin risers lower, and the wafer is set onto the lower arm.
- The lower arm is then returned to its home position.

3.7.7 Alignment 0087.1

This section describes the alignment bridge and main chuck movements during wafer alignment.

- The main chuck and alignment bridge move to the alignment position.
- The camera matching is performed between the bridge and chuck cameras using the target mark.
- The CSU moves to the reference pin macro position and searches for the reference pin image.
- After recording the reference pin, the CSU locates and records the remaining alignment pins in macro view mode and searches for the reference probe tip.

- After successful recognition, the CSU then locates the remaining alignment pins in micro view. During the micro view recognition, the alignment is collecting the pin tip XYZθ coordinates of the pin tip's actual positions.
- When probe alignment is complete, the CSU camera turns off. The alignment bridge macro camera is activated.
- The Z stage positions the calculated wafer center intersection under the camera and crosshairs. The macro image target recognition is performed.
- The stage indexes to the left of the center intersection and performs a coarse theta adjustment in macro view.
- The stage then moves to the last calculated die position on the right side of the wafer and repeats to image recognition and makes a fine theta adjustment.
- The stage moves back to the center location and the macro view turns off and the micro view turns on.
- The stage then moves to the crosshair position over the alignment target image.
- Image recognition is performed. If successful, the stage then moves to the last calculated die position on the left side of the wafer.
- Alignment target recognition is repeated. If successful, the stage moves in the opposite direction to position the micro view camera over the last calculated die and performs alignment target recognition.
- Upon completion, the stage moves back to the center location, the alignment target coordinate, and performs XYZθ positioning data.
- The stage then moves to the remaining four wafer alignment sites, collecting the XYZθ positioning data.
- Returning to the center position, the stage completes the micro alignment sequence.
- Prober alignment system then calculates the best fit PTPA positions for contact.
- The upper and lower camera matching is repeated for accuracy.

3.8 Prober Layout-Overview 0088.1

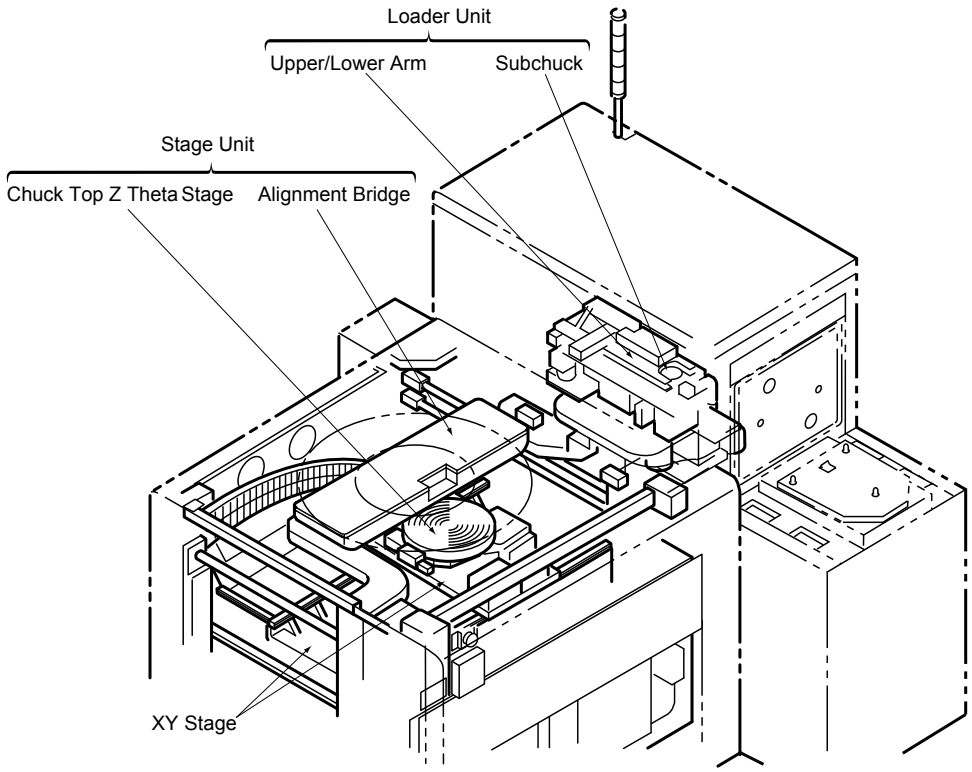
The loader and stage are the two main prober units.

The loader unit removes a wafer from its FOUP, determines the wafer size, orients the flat/notch, centers the wafer onto the arm, and loads the wafer onto the stage unit.

The stage unit uses image recognition to align the loaded wafers in relation to the probe card.

Sensor and image recognition determine the wafer size and its position on the chuck top. Since there are tolerance limits for wafer positioning, you must inspect and adjust the sensors, image recognition equipment, and other positioning equipment contained in the loader and stage units. The following sections describe the various parts of these two major components.

Prober Unit Layout

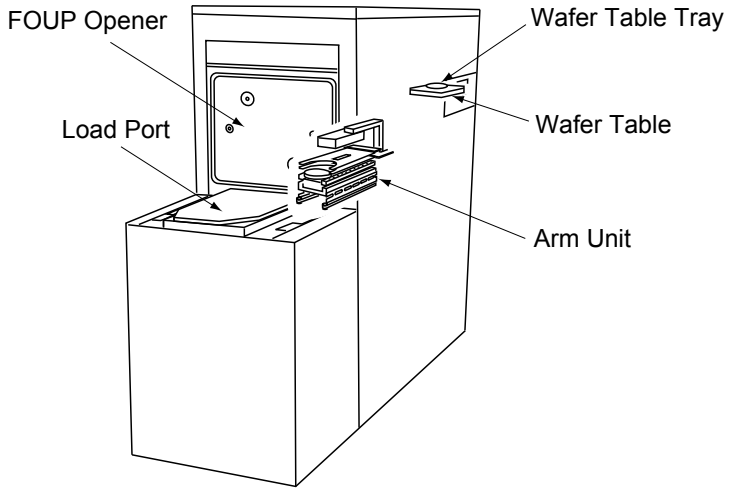


3.9 Loader Unit: Parts and Function 0089.1

The loader unit is composed of the FOUP opener, wafer table tray, wafer table, load port, and the arm unit. Loader unit components for single port loader and dual port loader are shown below.

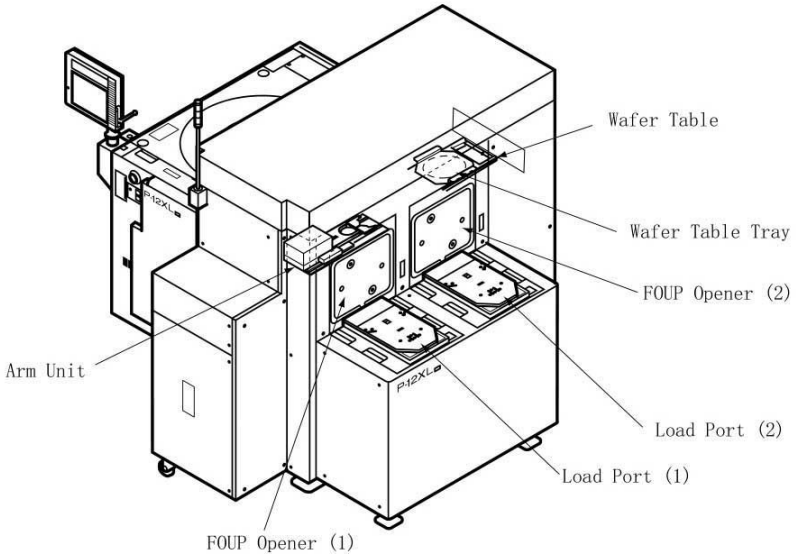
3.9.1 Loader Unit (Single Port and Wide Loader) 0090.1

Loader Unit Layout (Transparent Illustration)



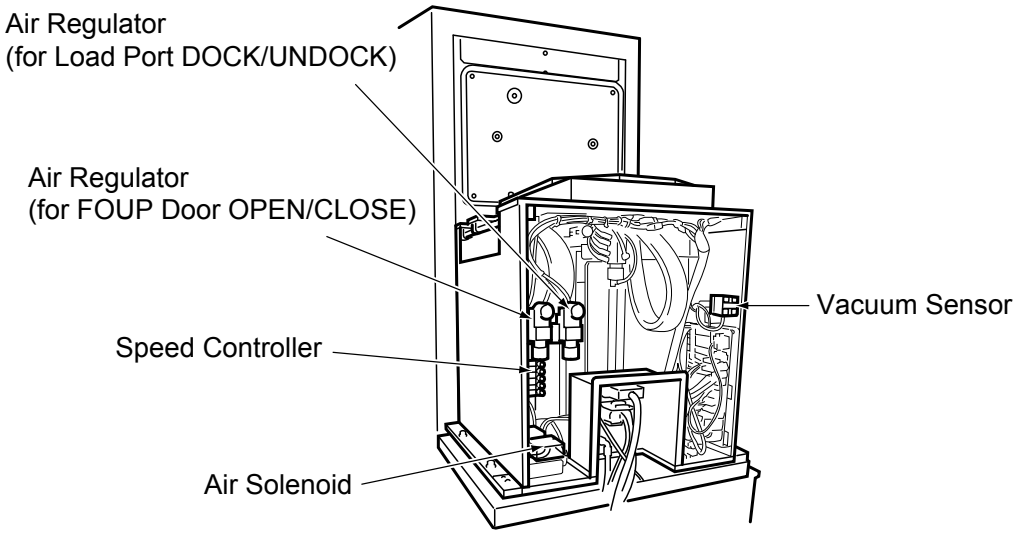
3.9.2 Loader Unit (Dual Port) 0091.1

Loader Unit Layout (Transparent Illustration)



3.9.3 Loader Unit Control System 0092.1

FOUP Control System



3.9.3.1 Air Regulator (for FOUP Door OPEN/CLOSE) 0093.1

This air regulator is the driving air adjusting regulator and functions as a display gauge for the FOUP door OPEN/CLOSE.

3.9.3.2 Air Regulator (for Load Port DOCK/UNDOCK) 0094.1

This air regulator is the driving air adjusting regulator and functions as a display gauge for the Load port DOCK/UNDOCK.

3.9.3.3 Speed Controller 0095.1

This controls the speed of the driving units of the FOUP opener and the load port.

3.9.3.4 Air Solenoid 0096.1

This controls the driving air for the FOUP opener and the load port.

3.9.3.5 Vacuum Sensor 0097.1

This detects the vacuum pressure for attaching the FOUP door.

3.9.4 FOUP Opener 0098.1

The FOUP opener is part of the Bolts Light loader. It opens and closes when the prober is retrieving and returning wafers to and from the FOUP.

3.9.5 Load Port 0099.1

The load port is a platform on which the FOUP is placed.

3.9.6 Wafer Table 0100.1

The wafer table is used to load individual wafers into and out of the prober. The wafer table tray rest on top of the wafer table.

3.9.7 Wafer Table Tray 0101.1

The wafer table tray is used to manually load wafers onto the wafer table.

3.10 Upper/Lower Arm Unit: Parts and Function 0102.1

3.10.1 Upper/Lower Arm Unit 0103.1

The function of the upper/lower arm assembly is to transfer wafers from the FOUP to the chuck top, and then back to the FOUP. The arm assembly components are described below:

3.10.1.1 Upper Arm 0104.1

The upper arm removes a wafer from the FOUP and places it on the chuck top.

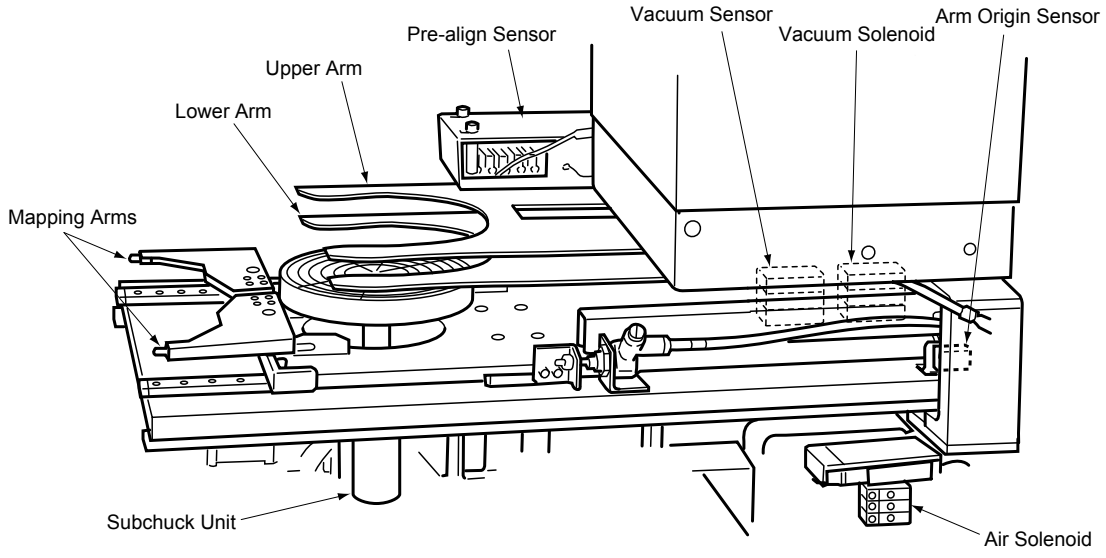
3.10.1.2 Lower Arm 0105.1

The lower arm transfers a wafer from the chuck top back into the FOUP.

3.10.1.3 Prealignment Sensor 0106.1

The prealignment sensor detects the wafer flat orientation and the wafer center position.

Upper/Lower Arm Assembly



3.10.1.4 Upper/lower Arms Origin Sensor 0107.1

The arm origin sensor detects the arm's presence when the arm is in the origin position.

3.10.1.5 Mapping Arms 0108.1

The mapping arm determines the positions of the wafers stored in the FOUP. The light-emitting sensor maps the thickness and position of each wafer in the FOUP.

3.10.1.6 Subchuck Assembly 0109.1

The subchuck holds the wafer while the prealigner orients the wafer's position for placement on the chuck.

3.10.1.7 Vacuum Sensor 0110.1

The vacuum sensor detects the vacuum pressure for the upper/lower arms and the subchuck.

3.10.1.8 Vacuum Solenoid 0111.1

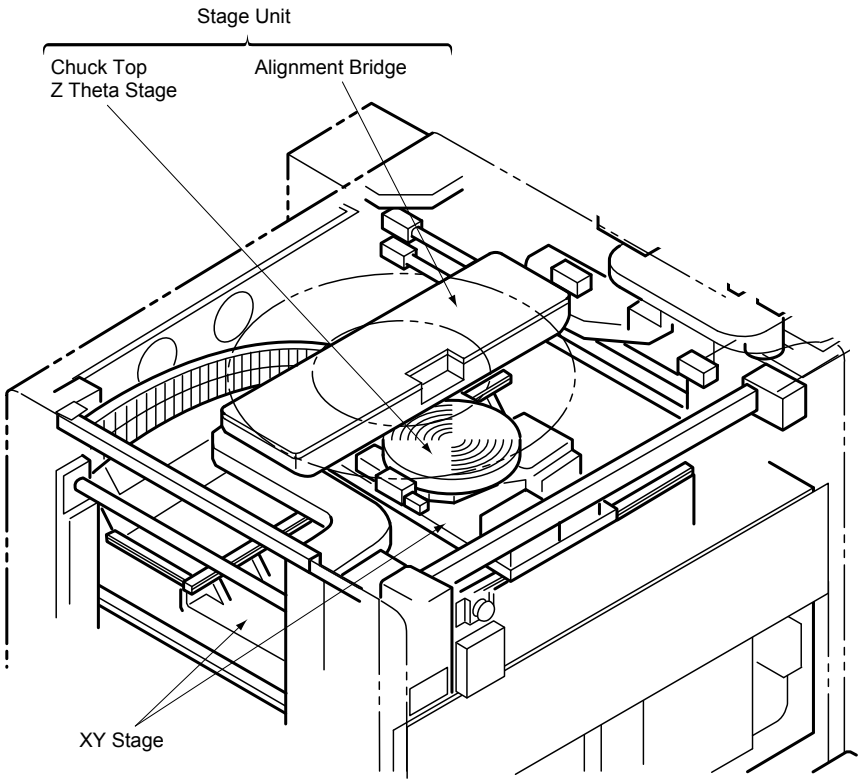
The vacuum solenoid controls the vacuum to both the upper/lower arms and to the subchuck.

3.11 Stage Unit: Parts and Function 0112.1

3.11.1 Stage 0113.1

The stage consists of the XY stage, the chuck, and the bridge. Each component of the stage, depicted in the following graphic, is described in the next section.

Stage Layout

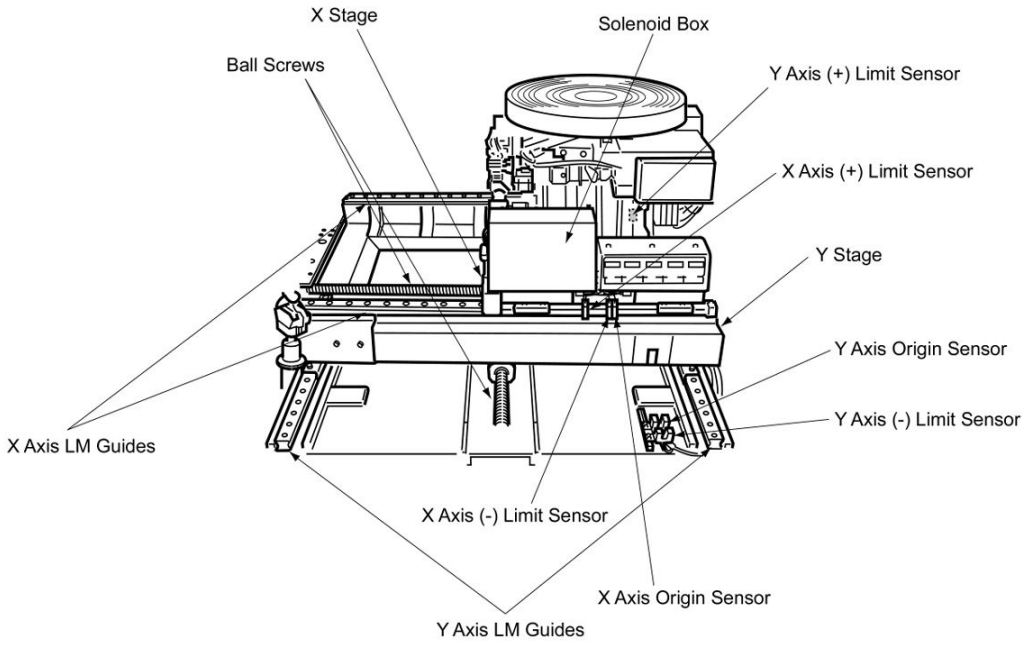


3.12 XY Stage Assembly: Parts and Function 0114.1

3.12.1 XY Stage Assembly 0115.1

The XY stage moves the chuck in the directions of both the X and Y axes. The XY stage components, depicted in the following graphic, are described below:

Stage Assembly Components



3.12.1.1 Solenoid Box 0116.1

The solenoid box houses the air solenoids for the main chuck target mechanism, as well as the main chuck vacuum solenoids.

3.12.1.2 X Axis Servo Motor 0117.1

This motor moves the X stage, via a ball screw, in the X axis direction.

3.12.1.3 Y Axis Servo Motor 0118.1

This motor drives the Y stage in the Y axis direction.

3.12.1.4 X Axis Sensor (Total of three) 0119.1

These photo sensors detect the X stage home position, as well as the positive and negative limits of the X stage travel.

3.12.1.5 Y Axis Sensor (Total of three) 0120.1

These photo sensors detect the Y stage home position, as well as the positive and negative limits of the Y stage travel.

3.12.1.6 X Axis LM Guides 0121.1

These guides are V-groove-type rails located on either side of the X stage to ensure that X motion is parallel to the ball screw drive.

3.12.1.7 Y Axis LM Guides 0122.1

These guides are V-groove-type rails located on either side of the Y stage to ensure that Y motion is parallel to the ball screw drive.

3.12.1.8 Ball Screw 0123.1

This is the drive mechanism that attaches to the servo motor and to the stage via a coupling device.

3.12.1.9 X Stage 0124.1

The X Stage houses the main chuck assembly; it moves left and right across the probe-station area.

3.12.1.10 Y Stage 0125.1

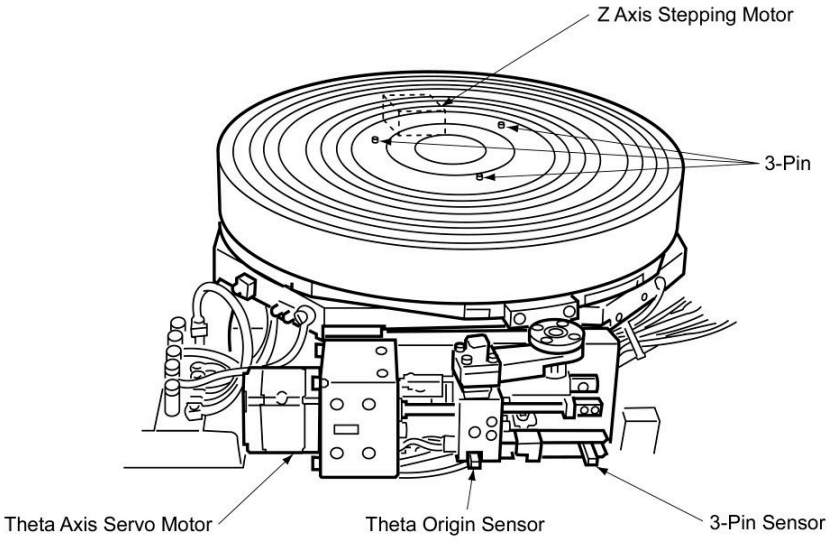
The Y Stage supports the X stage; it moves from front to back and vice-versa across the probe-station area.

3.13 Chuck Assembly: Parts and Function 0126.1

3.13.1 Chuck Assembly 0127.1

Wafers transferred from the FOUP by the upper/lower arms are placed on the chuck and held in place with vacuum. The chuck components, depicted in the following graphic, are described in the following sections.

Chuck Assembly



3.13.1.1 Theta Origin Sensor 0128.1

The theta origin sensor detects the chuck origin (home position) in the theta axis.

3.13.1.2 Theta Axis Servo Motor 0129.1

The theta axis servo motor rotates the chuck top in the theta direction.

3.13.1.3 Z Axis Stepping Motor 0130.1

The Z axis stepping motor moves the chuck top in the Z axis direction.

3.13.1.4 Chuck Top 0131.1

The wafer sits on top of the chuck during probing. The wafer is secured to the chuck top by a vacuum.

3.13.1.5 Theta Axis 0132.2

The theta axis consists of the theta motor and the theta ball screw. It allows the main chuck assembly to drive in a circular motion and the 3–pins to drive in a front to rear motion.

3.13.1.6 3-Pin Sensor 1304.1

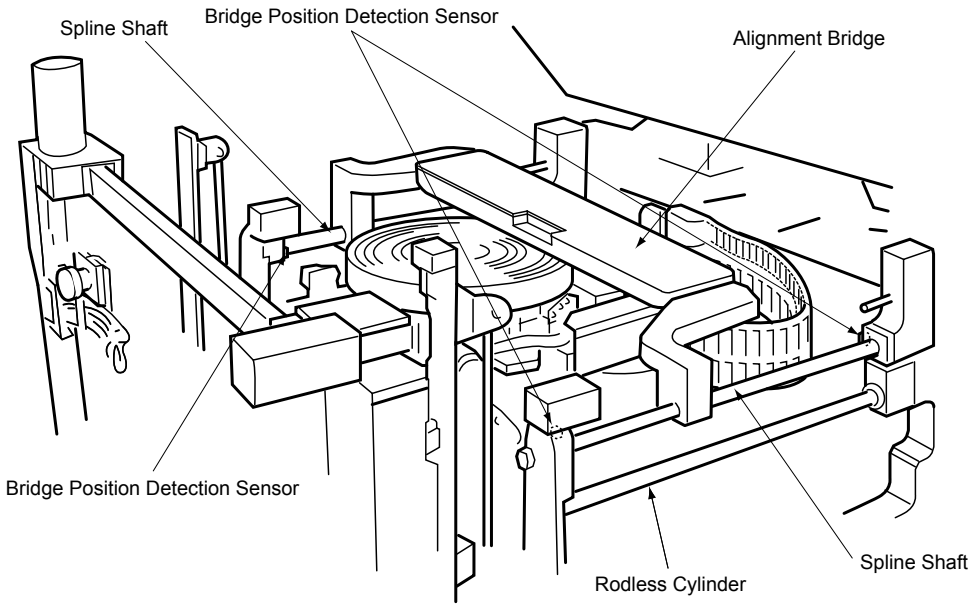
This sensor is used to detect the position of the 3-pins.

3.14 Bridge Assembly: Parts and Function 0133.1

3.14.1 Bridge Assembly 0134.1

The bridge assembly consists of the alignment bridge, the rodless cylinder, and the bridge position detection sensor. All of the bridge components are described in the following sections.

Alignment Bridge Assembly



3.14.1.1 Alignment Bridge 0135.1

The alignment bridge contains the imaging equipment that aligns the wafer on the chuck top.

3.14.1.2 Rodless Cylinder 0136.1

The rodless cylinder is used to drive the bridge unit.

3.14.1.3 Bridge Position Detection Sensor 0137.1

The bridge position detection sensor detects the bridge position at the alignment position or the escape position.

3.15 Loader Assembly Movements 0138.1

The loader unit contains two units: the FOUP opener and the arm unit.

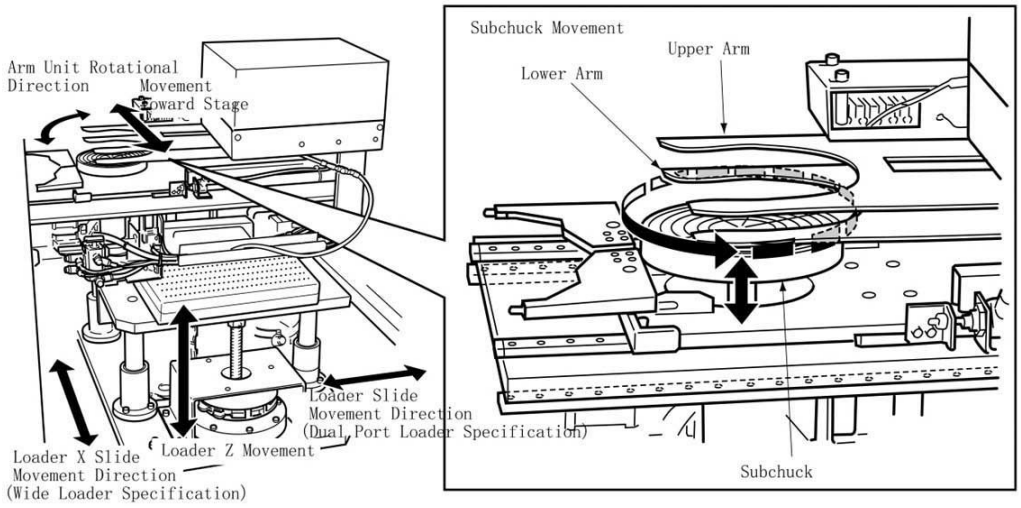
The FOUP opener is composed of the opener and the load port. A FOUP containing wafers is set on the load port and the opener opens the FOUP lid. During this operation, the load port moves forward and backward, and the opener moves up and down.

The arm unit is composed of the upper arm, the lower arm, the mapping arm, and the subchuck. The upper arm removes a wafer from the FOUP and transfers it to the stage. The lower arm removes a wafer from the stage and transfers it back to the FOUP. The mapping arm measures the thickness and the positions of the wafers in the FOUP.

When a wafer is removed from the FOUP or a wafer is returned to the FOUP, the full arm unit rotates in the direction of the load port and each arm moves forward and backward. When a wafer is removed from the wafer table or returned to the wafer table, the full arm unit rotates in the direction of the wafer table and each arm moves forward and backward. When a wafer is transferred to the stage or removed from the stage, the full arm unit rotates in the direction of the stage and the upper and lower arms move forward and backward to hand over or receive a wafer. During the mapping process, the full arm unit moves up and down while the mapping arm is extended into the FOUP.

The subchuck moves up and down. After the upper arms removes a wafer from the FOUP, the subchuck rises to receive the wafer and can rotate 360 degrees. During subchuck rotation, an optical sensor located above the wafer detects the outer circle of the wafer and measures the center position and the notch or the orientation flat position of the wafer.

Loader Assembly Movement Mechanism

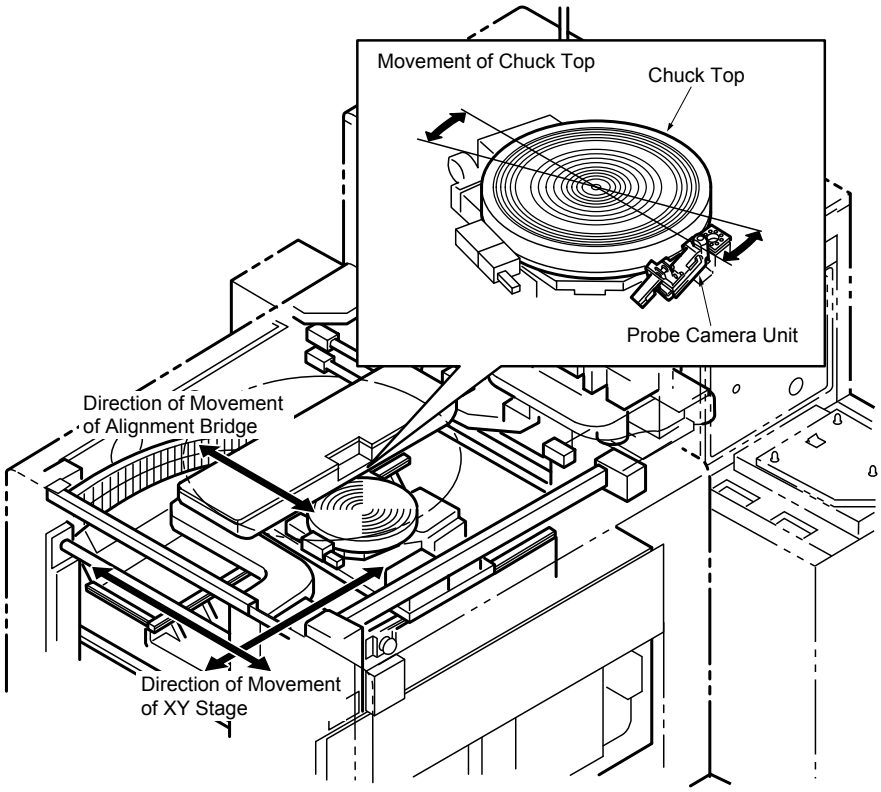


3.16 Stage Assembly: Wafer Transfer and Unit Movement 0139.1

The stage assembly performs a series of movements to receive wafers from the loader, align them, and begin testing. First, the XY stage moves the main chuck to the alignment position. Next, the alignment bridge moves forward to gather the image recognition data needed for alignment. The cameras contained inside of the bridge measure the wafer's position and attitude (scribe line inclinations).

An image recognition camera for the probe tips is located next to the main chuck. It detects the probe tips on the probe card attached to the head plate to align the probes to the wafer pads. The XY stage then moves the main chuck to the front, back, left, and right, and the theta and Z axis motors rotate and move it vertically to accurately align the wafer to the probe card probe tips.

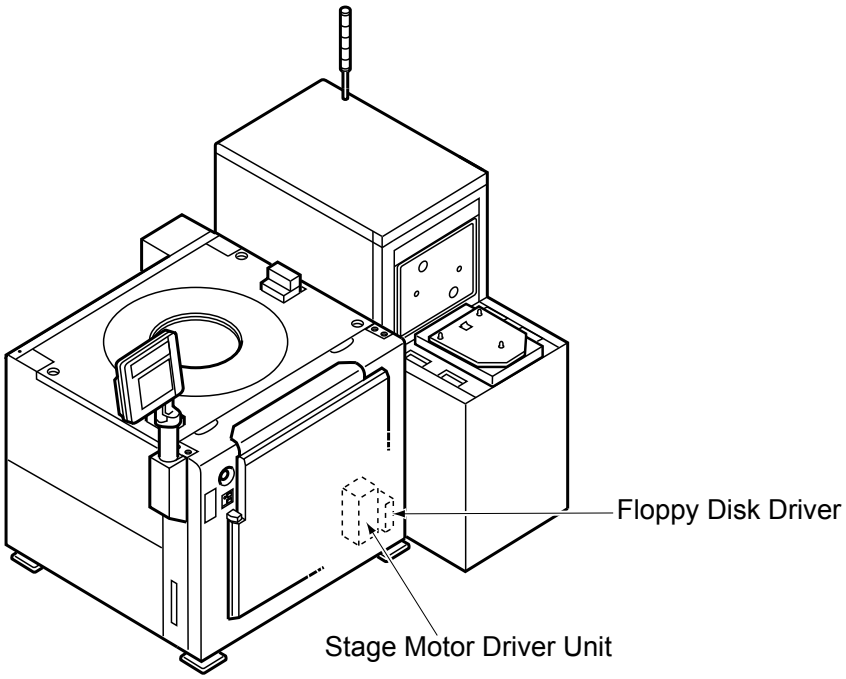
Stage Assembly Movement Mechanism



3.17 Servo Packs, Driver Boards and PCB Locations 0140.1

The P-12XL has driver boards that control stepping motors, servo packs that control servo motors, and solenoid valves that operate air cylinders. The servo packs and driver boards are installed on all prober units. Refer to **P-12XL Theory of Operations Manual** for further details on the circuit and driver boards.

Stage Assembly and PC Board Layout



3.17.1 Stage Motor Driver 0144.1

The stage motor driver assembly consists of the X, Y and theta servo motor drives and the Z and theta stepping motor drives. The SMD unit controls the stage motor.

3.17.2 MAGIC BCB (Bridge Control Board) 0142.1

The MAGIC bridge control board (BCB) controls the alignment bridge camera. It is mounted on the rear side of the loader assembly.

3.17.3 Probe Station Board 0143.1

The probe station board controls the stage assembly input/output (I/O). It is connected to the I/O channel from PCB MVME-316. A stage interlock PCB is located in the 14th slot in the VME card cage.

3.18 Controller Board Location and Function 0145.1

3.18.1 Main Controller 0146.1

The main controller contains the boards that control the prober in 20 slots numbered 1 to 20, starting from the left. The contents of each slot are described in the following table.

Main Controller Board Functions	
Slot Number	**Contents**
Slots 1 and 2	System CPU - main system and alignment system control.
Slots 3 and 4	PCB 147 CONA 2.5 inch HDD with a SCSI I/F is mounted on the PC board. One port is for an ethernet connection and the other for an external printer. MVME 147 P2 I/O signals are distributed SCSI is not connected to the FD-DRS232C x 4 CH Ch1: to debug Ch2: connected to touch panel Ch3, Ch4: I/O isolation is not done for the above
Slot 5	OCR PCB
Slots 6 to 9	Open
Slot 10	MR-MC01, Stage Motor Control
Slots 11	I/O M Board, Interface BRD, RS 232-485
Slot 12	PCB MVME 316—changes the VME bus signal to I/O channel and is connected to the PCB PST, PCB LST, and option rack.
Slot 13	Probe Station PCB #1 - controls the stage unit I/O (PST - OPT)
Slot 14	Probe Station PCB #2 - controls the stage unit I/O (PST - STD)
Slot 15	PCB SIO (Serial I/O)
Slot 16	Open
Slot 17	Open
Slot 18	GPIB communication PCB
Slots 19 to 20	A PCB tester I/F connector may be mounted. Tester cable and BIN/XY cable are compatible with P-8 series probers.

3.19 Power Distribution and Sequence Board 0147.1

3.19.1 Sequence Board 0148.1

In the P-12XL prober, the sequence board is located under the VME card cage. The fans for the VME card cage are controlled by this board.

3.19.2 Power Supply 0149.1

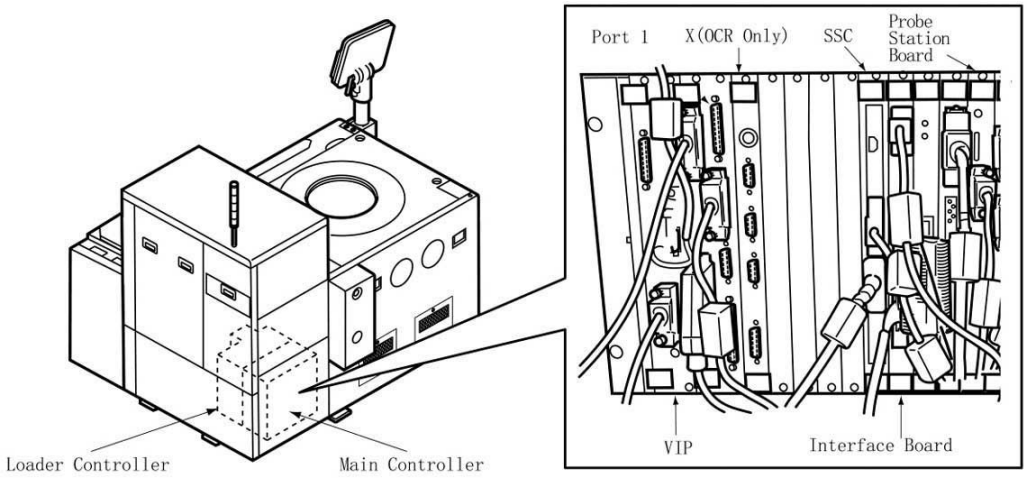
The power supply assembly is AC200/220/230/240 V and is located on the rear side of the stage. The components of the prober power supply are listed and described below.

Option Trans Unit

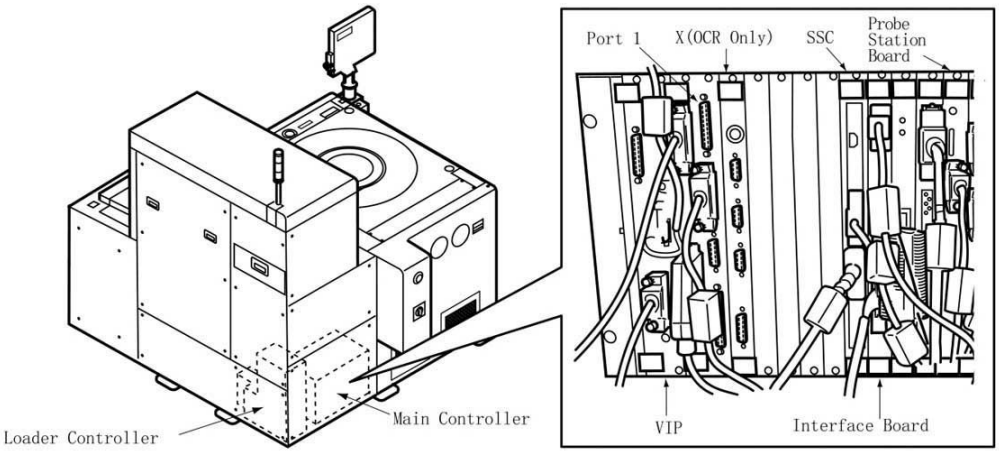
Supplies the 100 V power supply to an option device. It is located next to the air and vacuum gauges.

3.20 Functions of the Loader Assembly/PC Boards 0150.1

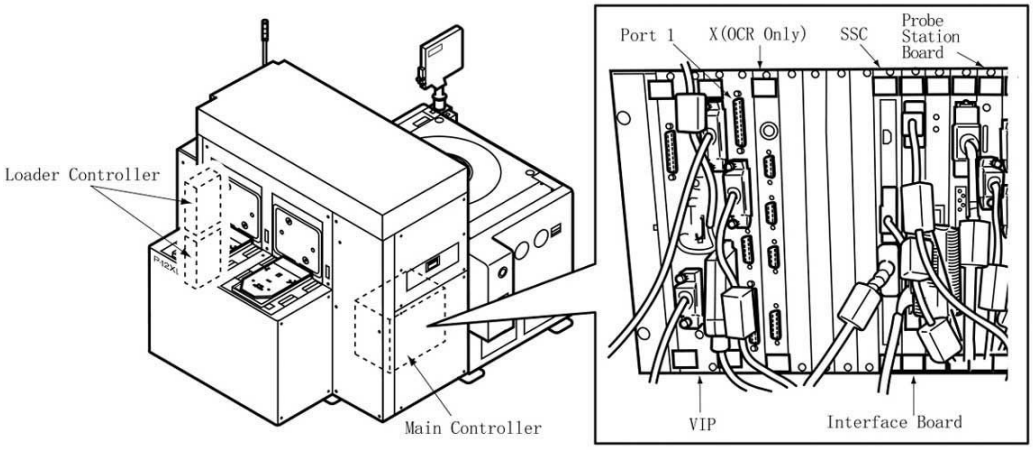
Loader Assembly/PC Boards Layout (Single Port)



Loader Assembly/PC Boards Layout (Wide Loader)



Loader Assembly/PC Boards Layout (Dual Port)



3.20.1 Main Controller 0153.1

The main controller contains the boards to control the equipment.

- Probe Station Board (PCB PST-STD): Controls various input/output signals for the stage unit.
- Interface Board: Controls alarm sounds and various optional input/output signals.

3.20.2 Loader Controller 0152.1

The loader controller contains the DC power supply and motor drivers necessary for loader control.

3.20.3 Loader Base Boards 0151.2

The loader base board controls the loader assembly I/O. It is connected to the I/O channel from PCB MVME0316. The loader base board is located in the loader controller box.

3.20.4 Stepping Motor Driver Unit 0154.1

All stepping motor drivers in the loader assembly are attached near each motor. The loader X motor driver for the dual port and the loader Z motor driver are located in the loader controller. The stepping motor drivers control each of the motors located in the loader unit.

C H A P T E R 4

Preparation for Maintenance

This chapter describes the preparations necessary for performing maintenance on the P-12XL as well as some component information. Each section describes the purpose of the associated procedure and provides the menu path to the appropriate screens for performing it.

4.1 Checking Utilities Before Turning on the Power Supply 0266.1

Introduction

Purpose:

To verify that all utilities, including the air pressure, vacuum pressure, and cables are operating correctly before powering on the prober. If any of the utilities are outside specification, the prober will operate incorrectly.

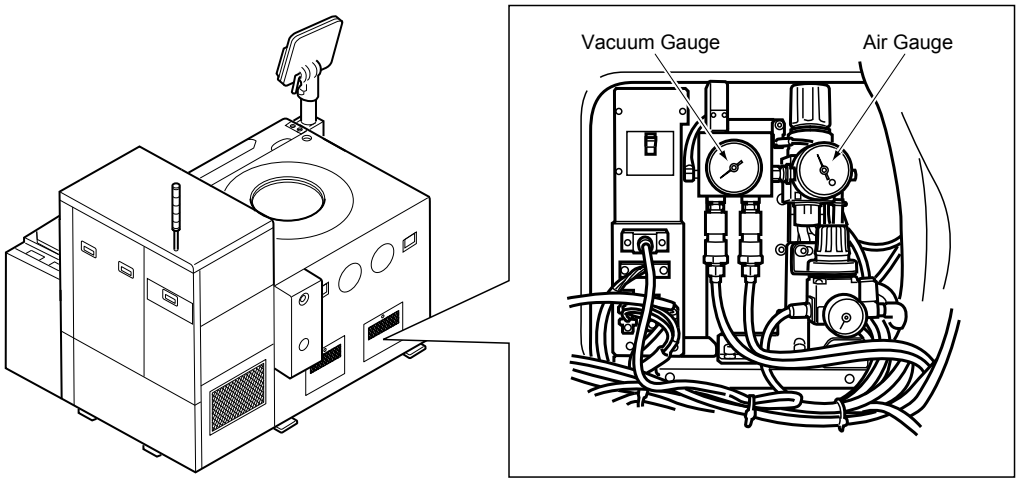
Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

1 Remove the stage rear panel door (right).

2 Check that the air gauge on the back of the prober reads 0.425 MPa.

Checking the Air Pressure



- If the air gauge is within specification, continue with Step 3.
- If the air gauge is outside specification, go to the air pressure adjustment procedure.

3 Check that the vacuum gauge on the back of the prober indicates a vacuum pressure of at least -50 kPa.

- If the vacuum gauge is within specification, continue with Step 4.
- If the vacuum gauge is outside specification, check the facilities supplying the vacuum to the prober, as well as the plumbing from the facility to the prober and the facility itself.

4 Check that all cables are securely fastened. Some examples are the hot and cold unit cables, all communication cables, and power and ground wires.

5 Reattach the stage rear panel door (right).

4.2 Turning on Main Power and Initializing the Prober 0267.1

Introduction

Purpose:

To safely and effectively turn on the prober's main power and initialize the system.

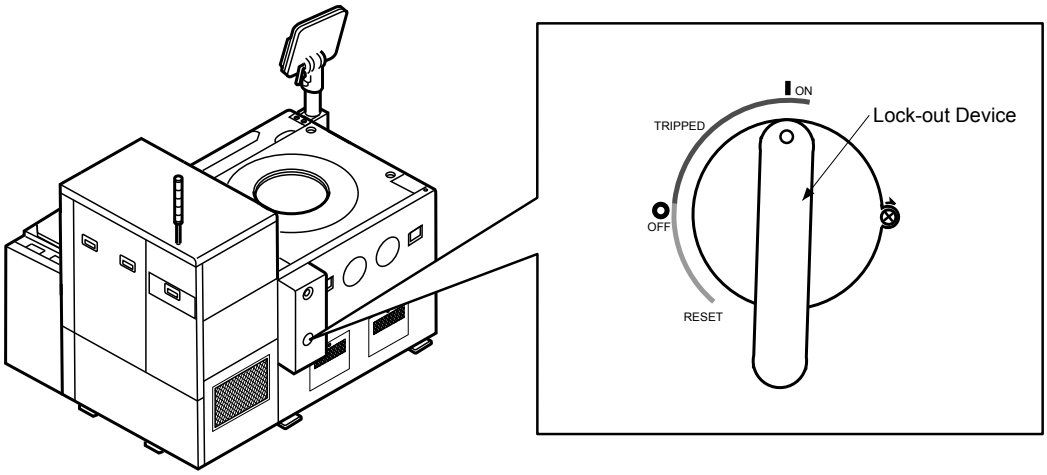
Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

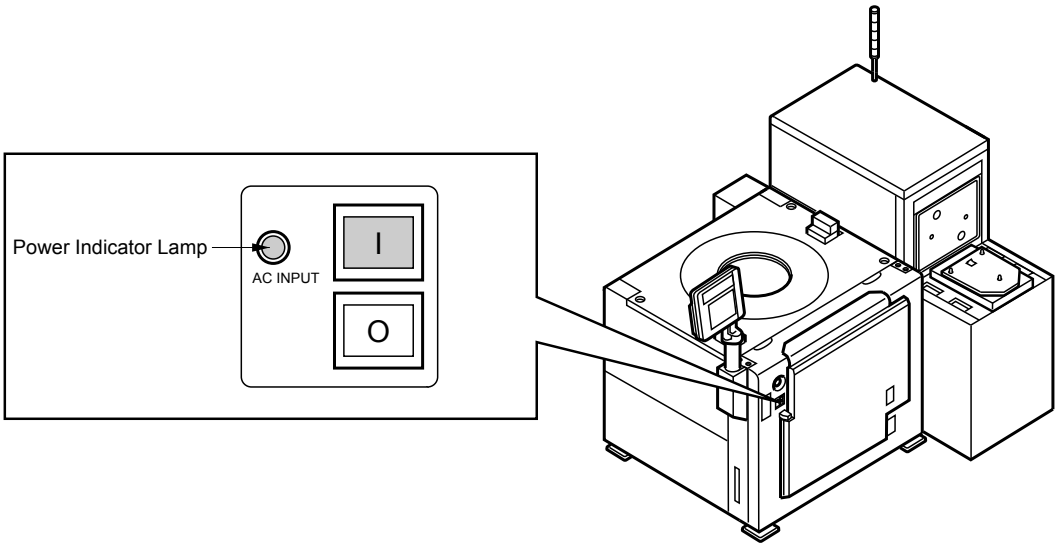
1 Locate the lockout device near the rear EMO SWITCH. Set the lockout device to the ON position.

Lockout Device and Main Power Supply Switch



2 Verify that the Power Indicator Lamp next to the power supply switch on the front of the prober is ON.

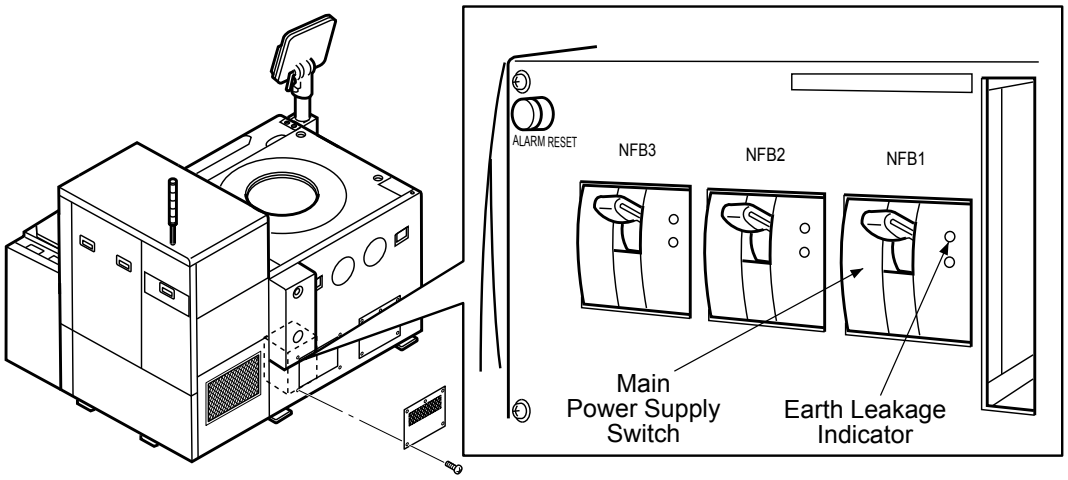
Power Supply Switch



- If the Power Indicator Lamp is ON, continue with step 3.
- If the Power Indicator Lamp is OFF, perform the following steps:

2.1 Check that the main power supply switch (NFB1) is set to ON and is in the correct position.

Main Power Supply Switch



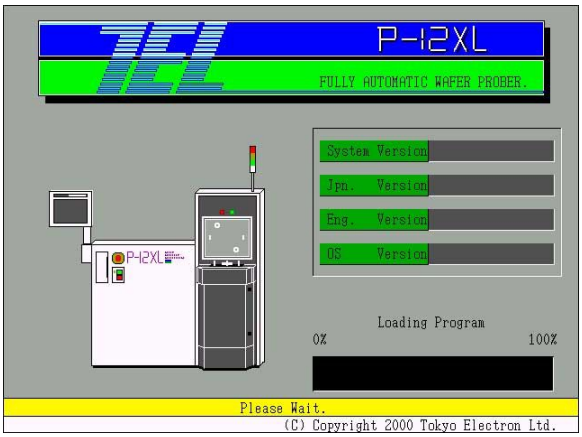
2.2 Check that the power is available from the factory facilities.

3 Press **[I]** to activate the main power supply. If the power does not turn ON, check that the EMO SWITCH is released.

An audible horn sounds, and the boot-up sequence begins. The *Software Loading Screen* displays the message `Booting System ...`

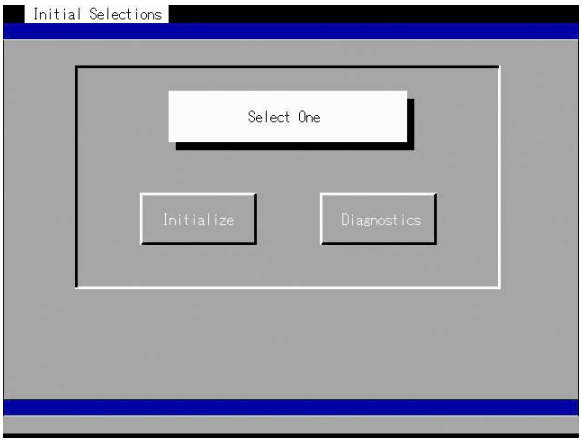
Next, a message is briefly displayed stating `Please Wait`. Then, the *Software Loading Screen* displays the software version on the prober, as well as a status indicator of the software loading process.

Software Loading Screen



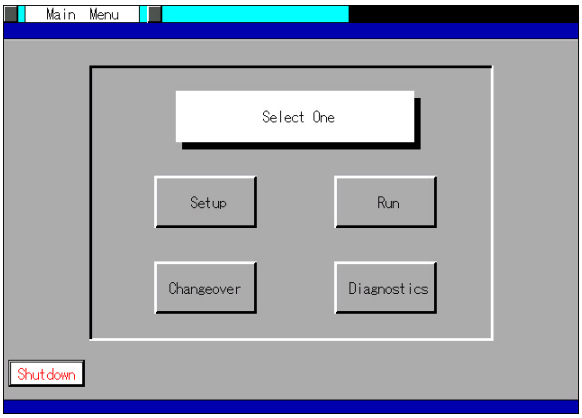
Next, the *Initialize Selection Menu* is displayed on the touch screen.

Initialize Selection Menu



4 Press INITIALIZE. The stage and loader perform an initialization sequence, and the *Main Menu* is displayed.

Main Menu



NOTE **If the *Japanese Initialize Selection Menu* appears on the screen, press CHANGE TO ENGLISH to display the English menu.**

4.3 Initializing the Prober 0212.1

Introduction

Purpose:

To properly initialize the prober through the *Diagnostics Menu*.

Depending on the condition of the prober, the initialization sequence may vary. Always initialize the prober before beginning any prober operation. Initialization ensures that all the internal parts are in their home positions and that any processes in progress will be stopped and not restart once a maintenance task has been performed.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

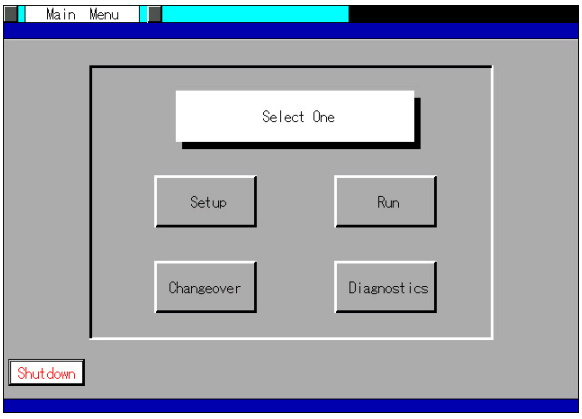
1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

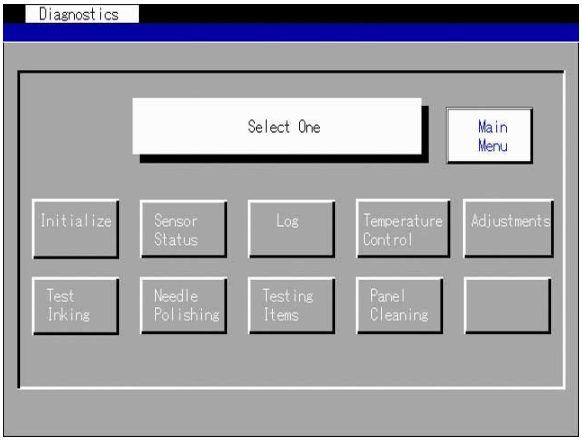
- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization from the *Main Menu* using the following steps.

▼ **Main Menu**



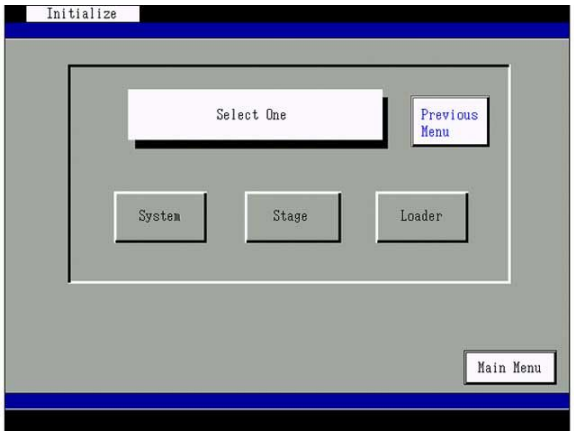
2 Press DIAGNOSTICS on the *Main Menu*.

Diagnostics Menu



3 Press INITIALIZE on the *Diagnostics Menu*. The *Initialize Menu* is displayed.

Initialize Menu



4 Use one of the following options to initialize the system.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area before initiating diagnostic move commands, such as solenoid transfer positions or when using the stage control arrow buttons.

- Press SYSTEM to initialize the entire prober.
- Press STAGE to initialize only the stage unit.
- Press LOADER to initialize only the loader unit.

The specified unit(s) of the prober initialize. As the stage and loader units initialize, the vacuum, air, and home sensors are checked and subcomponents move to their designated home positions.

NOTE **If wafers are detected within the system, the prober will return them to the available FOUP, wafer table, or request assistance from the user. This will increase initialization time.**

4.4 Opening and Closing the Head Plate 0170.1

Introduction

Purpose:

To safely and properly open and close the head plate.

Always close the head plate and tighten it securely before beginning testing.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	8.0 mm hexagonal wrench
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all of the steps for initialization and powering the prober ON/OFF should be skipped.**

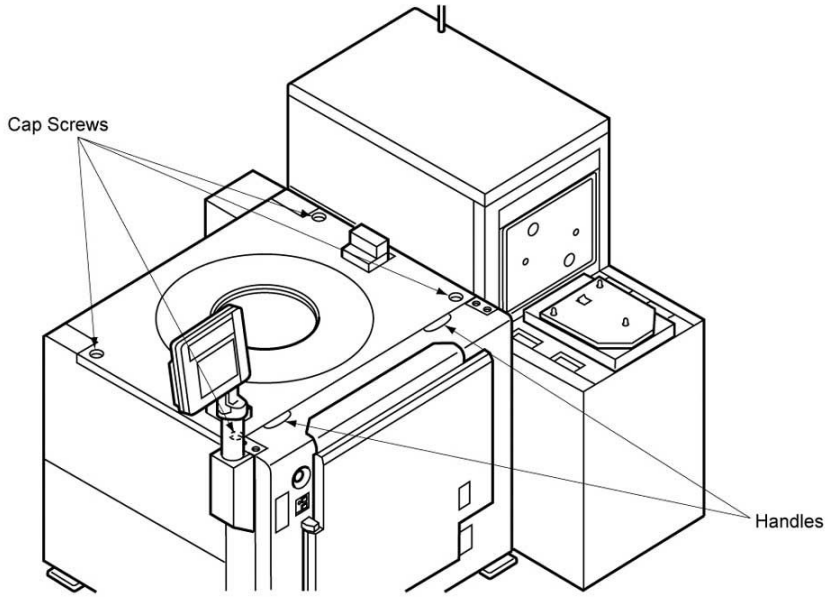
Opening the Head Plate (Standard Specification)

1 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Use an 8.0 mm hex wrench to loosen the head plate cap screws. Loosen the two rear cap screws on the head plate, then loosen the two front cap screws. When loosening the front cap screws, press down on the head plate.

Head Plate Fasteners

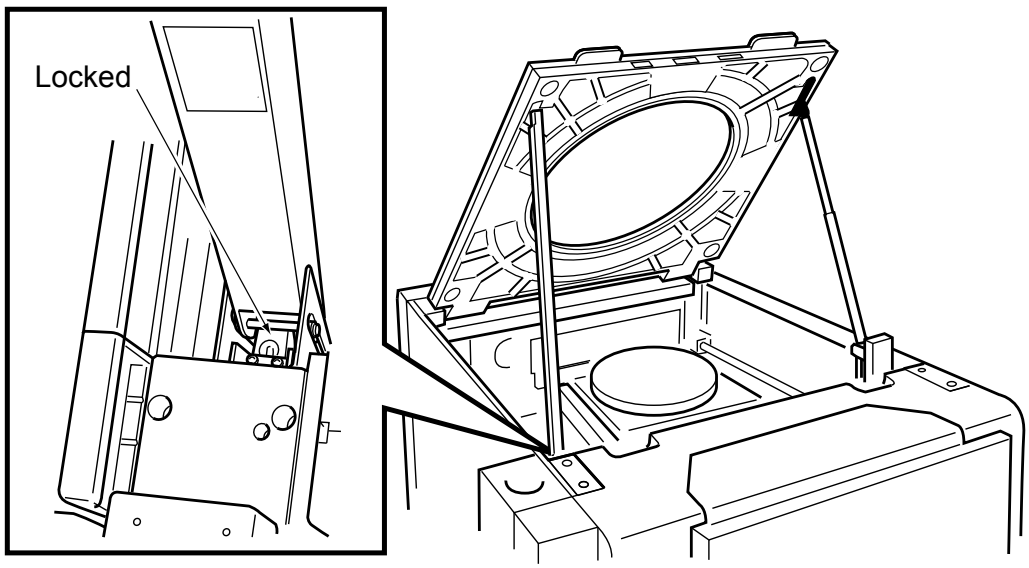


3 Hold the handle and lift the head plate upward. The head plate should now be raised to the upmost limit and locked position.

⚠ CAUTION **Mechanical Hazard**

The head plate can close unexpectedly and pinch fingers or hands. When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

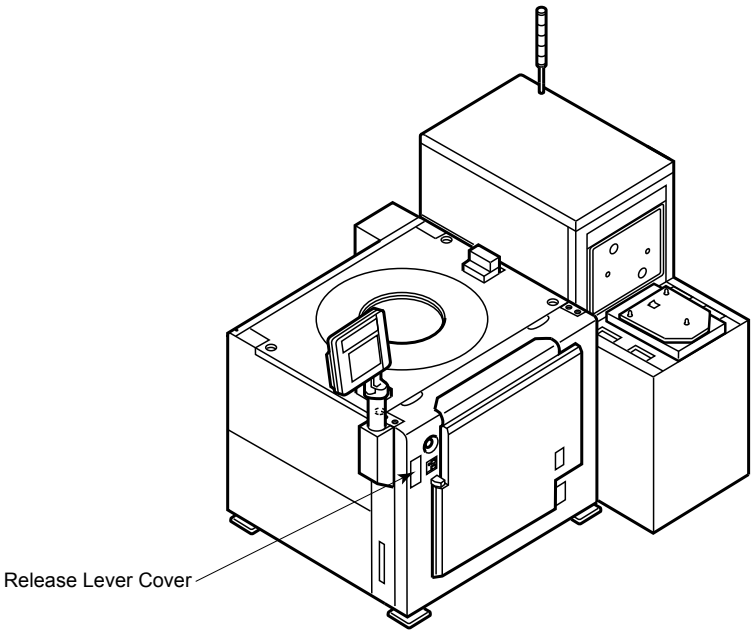
Opening the Head Plate



Closing the Head Plate (Standard Specification)

4 Open the release lever cover.

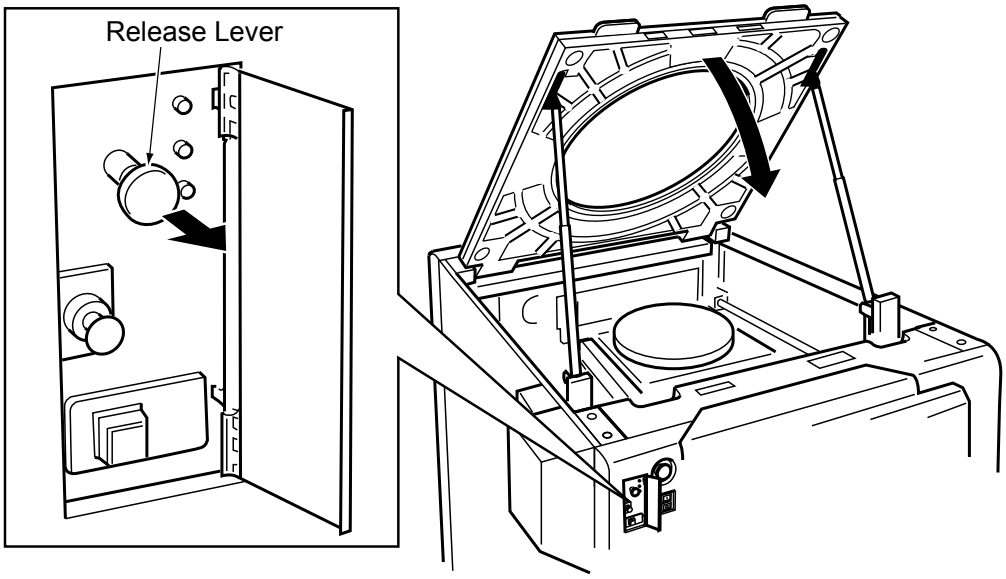
Release Lever Cover



NOTE **The release lever is located on the front left side of the stage unit for all specifications.**

5 If you have disabled the head plate interlock, enable it, then grasp the head plate handle with the right hand while pulling the RELEASE LEVER with the left hand. The head plate lock releases, allowing the head plate to be closed.

Closing the Head Plate



6 Gently close the head plate until it is seated onto the sub-head plate.

7 While pressing down on the head plate, use an 8.0 mm hex wrench to tighten the two front cap screws; then tighten the two rear cap screws. The head plate should now be secured.

NOTE **Tighten the cap screws at 55 N·m of tightening torque.**

8 Close the release lever cover.

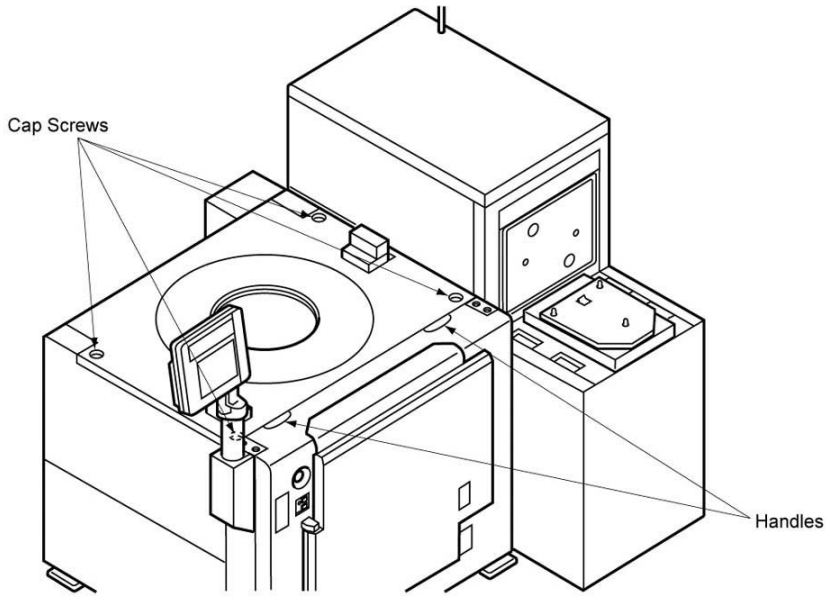
Opening the Head Plate (Optional Specification)

9 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

10 Use an 8.0 mm hex wrench to loosen the head plate cap screws. Loosen the two rear cap screws on the head plate, then loosen the two front cap screws. When loosening the front cap screws, press down on the head plate.

Head Plate Cap Screws

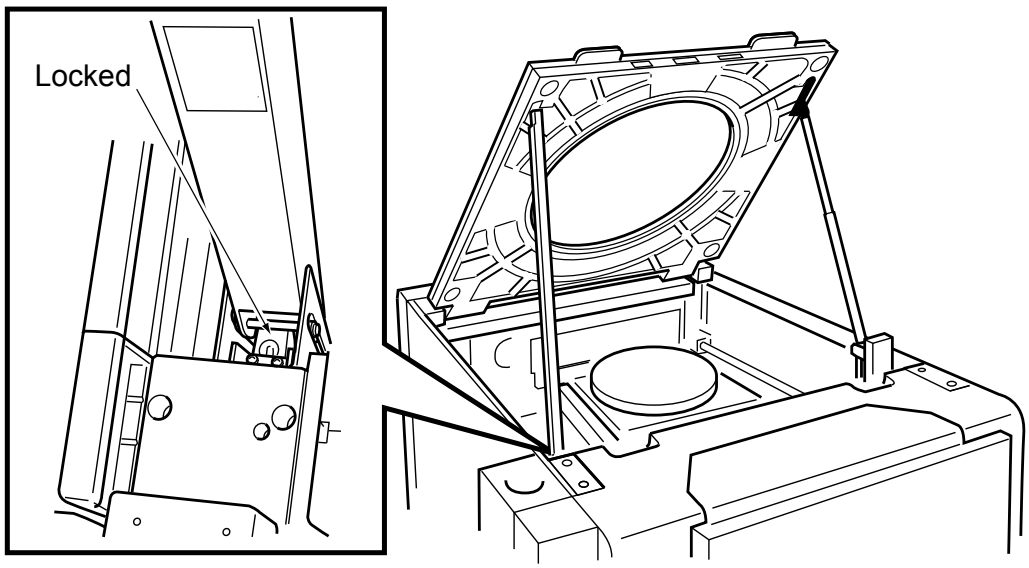


11 Hold the handle and lift the head plate upward. The head plate should now be raised to the upmost limit and locked position.

CAUTION **Mechanical Hazard**

The head plate can close unexpectedly and pinch fingers or hands. When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

▼ Opening the Head Plate



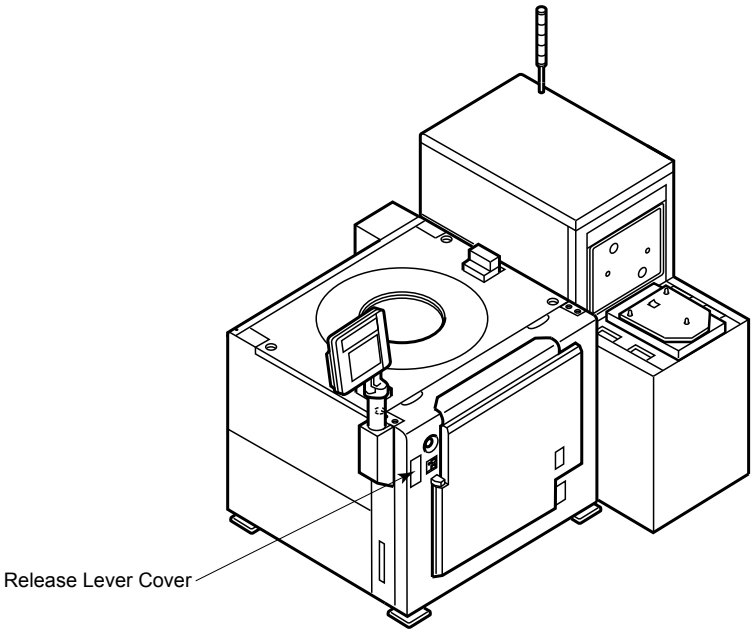
An error message will be displayed.

- If you are performing diagnostic procedures, refer to **Handling Lock-Ups** in the **P-12XL Basic Operations Manual** to recover from the error.
- If you are not performing any diagnostic tasks, close the head plate and initialize the system.

Closing the Head Plate (Optional Specification)

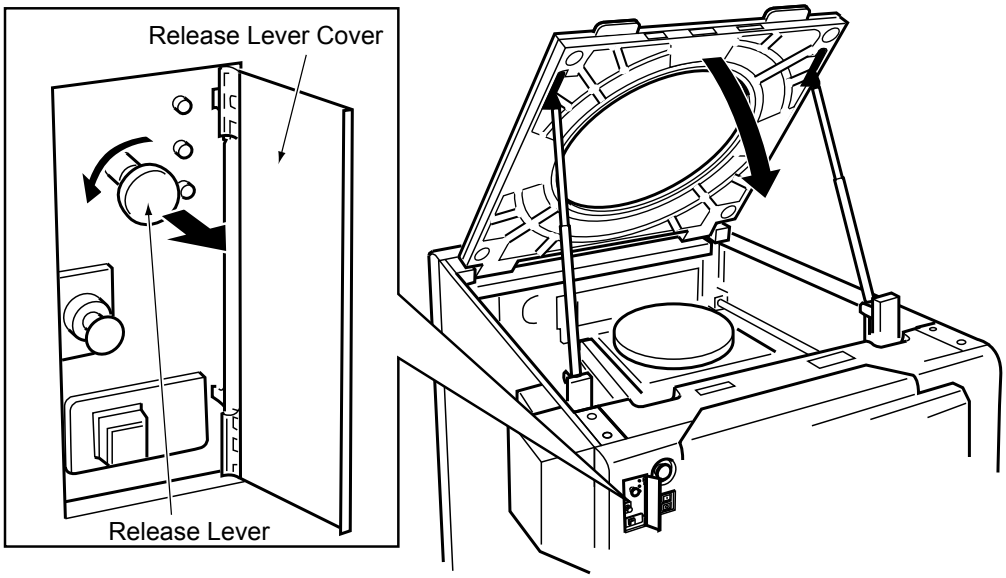
12 Open the release lever cover.

▼ Release Lever Cover



13 If you have disabled the head plate interlock, enable it, then pull the RELEASE LEVER outward and rotate the RELEASE LEVER 90° counterclockwise. The head plate lock releases, allowing the head plate to be closed.

Closing the Head Plate



14 Use both hands to gently close the head plate until it is seated on the sub-head plate.

15 While pressing down on the head plate, use an 8.0 mm hex wrench to tighten the two front cap screws; then tighten the two rear cap screws. The head plate should now be secured.

NOTE **Tighten the cap screws at 55 N·m or more of tightening torque.**

16 Rotate the RELEASE LEVER 90° clockwise and release the lever.

17 Close the release lever cover.

4.5 Removing and Attaching Stage Panels and Covers 0179.1

4.5.1 Removing and Attaching the Stage Front Panel 0180.1

Introduction

Purpose:

To remove and attach the stage front panel from the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Standard wrench 2.00 and 5.00 mm hexagonal wrenches #2 Phillips-head screwdriver Wire cutters
Parts or Consumables:	Tie wraps

Overview:

The stage front panel must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Stage Front Panel

1 Use one of the following methods to begin the procedure.

CAUTION **Mechanical Hazard**
Keep clear of the stage area when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, close the head plate and restore power by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**, then continue with the next step.
- If the prober power is ON, and the stage is located in a position near the (+) Y limit, go to step 3.

- If the prober power is OFF, and the stage is located in a position near the (+) Y limit, go to step 4.

2 Use the following steps to position the XY stage.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

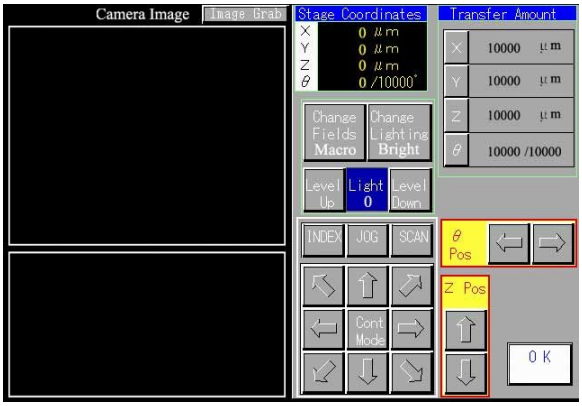
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

2.6 Press XYZθ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *XYZθ Joystick Transfer Menu* is displayed.

XYZθ Joystick Transfer Menu



2.7 Select the `INDEX` mode and set the transfer amount for the X and Y axes to 10,000 µm.

2.8 Use the stage arrow control buttons to move the XY stage to the rearmost position on the Y axis.

2.9 Press OK to exit the *XYZθ Joystick Transfer Menu*.

3 Perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

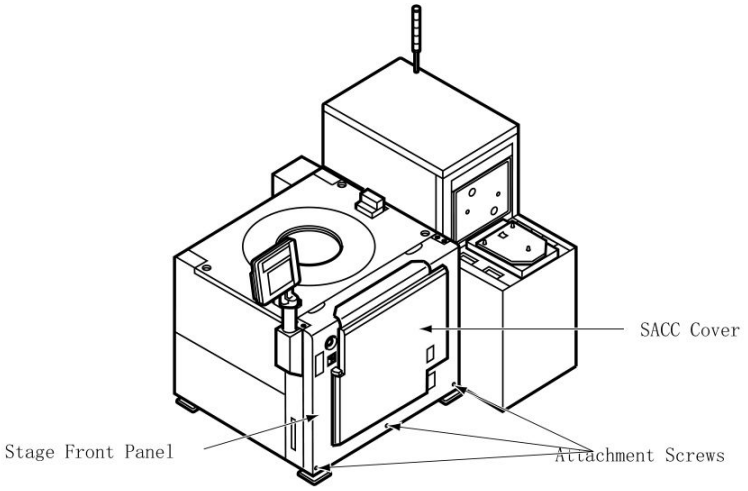
4 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard

When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

5 Remove the three attachment screws on the lower part of the stage front panel.

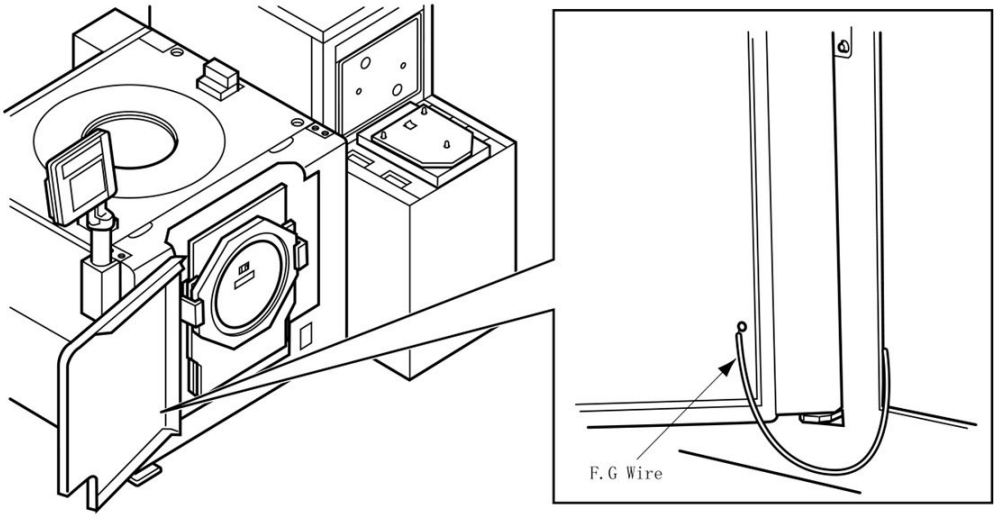
Stage Front Panel



6 Open the SACC cover.

7 Remove the SACC cover ground wire.

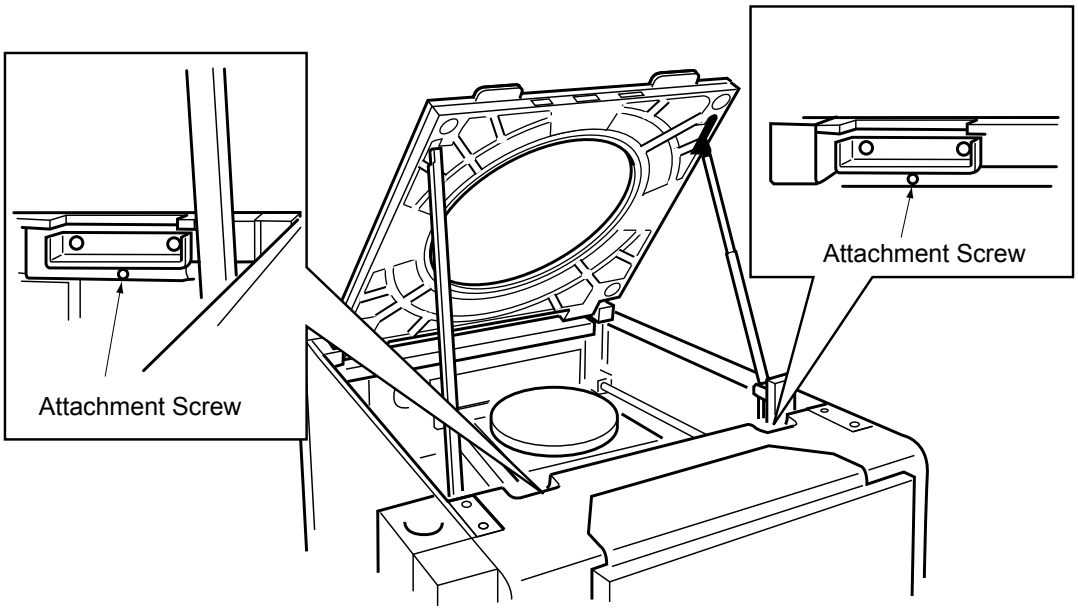
Removing the Ground Wire



8 Cut the tiewrap securing the SACC cover ground wire.

9 Remove the two attachment screws on the upper portion of the stage front panel located beneath the recessed openings of the head plate handles.

▼ **Stage Front Panel Attachment Screws**



10 Remove the stage front panel from the stage frame.

> **CAUTION** **Property Damage Hazard**
> **Use extreme care when removing the stage front panel to avoid interference with the card tray, interlock sensor wiring, and air tubing.**

11 Remove the stage front panel ground wire.

12 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Stage Front Panel

13 Use one of the following methods to begin the procedure.

> **⚠ CAUTION** **Mechanical Hazard**
> **Keep clear of the stage area when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

- If the power is disabled, close the head plate and restore power by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**, then continue with the next step.
- If the prober is powered on, and the stage is located in a position near the (+) Y limit, go to step 3.
- If the prober is disabled, and the stage is located in a position near the (+) Y limit, go to step 4.

14 Use the following steps to position the XY stage to the rearmost position on the Y axis.

14.1 Press DIAGNOSTICS on the *Main Menu*.

14.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

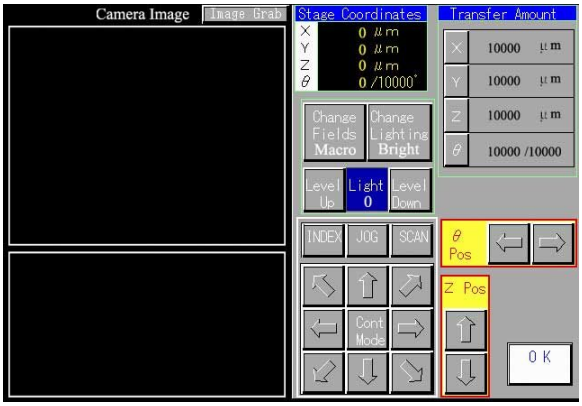
14.3 Input your password on the numeric keypad and press INPUT.

14.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

14.5 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

14.6 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *XYZθ Joystick Transfer Menu* is displayed.

XYZθ Joystick Transfer Menu



14.7 Select the `INDEX` mode and set the transfer amount for the X and Y axes to 10,000 µm.

14.8 Use the stage arrow control buttons to move the XY stage to the rearmost position on the Y axis.

14.9 Press OK to exit the *XYZθ Joystick Transfer Menu*.

15 Perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

16 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard

When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

17 Attach the stage front panel ground wire to the stage front panel.

18 Place the stage front panel against the frame. Route the SACC cover ground wire through the stage front panel access hole.

CAUTION Property Damage Hazard

Use extreme care when attaching the stage front panel to avoid interference with the card tray, interlock sensor wiring, and air tubing.

19 Insert and secure the two attachment screws located on the upper back side of the stage front panel, directly beneath the recessed openings of the head plate handles.

20 Insert and secure the two attachment screws located on the lower side of the stage front panel.

21 Use a tie wrap to fasten the SACC cover ground wire to the SACC cover.

22 Attach the SACC cover ground wire to the SACC cover.

23 Close the SACC cover.

4.5.2 Removing and Attaching the Stage Rear Panel and Doors 0181.1

Introduction

Purpose:

To remove and attach the stage rear panel and the stage rear panel doors.

The stage rear panel and/or and stage rear panel doors must be removed and reattached to safely and effectively perform maintenance on the prober.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	Standard wrench 2.00 and 5.00 mm hexagonal wrenches #2 Phillips-head screwdriver Wire cutters
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Stage Rear Panel

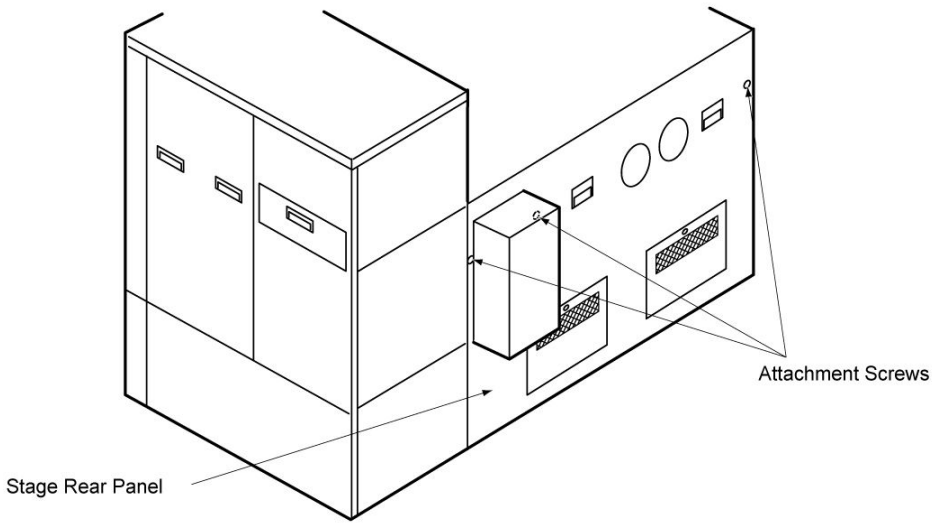
1 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

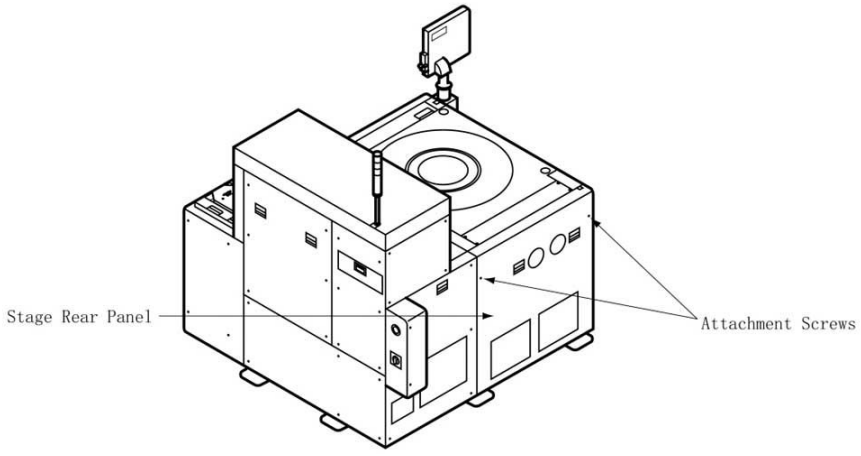
NOTE **If the lockout device is set to RESET, the stage rear panel cannot be removed.**

2 Remove the stage rear panel attachment screws (3 places for the single port or 2 places for the wide loader).

Removing the Stage Rear Panel (Single Port)



Removing the Stage Rear Panel (Wide Loader)



3 Pull the stage rear panel upward to remove it from the stage frame.

4 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Stage Rear Panel

5 Use one of the following methods to begin the procedure.

- If the power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

NOTE **If the lockout device is set to ON, the stage rear panel cannot be attached.**

6 Set the lockout device to the RESET position.

7 Use the support handles to grasp the stage rear panel. Position the panel to angle the top away from the tool and the bottom near the frame hinges.

8 Set the hinges on the stage rear panel (hanging side) into the hinges on the prober side (receiving side). Rotate the panel to the upright position.

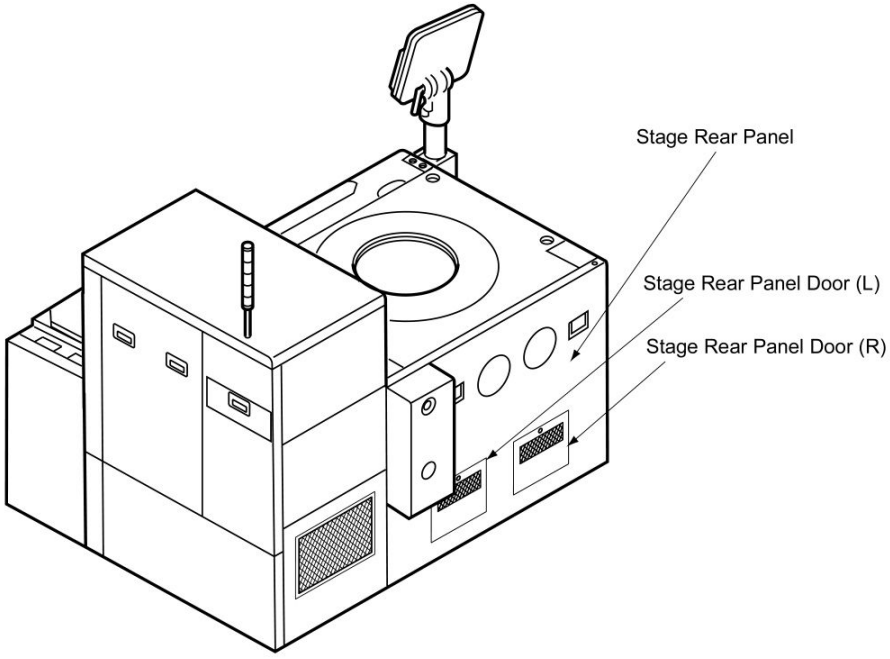
9 Loosely thread the panel attachment screws into position.

10 Align the panel to the proper position and secure the attachment screws.

Removing the Stage Rear Panel Doors

11 Remove the four attachment screws for the stage rear panel door (R or L).

Stage Rear Panel Doors (Left and Right)



12 Remove the appropriate stage rear panel door.

13 Place the panel door in an area where it cannot fall or cause obstruction.

Attaching the Stage Rear Panel Doors

14 Loosely thread the panel door attachment screws into position.

15 Align the panel door to the proper position and secure the attachment screws.

4.6 Removing and Attaching Loader Panels and Covers (Single Port and Wide Loader) 0182.1

4.6.1 Removing and Attaching the Stage Side Loader Panel (Single Port and Wide Loader) 0183.1

Introduction

Purpose:

To remove and attach the stage side loader panel.

The stage side loader panel must be removed and reattached to safely and effectively perform maintenance on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Stage Side Loader Panel (Single Port and Wide Loader)

1 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

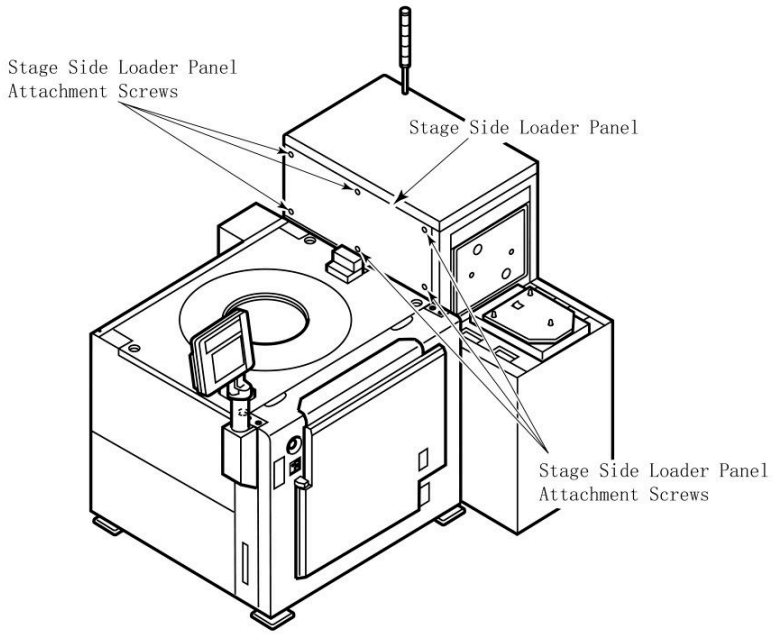
2 Close and secure the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

3 Remove the innermost attachment screws.

CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Stage Side Loader Panel**



4 Remove the upper front and rear corner attachment screws.

5 Remove the lower rear attachment screws.

6 Remove the lower front panel attachment screws.

> **⚠ CAUTION** **Mechanical Hazard**
> **Hold the stage side loader panel in place while you remove the lower front panel attachment screws to prevent the panel from falling.**

7 Remove the stage side loader panel from the stage frame.

8 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Stage Side Loader Panel (Single Port and Wide Loader)

9 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

10 Place the panel into position against the frame and properly align the attachment screw holes.

11 Loosely thread the panel attachment screws into position.

12 Align the panel to the proper position and secure the attachment screws.

4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) 0184.1

Introduction

Purpose:

To remove and attach the loader side panel.

The loader side panel must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Side Panel (Single Port and Wide Loader)

1 Use one of the following methods to begin the procedure.

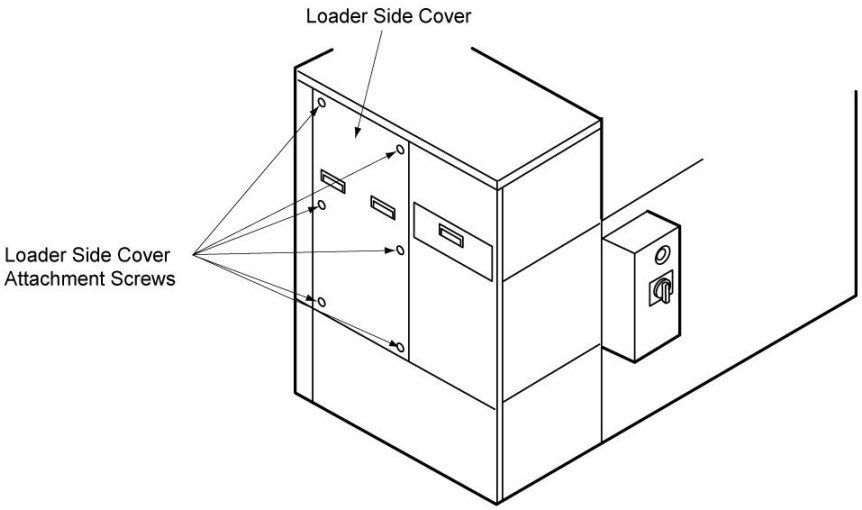
- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 6 loader side panel attachment screws.

CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Loader Side Panel**

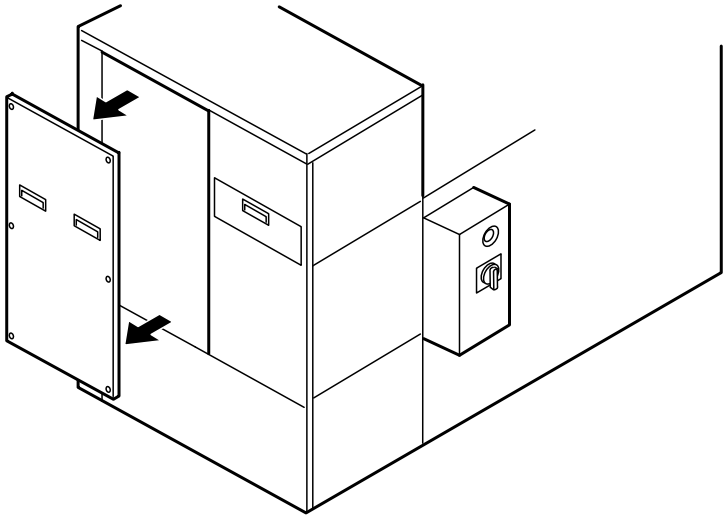


3 Pull the loader side panel horizontally away from the prober.

CAUTION **Property Damage Hazard**

The interlock switch key is attached to the loader side panel. Tilting the panel may damage the interlock switch.

▼ **Removing the Loader Side Panel**



4 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Side Panel (Single Port and Wide Loader)

5 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

6 Place the panel into position against the frame and properly align the attachment screw holes.

> **CAUTION** **Property Damage Hazard**
> **Check that the interlock switch is correctly inserted when attaching the loader side panel. If the switch is not correctly inserted, it may be damaged.**

7 Loosely thread the panel attachment screws into position.

8 Align the panel to the proper position and secure the four corner screws.

9 Tighten the remaining loader side panel attachment screws.

4.6.3 Removing and Attaching the Loader Desk Side Panel (Single Port and Wide Loader) 0185.1

Introduction

Purpose:

To remove and attach the loader desk side panel.

The loader desk side panel must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Desk Side Panel (Single Port and Wide Loader)

1 Use one of the following methods to begin the procedure.

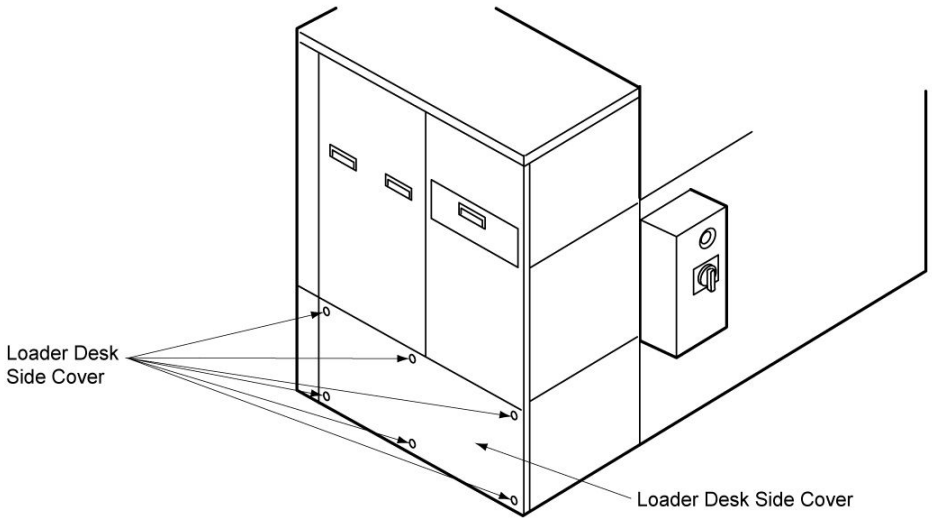
- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 6 loader desk side panel attachment screws.

CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the panel. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Loader Desk Side Panel**



3 Pull the loader desk side panel horizontally away from the prober.

4 Remove the ground wire from the loader desk side panel.

5 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Desk Side Panel (Single Port and Wide Loader)

6 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7 Attach the ground wire to the loader desk side panel.

8 Holding the panel at a slight angle, place the bottom of the loader desk side panel into the prober frame.

9 Loosely thread the panel attachment screws into position.

10 Align the panel to the proper position and secure the four corner screws.

11 Tighten the remaining loader desk side panel attachment screws.

4.6.4 Removing and Attaching the Loader Rear Panel (Upper) 1305.1

Introduction

Purpose:

To remove and reattach the loader rear upper panel to safely and effectively perform specific maintenance on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Rear Panel (Upper)

1 Use one of the following methods to begin the procedure.

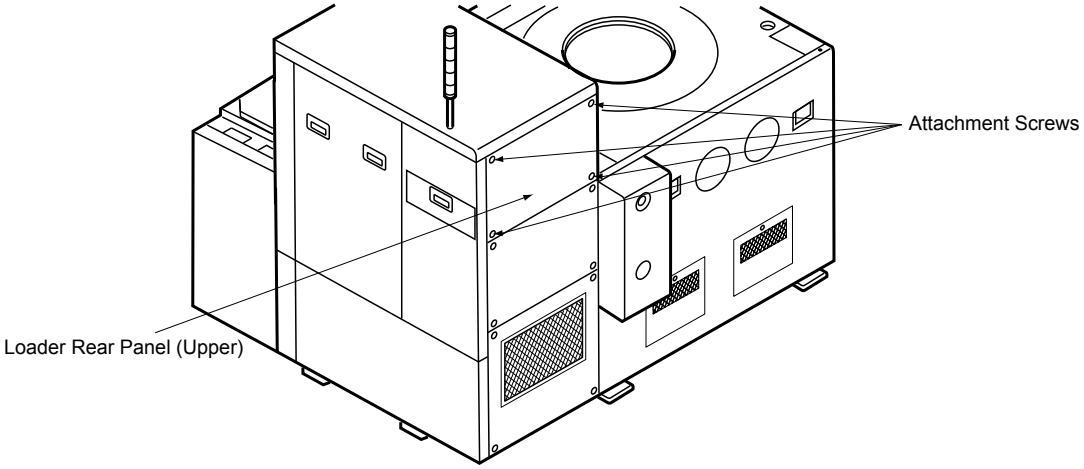
- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 4 loader rear panel (upper) attachment screws.

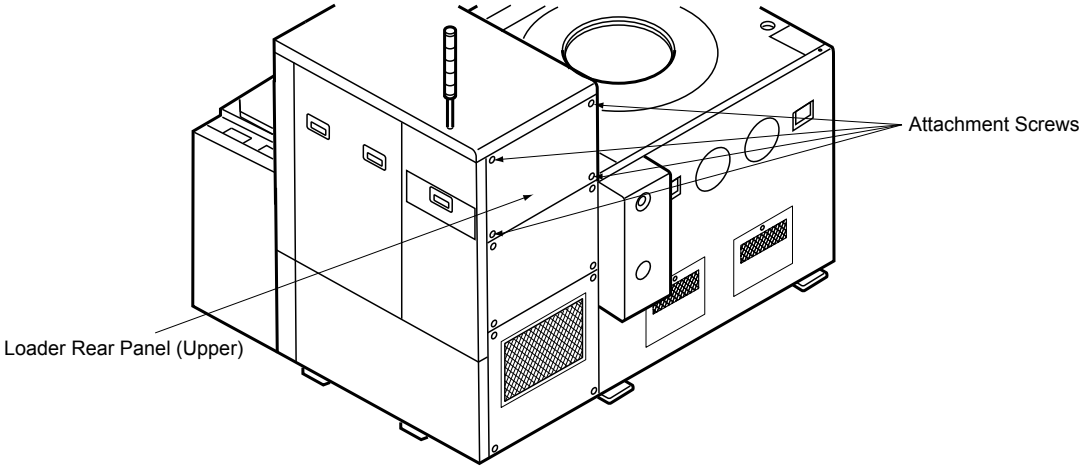
CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Loader Rear Panel (Upper) (Single Port Loader)**



▼ **Loader Rear Panel (Upper) (Wide Port Loader)**



3 Pull the loader rear panel (upper) horizontally away from the loader frame.

4 Remove the ground wire from the panel.

5 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Rear Panel (Upper)

6 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7 Connect the ground wire to the loader rear panel (upper).

8 Place the panel to be installed in the appropriate position.

9 Holding the panel at a slight angle, place the bottom of the loader rear panel (upper) onto the prober frame.

10 Loosely thread the panel attachment screws into position.

11 Align the panel to the proper position and secure the screws.

4.6.5 Removing and Attaching the Loader Rear Panel (Middle) 1306.1

Introduction

Purpose:

To remove and reattach the loader rear middle panel to safely and effectively perform specific maintenance on the prober.

Removal of the loader rear panel (middle) provides access to the OCR unit and option rack.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Rear Panel (Middle)

1 Use one of the following methods to begin the procedure.

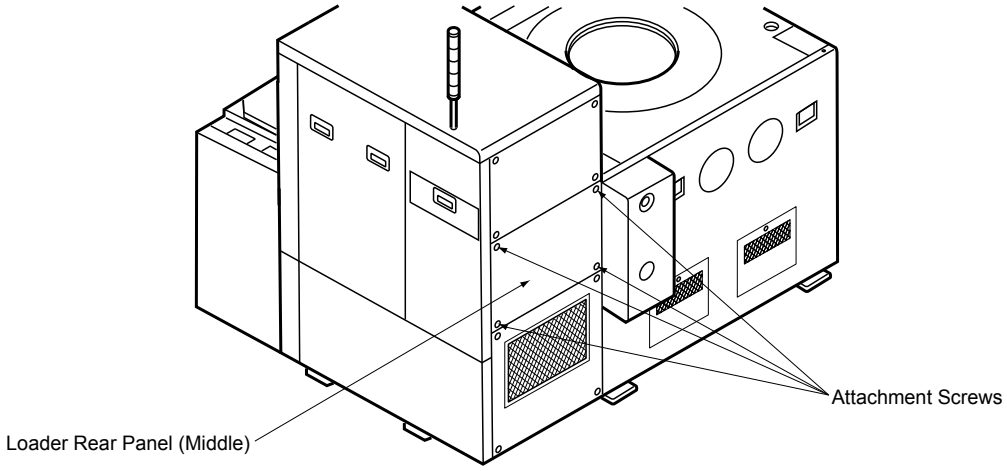
- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 4 loader rear panel (middle) attachment screws.

CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Loader Rear Panel (Middle) (Single Port Loader)**



3 Pull the loader rear panel (middle) horizontally away from the loader frame.

4 Remove the ground wire from the panel.

5 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Rear Panel (Middle)

6 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7 Connect the ground wire to the loader rear panel (middle).

8 Place the panel to be installed in the appropriate position.

9 Holding the panel at a slight angle, place the bottom of the loader rear panel (middle) onto the prober frame.

10 Loosely thread the panel attachment screws into position.

11 Align the panel to the proper position and secure the screws.

4.6.6 Removing and Attaching the Loader Rear Panel (Lower) 1307.1

Introduction

Purpose:

To remove and reattach the loader rear lower panel to safely and effectively perform specific maintenance on the prober.

Removal of the loader rear lower panel provides access to the VME card cage.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Rear Panel (Lower)

1 Use one of the following methods to begin the procedure.

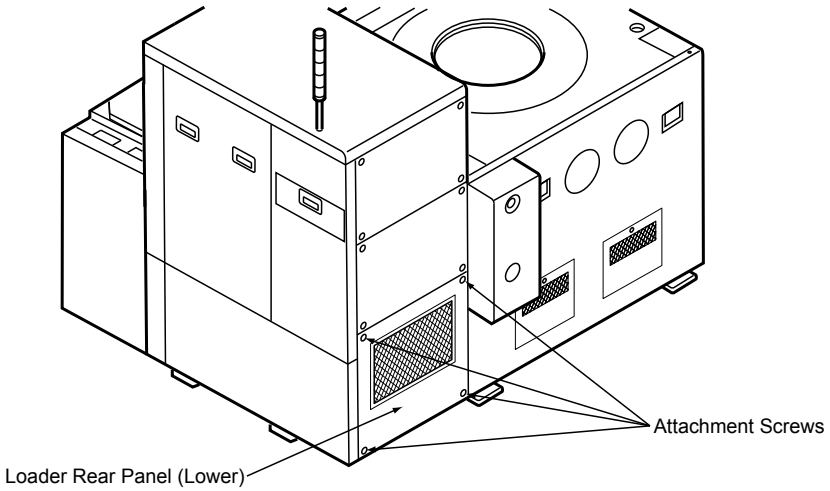
- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the loader rear panel (lower) attachment screws (6 places for the single port or 5 places for the wide loader).

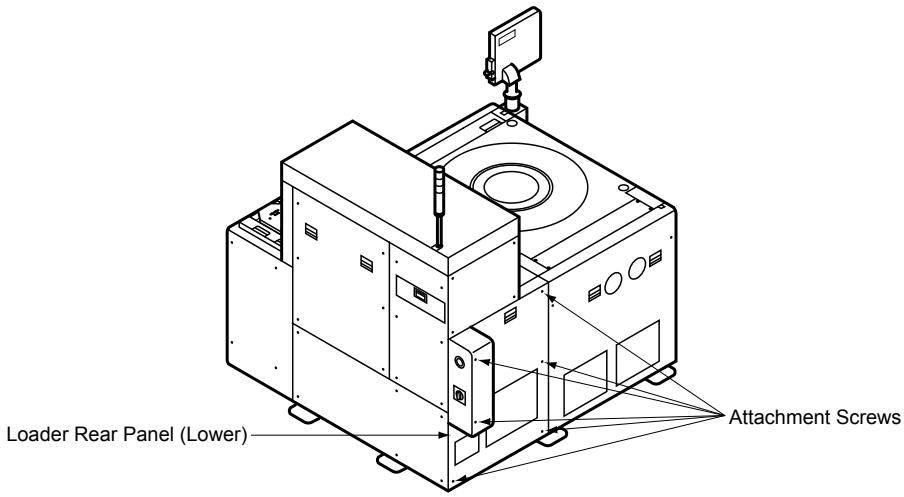
CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

Loader Rear Panel (Lower) (Single Port Loader)

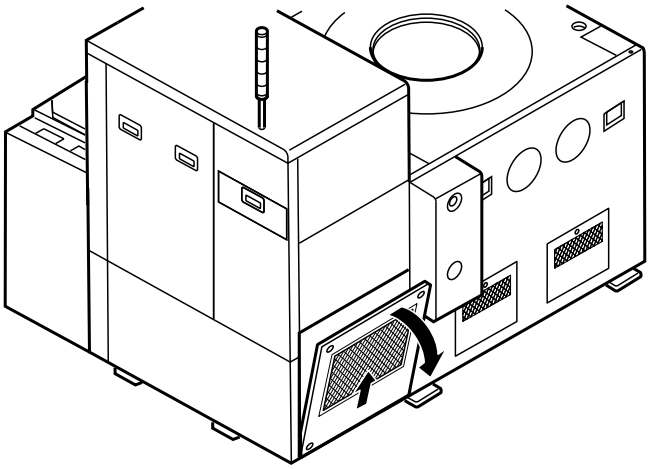


Loader Rear Panel (Lower) (Wide Loader)

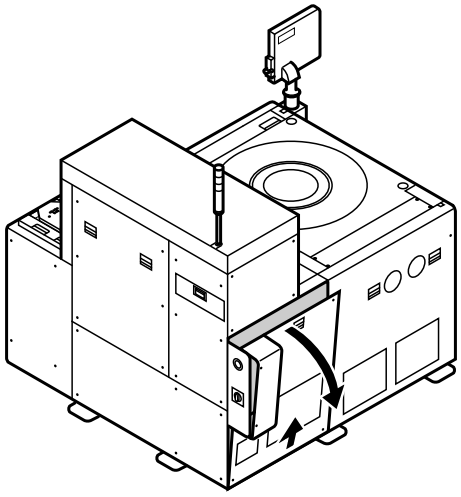


3 Open the loader rear panel (lower) forward, then pull it upward to remove it from the loader frame.

Removing the Loader Rear Panel (Lower) (Single Port Loader)



Removing the Loader Rear Panel (Lower) (Wide Loader)



4 Remove the ground wire from the panel.

5 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Rear Panel (Lower)

6 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7 Connect the ground wire to the loader rear panel (lower).

8 Place the panel to be installed in the appropriate position.

9 Holding the panel at a slight angle, place the bottom of the loader rear panel (lower) onto the prober frame.

10 Loosely thread the panel attachment screws into position.

11 Align the panel to the proper position and secure the screws.

4.6.7 Removing and Attaching the Loader Front Cover (Single Port and Wide Loader) 0187.1

Introduction

Purpose:

To remove and attach the loader front cover.

The loader front cover must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Front Cover (Single Port and Wide Loader)

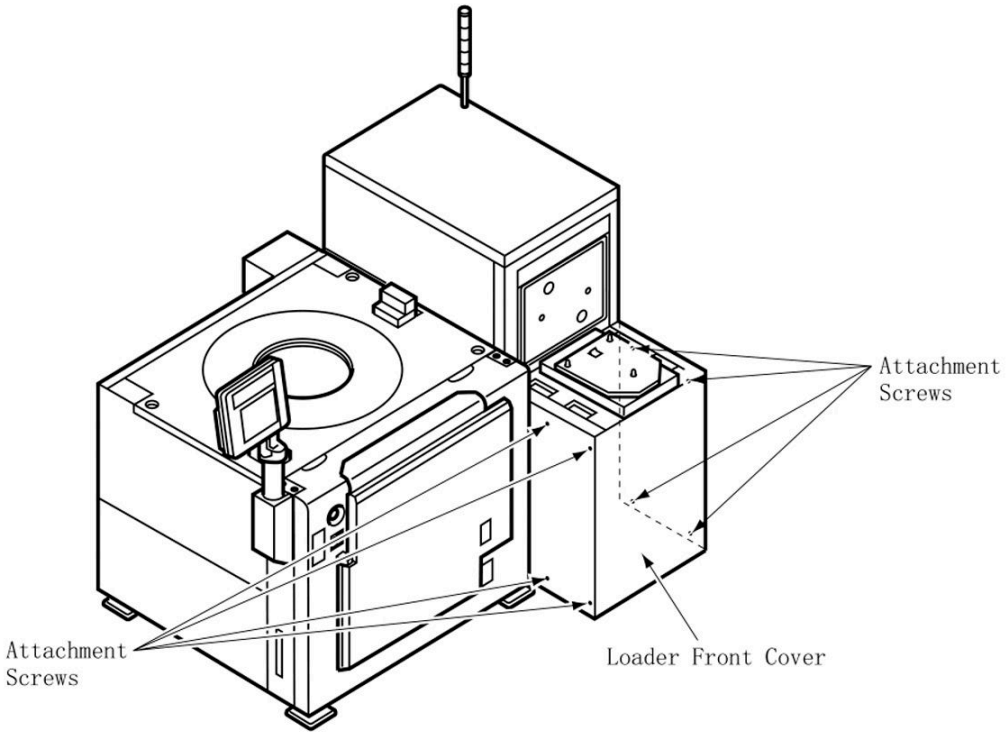
1 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the four loader front cover attachment screws (M4 x 8).

> **CAUTION** **Property Damage Hazard**
> **Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.**

Loader Front Cover



3 Horizontally tilt the loader front cover away from the loader frame.

4 Place the cover in an area were it cannot fall or cause obstruction.

Attaching the Loader Front Cover (Single Port and Wide Loader)

5 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

6 Place the cover over the FOUP opener inside panel, against the loader frame.

7 Loosely thread the loader front cover attachment screws into position.

8 Align the cover to the proper position and secure the corner screws.

4.6.8 Removing and Attaching the FOUP Opener Inside Panel (Single Port and Wide Loader) 0188.1

Introduction

Purpose:

To remove and attach the FOUP opener inside panel.

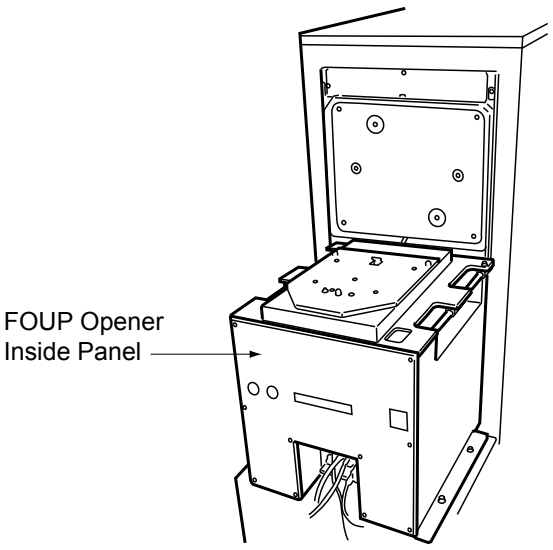
Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

Overview:

The FOUP opener inside panel must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

▼ **FOUP Opener Inside Panel**



NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the FOUP Opener Inside Panel (Single Port and Wide Loader)

1 Use one of the following methods to begin the procedure.

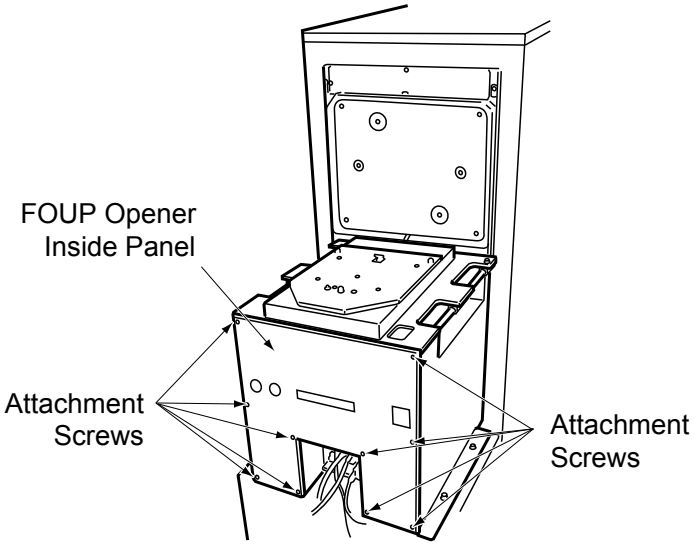
- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the loader front cover by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

3 Loosen the FOUP opener inside panel attachment screws (M4 x 6).

CAUTION **Property Damage Hazard**
Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Attachment Screws**



4 Grasp the panel by the center handle and lift upward and outward to remove.

5 Place the FOUP opener inside panel in an area where it cannot fall or cause obstruction.

Attaching the FOUP Opener Inside Panel (Single Port and Wide Loader)

6 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in**2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7 Grasp the panel by the center handle and align the attachment screw openings to the proper position.

8 Place the panel against the frame and lower it into position.

9 Secure the remaining opener inside panel attachment screws.

10 Reattach the loader front cover by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

4.7 Removing and Attaching Stage Panels and Covers (Dual Port) 0189.1

4.7.1 Removing and Attaching the Loader Right Side Panels (Dual Port) 0190.1

Introduction

Purpose:

To remove and attach the two loader right side panels.

The loader right side panels must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Right Side Panels (Dual Port)

1 Use one of the following methods to begin the procedure.

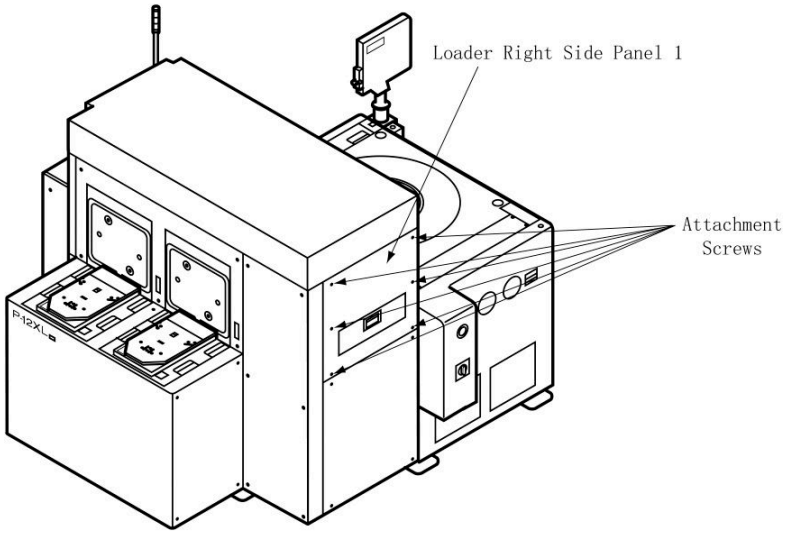
- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the loader side panel attachment screws (6 places for loader right side panel 1; 4 places for loader right side panel 2).

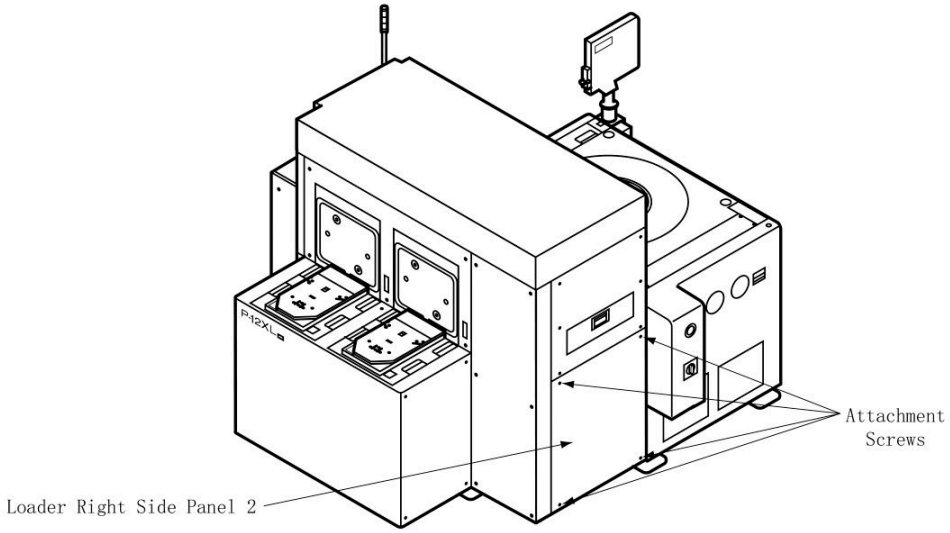
CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Loader Right Side Panel 1**



▼ **Loader Right Side Panel 2**



3 If you are removing loader right side panel 1, then disconnect the wafer table close sensor connector.

4 Pull the loader side panel horizontally away from the prober.

5 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Right Side Panels (Dual Port)

6 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7 If you are attaching loader right side panel 1, connect the wafer table close sensor connector.

8 Place the panel into position against the frame and properly align the attachment screw holes.

9 Loosely thread the panel attachment screws into position.

10 Align the panel to the proper position and secure the four corner screws.

11 Tighten the remaining loader right side panel attachment screws.

4.7.2 Removing and Attaching the Loader Left Side Panels (Dual Port) 0191.1

Introduction

Purpose:

To remove and attach the two loader left side panels.

The loader left side panels must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Left Side Panels (Dual Port)

1 Use one of the following methods to begin the procedure.

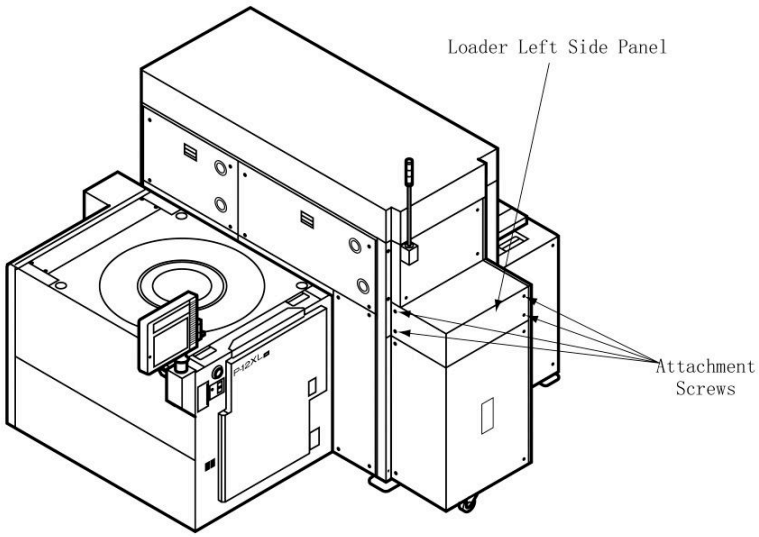
- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 4 loader left side panel attachment screws.

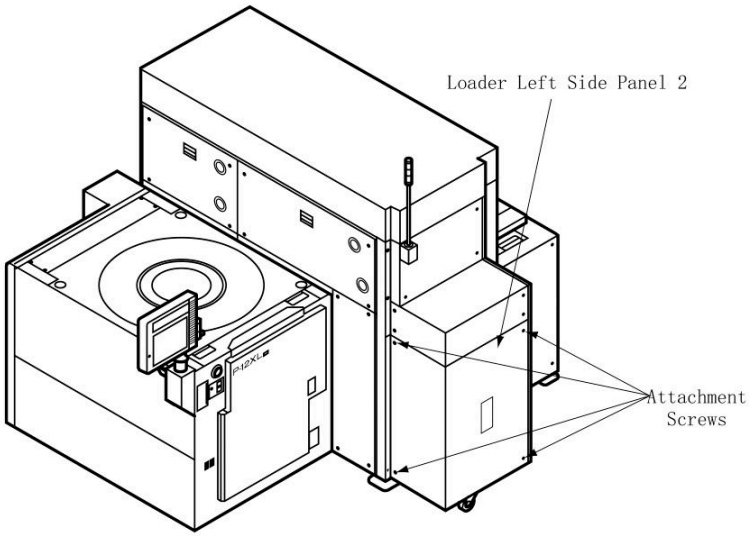
CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ **Loader Left Side Panel 1**



▼ **Loader Left Side Panel 2**



3 Pull the loader left side panel horizontally away from the prober.

4 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Left Side Panels (Dual Port)

5 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

6 Place the panel into position against the frame and properly align the attachment screw holes.

7 Secure the four attachment screws on the loader left side panel 1.

8 Secure the four attachment screws on the loader left side panel 2.

4.7.3 Removing and Attaching the Loader Front Cover (Dual Port) 0192.1

Introduction

Purpose:

To remove and attach the loader front cover.

The loader front cover must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Front Cover (Dual Port)

1 Use one of the following methods to begin the procedure.

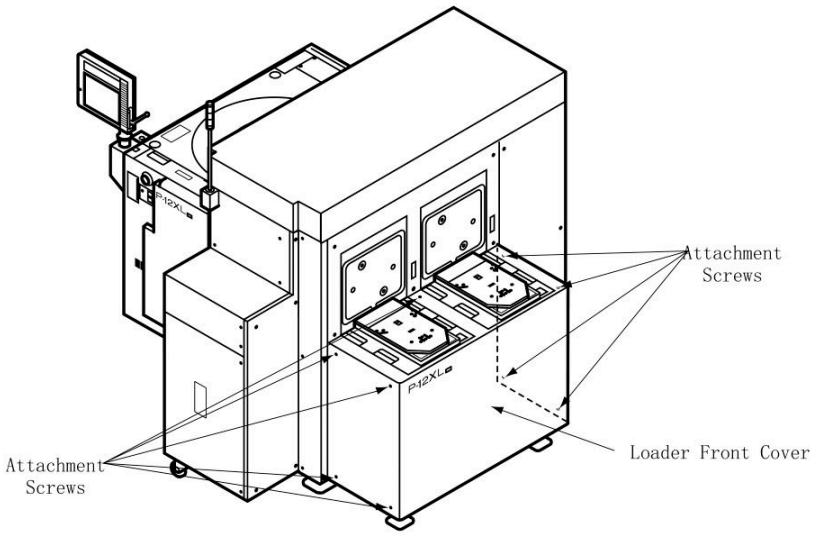
- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 9 loader front cover attachment screws.

CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ Loader Front Cover



3 Horizontally tilt the loader front cover away from the loader frame.

4 Place the cover in an area were it cannot fall or cause obstruction.

Attaching the Loader Front Cover (Dual Port)

5 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

6 Place the cover over the FOUP opener inside panel against the loader frame.

7 Loosely thread the four upper attachment screws into position.

8 Align the cover to the proper position and secure the four corner screws.

9 Tighten the remaining loader front cover attachment screws.

4.7.4 Removing and Attaching the Loader Front Right Panel (Dual Port) 0193.1

Introduction

Purpose:

To remove and attach the loader front right panel.

The loader front right panel must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Front Right Panel (Dual Port)

1 Use one of the following methods to begin the procedure.

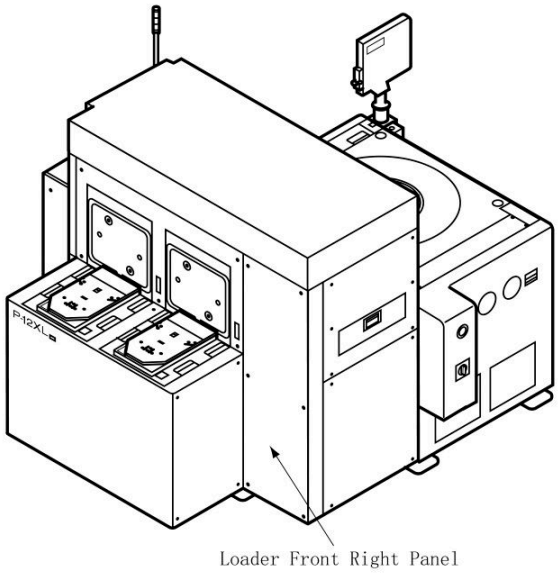
- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 6 loader front right panel attachment screws.

CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the cover. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

▼ Loader Front Right Panel



3 Pull the loader front right panel horizontally away from the prober.

4 Place the panel in an area where it cannot fall or cause obstruction.

Attaching the Loader Front Right Panel (Dual Port)

5 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

6 Place the panel into position against the frame and properly align the attachment screw holes.

7 Loosely thread the panel attachment screws into position.

8 Align the panel to the proper position and secure the four corner screws.

9 Tighten the remaining loader front right panel attachment screws.

4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) 0194.1

Introduction

Purpose:

To remove and attach the three loader rear panels.

The loader rear panels must be removed and reattached to safely and effectively perform specific maintenance procedures on the prober.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 1. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **If you are performing this procedure during the installation of the prober, all initialization and power cycle steps should be skipped.**

Removing the Loader Rear Panels (Dual Port)

1 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.

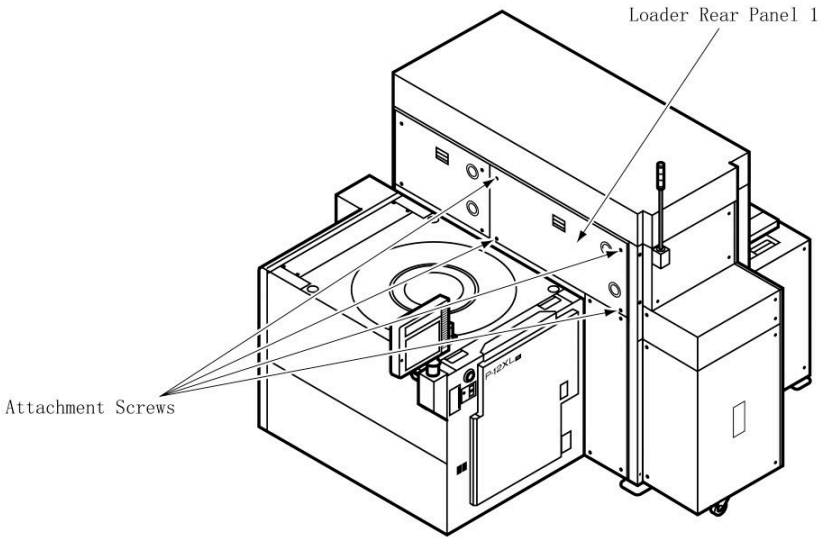
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the 4 loader rear panel attachment screws.

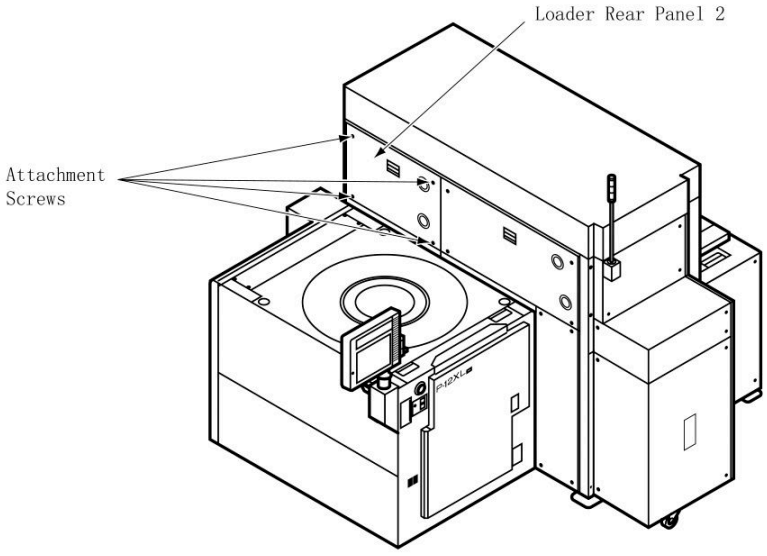
CAUTION **Property Damage Hazard**

Retrieving dropped attachment screws from inside the prober can be extremely difficult. Be careful not to drop any of the attachment screws when removing the panel. Screws that remain inside the tool after maintenance activity can cause severe damage to moving mechanisms and electrical circuits.

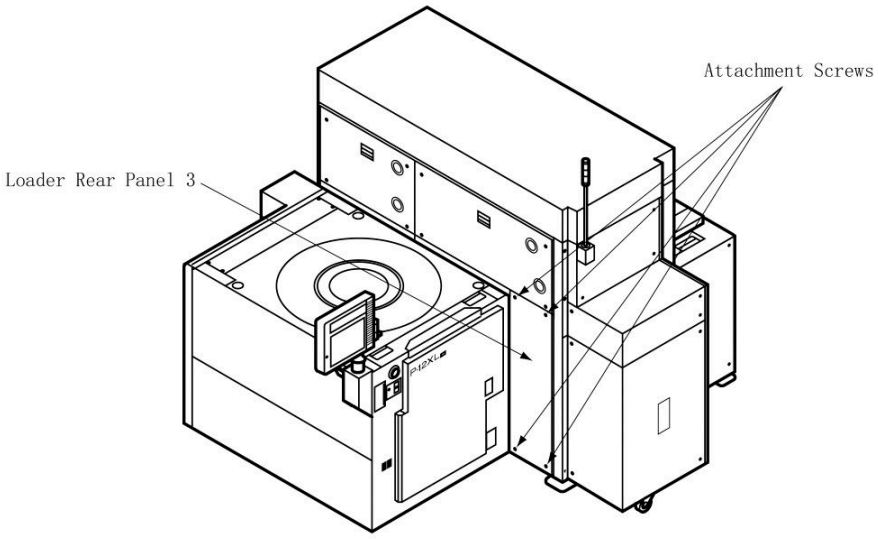
▼ **Loader Rear Panel 1**



▼ **Loader Rear Panel 2**



▼ **Loader Rear Panel 3**



3 Horizontally pull the loader rear panel away from the loader frame.

> **CAUTION** **Property Damage Hazard**
> **The shutter of the interlock switch is attached to the loader rear panel 1. Tilting the panel may damage the interlock switch.**

4 Place the panel in an area were it cannot fall or cause obstruction.

Attaching the Loader Rear Panels (Dual Port)

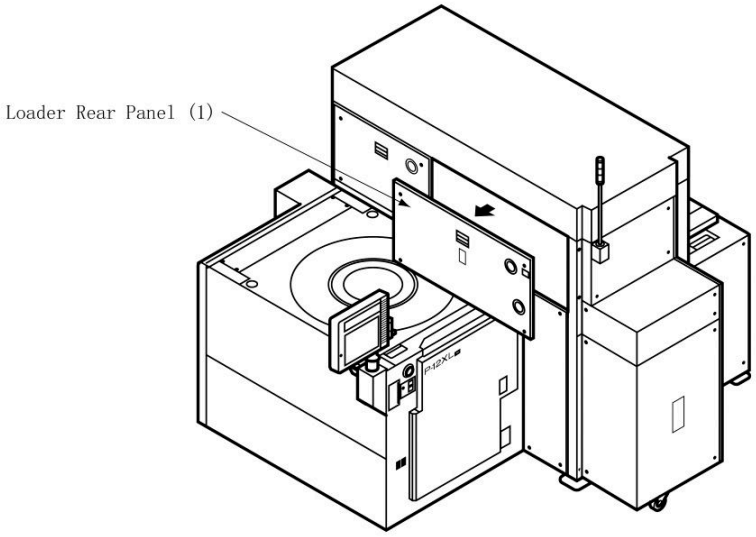
5 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout are in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

6 Horizontally align the panel to the proper position.

> **CAUTION** **Property Damage Hazard**
> **For the loader rear panel 1, check that the shutter of the interlock switch is inserted correctly when attaching the panel.**

Removing Loader Rear Panel 1



7 Secure the four panel attachment screws into position.

4.8 Installing the 200 mm Conversion Kit 1308.1

Introduction

Purpose:

To install the 200 mm wafer load port conversion kit.

Required Resources:

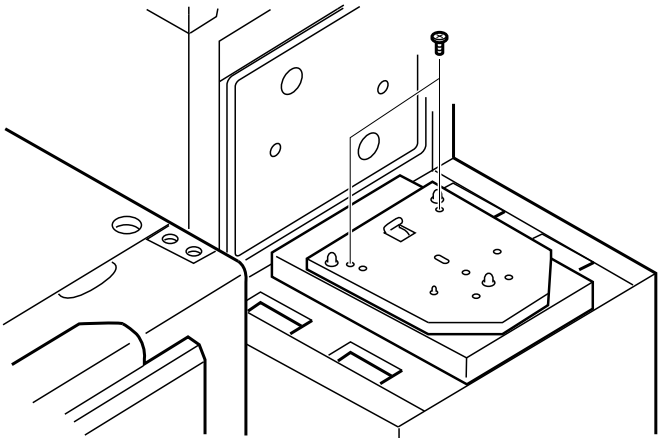
Time:	30 minutes
Personnel:	1 person
Tools:	Conversion kit Screwdriver
Parts or Consumables:	None

1 Perform a system shutdown and lockout and tagout the prober by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Check that the load port is in the undocked position.

3 Remove the two screws on the load port.

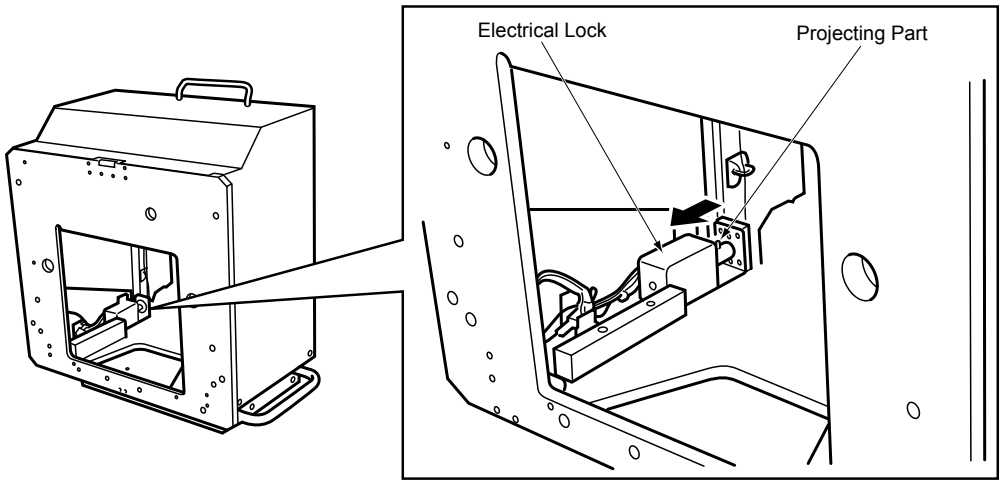
Load Port Screws



NOTE **Be sure to place the screws in a safe place so that they can be replaced after the conversion kit is removed.**

4 Press the projecting part of the electronic lock inside the conversion kit towards the rear of the conversion kit to release the door lock.

▼ **Conversion Kit Lock**



5 Open the conversion kit door.

6 Using the conversion kit handles, align the holes on the bottom of the conversion kit with the kinematic coupling pins on the load port.

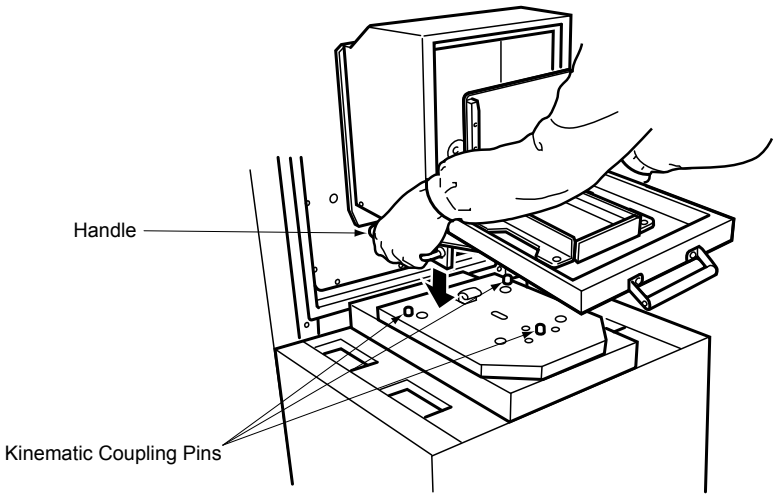
⚠ CAUTION **Mechanical Hazard**

To avoid pinching your hands or fingers in the conversion kit door, always hold the conversion kit by the handles.

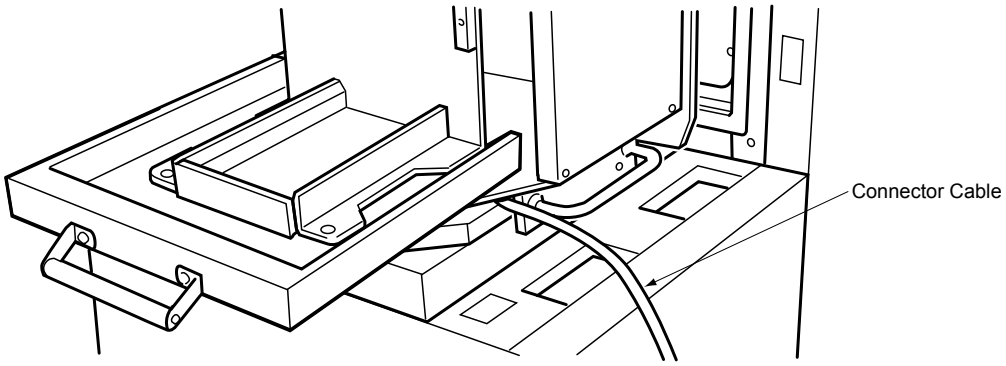
CAUTION **Property Damage Hazard**

Check for any interference between the conversion kit and the FOUP opener and between the conversion kit and the load port. Be sure to position the connector cable between the conversion kit and the load port so that the cable is not pinched or damaged.

▼ **Setting the Conversion Kit**

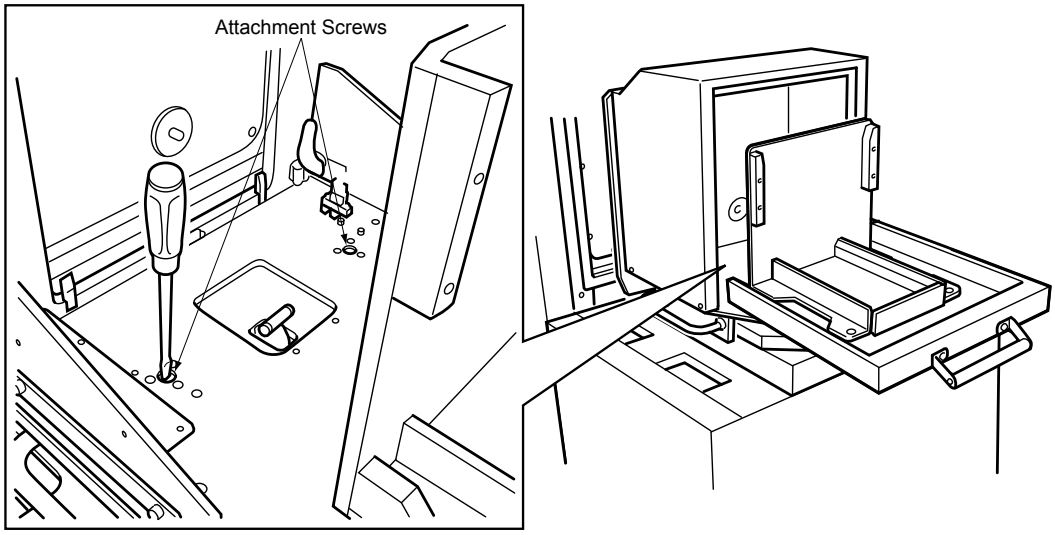


Connector Cable



7 Tighten the screws on the inside of the conversion kit to secure the conversion kit to the load port.

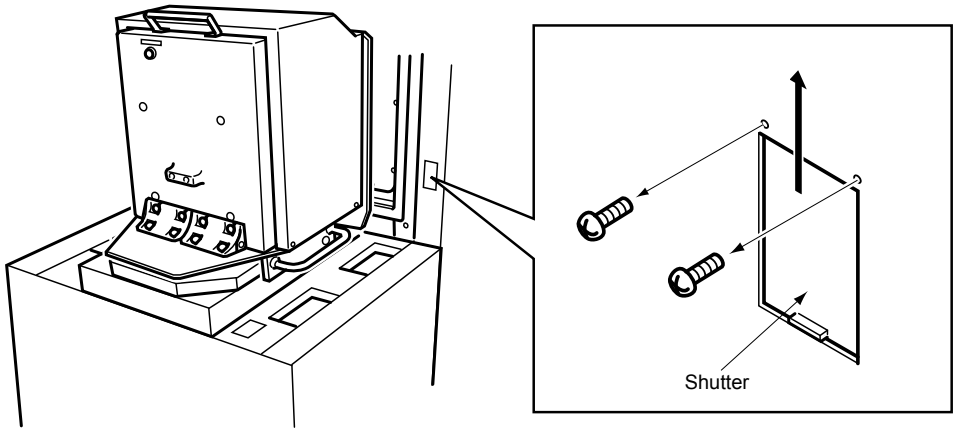
Securing the Conversion Kit



8 Close the conversion kit door.

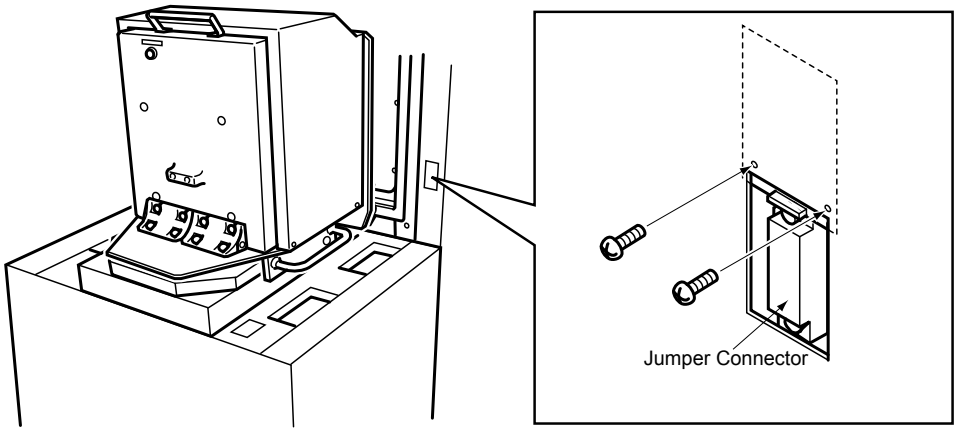
9 Remove the two screws from the connector shutter.

Shutter Screws



10 Raise the connector shutter and replace the two screws to fix it in the open position.

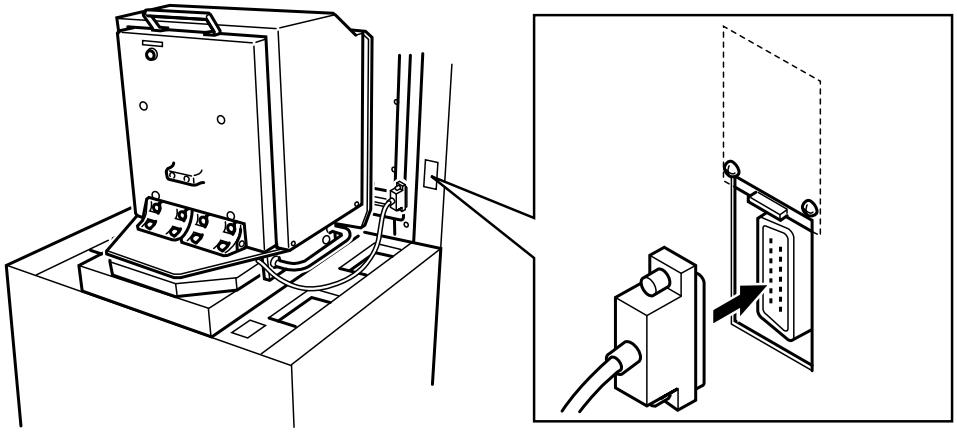
▼ **Replacing the Screws**



11 Remove the JP CONNECTOR (CNP).

12 Plug the serial port connector cable from the conversion kit into the prober connection and secure it using the screws on the connector.

▼ **Connecting the Serial Port Connector Cable**



4.9 Changing the Mapping Arm Position 1310.1

Introduction

Purpose:

To change the mapping arm between the 200 mm and 300 mm positions.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	Screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Changing the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

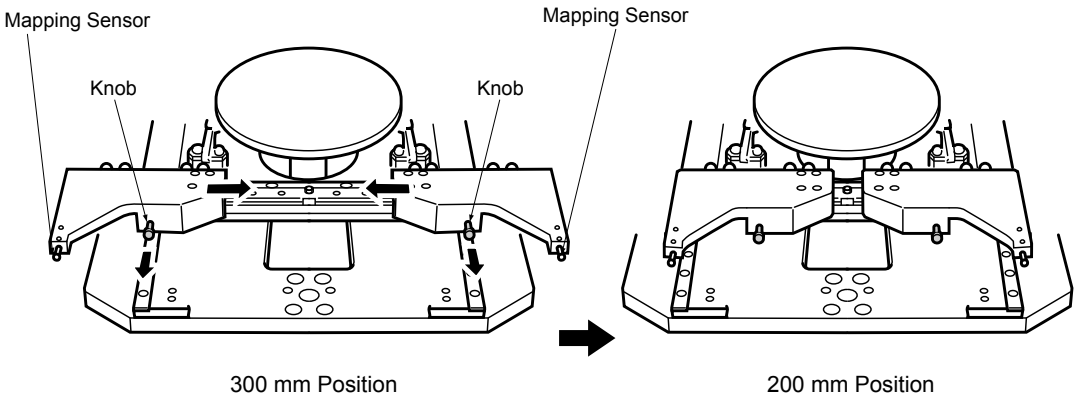
2 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

NOTE **The interlock is engaged when the loader side panel is removed. Therefore, the arm unit cannot be moved.**

3 While pulling the knob on the front of the mapping arm toward you, slide the mapping arm to desired position.

- If you will be testing 300 mm wafers, slide the arms to the outer positions.
- If you will be testing 200 mm wafers, slide the arms to the inner positions.

Mapping Arm Positions

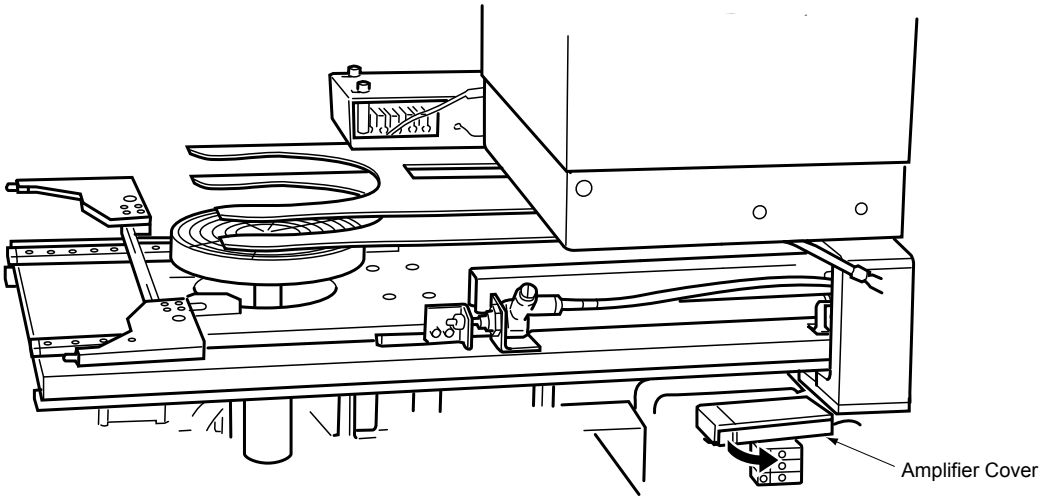


4 Release the knob on the mapping arm. The mapping arm is locked in the desired position.

NOTE **Check that the mapping arm is locked.**

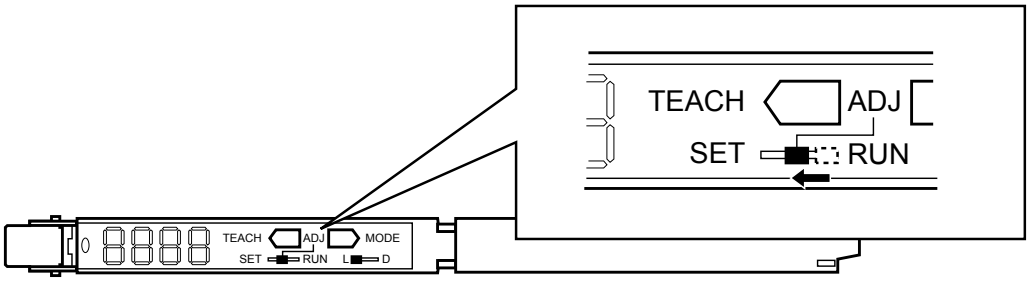
5 Open the amp cover.

Amp Cover



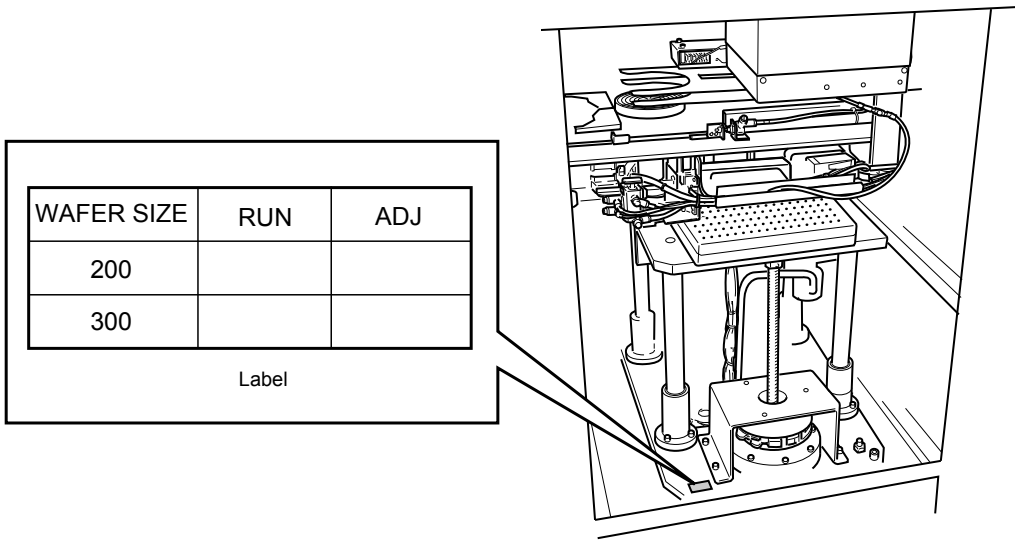
6 Change the amp mode from RUN to ADJ.

Changing the Amp Mode



7 Refer to the label affixed to the loader base and set the amp to the value described for the wafer size you will be probing.

▼ **Wafer Size Label**



8 Change the amp mode from ADJ to RUN.

9 Close the amp cover.

10 Reattach the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

11 Perform a system shutdown and lockout and tagout the prober by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

Changing the Dual Port Specification

12 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

13 Use the following steps to access the *Arm Unit Maintenance Menu*.

13.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

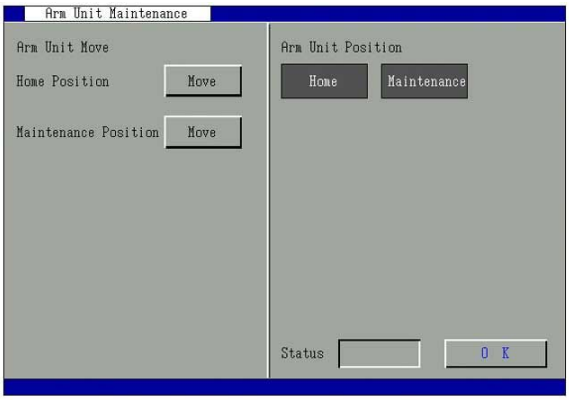
13.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

13.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

13.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

13.5 Press ARM UNIT MAINTENANCE on the *Loader Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

Arm Unit Maintenance Menu



14 Press MOVE next to `Maintenance Position` under `Arm Unit Move`. The arm unit moves to the maintenance position.

15 Remove loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

NOTE **The interlock is engaged when loader rear panel 1 is removed. Therefore, the arm unit cannot be moved.**

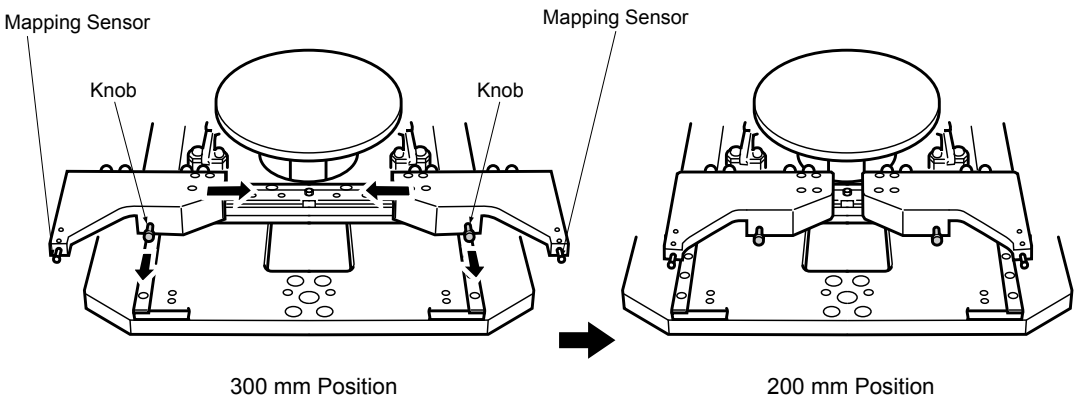
Although the buzzer will sound if an interlock error occurs, you can continue to work once the buzzer is stopped.

16 While pulling the knob on the front of the mapping arm toward you, slide the mapping arm to desired position.

If you will be testing 300 mm wafers, slide the arms to the outer positions.

If you will be testing 200 mm wafers, slide the arms to the inner positions.

Mapping Arm Positions

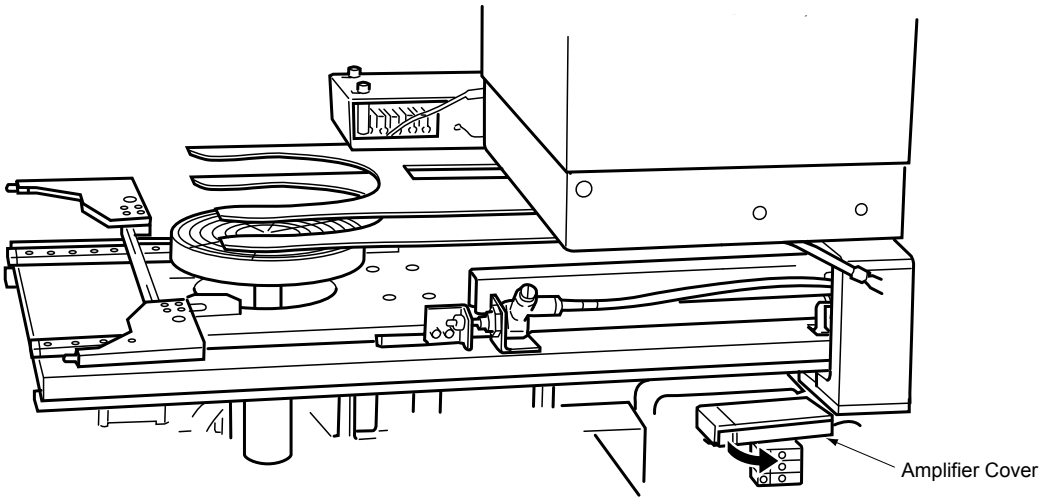


17 Release the knob on the mapping arm. The mapping arm is locked in the desired position.

NOTE **Check that the mapping arm is locked.**

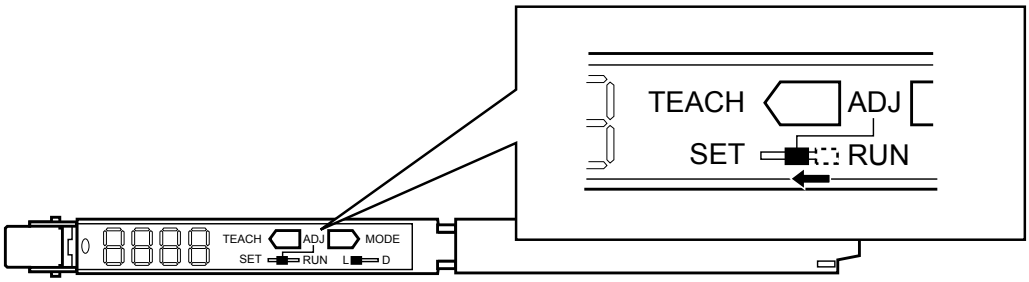
18 Open the amp cover.

Amp Cover



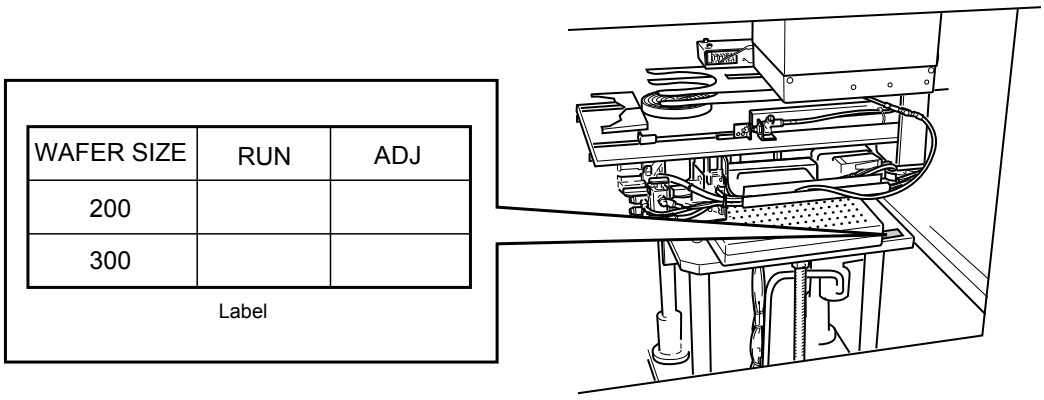
19 Change the amp mode from RUN to ADJ.

Changing the Amp Mode



20 Refer to the label affixed to the loader base and set the amp to the value described for the wafer size you will be probing.

Wafer Size Label



21 Change the amp mode from ADJ to RUN.

22 Close the amp cover.

23 Reattach loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

24 Perform a system shutdown and lockout and tagout the prober by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

4.10 Removing the 200 mm Conversion Kit 1313.1

Introduction

Purpose:

To remove the 200 mm wafer load port conversion kit.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Screwdriver
Parts or Consumables:	None

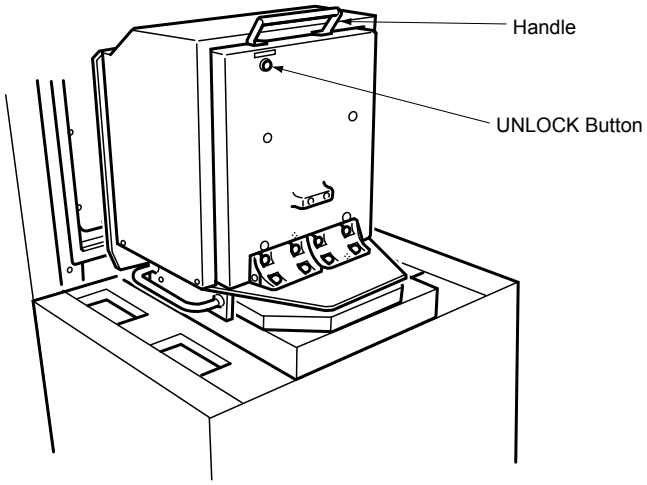
NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Restore power and perform a system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

2 Grasp the handle at the top of the conversion kit and press the UNLOCK button to release the lock.

Conversion Kit

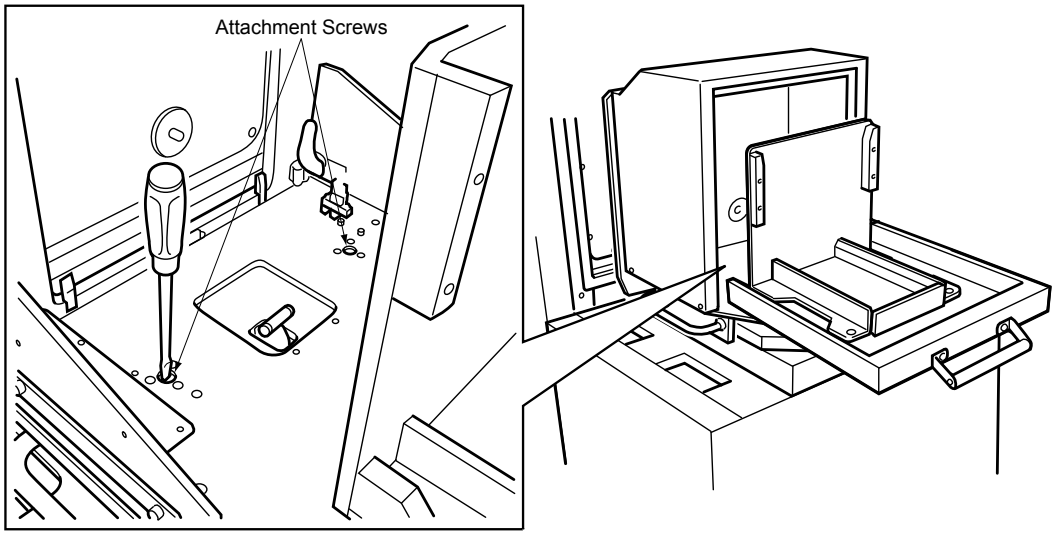


3 Open the conversion kit door.

4 Perform a system shutdown and lockout and tagout the prober by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

5 Loosen the attachment screws securing the conversion kit to the load port.

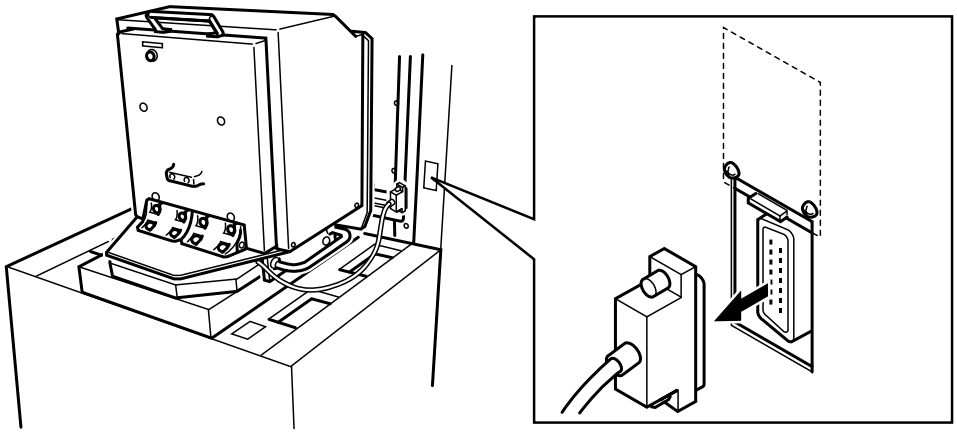
Conversion Kit Attachment Screws



6 Close the conversion kit door.

7 Loosen the two screws from the cable connector and disconnect the cable from the loader.

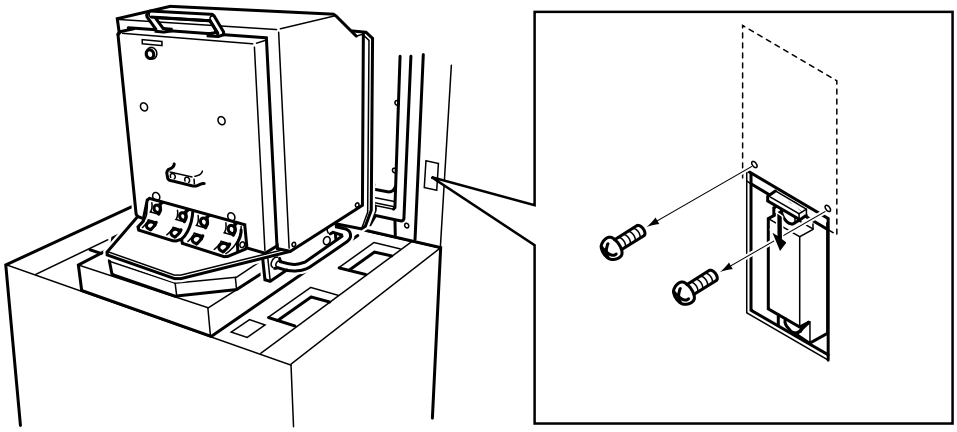
Removing the Serial Port Connector Cable



8 Reattach the JP CONNECTOR (CNP).

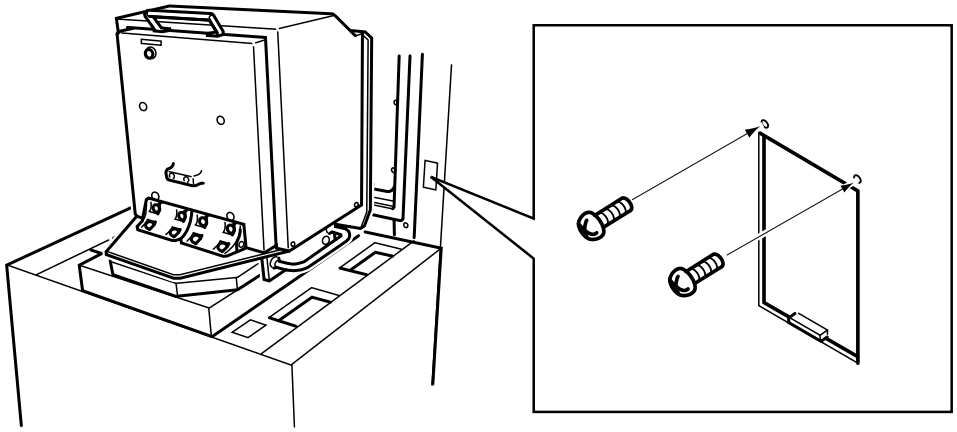
9 Remove the two fastening screws and close the shutter over the connector port.

▼ **Removing the Shutter Screws**



10 Secure the shutter in the closed position using the two fastening screws.

▼ **Replacing the Screws**



11 Remove the conversion kit from the load port.

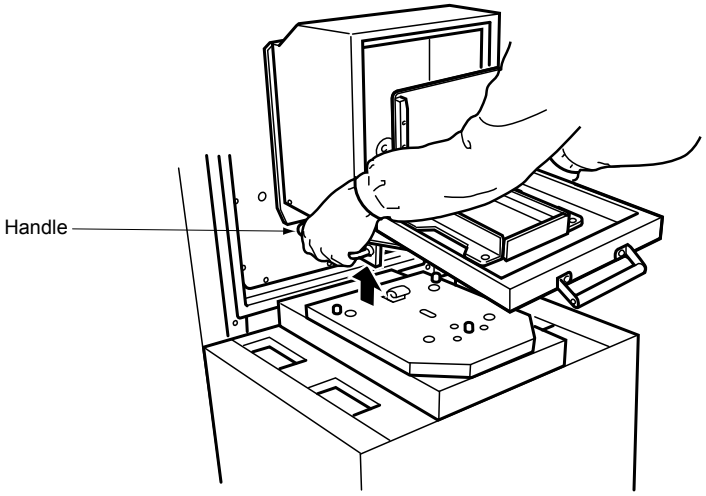
⚠ CAUTION **Ergonomic Hazard**

The conversion kit weighs 12 kg and can cause muscle strains if not handled correctly. To avoid injury to personnel or damage to the tools, be careful when removing the conversion kit.

⚠ CAUTION **Mechanical Hazard**

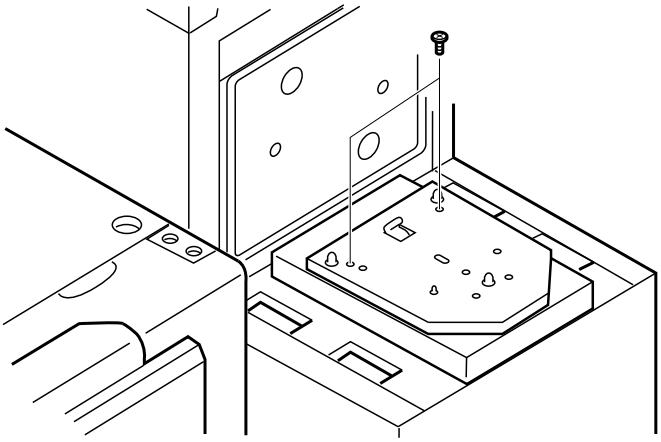
If the connector cable is still connected when the conversion kit is removed, it can be damaged or cause an accident. Be sure to disconnect the cable before removing the conversion kit from the load port.

Removing the Conversion Kit



12 Replace the two screws on the load port.

Load Port Screws



NOTE **Use the screws you removed from the load port when you installed the conversion kit.**

4.11 Changing Probe Cards Using the SACC 0358.1

Introduction

Purpose:

To change the probe card using the SACC.

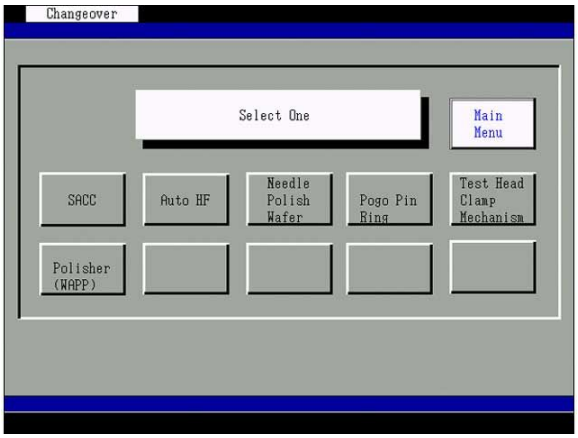
Pressing CHANGE CARD on the *SACC Function Operation Menu* provides the operator with a semiautomatic sequence that will unload a probe card and load another without opening the head plate.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Probe cards

1 Press CHANGEOVER on the *Main Menu*. The *Changeover Menu* is displayed.

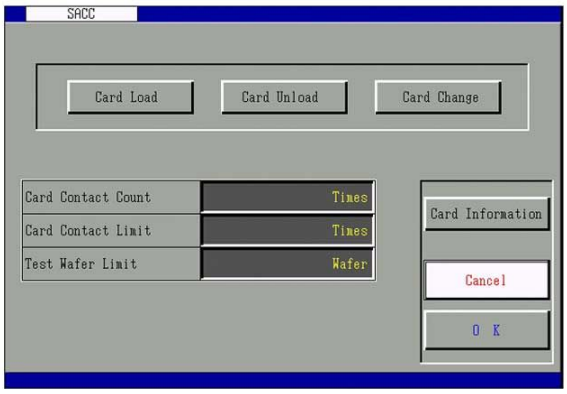
▼ **Changeover Menu**



2 Press SACC on the *Changeover Menu*. An assist menu is displayed stating `Personnel injury and damage to equipment can occur as a result of improper SACC operation. If choosing SACC operation by mistake, please press can-`

`cel.` Press OK. The XY stage retracts, and the *SACC Function Operation Menu* is displayed. The SACC can now be operated.

SACC Function Operation Menu



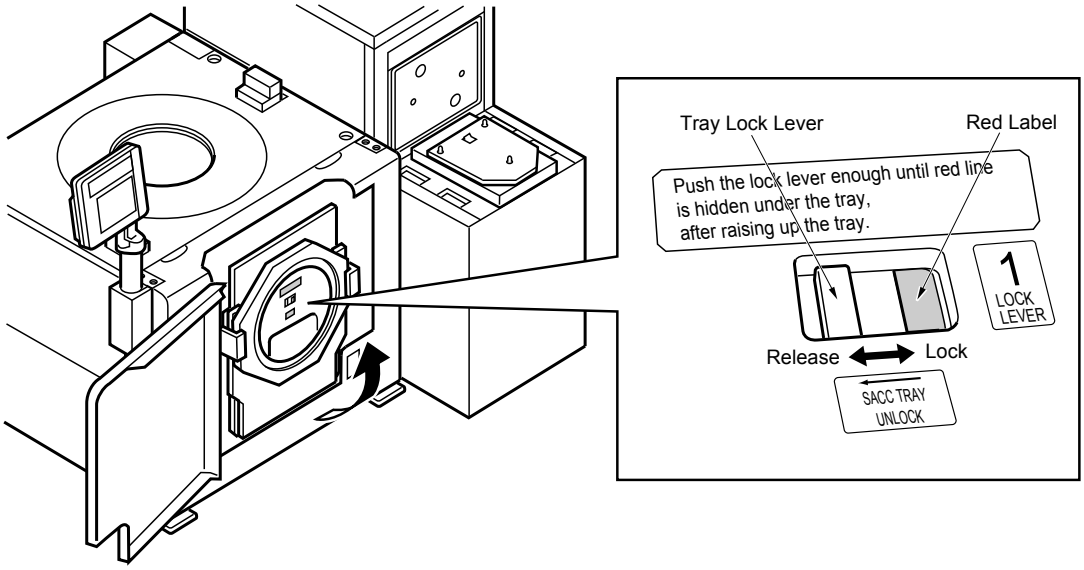
3 Press CARD CHANGE on the *SACC Function Operation Menu*. An assist menu is displayed stating `Open the SACC cover and prepare the tray.`

CAUTION **Mechanical Hazard**
Keep hands clear. Moving mechanical pinch hazard.

4 Open the SACC cover.

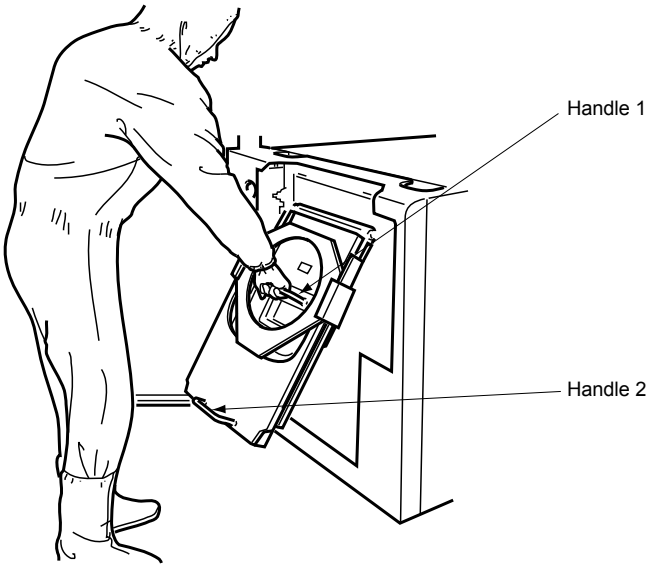
5 Slide the tray lock lever to the left until the entire red seal is visible.

Lifting the Card Tray



6 Using one hand, grasp handle 1 and lift the SACC tray to knee level.

Fastening the Card Tray



7 Using the other hand, grasp handle 2 and use both handles to lift the tray into the upright position.

8 Pull the card tray up and verify that the red seal on the tray lock lever is completely hidden, which indicates the lock lever is fully engaged.

CAUTION **Mechanical Hazard**

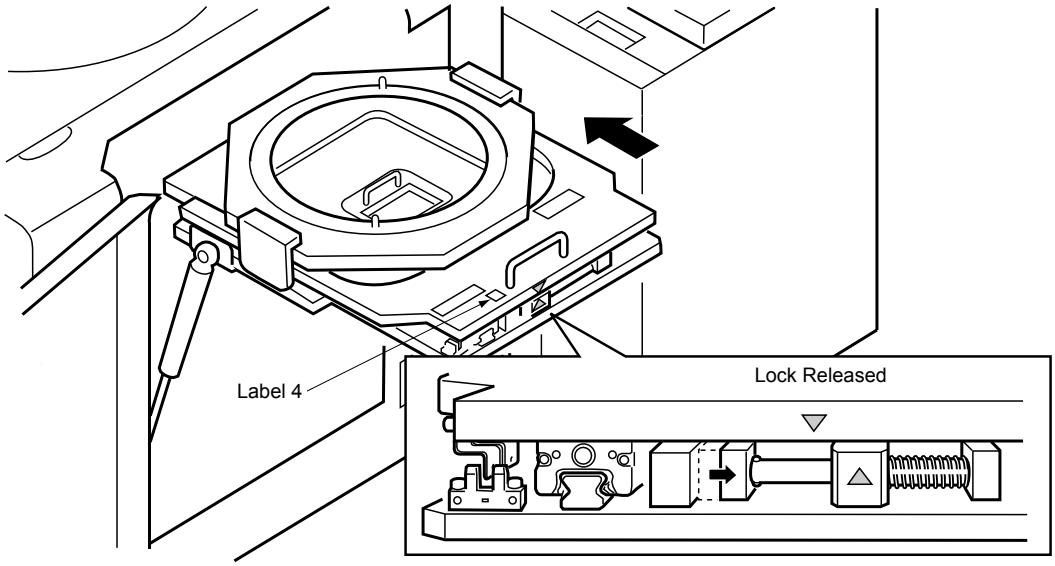
Always verify that the tray lock is secured in the lock position before releasing the handles.

9 Press OK on the assist menu. An assist menu appears stating `Lift and lock the SACC tray into the up position and then slide and lock the SACC tray into the load position.`

10 Check that the proper middle plate for the probe card in use is attached to the SACC. Middle plates differ depending on the type of probe card used.

11 Release the slide mechanism lock. Gently slide the SACC tray unit inside the stage area until it is locked in place by the slide mechanism lock. Check that the arrows are aligned and the tray is locked before performing the next step.

Inserting SACC Tray into Stage Area



12 Press OK on the assist menu. The prober begins removing the probe card from the head plate.

NOTE **Depending on the hardware settings of the prober and the test head, a check menu for the tester side vacuum may appear.**

13 When the prober has removed the probe card from the head plate, an assist menu is displayed stating `Gently slide and lock the SACC tray back into the home position and remove the probe card.`

14 Check that there is nothing obstructing the SACC tray path. After releasing the slide mechanism lock, slowly pull the SACC tray out of the stage area until it locks.

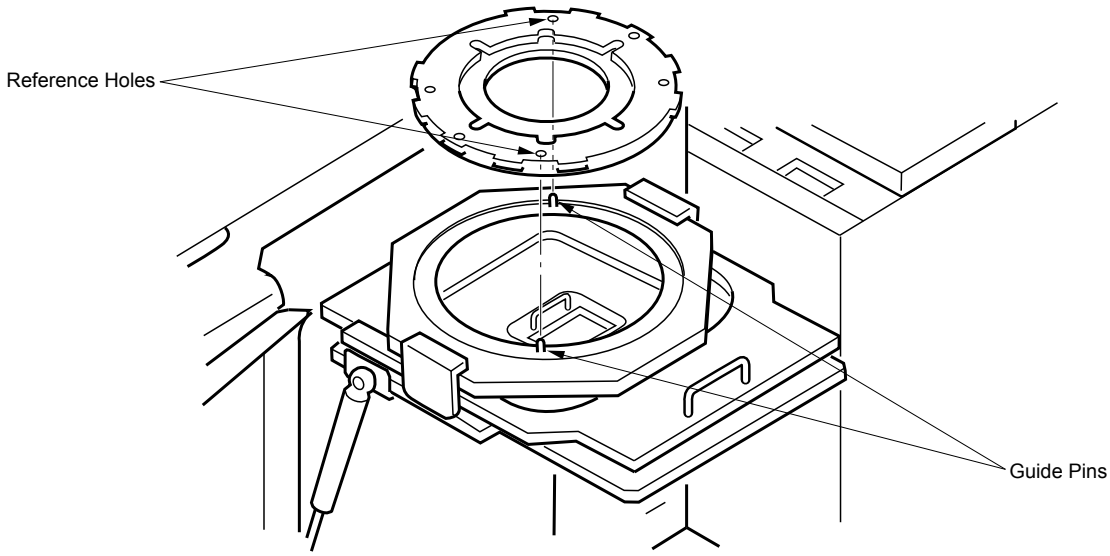
15 Lift and remove the probe card from the middle plate.

16 Align the reference holes on the probe card holder to the guide pins. If the probe card you are replacing is attached to a card holder, replace the entire card holder.

CAUTION **Property Damage Hazard**

If the probe card is attached to the card holder in the incorrect direction, the probe card and the wafer may be damaged. If the probe card you are replacing is attached to a card holder, check how the probe card is attached.

▼ **Placing a Probe Card Holder on the Card Tray**



17 Set the probe card onto the middle plate. Check the direction of the probe card, and then attach it to the card holder.

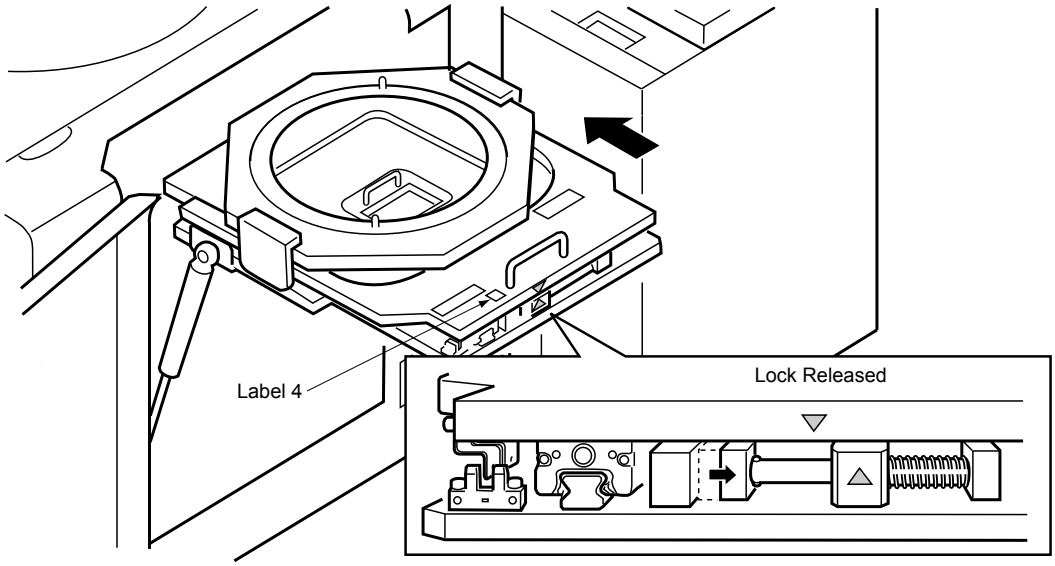
CAUTION **Property Damage Hazard**

If you perform the card clamp operation without a probe card, the part of the card holder that receives the probe card can be bent. Always attach a probe card to the card holder.

18 Press OK on the assist menu. A check menu is displayed stating `Lift and lock the SACC tray into the up position and then slide and lock the SACC tray into the load position.`

19 Release the slide mechanism lock. Gently slide the SACC tray inside the stage area until it is locked in place. Check that the arrows are aligned and the tray is locked before performing the next step.

▼ **Inserting SACC Tray into Stage Area**



20 Press OK on the assist menu. The probe card is loaded.

NOTE **Depending on the hardware settings of the prober and the test head, a check menu for the tester side vacuum may appear.**

21 After the probe card is loaded, an assist menu is displayed stating `Gently slide and lock SACC tray back into the home position.` Check that there is nothing obstructing the SACC tray path. After releasing the slide mechanism lock, slowly pull the SACC tray out of the stage area until it locks.

22 Press OK on the assist menu. A check menu is displayed stating `Store SACC arm and close cover.`

23 Turn the tray lock lever to the UNLOCK position, store the SACC tray unit and close the SACC cover. Press OK on the assist menu.

24 Press OK to exit the *SACC Function Operation Menu*. The prober initializes.

4.12 Changing Probe Cards Manually 0359.1

Introduction

Purpose:

To manually change the probe card, if the prober is not equipped with an SACC.

Required Resources:

Time:	20 minutes
Personnel:	2 people
Tools:	Mylar sheet 8.0 mm hex wrench
Parts or Consumables:	Probe cards

⚠ WARNING Ergonomic Hazard

This procedure must be performed by two or more persons who have been trained in changing probe cards manually. If the probe card falls during the changing process, it can cause serious damage to the machinery and/or injury to personnel. This procedure should only be used if absolutely necessary. It is recommended that the probe card be changed using the SACC as described in 4.11 Changing Probe Cards Using the SACC (see page 156).

⚠ CAUTION Electrical Hazard

The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

Changing a Probe Card Using a Card Easy-Attachment Mechanism

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard

The head plate can close unexpectedly and pinch finger or hands. When opening the head plate, check that the lock mechanism is in the fully locked position.

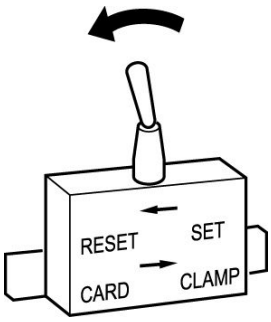
2 Cover the chuck top with a Mylar sheet or other protective covering.

3 Hold the probe card holder in place and have another operator move the card clamp switch on the card easy-attachment mechanism from SET to RESET. The card holder clamp rotates, and the probe card holder is released.

⚠ CAUTION Mechanical Hazard

The card holder clamp has rotating parts that can pinch hands or fingers. Keep clear of the card holder clamp when it is operating.

▼ **Setting the Card Clamp Switch**



4 Remove the probe card holder from the card easy-attachment mechanism.

5 Replace the probe card attached to the probe card holder. If the replacement probe card is attached to another probe card holder, then replace the entire probe card holder.

CAUTION **Property Damage Hazard**
If the probe card is attached in the incorrect direction, the probe card and wafer may be damaged. If the probe card you are replacing is attached to a card holder, check that the probe card is attached correctly.

6 Check the direction of the probe card, and then attach it to the card holder.

7 Align the probe card holder reference holes with the guide pins on the card easy-attachment mechanism and place the card holder into the card holder clamp.

CAUTION **Property Damage Hazard**
Be sure the probe card is aligned correctly to avoid jamming the card in the locking ring.

8 Hold the probe card holder in place and have another operator move the card clamp switch on the card easy-attachment mechanism from RESET to SET. The probe card holder clamp rotates and the probe card holder is locked in place.

CAUTION **Property Damage Hazard**
If you perform the card clamp operation without a probe card attached to the card holder, the part of the card holder that receives the probe card could be damaged. Always attach a probe card to the card holder.

9 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

4.13 Shutting Down the Power Supply 1499.1

Introduction

Purpose:

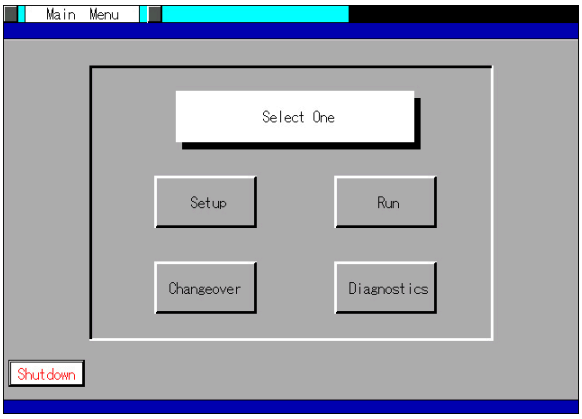
To stop the prober from accessing the hard disk and floppy disk drives, then shut down the power to the prober.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Navigate to the `Main Menu`. Depending on the menu displayed, you can use the PREVIOUS MENU and MAIN MENU buttons to navigate.

Main Menu

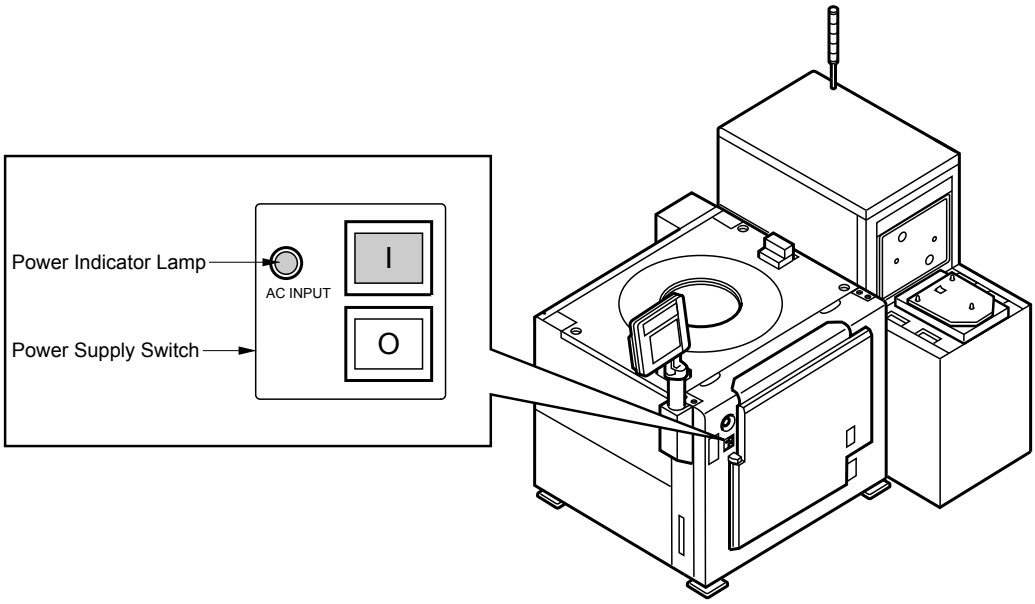


2 Press SHUTDOWN on the MAIN MENU. A check menu is displayed asking, `Do you want to shutdown?`

3 Press YES. The prober stops accessing the hard disk and floppy disk drives, then displays a message menu stating, `Restart the system.`

4 Check that the restart message is displayed, then press the [O] button on the power supply switch on the front of the prober to turn OFF the power to the prober.

Power Supply Switch



C H A P T E R 5

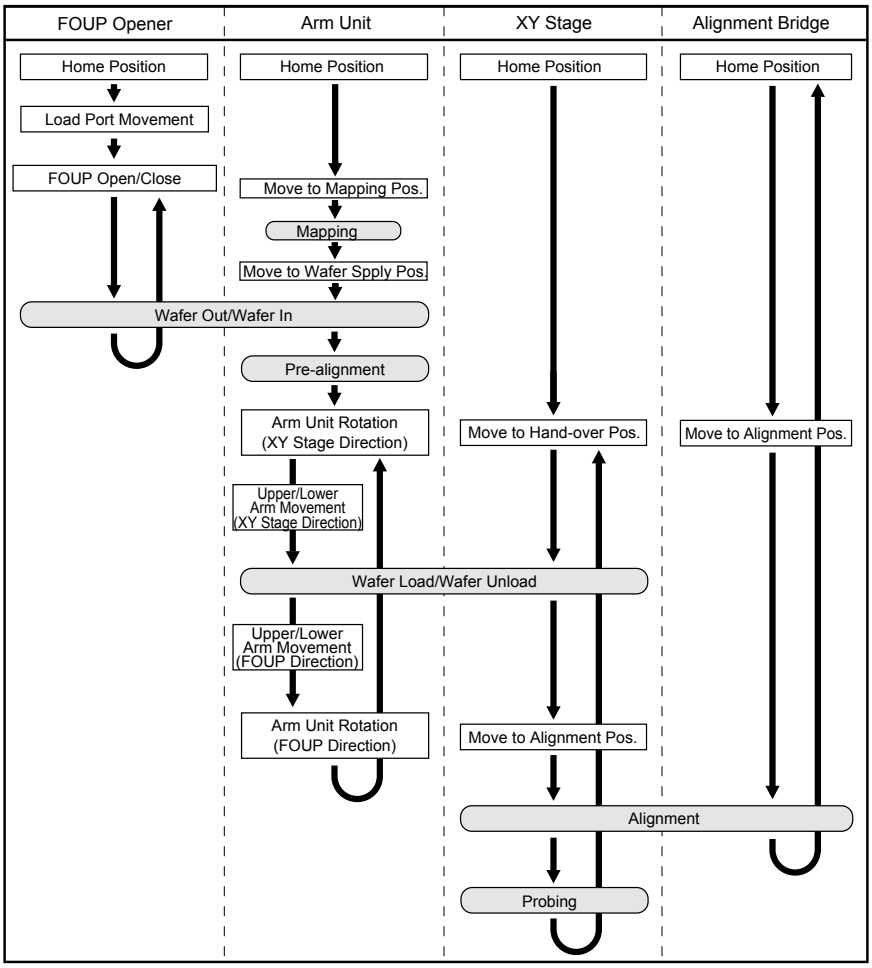
Configuring and Performing Running Diagnostics

This chapter describes the tasks to be used for diagnosing whether the prober requires maintenance. Each section describes the purpose of the associated procedure and provides the menu path to the appropriate screens for performing it.

5.1 Prober Mechanical Movement During the Running Diagnostic Test 0270.1

To check whether the prober is operating normally, inspect the movement of the various components during the prober's automated process. To accurately identify potential problems, you must understand how all the parts move in sequence. The following illustration shows the general outline of the prober component movements during the Running Diagnostic test.

Prober Movement Processes



5.2 Configuring the Running Diagnostic Parameters 0271.1

Introduction

Purpose:

To allow a visual and audio inspection of the prober's mechanical movements, while simulating the automatic probing process.

For the P-12XL probers, test cycling the prober through the normal operating motions is referred to as the Running Diagnostic test. Communication must be disabled between the tester and the prober during the running diagnostic test. Select NO to enable the running diagnostic test and disable tester communication.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

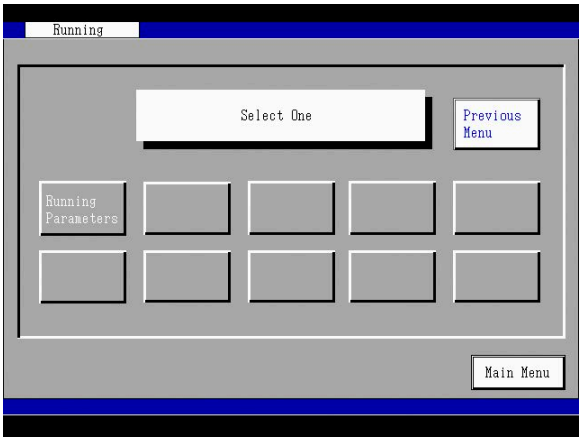
2 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

3 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

4 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

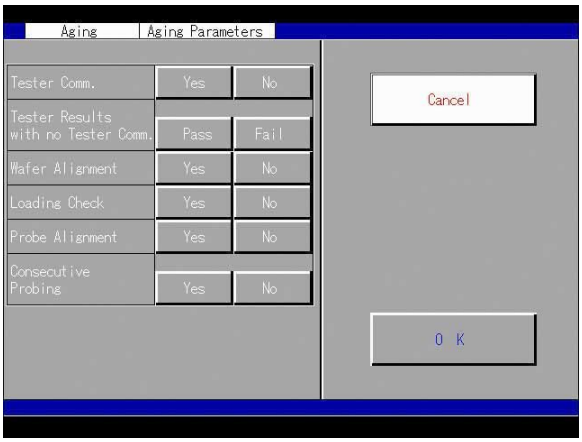
5 Press RUNNING on the *Adjustments Menu*. The *Running Menu* is displayed.

▼ **Running Menu**



6 Press RUNNING PARAMETERS on the *Running Menu*. The *Running Parameters Menu* is displayed.

▼ **Running (Aging) Parameters Menu**



7 Set each parameter. Refer to the table below for a description and explanation of each menu option.

▼ **Running (Aging) Parameters**

Item	Settings	Contents
Tester Comm. (Communications)	YES, NO	Enable/disable the communications link to the tester during the Running diagnostic. YES: Enables the communications link to the tester. NO: Disables the communications link to the tester and initiates the running diagnostic.
Tester Results with No Tester Comm.	PASS, FAIL	Sets the testing results displayed on the *RTWM* during the running diagnostic. PASS: Displays all testing results as “pass” on the *RTWM*. FAIL: Displays all testing results as “fail” on the *RTWM*.

Item	Settings	Contents
Wafer Alignment	YES, NO	Sets whether or not wafer alignment is performed during the running diagnostic. YES: Wafer alignment occurs during the running diagnostic. NO: Wafer alignment does not occur during the running diagnostic.
Loading Check	YES, NO	Sets whether or not a loading check is performed during the running diagnostic. YES: Wafers cycle through the loader—wafers are loaded from the FOUP, pre-aligned, transferred to the chuck top, and then unloaded from the chuck top back into the FOUP. NO: Disables the loading check.
Probe Alignment	YES, NO	Sets whether or not probe card alignment occurs during the running diagnostic. YES: Probe card alignment occurs during the running diagnostic. NO: Probe card alignment does not occur during the running diagnostic. **NOTE** **If `Alignment` and/or `Probe Alignment` is set to NO, you cannot perform contact checks or change offsets during the running diagnostic. If you attempt to perform a contact check, the prober prompts you to perform an alignment using the `Total Alignment` option presented on the *Functions Menu*.**
Consecutive Probing	YES, NO	Sets whether the prober continuously cycles wafers during the running diagnostic. YES: The prober continuously runs test wafers without ending the lot. NO: The prober does not continuously run test wafers and probes only one wafer.

8 Press NO for `Tester Comm`. Communication with the tester is disabled.

9 After confirming or adjusting all of the settings, press OK. A check menu is displayed with the message `Is it OK to change the setting value?` If the settings are correct, press YES. The settings are input, and the *Running Menu* is displayed.

10 Press PREVIOUS MENU on the *Running Menu*.

11 Press PREVIOUS MENU on the *Adjustments Menu*.

12 Press MAIN MENU on the *Diagnostics Menu*. The *Main Menu* is displayed.

5.3 Performing the Running Diagnostic Routine 0272.1

Introduction

Purpose:

To perform the running diagnostic routine.

When performing the running diagnostic procedure, it is necessary to select the wafer file that corresponds to the probe card and wafers that will be used.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **Before beginning the running diagnostic procedure, disable communication between the tester and prober by following the procedure described** **5.2 Configuring the Running Diagnostic Parameters (see page 169).**

1 Use one of the following methods to begin the procedure.

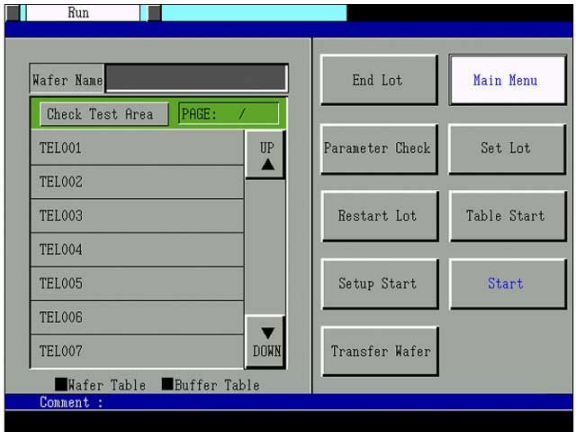
CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Press RUN on the *Main Menu*. The *Run Menu* is displayed.

Run Menu



NOTE **Verify that the file name displayed on the *Run Menu* is the one that will be used during the running test. If necessary, use the up and down arrow buttons to scroll through the list of wafer files.**

3 Use the following steps to set the overdrive amount.

3.1 Press PARAMETER CHECK on the *Run Menu*. The *Parameter Check Menu* is displayed.

Parameter Check Menu

3.2 Press WAFER PARAMETERS on the *Parameter Check Menu*.

3.3 Press CHANGE on the *Parameter Check Menu*.

3.4 Press OVERDRIVE on the *Item Selection Menu*. The numeric keypad is displayed.

3.5 Record the overdrive amount displayed on the touch screen.

3.6 Input -300µm for the overdrive amount and press OK. A check menu is displayed with the message `Are you changing the setting?` Press YES.

3.7 Press OK on the *Item Selection Menu*. The new overdrive amount is changed and the *Parameter Check Menu* is displayed.

3.8 Press PREVIOUS MENU. The *Run Menu* is displayed.

4 If GPIB communication is ON, the running test will not operate. Use the following steps to disable the GPIB communication settings.

4.1 Press OPERATION PARAMETER on the *Parameter Check Menu*.

4.2 Press CHANGE on the *Parameter check Menu*. The *Item Selection Menu* is displayed.

4.3 Press GPIB on the *Item Selection Menu*. The *GPIB Menu* is displayed.

▼ **GPIB Menu**

4.4 Press NO next to `GPIB` and then press OK. A check menu is displayed with the message `Are you changing the setting?` Press YES. The *Item Selection* is displayed.

4.5 Press PREVIOUS MENU on the *Item Selection Menu*. A message menu is displayed stating `Now Saving. Wait a minute.`

4.6 Press PREVIOUS MENU to return to the *Run Menu*.

▼ **Run Menu**

5 Check that the file name selected contains wafer and operation parameters for the probe card and wafers being used in the running diagnostic. (Changing wafer and operation parameters is described in the P-12XL Advanced Operations Manual. Select the correct file name for the FOUP and wafers that will be used.

6 Press START to begin the running diagnostic.

7 Check the following prober movements, referring to **5.4 Points of Inspection During the Running Diagnostic Test (see page 177)**:

- The mapping function should be operating correctly before loading.
- After loading, the wafer should be placed on the center of the chuck top.
- Ensure that the edge, micro, macro and theta probe alignment are performed correctly using the display on the *Camera Menu*.
- Ensure that recognition during alignment is performed correctly.
- While unloading, the wafer should not bounce when the 3-pins rise.
- No errors should occur during any operation.
- Ensure that all the wafers in the FOUP cycled correctly.

8 After the inspection points are complete and sufficient cycling has occurred, use the following steps to stop the running test diagnostic.

8.1 Press STOP on either the *Standard Testing Menu* or the *RTWM*. Testing stops and the *Stop Processing Menu* is displayed.

8.2 Press END TEST. The *Stop Selection Menu* is displayed.

8.3 Press END LOADING. The *End Loading Selection Menu* is displayed.

End Loading Selection Menu

8.4 Press END IMMEDIATELY. The wafer being tested is stopped and unloaded, and the arms return all wafers back to the FOUP. The *Run Menu* is displayed.

9 If you are using GPIB, perform the following steps to return the GPIB to the original setting.

9.1 Press PARAMETER CHECK on the *Run Menu*.

9.2 Press CHANGE on the *Parameter check Menu*. The *Item Selection Menu* is displayed.

9.3 Press GPIB on the *Item Selection Menu*. The *GPIB Menu* is displayed.

9.4 Press YES next to `GPIB` and then press OK. A check menu is displayed with the message `Are you changing the setting?` Press YES. The *Item Selection Menu* is displayed.

9.5 Press PREVIOUS MENU on the *Item Selection Menu*. A message menu is displayed stating `Now Saving. Wait a minute.`

9.6 Press PREVIOUS MENU to return to the *Run Menu*.

10 Use the following steps to return the overdrive amount to the original setting.

10.1 Press PARAMETER CHECK on the *Run Menu*. The *Parameter Check Menu* is displayed.

10.2 Press WAFER PARAMETERS on the *Parameter Check Menu*.

10.3 Press CHANGE on the *Parameter Check Menu*.

10.4 Press OVERDRIVE on the *Item Selection Menu*. The numeric keypad is displayed.

10.5 Set the overdrive amount to the value you recorded in step 3 and press OK. A check menu is displayed stating `Are you changing the setting?` Press YES.

10.6 Press OK on the *Item Selection Menu*. The new overdrive amount is changed and the *Parameter Check Menu* is displayed.

10.7 Press PREVIOUS MENU. The *Run Menu* is displayed.

11 Press MAIN MENU on the *Run Menu*. The *Main Menu* is displayed.

5.4 Points of Inspection During the Running Diagnostic Test 0273.1

The visual inspection described in 5.3 Performing the Running Diagnostic Routine (see page 172) is accomplished by setting the prober to perform the running diagnostic test. The prober will not actually test a product, but will cycle through all of the motions required during a normal testing sequence. The following table lists the prober steps, check points for visual inspection during that step, and the method for determining if there is an error in the step.

Points to Check During the Running Diagnostic Test

Prober Step	Check Point	
Mapping	Setting of Wafer FOUPs	No errors occur.
	Wafer Mapping Action	No errors occur.
Wafer Out	Upper Arm Insertion Position	Check for at least a 1 mm gap between wafer and upper arm.
	Upper Arm Wafer Vacuum	No errors occur.
Wafer In	Lower Arm Insertion Position	Check for at least a 1 mm gap between wafer and lower arm.
	Lower Arm Wafer Vacuum	Check that the wafer does not touch either the top or the bottom ledge of the FOUP board slot.
Prealignment	Subchuck Wafer Vacuum	No errors occur.
	Prealignment Movement	Theta rotation is under three rotations for flat/notch. No errors occur.
	Upper Arm Wafer Vacuum	No errors occur.
Wafer Loading	Chuck Top Wafer Vacuum	No errors occur.
	Wafer Centering	Check that the wafer has been centered on the chuck top.
Wafer Unloading	Movement During Wafer Vacuum	No errors occur, and the wafer is stable.
Alignment	Bridge Transfer	No errors occur.
	Target Transfer	Check that the target moves to the proper position.
	Bridge/Stage Camera Target Recognition	No errors occur.
	Probe Alignment Movement	No errors occur.
	Prealignment Accuracy	No errors occur.
	Wafer Alignment Movement	No errors occur.
Probing	Chuck Top Transfer Position	Check that the control map and probing area coordinates match.
	Probe Alignment Movement	No errors occur.

C H A P T E R 6

Stage Unit Inspections and Adjustments

This chapter provides the procedures for performing advanced stage inspections and adjustments on the prober. **6.1 Stage Calibrations: Overview (see page 180)** outlines each inspection, potential failure results, and corrective actions. The following sections provide each stage inspection or adjustment procedure, as well as the steps to access the appropriate screens to perform the procedure and any actions required for adjustment and completion.

6.1 Stage Calibrations: Overview 0821.1

Check the following inspections on the stage unit. The following list describes the items that require inspections and how to correct them when they are not at standard values.

- **6.2 Checking the Main Air Pressure Sensor (see page 185)**
  Inspections: Under `Main Unit` on the *Stage Sensors Check Menu*, `Air` is `ON` when the air fitting is connected.
  Failure Results: Wafer loading and testing will not operate correctly if the drop in air pressure is not detected. In addition, initialization will not be performed correctly.
  Corrective Action: Refer to **6.3 Checking the Main Air Pressure Sensor and Adjusting the Threshold (see page 188)** to make adjustments.

- **6.3 Checking the Main Air Pressure Sensor and Adjusting the Threshold (see page 188)**
  Inspections: The air pressure threshold value is 0.25 MPa.
  Failure Results: The locations requiring air will not function properly. In addition, initialization will not be performed correctly.
  Corrective Action: Refer to the procedures provided for adjustment.

- **6.4 Checking the Vacuum Pressure Sensor (see page 192)**
  Inspections: Under `Main Unit` on the *Stage Sensors Check Menu*, the `Vacuum` is `ON`.
  Failure Results: Wafer loading and testing will not operate correctly if the drop in the vacuum pressure is not detected. In addition, initialization will not be performed correctly.
  Corrective Action: Refer to **6.5 Checking and Adjusting the Vacuum Pressure Threshold (see page 195)** to make adjustments.

- **6.5 Checking and Adjusting the Vacuum Pressure Threshold (see page 195)**
  Inspections: The vacuum pressure threshold value is -26 kPa.
  Failure Results: The locations requiring vacuum will not function properly. In addition, initialization will not be performed correctly.
  Corrective Action: Refer to the procedures provided for adjustment.

- **6.6 Checking the Chuck Top Planarity (see page 198)**
  Inspections: The difference in heights of the testing positions that were specified are within the specification.
  Failure Results: Accurate contact will not be possible.
  Corrective Action: Refer to **6.7 Adjusting the Chuck Top Planarity (see page 207)** to make adjustments.

- **6.8 Checking the WAPP Planarity (see page 216)**
  Inspections: The difference in heights of the testing positions that were specified are within the specification.
  Failure Results: Accurate needle polish will not be possible.
  Corrective Action: Refer to **6.9 Adjusting the WAPP Planarity (see page 221)** to make adjustments.

- **6.10 Registering the WAPP Position (see page 228)**
  Inspections: WAPP flat adjustment; WAPP replacement.
  Corrective Action: Refer to the procedures provided for registration.

- **6.11 Calibrating the WAPP Vacuum Sensor (see page 230)**
  Inspections: The difference in the values displayed when switching the WAPP vacuum sensor from the testing mode to the set mode are within the specification.

Failure Results: There is the possibility of damaging the prober parts or the wafer.
Corrective Action: Refer to the procedures provided for adjustment.

- **6.12 Checking and Adjusting the WAPP Drive Times (see page 235)**
  Inspections: The operating time for both the up/down positions is between 1300 and 1500 ms.
  Failure Results: If the operating time (up) is too fast, the prober may be damaged. If it is too slow, needle polishing is not possible.
  Corrective Action: Perform the procedure provided. If the operating time is not within the specification after adjustment, contact TEL Field Service Support.

- **6.13 Checking Head Plate Planarity (see page 241)**
  Inspections: Each of the testing values is within the specification.
  Failure Results: The test results will be incorrect.
  Corrective Action: Refer to **6.14 Adjusting the Head Plate Planarity (see page 245)** to make adjustments.

- **6.15 Checking the Stage Movement Area (see page 252)**
  Inspections: The alignment center position coordinate and the initial offset amount are within the specification.
  Failure Results: Tests cannot be performed on all die.

- **6.16 Setting the X and Y Initial Offset Amounts (see page 256)**
  Corrective Actions: Refer to the procedure to set the initial offset amount for the X and Y axes.

- **6.17 Checking the X Axis Initial Sensor Position (see page 262)**
  Inspections: The X axis coordinate for the position where the initial sensor switches should be in a range of 1700 to 2300 µm when the initial offset amount is 0.
  Failure Results: The prober cannot be initialized correctly.
  Corrective Action: Refer to **6.18 Adjusting the X Axis Initial Sensor Position (see page 266)** to correct.

- **6.19 Checking the Y Axis Initial Sensor Position (see page 271)**
  Inspections: The Y axis coordinate for the position where the initial sensor switches should be in a range of 1700 to 2300 µm when the initial offset amount is 0.
  Failure Results: The prober cannot be initialized correctly.
  Corrective Action: Refer to **6.20 Adjusting the Y Axis Initial Sensor Positions (see page 275)** to make adjustments.

- **6.21 Checking the X Axis Limit Sensor Positions (see page 281)**
  Inspections: The X axis coordinate for the position where the X axis limit sensor switches should be within the specification.
  Failure Results: The movement of the stage exceeding the software limit will not be detected at the correct position.
  Corrective Action: Refer to **6.22 Adjusting the X Axis Limit Sensor Positions (see page 286)** to make adjustments.

- **6.23 Checking the Y Axis Limit Sensor Positions (see page 294)**
  Inspections: The Y axis coordinate for the position where the Y axis limit sensor switches should be within the specification.
  Failure Results: The movement of the stage exceeding the software limit will not be detected at the correct position.
  Corrective Action: Refer to **6.24 Adjusting the Y Limit Sensor Positions (see page 299)** to make adjustments.

- **6.25 Setting the Z Initial Offset Amount (see page 307)**
  Inspections: The bridge camera focus should be on the chuck top surface when the Z axis initial offset amount is between -15000 and -17000 µm. Also, the Z axis coordinate at that time should be between 3800 to 4200 µm.
  Failure Results: The prober could be damaged.
  Corrective Actions: Refer to the procedure to set the initial offset amount for the Z axis.

- **6.26 Checking Z Initial and Z2 Sensor Position (see page 316)**
  Inspections: The Z axis coordinate for the position where the Z axis initial sensor switches should be in a range of 700 to 1300 µm when the initial offset amount is 0. Also, the Z axis coordinate for the position where the Z2 sensor switches when the position where the Z axis initial sensor switches is set to Z0 should be in the range of Z0 + 500 µm ≤ Z2 ≤ Z0 + 800 µm.
  Failure Results: The prober cannot be initialized. The prober could be damaged.
  Corrective Action: Refer to **6.26 Checking Z Initial and Z2 Sensor Position (see page 316)** to move the sensor shutter positions.

- **6.28 Checking the Theta Initial Sensor Position (see page 338)**
  Inspections: The distance from the theta LM guide edge to the movement plate side should be 40.5 to 41.0 µm when the stage is at the probing center.
  Failure Results: Wafers will not be properly loaded or unloaded. Errors can also occur.
  Corrective Action: Refer to **6.29 Adjusting the Theta Initial Sensor Position (see page 344)** to make adjustments.

- **6.30 Checking the 3-Pin Sensor Position (see page 349)**
  Inspections: The `Chuck 3-pin Up` when the theta axis coordinates are -97000/10000° should register `OFF`. The `Chuck 3-pin Up` when the theta axis coordinates are -98000/10000° should register `ON`.
  Failure Results: Wafers will not be properly loaded or unloaded. Errors can also occur.
  Corrective Action: Refer to **6.31 Adjusting the 3-Pin Sensor Position (see page 354)** to make adjustments.

- **6.34 Checking the Probe (Chuck) Camera Position (see page 370)**
  Inspections: The focus is on the black circle on the probe camera position adjustment fixture.
  Failure Results: The probe needle cannot be recognized.
  Corrective Action: Refer to **6.35 Adjusting the Probe (Chuck) Camera Position (see page 373)** to make adjustments.

- **6.36 Checking the Alignment Bridge Position (see page 379)**
  Inspections: The alignment center position stage coordinates are within the following ranges.
  X axis: 176700 to 177300 µm
  Y axis: 210700 to 211300 µm
  Z axis: 3800 to 4200 µm
  Failure Results: Accurate alignment will not be possible.
  Corrective Action: Refer to **6.37 Adjusting the Alignment Bridge Position (see page 382)** to make adjustments.

- **6.38 Checking the Target Position and Focus (see page 389)**
  Inspections: The target is completely within the blue circle on the *Camera Matching Positioning Menu* and the target is in focus.
  Failure Results: Accurate alignment will not be possible.
  Corrective Action: Contact TEL Field Service Support.

- **6.39 Checking the Upper/Lower Camera Matching Position (see page 392)**

Inspections: No errors occur when the up/down cameras are positioned 5 times.
Failure Results: Accurate alignment will not be possible.
Corrective Action: Refer to **6.40 Adjusting the Upper/Lower Camera Matching Position (see page 394)** to make adjustments.

- **6.41 Checking the Bridge Camera Macro/Micro Optical Offset (see page 399)**
  Inspections: The crosshairs are at the same position in both the macro and micro field on the bridge camera.
  Failure Results: Accurate alignment will not be possible.
  Corrective Action: Refer to **6.42 Adjusting the Bridge Camera Macro/Micro Optical Offset (see page 403)**to make adjustments.

- **6.43 Checking the Bridge Camera Pixel Size (see page 408)**
  Inspections: The following parameters are within the specification.
  For VIP PCB:
  Bridge Macro Pixel Size
  X = 21.000000 to 24.000000 µm
  Y = 21.000000 to 24.000000 µm
  Bridge Micro Pixel Size
  X = 0.500000 to 0.580000 µm
  Y = 0.500000 to 0.580000 µm
  Failure Results: Accurate alignment will not be possible.
  Corrective Action: Refer to **6.44 Adjusting the Bridge Camera Pixel Size (see page 410)** to make adjustments.

- **6.45 Setting the Chuck Top Center (see page 414)**
  Corrective Action: Refer to the procedure to set.

- **6.46 Checking the Theta Cumulative and Theta Initial Position Offsets (see page 418)**
  Inspections: The following items are met for the testing results on the *Theta Initial Offset Amount/ R Offset Amount Menu*. The values of `+ Movement Amount` and `- Movement Amount` are between 49990 and 50010/10000°. The difference of the values of `+ Movement Amount` and `- Movement Amount` is ±10/10000°.
  Failure Results: Accurate alignment will not be possible.
  Corrective Action: Refer to **6.47 Adjusting the Theta Cumulative and Theta Initial Position Offsets (see page 422)** to make adjustments.

- **6.48 Checking the Probe (Chuck) Camera Macro/Micro Optical Offsets (see page 426)**
  Inspections: The crosshairs are at the same probe needle in both the macro and micro field on the probe camera.
  Failure Results: Accurate alignment will not be possible.
  Corrective Action: Refer to **6.49 Adjusting the Probe (Chuck) Camera Macro/Micro Optical Offsets (see page 430)** to make adjustments.

- **6.50 Checking the Probe (Chuck) Camera Pixel Size (see page 434)**
  Inspections: The following parameters are within the specification.
  For VIP PCB
  Chuck Macro Pixel Size
  X = 11.875000 to 13.125000 µm
  Y = 11.875000 to 13.125000 µm
  Chuck Micro Pixel Size
  X = 0.772000 to 0.853000 µm
  Y = 0.772000 to 0.853000 µm

Failure Results: Accurate alignment will not be possible.
Corrective Action: Refer to **6.51 Adjusting the Probe (Chuck) Camera Pixel Size (see page 436)** to make adjustments.

- **6.52 Checking the Contact Position (see page 440)**
  Inspections: The probe mark is on the wafer when the overdrive amount is between 1 and 5 µm.
  Failure Results: Accurate contact will not be possible.
  Corrective Action: Refer to **6.53 Adjusting the Contact Position (see page 447)** to make adjustments.

6.2 Checking the Main Air Pressure Sensor 1397.1

Introduction

Purpose:

To verify that the main air pressure sensor displays an accurate reading.

The main air pressure sensor threshold is the lowest level of air pressure at which the sensor will register a closed circuit. When the air pressure falls below 0.25 MPa, the sensor should register open and generate an error message. If the initialization errors occur after completing the adjustment, contact TEL Field Service Support.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver; Precision screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

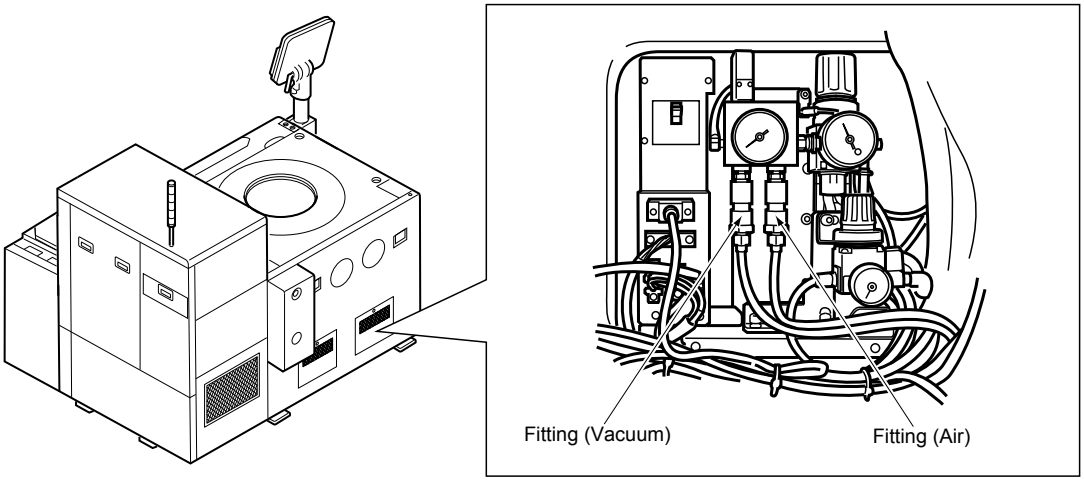
- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Remove the stage rear panel door (R) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.

3 Restore power to the prober by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Mechanical Hazard**
Keep clear of the stage area when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

4 Remove the air fitting connected to the prober. An error should occur and the message `Error Code E0609` should appear on the *Error Menu* displayed on the touch screen.

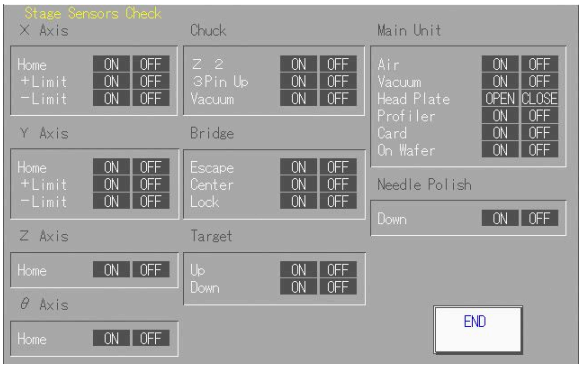


5 Press FUNCTIONS on the *Error Menu*. The *Error Functions Menu* is displayed.

▼ **Error Functions Menu**

6 Press STAGE STATUS on the *Error Functions Menu*. The *Stage Sensor Check Menu* is displayed.

▼ **Stage Sensor Check Menu**



7 Check that the `Main Unit Air` registers `OFF` on the *Stage Sensor Check Menu*.

8 Reconnect the air fitting.

9 Check that the `Main Unit Air` registers `ON` on the *Stage Sensor Check Menu*.

10 Press END on the *Stage Sensor Check Menu*. The *Error Functions Menu* is displayed.

11 Press PREVIOUS MENU on the *Error Functions Menu*.

12 Press INITIALIZE to clear the error. The stage and loader are initialized.

13 Perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

14 Reattach the stage rear panel door (right) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.

15 Restore power to the prober by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

⚠ CAUTION **Mechanical Hazard**

Keep clear of the stage area when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

6.3 Checking the Main Air Pressure Sensor and Adjusting the Threshold 0216.1

Introduction

Purpose:

To verify that the main air pressure sensor displays an accurate reading.

The main air pressure sensor threshold is the lowest level of air pressure at which the sensor will register a closed circuit. When the air pressure falls below 0.25 MPa, the sensor should register open and generate an error message. If the initialization errors occur after completing the adjustment, contact TEL Field Service Support.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver; Precision screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking the Main Air Pressure Sensor

1 Use one of the following methods to begin the procedure.

- If power is disabled and lockout and tagout is in place, go to the next step.
- If the prober is powered on, perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

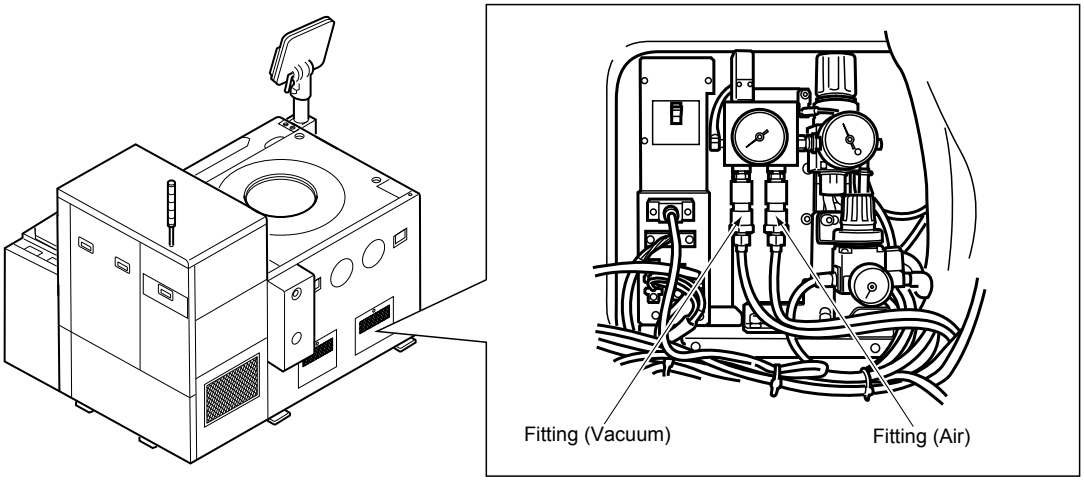
2 Remove the stage rear panel door (R) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.

3 Restore power to the prober by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Mechanical Hazard**

Keep clear of the stage area when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

4 Remove the air fitting connected to the prober. An error should occur and the message `Error Code E0609` should appear on the *Error Menu* displayed on the touch screen.

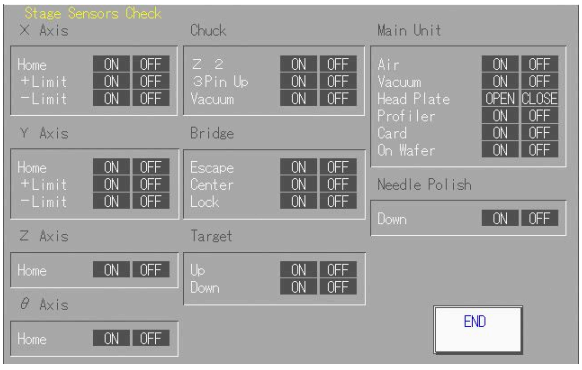


5 Press FUNCTIONS on the *Error Menu*. The *Error Functions Menu* is displayed.

▼ **Error Functions Menu**

6 Press STAGE STATUS on the *Error Functions Menu*. The *Stage Sensor Check Menu* is displayed.

▼ **Stage Sensor Check Menu**



7 Check that the `Main Unit Air` registers `OFF` on the *Stage Sensor Check Menu*.

8 Reconnect the air fitting.

9 Check that the Main Unit Air registers ON on the *Stage Sensor Check Menu*.

10 Press END on the *Stage Sensor Check Menu*. The *Error Functions Menu* is displayed.

11 Press PREVIOUS MENU on the *Error Functions Menu*.

12 Press INITIALIZE to clear the error. The stage and loader are initialized.

13 Perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

14 Reattach the stage rear panel door (right) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.

15 Restore power to the prober by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

⚠ CAUTION Mechanical Hazard

Keep clear of the stage area when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

Adjusting the Main Air Pressure Sensor Threshold

NOTE The following adjustment procedure begins from the point at which Checking the Main Air Pressure Sensor (see page 188) failed to meet specification.

16 Inspect that the air fitting is properly connected.

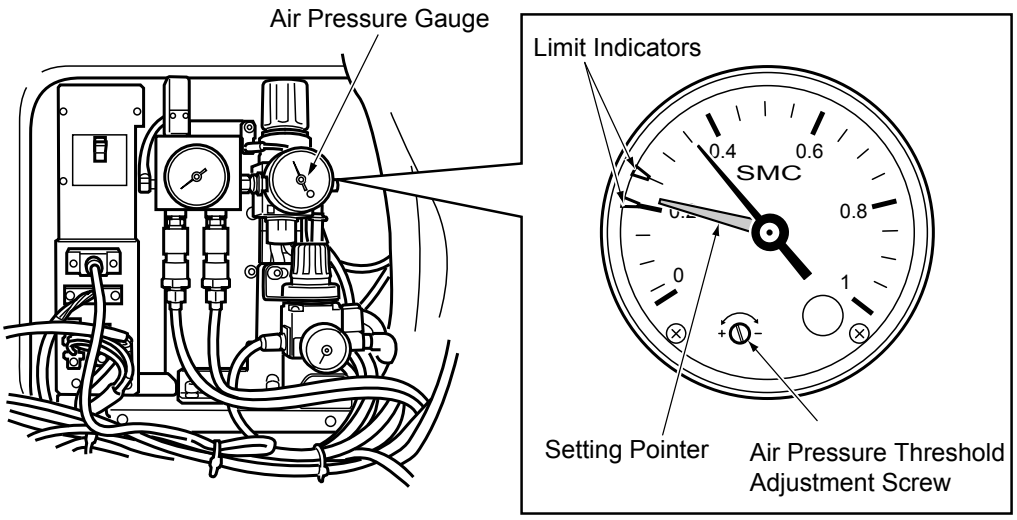
17 Check that the green indicator needle pointer on the main air pressure gauge is positioned at 0.25 MPa or greater.

- If the air pressure gauge is within specification, go to Step 4.
- If the air pressure gauge is outside specification, continue with Step 3.

18 Use the following steps to manually adjust the air pressure gauge.

18.1 Grasp the clear cover of the gauge display and rotate counterclockwise to remove it.

▼ **Air Pressure Gauge**



18.2 Use a precision screwdriver to rotate the air pressure threshold adjustment screw to move the green tab to the correct setting of 0.25 MPa.

18.3 Replace the clear cover.

19 Recheck the threshold set point by following the procedure described in **Checking the Main Air Pressure Sensor (see page 188)**.

6.4 Checking the Vacuum Pressure Sensor 0219.1

Introduction

Purpose:

To verify that the main vacuum pressure sensor is functioning properly.

If this sensor is not functioning, or is functioning incorrectly, the prober could damage its internal parts or even the wafers.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver
Parts or Consumables:	None

1 Use one of the following methods to begin the procedure.

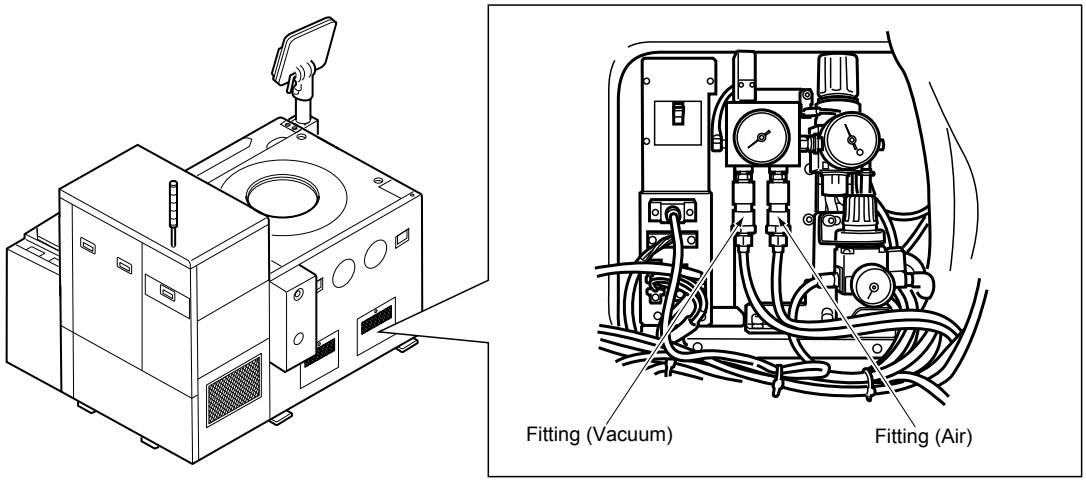
CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Remove the stage rear panel door (R) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.

3 Remove the vacuum fitting connected between the prober and the facility. Error Code `E0610` will be displayed on the *Error Menu*.

Fittings

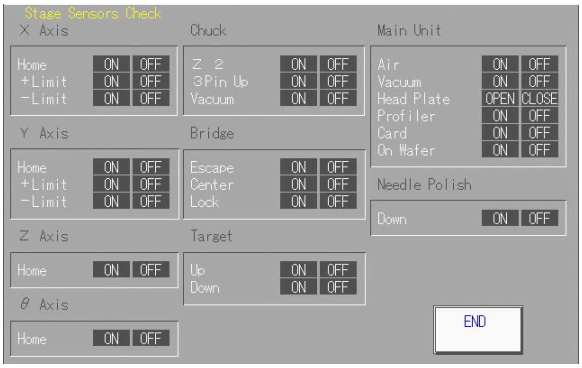


4 Press FUNCTION on the *Error Menu*. The *Error Functions Menu* is displayed.

Error Functions Menu

5 Press STAGE STATUS on the *Error Functions Menu*. The *Stage Sensor Check Menu* is displayed.

Stage Sensor Check Menu



6 Check that the `Main Unit Vacuum` on the *Stage Sensor Check Menu* is `OFF`.

7 Reconnect the vacuum fitting.

8 Check that the `Main Unit Vacuum` is `ON`.

9 Press END on the *Stage Sensor Check Menu*.

10 Press PREVIOUS MENU on the *Error Functions Menu*.

11 Press INITIALIZE. The stage and loader initialize.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If no errors occur during initialization, go to step 13.
- If an error occurs during initialization, continue with step 12.

12 Use the following steps to recover from an error during initialization.

12.1 Inspect that the vacuum fitting is correctly connected.

12.2 Inspect the vacuum pressure threshold setting by following the checking procedure to determine if the cause of the error is due to an improper setting.

13 Perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

14 Reattach the stage rear panel door (R) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.

15 Restore power to the prober by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

6.5 Checking and Adjusting the Vacuum Pressure Threshold 0220.1

Introduction

Purpose:

To check and, if necessary, adjust the vacuum pressure threshold.

The main system vacuum pressure sensor threshold is the lowest level of vacuum that the sensor will register as a closed circuit. When the main vacuum pressure rises to a point between -26 and -30 kPa, the vacuum sensor should register open and generate an error message. If the vacuum pressure is outside specification after completing the adjustment, contact TEL Field Service Support.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Digital tester
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

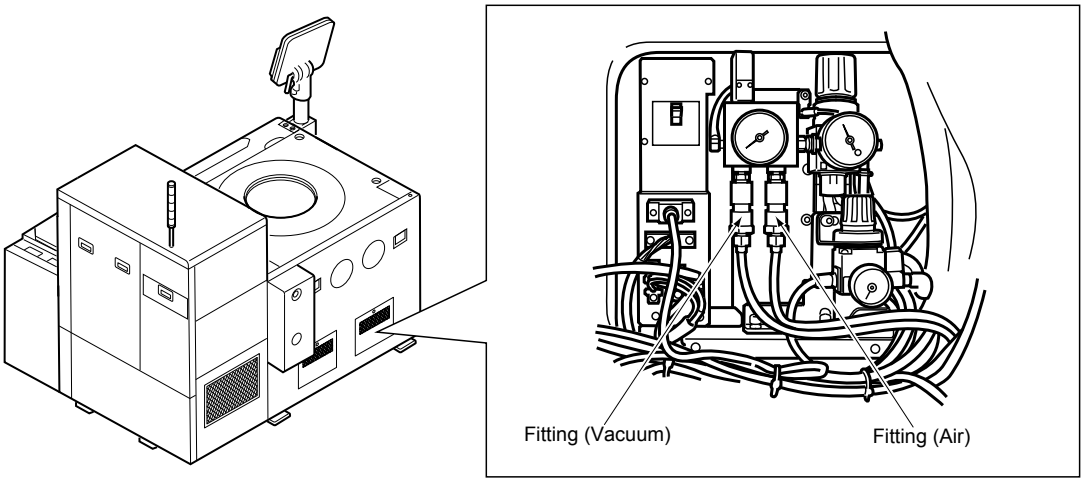
Checking the Vacuum Pressure Threshold

1. Remove the stage rear panel (R) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.
2. Locate the J40 (J2) wiring harness located to the right and above the main air/vacuum panel.
3. Perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.
4. Disconnect the J40 (J2) wiring harness connector.
5. Prepare a digital tester with leads and settings for continuity measurement.
6. Connect the leads of the digital tester to Pin 1 and Pin 2 on the female portion of the J40 connector. Pin 1 is the vacuum sensor circuit; Pin 2 is the vacuum sensor ground circuit.

   NOTE **The sensor status is normally closed under normal vacuum pressure and sensor threshold settings.**

7 Partially remove the vacuum fitting causing the vacuum pressure to leak.

▼ **Fittings**



8 Verify that when the circuit is opened in the normal range, the digital tester displays a value between -26 and -30 kPa.

9 Reattach the vacuum fitting.

10 Remove the digital tester leads from the connector.

11 Reconnect the J40 (J2) wiring harness connector.

12 Reattach the stage rear panel (R) by following the procedure described in **4.5.2 Removing and Attaching the Stage Rear Panel and Doors (see page 111)**.

13 Restore power to the prober by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

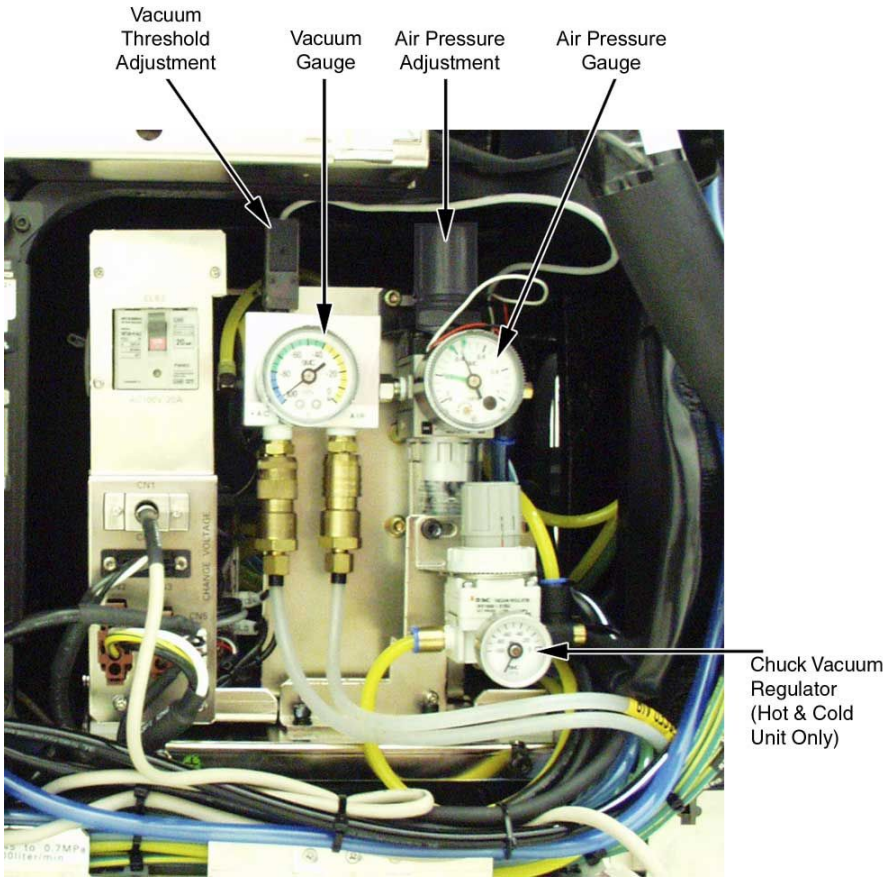
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

Adjusting the Vacuum Pressure Threshold

14 To adjust the main vacuum sensor threshold point, use the trimmer located on top of the vacuum switch.

- To increase the set point, rotate the trimmer clockwise.
- To decrease the set point, rotate the trimmer counterclockwise.

Vacuum Trimmer



15 Recheck the threshold set point by following the procedure described in **Checking the Vacuum Pressure Threshold (see page 195)**.

6.6 Checking the Chuck Top Planarity 1402.2

Introduction

Purpose:

To verify the planarity of the chuck top.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	Mylar sheet Lever-type dial gauge Hexagonal wrench
Parts or Consumables:	None

WARNING Mechanical Hazard

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

NOTE You must remove the probe card before starting this procedure. Refer to the procedure described in 4.11 Changing Probe Cards Using the SACC (see page 156).

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION Mechanical Hazard

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

2 Disable the head plate interlock.

3 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION Property Damage Hazard

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

4 Use the following steps to display the *Specified Stage Position Transfer Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*.

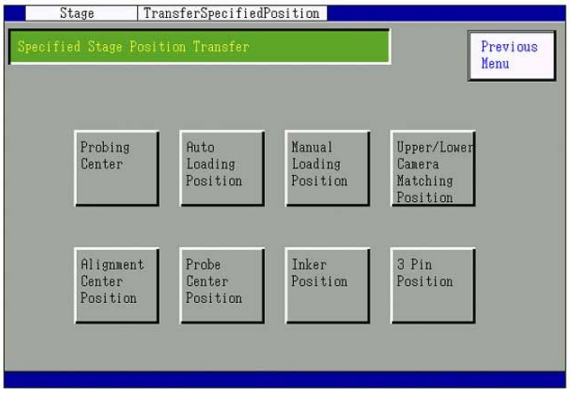
4.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

4.3 Input your password on the numeric keypad and press INPUT.

4.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

4.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Transfer Menu* is displayed.

▼ **Specified Stage Position Transfer Menu**



5 Press PROBING CENTER. A check menu is displayed with the message `Transfer Stage?` Check that nothing will interfere with the movement of the stage, then press YES.

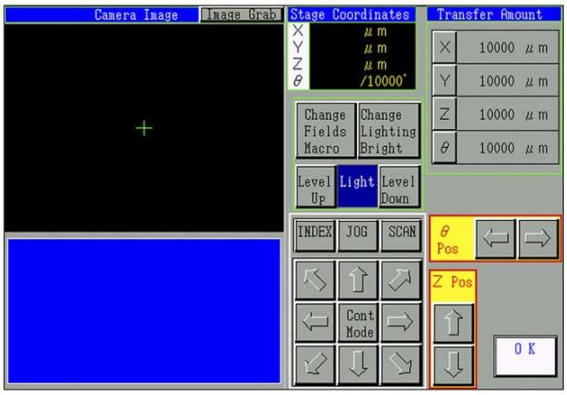
6 Use the following steps to move the chuck top to the contact height.

6.1 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

6.2 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

6.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

Stage Control Menu



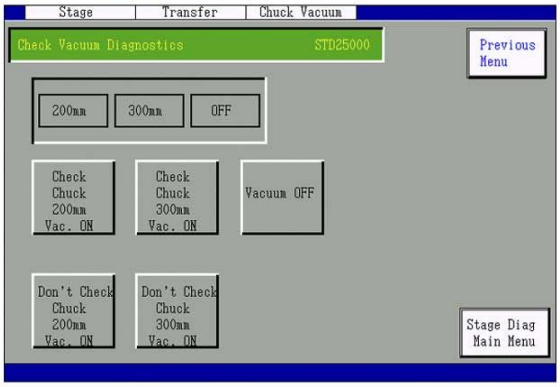
6.4 Use the Z stage arrow buttons to raise the chuck top to 68000 µm.

7 Press OK on the *Stage Control Menu*.

8 Lay a protective Mylar sheet over the chuck top.

9 Press CHUCK VACUUM on the *All Axis Transfer Menu*. The *Chuck Vacuum Diagnostics Menu* is displayed.

Chuck Vacuum Diagnostics Menu



10 Press DON'T CHECK CHUCK 300MM VAC. ON. The chuck top 300 mm vacuum line turns on.

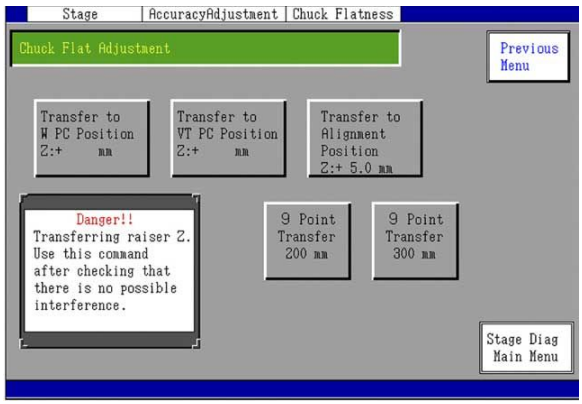
11 Use the following steps to display the *Chuck Flatness Adjustment Menu*.

11.1 Press STAGE DIAG MAIN MENU on the *Chuck Vacuum Diagnostics Menu*.

11.2 Press ACCURACY ADJUSTMENTS on the *Stage Adjustments Menu*.

11.3 Press CHUCK SURFACE FLATNESS on the *Stage Accuracy Adjustments Menu*. The *Chuck Flat Adjustment Menu* is displayed.

▼ **Chuck Flatness Adjustment Menu**



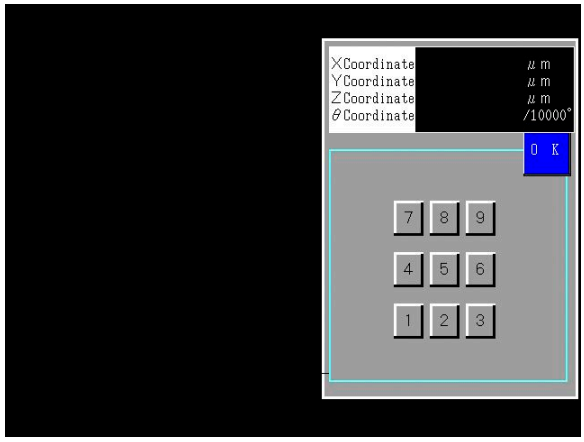
12 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Property Damage Hazard**

Close the head plate gently while checking that there is no interference between the card holder and the insert ring.

13 Press 9 POINT TRANSFER 300 MM on the *Chuck Flat Adjustment Menu*. The *9 Point Check Switch* is displayed.

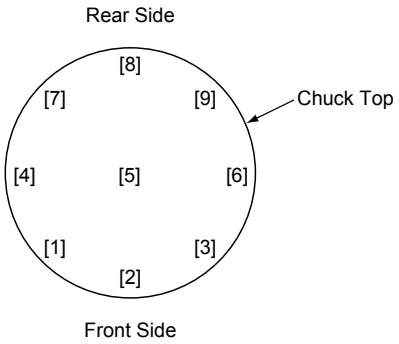
▼ **9 Point Check Switch Screen**



The number buttons (1–9) are used to move the chuck top to each of the measuring positions.

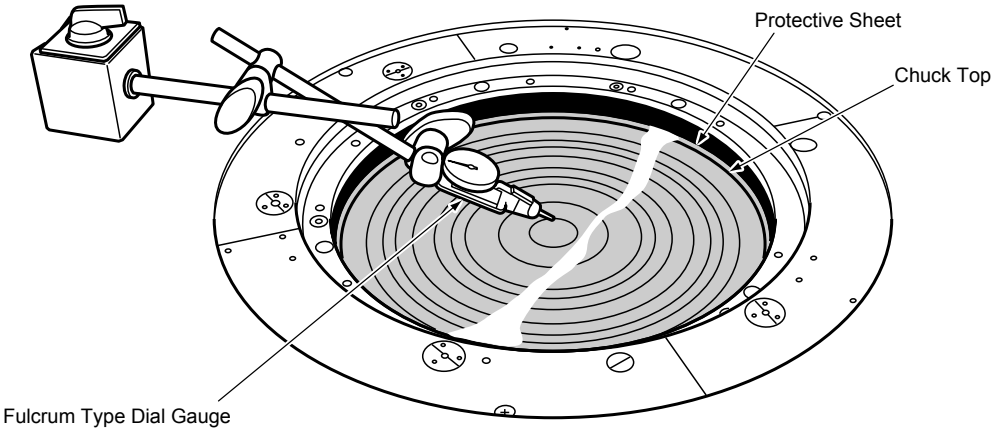
Pressing one of the number buttons moves the specified position to the probing center. The following figure illustrates the measurement positions.

Chuck Top Measurement Positions Specified by Number



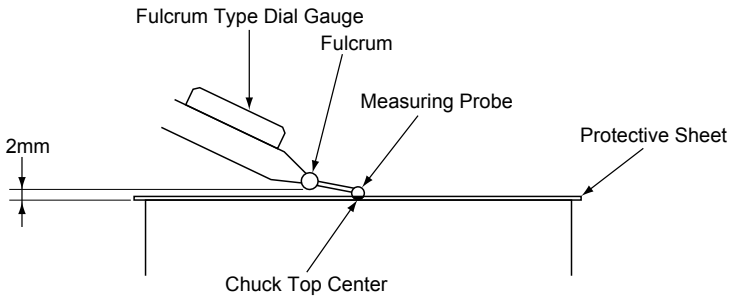
14 Set the lever-type dial gauge on the head plate.

Setting the Lever-Type Dial Gauge



15 Touch the dial gauge probe to the chuck-top center with the fulcrum point 2 mm higher than the chuck top surface. Set the gauge to **0** as a reference.

Setting the Gauge



16 Use the following steps to measure the planarity at the 300 mm wafer contact position.

16.1 Press 5 on the *Testing Position Menu*. The chuck top moves to the testing position.

16.2 Record the value on the dial gauge.

NOTE **Measure the chuck top beginning with its center. You will not get accurate measurements if you begin from any other position.**

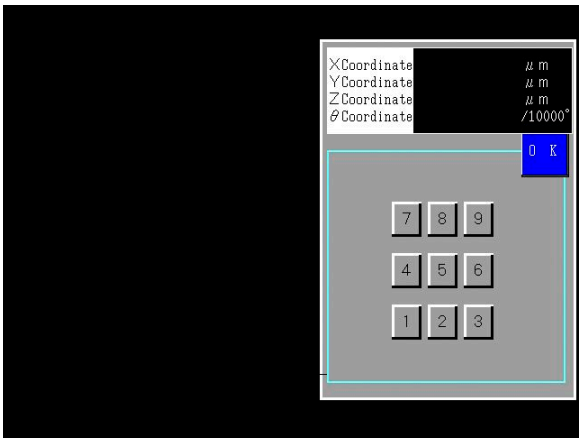
16.3 Repeat the last two substeps to measure the chuck top height at all the other measurement points (1 through 4, 6 through 9). Use the following table to record the values:

Position	Measurement
1	
2	
3	
4	
5	
6	
7	
8	
9	

17 After measuring all the points, press OK on the *Testing Position Menu*.

18 Press 9 POINT TRANSFER 200MM on the *Chuck Flat Adjustment Menu*. The *9 Point Check Switch* is displayed.

9 Point Check Switch Screen



NOTE **The numbers on the display represent the chuck-top planarity measuring positions.**

19 Use the following steps to measure the planarity at the 200 mm wafer contact position.

19.1 Press 5 on the *Testing Position Menu*. The chuck top moves to the testing position.

19.2 Record the value on the dial gauge.

NOTE **Measure the chuck top beginning with its center. You will not get accurate measurements if you begin from any other position.**

19.3 Repeat the last two substeps to measure the chuck top height at all the other measurement points (1 through 4, 6 through 9). Use the following table to record the values:

Position	Measurement
1	
2	
3	
4	
5	
6	
7	
8	
9	

20 After measuring, press OK. The *Chuck Flat Adjustment Menu* is displayed.

21 Remove the lever-type dial gauge.

22 Use the following steps to move the chuck top to the alignment position.

22.1 Press STAGE DIAG MENU on the *Chuck Flat Adjustment Menu*.

22.2 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

22.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

22.4 Use the Z stage arrow buttons to move the chuck top to the 4000 µm position.

23 Use the following steps to display the *Chuck Flat Adjustment Menu*.

23.1 Press OK on the *Stage Control Menu*.

23.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

23.3 Press ACCURACY ADJUSTMENT on the *Stage Adjustments Menu*.

23.4 Press CHUCK SURFACE FLATNESS on the *Stage Accuracy Adjustments Menu*. The *Chuck Flat Adjustments Menu* is displayed.

24 Repeat steps 13 through 19 to measure the 300 mm and 200 mm wafer testing positions when the chuck top is at the alignment position (Z axis coordinate of 4000 µm).

25 Check the following points:

- Calculate the difference between the maximum and minimum values obtained. Check that the difference falls within the specified range in the following table.

•

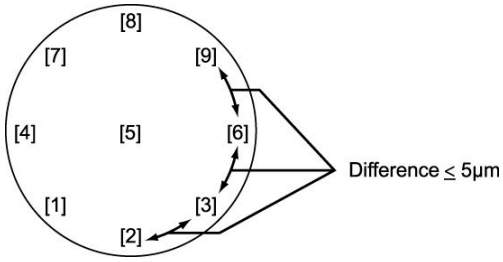
Specified Measurement Range

Testing Temperature	Specified Range
Room Temperature ≤ Testing Temp. ≤ 50° C	15 µm or less
50° C ≤ Testing Temp. ≤ 150° C	30 µm or less

- Check that the difference between adjacent measurement positions is less than or equal to 5 µm. For example, the difference between position 6 and position 9 and the difference between position 6 and position 3 should be less than or equal to 5 µm.

•

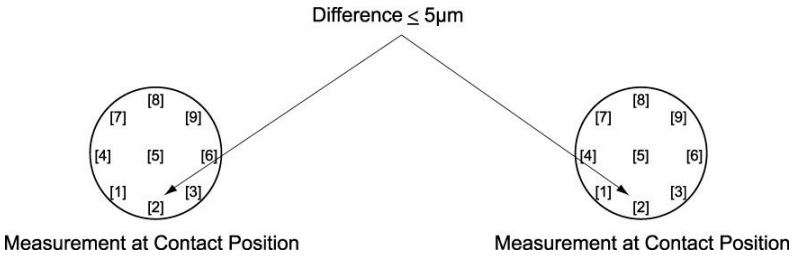
Difference between Adjacent Measurement Positions



- Compare the values for each position to the matching position for the same size wafer at the different chuck top height. The difference should be less than or equal to 5 µm. For example, position 2 for the 200 mm wafer at the contact position should be within 5 µm of position 2 for the 200 mm wafer at the alignment position.

•

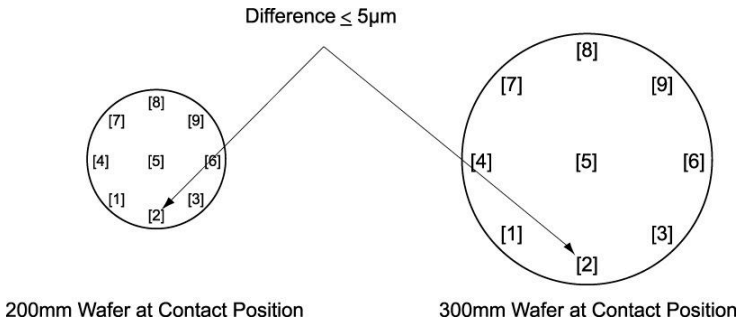
Difference between Same Wafer Size at Different Height



- Compare the values for each position to the matching position for the same chuck top height with different sized wafers. The difference should be within 5 µm. For example, position 2 for the 200 mm wafer at the contact position should be within 5 µm of position 2 for the 300 mm wafer at the contact position.

•

▼ **Difference between Different Wafer Size at Same Height**



26 Press OK on the *Testing Position Menu*.

27 Remove the lever-type dial gauge.

28 Use the following steps to display the *Chuck Vacuum Diagnostics Menu*.

28.1 Press STAGE DIAG MAIN MENU on the *Chuck Flat Adjustment Menu*.

28.2 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

28.3 Press CHUCK VACUUM on the *All Axis Adjustments Menu*. The *Chuck Vacuum Diagnostics Menu* is displayed.

29 Press VACUUM OFF. The chuck vacuum turns off.

30 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

31 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

32 Remove the protective Mylar sheet from the chuck top.

33 Enable the head plate interlock, then close the head plate.

⚠ WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.7 Adjusting the Chuck Top Planarity 1403.2

Introduction

Purpose:

To adjust the planarity of the chuck top.

Required Resources:

Time:	60 minutes
Personnel:	1 person
Tools:	Mylar sheet Lever-type dial gauge Hexagonal wrench
Parts or Consumables:	Shims Measurements recorded from the checking procedure (refer to **6.6 Checking the Chuck Top Planarity (see page 198)**)

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

2 Disable the head plate interlock.

3 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

4 Use the following steps to display the *Specified Stage Position Transfer Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*.

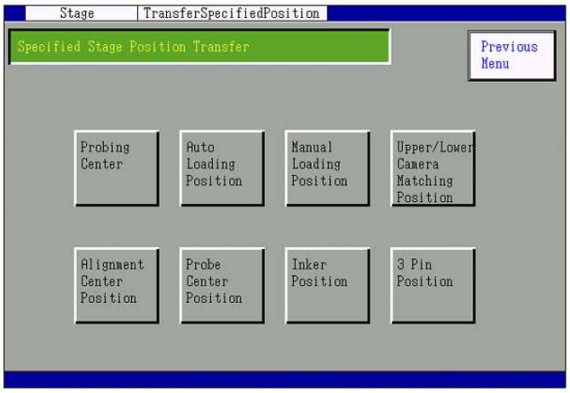
4.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

4.3 Input your password on the numeric keypad and press INPUT.

4.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

4.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Transfer Menu* is displayed.

▼ **Specified Stage Position Transfer Menu**



5 Press PROBING CENTER. A check menu is displayed with the message `Transfer Stage?` Check that nothing will interfere with the movement of the stage, then press YES.

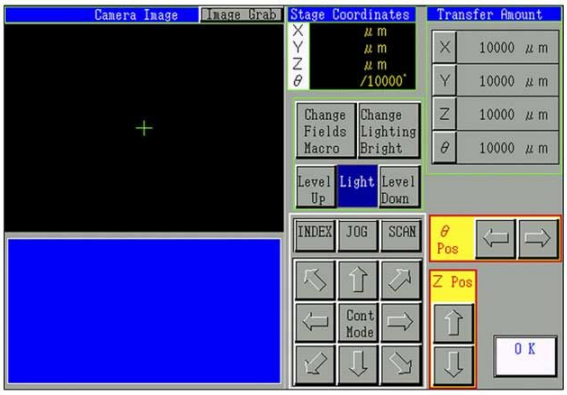
6 Use the following steps to move the chuck top to the contact height.

6.1 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

6.2 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

6.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



6.4 Use the Z stage arrow buttons to raise the chuck top to 68000 µm.

7 Lay a Mylar sheet over the main chuck.

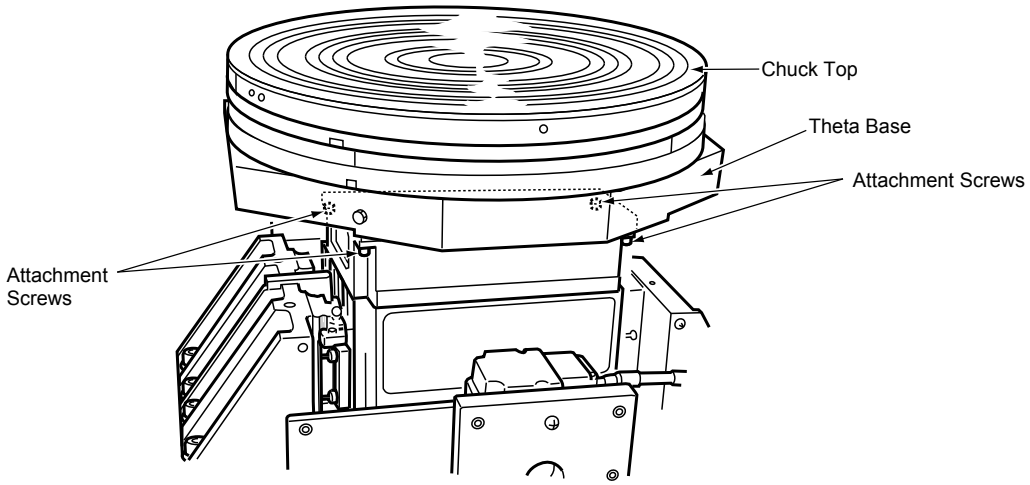
> **CAUTION** **Property Damage Hazard**
> **The Mylar sheet will prevent any damage to the main chuck while working on it. If the machine has a hot chuck, use a heat resistant Mylar sheet.**

8 Press OK to exit to a passive screen.

> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control keys.**

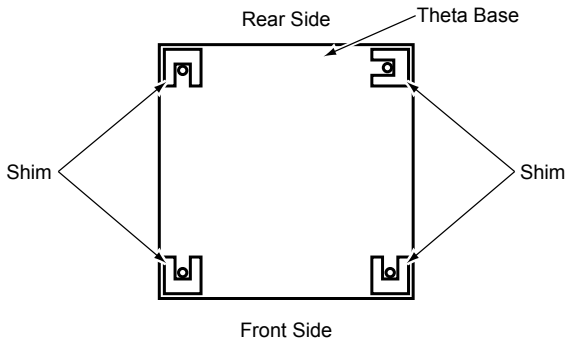
9 Loosen the 4 attachment screws on the theta base.

▼ **Theta Base Attachment Screws**



10 Using the measurements taken during **6.6 Checking the Chuck Top Planarity (see page 198)** as your guide, adjust the chuck top height by inserting the shims under the theta base. The shims may be inserted in four places.

Shim Insertion Positions



11 Tighten the attachment bolts to secure the theta base.

12 Use the following steps to initialize the stage.

12.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

12.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

12.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. The stage is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

13 Repeat **6.6 Checking the Chuck Top Planarity (see page 198)** to confirm that the new planarity measurement is within specification.

NOTE **If you completely removed the chuck top, then perform steps 14 through 29.**

14 Use the following steps to move the stage to the probing center position.

14.1 Press DIAGNOSTICS on the *Main Menu*.

14.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

14.3 Input your password on the numeric keypad and press INPUT.

14.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

14.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Transfer Menu* is displayed.

14.6 Press PROBING CENTER. A check menu is displayed with the message `Transfer Stage?` Check that nothing will interfere with the movement of the stage, then press YES.

15 Use the following steps to move the chuck top to the contact height.

15.1 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

15.2 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

15.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

15.4 Use the Z stage arrow buttons to raise the chuck top to 68000 µm.

16 Press OK to exit to a passive screen.

> **CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control keys.**

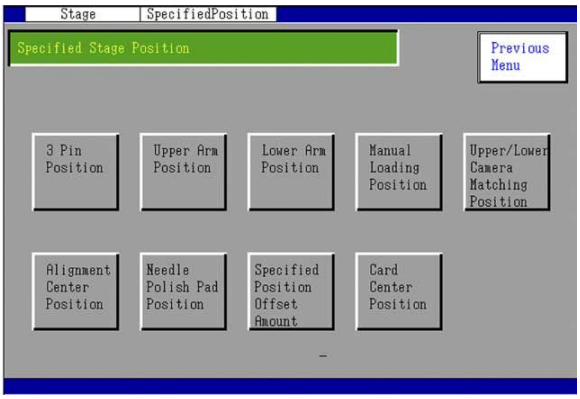
17 Loosen the 4 attachment screws on the theta base.

18 Use the following steps to move the chuck top and the alignment bridge.

18.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

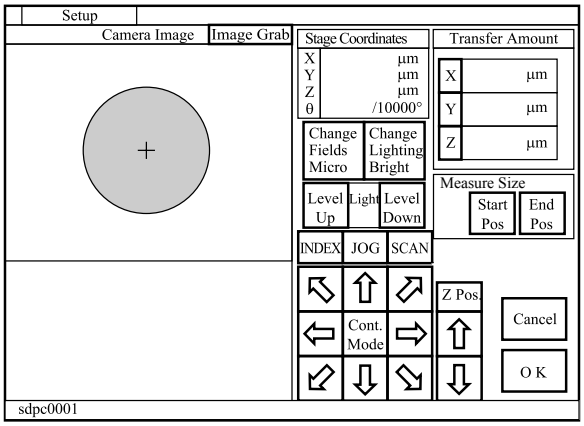
18.2 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

▼ **Specified Stage Position Menu**



18.3 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. The chuck top and alignment bridge move to the alignment position and the *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



19 Press JOG.

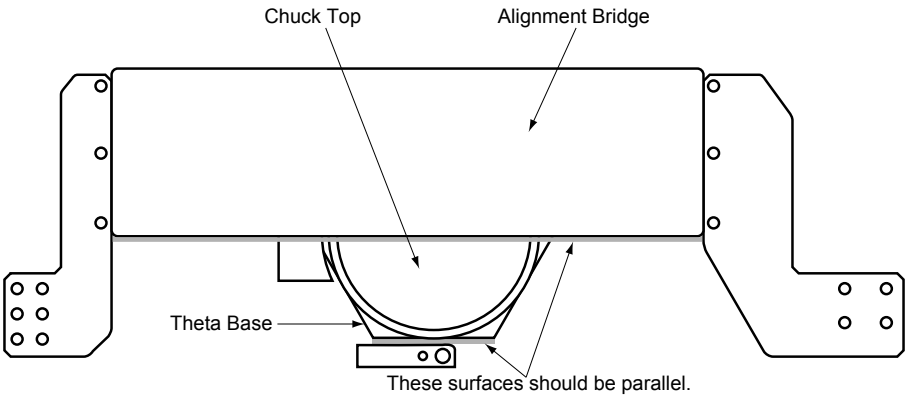
> **CAUTION** **Mechanical Hazard**
> **Always select JOG mode when working inside the prober.**

20 Check that the camera image is in the micro field view. If necessary, switch the camera image to micro field view by pressing CHANGE FIELD.

21 Move the chuck top manually to the position where the following conditions are met.

- On the camera image, the center of the chuck top (marked by a black hole) should be centered under the crosshairs.
- The front side of the theta base and the alignment bridge should be parallel.

▼ **Parallel Adjustment**



22 Use the following steps to move the stage

22.1 Press CANCEL on the *Stage Control Menu*.

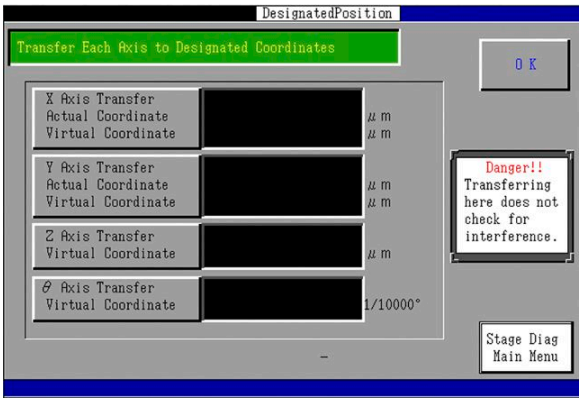
> **NOTE** **Always press CANCEL when exiting the *Stage Control Menu*. Pressing OK will register a false alignment center coordinate and may cause incorrect alignment.**

22.2 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

22.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

22.4 Press XYZΘ DESIGNATED POSITION on the *All Axis Transfer Menu*. The *Transfer to Designated Coordinates Menu* is displayed.

▼ **Transfer to Designated Coordinates Menu**



22.5 Set the Z AXIS TRANSFER VIRTUAL COORDINATE to 68,000 µm.

23 Press OK, then press YES on the *Transfer to Designated Position Menu*. The *All Axis Transfer Menu* is displayed.

> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control keys.**

24 Tighten the attachment screws to secure the theta base. Be careful not to move the theta base while tightening the screws.

25 Use the following steps to initialize the stage.

25.1 Press STAGE DIAG MAIN MENU on the *Designated Position Menu*.

25.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

25.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. The stage is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

26 Use the following steps to move the chuck top and the alignment bridge.

26.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

26.2 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

26.3 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. The chuck top and alignment bridge move to the alignment position and the *Stage Control Menu* is displayed.

27 Check that the camera image is in the micro field view. If necessary, change the view by pressing CHANGE FIELD.

28 Use the control buttons to position the crosshairs over the center of the chuck top (marked by a black hole), then focus on the chuck top surface.

29 Check that the coordinates of the X, Y, and Z axes are within the following specifications:

- X axis: 176700 to 177300 µm
- Y axis: 210700 to 211300 µm
- Z axis: 3800 to 4200 µm

If the coordinates are outside of specification, press CANCEL and return to the *Main Menu*, then repeat steps 14 through 29.

30 Use the following steps to save the initial offset amount to the SYS information.

30.1 Press OK on the *Stage Control Menu*. A check menu is displayed with the message `Return BRDG, TRGT, PLSHR, LAMP.` Press YES.

30.2 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

30.3 Press PREVIOUS MENU on the *Stage Adjustments Menu*. A check menu is displayed with the message `Save SYS Information?`

30.4 Press YES. The initial offset amount is saved to the SYS information.

31 Use the following steps to initialize the stage.

31.1 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exists, press OK.

31.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

31.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. The stage is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the stage.**

32 Use the following steps to move the chuck top and the alignment bridge.

32.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

32.2 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

32.3 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. The chuck top and alignment bridge move to the alignment position and the *Stage Control Menu* is displayed.

33 Check that the camera image is in the micro field view. If necessary, change the view by pressing CHANGE FIELD.

34 Check that the coordinates of the X, Y, and Z axes are within the following specifications:

- X axis: 176700 to 177300 µm
- Y axis: 210700 to 211300 µm
- Z axis: 3800 to 4200 µm

35 Press CANCEL.

36 Repeat **6.6 Checking the Chuck Top Planarity (see page 198)** to confirm that the new planarity measurement is within specification.

37 Enable the head plate interlock, then close the head plate.

⚠ WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.8 Checking the WAPP Planarity 1405.1

Introduction

Purpose:

To check that the planarity of the WAPP is within specification.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Lever-type dial gauge Dial gauge Hexagonal wrench Protective Mylar sheet
Parts or Consumables:	None

⚠ WARNING Mechanical Hazard

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

NOTE Check that there are no polish sheets on the WAPP before performing the procedure.

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

2 Disable the head plate interlock.

3 Close the head plate.

4 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

5 Use the following steps to position the stage.

5.1 Press DIAGNOSTICS on the *Main Menu*.

5.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

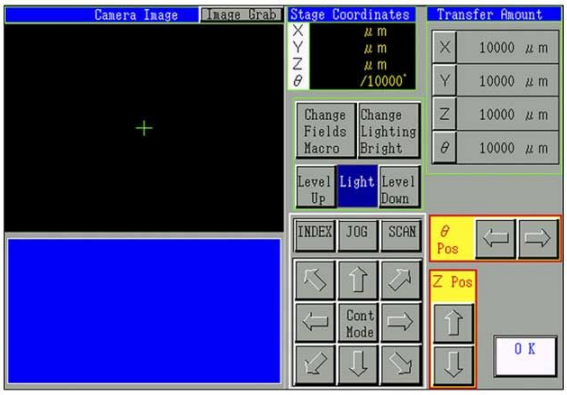
5.3 Input your password on the numeric keypad and press INPUT.

5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

5.5 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

5.6 Press XYZθ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



5.7 Use the arrow buttons to position the chuck top at the following coordinates:

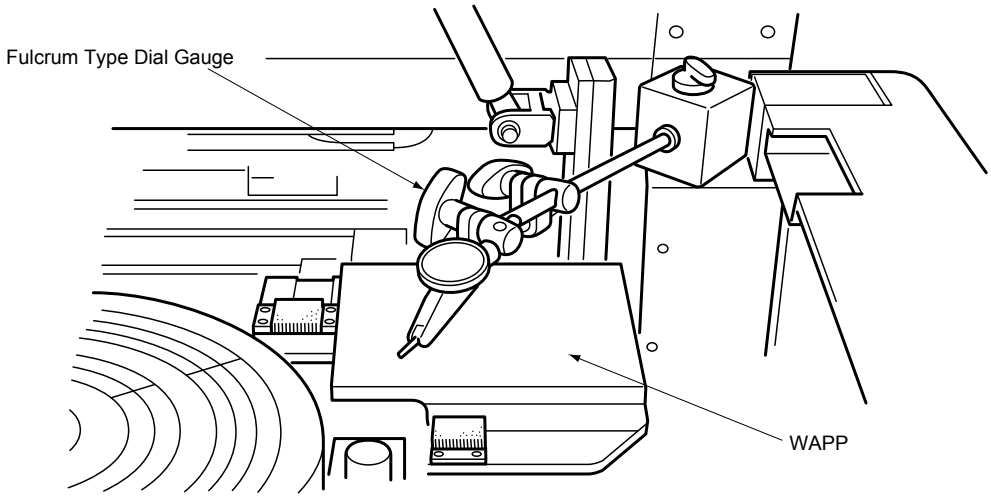
- X axis: 110000 µm
- Y axis: 160000 µm
- Z axis: 64000 µm

6 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.**

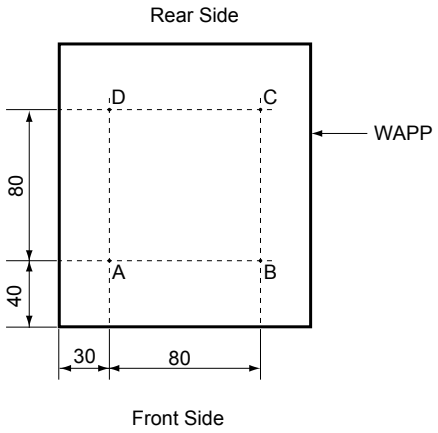
7 Attach the lever-type dial gauge to the stage frame.

Attaching the Dial Gauge



8 Set the lever-type dial gauge with the measurement probe tip positioned at point D as indicated in the following figure, then set the gauge to 0.

Setting the Lever-Type Dial Gauge



(Unit; mm)

9 Measure the height of the WAPP at points A, B and C as indicated in the previous figure by moving the stage to the specified points. Record the values for each point.

CAUTION **Property Damage Hazard**

Always lower the stage 500 µm in the Z direction before moving the stage in the X or Y directions to avoid damaging the WAPP.

10 Check the following points is inspection:

- The difference between the values recorded at each point (A, B, C, and D) is less than or equal to 10 µm.
- The values for each measurement point should be as follows:
  D < C < B
  D < A < B

If the value at any of the measurement points is out of specifications, go to **6.9 Adjusting the WAPP Planarity (see page 221)**.

11 Remove the lever-type dial gauge.

12 Use the following steps to raise the WAPP unit.

12.1 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

12.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*. The *Stage Adjustments Menu* is displayed.

12.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*. The *Stage Options Menu* is displayed.

12.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

12.5 Press WAPP on the *Option Control Menu*. The *WAPP Diagnostics Menu* is displayed and the WAPP unit rises.

13 Lay the protective Mylar sheet over the chuck top.

14 Set the dial gauge onto the chuck top.

CAUTION **Property Damage Hazard**
Be careful not to damage the chuck top when setting the dial gauge onto the chuck top.

15 Measure the distance between the chuck top surface and WAPP surface with the dial gauge. Record the value.

16 Check that the value obtained in the previous step is between 2.2 and 3.2 mm.

If the value is out of specification, go to **6.9 Adjusting the WAPP Planarity (see page 221)**.

NOTE **This specification is the range for a WAPP without a polish sheet.**

17 Remove the dial gauge.

18 Remove the protective Mylar sheet from the chuck top.

19 Use the following steps to initialize the stage.

19.1 Press STAGE DIAG MAIN MENU on the *WAPP Diagnostics Menu*. The *Stage Adjustments Menu* is displayed.

19.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

19.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. The stage is initialized.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes or other objects from the stage area when powering on or initializing the prober.

20 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.9 Adjusting the WAPP Planarity 1406.1

Introduction

Purpose:

To adjust the planarity of the WAPP until it is within specification.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Lever-type dial gauge Dial gauge Hexagonal wrench Protective Mylar sheet Torque wrench
Parts or Consumables:	Shims

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **Check that there are no polish sheets on the WAPP before performing the procedure.**

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

2 Disable the head plate interlock.

3 Close the head plate.

4 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

5 Use the following steps to position the stage.

5.1 Press DIAGNOSTICS on the *Main Menu*.

5.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

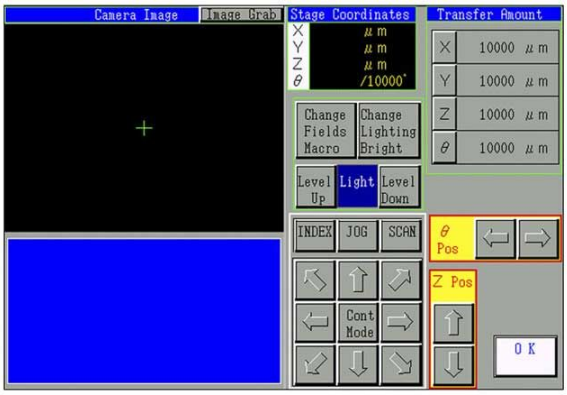
5.3 Input your password on the numeric keypad and press INPUT.

5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

5.5 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

5.6 Press XYZθ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

Stage Control Menu



5.7 Use the arrow buttons to position the chuck top at the following coordinates:

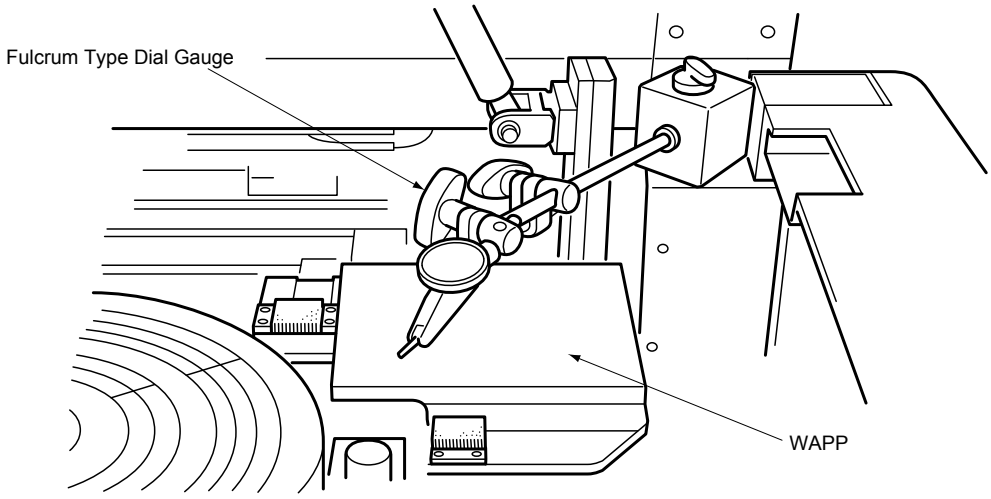
- X axis: 110000 µm
- Y axis: 160000 µm
- Z axis: 64000 µm

6 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **CAUTION** **Mechanical Hazard**
> **To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.**

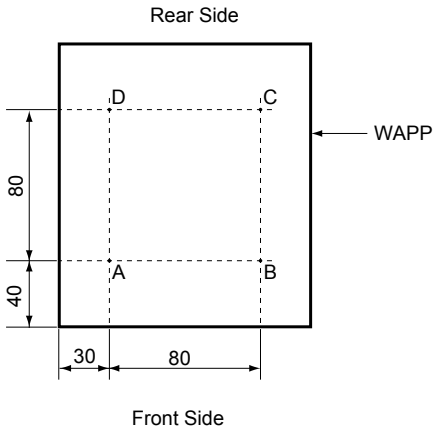
7 Attach the lever-type dial gauge to the stage frame.

Attaching the Dial Gauge



8 Set the lever-type dial gauge with the measurement probe tip positioned at point D as indicated in the following figure, then set the gauge to 0.

Setting the Lever-Type Dial Gauge



9 Measure the height of the WAPP at points A, B and C as indicated in the previous figure by moving the stage to the specified points. Record the values for each point.

CAUTION **Property Damage Hazard**

Always lower the stage 500 µm in the Z direction before moving the stage in the X or Y directions to avoid damaging the WAPP.

10 Remove the lever-type dial gauge.

11 Use the arrow buttons to position the chuck top at the following coordinates:

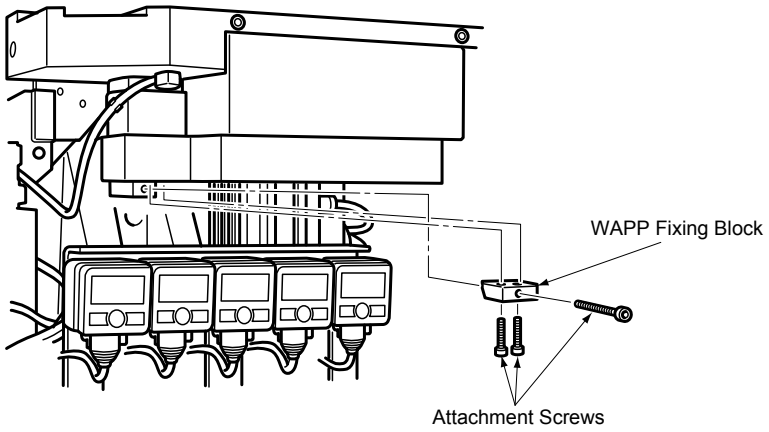
- X axis: 163000 µm
- Y axis: 165000 µm
- Z axis: 65000 µm

12 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control keys.**

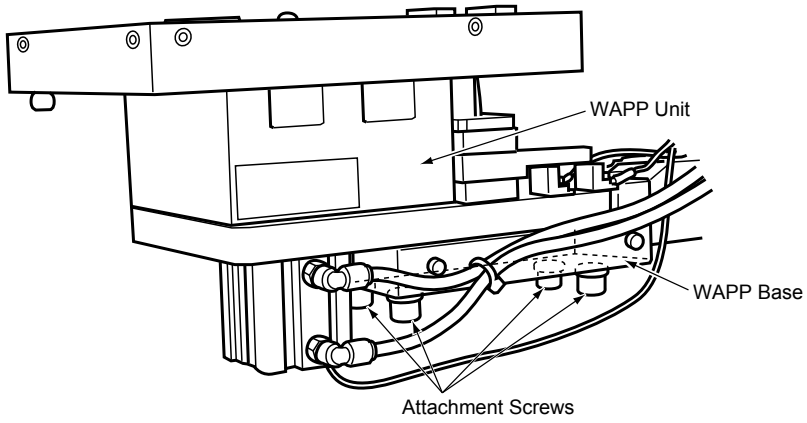
13 Remove the WAPP securing block.

WAPP Securing Block



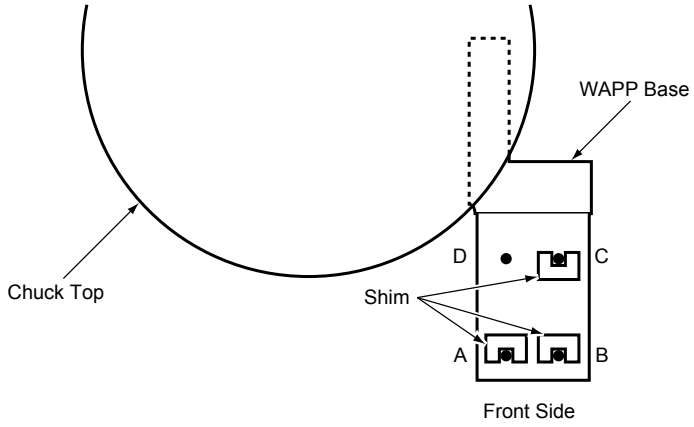
14 Remove the four WAPP attachment screws.

WAPP Unit Attachment Screws



15 Insert the shim(s) between the WAPP unit and the WAPP base.

▼ **Shim Insertion Positions**



Use the following equations to calculate the amount the unit should be shimmed. (These are general calculations.)

A shim amount = (A measurement value – D measurement value) x 2

B shim amount = (A shim amount + C shim amount)

C shim amount = (C measurement value – D measurement value) x 0.6

NOTE **To insert shims into positions A or D, you must remove the WAPP unit first. Be careful not to damage any of the exposed prober piping or wiring when removing the WAPP unit.**

16 Replace the WAPP securing block and the WAPP unit. Tighten the attachment screws to the torque values indicated in the following table.

▼ **Torque Values**

WAPP Base	Torque Value
Ceramic	8 N•m (80 kgf•cm)
Metal	27.5 N•m (275 kgf•cm)

17 Use the following steps to move the chuck top.

17.1 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

17.2 Use the arrow buttons to position the chuck top at the following coordinates:

- X axis: 110000 µm
- Y axis: 160000 µm
- Z axis: 64000 µm

18 Repeat steps 6 through 9 to measure the WAPP planarity again and check that it is within the following specifications:

- The difference between the values recorded at each point (A, B, C, and D) is less than or equal to 10 µm.
- The values for each measurement point should be as follows:
  D < C < B
  D < A < B

If the planarity is out of specification, repeat steps 10 through 18.

19 Use the following steps to raise the WAPP unit.

19.1 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

19.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*. The *Stage Adjustments Menu* is displayed.

19.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*. The *Stage Options Menu* is displayed.

19.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

19.5 Press WAPP on the *Option Control Menu*. The *WAPP Diagnostics Menu* is displayed and the WAPP unit rises.

20 Lay the protective Mylar sheet over the chuck top.

21 Set the dial gauge onto the chuck top.

CAUTION **Property Damage Hazard**
Be careful not to damage the chuck top when setting the dial gauge onto the chuck top.

22 Measure the distance between the chuck top surface and WAPP surface with the dial gauge. Record the value.

23 Check that the value obtained in the previous step is between 2.2 and 3.2 mm.

If the value is out of specification, repeat steps 10 and following.

NOTE **This specification is the range for a WAPP without a polish sheet.**

24 Remove the dial gauge.

25 Remove the protective Mylar sheet from the chuck top.

26 Use the following steps to initialize the stage.

26.1 Press STAGE DIAG MAIN MENU on the *WAPP Diagnostics Menu*. The *Stage Adjustments Menu* is displayed.

26.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

26.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes or other objects from the stage area when powering on or initializing the prober.

27 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.10 Registering the WAPP Position 1407.2

Introduction

Purpose:

To register the position of the WAPP after adjusting the WAPP planarity or replacing the WAPP.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	WAPP

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Perform a system shutdown and perform lockout and tagout on the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

2 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**
To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

3 Set the WAPP on the WAPP unit

4 Close the head plate

5 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

6 Use the following steps to display the *Needle Polish Pad Position Menu*.

6.1 Press DIAGNOSTICS on the *Main Menu*.

6.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

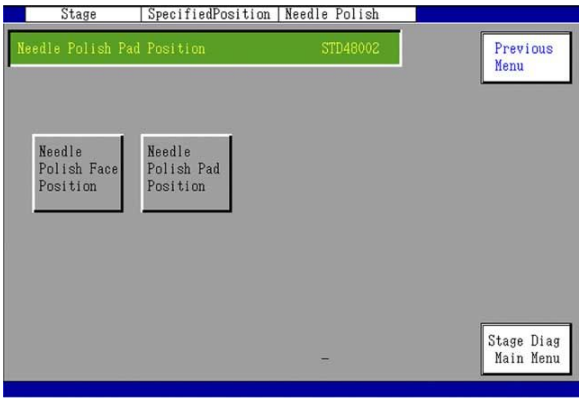
6.3 Input your password on the numeric keypad and press INPUT.

6.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

6.5 Press SPECIFIED POSITION on the *Stage Adjustments Menu*.

6.6 Press NEEDLE POLISH PAD POSITION on the *Specified Stage Position Menu*. The *Needle Polish Pad Position Menu* is displayed.

Needle Polish Pad Position Menu



7 Use the following steps to register the position of the WAPP.

7.1 If the polish sheet is NOT mounted, press NEEDLE POLISH PAD POSITION. If the polish sheet IS mounted, press NEEDLE POLISH FACE POSITION. The *Stage Control Menu* is displayed.

7.2 Follow the directions on the menu to position the crosshairs over the corner of the WAPP.

7.3 Press OK. The corner of the WAPP is registered. The camera image switches to the micro field view.

7.4 Follow the directions on the menu to focus the surface of the WAPP.

7.5 Press OK. The height of the WAPP surface is registered. The *Needle Polish Pad Position Menu* is displayed.

7.6 Press PREVIOUS MENU twice on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?`

7.7 Press YES. The revised value is saved to the SYS information. The *Diagnostics Menu* is displayed.

6.11 Calibrating the WAPP Vacuum Sensor 0223.1

Introduction

Purpose:

To calibrate the WAPP vacuum sensor.

The WAPP vacuum sensor monitors the WAPP vacuum pressure and notifies the main controller of the vacuum pressure available for proper operation. If this sensor is not functioning, or is functioning incorrectly, the prober's internal parts or the wafers could be damaged. Perform the following procedure to verify that the WAPP vacuum pressure sensor displays an accurate reading.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *WAPP Diagnostics Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

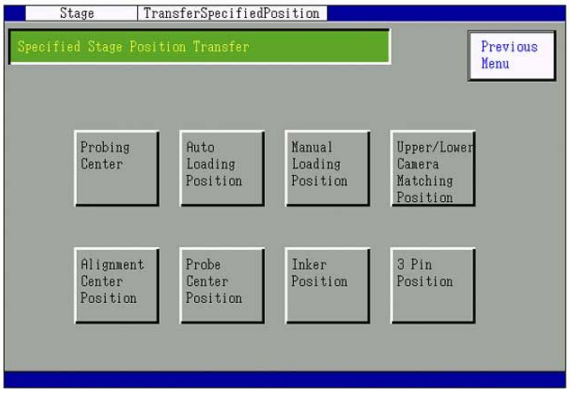
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exists, press OK. The *Stage Adjustment Menu* is displayed.

2.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustment Menu*. The *Transfer Specified Position Menu* is displayed.

▼ **Transfer Specified Position Menu**



2.6 Press PROBE CENTER POSITION on the *Transfer Specified Position Menu*. A check message is displayed stating `Transfer Stage?` Check for any physical interference with the stage; if none exists, press YES. The stage moves to a center position.

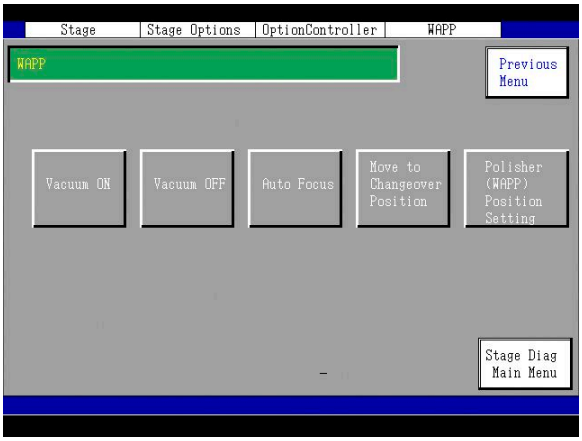
2.7 Press PREVIOUS MENU. The *Stage Adjustment Menu* is displayed.

2.8 Press STAGE OPTIONS on the *Stage Adjustment Menu*. The *Stage Options Menu* is displayed.

2.9 Press OPTION CONTROLLER on the *Stage Options Menu*. The *Option Controller Menu* is displayed.

2.10 Press WAPP on the *Option Controller Menu*. The *WAPP Diagnostics Menu* is displayed.

▼ **WAPP Diagnostics Menu**



3 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

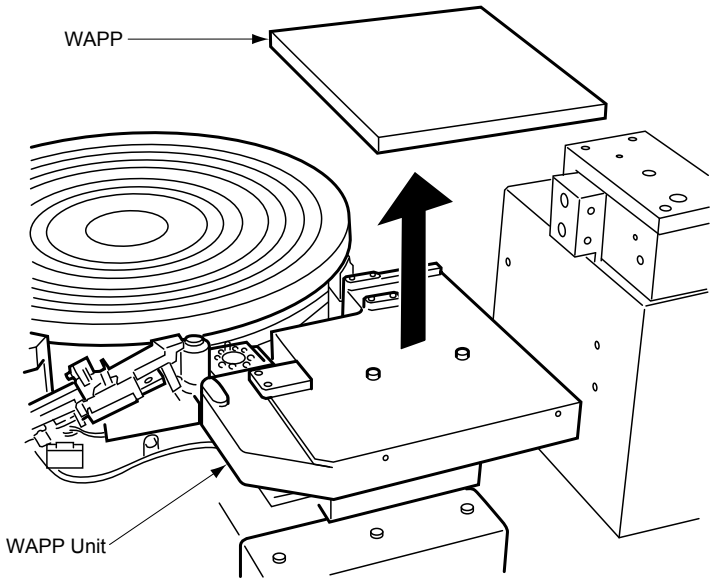
⚠ CAUTION Mechanical Hazard

When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

NOTE **The head plate interlocks will not generate an error if the stage does not move. Because this procedure is performed without moving the stage, having the head plate open should not generate an error. If an error is generated, the prober must be initialized before any further maintenance can be performed.**

4 Check that a WAPP is not present on the WAPP unit.

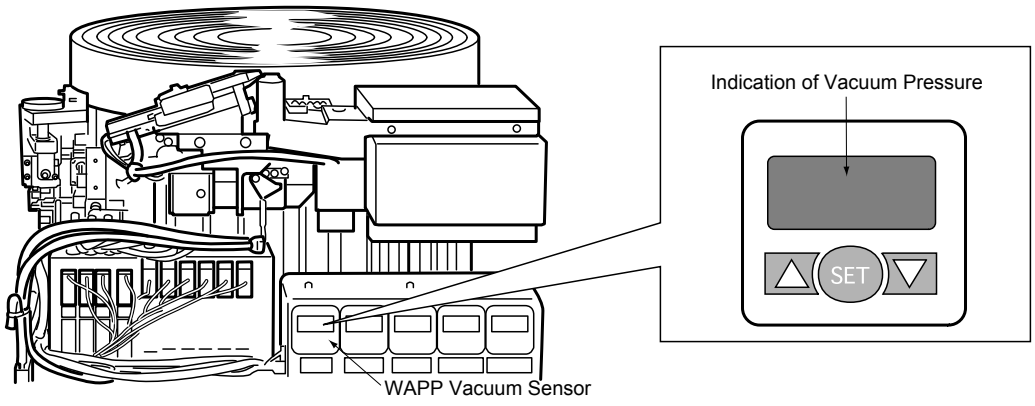
- If the WAPP is not present, continue with step 5.
- If the WAPP is present, press VACUUM OFFon the *WAPP Diagnostics Menu*, and remove the WAPP from the WAPP unit.



5 Press VACUUM ONon the *WAPP Diagnostics Menu*. The WAPP vacuum turns ON.

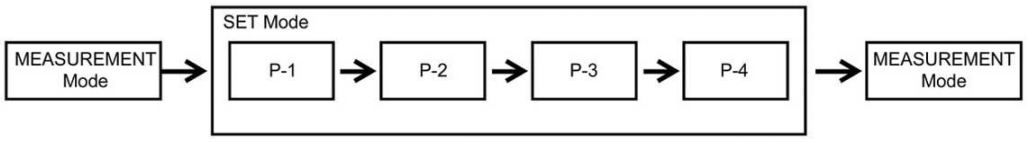
6 Check that the WAPP vacuum sensor at the front of the X stage is in the MEASUREMENT mode. When the stage vacuum sensor is in the measurement mode, the numerical display does not flash. Record the value on the vacuum pressure display.

▼ WAPP Vacuum Sensor Location



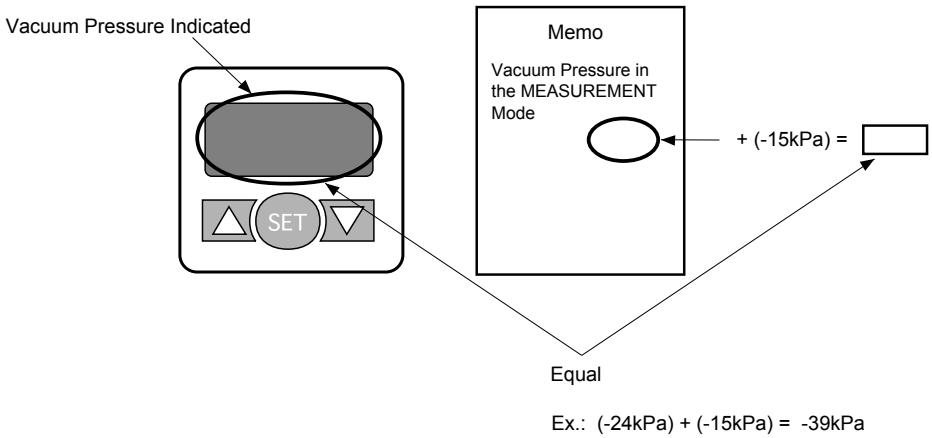
7 Press SET to change the WAPP vacuum sensor mode from MEASUREMENT to SET.

Changing the Vacuum Sensor Mode



8 Check that the value displayed in the P-1 SET mode is equal to the value you recorded in step 6 plus -15 kPa.

Checking the Vacuum Pressure



- If the value displayed is within specification, go to step 9.
- If the value displayed in the P-1 SET mode is outside specification, use the UP and DOWN arrows to change the displayed value to meet specification.

9 Press SET to change the vacuum sensor mode to P-2.

10 Check that the value displayed in the P-2 SET mode is equal to the value you recorded in step 6 plus -10 kPa.

- If the value displayed is within specification, go to step 11.
- If the value displayed is outside specification, use the UP and DOWN arrows to change the displayed value until it is within specification.

NOTE **Do NOT change the settings of the P-3 and P-4 sensors.**

11 Press SET to change the WAPP vacuum sensor mode from SET to MEASUREMENT.

12 Press VACUUM OFF on the *WAPP Diagnostics Menu*. The WAPP vacuum turns OFF.

13 Place the WAPP onto the WAPP unit.

14 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

15 Press STAGE DIAG MAIN MENU on the *WAPP Diagnostics Menu*.

16 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*. The *Basic Functions Menu* is displayed.

17 Press INITIALIZE STAGE on the *Basic Functions Menu*. A check menu is displayed stating `Execute Initial?` Check for any interference; if none exists, press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

18 Press PREVIOUS MENU on the *Basic Functions Menu*.

19 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating `Save SYS Information?` Press NO. The *Main Menu* is displayed.

6.12 Checking and Adjusting the WAPP Drive Times 0314.1

Introduction

Purpose:

To check and adjust the WAPP drive times.

Verify the transfer drive times to the **Up** and **Down** positions are **2,000 ms** or less. If either transfer time is outside specification after completing the adjustment, contact TEL Field Service Support.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Flat-blade screwdriver Hexagonal wrench
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking the WAPP Transfer Time

1 Check that the air pressure is approximately 0.425 MPa.

2 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

3 Use the following steps to position the chuck at the center of the stage.

3.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

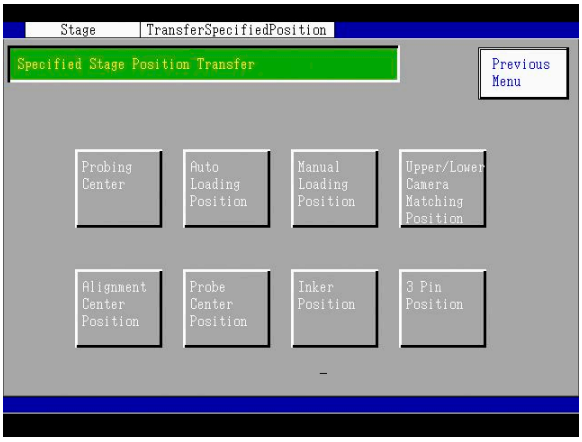
3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

3.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press STAGE on the *Adjustments Menu*. A message menu stating is displayed `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

3.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Transfer Specified Position Menu* is displayed.

▼ **Transfer Specified Position Menu**



3.6 Press PROBING CENTER on the *Transfer Specified Position Menu*. A check menu stating `Transfer Stage?` is displayed. Press YES. The chuck moves to the center of the stage.

4 Use the following steps to access the *Solenoid Drive Test Menu*.

4.1 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

4.2 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*. The *Basic Functions Menu* is displayed.

4.3 Press INSPECT on the *Basic Functions Menu*. The *Stage Inspections Menu* is displayed.

4.4 Press SOLENOID DRIVE TEST on the *Stage Inspections Menu*. The *Solenoid Drive Test Menu* is displayed.

▼ **Solenoid Drive Test Menu**

5 Press NEEDLE POLISH. The *Probe Polish Pad Transfer Time Menu* is displayed.

6 Verify the transfer drive times to the **Up** and **Down** positions are between 1300 and 1500 ms. If either time is outside specification, refer to **Adjusting WAPP Transfer Times (see page 237)**.

7 Use the following steps to stop cycling and initialize the stage.

7.1 Press CANCEL to stop cycling. The *Solenoid Drive Test Menu* is displayed.

7.2 Then press PREVIOUS MENU on the *Solenoid Drive Test Menu*. The *Stage Inspections Menu* is displayed.

7.3 Press PREVIOUS MENU. The *Stage Functions Menu* is displayed.

7.4 Press INITIALIZE STAGEon the *Stage Functions Menu*. A check menu is displayed stating `Execute Initial?` Press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

Adjusting WAPP Transfer Times

NOTE **The following adjustment procedure begins from the point at which Checking the WAPP Transfer Time (see page 235) failed to meet specification.**

8 Use the following steps to move the stage to the center position.

8.1 Press CANCEL to stop the movement of the WAPP.

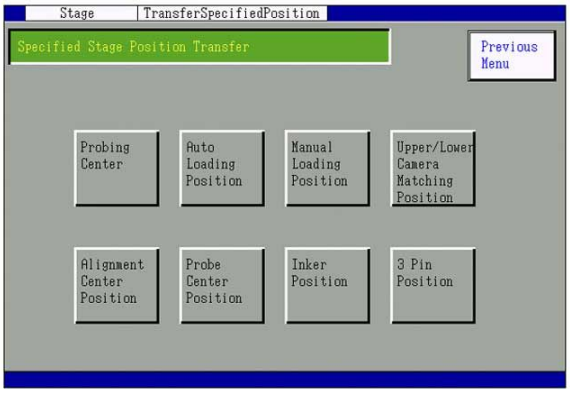
8.2 Press PREVIOUS MENU on the *Solenoid Drive Test Menu*.

8.3 Press PREVIOUS MENU on the *Stage Inspections Menu*.

8.4 Press PREVIOUS MENU on the *Basic Functions Menu*.

8.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*.

▼ **Transfer Specified Position Menu**



8.6 Press PROBING CENTER on the *Transfer Specified Position Menu*. A check menu is displayed stating `Transfer Stage?` Press YES. The stage moves to the prober center position.

9 Use the following steps to raise the Z stage.

9.1 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

9.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

9.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *XYZθ Joystick Transfer Menu* is displayed.

9.4 Select the SCAN mode and set the Z axis transfer amount to **100** µm.

9.5 Press the UP arrow button under the `Z Pos` to raise the Z stage to 50,000 µm.

9.6 Press OK on the *XYZθ Joystick Transfer Menu*. The *All Axis Transfer menu* is displayed.

10 Use the following steps to display the *Solenoid Drive Test Menu*.

10.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

10.2 Press PREVIOUS MENU on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

10.3 Press INSPECT on the *Stage Functions Menu*.

10.4 Press SOLENOID DRIVE TEST on the *Stage Inspections Menu*. The *Solenoid Drive Test Menu* is displayed.

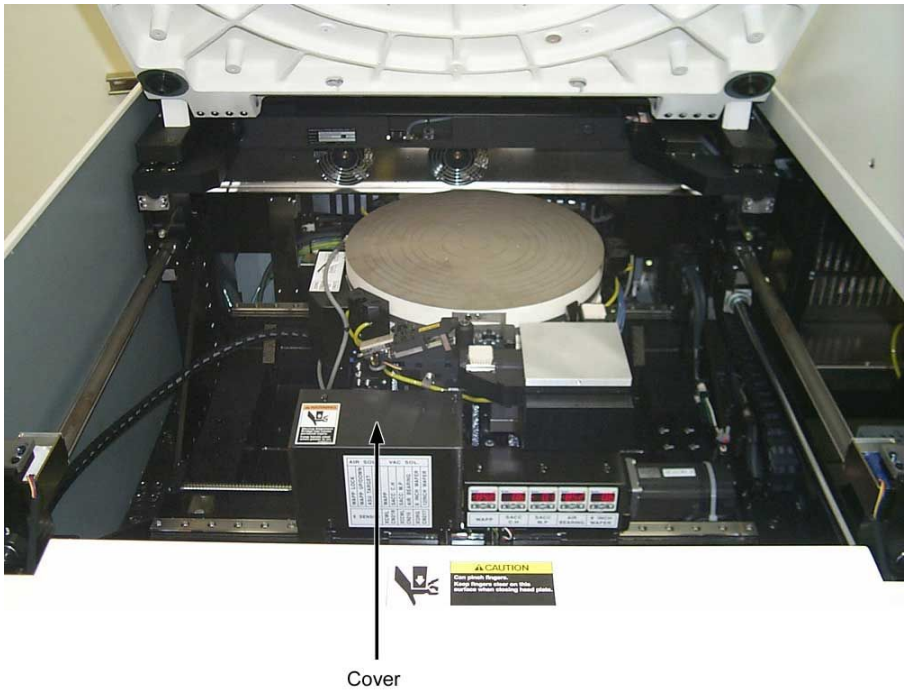
11 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard

When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

12 Use a 2.5 mm hex wrench to remove the stage solenoid cover.

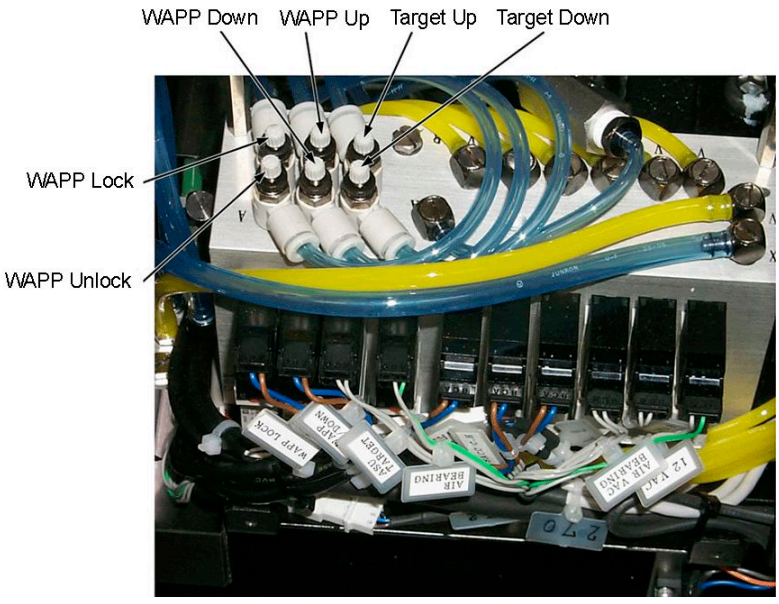
Stage Solenoid Cover



13 Press NEEDLE POLISH to begin the WAPP drive time test.

14 Rotate the WAPP Up/Down and Lock/Unlock speed controller lock nuts counterclockwise to loosen them.

Speed Controller (WAPP Up Position)



15 Adjust the transfer times by turning the speed controller knobs until the transfer times are between 1300 and 1500 ms.

16 Rotate the lock nuts clockwise to tighten them.

Restoring to Normal Operating Conditions

17 Press CANCEL. The *Solenoid Drive Test Menu* is displayed.

18 Press PREVIOUS MENU on the *Solenoid Drive Test Menu*.

19 Press PREVIOUS MENU on the *Stage Inspections Menu*.

20 Reattach the stage solenoid cover.

21 Press INITIALIZE STAGEon the *Stage Functions Menu*. A check menu is displayed stating `Execute Initial?` Press YES. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

22 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

6.13 Checking Head Plate Planarity 1409.2

Introduction

Purpose:

To check the planarity of the head plate.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Lever-type dial gauge Protective Mylar sheet
Parts or Consumables:	None

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

NOTE Check the head plate with an insert ring attached to the card holder. Use a card holder without a probe card.

1 Use one of the following methods to begin the procedure.

CAUTION Property Damage Hazard
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to position the stage.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

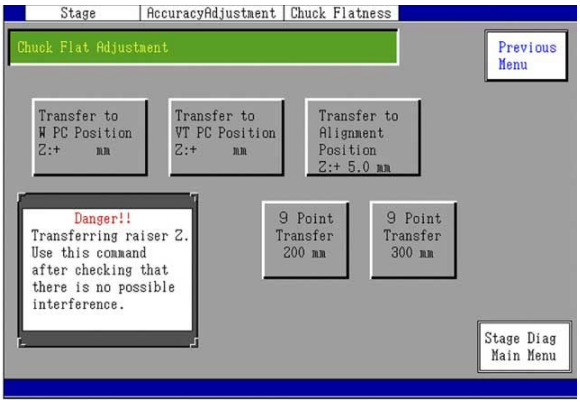
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press ACCURACY ADJUSTMENT on the *Specified Stage Adjustments Menu*.

2.6 Press CHUCK SURFACE FLAT on the *Stage Adjustment Menu*. The *Chuck Flat Adjustment Menu* is displayed.

Chuck Flat Adjustment Menu



3 Press TRANSFER TO W PC POSITION Z: + 67.0 MM on the *Chuck Flat Adjustment Menu*. The chuck top rises 67.0 mm from its initial position.

4 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

5 Place a protective Mylar sheet over the chuck top.

6 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

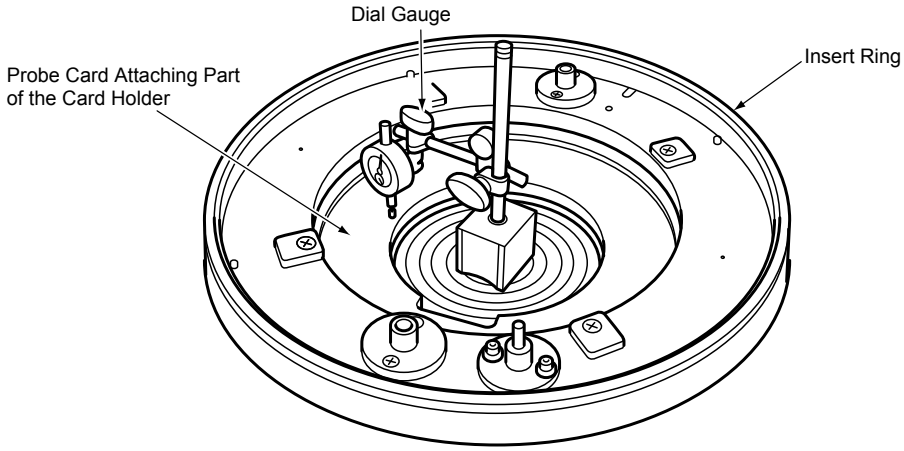
CAUTION **Property Damage Hazard**

Close the head plate gently while checking that there is no interference between the card holder and the chuck top.

7 Set the lever type dial gauge on the center of the chuck top.

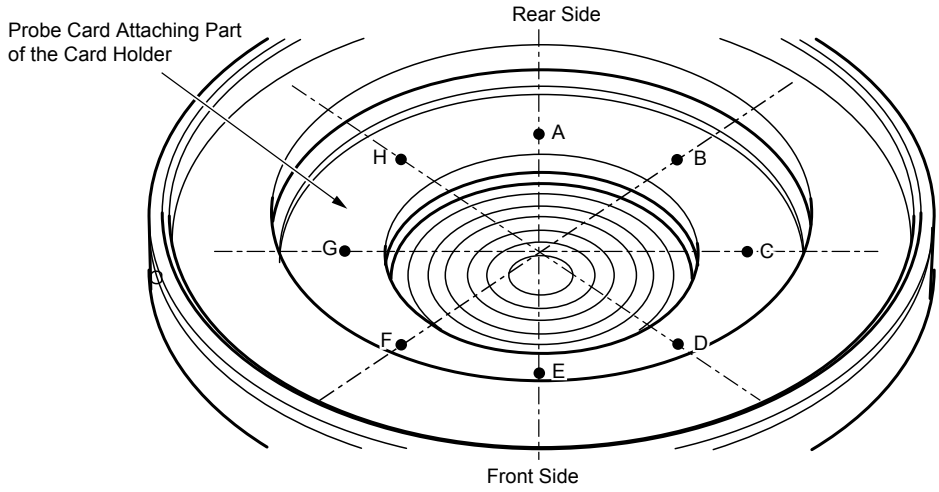
8 Set measuring probe on the part of the card holder where the probe card is attached, then reset the dial gauge to 0.

Setting Up the Dial Gauge



9 Rotate the dial gauge approximately 45° at a time and measure eight different points. Record each value as it is measured.

Points of Measurement



10 Verify the all of the values you recorded are within the specification.

If any of the values you recorded are outside of the specification, refer to **6.14 Adjusting the Head Plate Planarity (see page 245)**.

NOTE **The specification differs depending on the prober specification.**

11 Remove the dial gauge from the prober.

12 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.**

13 Remove the protective Mylar sheet from the chuck top.

14 Close the head plate.

6.14 Adjusting the Head Plate Planarity 1410.1

Introduction

Purpose:

To adjust the planarity of the head plate.

Required Resources:

Time:	60 minutes
Personnel:	1 person
Tools:	Lever-type dial gauge Protective Mylar sheet Hexagonal Wrench Adjustable bolt adjustment device
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to position the stage.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

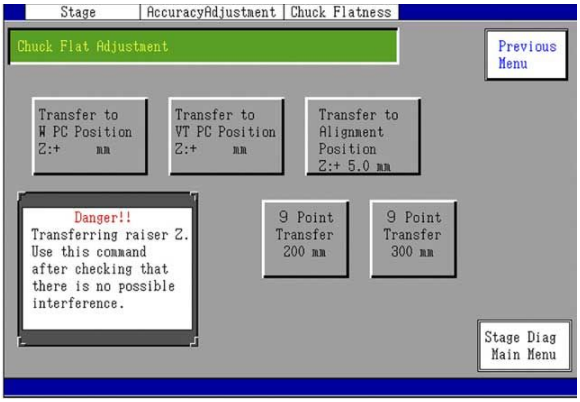
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*.

2.6 Press ACCURACY ADJUSTMENT on the *Specified Stage Adjustments Menu*.

2.7 Press CHUCK SURFACE FLAT on the *Stage Adjustment Menu*. The *Chuck Flat Adjustment Menu* is displayed.

Chuck Flat Adjustment Menu



3 Press TRANSFER TO W PC POSITION Z: + 67.0 MM on the *Chuck Flat Adjustment Menu*. The chuck top rises 67.0 mm from its initial position.

4 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

5 Place a protective Mylar sheet over the chuck top.

6 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

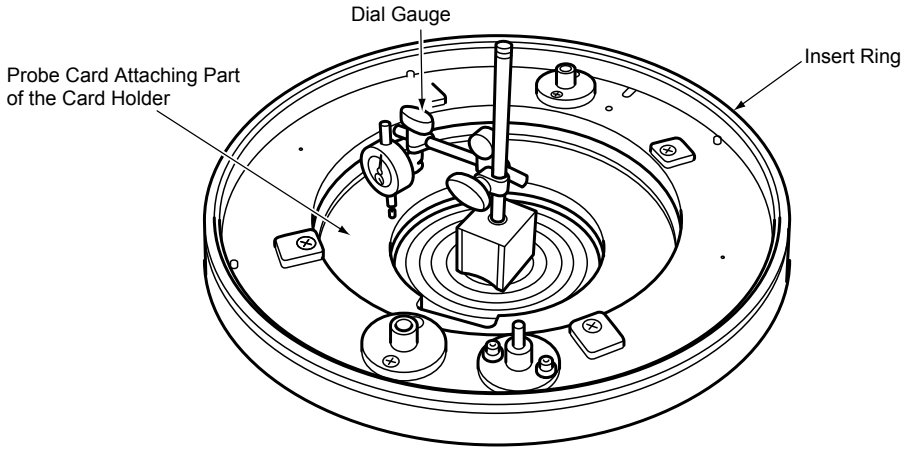
CAUTION Property Damage Hazard

Close the head plate gently while checking that there is no interference between the card holder and the chuck top.

7 Set the lever type dial gauge on the center of the chuck top.

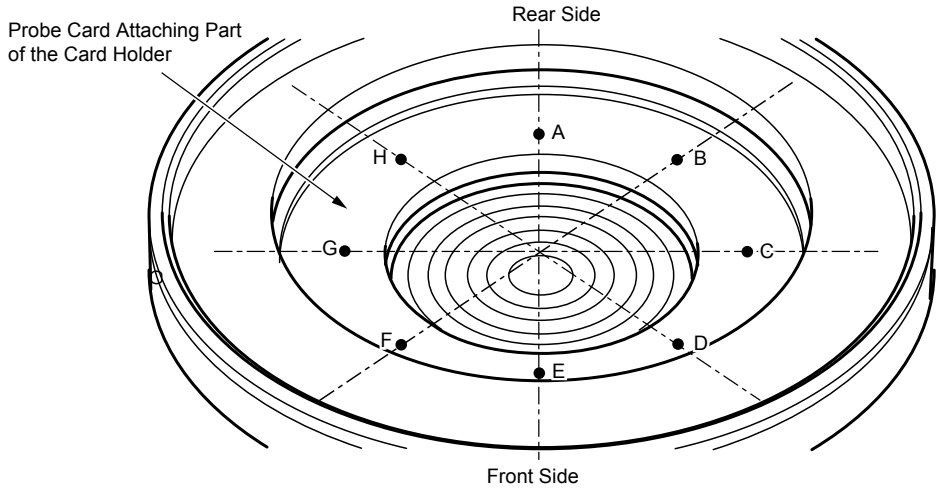
8 Set measuring probe on the part of the card holder where the probe card is attached, then reset the dial gauge to 0.

Setting Up the Dial Gauge



9 Rotate the dial gauge approximately 45° at a time and measure eight different points. Record each value as it is measured.

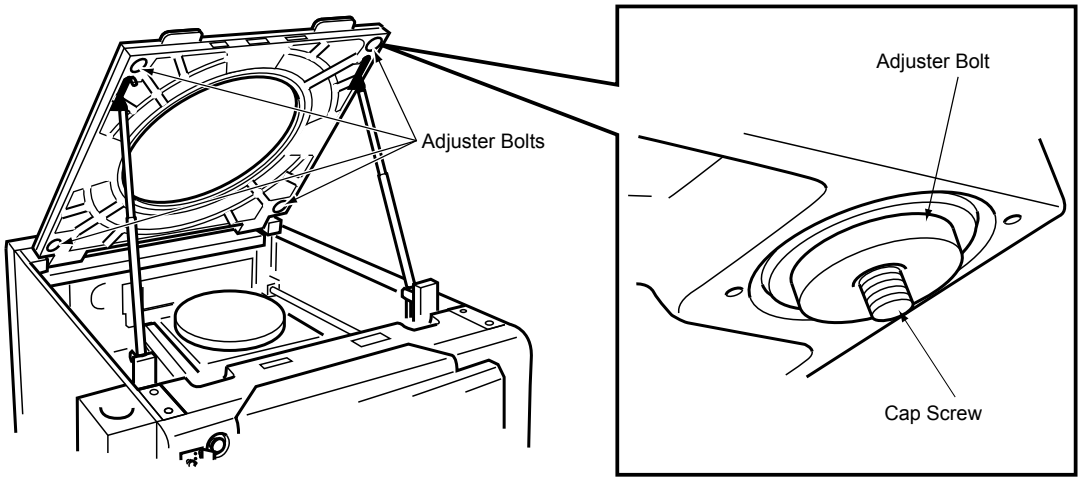
Points of Measurement



10 Remove the dial gauge from the chuck top.

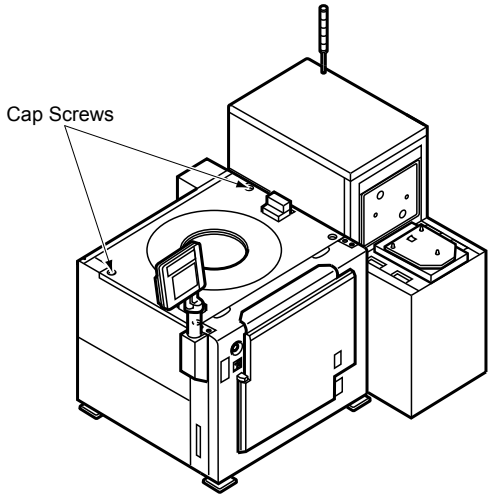
11 Use the following steps to raise the two rear adjustable bolts on the head plate.

Head Plate Adjustment Bolts



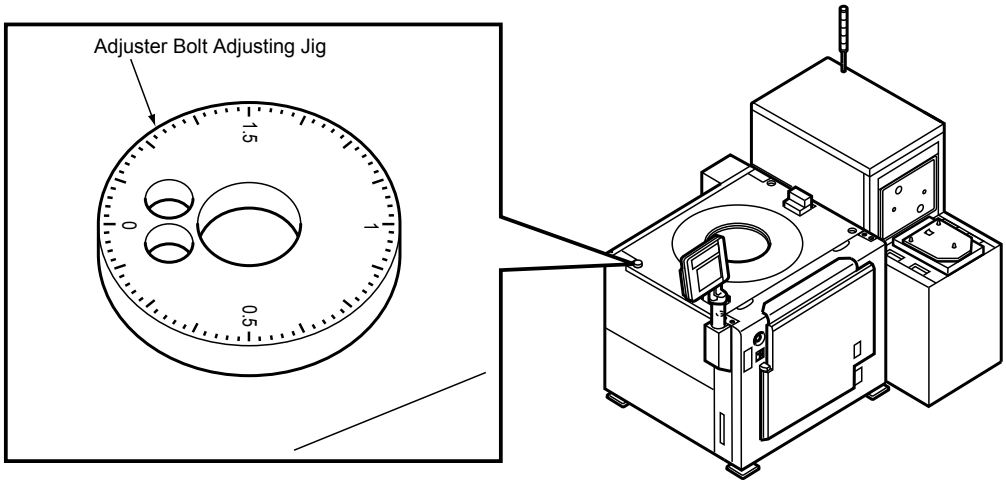
11.1 Loosen the two rear cap screws on the head plate.

Head Plate Rear Cap Screws



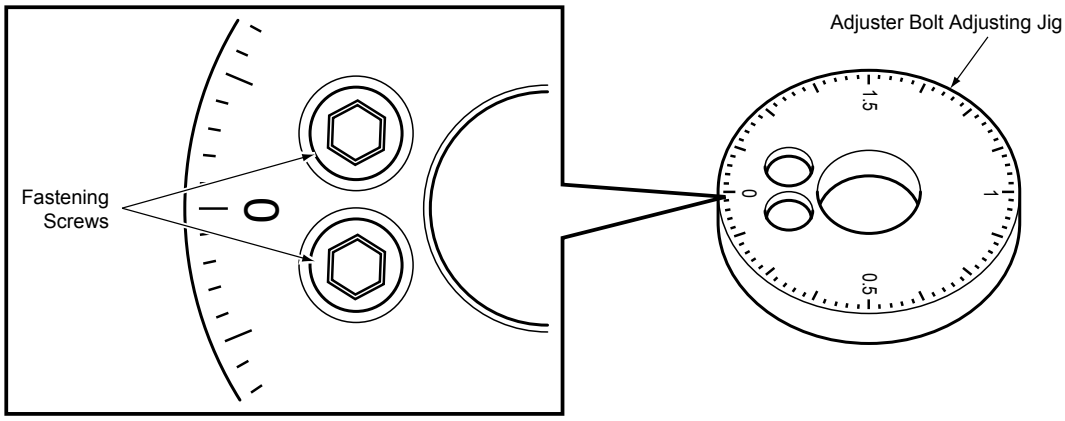
11.2 Set the adjustable bolt adjustment device in place.

Adjustable Bolt Adjustment Device



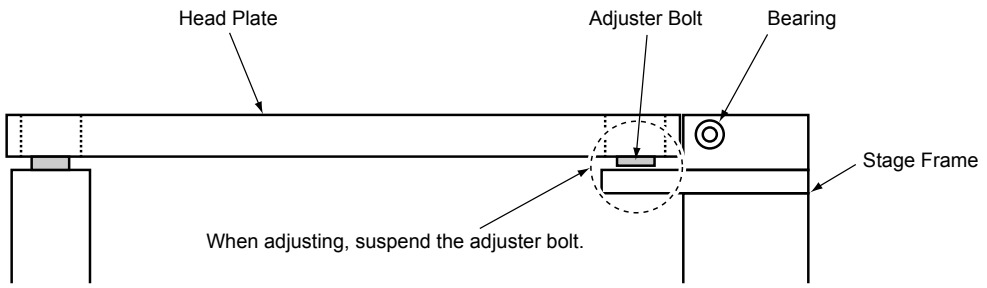
11.3 Loosen the two fastening screws on the adjustable bolt.

Adjustable Bolt Fastening Screws



11.4 Turn the adjustment device to raise the height of the adjustable bolts.

Adjusting the Adjustable Bolt



NOTE **Turning the adjustment device one turn raises the bolt by 2 mm. One graduation is equal to 20 µm.**

11.5 Remove the adjustment device.

12 Repeat steps 7 through 10 to measure the head plate planarity again and record the results.

13 Use the following steps to adjust the two front adjustable bolts on the head plate.

13.1 Loosen the two front cap screws on the head plate.

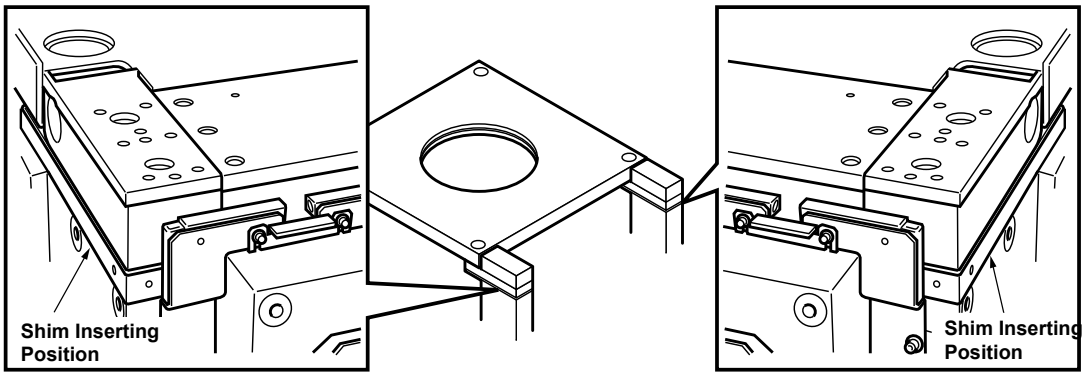
NOTE **Do not loosen the two front cap screws too much or the head plate will open.**

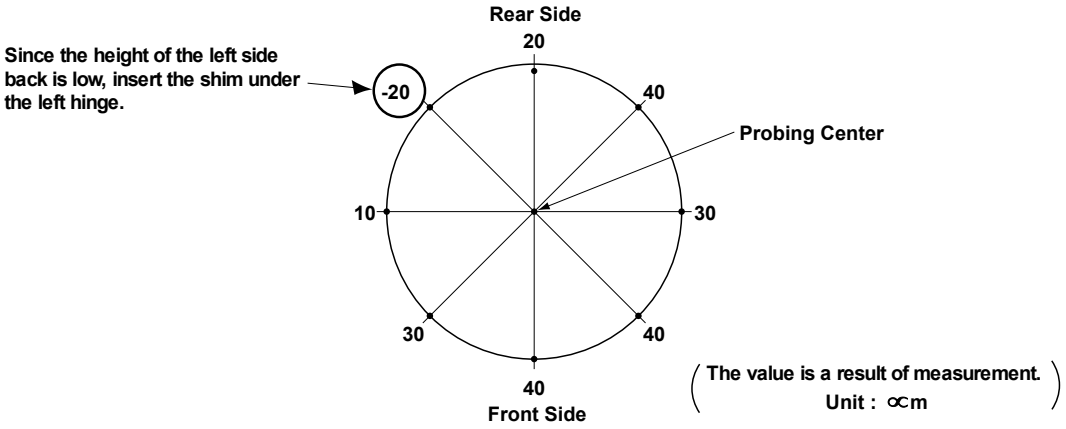
13.2 Set the adjustable bolt adjustment device in place.

13.3 Loosen the two fastening screws on the adjustable bolt.

13.4 Using the values you recorded in step 12, adjust the front adjustable bolts as necessary to correct the planarity of the head plate.

NOTE **If the head plate planarity cannot be brought within the specification using the front adjustable bolts, you need to insert a shim under the head plate hinge. The shim should be inserted under the lower hinge after measuring the head plate planarity again.**





14 Tighten the two fastening screws on the front adjustable bolts.

15 Using the adjustment device, lower the two rear adjustable bolts until they make contact with the stage frame.

16 Tighten the two fastening screws on the rear adjustable bolts.

17 Repeat steps 7 through 10 to check the head plate planarity again and record the results.

18 Verify that the value obtained in step 17 is within the specification. If necessary, repeat this procedure to adjust the head plate planarity.

19 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
>
> **To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.**

20 Remove the protective Mylar sheet from the chuck top.

21 Close the head plate.

6.15 Checking the Stage Movement Area 1411.2

Introduction

Purpose:

To check the alignment center position coordinate and the initial offset amount.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to position the stage.

2.1 Press DIAGNOSTICS on the *Main Menu*.

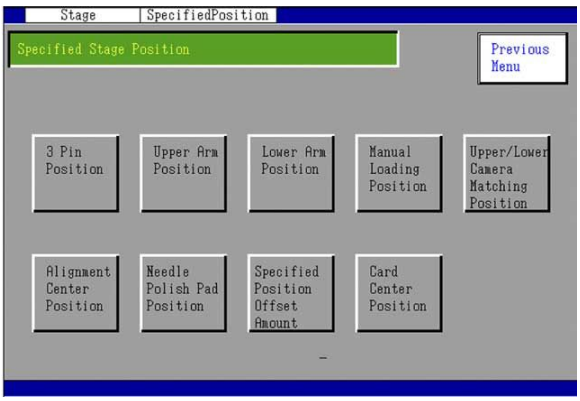
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

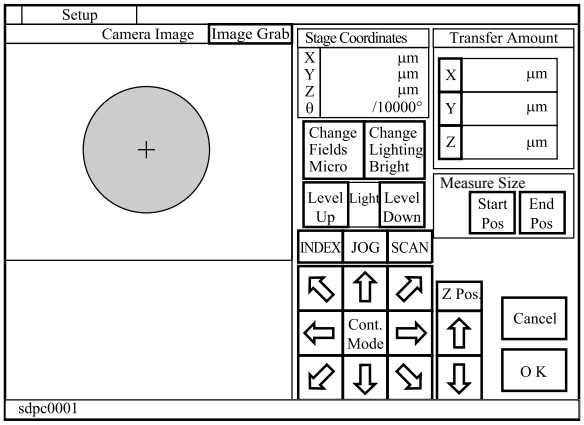
2.5 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

Specified Stage Position Menu



2.6 Press ALIGNMENT CENTER POSITION. The chuck top and alignment bridge move to the alignment position and the *Stage Control Menu* is displayed.

Stage Control Menu



3 Check that the camera image is in the micro field view. If necessary, change the view by pressing CHANGE FIELD.

4 Use the arrow buttons to align the crosshairs over the center of the chuck top (marked by a black hole). This verifies that the chuck top surface is in focus. Check that the coordinates of the X, Y, and Z axes are within the following specifications:

- X axis: 177000 ± 300 µm
- Y axis: 211000 ± 300 µm
- Z axis: 4000 ± 200 µm

5 Press CANCEL on the *Stage Control Menu*. The *Specified Stage Position Menu* is displayed.

6 Use the following steps to check the X axis initial offset amount:

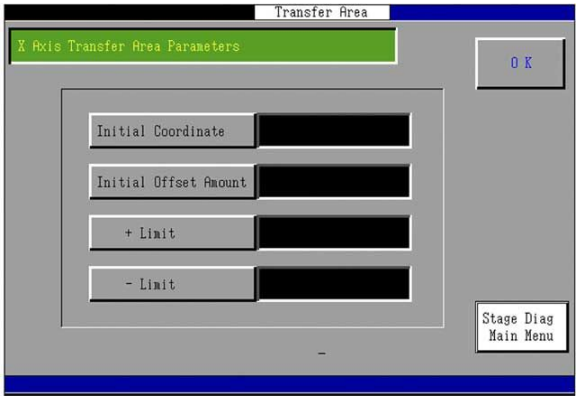
6.1 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

6.2 Press ALL AXIS PARAMETERS on the *Stage Adjustments Menu*.

6.3 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

6.4 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

X Axis Transfer Area Parameters Menu



6.5 Check that the initial offset amount for the X axis is between -5000 and -9000 µm.

7 Use the following steps to check the Y axis initial offset amount.

7.1 Press OK on the *X Axis Transfer Area Parameters Menu*.

7.2 Press ALL AXIS TRANSFER AREA.

7.3 Press Y AXIS on the *Select Axis Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

7.4 Check that the initial offset amount for the Y axis is between -6000 and -10000 µm.

8 Use the following steps to check the Z axis initial offset amount.

8.1 Press OK on the *Y Axis Transfer Area Parameters Menu*.

8.2 Press ALL AXIS TRANSFER AREA.

8.3 Press Z AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

8.4 Check that the initial offset amount is between -15000 and -17000 µm.

8.5 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed asking, `Do you want to validate this data?` Press NO.

9 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

10 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed asking, `Execute Initial?`. Press YES. The stage is initialized.

CAUTION **Property damage hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

11 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

12 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating `Save SYS Information?`

13 Press NO on the check menu.

6.16 Setting the X and Y Initial Offset Amounts 1413.2

Introduction

Purpose:

To set the X and Y axes initial offset amounts.

It is necessary to set the initial offset amounts so that the X coordinate is between 176700 and 177300 µm and the Y coordinate is between 210700 and 211300 µm when the chuck top is moved to the alignment center position. It is also necessary for accuracy in many other prober operations.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the set the X axis initial offset to 0.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT.

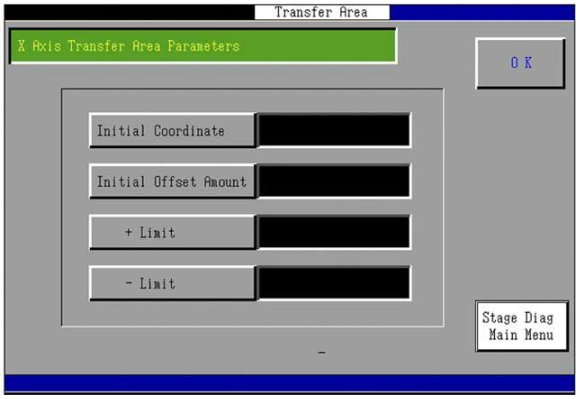
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*. The *All Axis Parameters Menu* is displayed.

2.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*. The *Select Axis Menu* is displayed.

2.7 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

▼ **X Axis Transfer Area Parameters Menu**



2.8 Press `Initial Offset Amount` on the *X Axis Transfer Area Menu*. A numeric keypad is displayed.

2.9 Input 0 on the numeric keypad. Press OK. The *X Axis Transfer Area Parameters Menu* is displayed.

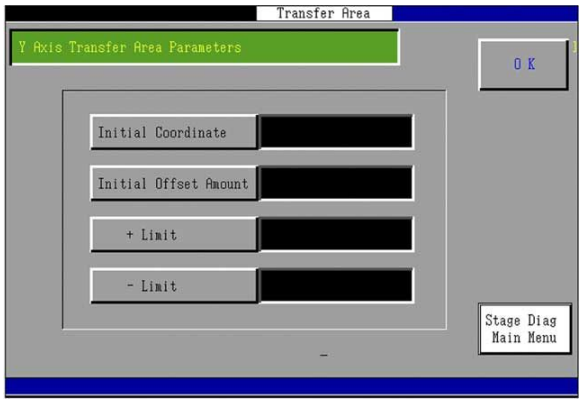
2.10 Press OK on the *X Axis Transfer Area Parameters Menu*. A check menu stating `Validate this data?` is displayed. Press YES. The *Stage Parameters Menu* is displayed.

3 Use the following steps to set the Y axis initial offset to 0.

3.1 Press ALL AXIS TRANSFER AREA The *Select Axis Menu* is displayed.

3.2 Press Y AXIS on the *Select Axis Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

▼ **Y Axis Transfer Area Parameters Menu**



3.3 Press `Initial Offset Amount` on the *Y Axis Transfer Area Menu*. A numeric keypad is displayed.

3.4 Input 0 on the numeric keypad. Press OK. The *Y Axis Transfer Area Parameters Menu* is displayed.

3.5 Press OK on the *Y Axis Transfer Area Parameters Menu*. A check menu stating `Validate this data?` is displayed. Press YES. The *All Axis Parameters Menu* is displayed.

4 Use the following steps to initialize the stage.

4.1 Press *Previous Menu*.

4.2 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*.

4.3 Press INITIALIZE STAGE on the *Basic Functions Menu*. A check menu stating `Execute initial?` is displayed. Press YES. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes or other objects from the stage area when powering on or initializing the prober.**

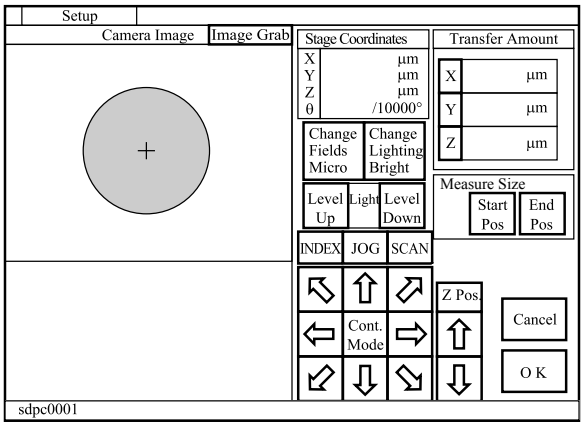
5 Use the following steps to position the chuck top and alignment bridge.

5.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

5.2 Press SPECIFIED POSITION on the *Stage Adjustment Menu*. The *Specified Stage Position Menu* is displayed.

5.3 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. A check menu is displayed stating `The stage and bridge will move.`. Press YES. The stage and bridge move to the alignment center, and *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



6 Use the following steps to calculate the X and Y axes initial offset amounts.

6.1 Record the current X and Y coordinate. Insert these values in the **X1** and **Y1** positions respectively in the Initial Offset Worksheet in step 6.11.

6.2 Press START POS on the *Measure Size Menu*.

6.3 Press CHANGE FIELD to change the camera image from the micro to macro field view.

6.4 Set the transfer amount to 100 µm for each axis

NOTE **If you cannot see an image, adjust the light level up until you see an image.**

6.5 Using the control buttons, align the green crosshairs over the chuck top center (the center of the black circle). This is a coarse adjustment.

6.6 Press CHANGE FIELD to change the camera image from the macro to the micro field view.

6.7 Set the transfer amount to 1µm both axes.

6.8 Use the control buttons to align the green cross with the chuck top center. This is a fine adjustment.

NOTE **Make sure the image is in focus by using the chuck top surface as your reference.**

6.9 Record the current X and Y coordinates next to **X2** and **Y2** respectively in the Initial Offset Worksheet in the next step.

6.10 Press END POS on the *Measure Size Menu*.

6.11 Check that the values recorded in the previous steps are input into the following table.

▼ **Initial Offset Worksheet**

X1		Y1	
X2		Y2	
X1 – X2		Y1 – Y2	

6.12 Subtract X2 from X1. Always input the result as a negative number.

-[X1 - X2] = (-XXXX µm)

6.13 Confirm that the initial offset value calculated in step 6.12 is between -5,000 and -9,000 µm.

6.14 Subtract Y2 from Y1. Always input the result as a negative number.

-[Y1 - Y2] = (-XXXX µm)

6.15 Confirm that the initial offset value calculated in step 6.14 is between -6,000 and -10,000 µm.

7 Use the following steps to display the *X Axis Transfer Area Parameters Men* and input the X axis offset amount.

7.1 Press CANCEL. A check menu stating `Return BRIDGE, TARGET, PLSHR, LAMP` is displayed. Press YES. The *Specified Stage Position Menu* is displayed.

CAUTION **Property Damage Hazard**
It is very important to CANCEL. If you press OK, you will be saving an incorrect value.

7.2 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

7.3 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

7.4 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

7.5 Press X AXIS on the *All Axis Transfer Area Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

7.6 Press INITIAL OFFSET AMOUNT on the *X Axis Transfer Area Parameters Menu*. A numeric keypad is displayed.

7.7 Input the number calculated in the Initial Offset Worksheet for the X axis offset amount and press OK. A check menu is displayed stating `Validate this data?`

NOTE **This number must be negative, to indicate negative stage movement.**

7.8 Press YES. The *Stage Adjustments Menu* is displayed.

8 Use the following steps to display the *X Axis Transfer Area Parameters Men* and input the X axis offset amount.

8.1 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

8.2 Press Y AXIS on the *All Axis Transfer Area Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

8.3 Press INITIAL OFFSET AMOUNT on the *Y Axis Transfer Area Parameters Menu*. A numeric keypad is displayed.

8.4 Input the number calculated in the Initial Offset Worksheet for the Y axis offset amount and press OK. A check menu is displayed stating `Validate this data?`

NOTE **This number must be negative, to indicate negative stage movement.**

8.5 Press YES. The *Stage Adjustments Menu* is displayed.

9 Use the following steps to initialize the stage and verify the new initial offset value.

9.1 Press *Previous Menu*.

9.2 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*.

9.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed with the message `Execute initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

9.4 Press PREVIOUS MENU on the *Basic Functions Menu*.

9.5 Press SPECIFIED POSITION on the *Stage Adjustment Menu*.

9.6 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. A check menu is displayed with the message `Stage/bridge moves.` Press YES. The *Stage Control Menu* is displayed.

9.7 Check that the camera image is in the micro field view. If necessary, press CHANGE FIELD to change the view.

9.8 Check the following points of inspection:

- The crosshairs should be positioned over the center of the chuck top (the center of the black hole).
- The X coordinate value is between 176700 and 177300 µm.
- The Y coordinate value is between 210700 and 211300 µm.

If any of the values is not within the specification, repeat the procedure up to this point to correct the values.

NOTE **If the crosshairs are not positioned over the chuck top, use the arrow buttons to adjust the position. If the new position is within 50 µm of the previous position, it is not necessary to repeat the procedure.**

10 Use the following steps to save the initial offset amounts to the system information.

10.1 Press OK on the *Stage Control Menu*. A check menu is displayed stating `Return BRIDGE, TARGET, PLSHR, LAMP.` Press YES.

10.2 Press PREVIOUS MENUon the *Specified Stage Position Menu*.

10.3 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating `Save SYS Information?`

10.4 Press YES on the check menu. The initial offset amounts are saved to the system information.

6.17 Checking the X Axis Initial Sensor Position 1414.2

Introduction

Purpose:

To check the X axis initial sensor position.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

Prerequisite Skills:

Tokyo Electron's P-12XL Operations and Maintenance training course.

Any local test floor required training for dealing with the hazards identified in this procedure.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *X Axis Transfer Area Parameters Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

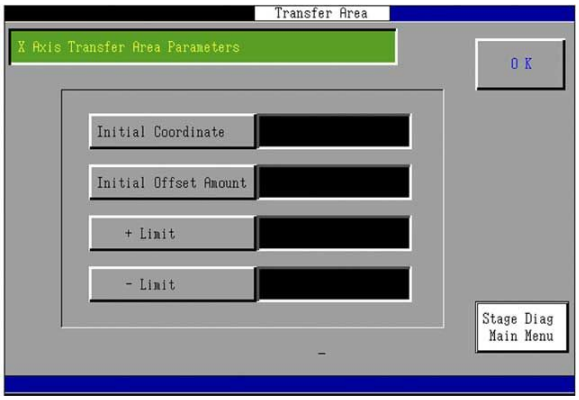
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

2.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

2.7 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

X Axis Transfer Area Parameters Menu



3 Record the `Initial Offset Amount` displayed on the touch screen.

4 Use the following steps to set the initial offset amount to 0.

4.1 Press `Initial Offset Amount` on the *X Axis Transfer Area Menu*. A numeric keypad is displayed.

4.2 Input 0 on the numeric keypad. Press OK. The *X Axis Transfer Area Parameters Menu* is displayed. Press STAGE DIAG MAIN MENU. A check menu stating `Validate this data?` is displayed. Press YES. The *All Axis Parameters Menu* is displayed.

5 Use the following steps to initialize the stage.

5.1 Press BASIC FUNCTIONS *Stage Parameters Menu*.

5.2 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The X axis moves to its initial position.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

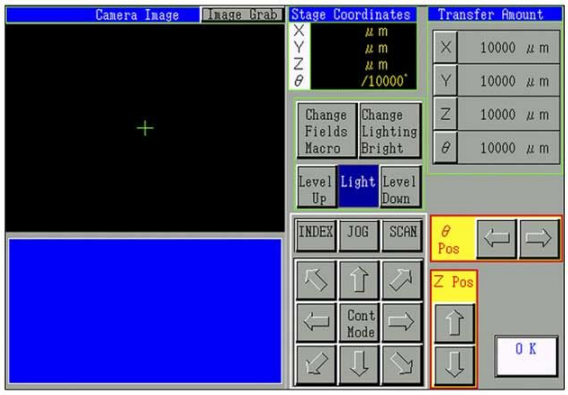
6 Use the following steps to access the *Stage Control Menu*.

6.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

6.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

6.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



7 Use the arrow buttons to move the X axis to 1700 µm.

8 Use the following steps to display the *Stage Sensors Check Menu*.

8.1 Press OK on the *Stage Control Menu*.

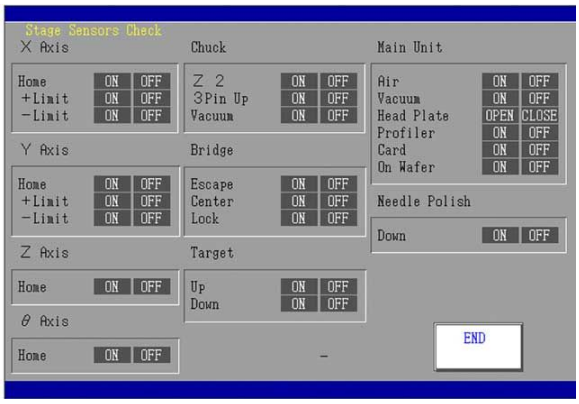
8.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

8.3 Press STAGE OPTIONS on the *Stage Adjustment Menu*.

8.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

8.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensors Check Menu* is displayed.

▼ **Stage Sensors Check Menu**



9 Under `X Axis`, check that the `Home` sensor is ON.

10 Use the following steps to display the *Stage Control Menu*.

10.1 Press END on the *Stage Sensors Check Menu*.

10.2 Press STAGE DIAG MAIN MENU on the *Option Control Menu*.

10.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

10.4 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

11 Set the X axis transfer amount to 100 µm

12 Use the arrow buttons to move the stage in the positive direction until the X axis coordinate is 2300 µm.

13 Use the following steps to display the *Stage Sensors Check Menu*.

13.1 Press OK on the *Stage Control Menu*.

13.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

13.3 Press STAGE OPTIONS on the *Stage Adjustment Menu*.

13.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

13.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensors Check Menu* is displayed.

14 Under `X Axis`, check that the `Home` sensor is OFF.

15 Use the following steps to display the *X Axis Transfer Area Menu*.

15.1 Press END on the *Stage Sensor Check Menu*.

15.2 Press STAGE DIAG MAIN MENU on the *Stage Options Menu*.

15.3 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

15.4 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

15.5 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Menu* is displayed.

16 Input the `Initial Offset Amount` value you recorded in step 3 to restore the original setting.

17 Press STAGE DIAG MAIN MENU. A check menu is displayed with the message `Validate this data?` Press YES.

18 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

19 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The X axis moves to its initial position.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

20 Use the following steps to save the SYS information.

20.1 Press PREVIOUS MENU on the *Stage Functions Menu*. The *Stage Adjustment Menu* is displayed.

20.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed asking, `Save SYS information?` Press YES. The SYS information is saved.

6.18 Adjusting the X Axis Initial Sensor Position 1415.2

Introduction

Purpose:

To adjust the X axis initial sensor position.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

WARNING Mechanical Hazard
The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION Mechanical Hazard
When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

2 Disable the head plate interlock.

3 Close the head plate.

4 Release the lockout and tagout, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION Property Damage Hazard
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

5 Use the following steps to access the *X Axis Transfer Area Parameters Menu*.

5.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

5.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

5.3 Input your password on the numeric keypad and press INPUT.

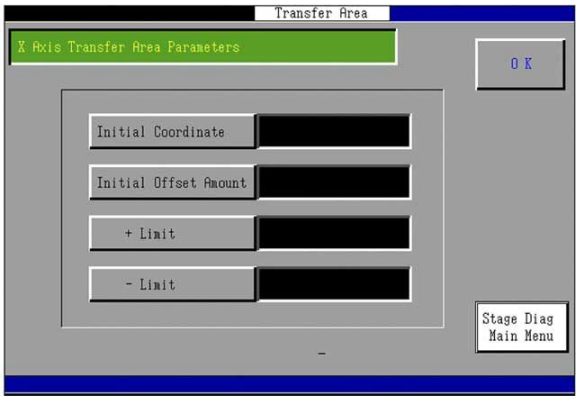
5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

5.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

5.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

5.7 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

X Axis Transfer Area Parameters Menu



6 Record the `Initial Offset Amount` displayed on the touch screen.

7 Use the following steps to set the initial offset amount to 0.

7.1 Press `Initial Offset Amount` on the *X Axis Transfer Area Menu*. A numeric keypad is displayed.

7.2 Input 0 on the numeric keypad. Press OK. The *X Axis Transfer Area Parameters Menu* is displayed. Press STAGE DIAG MAIN MENU. A check menu stating `Validate this data?` is displayed. Press YES. The *All Axis Parameters Menu* is displayed.

8 Use the following steps to initialize the stage.

8.1 Press BASIC FUNCTIONS *Stage Parameters Menu*.

8.2 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The X axis moves to its initial position.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

9 Use the following steps to move the stage to the probing center.

9.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

9.2 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*.

9.3 Press PROBING CENTER POSITION on the *Specified Stage Position Transfer Menu*. A check menu is displayed stating, `Transfer Stage?` Check for any interference with the stage; if there is none, press YES.

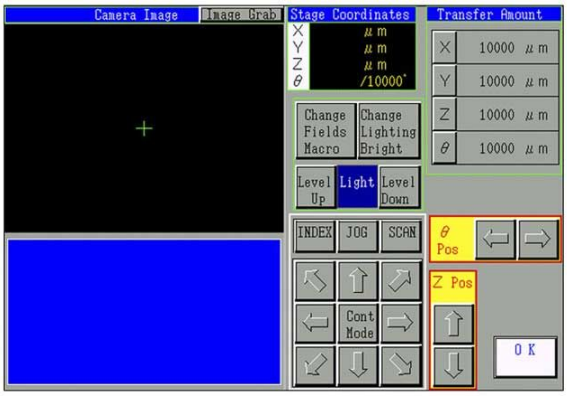
10 Use the following steps to access the *Stage Control Menu*.

10.1 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

10.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

10.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

Stage Control Menu



11 Select SCAN and move the stage to 2000 µm.

12 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

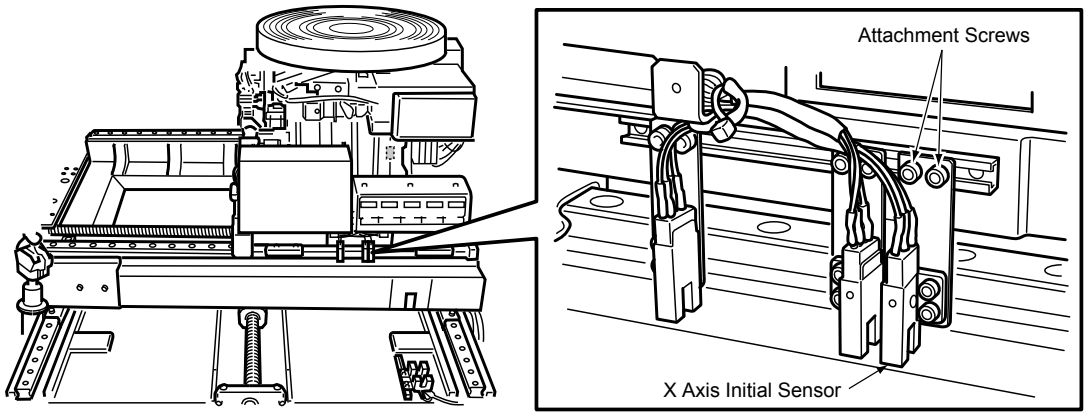
> **⚠ CAUTION** **Mechanical Hazard**
> **Be sure to always exit to a passive screen before working inside the prober to avoid accidental stage movement and injury to personnel. A passive screen does not contain any buttons that can operate the prober.**

13 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.**

14 Loosen the attachment screws on the attachment bracket of the X axis initial sensor.

X Axis Initial Sensor Attachment Bracket and Screws



15 Move the bracket until the X axis initial sensor LED switches from ON to OFF.

16 Tighten the attachment bracket screws.

17 Press XYZθ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

18 Use the arrow buttons to move the stage back and forth and check that the X axis initial sensor LED switches states between 1700 and 2300 µm.

19 Use the following steps to display the *X Axis Transfer Area Parameters Menu*.

19.1 Press OK on the *Stage Control Menu*.

19.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

19.3 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

19.4 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

19.5 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

20 Input the initial offset amount you recorded in step 6 to restore the original setting.

21 Press STAGE DIAG MAIN MENU on the *X Axis Transfer Area Parameters Menu*. A check menu is displayed stating, `Do you want to validate this data?` Press YES.

22 Press BASIC FUNCTIONS *Stage Parameters Menu*.

23 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

24 Use the following steps to move the chuck top and the alignment bridge.

24.1 Press PREVIOUS MENU on the *Basic Functions Menu*.

24.2 Press SPECIFIED POSITION on the *Stage Adjustment Menu*.

24.3 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. The chuck top and the alignment bridge move to the alignment center position and the *Stage Control Menu* is displayed.

25 Check that the camera image is in the micro field view. If necessary, press CHANGE FIELD to change the view.

26 Use the camera image to align the crosshairs over the center of the chuck top (marked by a black hole). This verifies that the chuck top surface is in focus. Check that the X, Y and Z coordinates are within the following specifications.

- X axis: 176700 to 177300 µm
- Y axis: 210700 to 211300 µm
- Z axis: 3800 to 4200 µm

If any of the values is out of specification, contact TEL Field Service Support.

27 Press CANCEL on the *Stage Control Menu*. A check menu is displayed stating `Return BRIDGE, TARGET, PLSHR, LAMP.` Press YES.

28 Press PREVIOUS MENUon the *Specified Stage Position Menu*.

29 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating `Save SYS Information?`

30 Press NO on the check menu.

31 Enable the head plate interlock, then close the head plate.

6.19 Checking the Y Axis Initial Sensor Position 1416.2

Introduction

Purpose:

To check the Y axis initial sensor position.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Y Axis Transfer Area Parameters Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

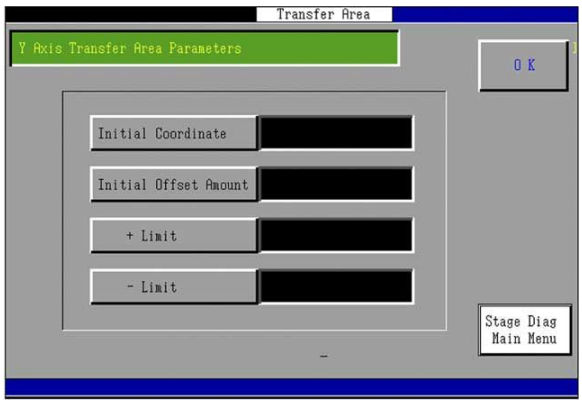
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

2.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

2.7 Press Y AXIS on the *Select Axis Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

▼ **Y Axis Transfer Area Parameters Menu**



3 Record the `Initial Offset Amount` displayed on the touch screen.

4 Use the following steps to set the initial offset amount to 0.

4.1 Press `Initial Offset Amount` on the *Y Axis Transfer Area Menu*. A numeric keypad is displayed.

4.2 Input 0 on the numeric keypad. Press OK. The *Y Axis Transfer Area Parameters Menu* is displayed. Press STAGE DIAG MAIN MENU. A check menu stating `Validate this data?` is displayed. Press YES.

5 Use the following steps to initialize the stage.

5.1 Press BASIC FUNCTIONS on the *Stage Parameters Menu*.

5.2 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The stage is initialized

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

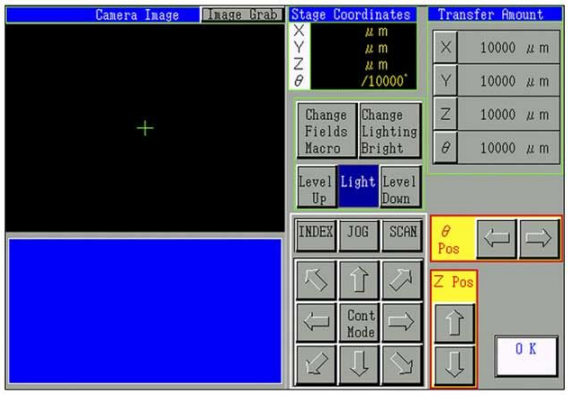
6 Use the following steps to access the *Stage Control Menu*.

6.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

6.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

6.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



7 Use the arrow buttons to move the Y axis to 1700 µm.

8 Use the following steps to display the *Stage Sensors Check Menu*.

8.1 Press OK on the *Stage Control Menu*.

8.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

8.3 Press STAGE OPTIONS on the *Stage Adjustment Menu*.

8.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

8.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensors Check Menu* is displayed.

▼ **Stage Sensors Check Menu**

9 Under `Y Axis`, check that the `Home` sensor is ON.

10 Use the following steps to display the *Stage Control Menu*.

10.1 Press END on the *Stage Sensors Check Menu*.

10.2 Press STAGE DIAG MAIN MENU on the *Option Control Menu*.

10.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

10.4 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

11 Set the Y axis transfer amount to 100 µm

12 Use the arrow buttons to move the stage in the positive direction until the Y axis coordinate is 2300 µm.

13 Use the following steps to display the *Stage Sensors Check Menu*.

13.1 Press OK on the *Stage Control Menu*.

13.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

13.3 Press STAGE OPTIONS on the *Stage Adjustment Menu*.

13.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

13.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensors Check Menu* is displayed.

14 Under `Y Axis`, check that the `Home` sensor is OFF.

15 Use the following steps to display the *Y Axis Transfer Area Menu*.

15.1 Press END on the *Stage Sensor Check Menu*.

15.2 Press STAGE DIAG MAIN MENU on the *Stage Options Menu*.

15.3 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

15.4 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

15.5 Press Y AXIS on the *Select Axis Menu*. The *Y Axis Transfer Area Menu* is displayed.

16 Input the `Initial Offset Amount` value you recorded in step 3 to restore the original setting.

17 Press STAGE DIAG MAIN MENU. A check menu is displayed with the message `Validate this data?` Press YES.

18 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

19 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

20 Use the following steps to save the SYS information.

20.1 Press PREVIOUS MENU on the *Stage Functions Menu*. The *Stage Adjustment Menu* is displayed.

20.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed asking, `Save SYS information?` Press YES. The SYS information is saved.

6.20 Adjusting the Y Axis Initial Sensor Positions 1417.2

Introduction

Purpose:

To adjust the Y axis initial sensor position.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Hexagonal wrench Screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Y Axis Transfer Area Parameters Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

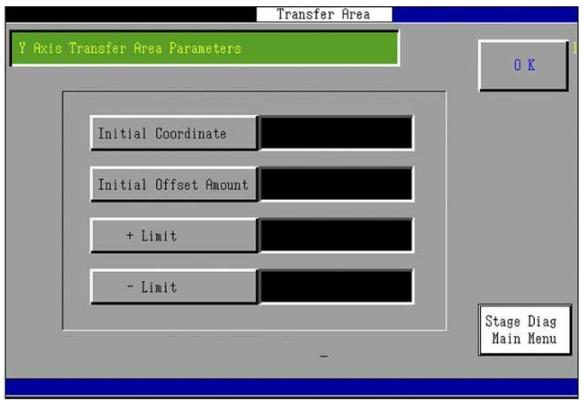
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

2.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

2.7 Press Y AXIS on the *Select Axis Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

▼ **Y Axis Transfer Area Parameters Menu**



3 Record the `Initial Offset Amount` displayed on the touch screen.

4 Use the following steps to set the initial offset amount to 0.

4.1 Press `Initial Offset Amount` on the *Y Axis Transfer Area Menu*. A numeric keypad is displayed.

4.2 Input 0 on the numeric keypad. Press OK. The *Y Axis Transfer Area Parameters Menu* is displayed. Press STAGE DIAG MAIN MENU. A check menu stating `Validate this data?` is displayed. Press YES. The *All Axis Parameters Menu* is displayed.

5 Use the following steps to initialize the stage.

5.1 Press BASIC FUNCTIONS *Stage Parameters Menu*.

5.2 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

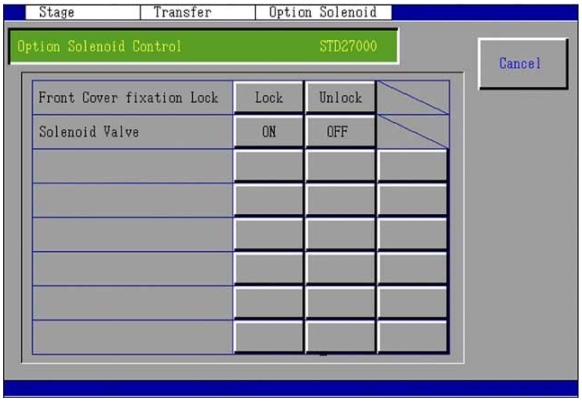
6 Use the following steps to open the SACC cover and lift the SACC tray.

6.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

6.2 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

6.3 Press OPTION SOLENOID DRIVE on the *All Axis Transfer Menu*. The *Option Solenoid Control Menu* is displayed.

▼ **Option Solenoid Control Menu**



6.4 For the `Front Cover Fixable Lock`, press UNLOCK. The SACC cover lock is released.

6.5 Open the SACC cover.

6.6 Lift the SACC tray up until it is locked.

6.7 With the tray in the up position, push the tray lock lever in the direction of the lock until the red label is completely hidden.

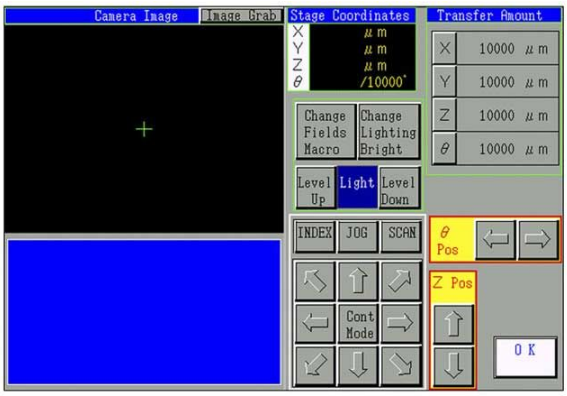
> **⚠ CAUTION** **Mechanical Hazard**
> **After lifting the SACC tray, be sure that the tray lock lever is completely locked before releasing the SACC tray.**

7 Use the following steps to access the *Stage Control Menu*.

7.1 Press CANCEL on the *Option Solenoid Control Menu*.

7.2 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



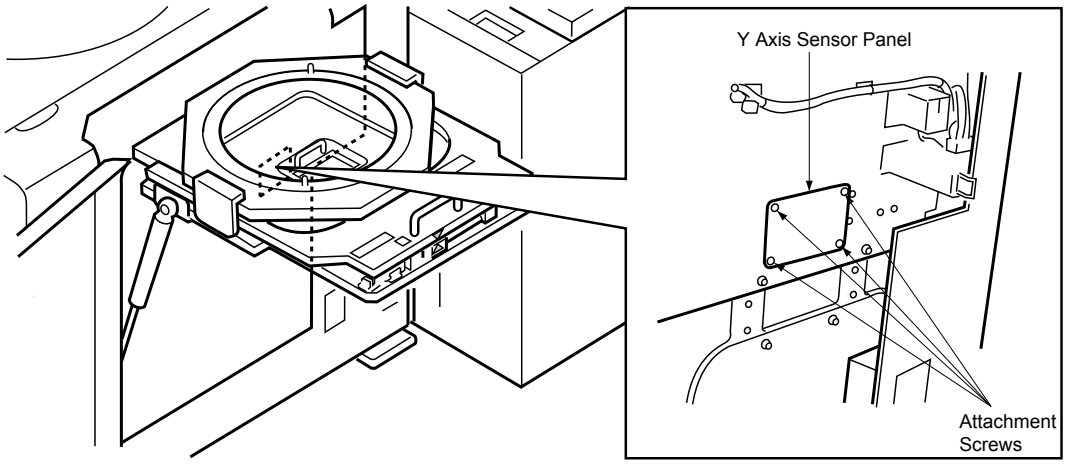
8 Select SCAN and move the stage until the Y axis coordinate is 2,000 µm.

9 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **CAUTION** **Mechanical Hazard**
> **Be sure to always exit to a passive screen before working inside the prober to avoid accidental stage movement and injury to personnel. A passive screen does not contain any buttons that can operate the prober.**

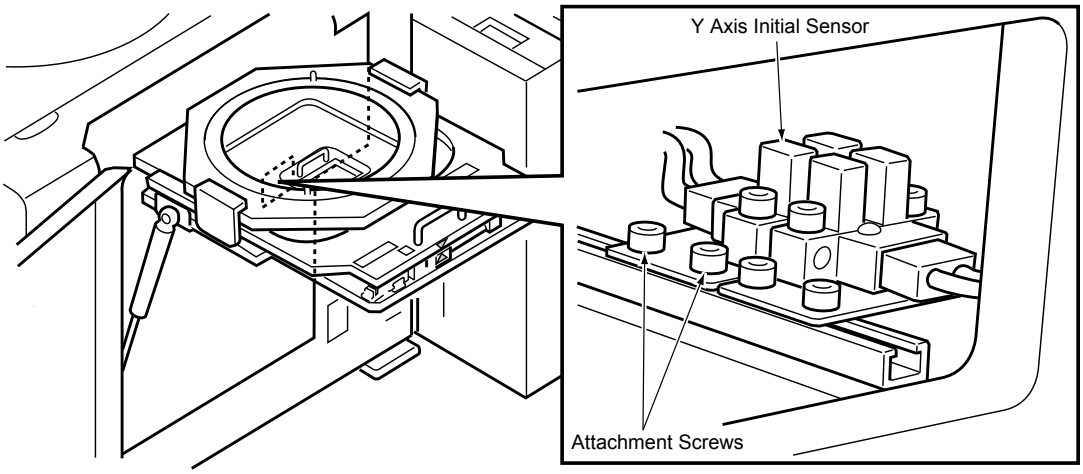
10 Remove the Y axis sensor panel.

Y Axis Sensor Panel



11 Loosen the attachment screws on the attachment bracket of the Y axis initial sensor.

Y Axis Initial Sensor Attachment Bracket and Screws



12 Move the bracket until the Y axis initial sensor LED switches from ON to OFF.

13 Tighten the attachment bracket screws.

14 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

15 Use the arrow buttons to move the stage back and forth and check that the Y axis initial sensor LED switches states between 1700 and 2300 µm.

16 Reattach the Y axis sensor panel.

17 While grasping the handles, release the SACC tray lock lever and lower the SACC to its stored position.

18 Press OK on the *Stage Control Menu*.

19 Press OPTION SOLENOID DRIVE on the *All Axis Transfer Menu*. The *Option Solenoid Control Menu* is displayed.

20 Close the SACC cover.

21 Press LOCK on the *Option Solenoid Control Menu*. The SACC cover is locked.

22 Press CANCEL on the *Option Solenoid Control Menu*.

23 Use the following steps to display the *Y Axis Transfer Area Parameters Menu*.

23.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

23.2 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

23.3 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

23.4 Press Y AXIS on the *Select Axis Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

24 Input the initial offset amount you recorded in step 3 to restore the original setting.

25 Press STAGE DIAG MAIN MENU on the *Y Axis Transfer Area Parameters Menu*. A check menu is displayed stating, `Do you want to validate this data?` Press YES.

26 Press BASIC FUNCTIONS *Stage Parameters Menu*.

27 Press INITIALIZE STAGE. A check menu is displayed with the message `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

28 Use the following steps to move the chuck top and the alignment bridge.

28.1 Press PREVIOUS MENU on the *Basic Functions Menu*.

28.2 Press SPECIFIED POSITION on the *Stage Adjustment Menu*.

28.3 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. The chuck top and the alignment bridge move to the alignment center position and the *Stage Control Menu* is displayed.

29 Check that the camera image is in the micro field view. If necessary, press CHANGE FIELD to change the view.

30 Use the camera image to align the crosshairs over the center of the chuck top (marked by a black hole). This verifies that the chuck top surface is in focus. Check that the X, Y and Z coordinates are within the following specifications.

- X axis: 176700 to 177300 µm
- Y axis: 210700 to 211300 µm
- Z axis: 3800 to 4200 µm

If any of the values is out of specification, contact TEL Field Service Support.

31 Press CANCEL on the *Stage Control Menu*. A check menu is displayed stating `Return BRIDGE, TARGET, PLSHR, LAMP.` Press YES.

32 Press PREVIOUS MENUon the *Specified Stage Position Menu*.

33 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating `Save SYS Information?`

34 Press NO on the check menu.

6.21 Checking the X Axis Limit Sensor Positions 1418.2

Introduction

Purpose:

To check the X axis limit sensor positions.

This procedure should be performed annually.

If the stage moves past the limit sensor, the ball screws will be damaged.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

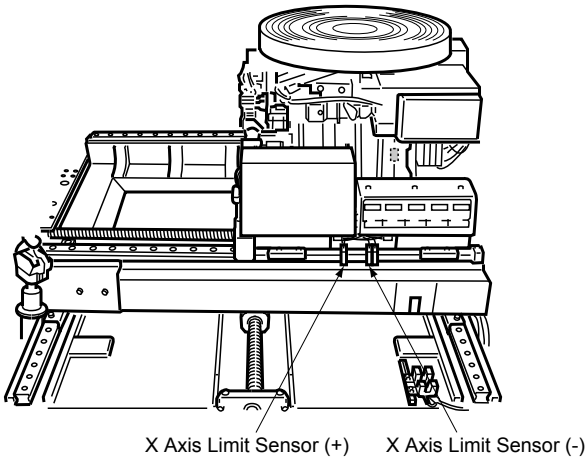
Prerequisite Skills:

Tokyo Electron's P-12XL Operations and Maintenance training course.

Any local test floor required training for dealing with the hazards identified in this procedure.

Overview:

X Axis Limit Sensors



Negative (–) Limit Spec	Positive (+) Limit Spec	Negative (–) Limit Setting	Positive (+) Limit Setting
-1300 to -700 µm	326,700 to 327,300 µm	-1500	327,500

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *X Axis Transfer Area Parameters Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT.

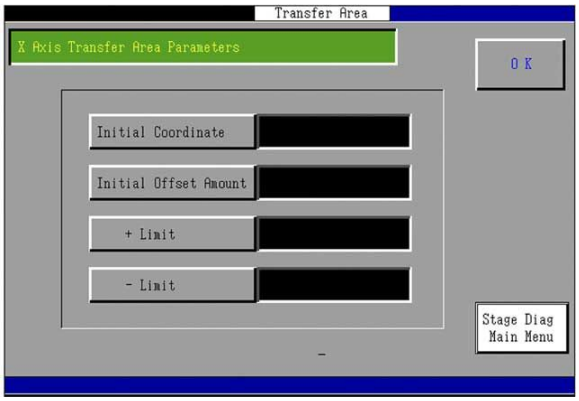
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*. The *Stage Parameters Menu* is displayed.

2.6 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

2.7 Press X AXIS on the *All Axis Transfer Area Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

▼ **X Axis Transfer Area Parameters Menu**



3 Use the following steps to change the software limits for the X axis.

3.1 Record the current values for the X axis `Positive (+) Limit` and `Negative (-) Limit`.

▼ **X Limit Values**

Positive (+) Limit	
Negative (–) Limit	

3.2 Set the X axis positive (+) limit to 327,500 µm.

3.3 Set the X axis negative (–) limit to -1500 µm.

3.4 Press OK on the *X Axis Transfer Area Parameters Menu*. A check menu is displayed stating `Validate this data?` Press YES to save the new settings.

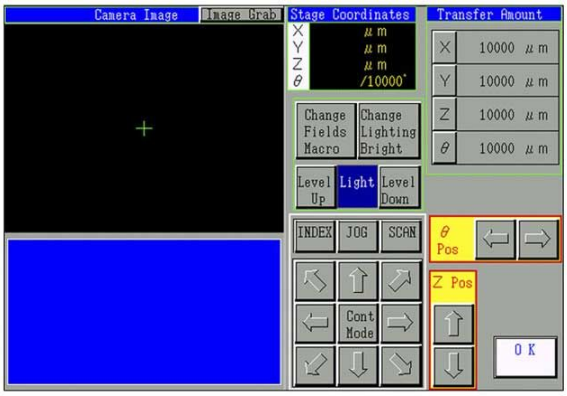
4 Use the following steps to check the position of the negative (–) X axis limit sensor.

4.1 Press PREVIOUS MENU.

4.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*. The *All Axis Transfer Menu* is displayed.

4.3 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



4.4 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

CAUTION **Property Damage Hazard**

Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.

4.5 Select SCAN mode and set the transfer amount to 100µm.

4.6 Use the X axis control arrows to move the stage to the right (negative direction) until it stops and an error message is displayed.

5 Verify that x axis coordinate is between -700 and -1,300 µm.

6 Use the following steps to check the sensor status.

6.1 Press FUNCTIONS on the *Error Message Menu*.

6.2 Press STAGE STATUS. The *Stage Status Menu* is displayed.

▼ **Stage Sensor Check Menu**

6.3 Under `X Axis`, check that the `- Limit` is `ON`.

7 Use the following steps to initialize the stage.

7.1 Press END on the *Stage Sensor Check Menu*. The *Error Functions Menu* is displayed.

7.2 Press PREVIOUS MENU on the *Error Functions Menu*. The *Error Menu* is displayed.

7.3 Press INITIALIZE on the *Error Menu*. The prober is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

8 Use the following steps to check the positive (+) X limit sensor.

8.1 Press XYZTHETA JOYSTICK TRANSFER.

8.2 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

> **CAUTION** **Property Damage Hazard**
> **Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.**

8.3 Use the X axis control arrows in the `INDEX` or `JOG` to move the stage to the 326000 µm position.

8.4 Select the SCAN mode and set the transfer amount to 100 µm.

8.5 Use the X axis control arrows to move the stage to the left until it stops and an error message is displayed.

8.6 Verify that this coordinate is between 326700 and 327300 µm.

9 Use the following steps to check the sensor status.

9.1 Press FUNCTIONS on the *Error Message Menu*.

9.2 Press STAGE STATUS. The *Stage Status Menu* is displayed.

10 Check that the `X Axis + Limit` is `ON`.

11 Use the following steps to initialize the stage.

11.1 Press END on the *Stage Sensor Check Menu*. The *Error Functions Menu* is displayed.

11.2 Press PREVIOUS MENU on the *Error Functions Menu*. The *Error Menu* is displayed.

11.3 Press INITIALIZE on the *Error Menu*. The prober is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

12 Use the following steps to display the *X Axis Transfer Area Parameters Menu*.

12.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

12.2 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

12.3 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

12.4 Press X AXIS on the *All Axis Transfer Area Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

13 Use the following steps to set the X axis software limits.

13.1 Press + LIMIT, input 326000 on the numeric keypad and press OK.

13.2 Press - LIMIT, input 0 on the numeric keypad and press OK.

14 Press STAGE DIAG MAIN MENU on the *X Axis Transfer Area Parameter Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

15 Use the following steps to initialize the stage.

15.1 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*. The *Basic Functions Menu* is displayed.

15.2 Press INITIALIZE STAGE on the *Basic Functions Menu*. A check menu is displayed stating `Execute initial?` Press YES. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

16 Use the following steps to save the X axis limits to the system information.

16.1 Press PREVIOUS MENU on the *Basic Functions Menu*. The *Stage Adjustment Menu* is displayed.

16.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating, `Save SYS Information?` Press YES. The X axis software limits are saved.

6.22 Adjusting the X Axis Limit Sensor Positions 1420.2

Introduction

Purpose:

To adjust the X axis limit sensor position.

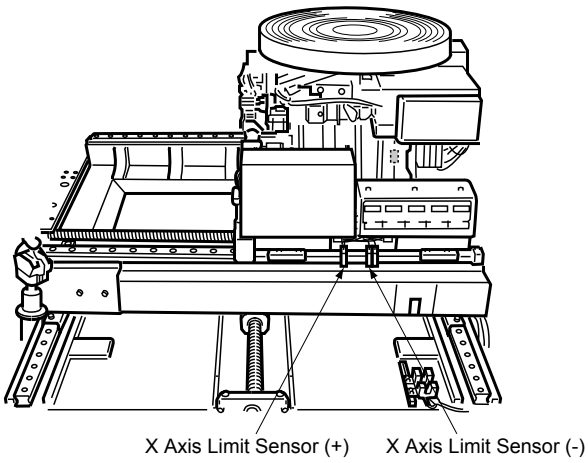
If the stage moves past the limit sensor, the ball screws will be damaged.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

Overview:

X Axis Limit Sensors



Negative (–) Limit Spec	Positive (+) Limit Spec	Temporary Negative (–) Limit Setting	Temporary Positive (+) Limit Setting
-1300 to -700 µm	326,700 to 327,300 µm	-1500	327,500

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **CAUTION** **Mechanical Hazard**
> **When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.**

2 Disable the head plate interlock.

3 Close the head plate.

4 Release the lockout and tagout, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

5 Use the following steps to access the *X Axis Transfer Area Parameters Menu*.

5.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

5.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

5.3 Input your password on the numeric keypad and press INPUT.

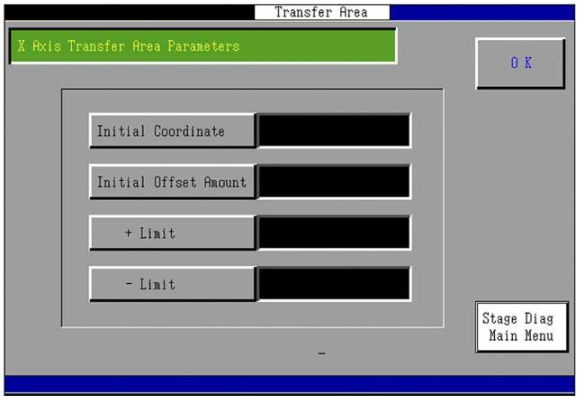
5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

5.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

5.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

5.7 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

▼ **X Axis Transfer Area Parameters Menu**



6 Use the following steps to change the software limits for the X axis.

6.1 Set the X axis positive (+) limit to 327,500µm.

6.2 Set the X axis negative (–) limit to -1500µm.

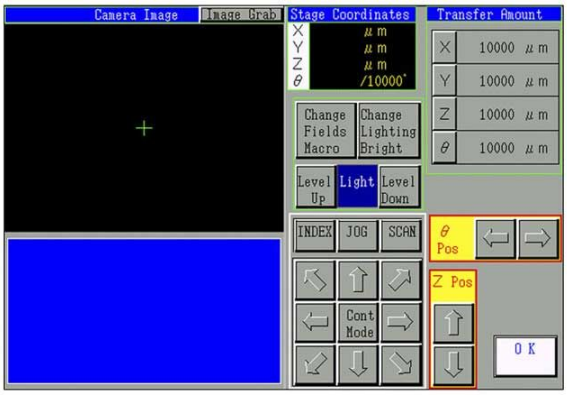
6.3 Press STAGE DIAG MAIN MENU. A check menu is displayed stating `Validate this data?` Press YES to save the new settings.

7 Use the following steps to display the *Stage Control Menu*.

7.1 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*. The *All Axis Transfer Menu* is displayed.

7.2 Press XYZθ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



8 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

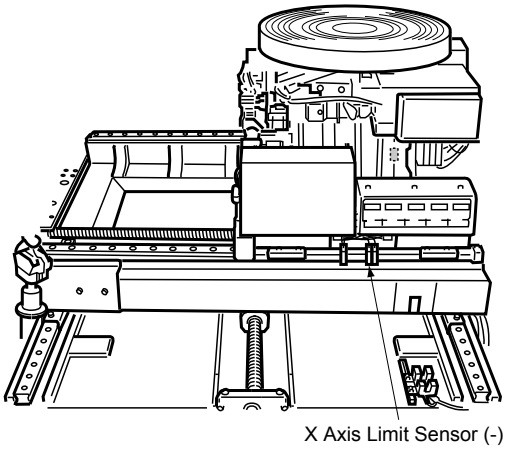
CAUTION **Property Damage Hazard**

Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.

9 Using the arrow control buttons, move the stage to a position where the negative (-) X axis limit sensor can be seen.

NOTE **Use steps 9 through 12 to adjust the negative (-) X axis limit sensor.**

▼ Negative (-) X Axis Limit Sensor



10 Use the following steps to adjust the -X limit sensor.

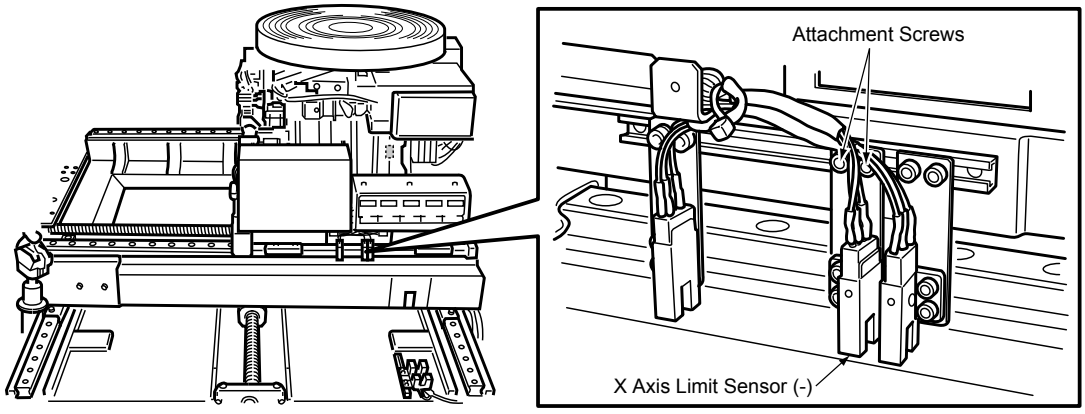
10.1 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

CAUTION **Mechanical Hazard**

Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.

10.2 Loosen the attachment bracket screws for the negative X axis limit sensor and move the sensor all the way to the left.

▼ Negative (-) X Limit Sensor



10.3 Tighten the screws enough so that the sensor will not move inadvertently.

10.4 Press XYZ⊙ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

10.5 Use the control buttons to move the stage to the right until the X coordinate position is -1,000 µm.

10.6 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.**

10.7 Loosen the attachment screws on the sensor bracket.

10.8 Move the bracket to the position where the negative X axis limit sensor LED toggles from ON to OFF.

10.9 Tighten the limit sensor attachment bracket screws securely.

11 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

12 Use the following steps to check the position of the negative X axis limit sensor.

12.1 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

> **CAUTION** **Property Damage Hazard**
> **Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.**

12.2 Select SCAN mode and set the transfer amount to 100 µm.

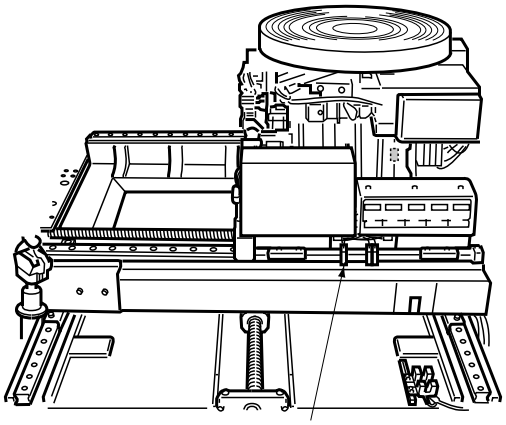
12.3 Use the arrow buttons to move the stage back and forth to check that the sensor changes states at a point on the X axis between -1300 and -700 µm

12.4 Press INITIALIZE on the error message menu and repeat steps 11–12.

13 Using the arrow control buttons, move the stage to a position where the positive (+) X axis limit sensor can be seen.

> **NOTE** **Use steps 13 through 16 to adjust the positive (+) X axis limit sensor.**

▼ Positive (+) X Axis Limit Sensor



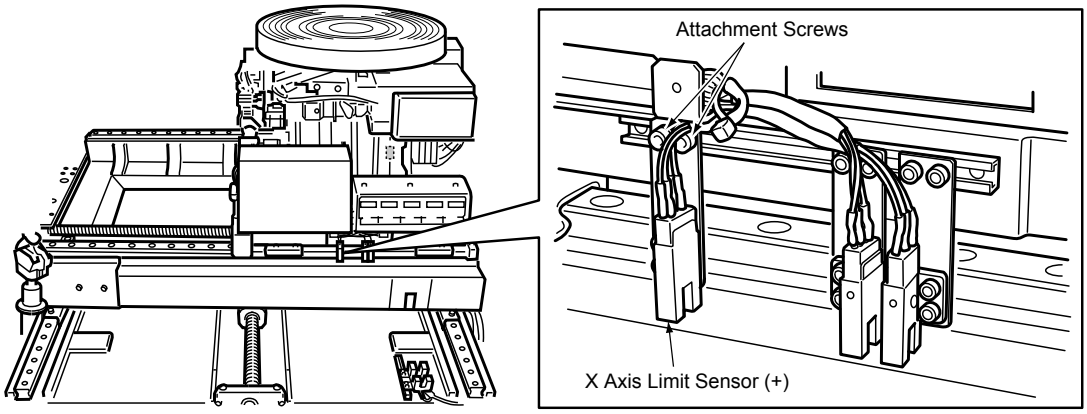
14 Use the following steps to adjust the +X limit sensor.

14.1 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.**

14.2 Loosen the attachment bracket screws for the + X axis limit sensor and move the sensor all the way to the right.

▼ Positive (+) X Limit Sensor



14.3 Tighten the screws enough so that the sensor will not move inadvertently.

14.4 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

14.5 Use the control buttons to move the stage to the left until the X coordinate position is 327,000 µm.

14.6 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.**

14.7 Loosen the attachment screws on the sensor bracket.

14.8 Move the bracket to the position where the positive X axis limit sensor LED toggles from ON to OFF.

14.9 Tighten the limit sensor attachment bracket screws securely.

15 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

16 Use the following steps to check the position of the positive X axis limit sensor.

16.1 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

CAUTION **Property Damage Hazard**

Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.

16.2 Select SCANmode and set the transfer amount to 100 µm.

16.3 Use the arrow buttons to move the stage to check that the sensor changes states at a point on the X axis between 326,700 and 327,300 µm

16.4 Press INITIALIZE on the error message menu and repeat steps 15–16.

17 Use the following steps to display the *X Axis Transfer Area Parameters Menu*.

17.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

17.2 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

17.3 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

17.4 Press X AXIS on the *Select Axis Menu*. The *X Axis Transfer Area Parameters Menu* is displayed.

18 Use the following steps to set the X axis software limits.

18.1 Press + LIMIT, input 326,000 on the numeric keypad and press OK.

18.2 Press - LIMIT, input 0 on the numeric keypad and press OK.

18.3 Press STAGE DIAG MAIN MENU on the *X Axis Transfer Area Parameter Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

19 Use the following steps to initialize the stage.

19.1 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*. The *Basic Functions Menu* is displayed.

19.2 Press INITIALIZE STAGE on the *Basic Functions Menu*. A check menu is displayed stating `Execute initial?` Press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

20 Use the following steps to save the X axis limits to the system information.

20.1 Press PREVIOUS MENU on the *Basic Functions Menu*. The *Stage Adjustment Menu* is displayed.

20.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating, `Save SYS Information?` Press YES. The X axis software limits are saved.

21 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.23 Checking the Y Axis Limit Sensor Positions 1421.2

Introduction

Purpose:

To check the Y axis limit sensor positions.

This procedure should be performed annually.

If the stage moves past the limit sensor, the ball screws will be damaged.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

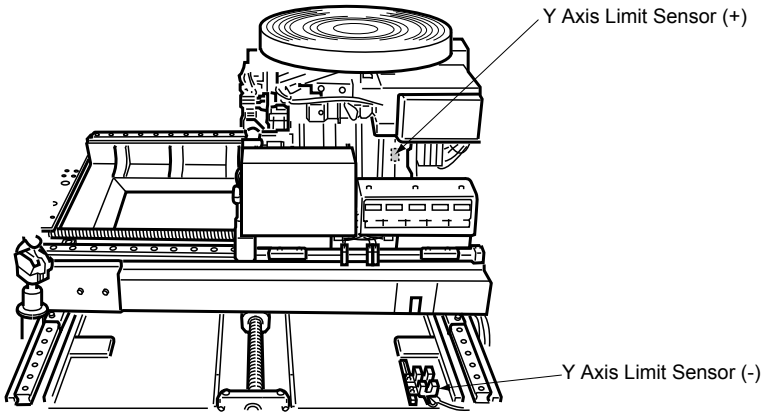
Prerequisite Skills:

Tokyo Electron's P-12XL Operation and Maintenance training course.

Any local test floor required training for dealing with the hazards identified in this procedure.

Overview:

Y Axis Limit Sensors



Negative (–) Limit Spec	Positive (+) Limit Spec	Negative (–) Limit Setting	Positive (+) Limit Setting
-1300 to -700 µm	445,700 to 446,300 µm	-1500	446,500

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Y Axis Transfer Area Parameters Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT.

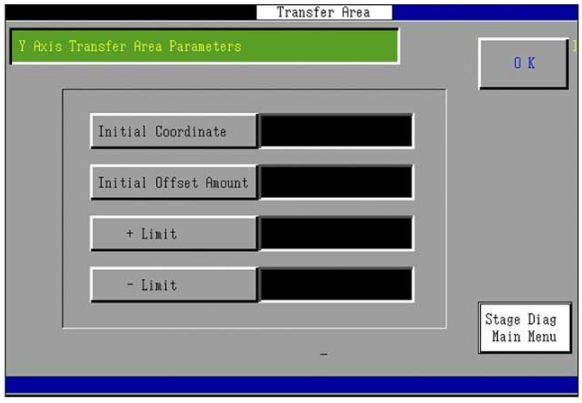
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*. The *Stage Parameters Menu* is displayed.

2.6 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

2.7 Press Y AXIS on the *All Axis Transfer Area Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

▼ **Y Axis Transfer Area Parameters Menu**



3 Use the following steps to change the software limits for the Y axis.

3.1 Record the current values for the Y axis `Positive (+) Limit` and `Negative (-) Limit`.

▼ **Y Limit Values**

Positive (+) Limit	
Negative (–) Limit	

3.2 Set the Y axis positive (+) limit to 446,500 µm.

3.3 Set the Y axis negative (–) limit to -1500 µm.

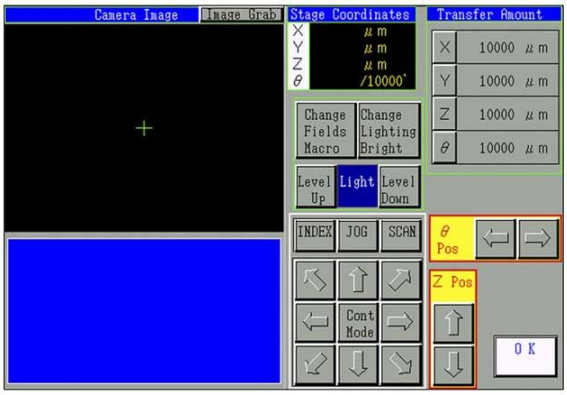
3.4 Press STAGE DIAG MAIN MENU. A check menu is displayed stating `Validate this data?` Press YES to save the new settings.

4 Use the following steps to check the position of the negative (–) Y axis limit sensor.

4.1 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*. The *All Axis Transfer Menu* is displayed.

4.2 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



4.3 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

CAUTION **Property Damage Hazard**

Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.

4.4 Select SCAN mode and set the Y axis transfer amount to 100µm.

4.5 Use the Y axis control arrows to move the stage towards the front (negative direction) until it stops and an error message is displayed.

5 Verify that Y axis coordinate is between -700 and -1,300 µm.

6 Use the following steps to check the sensor status.

6.1 Press FUNCTIONS on the *Error Message Menu*.

6.2 Press STAGE STATUS. The *Stage Status Menu* is displayed.

▼ **Stage Sensor Check Menu**

6.3 Under `Y Axis`, check that the `- Limit` is `ON`.

7 Use the following steps to initialize the stage.

7.1 Press END on the *Stage Sensor Check Menu*. The *Error Functions Menu* is displayed.

7.2 Press PREVIOUS MENU on the *Error Functions Menu*. The *Error Menu* is displayed.

7.3 Press INITIALIZE on the *Error Menu*. The prober is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

8 Use the following steps to check the positive (+) Y axis limit sensor.

8.1 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

> **CAUTION** **Property Damage Hazard**
> **Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.**

8.2 Use the Y axis control arrows in the `INDEX` or `JOG` to move the Y axis to the 445000 µm position.

8.3 Select the SCAN mode and set the transfer amount to 100µm.

8.4 Use the Y axis control arrows to move the stage to the rear until it stops and an error message is displayed.

8.5 Verify that this coordinate is between 445,700 and 446,300 µm.

9 Use the following steps to check the sensor status.

9.1 Press FUNCTIONS on the *Error Message Menu*.

9.2 Press STAGE STATUS. The *Stage Status Menu* is displayed.

10 Check that the `Y Axis + Limit` is `ON`.

11 Use the following steps to initialize the stage.

11.1 Press END on the *Stage Sensor Check Menu*. The *Error Functions Menu* is displayed.

11.2 Press PREVIOUS MENU on the *Error Functions Menu*. The *Error Menu* is displayed.

11.3 Press INITIALIZE on the *Error Menu*. The prober is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

12 Use the following steps to display the *Y Axis Transfer Area Parameters Menu*.

12.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

12.2 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

12.3 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

12.4 Press Y AXIS on the *All Axis Transfer Area Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

13 Use the following steps to set the Y axis software limits.

13.1 Press + LIMIT, input 445000 on the numeric keypad and press OK.

13.2 Press - LIMIT, input 0 on the numeric keypad and press OK.

14 Press STAGE DIAG MAIN MENU on the *Y Axis Transfer Area Parameter Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

15 Use the following steps to initialize the stage.

15.1 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*. The *Basic Functions Menu* is displayed.

15.2 Press INITIALIZE STAGE on the *Basic Functions Menu*. A check menu is displayed stating `Execute initial?` Press YES. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

16 Use the following steps to save the Y axis limits to the system information.

16.1 Press PREVIOUS MENU on the *Basic Functions Menu*. The *Stage Adjustment Menu* is displayed.

16.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating, `Save SYS Information?` Press YES. The Y axis software limits are saved.

6.24 Adjusting the Y Limit Sensor Positions 1422.2

Introduction

Purpose:

To adjust the Y axis limit sensor position.

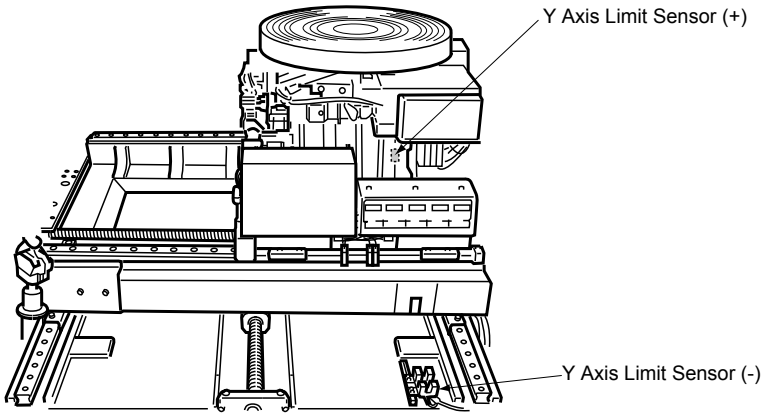
If the stage moves past the limit sensor, the ball screws will be damaged.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Overview:

Y Axis Limit Sensors



Negative (–) Limit Spec	Positive (+) Limit Spec	Temporary Negative (–) Limit Setting	Temporary Positive (+) Limit Setting
-1300 to -700 µm	445,700 to 446,300 µm	-1500	446,500

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.**

2 Disable the head plate interlock.

3 Close the head plate.

4 Release the lockout and tagout, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

5 Use the following steps to display the *Y Axis Transfer Area Parameters Menu*.

5.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

5.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

5.3 Input your password on the numeric keypad and press INPUT.

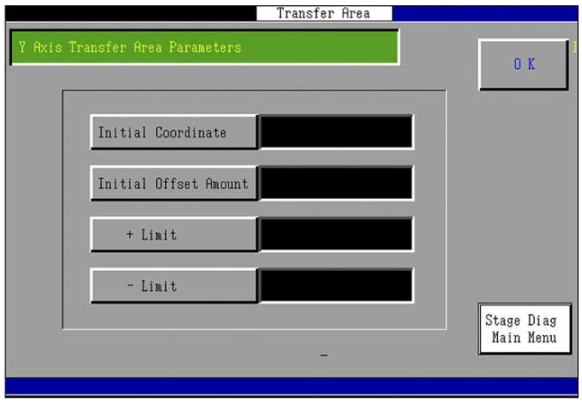
5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

5.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*. The *Stage Parameters Menu* is displayed.

5.6 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

5.7 Press Y AXIS on the *All Axis Transfer Area Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

▼ Y Axis Transfer Area Parameters Menu



6 Use the following steps to change the software limits for the Y axis.

6.1 Record the current values for the Y axis `Positive (+) Limit` and `Negative (–) Limit`.

▼ **Y Limit Values**

Positive (+) Limit	
Negative (–) Limit	

6.2 Set the Y axis positive (+) limit to 446,500µm.

6.3 Set the Y axis negative (–) limit to -1500µm.

6.4 Press OK. A check menu is displayed stating `Validate this data?` Press YES to save the new settings.

7 Use the following steps to open the SACC cover and lift the SACC tray.

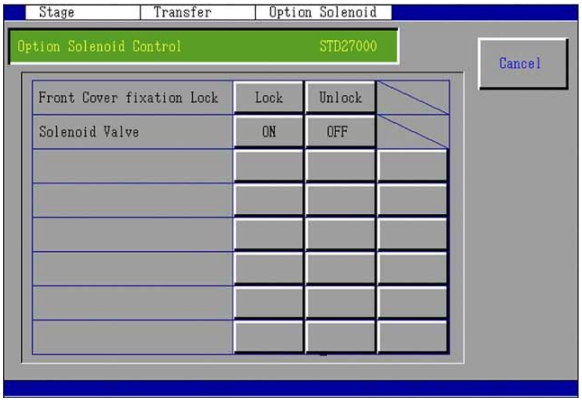
NOTE **Use steps 7 through 13 to adjust the negative Y axis limit sensor.**

7.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

7.2 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

7.3 Press OPTION SOLENOID DRIVE on the *All Axis Transfer Menu*. The *Option Solenoid Control Menu* is displayed.

▼ **Option Solenoid Control Menu**



7.4 For the `Front Cover Fixable Lock`, press UNLOCK. The SACC cover lock is released.

7.5 Open the SACC cover.

7.6 Lift the SACC tray up until it is locked.

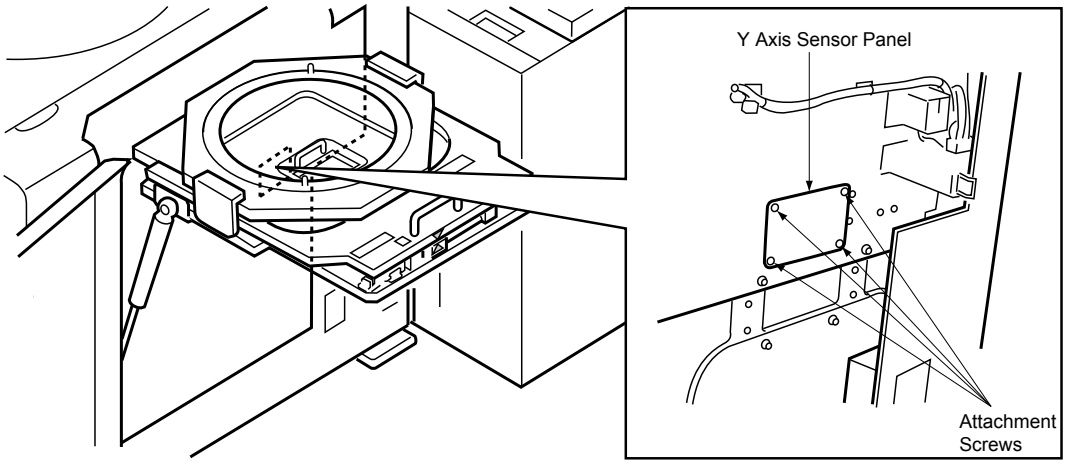
7.7 With the tray in the up position, push the tray lock lever in the direction of the lock until the red label is completely hidden.

⚠ CAUTION **Mechanical Hazard**

After lifting the SACC tray, be sure that the tray lock lever is completely locked before releasing the SACC tray.

8 Remove the Y axis sensor panel.

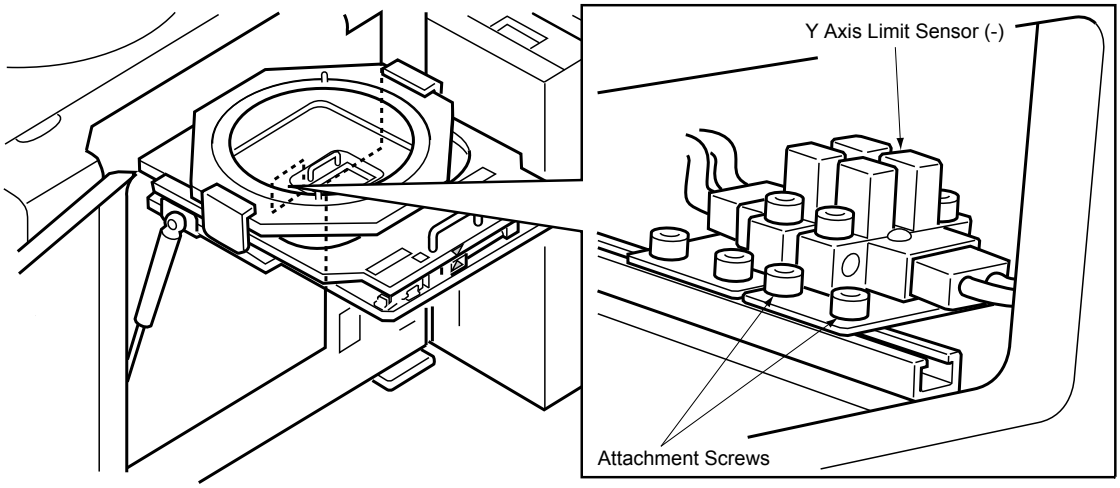
▼ Y Axis Sensor Panel



9 Use the following steps to adjust the (-) Y limit sensor.

9.1 Loosen the negative Y limit sensor attachment bracket screws and move the sensor forward as far as possible.

▼ (-) Y Limit Sensor Position

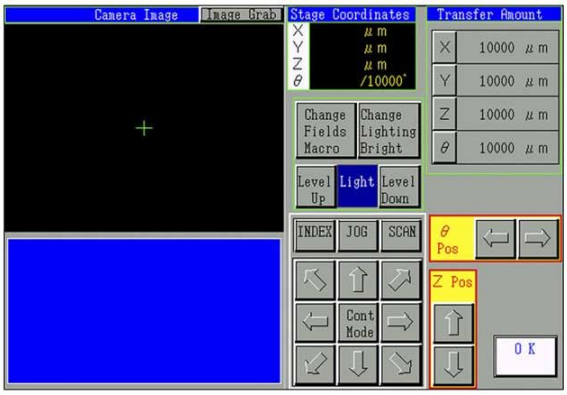


9.2 Securely tighten the limit sensor attachment bracket screws.

9.3 Press CANCEL on the *Option Solenoid Control Menu*.

9.4 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



9.5 Select the SCAN mode and set the transfer amount to 100μm.

9.6 Use the control buttons to move the stage to the front until the Y coordinate position is **-1,000** μm.

9.7 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober to perform maintenance. If you do not exit the *Stage Control Menu*, you can be injured by inadvertent use of the stage control buttons.**

9.8 Loosen the attachment screws.

9.9 Move the bracket to the position where the negative limit sensor LED toggles from ON to OFF.

9.10 Securely tighten the limit sensor attachment bracket screws.

10 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

11 Use the following steps to check the position of the negative Y axis limit sensor.

11.1 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

> **CAUTION** **Property Damage Hazard**
> **Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.**

11.2 Select SCAN mode and set the transfer amount to 100 μm.

11.3 Use the arrow buttons to move the stage back and forth to check that the sensor changes states at a point on the Y axis between -1300 and -700 μm

11.4 Press INITIALIZE on the error message menu and repeat steps 10–11.

12 Reattach the Y axis sensor panel.

13 Use the following steps to store the SACC tray and close the SACC cover.

13.1 While grasping the handles, release the SACC tray lock lever and lower the SACC to its stored position.

13.2 Press OPTION SOLENOID DRIVE on the *All Axis Transfer Menu*. The *Option Solenoid Control Menu* is displayed.

13.3 Close the SACC cover.

13.4 Press LOCK on the *Option Solenoid Control Menu*. The SACC cover is locked.

13.5 Press CANCEL on the *Option Solenoid Control Menu*.

14 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Property Damage Hazard**

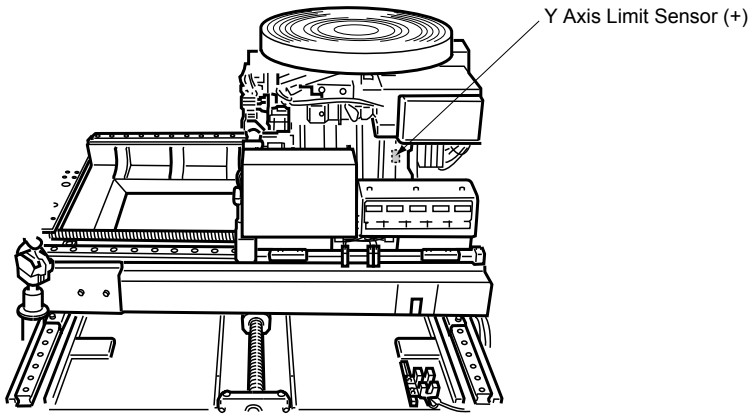
Pinch Hazard. When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

15 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

NOTE **Use steps 15 through 19 to adjust the positive (+) Y axis limit sensor.**

16 Using the arrow control buttons, move the stage to a position where the positive (+) Y axis limit sensor can be seen.

Positive (+) Y Axis Limit Sensor



17 Use the following steps to adjust the + Y limit sensor.

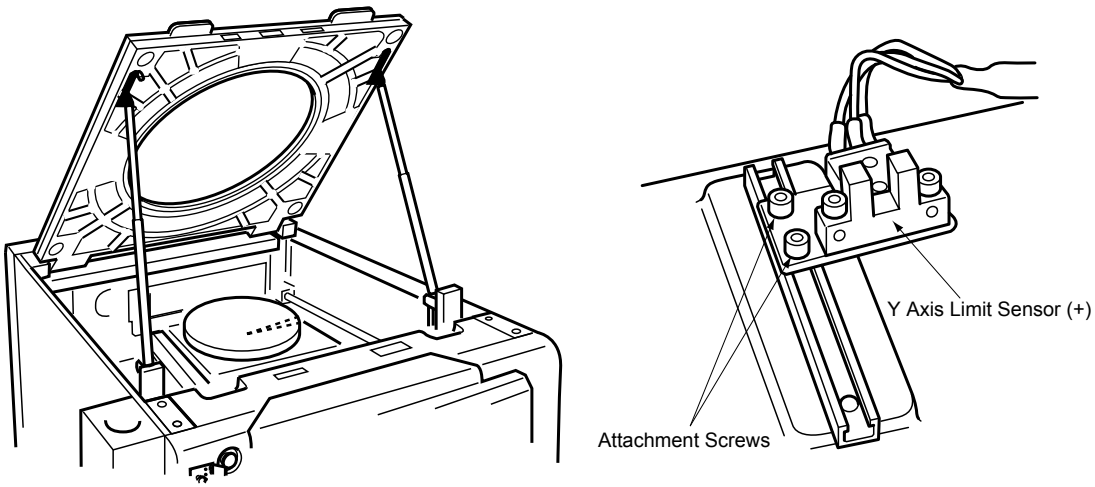
17.1 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

CAUTION **Mechanical Hazard**

Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.

17.2 Loosen the attachment bracket screws for the + Y axis limit sensor and move the sensor all the way to the rear.

▼ **Positive (+) Y Limit Sensor**



17.3 Tighten the screws enough so that the sensor will not move inadvertently.

17.4 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

17.5 Select the INDEXμm.

17.6 Use the control buttons to move the stage until the Y coordinate position is 446,000 μm.

17.7 Move the X axis to the 300,000 μm position.

17.8 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.**

17.9 Loosen the attachment screws on the sensor bracket.

17.10 Move the bracket to the position where the positive Y axis limit sensor LED toggles from ON to OFF.

17.11 Tighten the limit sensor attachment bracket screws securely.

18 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

19 Use the following steps to check the position of the positive Y axis limit sensor.

19.1 Check that the continuous move mode is off. If it is not, press CONT. MODE to toggle it off.

> **CAUTION** **Property Damage Hazard**
> **Do not use CONT. MODE when the ball screw is near the end of the stroke. The stage ball screw could be damaged by a collision between the stage frame and stopper.**

19.2 Select the SCAN mode and set the transfer amount to 100 μm.

19.3 Use the arrow buttons to move the stage to check that the sensor changes states at a point on the Y axis between 445,700 and 446,300 µm

19.4 Press INITIALIZE on the error message menu and repeat steps 18–19.

20 Use the following steps to display the *Y Axis Transfer Area Parameters Menu*.

20.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

20.2 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

20.3 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

20.4 Press Y AXIS on the *Select Axis Menu*. The *Y Axis Transfer Area Parameters Menu* is displayed.

21 Use the following steps to set the Y axis software limits.

21.1 Press + LIMIT, input 445,000 on the numeric keypad and press OK.

21.2 Press - LIMIT, input 0 on the numeric keypad and press OK.

22 Press STAGE DAIG MAIN MENU on the *Y Axis Transfer Area Parameter Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

23 Use the following steps to initialize the stage.

23.1 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*. The *Basic Functions Menu* is displayed.

23.2 Press INITIALIZE STAGE on the *Basic Functions Menu*. A check menu is displayed stating `Execute initial?` Press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

24 Use the following steps to save the Y axis limits to the system information.

24.1 Press PREVIOUS MENU on the *Basic Functions Menu*. The *Stage Adjustment Menu* is displayed.

24.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed stating, `Save SYS Information?` Press YES. The Y axis software limits are saved.

25 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.25 Setting the Z Initial Offset Amount 0831.2

Introduction

Purpose:

To correct the Z initial offset amount after you have adjusted the Z initial sensor.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Mylar sheet Ruler #2 Phillips-head screwdriver Hexagonal wrench
Parts or Consumables:	Z initial offset alignment fixture

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**

When opening the head plate, always ensure that the lock mechanism is fully engaged to avoid a possible pinch hazard to personnel.

2 Disable the head plate interlock

3 Close the head plate.

4 Release lockout and tagout, restore power and perform a system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

5 Use the following steps to display the *Z Axis Transfer Area Parameters Menu*.

5.1 Press DIAGNOSTICS on the *Main Menu*.

5.2 Press ADJUSTMENTS. A password menu is displayed.

5.3 Input your password on the numeric keypad and press INPUT.

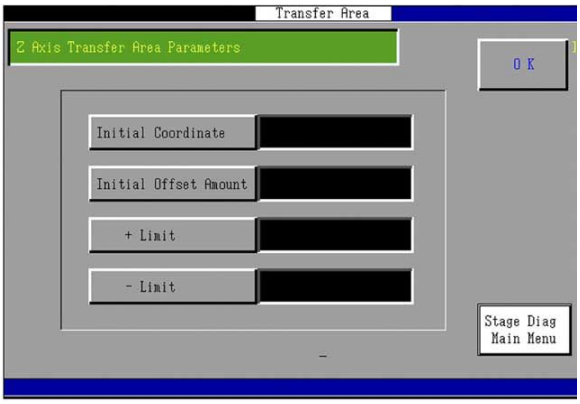
5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the prober.` Press OK.

5.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

5.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

5.7 Press Z AXIS on the *All Axis Transfer Area Menu* to display the *Z Axis Transfer Area Parameters Menu*.

Z Axis Transfer Area Parameters Menu



6 Use the following steps to set the initial coordinate ad initial offset amount to 0.

6.1 Record the initial offset amount and initial coordinate displayed on the menu.

6.2 Press INITIAL COORDINATE. Input 0 on the numeric keypad and press OK.

6.3 Press INITIAL OFFSET AMOUNT. Input 0 on the numeric keypad and press OK.

6.4 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

7 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

8 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

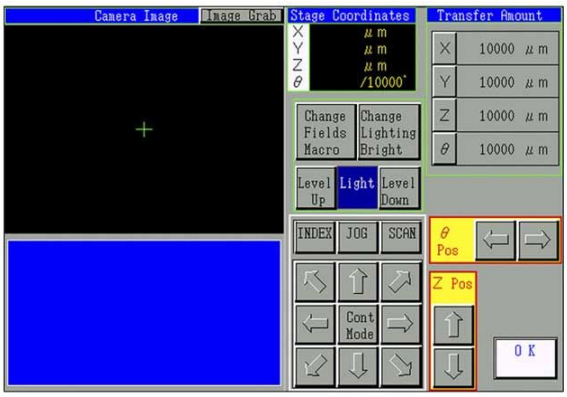
9 Use the following steps to move the stage unit.

9.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

9.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

9.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ Stage Control Menu



9.4 Using the arrow buttons on the *Stage Control Menu*, move the stage to the following coordinates:

X = 260,000 µm

Y = 260,000 µm.

9.5 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

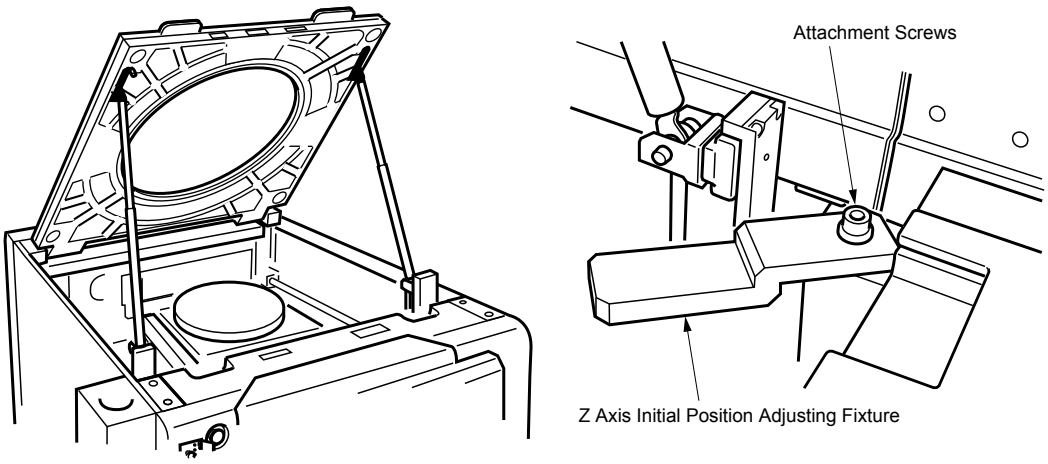
10 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard
When opening the head plate, always ensure that the lock mechanism is fully engaged to avoid a possible pinch hazard to personnel.

11 Attach the Z initial offset alignment fixture to the right side of the frame at the front of the stage.

NOTE If the WAPP interferes with the alignment fixture, attach the fixture to the rear of the stage.

▼ **Z Initial Offset Alignment Fixture**



12 Press XYZΘ JOYSTICK TRANSFER.

13 Use the arrow control buttons to elevate the Z axis to the 52,000 µm position. At this height, the stage should be at approximately the same height as the upper surface of the alignment fixture.

CAUTION **Property Damage Hazard**

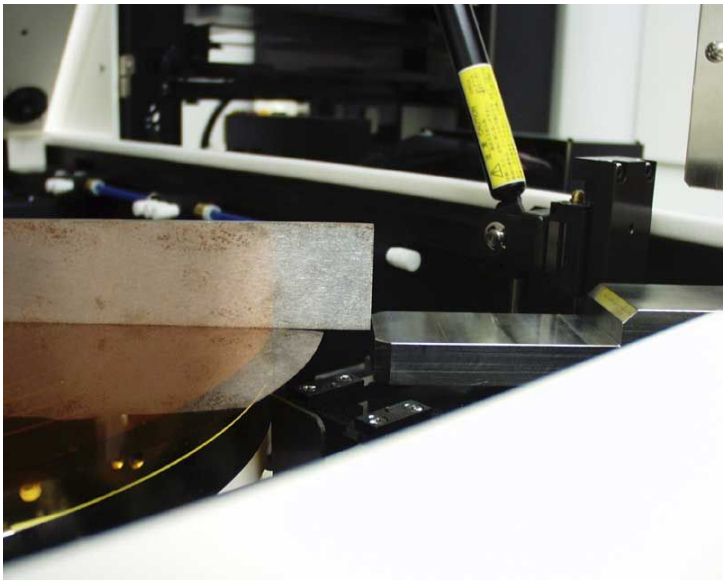
Check that there is no interference between the chuck top and the alignment fixture before moving the stage.

14 Move the stage in the X and Y directions until it is near the alignment fixture.

15 Cover the chuck top with the protective Mylar sheet.

16 Use the ruler to check the height difference between the surface of the chuck top and the upper surface of the alignment device.

▼ **Checking the Height Difference**



17 Use the following steps to adjust the chuck top height.

17.1 Select the SCAN mode and set the transfer amount for the Z axis to 100µm.

17.2 Use the Z axis control buttons to reposition the chuck top surface so that it is the same height as the surface of the alignment fixture.

17.3 Verify that the Z axis coordinate is between 51000 and 53000 µm when the surfaces are coplanar.

18 Press OK on the *Stage Control Menu*.

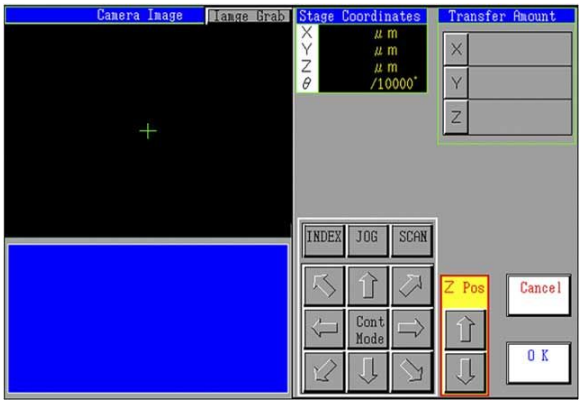
19 Use the following steps to display the *Z Initial Position Menu*.

19.1 Press PREVIOUS MENU.

19.2 Press AREA ADJUSTMENT on the *Stage Adjustment Menu*.

19.3 Press Z INITIAL POSITION on the *Area Adjustment Menu*. The *Z Initial Position Menu* is displayed.

▼ Z Initial Position Menu



20 Press OK on the *Z Initial Position Menu*. A check menu is displayed stating, `Do you want to validate this data?` Press YES. The Z initial offset is calculated and registered.

NOTE **The Z initial offset amount registered in this step is a temporary value. Use the following steps to set the correct offset amount.**

21 Use the following steps to display the *Z Axis Transfer Area Parameters Menu*.

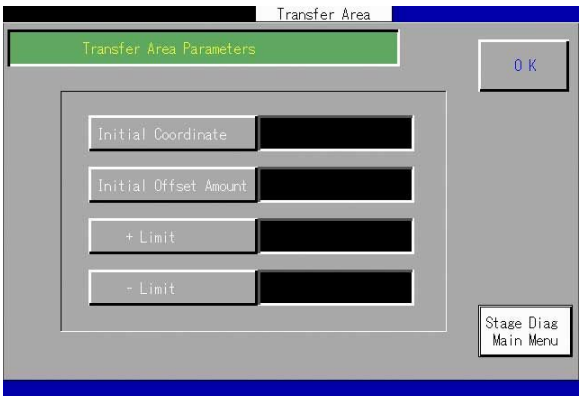
21.1 Press PREVIOUS MENU.

21.2 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

21.3 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

21.4 Press Z AXIS on the *All Axis Transfer Area Menu*. The *Z Axis Transfer Area Parameters Menu* is displayed.

Z Axis Transfer Area Parameters Menu



22 Verify that the initial offset amount is between -15000 and -17000 µm. Record the amount.

23 Press INITIAL COORDINATE. Using the numeric keypad, input 19000 and press OK.

24 Remove the Z initial offset alignment fixture and the Mylar sheet from the prober.

25 Use the following steps to initialize the stage.

25.1 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed stating, `Do you want to validate this data?` Press YES.

25.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

25.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

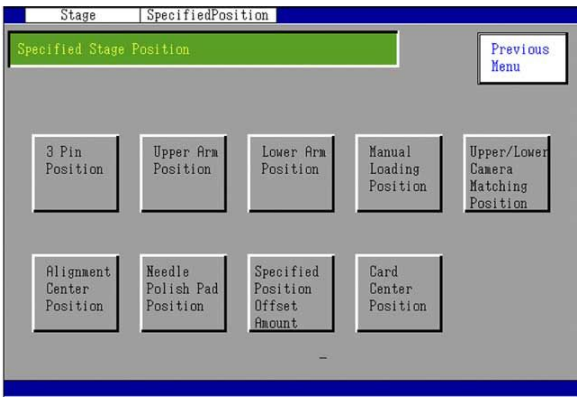
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

26 Use the following steps to move the chuck top and the alignment bridge.

26.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

26.2 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

Specified Stage Position Menu



26.3 Press ALIGNMENT CENTER POSITION. A message is displayed stating, `Stage and bridge will move.` Press YES. The chuck top and the alignment bridge move to the alignment position and the *Stage Control Menu* is displayed.

27 Verify that the camera image is set to the micro field. If necessary, change the field setting by pressing CHANGE FIELD.

28 Record the Z axis coordinate displayed on the *Stage Control Menu*.

29 Use the arrow buttons to raise and lower the chuck top until the camera image is in focus, then record the Z axis coordinate.

30 Use the following steps to display the *Z Axis Transfer Area Parameters Menu*.

30.1 Press CANCEL on the *Stage Control Menu*. A message is displayed. Press YES.

NOTE **Always press CANCEL to exit the *Stage Control Menu*. Press OK registers a false alignment center coordinate and may cause imprecise alignment.**

30.2 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

30.3 Press ALL AXIS PARAMETERS on the *Stage Adjustments Menu*.

30.4 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

30.5 Press Z AXIS on the *Select Axis Menu*. The *Z Axis Transfer Area Parameters Menu* is displayed.

31 Use the following steps to input the correct initial offset amount.

31.1 Use the following values to complete the equation:

Use the value recorded in step 28 for the value of Zo.

Use the value recorded in step 29 for the value of Zf.

Use the value recorded in step 22 (temporary initial offset amount) for the value of Zk.

Equation: Zf - Zo + (Zk) = Z axis initial offset amount

Example:

Zf = 4050

Zo = 3950

Zk = -15500

4050 - 3950 + (-15500) = -15400 (Z axis initial offset amount)

NOTE **The specified range of the Z axis initial offset amount is between -15000 and -17000 µm.**

31.2 Press INITIAL OFFSET. Using the numeric keypad, input the initial offset amount calculated in the previous step and press OK.

32 Use the following steps to initialize the stage.

32.1 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed stating, `Do you want to validate this data?` Press YES.

32.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

32.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

33 Use the following steps to move the chuck top and the alignment bridge.

33.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

33.2 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

33.3 Press ALIGNMENT CENTER POSITION. A message is displayed stating, `Stage and bridge will move.` Press YES. The chuck top and the alignment bridge move to the alignment position and the *Stage Control Menu* is displayed.

34 Verify that the camera image is set to the micro field. If necessary, change the field setting by pressing CHANGE FIELD.

35 Use the camera image to check that the chuck top is in focus and check that the Z axis coordinate is between 3800 and 4200 µm.

36 Use the following steps to save the Z axis initial offset amount to the SYS information.

36.1 Press CANCEL on the *Stage Control Menu*. A message is displayed. Press YES.

NOTE **Always press CANCEL to exit the *Stage Control Menu*. Press OK registers a false alignment center coordinate and may cause imprecise alignment.**

36.2 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

36.3 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS information?` Press YES. The Z initial offset amount is saved.

37 Enable the head plate interlock, then close the head plate.

⚠ WARNING Mechanical Hazard

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.26 Checking Z Initial and Z2 Sensor Position 0829.2

Introduction

Purpose:

To check the positions of the Z axis initial sensor and Z2 sensor so that initialization is performed correctly.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking Z Initial Sensor Position

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to transfer the stage to the probing center.

2.1 Press DIAGNOSTICS on the *Main Menu*.

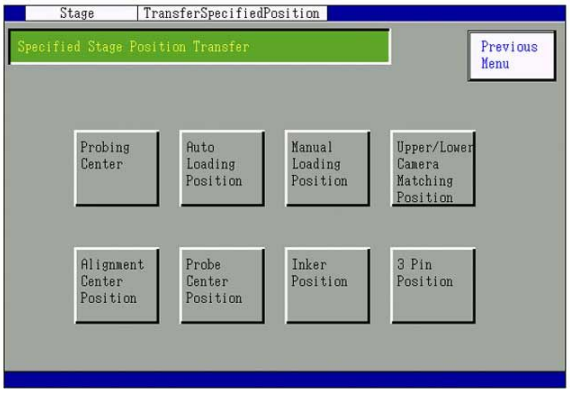
2.2 Press ADJUSTMENTS. A password menu is displayed.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the prober.` Press OK.

2.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Transfer Menu* is displayed.

▼ **Specified Stage Position Transfer Menu**



2.6 Press PROBING CENTER. A message menu is displayed stating, `Transfer Stage?` Check that there is no interference with the stage, then press OK.

3 Use the following steps to display the *Z Axis Transfer Area Parameters Menu*.

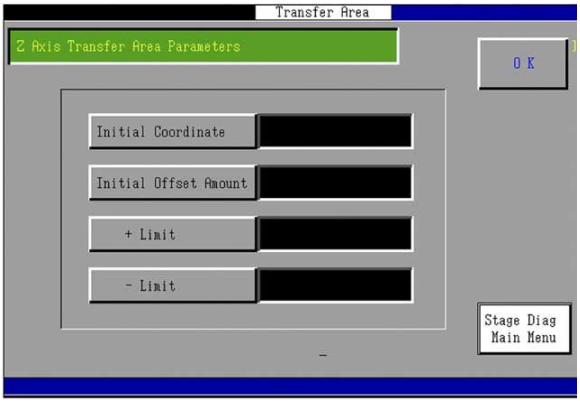
3.1 Press PREVIOUS MENU on the *Stage Adjustment Menu*.

3.2 Press ALL AXIS PARAMETERS.

3.3 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

3.4 Press Z AXIS on the *All Axis Transfer Area Menu* to display the *Z Axis Transfer Area Parameters Menu*.

▼ **Z Axis Transfer Area Parameters Menu**



4 Record the initial offset amount and initial coordinate displayed on the menu.

5 Use the following steps to set the initial offset amount and initial coordinate to **0** .

5.1 Press INITIAL COORDINATE. Input 0 on the numeric keypad and press OK.

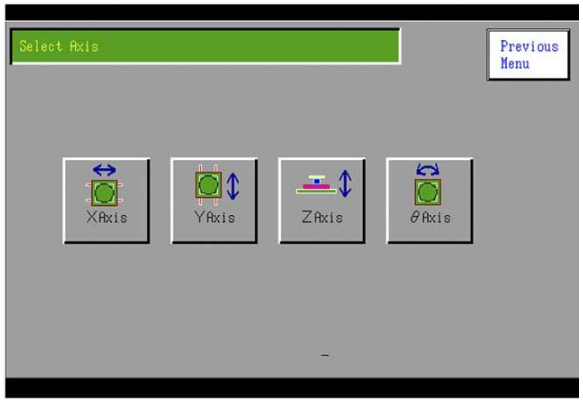
5.2 Press INITIAL OFFSET AMOUNT. Input 0 on the numeric keypad and press OK.

5.3 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed asking, `Validate this data?` Press YES.

6 Use the following steps to initialize the stage Z axis.

6.1 Press INITIALIZE ALL AXIS on the *Stage Adjustments Menu*. The *Select Axis Menu* is displayed.

▼ **Select Axis Menu**



6.2 Press Z AXIS. A check menu is displayed stating, `Execute Initial?` Press YES. The Z axis moves to the initial position.

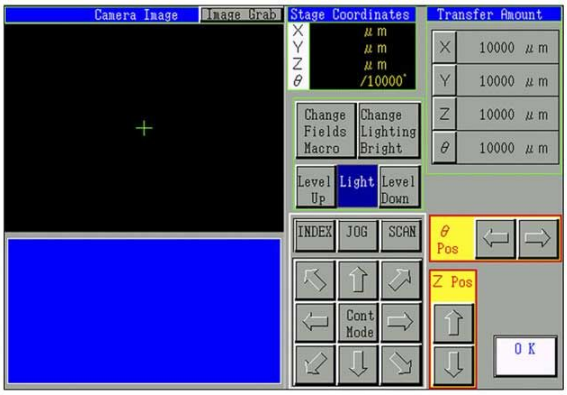
CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

7 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

8 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



9 Select the SCAN mode and set the transfer amount for the Z axis to 100 µm.

10 Use the Z stage control buttons to move the position of the Z axis to 700 µm.

11 Use the following steps to display the *Stage Sensor Check Menu*.

11.1 Press OK on the *Stage Control Menu*.

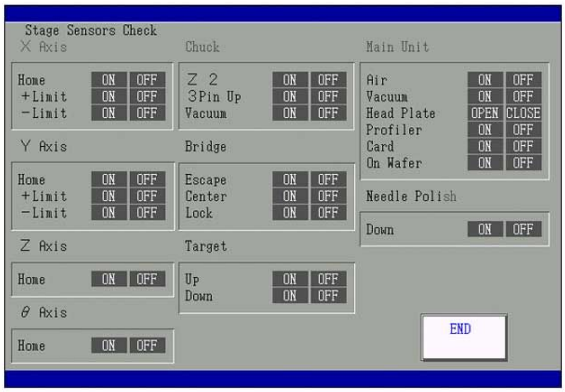
11.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

11.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*.

11.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

11.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensor Check Menu* is displayed.

▼ **Stage Sensor Check Menu**



12 Under `Z Axis`, check that the `Home` sensor is ON. If it is not, refer to the procedure **6.27 Adjusting the Z Initial and Z2 Sensors (see page 327)**.

13 Use the following steps to return to the *Stage Control Menu*.

13.1 Press END on the *Stage Sensor Check Menu*.

13.2 Press STAGE DIAG MAIN MENU

13.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

13.4 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

14 Select the SCAN mode and set the transfer amount for the Z axis to 100 µm.

15 Use the Z stage control buttons to move the position of the Z axis to 1300 µm.

16 Use the following steps to display the *Stage Sensor Check Menu*.

16.1 Press OK on the *Stage Control Menu*.

16.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

16.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*.

16.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

16.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensor Check Menu* is displayed.

17 Under `Z Axis`, check that the `Home` sensor is OFF. If it is not, refer to the procedure **6.27 Adjusting the Z Initial and Z2 Sensors (see page 327)**.

18 Use the following to display the *Z Axis Transfer Area Parameters Menu*.

18.1 Press END on the *Stage Sensor Check Menu*.

18.2 Press STAGE DIAG MAIN MENU

18.3 Press ALL AXIS PARAMETERS.

18.4 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

18.5 Press Z AXIS on the *Select Axis Menu*. The *Z Axis Transfer Area Parameters Menu* is displayed.

19 Input the values for the initial coordinate and the initial offset amount that you recorded in step 4.

20 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed stating, `Validate this data?` Press YES.

21 Use the following steps to initialize the stage.

21.1 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

21.2 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

22 Use the following steps to save SYS information.

22.1 Press PREVIOUS MENU on the *Stage Adjustment Menu* is displayed.

22.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed asking, `Save SYS Information?` Press YES. The SYS information is saved.

23 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

Checking the Z2 Sensor Position

1 Use one of the following methods to begin the procedure.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to transfer the stage to the probing center.

2.1 Press DIAGNOSTICS on the *Main Menu*.

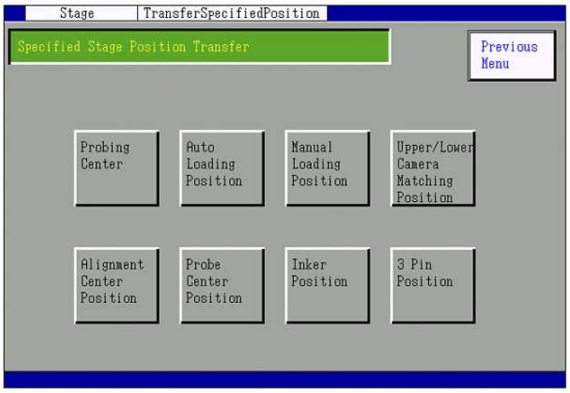
2.2 Press ADJUSTMENTS. A password menu is displayed.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the prober.` Press OK.

2.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Transfer Menu* is displayed.

▼ **Specified Stage Position Transfer Menu**



2.6 Press PROBING CENTER. A message menu is displayed stating, `Transfer Stage?` Check that there is no interference with the stage, then press OK.

3 Use the following steps to display the *Z Axis Transfer Area Parameters Menu*.

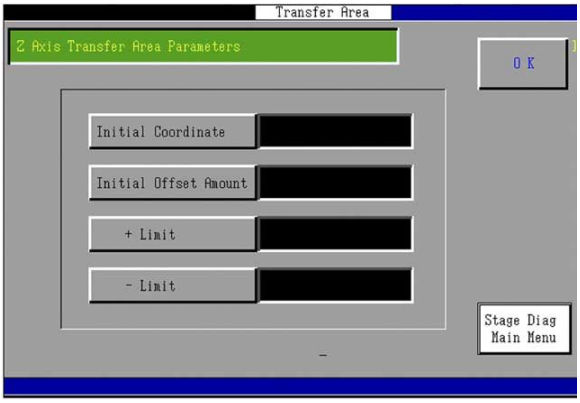
3.1 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

3.2 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

3.3 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

3.4 Press Z AXIS on the *All Axis Transfer Area Menu* to display the *Z Axis Transfer Area Parameters Menu*.

▼ **Z Axis Transfer Area Parameters Menu**



4 Record the initial offset amount and initial coordinate displayed on the menu.

5 Use the following steps to set the initial offset amount and initial coordinate to **0** .

5.1 Press INITIAL COORDINATE. Input 0 on the numeric keypad and press OK.

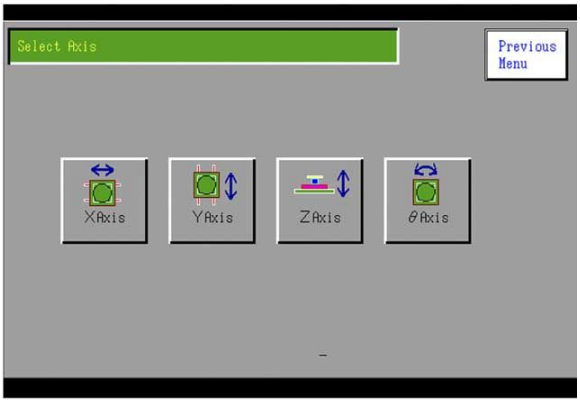
5.2 Press INITIAL OFFSET AMOUNT. Input 0 on the numeric keypad and press OK.

5.3 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

6 Use the following steps to initialize the stage Z axis.

6.1 Press INITIALIZE ALL AXIS on the *Stage Adjustments Menu*. The *Select Axis Menu* is displayed.

▼ **Select Axis Menu**



6.2 Press Z AXIS. A check menu is displayed stating, `Execute Initial?` Press YES. The Z axis moves to the initial position.

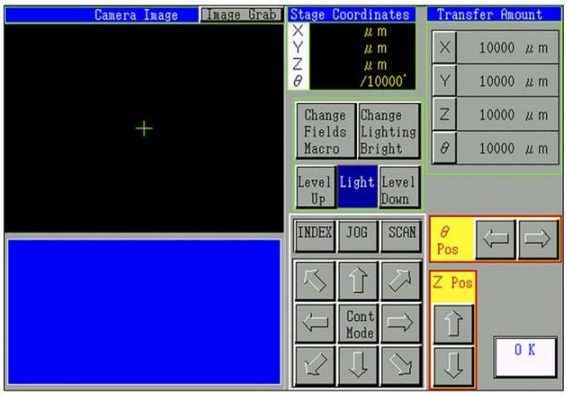
CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

7 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

8 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



9 Select the SCAN mode and set the transfer amount for the Z axis to100 μm.

10 Use the Z stage control buttons to move the position of the Z axis to 700 μm.

11 Use the following steps to display the *Stage Sensor Check Menu*.

11.1 Press OK on the *Stage Control Menu*.

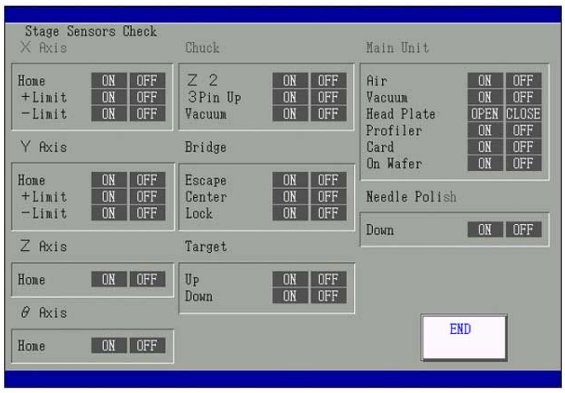
11.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

11.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*.

11.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

11.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensor Check Menu* is displayed.

▼ **Stage Sensor Check Menu**



12 Under `Z Axis`, check that the `Home` sensor is `ON`. If it is not, go to step 18.

13 Use the following steps to return to the *Stage Control Menu*.

13.1 Press END on the *Stage Sensor Check Menu*.

13.2 Press STAGE DIAG MAIN MENU.

13.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

13.4 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

14 Select the SCAN mode and set the transfer amount for the Z axis to 100 µm.

15 Raise the stage 100 µm higher than the current Z axis position.

16 Use the following steps to display the *Stage Sensor Check Menu*.

16.1 Press OK on the *Stage Control Menu*.

16.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

16.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*.

16.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

16.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensor Check Menu* is displayed.

17 Under `Z Axis`, check the status of the `Home` sensor.

- If the `Home` sensor is ON, repeat steps 13 through 17 until it is OFF.
- If the `Home` sensor is OFF, continue with the next step.

18 Use the following steps to return to the *Stage Control Menu*.

18.1 Press END on the *Stage Sensor Check Menu*.

18.2 Press STAGE DIAG MAIN MENU

18.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

18.4 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

19 Record the current Z axis coordinate.

20 Starting from the coordinate recorded in step 19, raise the Z axis by 500 µm.

21 Use the following steps to display the *Stage Sensor Check Menu*.

21.1 Press OK on the *Stage Control Menu*.

21.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

21.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*.

21.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

21.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensor Check Menu* is displayed.

22 Under `Chuck`, check that the `Z2` sensor is ON. If it is not, to the procedure **6.27 Adjusting the Z Initial and Z2 Sensors (see page 327)**

23 Use the following steps to return to the *Stage Control Menu*.

23.1 Press END on the *Stage Sensor Check Menu*.

23.2 Press STAGE DIAG MAIN MENU

23.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

23.4 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

24 Starting from the position in step 21, raise the Z axis an additional 300 µm. (This should be 800 µm above the coordinate recorded in step 19.)

25 Use the following steps to display the *Stage Sensor Check Menu*.

25.1 Press OK on the *Stage Control Menu*.

25.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

25.3 Press STAGE OPTIONS on the *Stage Adjustments Menu*.

25.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

25.5 Press STAGE STATUS DISPLAY on the *Option Control Menu*. The *Stage Sensor Check Menu* is displayed.

26 Under `Chuck`, check that the `Z2` sensor is OFF. If it is not, go to the procedure **6.27 Adjusting the Z Initial and Z2 Sensors (see page 327)**.

27 Use the following steps to display the *Z Axis Transfer Area Parameters Menu*.

27.1 Press END on the *Stage Sensor Check Menu*.

27.2 Press STAGE DIAG MAIN MENU

27.3 Press ALL AXIS PARAMETER on the *Stage Adjustments Menu*.

27.4 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

27.5 Press Z AXIS on the *All Axis Transfer Area Menu* to display the *Z Axis Transfer Area Parameters Menu*.

28 Input the values you recorded in step 4 for the initial coordinate and the initial offset amount.

29 Press STAGE DIAG MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed stating, `Do you want to validate this data?` Press YES.

30 Use the following steps to initialize the stage.

30.1 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

30.2 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

31 Use the following steps to save SYS information.

31.1 Press PREVIOUS MENU on the *Stage Adjustment Menu* is displayed.

31.2 Press MAIN MENU on the *Stage Adjustment Menu*. A check menu is displayed asking, `Save SYS Information?` Press YES. The SYS information is saved.

6.27 Adjusting the Z Initial and Z2 Sensors 0830.2

Introduction

Purpose:

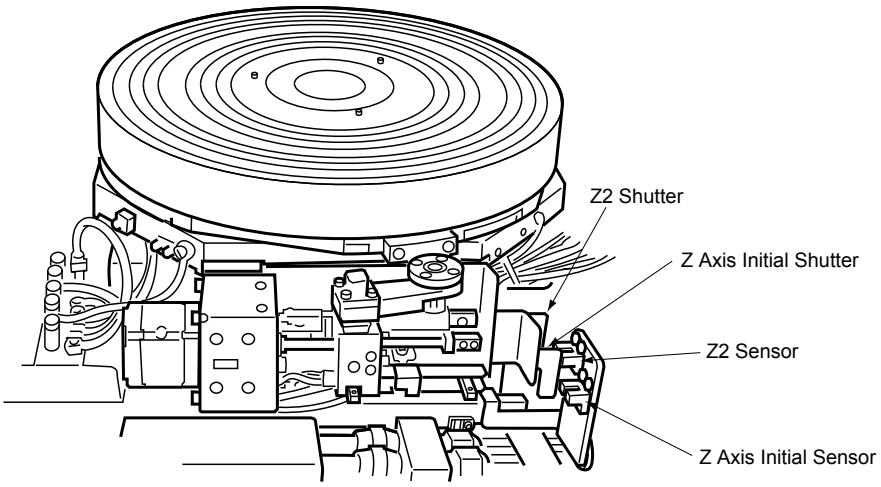
To adjust the positions of the Z initial and Z2 sensors to operate within the required specification.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Hexagonal wrenches
Parts or Consumables:	None

Overview:

Z Initial and Z2 Sensor Positions



Adjusting Z Initial Sensor

WARNING Mechanical Hazard
The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The following procedure begins at the point at which 6.26 Checking Z Initial and Z2 Sensor Position (see page 316) failed to meet specification.

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.**

2 Disable the head plate interlock.

3 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

4 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

5 Use the following steps to transfer the stage to the probing center.

5.1 Press DIAGNOSTICS on the *Main Menu*.

5.2 Press ADJUSTMENTS. A password menu is displayed.

5.3 Input your password on the numeric keypad and press INPUT.

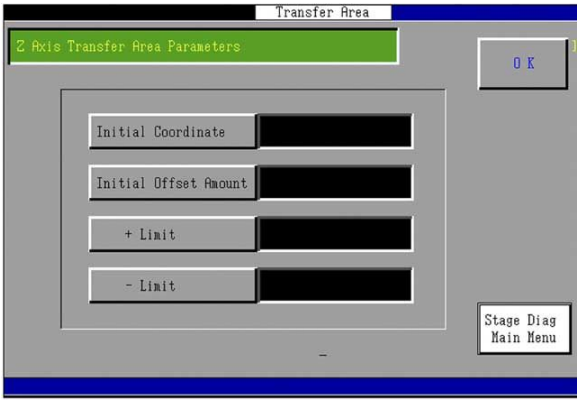
5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the prober.` Press OK.

5.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

5.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

5.7 Press Z AXIS on the *All Axis Transfer Area Menu* to display the *Z Axis Transfer Area Parameters Menu*.

▼ **Z Axis Transfer Area Parameters Menu**



6 Record the initial offset amount and initial coordinate displayed on the menu.

7 Use the following steps to set the initial offset amount and initial coordinate to **0**

7.1 Press INITIAL COORDINATE. Input 0 on the numeric keypad and press OK.

7.2 Press INITIAL OFFSET AMOUNT. Input 0 on the numeric keypad and press OK.

7.3 Press OK on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

8 Press PREVIOUS MENU on the *Stage Adjustments Menu*.

9 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

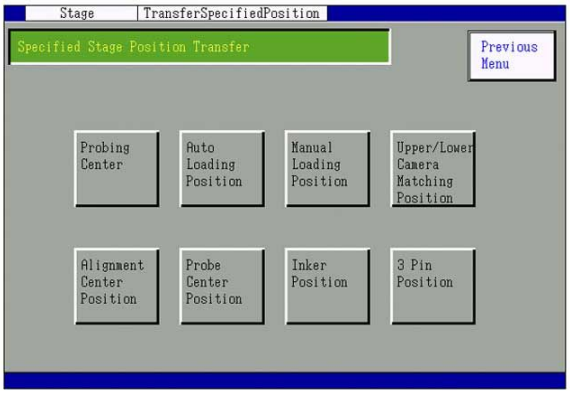
CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

10 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES.

11 Press PREVIOUS MENU on the *Stage Functions Menu*.

12 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Transfer Menu* is displayed.

▼ **Specified Stage Position Transfer Menu**



13 Use the following steps to transfer the stage to the probing center position.

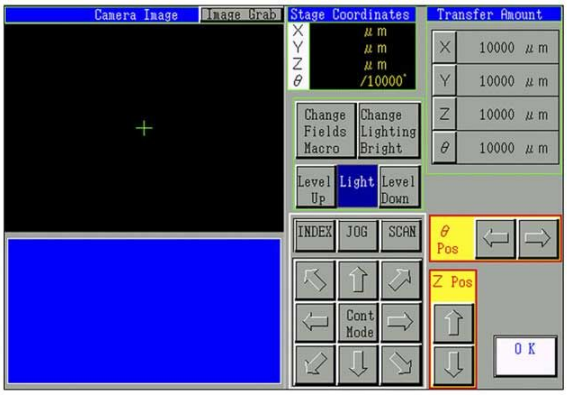
13.1 Press PROBING CENTER POSITION *Specified Stage Position Transfer Menu*. A check menu is displayed stating, `Transfer Stage?` Check that there is no interference with the stage, then press YES. The stage moves to the probing center.

13.2 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

13.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

13.4 Press XYZΘ JOYSTICK TRANSFER on the *All Axes Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



14 Select the SCAN mode and set the transfer amount for the Z axis to 100 μm.

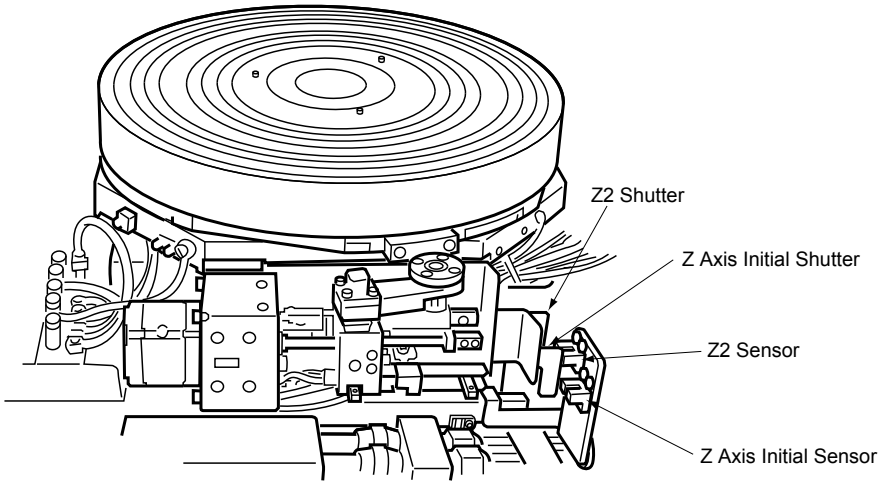
15 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

16 Using the Z axis control buttons, raise the stage Z until the Z initial sensor LED switches from OFF to ON, then record the coordinate at which this occurs.

▼ **Z Initial and Z2 Sensor Positions**



17 Select the INDEX mode and set the transfer amount for the Z axis to 1000μm.

18 Raise the stage to 50000 μm.

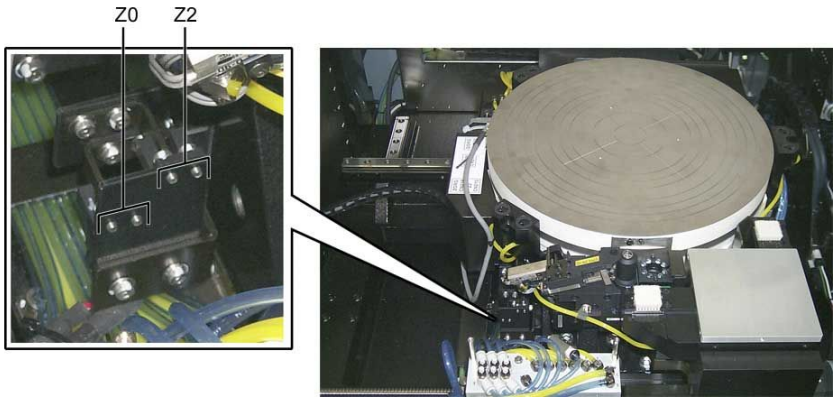
19 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

⚠ CAUTION **Mechanical Hazard**

Before working inside the prober, always exit to a passive screen on the touch screen.

20 Use a hex wrench to loosen the Z initial shutter attachment screws.

Z Initial Sensor Shutter Position



21 Based on the coordinate position you recorded in step 16, adjust the shutter position.

- If the coordinate was lower than 700 µm, lower the shutter position.
- If the coordinate was higher than 1300 µm, raise the shutter position.

22 Use the hex wrench to tighten the Z initial shutter attachment bolts.

23 Use the following steps to initialize the stage Z axis.

23.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

23.2 Press INITIALIZE ALL AXIS on the *Stage Adjustments Menu*. The *Select Axis Menu* is displayed.

23.3 Press Z AXIS. A check menu is displayed stating, `Execute Initial?` Press YES. The Z axis moves to the initial position.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

24 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

25 Press XYZΘ JOYSTICK TRANSFER on the *All Axes Transfer Menu*. The *Stage Control Menu* is displayed.

26 Select the SCAN and set the transfer amount for the Z axis to 100µm.

27 Raise the stage to check that the Z initial sensor LED turns from OFF to ON at a coordinate between 700 and 1300 µm.

- If the Z initial sensor does not operate correctly, repeat steps 16 through 27 to adjust the position.
- If the Z initial sensor operates correctly, go to **Restoring to Normal Operating Conditions (see page 336)**.

Adjusting the Z2 Sensor

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE **The following procedure begins at the point at which 6.26 Checking Z Initial and Z2 Sensor Position (see page 316) failed to meet specification.**

28 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

29 Disable the head plate interlock.

30 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

31 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

32 Use the following steps to transfer the stage to the probing center.

32.1 Press DIAGNOSTICS on the *Main Menu*.

32.2 Press ADJUSTMENTS. A password menu is displayed.

32.3 Input your password on the numeric keypad and press INPUT.

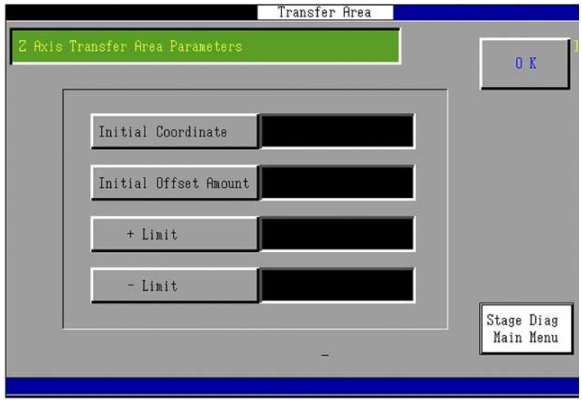
32.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the prober.` Press OK.

32.5 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

32.6 Press ALL AXIS TRANSFER AREA on the *All Axis Parameters Menu*.

32.7 Press Z AXIS on the *All Axis Transfer Area Menu* to display the *Z Axis Transfer Area Parameters Menu*.

▼ **Z Axis Transfer Area Parameters Menu**



33 Record the initial offset amount and initial coordinate displayed on the menu.

34 Use the following steps to set the initial offset amount and initial coordinate to **0**

34.1 Press INITIAL COORDINATE. Input 0 on the numeric keypad and press OK.

34.2 Press INITIAL OFFSET AMOUNT. Input 0 on the numeric keypad and press OK.

34.3 Press OK on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed with the message `Validate this data?` Press YES.

35 Press PREVIOUS MENU on the *Stage Adjustments Menu*.

36 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

CAUTION **Property Damage Hazard**

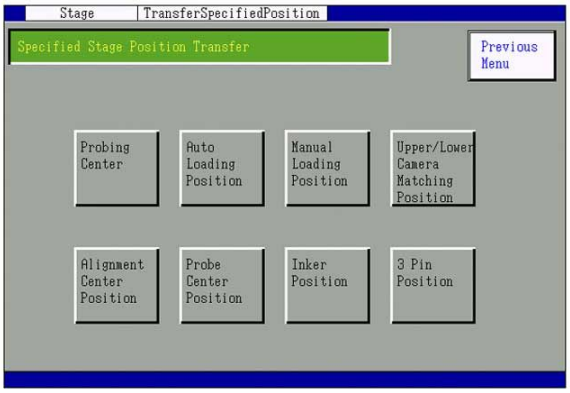
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

37 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES.

38 Press PREVIOUS MENU on the *Stage Functions Menu*.

39 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Transfer Menu* is displayed.

▼ **Specified Stage Position Transfer Menu**



40 Use the following steps to transfer the stage to the probing center position.

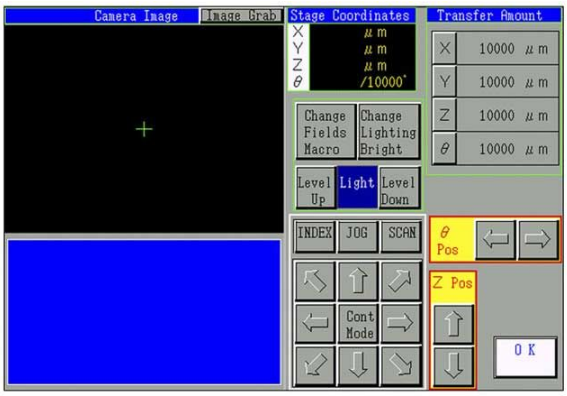
40.1 Press PROBING CENTER POSITION *Specified Stage Position Transfer Menu*. A check menu is displayed stating, `Transfer Stage?` Check that there is no interference with the stage, then press YES. The stage moves to the probing center.

40.2 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

40.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

40.4 Press XYZΘ JOYSTICK TRANSFER on the *All Axes Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



41 Select the SCAN mode and set the transfer amount for the Z axis to 100μm.

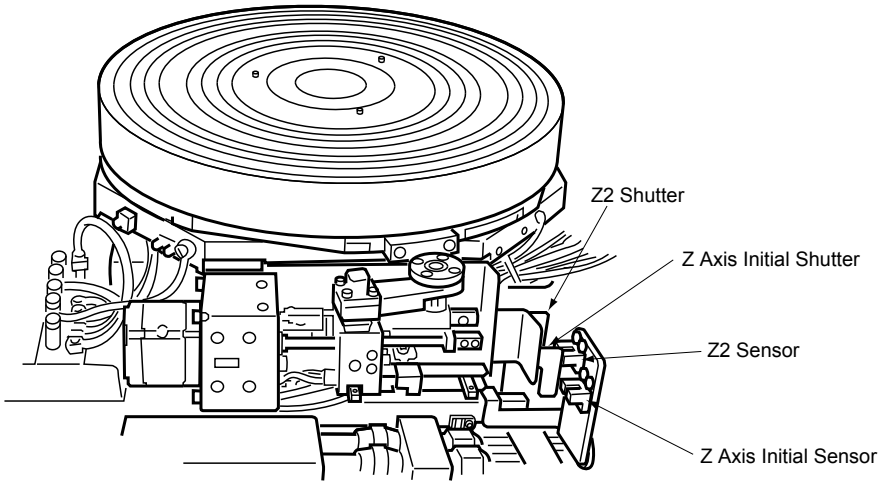
42 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION Mechanical Hazard

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

43 Using the Z axis control buttons, raise the stage Z until the Z initial sensor LED switches from OFF to ON. Record this position.

Z Initial and Z2 Sensor Positions



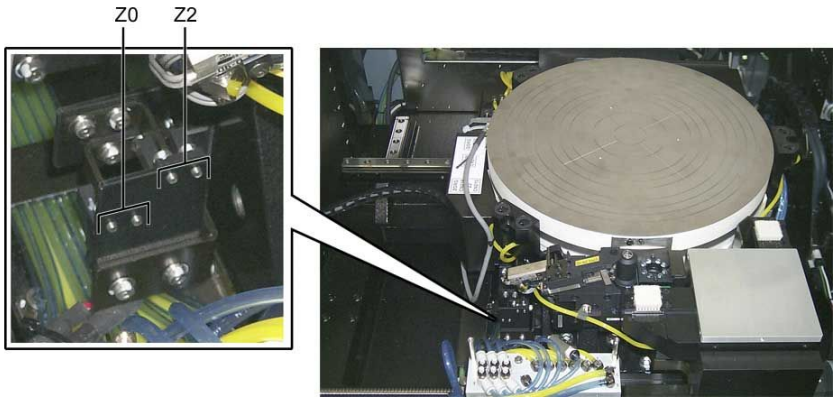
44 Raise the stage Z by 650 µm from the position you recorded in the previous step.

45 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

CAUTION **Mechanical Hazard**
Before working inside the prober, always exit to a passive screen on the touch screen.

46 Use a hex wrench to loosen the Z2 shutter attachment screws.

Z Initial Sensor Shutter Position



47 Gently move the shutter to the position where the shutter interrupts the sensor and the LED turns OFF.

48 Use the hex wrench to tighten the Z initial shutter attachment bolts.

49 Use the following steps to initialize the stage Z axis.

49.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

49.2 Press INITIALIZE ALL AXIS on the *Stage Adjustments Menu*. The *Select Axis Menu* is displayed.

49.3 Press Z AXIS. A check menu is displayed stating, `Execute Initial?` Press YES. The Z axis moves to the initial position.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

50 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

51 Press XYZΘ JOYSTICK TRANSFER on the *All Axes Transfer Menu*. The *Stage Control Menu* is displayed.

52 Select the SCAN and set the transfer amount for the Z axis to 100µm.

53 Raise the stage Z and record the coordinates at which the Z and Z2 sensor LEDs switch from OFF to ON. Check that they are correct using the following formula:

$Z\ initial + 500 \leq Z2 \leq Z\ initial + 800$

- If the Z2 sensor does not operate correctly, repeat steps 16 through 26 to adjust the position.
- If the Z2 sensor operates correctly, go to **Restoring to Normal Operating Conditions (see page 336)**.

Restoring to Normal Operating Conditions

54 Use the following steps to access the *Z Axis Transfer Area Parameters Menu*.

54.1 Press OK on the *Stage Control Menu*.

54.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*

54.3 Press ALL AXIS PARAMETERS on the *Stage Adjustment Menu*.

54.4 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

54.5 Press Z AXIS on the *Select Axis Menu*. The *Z Axis Transfer Area Parameters Menu* is displayed.

55 Input the `Initial Offset Amount` and `Initial Coordinate` values you previously recorded.

56 Press STAGE DIAG MAIN MENU on the *Z Axis Transfer Area Parameters Menu*. A check menu is displayed stating `Do you want to validate this data?` Press YES to save the settings.

57 Use the following steps to initialize the stage.

57.1 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

57.2 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES.

57.3 Press PREVIOUS MENU.

57.4 Press MAIN MENU. A check menu is displayed asking, `Save SYS Information?` Press YES. The SYS information is saved.

58 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

6.28 Checking the Theta Initial Sensor Position 1425.2

Introduction

Purpose:

To check the theta axis initial sensor position.

If at any other time the prober encounters problems with wafer loading/unloading, perform this check as a troubleshooting measure. If the theta initial sensor is out of specification, normal wafer loading/unloading will not be possible and errors will occur.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Hexagonal wrench Protective Mylar sheet Ruled scale
Parts or Consumables:	None

Prerequisite Skills:

Tokyo Electron's P-12XL Operation and Maintenance training course.

Any local test floor required training for dealing with the hazards identified in this procedure.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking the Theta Initial Sensor Position

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to move the stage to the probing center.

2.1 Press DIAGNOSTICS on the *Main Menu*.

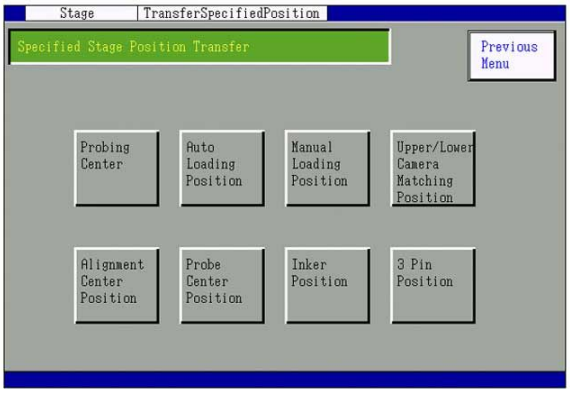
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustment Menu*. The *Transfer Specified Position Menu* is displayed.

Transfer Specified Position Menu



2.6 Press PROBING CENTER. A check menu stating `Transfer Stage?` is displayed. Check with for any interferences with the stage. If none exist, press YES. The stage moves to the probing center.

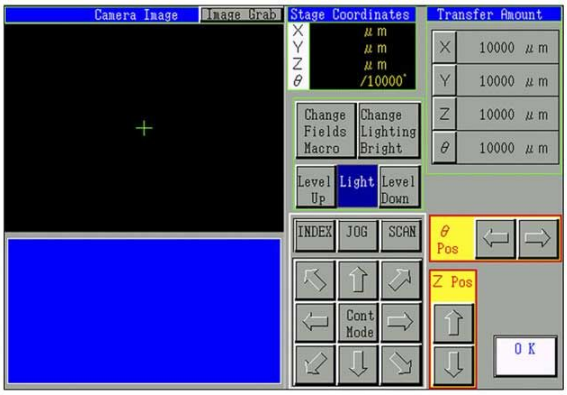
3 Use the following steps to position the stage.

3.1 Press PREVIOUS MENU on the *Transfer Specified Position Menu*.

3.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

3.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



3.4 Select the INDEX mode and set the Z axis transfer amount to1000 μm.

3.5 Use the Z stage control arrow buttons to raise the Z stage to 50000 μm.

3.6 Press OK to exit the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

⚠ CAUTION Mechanical Hazard

Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.

4 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

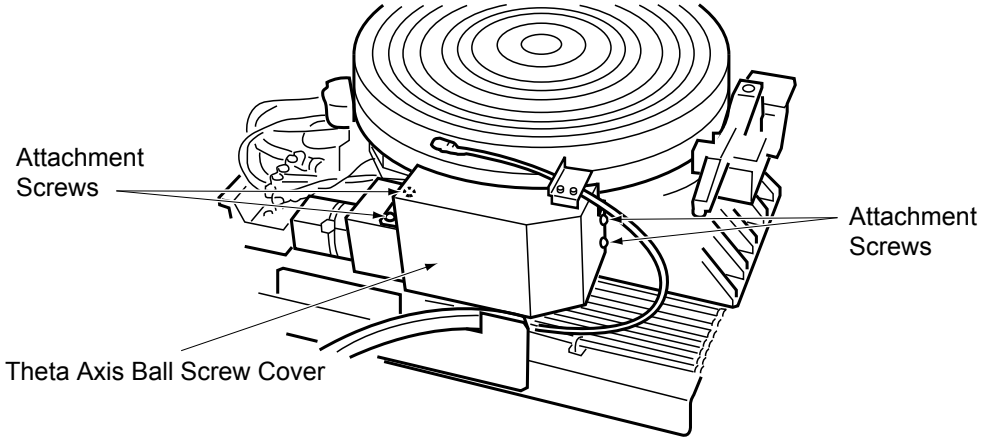
⚠ CAUTION Mechanical Hazard

When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

NOTE An interlock error will not occur as long as the stage does not move while you are performing the diagnostic adjustments. If an error occurs, the prober must be initialized before the procedure can be continued.

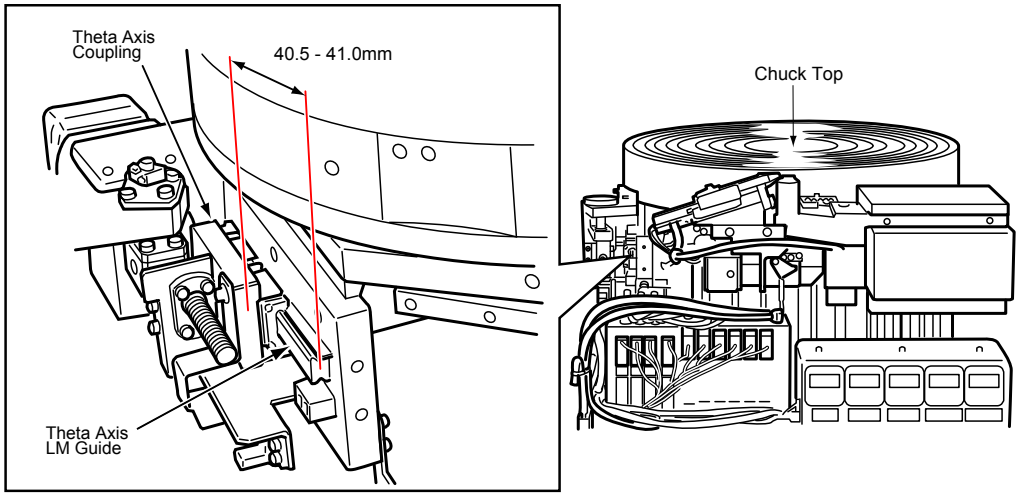
5 Remove the theta axis cover screws and remove the cover. Be careful not to damage the chuck ground wire when removing the cover.

Theta Axis Cover



6 Use a scaled rule to measure the distance between the end of the theta LM guide and the end of the theta axis coupling.

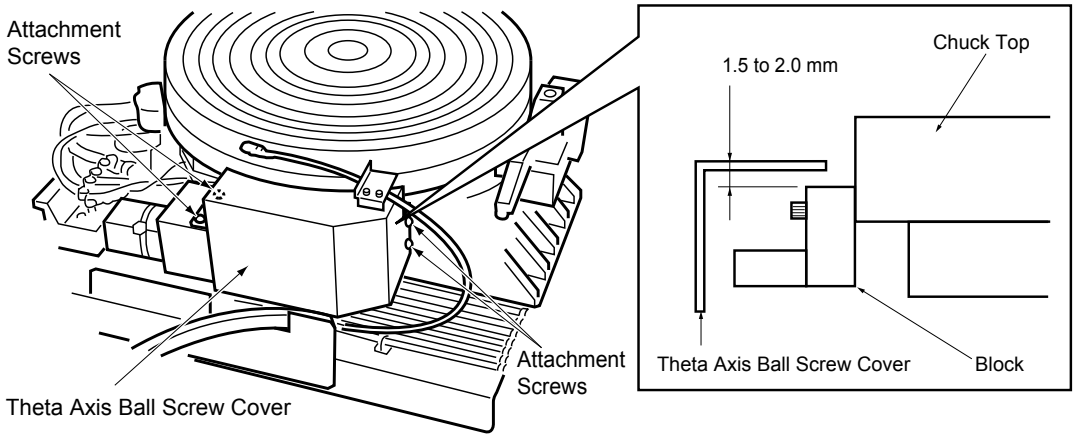
Theta Origin Sensor Position



7 Verify the value measured is between 40.5 and 41.0 mm.

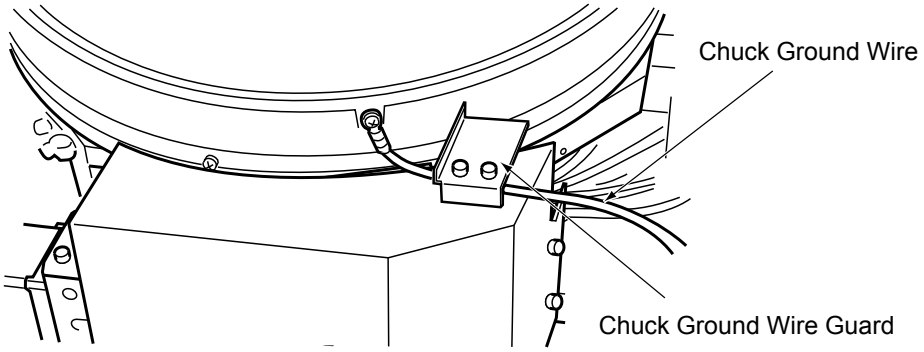
8 Attach the theta axis ball screw cover. Check that the distance from the top of the cover to the top of the block is between 1.5 and 2.0 mm.

Attaching the Theta Axis Ball Screw Cover



9 Insert the chuck ground wire through the theta axis ball screw cover and chuck ground wire guard. Be sure that the chuck ground wire does not protrude above the chuck top upper surface.

Chuck Ground Wire Guard



10 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

11 Use the following steps to initialize the stage.

11.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*. The *Stage Adjustments Menu* is displayed.

11.2 Press BASIC FUNCTIONS on the *Stage Functions Menu* is displayed.

11.3 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed asking, `Execute Initial?`. Press YES. The stage is initialized.

> **CAUTION** **Property damage hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

12 Press PREVIOUS MENU.

13 Press MAIN MENU. A check menu is displayed asking, `Save SYS Information?` Press NO.

14 If the results are out of specification, refer to **6.29 Adjusting the Theta Initial Sensor Position (see page 344)**.

6.29 Adjusting the Theta Initial Sensor Position 1426.2

Introduction

Purpose:

To adjust the theta axis initial sensor position.

If at any other time the prober encounters problems with wafer loading/unloading, perform this check as a troubleshooting measure. If the theta origin sensor is out of specification, normal wafer loading/unloading will not be possible and errors will occur.If the distance measured is outside specification upon completing the adjustment, contact TEL Field Service Support.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Hexagonal wrench Mylar sheet Scaled rule
Parts or Consumables:	None

WARNING Mechanical Hazard

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

Adjusting the Theta Initial Sensor Position

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION Mechanical Hazard

When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

2 Disable the head plate interlock.

3 Close the head plate.

4 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

5 Use the following steps to move the stage to the probing center.

5.1 Press DIAGNOSTICS on the *Main Menu*.

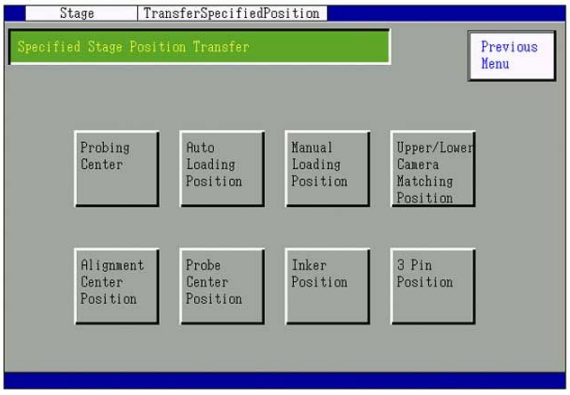
5.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

5.3 Input your password on the numeric keypad and press INPUT.

5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

5.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustment Menu*. The *Transfer Specified Position Menu* is displayed.

Transfer Specified Position Menu



5.6 Press PROBING CENTER. A check menu stating `Transfer Stage?` is displayed. Check with for any interferences with the stage. If none exist, press YES. The stage moves to the probing center.

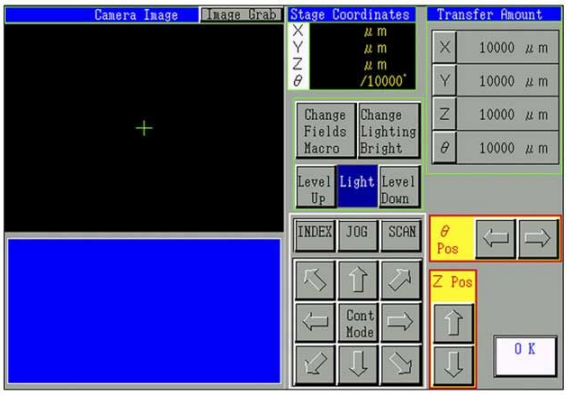
6 Use the following steps to position the stage.

6.1 Press PREVIOUS MENU on the *Transfer Specified Position Menu*.

6.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

6.3 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



6.4 Select the INDEX mode and set the Z axis transfer amount to1000μm.

6.5 Use the Z stage control arrow buttons to raise the Z stage to 50000 μm.

6.6 Press OK to exit the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

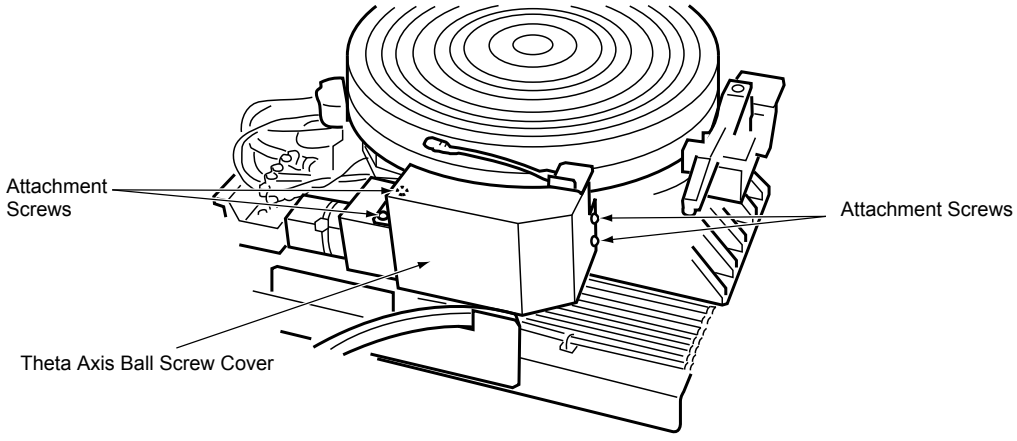
> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.**

7 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.**

8 Remove the theta axis cover screws and remove the cover.

▼ **Theta Axis Cover**



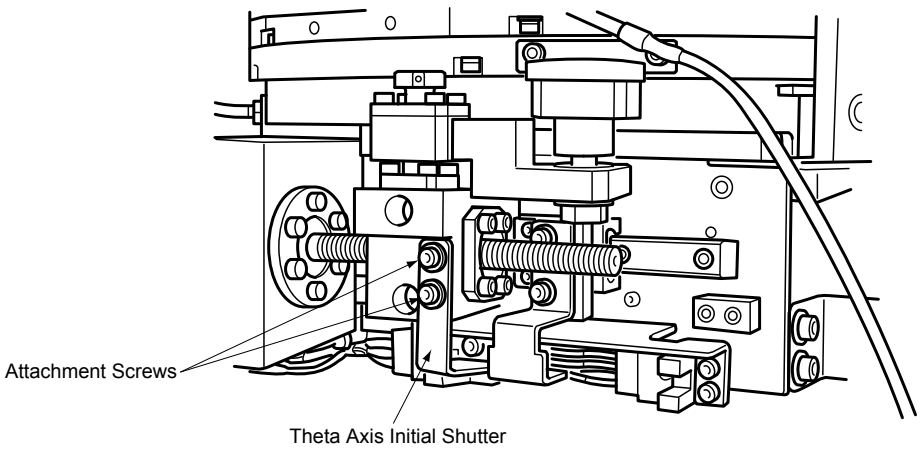
9 Lay a Mylar sheet over the chuck top.

CAUTION **Property Damage Hazard**

The Mylar sheet will prevent any damage to the chuck top while you are working. If you are using the hot chuck specification, use a heat resistant Mylar sheet.

10 Loosen the attachment screws on the theta axis initial shutter.

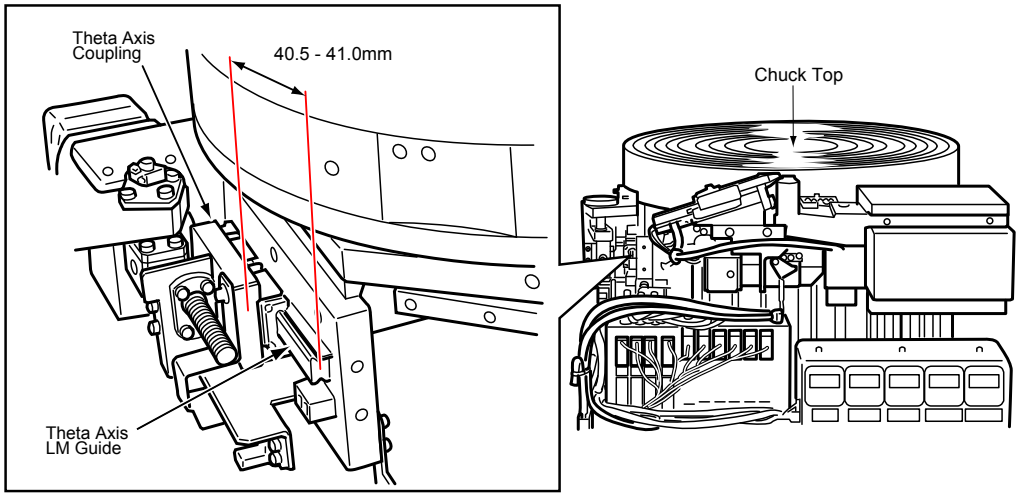
Theta Axis Initial Shutter



11 Using the scaled rule as a guide, adjust the shutter position so that the distance between the end of the theta LM guide and the end of the theta axis coupling is between 40.5 and 41.0 mm.

NOTE **To lower the value, move the shutter to the back of the prober; to increase the value, move the shutter to the front.**

Adjusting the Shutter Position



12 Tighten the shutter attachment screws.

13 Use the following steps to initialize the theta axis.

13.1 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

13.2 Press INITIALIZE ALL AXIS on the *Stage Adjustments Menu*.

13.3 Press THETA AXIS on the *Select Axis Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage moves to the theta axis initial position.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

14 Use the scale to measure the distance between the side of theta axis LM guide and the side of movable plate. Verify the value is between 40.5 and 41.0 mm.

If the value is outside of the specification, repeat steps 9 through 13 to readjust the sensor position.

15 Reattach the theta axis cover using the four screws.

16 Remove the Mylar sheet.

17 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

18 Perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

6.30 Checking the 3-Pin Sensor Position 1428.2

Introduction

Purpose:

To check the 3-pin sensor position.

If at any other time the prober encounters problems with wafer loading/unloading, perform this check as a troubleshooting measure. If the 3-pin riser sensor is out of specification, normal wafer loading/unloading will not be possible and errors will occur.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

Prerequisite Skills:

Tokyo Electron's P-12XL Operation and Maintenance training course.

Any local test floor required training for dealing with the hazards identified in this procedure.

Checking the 3-Pin Sensor Position

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Theta Axis Transfer Area Parameters Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT.

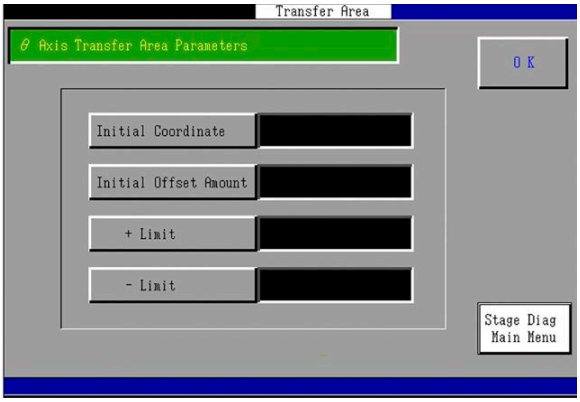
2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

2.5 Press ALL AXIS PARAMETERS on the *Stage Adjustments Menu*.

2.6 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*

2.7 Press θ AXIS on the *Select Axis Menu*. The *Theta Axis Transfer Area Parameters Menu* is displayed.

Theta Axis Transfer Area Parameters Menu



3 Set the - LIMIT value to **-100000** .

4 Press OK on the *Theta Axis Transfer Area Parameters Menu*. A message menu appears asking, `Validate Y/N?` Press YES.

5 Use the following steps to move the stage to the autoloading position.

5.1 Press PREVIOUS MENU.

5.2 Press TRANSFER SPECIFIED POSITION.

5.3 Press AUTO LOADING POSITION. A check menu is displayed stating `Transfer Stage?` Press YES. The stage moves to the autoloading position.

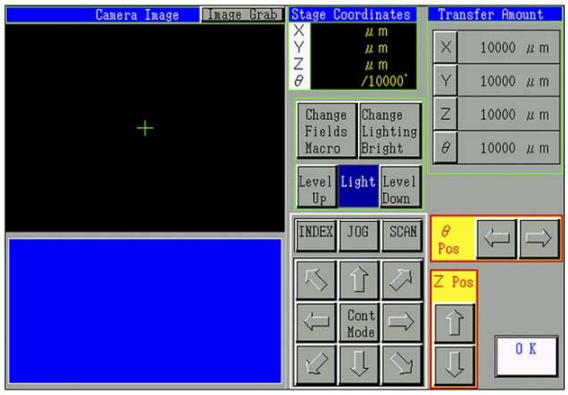
6 Use the following steps to display the *Stage Control Menu*.

6.1 Press PREVIOUS MENU.

6.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

6.3 Press XYZθ JOYSTICK TRANSFER on the *Diagnostics Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



7 Use the Z stage control arrows to raise the Z stage to 50000 µm.

8 Use the theta control arrows to move the chuck theta to -97,000/10,000 µm.

> **CAUTION** **Property Damage Hazard**
> **If you attempt to move in theta when the chuck is below 19,000 µm in Z, the 3-pin mechanism will be damaged.**

9 Use the following steps to access the *Stage Sensor Check Menu*.

9.1 Press OK on the *Stage Control Menu*.

9.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

9.3 Press STAGE OPTIONS on the *Stage Adjustment Menu*.

9.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

9.5 Press STAGE STATUS DISPLAY on the *Option Controller Menu*. The *Stage Sensor Check Menu* is displayed.

▼ **Stage Sensor Check Menu**

10 Under `Chuck`, check that the `3 Pin Up` sensor is `OFF`.

11 Use the following steps to access the *Stage Control Menu*.

11.1 Press END on the *Stage Sensor Check Menu*.

11.2 Press STAGE DIAG MAIN MENU on the *Option Control Menu*.

11.3 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

11.4 Press XYZΘ JOYSTICK TRANSFER on the *Diagnostics Menu*. The *Stage Control Menu* is displayed.

12 Use the theta control arrows to move the chuck top to the theta position of -98,000/10,000°.

13 Use the following steps to access the *Stage Sensor Check Menu*.

13.1 Press OK on the *Stage Control Menu*.

13.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

13.3 Press STAGE OPTIONS on the *Stage Adjustment Menu*.

13.4 Press OPTION CONTROLLER on the *Stage Options Menu*.

13.5 Press STAGE STATUS DISPLAY on the *Option Controller Menu*. The *Stage Sensor Check Menu* is displayed.

14 Under `Chuck`, check that the `3 Pin Up` sensor is `ON`.

15 Use the following steps to initialize the theta axis.

15.1 Press END on the *Stage Control Menu*.

15.2 Press STAGE DIAG MAIN MENU on the *Option Control Menu*.

15.3 Press INITIALIZE ALL AXIS on the *Stage Menu*.

15.4 Press Θ AXIS on the *All Axis Transfer Area Menu*. A check menu is displayed with the message `Execute initial?` Press YES. The stage moves to the theta axis initial position.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

16 Use the following steps to set the theta axis software limit to its original setting.

16.1 Press ALL AXIS PARAMETERS on the *Stage Adjustments Menu*.

16.2 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

16.3 Press Θ AXIS on the *Select Axis Menu*.

16.4 Set the - LIMIT value to **-50000** .

16.5 Press OK on the *Theta Axis Transfer Area Parameters Menu*. A check menu is displayed, stating `Validate this data?` Press YES.

17 Press PREVIOUS MENU on the *Stage Parameters Menu*.

18 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

19 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed with the message `Execute Initial?` Press YES. The stage is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

20 Press PREVIOUS MENU.

21 Press MAIN MENU. A check menu is displayed asking, `Save SYS Information?` Press YES. The SYS information is saved.

22 If the results are out of specification, refer to **6.31 Adjusting the 3-Pin Sensor Position (see page 354)**

6.31 Adjusting the 3-Pin Sensor Position 1429.2

Introduction

Purpose:

To adjust the 3-pin sensor position.

This procedure will ensure that the 3-pin sensor is actuating at the correct physical position in relation to the chuck top rotation as the 3-pins rise above or fall below the chuck top surface at specified height addresses. If the 3-pin riser sensor is out of specification, normal wafer loading/unloading will not be possible and errors will occur.

If the position is still outside of the specification after completing the adjustment, contact TEL Field Service Support.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	Hexagonal wrench
Parts or Consumables:	None

WARNING Mechanical Hazard
The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

Adjusting the 3-Pin Sensor Position

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION Mechanical Hazard
When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

2 Disable the head plate interlock.

3 Close the head plate.

4 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

5 Use the following steps to access the *Theta Axis Transfer Area Parameters Menu*.

5.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

5.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

5.3 Input your password on the numeric keypad and press INPUT.

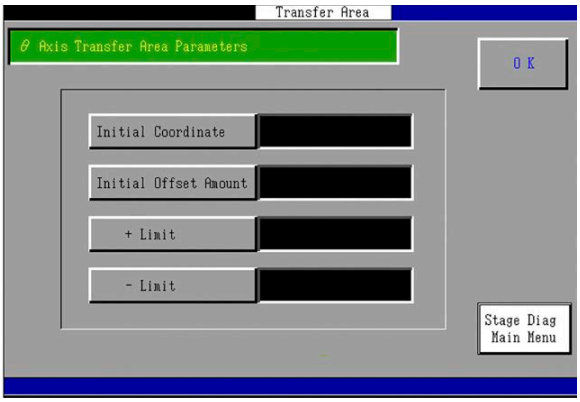
5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

5.5 Press ALL AXIS PARAMETERS on the *Stage Adjustments Menu*.

5.6 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*

5.7 Press Θ AXIS on the *Select Axis Menu*. The *Theta Axis Transfer Area Parameters Menu* is displayed.

Theta Axis Transfer Area Parameters Menu



6 Press – LIMIT. Input -1000000 on the numeric keypad and press OK.

7 Press OK on the *Theta Axis Transfer Area Parameters Menu*. A message menu appears asking, `Validate Y/N?` Press YES.

8 Use the following steps to move the stage to the autoloading position.

8.1 Press PREVIOUS MENU.

8.2 Press TRANSFER SPECIFIED POSITION.

8.3 Press AUTO LOADING POSITION. A check menu is displayed stating `Transfer Stage?` Press YES. The stage moves to the autoloading position.

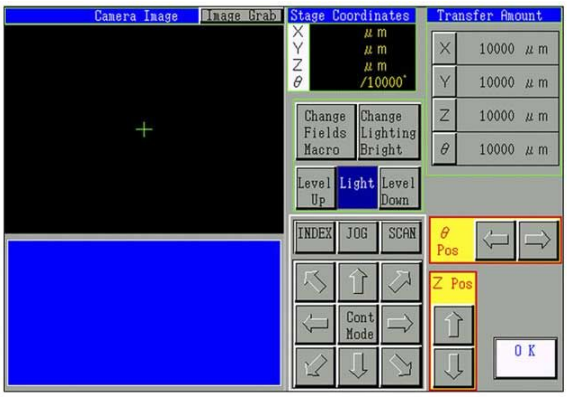
9 Use the following steps to display the *Stage Control Menu*.

9.1 Press PREVIOUS MENU.

9.2 Press ALL AXIS TRANSFER on the *Stage Adjustment Menu*.

9.3 Press XYZΘ JOYSTICK TRANSFER on the *Diagnostics Menu*. The *Stage Control Menu* is displayed.

Stage Control Menu



10 Use the Z stage control arrows to raise the Z stage to 50000 µm.

11 Use the theta control arrows to move the chuck theta to -97,500/10,000 µm.

CAUTION **Property Damage Hazard**

If you attempt to move in theta when the chuck is below 19,000 µm in Z, the 3-pin mechanism will be damaged.

12 Press OK on the *Stage Control Menu* the *All Axis Transfer Menu* is displayed.

⚠ CAUTION **Mechanical Hazard**

Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control buttons.

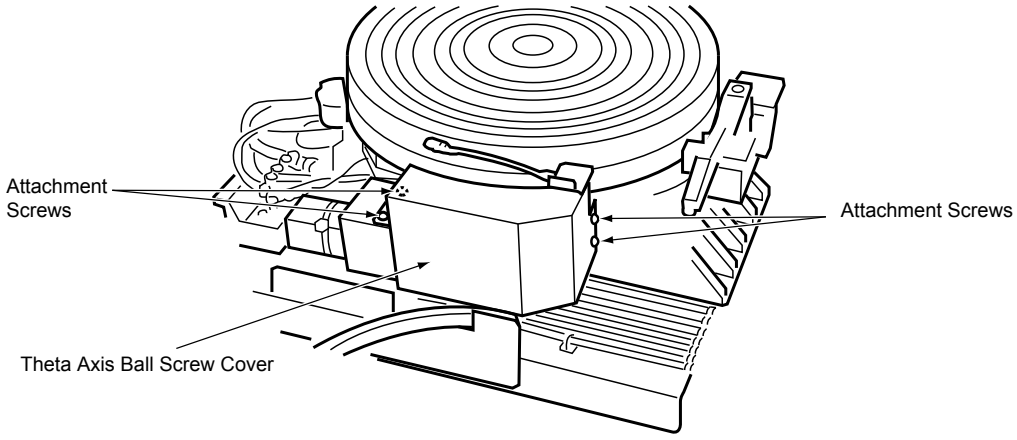
13 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

⚠ CAUTION **Mechanical Hazard**

When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

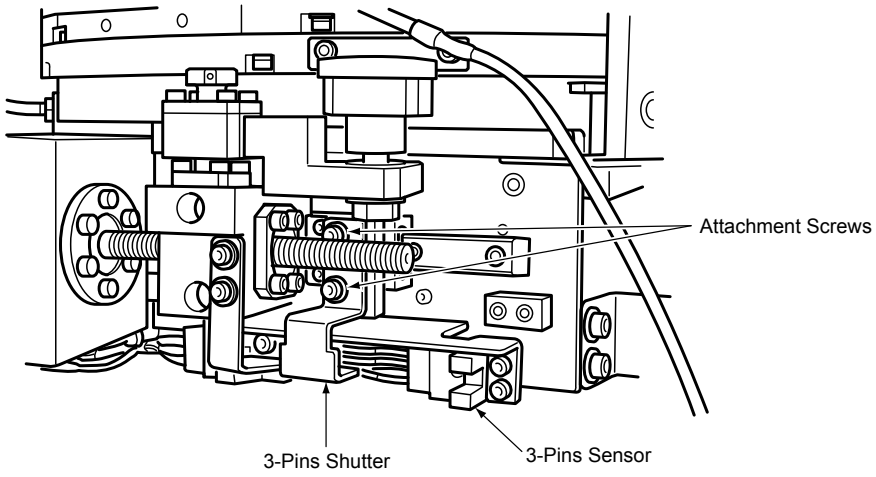
14 Remove the four theta axis cover screws and remove the cover.

Theta Axis Cover



15 Loosen the 3-pin shutter attachment screws.

3-Pin Sensor Shutter



16 Adjust the position of the 3-pin shutter to until the 3-pin sensor LED switches from ON to OFF.

17 Tighten the 3-pin shutter attachment screws.

18 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

19 Set the theta axis transfer amount to 100/10000°.

20 Use the theta control arrows to move the chuck theta back and forth to check that the 3-pin sensor changes state between -97000/10000° and -98000/10000°.

CAUTION **Property Damage Hazard**

If you attempt to move in theta when the chuck is below 19,000 µm in Z, the 3-pin mechanism will be damaged.

21 Press OK on the *Stage Control Menu*.

22 Reattach the theta axis cover.

23 Replace and tighten the four theta axis cover screws.

24 Enable the head plate interlock, then close the head plate.

> **⚠ WARNING** **Mechanical Hazard**
> **Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.**

25 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

26 Press ALL AXES PARAMETERS on the *Stage Adjustments Menu*.

27 Press ALL AXIS TRANSFER AREA on the *Stage Parameters Menu*.

28 Press THETA AXIS on the *Select Axis Menu*.

29 Press – LIMIT. A numeric keypad is displayed.

30 Input –50,000 on the numeric keypad and press INPUT.

31 Press OK. A check menu is displayed with the message `Validate this Data?`. Press YES on the check menu.

32 Press PREVIOUS MENU on the *Stage Parameters Menu*.

33 Press BASIC FUNCTIONS on the *Stage Menu*.

34 Press INITIALIZE STAGE on the *Basic Functions Menu*. A check menu is displayed with the message `Execute initial?` Press YES. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

35 Press PREVIOUS MENU.

36 Press MAIN MENU. A check menu is displayed asking, `Save SYS Information?` Press YES. The SYS information is saved.

6.32 Checking the 3-Pin Positions 0835.2

Introduction

Purpose:

To check the down, middle and up positions of the 3-pins.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	Scaled ruler Protective Mylar sheet with 3-pin holes Hexagonal wrench
Parts or Consumables:	300 mm wafer

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Preparing the Prober

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

2 Disable the head plate interlock.

3 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

4 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

5 Use the following steps to access the *3 Pin Specified Position Menu*.

5.1 Press DIAGNOSTICS on the *Main Menu*.

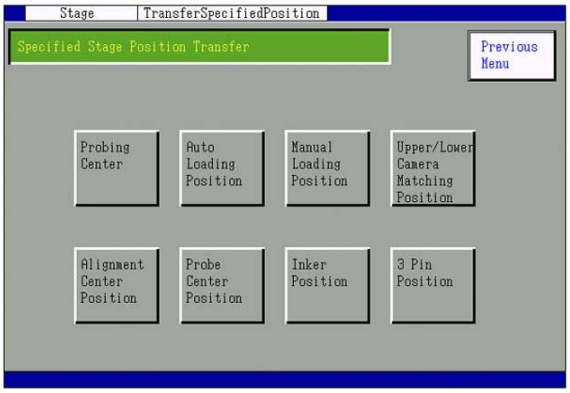
5.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

5.3 Input your password on the numeric keypad and press INPUT.

5.4 Press STAGE on the *Adjustments Menu*. A message menu stating `Not all interference checks are done. Remember this when operating the prober` is displayed. Check for any interference with the stage; if none exit, press OK.

5.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustment Menu*. The *Transfer Specified Position Menu* is displayed.

Transfer Specified Position Menu

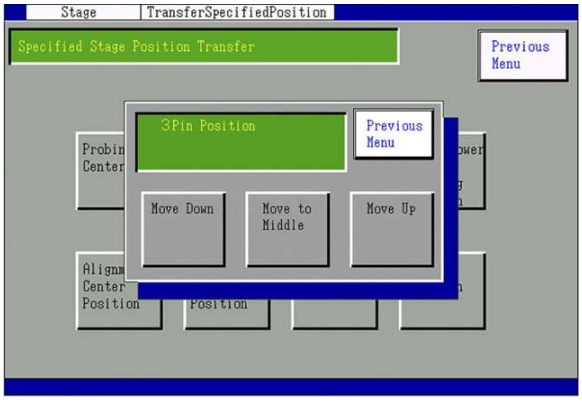


5.6 Press PROBING CENTER on the *Transfer Specified Position Menu*. A check menu is displayed with the message `Transfer Stage?`

5.7 Press YES on the check menu.

5.8 Press 3 PIN POSITION. The *3 Pin Specified Position Menu* is displayed.

3 Pin Specified Position Menu



Checking the DOWN Position

6 Press MOVE DOWN on the *3 Pin Specified Position Menu*. The Z stage rises, the theta bearing activates and the chuck top rotates. A check menu is displayed with the message `Transfer to Down?`

7 Press YES. The Z stage moves to the 3-pin down position.

8 Use the following steps to display the *Stage Control Menu*.

8.1 Press PREVIOUS MENU on the*3 Pin Specified Position Menu*

8.2 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

8.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

8.4 Press XYZΘ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

9 Use the arrow buttons to lower the stage 1000 µm below the current position. The 3-pins are raised.

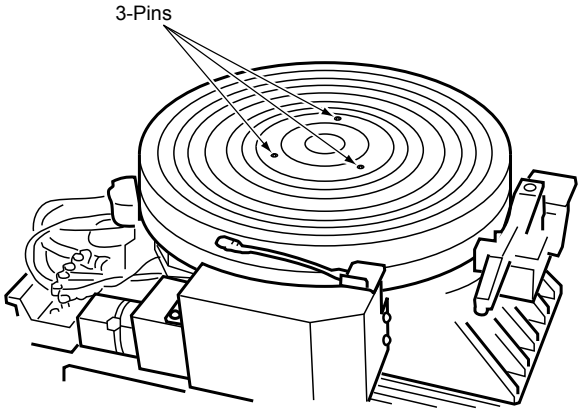
10 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **⚠ CAUTION** **Mechanical Hazard**
> **Before working inside the prober, always exit to a passive screen on the touch screen.**

11 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

12 Visually check that the 3-pins are the same height as the chuck top, or are just below the surface. Verify the position using the highest of the three pins. If they are not at the proper height, note this for future adjustment.

Checking the Down Position



13 Continue with the next subprocedure to check the middle position.

Checking the MIDDLE Position

14 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*.

15 Press 3 PIN POSITION.

16 Press MOVE TO MIDDLE on the *3 Pin Specified Position Menu*. The stage raises, the theta bearing is activated, and the chuck top rotates. A check menu is displayed with the message `Transfer to Middle?`

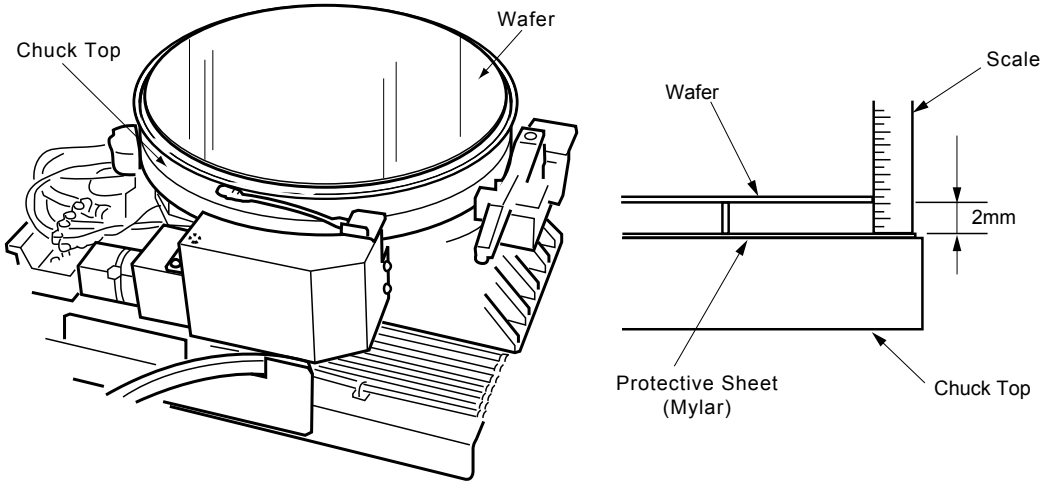
17 Press YES on the check menu. The Z stage moves to the 3-pin middle position.

18 Place a protective Mylar sheet onto the chuck top surface so that the 3-pins protrude through the sheet.

19 Place the 300 mm wafer onto the 3-pins.

20 At several points on the outer edge of the wafer, measure the distance between the chuck top surface and the wafer. At each point, the wafer should be between 1.5 and 2.0 mm above the chuck top surface. If they are not at the proper distance, note this for future adjustment.

Measuring the Middle Position



21 Remove the wafer from the 3-pins.

22 Remove the protective Mylar sheet from the chuck top.

23 Continue with the next subprocedure to check the up position.

Checking the UP Position Height Address

24 Press MOVE UP on the *3-Pin Position Menu*. A check menu is displayed with the message `Transfer to Up position?`

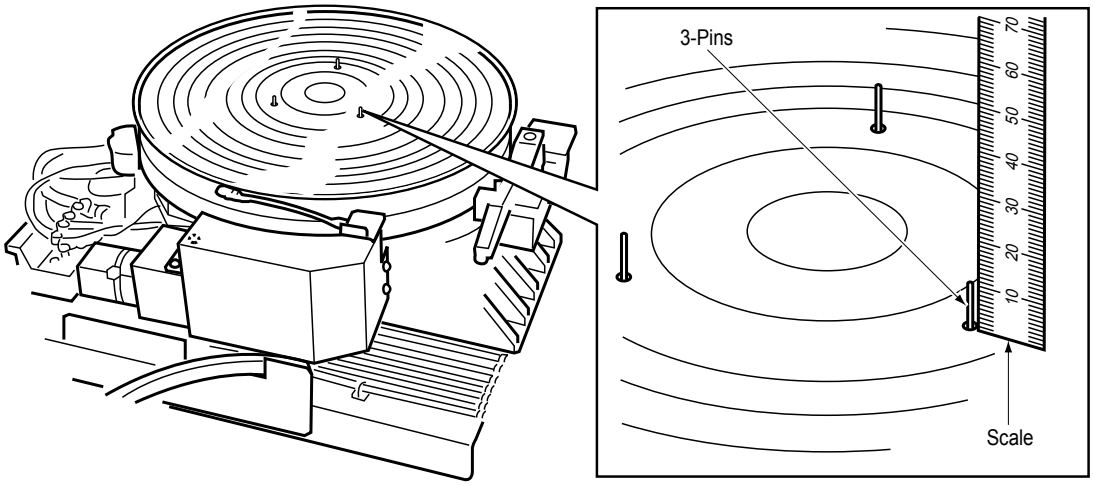
25 Press YES. The Z stage moves to the 3-pin up position

26 Press PREVIOUS MENU to return to the*Transfer Specified Position Menu*.

27 Place a protective Mylar sheet onto the chuck top surface so that the 3-pins protrude through the sheet.

28 Use the scaled ruler to measure the distance from the tip of the 3-pins to the chuck top surface.

Measuring the Up Position



29 Verify that the height of each pin is between 10.50 and 11.0 mm above the chuck top surface. If they are not, note this for future adjustment.

30 Remove the protective Mylar sheet from the chuck top.

31 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

32 Continue to the next subprocedure to restore the prober to normal operating conditions.

Restoring to Normal Operating Conditions

33 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

34 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*. The *Stage Functions Menu* is displayed.

35 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

36 Press PREVIOUS MENU.

37 Press MAIN MENU. A check menu is displayed asking, `Save SYS Information?` Press NO.

6.33 Adjusting the 3-Pin Positions 0836.2

Introduction

Purpose:

To adjust the 3-pin positions.

The 3-pins should be adjusted so that the wafer can be transferred to and from the chuck top correctly.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Scaled ruler Protective Mylar sheet with 3-pin holes Hexagonal wrench
Parts or Consumables:	300 mm wafer

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **The following adjustment procedures begin from the point at which 6.32 Checking the 3-Pin Positions (see page 359) failed to meet specification. Perform the applicable subprocedure(s) for the adjustment needed.**

Preparing the Prober

WARNING **Mechanical Hazard**
The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**
To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

2 Disable the head plate interlock.

3 If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

4 Use the following steps to access the *3 Pin Specified Position Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*.

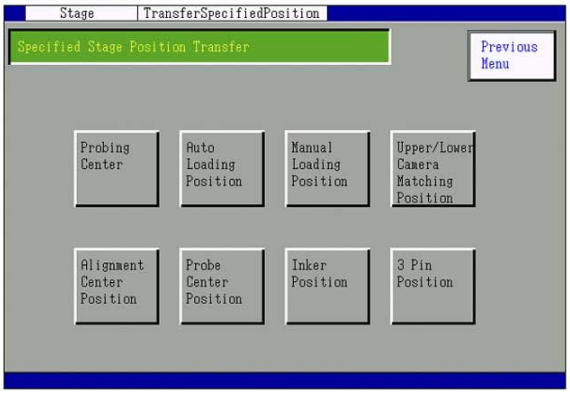
4.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

4.3 Input your password on the numeric keypad and press INPUT.

4.4 Press STAGE on the *Adjustments Menu*. A message menu stating `Not all interference checks are done. Remember this when operating the prober` is displayed. Check for any interference with the stage; if none exit, press OK.

4.5 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustment Menu*. The *Transfer Specified Position Menu* is displayed.

Transfer Specified Position Menu



4.6 Press PROBING CENTER on the *Transfer Specified Position Menu*. A check menu is displayed with the message `Transfer Stage?`

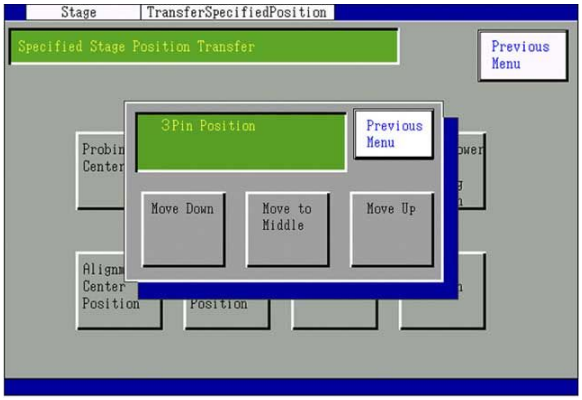
4.7 Press YES on the check menu.

4.8 Press PREVIOUS MENU.

4.9 Press SPECIFIED POSITION.

5 Press 3 PIN POSITION. The *3 Pin Specified Position Menu* is displayed.

3 Pin Specified Position Menu

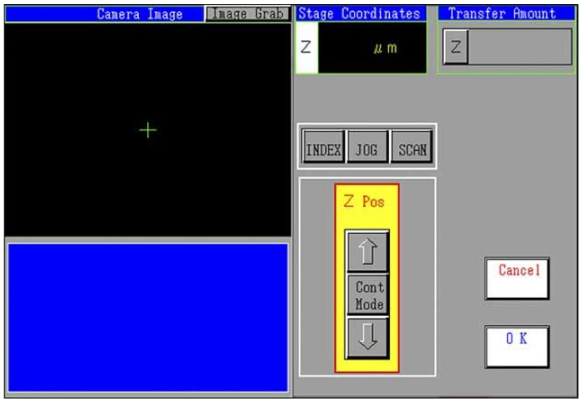


Adjusting the DOWN Position

6 Press DOWN POSITION on the *3–Pin Position Menu*. The chuck top air bearing will activate and the chuck top will rotate. A check menu is displayed with the message `Transfer to down position?`

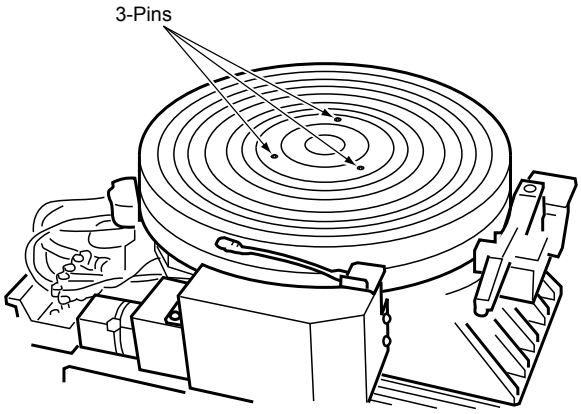
7 Press NO on the check menu. The *Stage Control Menu* is displayed.

Stage Control Menu



8 Use the arrow buttons to adjust the height of the stage so that the tip of the highest 3-pin at the same height as the chuck top surface.

Adjusting the Down Position



9 Use the arrow buttons to raise the stage 1000 µm above the position you adjusted the stage to in step 8. The 3-pins will lower.

10 Press OK on the *Stage Control Menu*. A check menu is displayed.

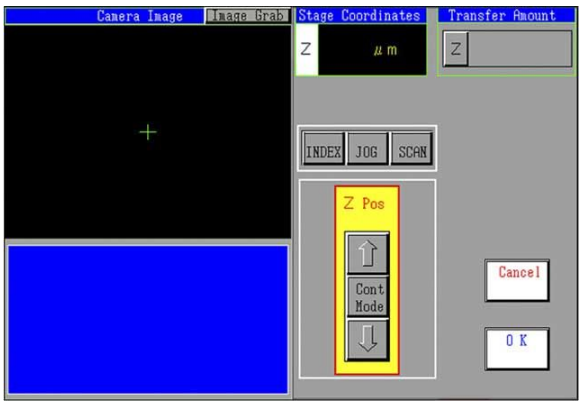
11 Press YES on the check menu. The new down position is registered and the stage rises, the theta bearing is activated and the chuck top rotates.

Adjusting the MIDDLE Position

12 Press WAFER MIDDLE POSITION on the *3 Pin Specified Position Menu.* The chuck top air bearing will activate and the chuck top will rotate in the theta direction to the load pin coordinate. A check menu is displayed with the message `Transfer to mid position?`

13 Press NO on the check menu. The *Stage Control Menu* is displayed.

Stage Control Menu



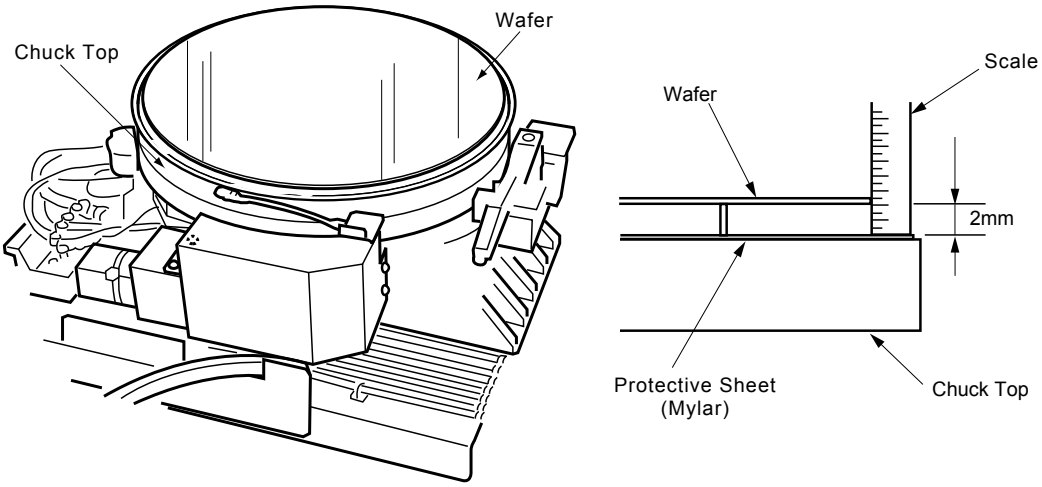
14 Place the protective Mylar sheet on the chuck top with the 3-pins protruding through the sheet.

15 Use the arrow buttons to position the tips of the 3-pins approximately 2.0 mm above the chuck top surface.

16 Place the 300 mm wafer onto the 3-pins.

17 Use the arrow buttons to adjust the distance between the chuck top surface and the wafer until it is between 1.5 and 2.0 mm. Measure the distance using the scaled ruler.

▼ **Adjusting the Middle Position**



18 Remove the wafer from the 3-pins.

19 Remove the protective Mylar sheet from the chuck top.

20 Press OK on the *Stage Control Menu*. A check menu is displayed.

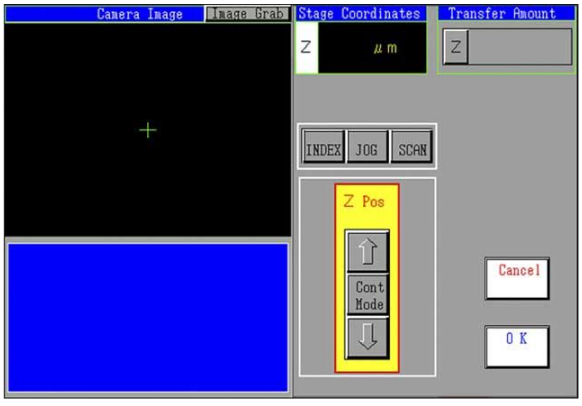
21 Press YES on the check menu. The middle position is registered and the stage rises, the theta bearing is activated, and the chuck top rotates.

Adjusting the UP Position

22 Press UP POSITION on the *3 Pin Specified Position Menu*. The chuck top air bearing will activate and the chuck top will rotate in the theta direction to the load pin coordinate. A check menu is displayed with the message `Transfer to up position?`

23 Press NO on the check menu. The *Stage Control Menu* is displayed.

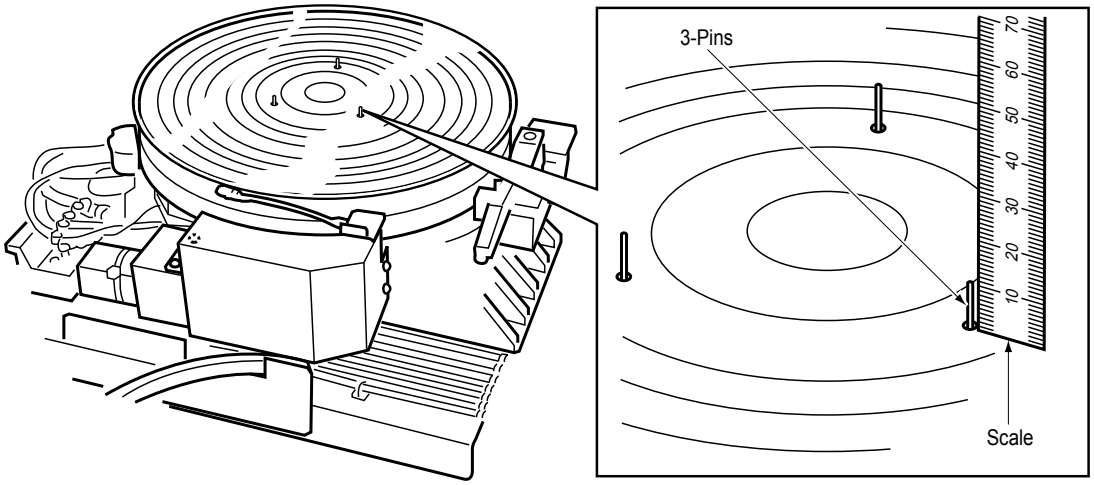
▼ **Stage Control Menu**



24 Place the protective Mylar sheet on the chuck top with the 3-pins protruding through the sheet.

25 Use the arrow buttons to position the tips of the 3-pins are between 10.5 and 11.0 mm above the chuck top surface. Use the scaled ruler to check the distance.

Adjusting the Up Position



26 Remove the protective Mylar sheet from the chuck top.

27 Press OK on the *Stage Control Menu*. A check menu is displayed.

28 Press YES on the check menu. The up position is registered and the stage rises, the theta bearing is activated, and the chuck top rotates.

Restoring to Normal Operating Conditions

29 Press STAGE DIAG MAIN MENU on the *3 Pin Specified Position Menu*.

30 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

31 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

32 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

33 Press PREVIOUS MENU on the *Stage Functions Menu*.

34 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?`

35 Press YES. The 3-pin positions are saved to the SYS information.

6.34 Checking the Probe (Chuck) Camera Position 1004.2

Introduction

Purpose:

To check the probe (chuck) camera unit position (height).

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Probe (chuck) camera position adjustment device Protective Mylar sheet
Parts or Consumables:	None

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to set the probe (chuck) camera position adjustment device on the chuck top.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input the password using the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu stating `Not all interference checks are done. Remember this when operating the prober` is displayed. Press OK on the message menu.

2.5 Press TRANSFER SPECIFIED POSITIONon the *Stage Adjustment Menu*.

2.6 Press PROBING CENTER. A check menu is displayed. Check for any interference with the stage; if none exists, press YES on the check menu. The stage moves to the probing center.

2.7 Press PREVIOUS MENU on the *Specified Stage Position Transfer Menu*.

2.8 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

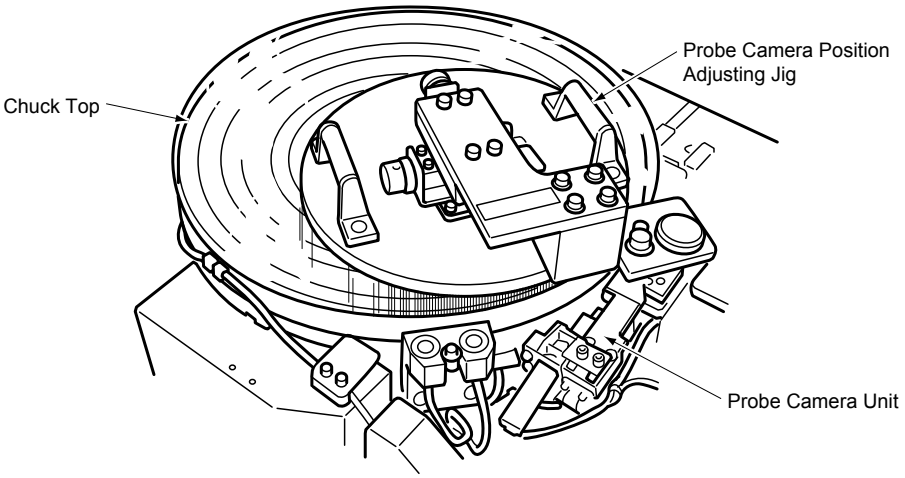
⚠ CAUTION **Mechanical Hazard**

To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.

2.9 Place the protective Mylar sheet over the chuck top.

2.10 Check that there is no damage or dirt on the adjustment device, then set it on the chuck top.

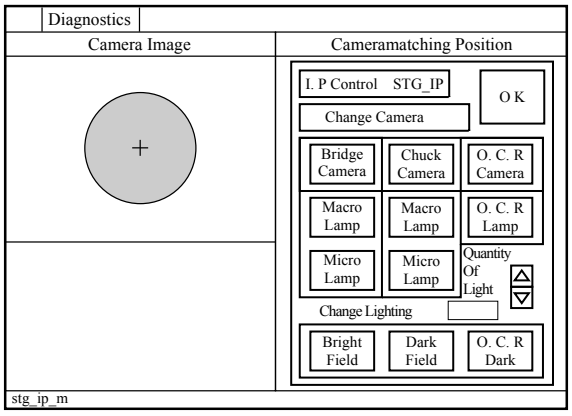
Probe (Chuck) Camera Position Adjustment Device



3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

4 Press I.P. CONTROL on the *All Axis Transfer Menu*. The *I.P. Control STG_IP Menu* is displayed.

I.P. Control STG_IP Menu

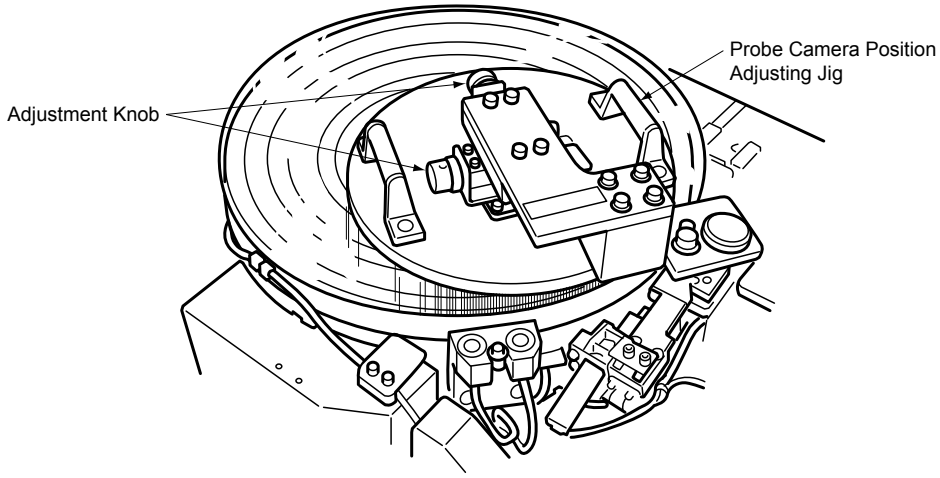


5 Press CHUCK CAMERA on the *I.P. Control STG_IP Menu*.

6 Press MICRO LAMP under `Chuck Camera`.

7 Using the control knobs on the adjustment device, align the crosshairs on the center of the black circle.

Adjustment Knob



8 Use the `Quantity of Light` arrows to adjust the light level.

9 Check that the black dot is in focus.

- If the black dot is in focus, continue to the next step.
- If the black dot is out of focus, perform the procedure described in **6.35 Adjusting the Probe (Chuck) Camera Position (see page 373)**.

10 Press OK on the *I.P. Control STG_IP Menu*.

11 Press PREVIOUS MENU on the *All Axis Transfer Menu*. The *Stage Adjustments Menu* is displayed.

12 Remove the adjustment device from the chuck top.

13 Remove the protective Mylar sheet from the chuck top.

14 Close the head plate.

15 Press BASIC FUNCTIONS.

16 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

17 Press PREVIOUS MENU on the *Stage Functions Menu*.

18 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO.

6.35 Adjusting the Probe (Chuck) Camera Position 1005.2

Introduction

Purpose:

To adjust the probe (chuck) camera unit position (height).

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Screwdriver Hexagonal wrench Protective Mylar sheet Probe (chuck) camera position adjustment device
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to position the stage.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

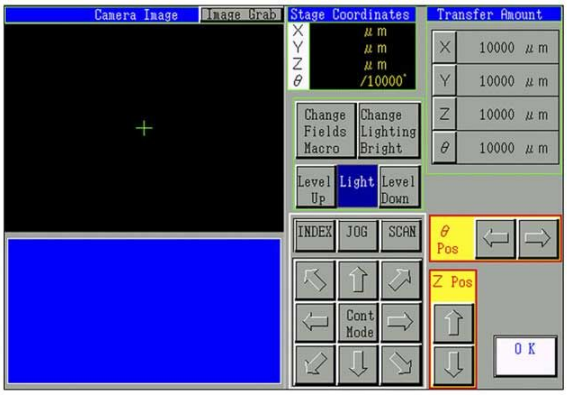
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

2.6 Press XYZ⊖ JOYSTICK TRANSFER on the *All Axis Transfer Menu*. The *Stage Control Menu* is displayed.

Stage Control Menu



2.7 Use the arrow buttons to position the chuck top at the following coordinates:

- X axis: 163000 µm
- Y axis: 165000 µm
- Z axis: 65,000 µm

3 Press OK on the *Stage Control Menu*. The *All Axis Transfer Menu* is displayed.

> **⚠ CAUTION** **Mechanical Hazard**
> **Always revert to a passive screen before reaching into the prober. Injury to personnel may occur by inadvertent use of the stage control keys.**

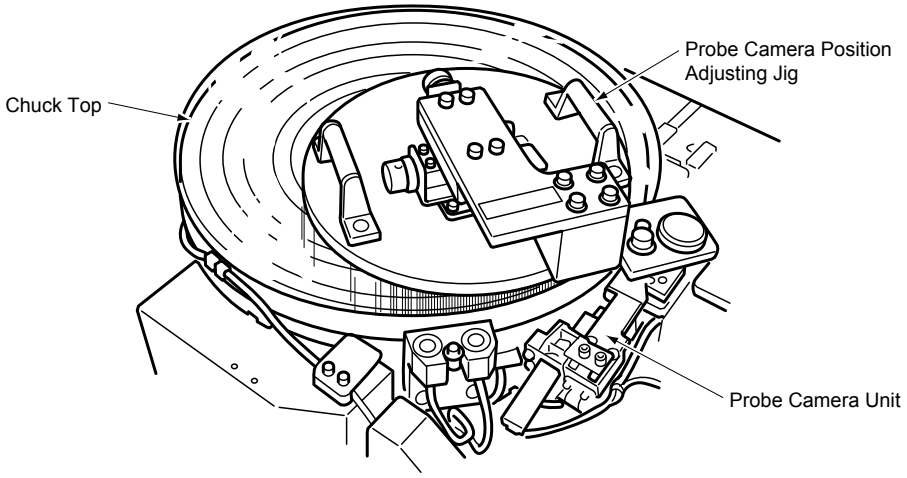
4 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **To avoid a possible mechanical pinch hazard, be sure that the head plate lock mechanism is fully engaged after opening the head plate.**

5 Place the protective Mylar sheet over the chuck top.

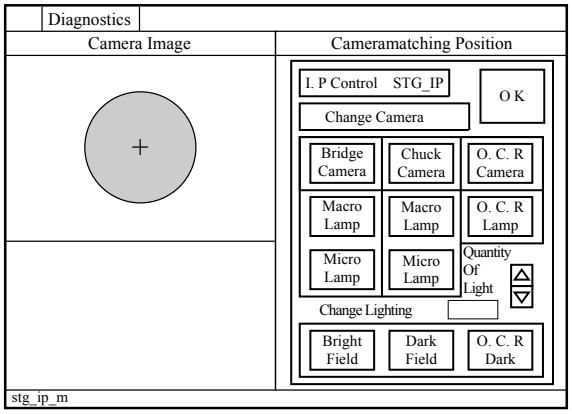
6 Set the probe (chuck) camera position adjustment device on the chuck top.

Probe (Chuck) Camera Position Adjustment Device



7 Press I.P. CONTROL on the *All Axis Transfer Menu*. The *I.P. Control STG_IP Menu* is displayed.

I.P. Control STG_IP Menu

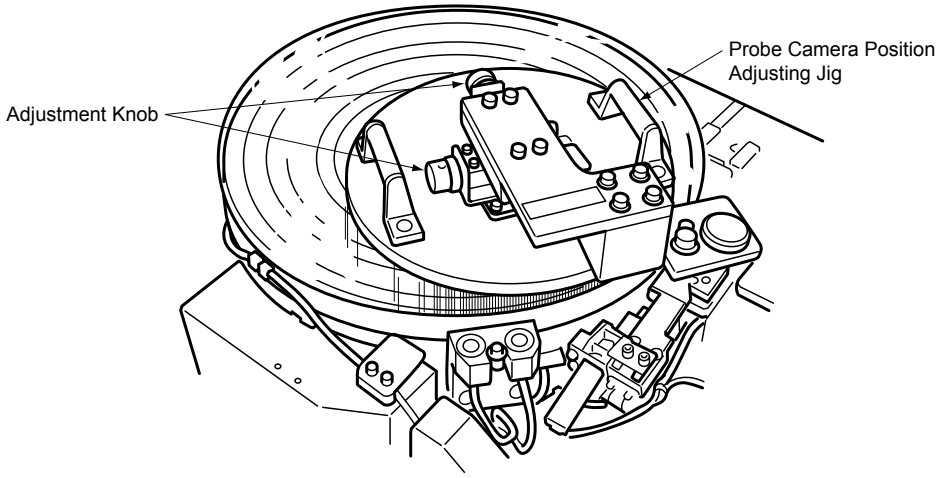


8 Press CHUCK CAMERA on the *I.P. Control STG_IP Menu*.

9 Press MICRO LAMP under `Chuck Camera`.

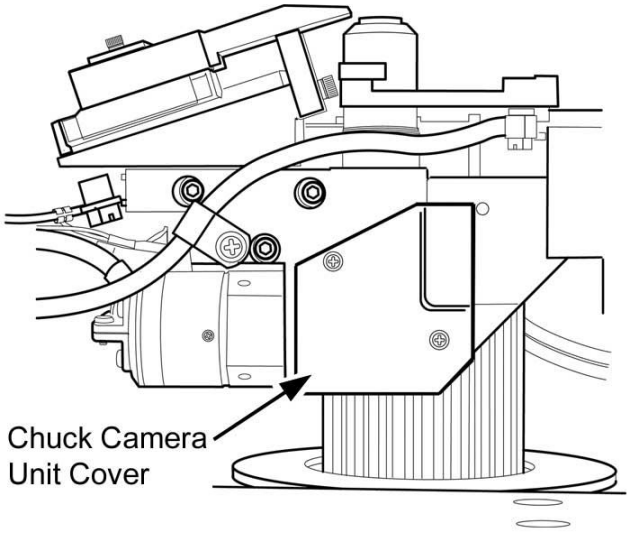
10 Using the control knobs on the adjustment device, align the crosshairs on the center of the black circle.

Adjustment Knob



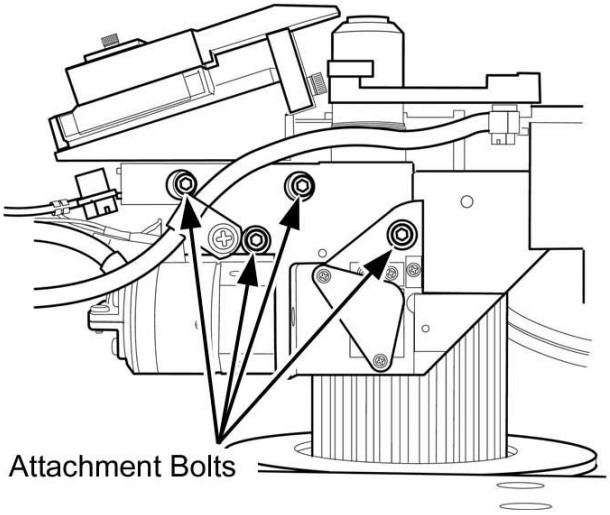
11 Remove the probe (chuck) camera unit cover.

Probe (Chuck) Camera Unit Cover



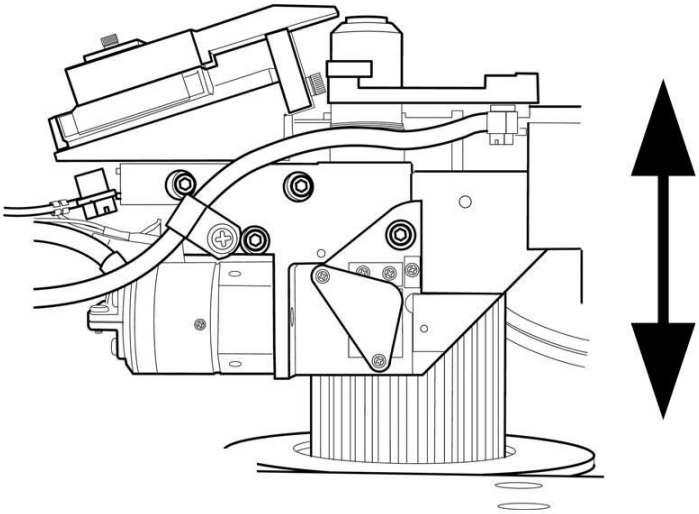
12 Loosen the 4 attachment bolts on the probe (chuck) camera unit.

Probe (Chuck) Camera Unit Attachment Bolts



13 Move the probe (chuck) camera unit up or down as needed to focus the black circle on the *I.P. Control STG_IP Menu*.

Moving the Probe (Chuck) Camera Unit



NOTE **The probe (chuck) camera unit is extremely sensitive. Slight movements can have a significant impact on the focus of the camera image. Use care when adjusting the camera.**

14 Tighten the probe (chuck) camera unit attachment bolts, making sure to tighten the upper bolts first.

CAUTION **Property Damage Hazard**

If the torque is greater than 10 kg·cm, the ASU camera could be damaged. Be sure to tighten the bolts to a torque of 10 kg·cm.

15 Reattach the probe (chuck) camera unit cover.

16 Press OK on the *I.P. Control STG_IP Menu*.

17 Press PREVIOUS MENU on the *All Axis Transfer Menu*. The *Stage Adjustments Menu* is displayed.

18 Remove the adjustment device from the chuck top.

19 Remove the protective Mylar sheet from the chuck top.

20 Close the head plate.

21 Press BASIC FUNCTIONS.

22 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed stating, `Execute Initial?` Press YES. The stage is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

23 Press PREVIOUS MENU on the *Stage Functions Menu*.

24 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO.

6.36 Checking the Alignment Bridge Position 1431.2

Introduction

Purpose:

To check the alignment bridge position.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Scale Hex wrench Screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Check that the air pressure is 0.425 MPa. Refer to the necessary adjustment procedure if the air pressure is out of specification.

2 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

3 Use the following steps to move the chuck top and alignment bridge.

3.1 Press DIAGNOSTICS on the *Main Menu*.

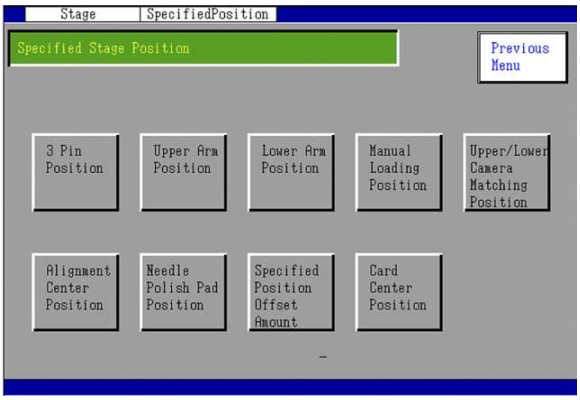
3.2 Press ADJUSTMENTS on the *Diagnostics Menu*

3.3 Enter your password on the *Password Menu* and press RETURN.

3.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interferences with the stage. If none exist, press OK on the message menu.

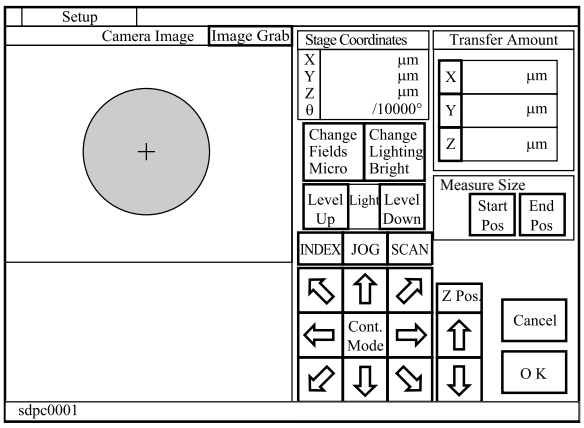
3.5 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

Specified Stage Position Menu



3.6 Press ALIGNMENT CENTER POSITION and press YES to the message. The chuck top and alignment bridge move to the alignment position, and the *Stage Control Menu* is displayed.

Stage Control Menu



4 Verify that the camera image is in the micro field. If the camera image is not in the micro field, switch it into the micro field by pressing CHANGE FIELD.

5 Use the camera image to align the crosshairs onto the center of the chuck top (the center of the black circle). This verifies that the chuck top surface is in focus.

Verify that the coordinates of the X, Y and Z axes are within the following specifications:

- X axis between 176700 and 177300 µm
- Y axis between 210700 and 211300 µm
- Z axis between 3800 and 4200 µm

6 Press CANCEL on the *Stage Control Menu* and YES to the message. The *Specified Stage Position Menu* is displayed.

> **CAUTION** **Property Damage Hazard**
> **Always press CANCEL to exit the *Stage Control Menu*. Pressing OK falsely registers the alignment center coordinate and may cause imprecise alignment.**

7 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

8 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

9 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu asking `Execute Initial?` is displayed. Press YES to initialize the stage.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

10 Press PREVIOUS MENU on the *Stage Functions Menu*.

11 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO.

6.37 Adjusting the Alignment Bridge Position 1432.2

Introduction

Purpose:

To adjust the alignment bridge position.

Required Resources:

Time:	60 minutes
Personnel:	1 person
Tools:	Scale Hex wrench Screwdriver
Parts or Consumables:	Shim

WARNING Mechanical Hazard
The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**and disable the interlock.

CAUTION Mechanical Hazard
When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

2 Disable the head plate interlock.

3 Close the head plate.

4 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION Property Damage Hazard
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

5 Use the following steps to change menus:

5.1 Press DIAGNOSTICS on the *Main Menu*.

5.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

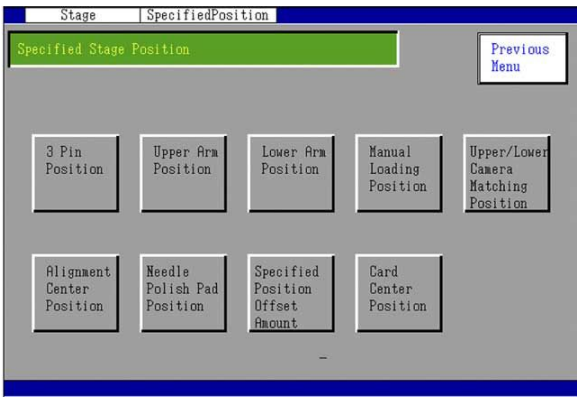
5.3 Enter your password on the *Password Menu*and press INPUT.

5.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.`

Check for any interferences with the stage. If none exist, press OK on the message menu.

5.5 Press SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Specified Stage Position Menu* is displayed.

Specified Stage Position Menu

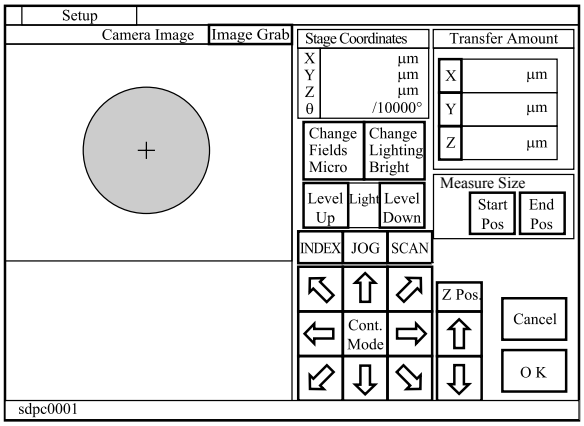


6 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. A check menu is displayed stating `Stage/bridge will move.`

7 Press YES. The stage and alignment bridge move to the alignment center and the *Stage Control Menu* is displayed.

NOTE **While adjusting the alignment bridge position, do not press** OK **on the *Stage Control Menu* until all the adjustments are complete. If you press** OK**, the coordinates of X, Y, and Z axes are automatically saved.**

▼ **Stage Control Menu**



8 Use the arrow buttons to position the chuck top on the coordinate as follows:

- X axis coordinate: 177000 µm
- Y axis coordinate: 211000 µm

9 Select JOG.

10 Press CANCEL to exit to a passive screen.

11 A message is displayed stating `Return BRDG, TRGT, PLSHR, Lamp`. Press NO.

12 Press PREVIOUS MENU.

13 Press ALL AXIS TRANSFER.

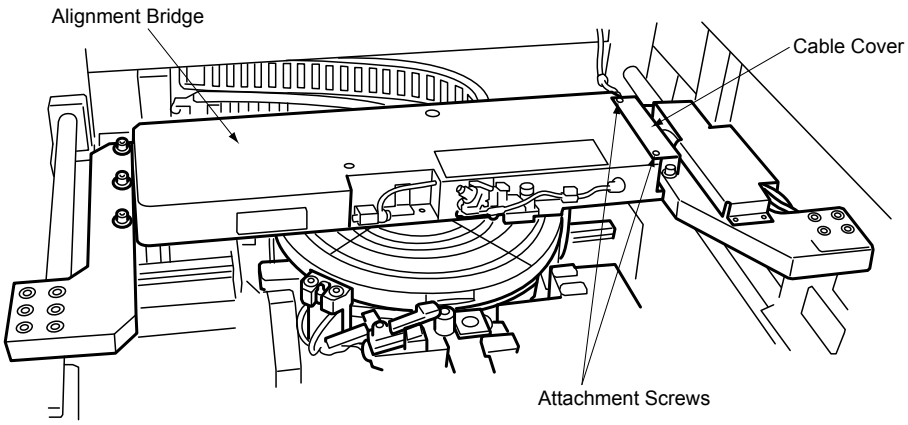
14 Press I.P. CONTROL.

15 Open the head plate.

> **⚠ CAUTION** **Mechanical Hazard**
>
> **When opening the head plate, check that the lock mechanism is in the fully locked position. If not, you may receive a mechanical pinch hazard.**

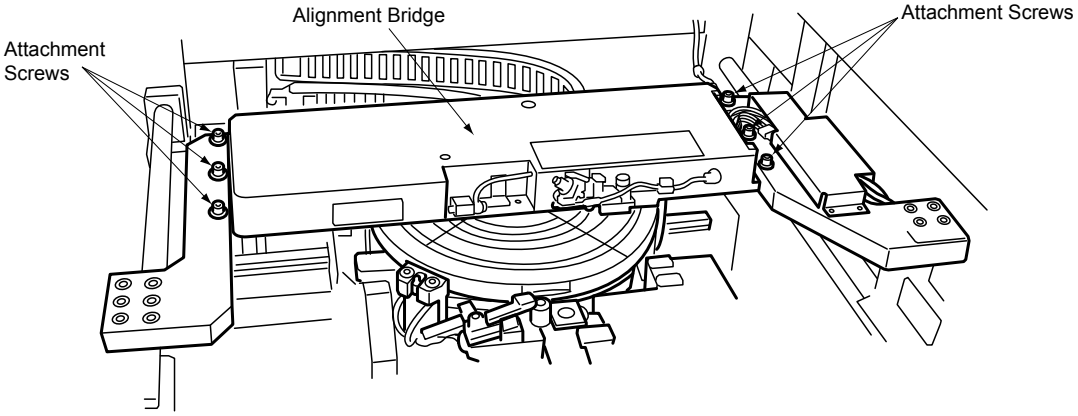
16 Remove the cable cover on the right side of the alignment bridge.

Cable Cover



17 Loosen the attachment screws in 6 places on the alignment bridge.

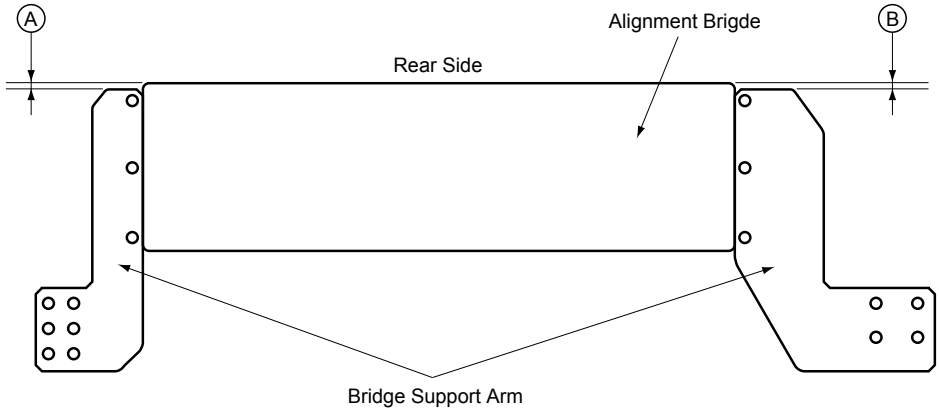
Alignment Bridge Attachment Screws



18 Move the alignment bridge so that the center of the chuck top (the center of the black hole) is displayed in the center of the camera image.

19 Verify that the difference between A and B is within 1 mm, as shown in

Checking the Alignment Bridge Attachment Points



20 Uniformly tighten the attachment screws on the alignment bridge.

21 Verify that the Z axis coordinate is between 3800 and 4200 µm. Perform the following steps if it is out of specification.

21.1 Loosen the attachment screws in six places on the alignment bridge.

21.2 Insert or remove the shims below the mounting screws of the alignment bridge in six places, so that the chuck top surface is focused on the camera image.

21.3 After the adjustment, uniformly tighten the attachment screws on the alignment bridge.

NOTE **Always use Tokyo Electron-manufactured shims.**
Contact the TEL Field Service Support for adding shims.

21.4 Attach the cable cover.

22 Perform the following steps to switch menus:

NOTE **While adjusting the alignment bridge position, do not press** OK **on the *Stage Control Menu* until all adjustments are complete.**
If you press OK**, the coordinates of X, Y, and Z axes are automatically saved.**

22.1 Press OKon the *I.P. Control Menu*.

22.2 Press PREVIOUS MENU on the *All Axis Transfer Menu*.

22.3 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

22.4 Press INSPECT on the *Stage Functions Menu*.

22.5 Press SOLENOID DRIVE TESTon the *Stage Inspections Menu*. The *Solenoid Drive Test Menu* is displayed.

▼ **Solenoid Drive Test Menu**

23 Verify that the delay time is set at a minimum of 6 seconds. If it is not, input the correct delay time.

24 Press BRIDGE.

The alignment bridge travels and returns between the alignment position and the escape position. The alignment bridge transfer time is displayed.

25 Press CANCEL when the alignment bridge travels and returns 10 times.

26 Perform the following steps to move the chuck top and alignment bridge.

26.1 Press STAGE DIAG MAIN MENU on the*Solenoid Drive Test Menu*.

26.2 Press SPECIFIED POSITION on the *Stage Adjustments Menu*.

26.3 Press ALIGNMENT CENTER POSITION on the *Specified Stage Position Menu*. A check menu stating is displayed stating, `Stage/bridge will move.`

26.4 Press YES. The stage and alignment bridge move to the alignment center and the *Stage Control Menu* is displayed.

27 Verify that the camera image is in the micro field.

If the camera image is not in the micro field, switch it into the micro field by pressing CHANGE FIELD.

28 Use the camera image to align the crosshairs onto the center of the chuck top (the center of the black circle). This verified that the chuck top surface is in focus.

Perform the following steps when you cannot find the crosshair position.

28.1 Align the crosshairs on the hold in the center of the chuck top, then focus on the chuck top surface.

28.2 Verify that the coordinates of the X, Y and Z axes are within the following specifications:

- X axis: 176700 to 177300 µm
- Y axis: 210700 to 211300 µm
- Z axis: 3800 to 4200 µm

29 PressOK on the *Stage Control Menu*.

NOTE **Make sure that all adjustments are complete before pressing** OK **on the *Stage Control Menu*.**
If you press OK**, the X, Y and Z coordinates are automatically saved.**

30 A message is displayed stating `Return BRDG, TRGT, PLSHR, Lamp`. Press YES.

31 Press PREVIOUS MENU on the *Specified Stage Position Menu*.

32 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu stating is displayed stating, `Save SYS Information?`

33 Press YES to save the alignment bridge position to the SYS Information.

34 Enable the interlock of the head plate, then close the head plate.

⚠ CAUTION **Mechanical Hazard**

After performing maintenance, make sure to enable the interlock function on the prober. It can cause serious injury if the prober is used without the interlock function enabled.

35 An error will occur. Press INITIALIZE on the error menu.

6.38 Checking the Target Position and Focus 1434.2

Introduction

Purpose:

To check the target position.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

Prerequisite Skills:

Tokyo Electron's P-12XL Operations and Maintenance training course.

Any local test floor required training for dealing with the hazards described in this procedure.

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

2 Use the following steps to change menus.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input the password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the probe.` Press OK on the message menu.

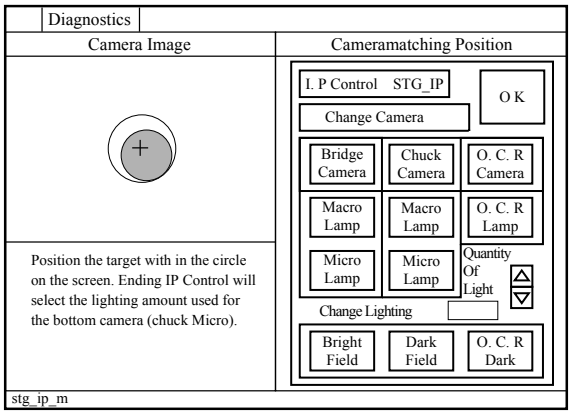
2.5 Press SPECIFIED POSITION on the *Stage Adjustments Menu*.

2.6 Press UPPER/LOWER CAMERA MATCHING POSITION on the *Specified Position Menu*.

2.7 Press ADJUST THE CHUCK TARGET POSITION on the *Upper/Lower Camera Matching Position Menu*. A check menu is displayed stating `Return BRDG, TRGT, PLSHR, LAMP?`

2.8 Press YES on the check menu. The *Camera Matching Position Menu* is displayed.

Camera Matching Position Menu

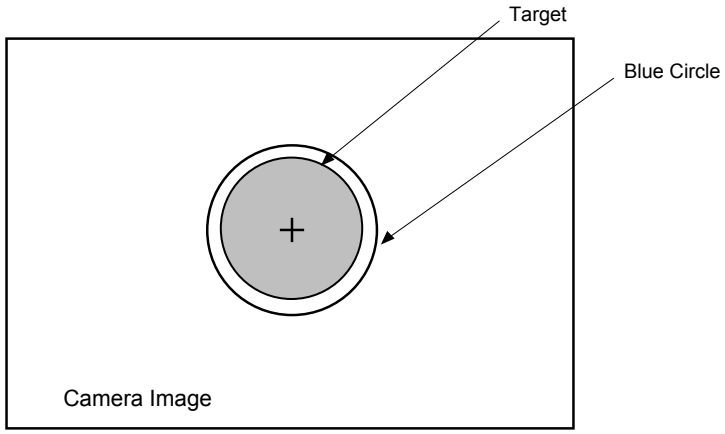


3 Check the target.

- The target should be completely within the blue circle.
- The target should be in focus.

If the target is not in the blue circle, or if the target is out of focus, contact TEL Field Service Support.

Sample Target



4 Use the following steps to initialize the stage.

4.1 Press OK to exit the *Camera Matching Position Menu*.

4.2 Press STAGE DIAG MAIN MENU on the *Upper/Lower Camera Matching Position Menu*.

4.3 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

4.4 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed, stating `Execute Initial?` Press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

5 Press PREVIOUS MENU on the *Basic Functions Menu*. The *Stage Adjustments Menu* is displayed.

6 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed, stating `Save SYS Information?` Press NO.

6.39 Checking the Upper/Lower Camera Matching Position 1435.2

Introduction

Purpose:

To check the offset position of the bridge camera and the probe (chuck) camera.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Check that the air pressure is 0.425 MPa. Refer to the necessary adjustment procedure if the air pressure is out of specification.

2 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

3 Use the following steps to switch the menus.

3.1 Press DIAGNOSTICS on the *Main Menu*.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

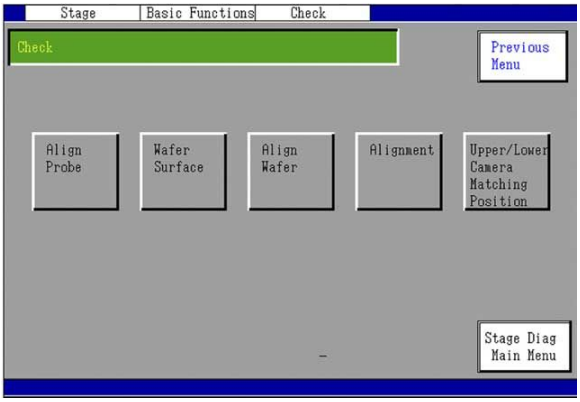
3.3 Enter your password on the *Password Menu* and press INPUT.

3.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

3.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

3.6 Press CHECK on the *Stage Functions Menu*. A *Check Menu* is displayed.

▼ **Check Menu**



4 Press UPPER/LOWER CAMERA MATCHING POSITION on the *Check Menu*. The prober performs matching on the upper/lower camera position.

5 Repeat Step 4 five times to verify that there is no error. If an error occurs, refer to **6.40 Adjusting the Upper/Lower Camera Matching Position (see page 394)** to adjust the position; otherwise, proceed to step 6.

6 Press STAGE DIAGNOSTICS MAIN MENU.

7 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu stating is displayed stating, `Save SYS Information?` Press YES to save the position information.

6.40 Adjusting the Upper/Lower Camera Matching Position 0818.2

Introduction

Purpose:

To adjust the upper/lower camera matching position.

Set the bridge camera and probe (chuck) camera to the positions where they can recognize the target mark under proper lighting.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to switch menus.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

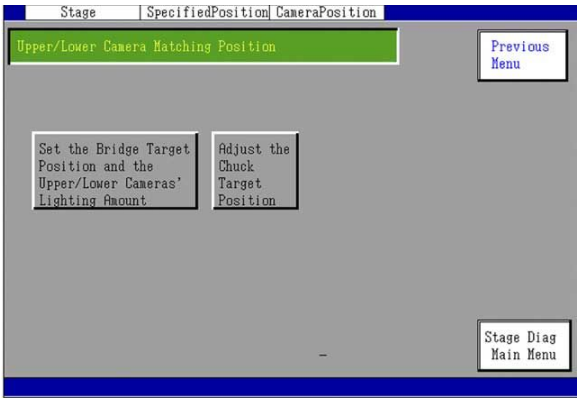
2.3 Enter your password on the *Password Menu* and press RETURN.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, pressOK.

2.5 Press SPECIFIED POSITION on the *Stage Adjustment Menu*.

2.6 Press UPPER/LOWER CAMERA MATCHING POSITION on the *Specified Position Menu*. The *Upper/Lower Camera Matching Position Menu* is displayed.

▼ **Upper/Lower Camera Matching Position Menu**

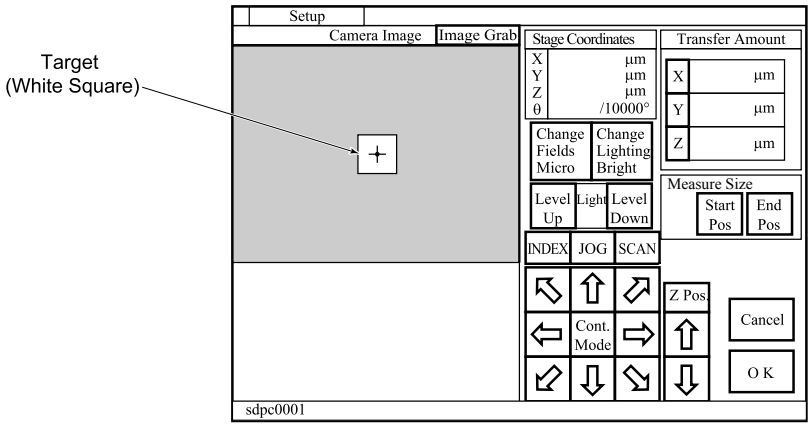


3 Press SET THE BRIDGE TARGET POSITION AND THE UPPER/LOWER CAMERA'S LIGHTING AMOUNT on the *Upper/Lower Camera Matching Position Menu*. A check menu is displayed with the message `Transfer to Macro Position?`

4 Press YES.

The stage and alignment bridge move to the macro position. The *Stage Control Menu* is displayed. Also, the camera image displays the target (a white square) in the macro field.

▼ **Stage Control Menu**



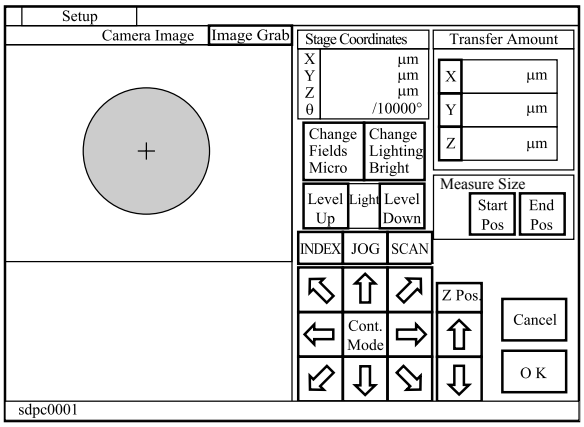
5 Perform a rough adjustment in the macro field.

Use the arrow buttons to position the crosshairs on the black point in the center of the white square.

NOTE **If the camera image is set to "Dark", press CHANGE LIGHTINGto set it to "Bright." If the image is out of focus, refocus the image.**

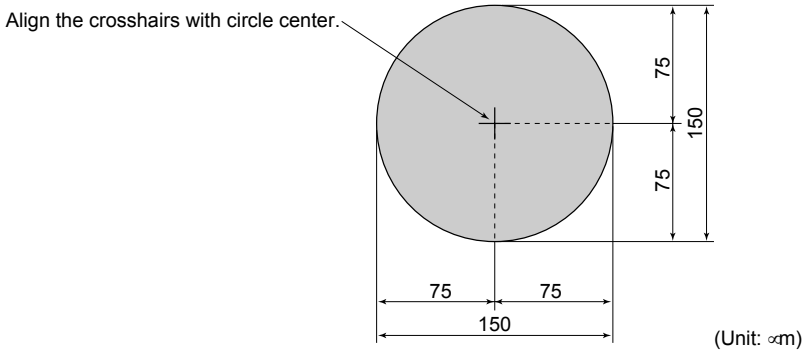
6 Press OK on the Stage Control Menu. The camera image switches to the micro field. Increase the light level to around 75.

Stage Control Menu



7 Precisely align the crosshairs on the center of the target (the center of the black circle) in the micro field. The black circle is 150 µm in diameter.

Positioning the Crosshairs

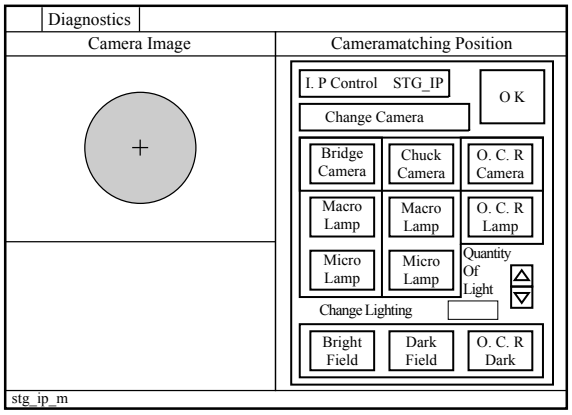


NOTE **If the camera image is set to "Dark", press CHANGE LIGHTING to set it to "Bright." If the image is out of focus, refocus the image.**

8 Press OKon the *Stage Control Menu*

The *I.P. Control STG_IP Menu* is displayed.

▼ **I.P. Control STG_IP Menu**



9 Use the following steps to set the micro lamp of the probe (chuck) camera.

NOTE **The micro lamp is the only lamp you can set.**

9.1 Press CHUCK CAMERA on the *I.P. Control STG_IP Menu*.

9.2 Press theMICRO LAMP button, located below the CHUCK CAMERAbutton.

9.3 Use the up/down arrows to adjust the quantity of light lighter or darker, so that the edge of the target is clear.

NOTE **Set the lighting between 15 and 20.**

9.4 Press OK. The *Upper/Lower Camera Matching Position Menu*is displayed.

9.5 Press PREVIOUS MENU.

10 Press SPECIFIED POSITION OFFSET AMOUNT. The *Specified Position Offset Menu* is displayed.

▼ **Specified Position Offset Menu**

11 Verify that every axis value of "Upper/Lower Camera" is within the following specification.

- X axis: –2000 to 2000 µm
- Y axis: –2000 to 2000 µm

- Z axis: –1000 to 1000 µm

12 Press STAGE DIAG MAIN MENU on the *Specified Position Offset Menu*.

13 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

14 Press CHECK on the *Stage Functions Menu*

15 Press UPPER/LOWER CAMERA MATCHING POSITION on the check menu. The prober will match the upper/lower camera position.

16 Verify that an error does not occur while matching the upper/lower camera position.

Repeat steps 3 through 16 if an error does occur.

17 Press STAGE DIAG MAIN MENU on the check menu.

18 Press MAIN MENUon the check menu.

A check menu that says is displayed asking, `Save SYS Information?`

Press YES to save the new setting.

6.41 Checking the Bridge Camera Macro/Micro Optical Offset 1437.2

Introduction

Purpose:

To verify that the crosshairs are in the same position in both the macro and micro field on the camera image of the bridge camera.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Wafer Transfer Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

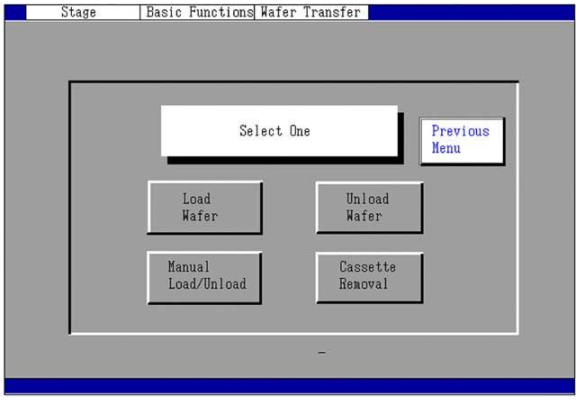
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

2.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

▼ **Wafer Transfer Menu**



2.7 Press LOAD WAFER on the *Wafer Transfer Menu*.

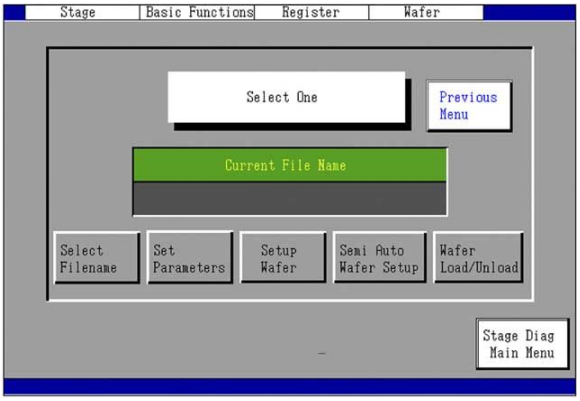
3 Load a wafer onto the chuck top.

4 Use the following steps to create a new file name.

4.1 Press INPUT on the *Stage Functions Menu*.

4.2 Press WAFER on the *Register Menu*. The *Wafer Menu* is displayed.

▼ **Wafer Menu**



4.3 Press SELECT FILENAME on the *Wafer Menu*. Select the correct wafer file.

5 Press OK on the *Wafer Menu*. Set the parameters for the wafer to be used.

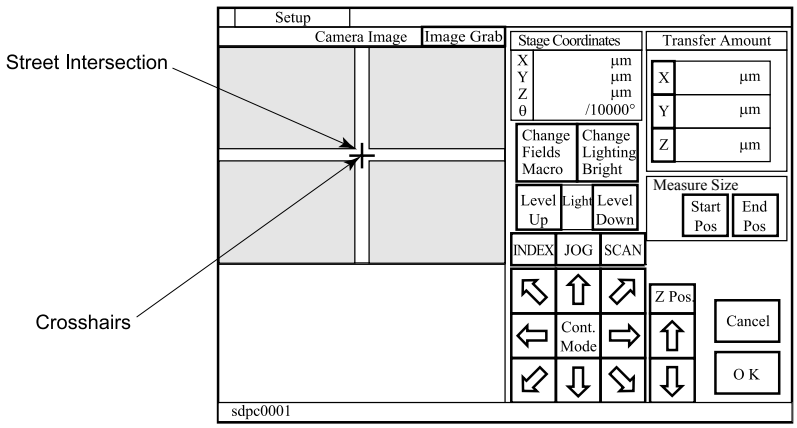
6 Press SEMI AUTO WAFER SETUP on the *Wafer Menu*. A check menu is displayed stating, `Stage/bridge will move.` Press YES. The *Stage Control Menu* is displayed.

7 Use the following steps to verify that the crosshairs are in the same position in both the macro and micro field views.

7.1 Use the arrow buttons to position the crosshairs over the street intersection.

NOTE **It is easier to check the position if you select an easily identified mark, even when the field is changed. For example, use the street intersection to complete the check.**

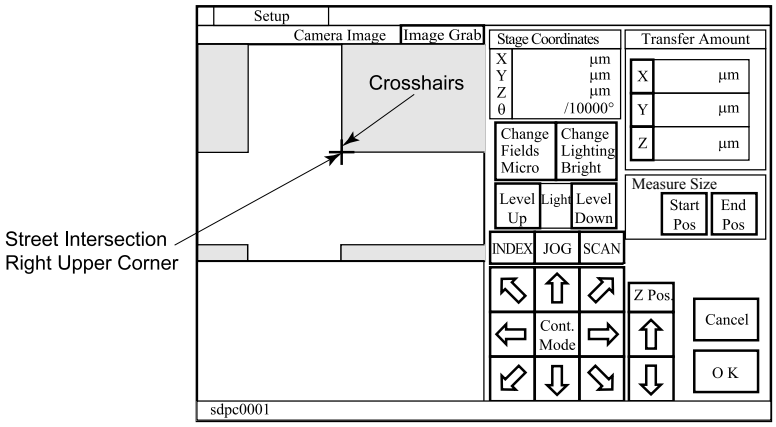
Positioning the Crosshairs (Macro)



7.2 Press CHANGE FIELD on the *Stage Control Menu*.

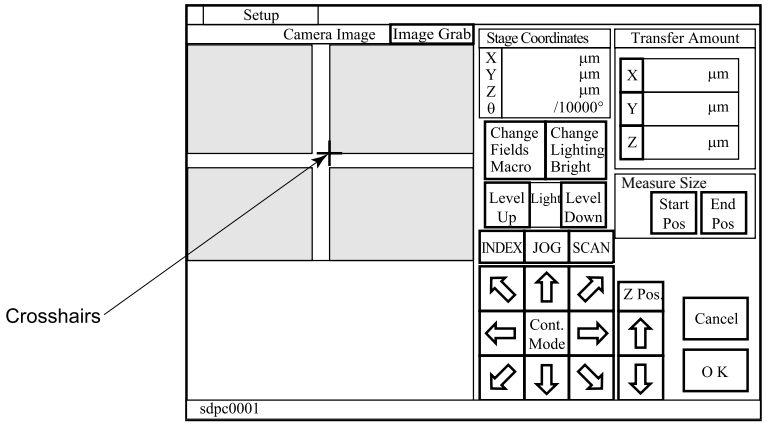
7.3 Use the arrow buttons to position the crosshairs over one corner of the street intersection.

Positioning the Crosshairs (Micro)



7.4 Press CHANGE FIELD on the *Stage Control Menu*.

Verifying the Crosshairs Position



7.5 Verify that the crosshairs are in the same position in both the macro and micro field view.

If the crosshairs are in different positions, go to **6.42 Adjusting the Bridge Camera Macro/ Micro Optical Offset (see page 403)**.

7.6 Press CANCEL on the *Stage Control Menu*. Press YES to the message. The *Register Menu* is displayed.

8 Press PREVIOUS MENU twice on the *Register Menu*.

9 Press WAFER TRANSFER on the *Stage Functions Menu*.

10 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

11 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed, stating `Execute Initial?` Press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

12 Press PREVIOUS MENU.

13 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu stating is displayed stating, `Save SYS Information?`. Press NO.

6.42 Adjusting the Bridge Camera Macro/Micro Optical Offset 1438.2

Introduction

Purpose:

To adjust the camera image of the bridge camera so that the crosshairs are on the same position in both the macro and micro field.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Wafer Transfer Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

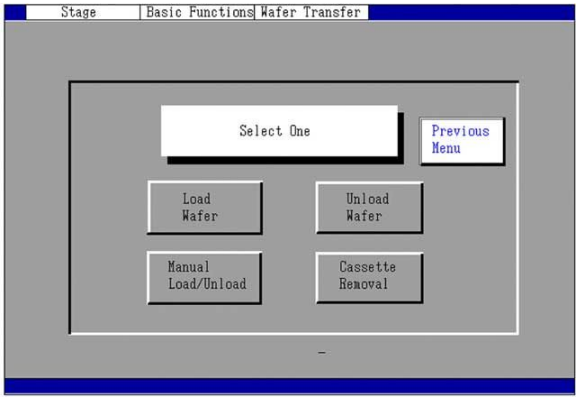
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

2.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



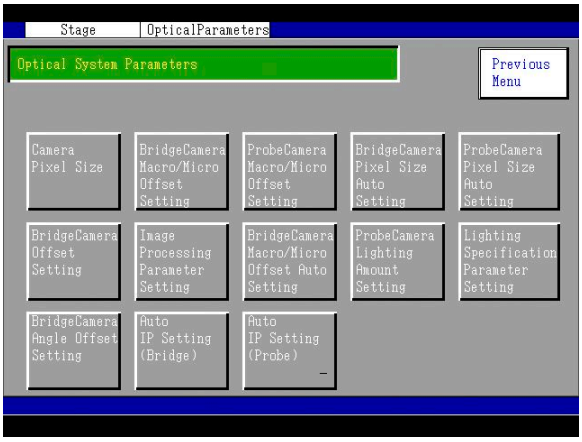
2.7 Press LOAD WAFER on the *Wafer Transfer Menu*.

3 Load a wafer onto the chuck top.

4 Press PREVIOUS MENU on the *Stage Functions Menu*.

5 Press OPTICAL SYSTEM PARAMETERS. The *Optical System Parameters Menu* is displayed.

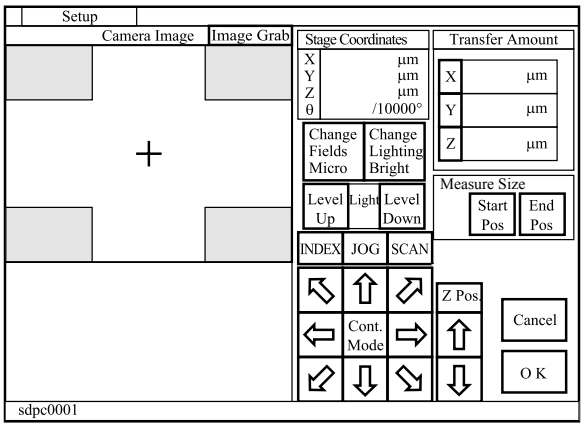
Optical System Parameters Menu



6 Press BRIDGE CAMERA MACRO/MICRO OFFSET SETTING. A check menu is displayed stating, `Transfer to micro position.`

7 Press YES on the check menu. The *Stage Control Menu* is displayed with the camera in the micro field view.

Stage Control Menu



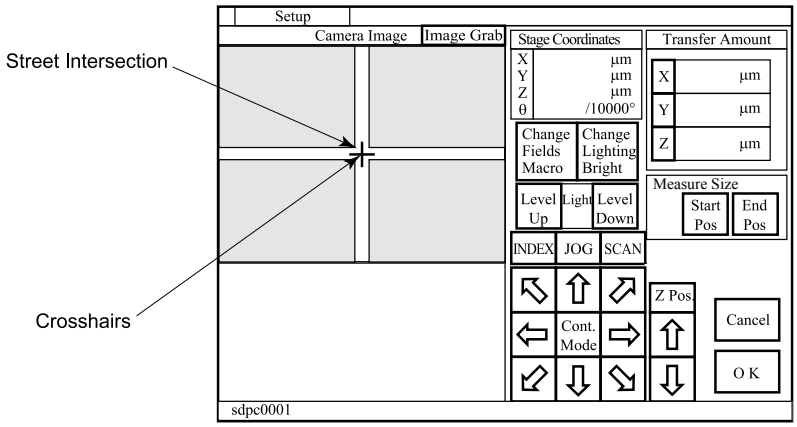
8 Use the following steps to adjust the crosshairs so that they are in the same position in both the macro and micro field view.

8.1 Press CHANGE FIELDS on the *Stage Control Menu* to switch to the macro field view.

8.2 Use the arrow buttons to position the crosshairs over the street intersection.

NOTE **It is easier to check the position if you select an easily identified mark, even when the field is changed. For example, use the street intersection to complete the check.**

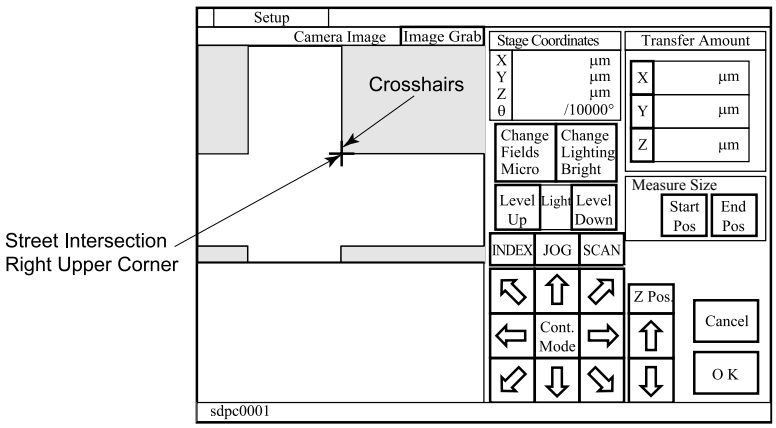
Positioning the Crosshairs (Macro)



8.3 Press CHANGE FIELD on the *Stage Control Menu* to switch to the micro field view.

8.4 Use the arrow buttons to position the crosshairs over one corner of the street intersection.

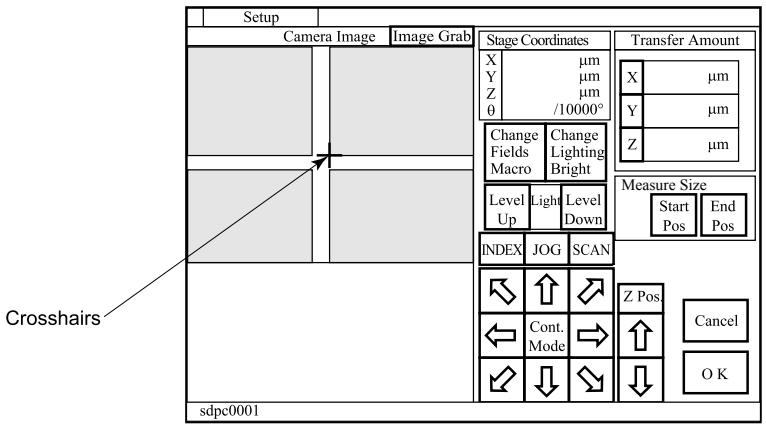
Positioning the Crosshairs (Micro)



8.5 Press OK on the *Stage Control Menu*. The micro field offset position is registered. Press YES and the camera image switches to the macro field view.

8.6 Use the arrow buttons to position the crosshairs over the same street intersection corner that was registered in the micro field.

Verifying the Crosshairs Position



8.7 Press OK on the *Stage Control Menu*. The macro field offset position is registered. Press YES and the *Optical System Parameters Menu* is displayed.

9 Press PREVIOUS MENU on the *Optical System Parameters Menu*.

10 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

11 Press WAFER TRANSFER on the *Stage Functions Menu*.

12 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

13 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed, stating `Execute Initial?` Press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

14 Press PREVIOUS MENU on the *Stage Functions Menu*.

15 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?`

16 Press YES on the check menu. The bridge macro/micro camera offset data is saved. The *Main Menu* is displayed.

6.43 Checking the Bridge Camera Pixel Size 1440.1

Introduction

Purpose:

To check the bridge camera pixel size.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Camera Pixel Size Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

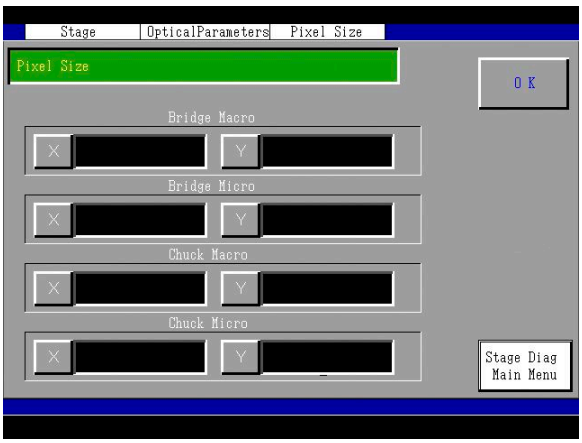
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press OPTICAL SYSTEM PARAMETERS.

2.6 Press CAMERA PIXEL SIZE. The *Camera Pixel Size Menu* is displayed.

Camera Pixel Size Menu



3 Verify that the parameters are within the following specifications:

For VIP PCB:

- Bridge Macro pixel size:
  X = 21.000000 to 24.000000 µm
  Y = 21.000000 to 24.000000 µm
- Bridge Micro pixel size:
  X = 0.500000 to 0.580000 µm
  Y = 0.500000 to 0.580000 µm

If any of the values is outside the specification, go to **6.44 Adjusting the Bridge Camera Pixel Size (see page 410)**.

4 Press STAGE DIAG MAIN MENU on the *Pixel Size Menu*.

5 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO.

6.44 Adjusting the Bridge Camera Pixel Size 1441.2

Introduction

Purpose:

To adjust the bridge camera pixel size.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Wafer Transfer Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

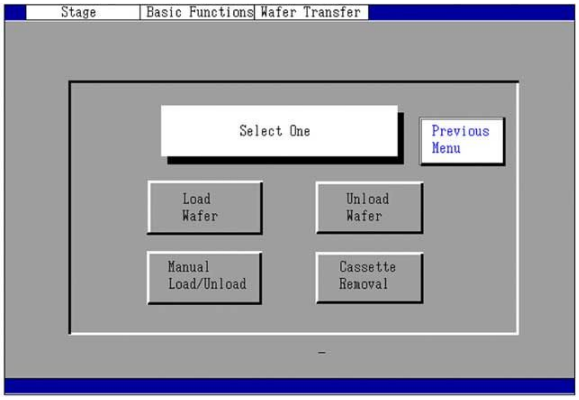
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

2.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



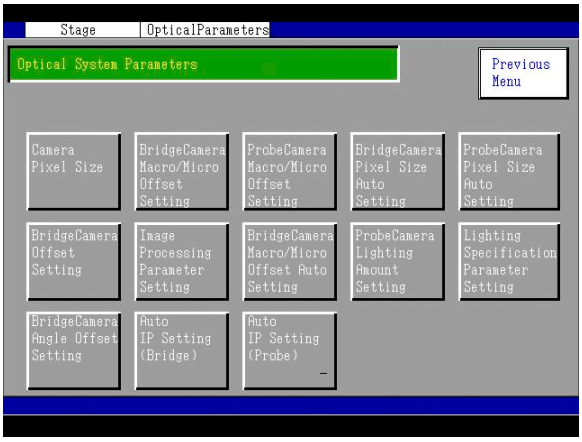
2.7 Press LOAD WAFER on the *Wafer Transfer Menu*.

3 Load a wafer onto the chuck top.

4 Press PREVIOUS MENU on the *Stage Functions Menu*.

5 Press OPTICAL SYSTEM PARAMETERS. The *Optical System Parameters Menu* is displayed.

Optical System Parameters Menu

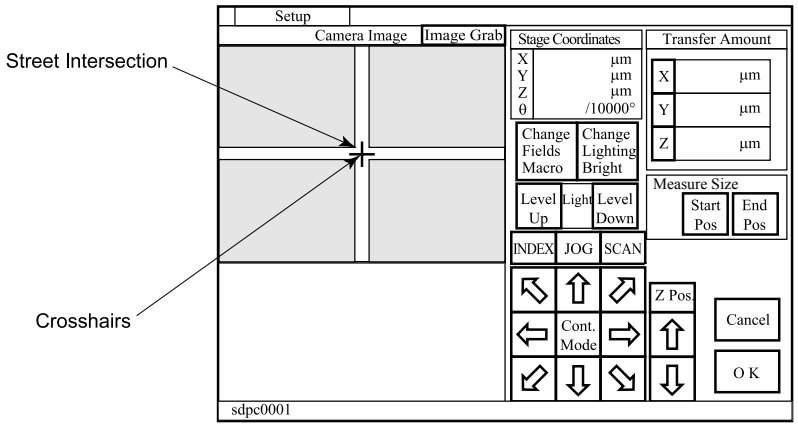


6 Press BRIDGE CAMERA PIXEL SIZE AUTO SETTING. A check menu is displayed stating, `Transfer to micro position.`

Press YES on the check menu. The *Stage Control Menu* is displayed.

7 Follow the instructions on the *Stage Control Menu* to position the crosshairs over the street intersection.

▼ **Stage Control Menu**



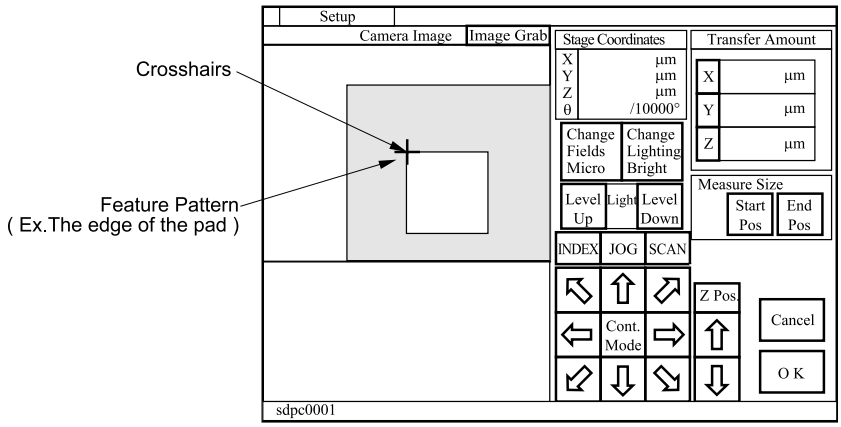
8 Press OK. A message menu is displayed stating, `Execute automatic setting.`

9 Press YES. on the check menu. The prober obtains the pixel information in the macro field, then a check menu is displayed stating, `Transfer Stage?`

10 Press YES. The camera image switches to the micro field view.

11 Follow the directions on the *Stage Control Menu* to position the crosshairs on the corner of the pad.

▼ **Pad Corner**



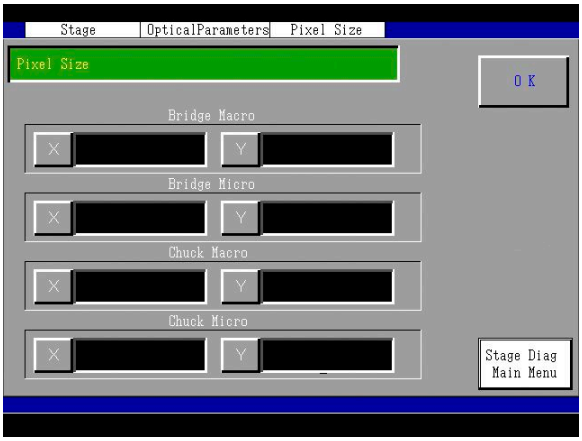
12 Press OK on the *Stage Control Menu*. A check menu is displayed stating, `Execute automatic setting?`

13 Press YES on the check menu. The prober obtains the pixel information in the micro field and a check menu is displayed stating, `Return BRDG, TRGT, PLSHR, LAMP.`

14 Press YES on the check menu. The *Optical System Parameters Menu* is displayed.

15 Press CAMERA PIXEL SIZE. The *Camera Pixel Size Menu* is displayed.

Camera Pixel Size Menu



16 Verify that the parameters are within the following specifications:

For VIP PCB:

- Bridge Macro pixel size:
  X = 21.000000 to 24.000000 µm
  Y = 21.000000 to 24.000000 µm
- Bridge Micro pixel size:
  X = 0.500000 to 0.580000 µm
  Y = 0.500000 to 0.580000 µm

17 Press STAGE DIAG MAIN MENU on the *Optical System Parameters Menu*.

18 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

19 Press WAFER TRANSFER on the *Stage Functions Menu*.

20 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

21 Press INITIALIZE STAGE on the *Stage Functions Menu*. A check menu is displayed, stating `Execute Initial?` Press YES. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

22 Press PREVIOUS MENU.

23 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu stating is displayed stating, `Save SYS Information?`. Press YES. The information is saved.

6.45 Setting the Chuck Top Center 1442.2

Introduction

Purpose:

To set the chuck top center.

The chuck top center is set based on the target position.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Wafer Transfer Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

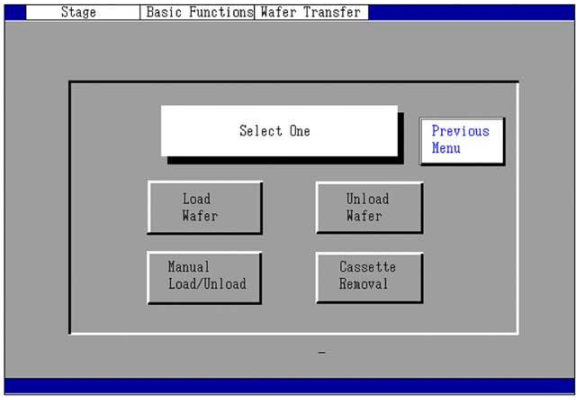
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

2.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

▼ **Wafer Transfer Menu**



2.7 Press LOAD WAFER on the *Wafer Transfer Menu*.

3 Load a wafer onto the chuck top.

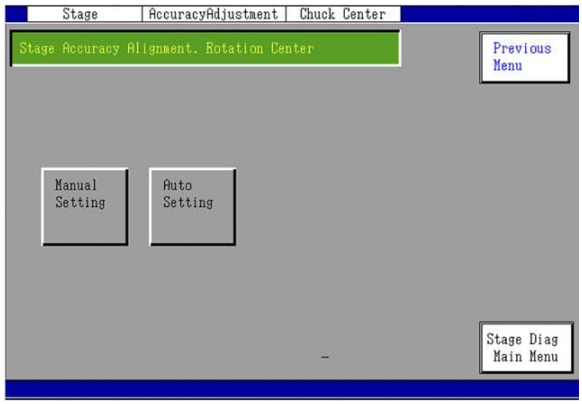
4 Use the following steps to display the *Stage Accuracy Alignment, Rotation Center Menu*.

4.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

4.2 Press ACCURACY ADJUSTMENT on the *Stage Adjustments Menu*.

4.3 Press CHUCK CENTER on the *Stage Accuracy Adjustments Menu*. The *Stage Accuracy Alignment, Rotation Center Menu* is displayed.

▼ **Stage Accuracy Alignment, Rotation Center Menu**

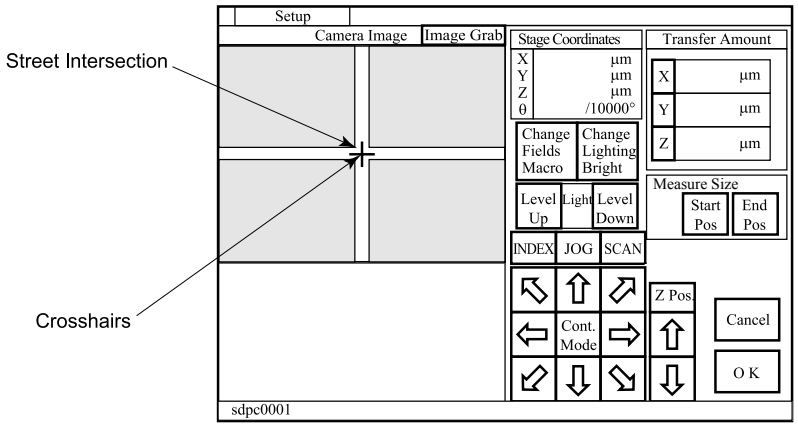


5 Press AUTO SETTING. A check menu is displayed stating, `Stage/Bridge will move.`

6 Press YES on the check menu. The *Stage Control Menu* is displayed.

7 Follow the instructions on the *Stage Control Menu* to position the crosshairs over the corner of the street intersection.

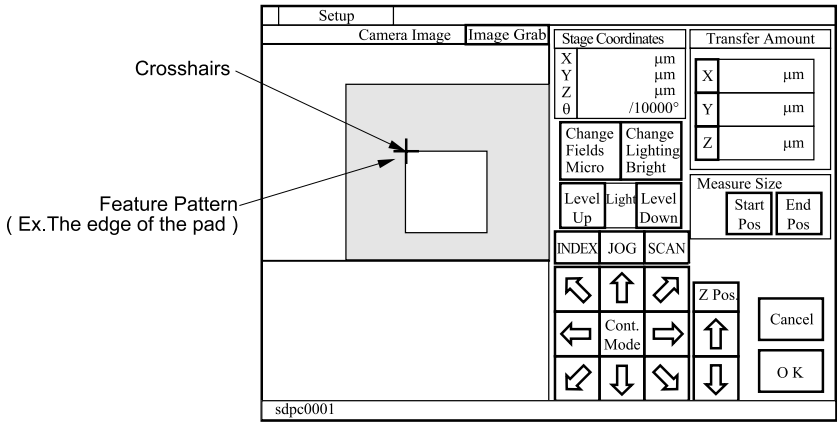
Stage Control Menu



8 Press OK. The camera image switches to the micro field view.

9 Follow the directions on the *Stage Control Menu* to position the crosshairs on the corner of the pad.

Pad Corner



10 Press OK on the *Stage Control Menu*. A check menu is displayed stating, `Execute automatic offset?`

11 Press YES on the check menu. The prober detects the chuck top center and a check menu is displayed stating, `Stage/Bridge will move.`

12 Press YES on the check menu. The *Stage Accuracy Adjustment Menu* is displayed.

13 Use the following steps to unload the wafer.

13.1 Press PREVIOUS MENU on the *Stage Accuracy Adjustment Menu*.

13.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

13.3 Press WAFER TRANSFER on the *Stage Functions Menu*.

13.4 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

14 Use the following steps to save the data to the system information.

14.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

14.2 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press YES on the check menu. The chuck top center position is saved.

6.46 Checking the Theta Cumulative and Theta Initial Position Offsets 1443.2

Introduction

Purpose:

The theta initial position is the position where the chuck top turns the same angle when the motor rotates the same amount in either direction. An initial position offset to the initial position must be applied because there is a difference in where the theta coordinate system begins and the theta initial position. Theta also requires a cumulative error correction so that the chuck top can move as directed. There are two different situations which require the theta cumulative and/or theta initial position offsets to be changed. If the rotation of the chuck has ±5° of travel during wafer alignment (a sign of this problem is that the probe marks are off in X and Y in varying amounts around the wafer), the theta cumulative offset needs to be adjusted. If the theta initial sensor position was adjusted, the theta initial position offset also needs to be adjusted.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	TEL 300 mm quartz wafer

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **You must use the wafer file that matches the wafer being used.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Wafer Transfer Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

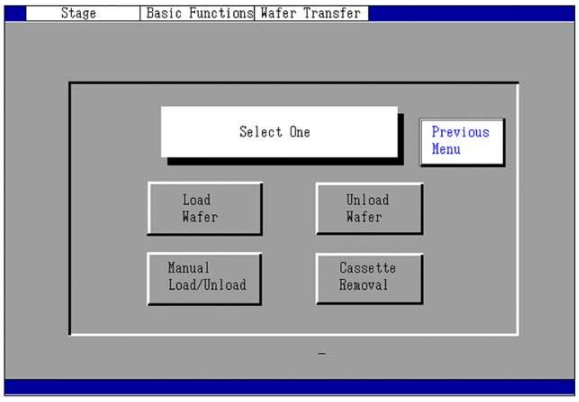
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

2.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



2.7 Press LOAD WAFER on the *Wafer Transfer Menu*.

3 Load the TEL 300 mm quartz wafer onto the chuck top.

4 Use the following steps to display the *θ Initial Position Offset/R Offset Menu*.

4.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

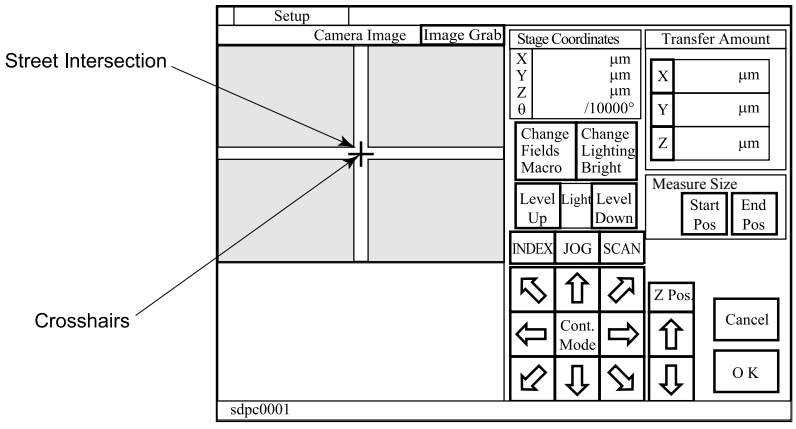
4.2 Press ACCURACY ADJUSTMENT on the *Stage Adjustments Menu*.

4.3 Press CUMULATIVE θ INITIAL POSITION OFFSET on the *Stage Accuracy Adjustments Menu*. A check menu is displayed stating, `Stage/Bridge will move.`

4.4 Press YES on the check menu. The *Stage Control Menu* is displayed.

4.5 Follow the instructions on the *Stage Control Menu* to position the crosshairs over the corner of the street intersection.

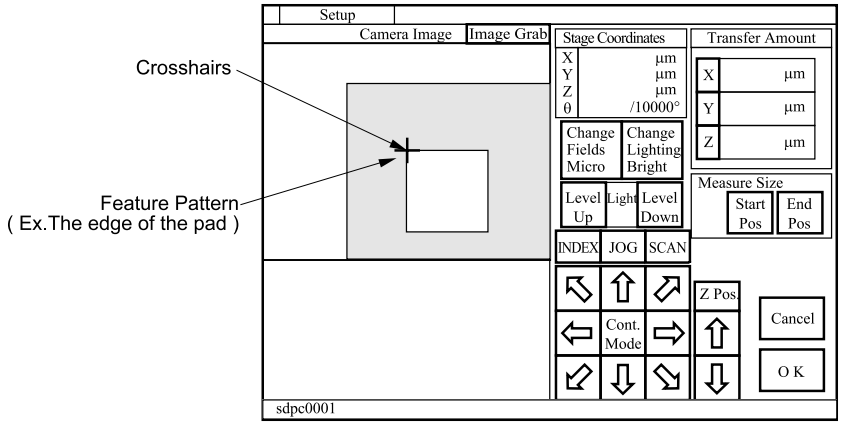
Stage Control Menu



4.6 Press OK. The camera image switches to the micro field view.

4.7 Follow the directions on the *Stage Control Menu* to position the crosshairs on the corner of the pad.

▼ **Pad Corner**



4.8 Press OK on the *Stage Control Menu*. The *θ Initial Position Offset/R Offset Menu* is displayed.

▼ **θ Initial Position Offset/R Offset Menu**

The *θ Initial Position Offset/R Offset Menu* menu items are described below.

▼ **θ Initial Position Offset/R Offset Menu Parameters**

Item	Contents
Starting Angle ±	Default value: 0/10000°
Testing Angle ±	Default value: 50000/10000°.
+Transfer	Prober calculated value
—Transfer	Prober calculated value
Initial Offset Amount	Not displayed

Item	Contents
R **Offset Amount**	The current rotation offset value is displayed. The default value is 1730000 µm.
L **Offset Amount**	The default value is fixed (466000 µm).
B **Offset**	The current parameter value is displayed. The distance between the chuck top center and the theta axis ball screw center is displayed (X direction). The default value is 1800000 µm.

5 Press CHECK. The prober rotates the chuck ±5° and aligns the wafer to the micro site to calculate the ± transfer values.

The testing result is displayed on the *Theta Initial Offset and R Offset Setting Menu*.

6 Check that the results are within the following specifications:

- The values for the + transfer and – transfer are between 49990 and 50010/10000°.
- The difference between the + transfer and – transfer is less than or equal to 10/10000°.
- If the values are within specification, press OK. A message menu appears stating, `Stage/bridge will move. Y/N?`Press YES.
- If the values are not within specification, go to **6.47 Adjusting the Theta Cumulative and Theta Initial Position Offsets (see page 422)**.

7 Use the following steps to unload the wafer.

7.1 Press PREVIOUS MENU. The *Stage Adjustment Menu* is displayed.

7.2 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*.

7.3 Press WAFER TRANSFER on the *Basic Functions Menu*.

7.4 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded and the *Wafer Transfer Menu* is displayed.

8 Use the following steps to complete the procedure.

8.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

8.2 Press PREVIOUS MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?`

8.3 Press NO on the check menu. The *Main Menu* is displayed.

6.47 Adjusting the Theta Cumulative and Theta Initial Position Offsets 1444.2

Introduction

Purpose:

To adjust the coefficient when converting the direct line operation to rotation operation.

If the position is still out of the specification after completing the adjustment, contact TEL Field Service Support.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafer

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **TEL recommends the use of a TEL 300 mm quartz wafer to ensure accurate adjustment.**

NOTE **You must use the wafer file that matches the wafer being used.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Wafer Transfer Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

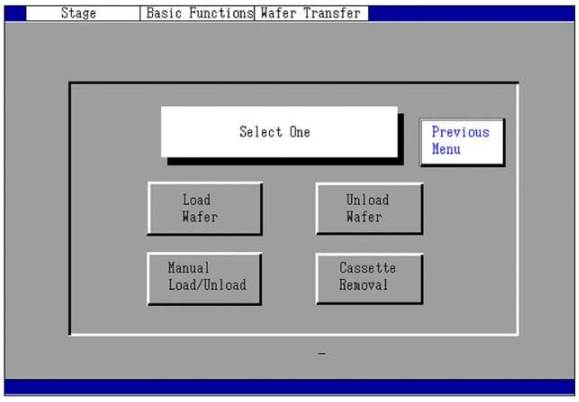
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

2.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

2.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

Wafer Transfer Menu



2.7 Press LOAD WAFER on the *Wafer Transfer Menu*.

3 Load the wafer onto the chuck top.

4 Use the following steps to display the *θ Initial Position Offset/R Offset Menu*.

4.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

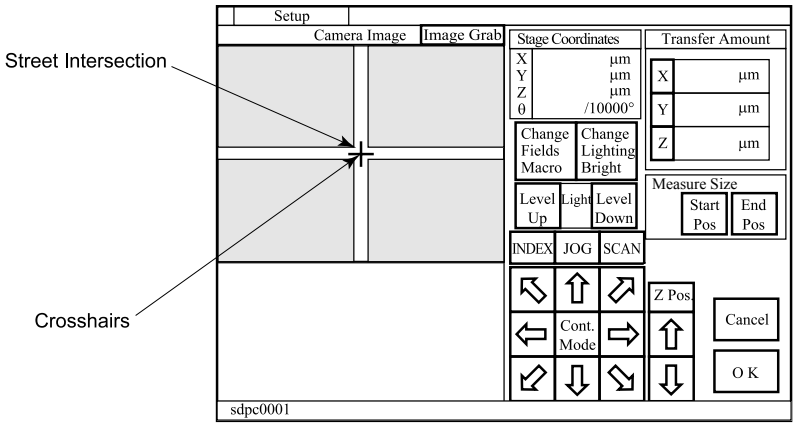
4.2 Press ACCURACY ADJUSTMENT on the *Stage Adjustments Menu*.

4.3 Press CUMULATIVE θ INITIAL POSITION OFFSET on the *Stage Accuracy Adjustments Menu*. A check menu is displayed stating, `Stage/Bridge will move.`

4.4 Press YES on the check menu. The *Stage Control Menu* is displayed.

4.5 Follow the instructions on the *Stage Control Menu* to position the crosshairs over the corner of the street intersection.

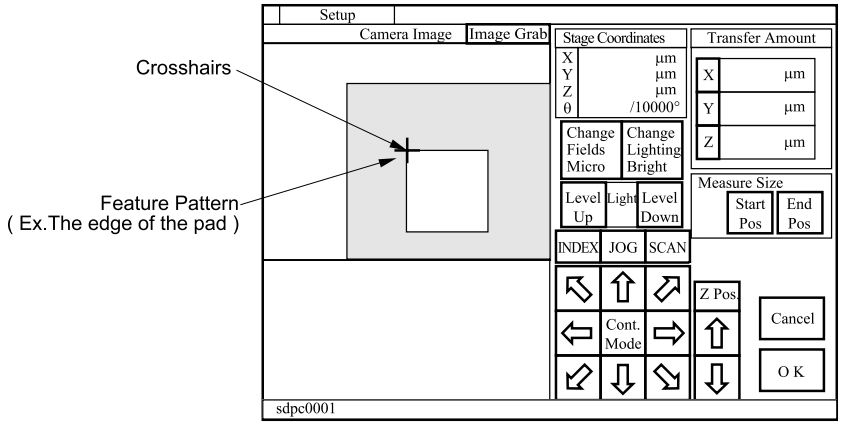
Stage Control Menu



4.6 Press OK. The camera image switches to the micro field view.

4.7 Follow the directions on the *Stage Control Menu* to position the crosshairs on the corner of the pad.

▼ **Pad Corner**



4.8 Press OK on the *Stage Control Menu*. The *θ Initial Position Offset/R Offset Menu* is displayed.

▼ **θ Initial Position Offset/R Offset Menu**

5 Press CHECK. The prober rotates the chuck ±5° and aligns the wafer to the micro site to calculate the ± transfer values.

The testing result is displayed on the *Theta Initial Offset and R Offset Setting Menu*.

6 Check the testing results and adjust the R offset and B offset amounts so that they match the following specifications:

- The values for the + transfer and – transfer are between 49990 and 50010/10000°.
- The difference between the + transfer and – transfer less than or equal to 10/10000°.

▼ **R Offset Amount Adjustment**

	Value of + Transfer	Value of – Transfer
Increase the R Offset Amount	Increased	Decreased

	Value of + Transfer	Value of – Transfer
Decrease the R Offset Amount	Decreased	Increased

▼ **B Offset Amount Adjustment**

	Value of + Transfer	Value of – Transfer
Increase the B Offset Amount	Increased	Increased
Decrease the B Offset Amount	Decreased	Decreased

NOTE **The L Offset Amount is fixed and should not be adjusted.**
The Theta Initial Offset value is fixed at 0 and should not be adjusted.

7 After inputting the new offset amounts, press CHECK. The theta alignment inspection routine is performed to recheck the transfer amounts and display new offsets.

Repeat steps 6 and 7 if necessary until the testing results fall within the specifications.

8 Use the following steps to save the offset amounts.

8.1 Press OK on the *θ Initial Position Offset/R Offset Menu*.

8.2 Press YES to the message.

8.3 Press PREVIOUS MENU on the *Stage Accuracy Adjustment Menu*.

8.4 Press BASIC FUNCTIONS on the *Stage Adjustment Menu*.

8.5 Press WAFER TRANSFER on the *Basic Functions Menu*.

8.6 Press UNLOAD WAFER on the *Wafer Transfer Menu*. A message stating `Transferring Wafer` is displayed, and the wafer is unloaded. The *Wafer Transfer Menu* is displayed.

8.7 Press PREVIOUS MENU on the *Stage Functions Menu*.

8.8 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating `Save SYS Information?`

8.9 Press YES. The offsets are saved to the system information. The *Main Menu* is displayed.

6.48 Checking the Probe (Chuck) Camera Macro/Micro Optical Offsets 1446.2

Introduction

Purpose:

To verify that the crosshairs are in the same position in both the macro and micro field on the probe (chuck) camera image.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Probe card

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to install a probe card.

2.1 Press CHANGEOVER on the *Main Menu*.

2.2 Press SACC on the *Changeover Menu*.

2.3 Press CARD LOAD on the *SACC Operations Menu*.

2.4 Follow the screen prompts to load the probe card using the SACC.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

3 When the probe card is loaded, press MAIN MENU on the *Changeover Menu*.

4 Use the following steps to select a filename.

4.1 Press DIAGNOSTICS on the *Main Menu*.

4.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

4.3 Input your password on the numeric keypad and press INPUT.

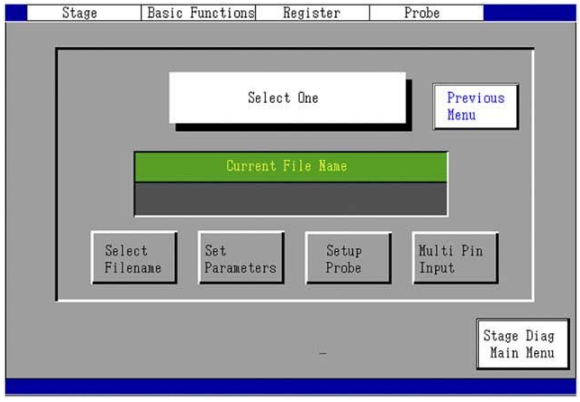
4.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

4.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

4.6 Press INPUT on the *Stage Functions Menu*.

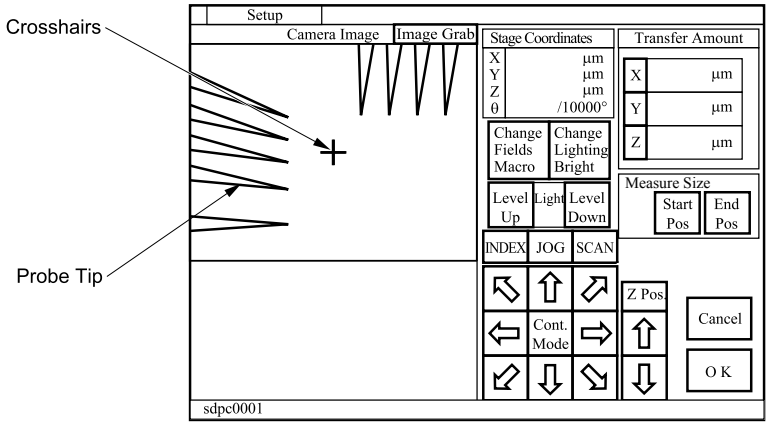
4.7 Press PROBE on the *Register Menu*. The *Probe Card Input Menu* is displayed.

Probe Card Input Menu



5 Press SETUP PROBE on the *Probe Card Input Menu* and press YES to the message. The *Stage Control Menu* is displayed and the camera image is displayed in the macro field view.

Stage Control Menu (Macro)

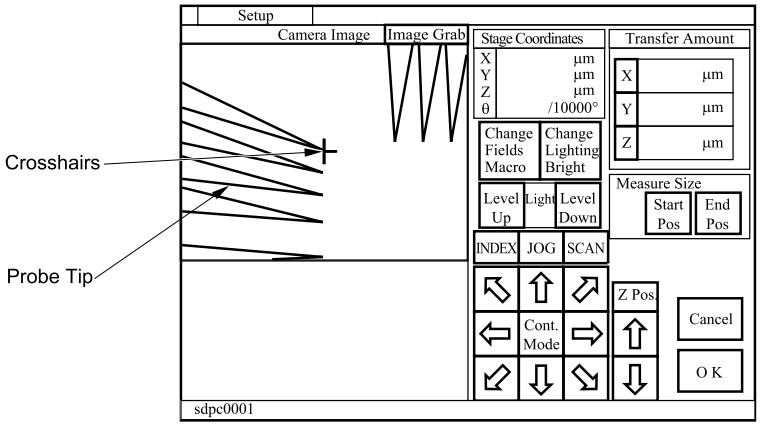


6 Use the following steps to check that the crosshairs are on the same probe tip in both the macro and micro field views.

6.1 Use the stage control arrow buttons for the XY axis to center the green crosshairs over a probe. Adjust the lighting amount or the focus as necessary.

NOTE **To perform the check, you should select a probe that is easily identified in both views.**

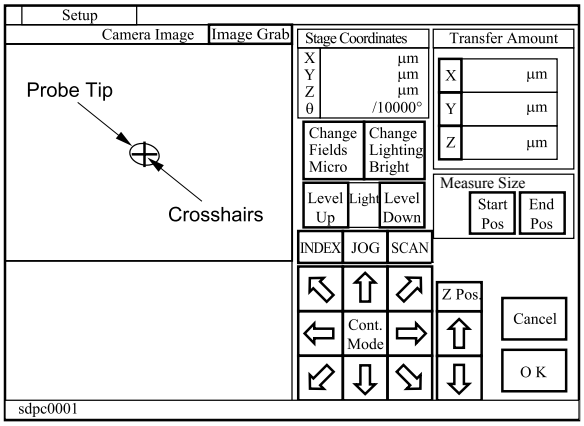
Positioning the Crosshairs (Macro)



6.2 Press CHANGE FIELD on the *Stage Control Menu*. The camera images switches to the micro field view.

6.3 Check that the crosshairs are over the same probe tip in both the macro and micro field views.

Crosshairs Position (Micro)



If the crosshairs are in different positions in the micro and macro field views, go to **6.49 Adjusting the Probe (Chuck) Camera Macro/Micro Optical Offsets (see page 430)**.

6.4 Press CANCEL on the *Stage Control Menu* and press YES to the message. The *Optical System Parameters Menu* is displayed.

7 Press PREVIOUS MENU on the *Optical System Parameters Menu*.

8 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?`

9 Press NO. The *Main Menu*.

10 Use the following steps to remove the probe card and complete this procedure.

10.1 Press CHANGEOVER.

10.2 Press SACC.

10.3 Press UNLOAD CARD to remove the probe card. Follow the screen prompts until the operation is complete.

10.4 Press OK on the *SACC Operations Menu*.

10.5 Press MAIN MENU on the *Changeover Menu*.

10.6 Press DIAGNOSTICS on the *Main Menu*.

10.7 Press INITIALIZE on the *Diagnostics Menu*.

10.8 Press SYSTEM. The system is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

10.9 Press MAIN MENU on the *Diagnostics Menu*. The *Main Menu* is displayed.

6.49 Adjusting the Probe (Chuck) Camera Macro/Micro Optical Offsets 1447.2

Introduction

Purpose:

To adjust the probe (chuck) camera image so that the crosshairs are in the same position in both the macro and micro field on the probe (chuck) camera image.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Probe card

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to install a probe card.

2.1 Press CHANGEOVER on the *Main Menu*.

2.2 Press SACC on the *Changeover Menu*.

2.3 Press CARD LOAD on the *SACC Operations Menu*.

2.4 Follow the screen prompts to load the probe card using the SACC.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

2.5 When the operation is complete, press OK on the *SACC Operations Menu*.

3 Press MAIN MENU on the *Changeover Menu*.

4 Use the following steps to display the *Optical System Parameters Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*.

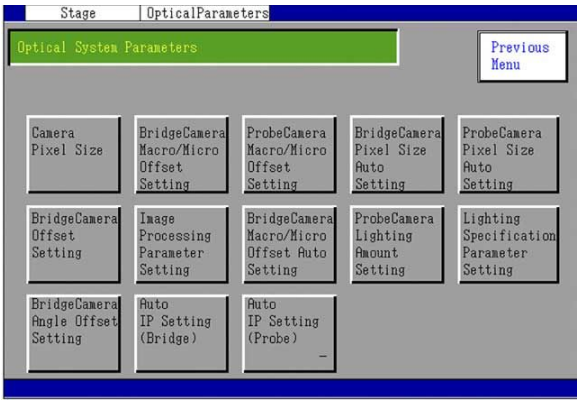
4.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

4.3 Input your password on the numeric keypad and press INPUT.

4.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

4.5 Press OPTICAL SYSTEM PARAMETERS on the *Stage Adjustments Menu*. The *Optical System Parameters Menu* is displayed.

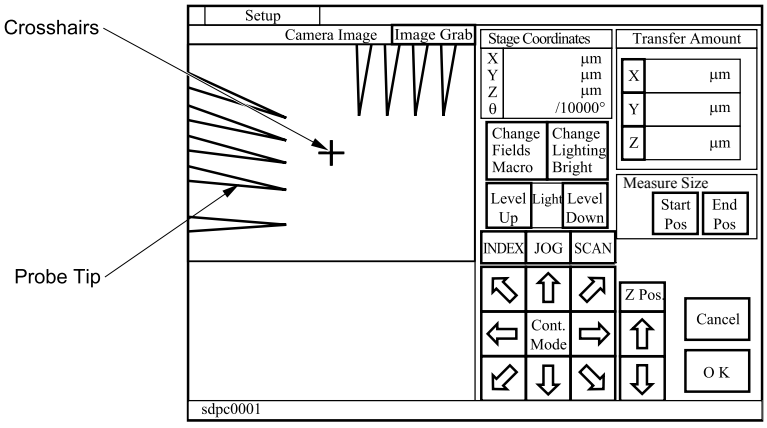
Optical System Parameters Menu



5 Press PROBE CAMERA MACRO/MICRO OFFSET SETTING on the *Optical System Parameters Menu*. A check menu is displayed stating, `Transfer Stage?`

6 Press YES. The *Stage Control Menu* is displayed and the camera image is displayed in the macro field view.

Stage Control Menu (Macro)

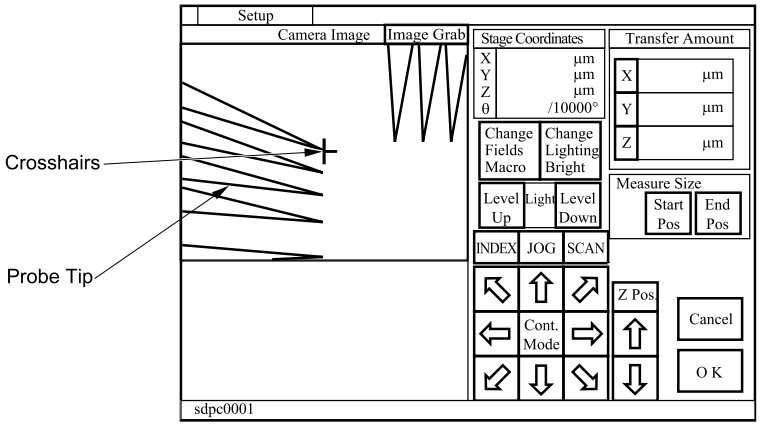


7 Use the following steps to position the crosshairs on the same probe tip in both the macro and micro field views.

7.1 Use the stage control arrow buttons for the XY axis to center the green crosshairs over a probe. Adjust the lighting amount or the focus as necessary.

NOTE **To perform the check, you should select a probe that is easily identified in both views.**

▼ **Positioning the Crosshairs (Macro)**

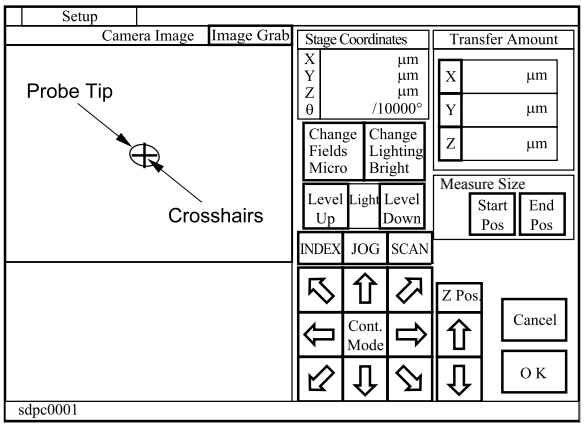


7.2 Press OK. A check menu is displayed stating `Transfer Stage?`

7.3 Press YES. The offset position is registered for the macro field. The camera image switches to the micro field.

7.4 Use the stage control arrow buttons for the XY axis to center the green crosshairs over the center of the probe tip that was registered in the macro field. Adjust the lighting amount or the focus as necessary.

▼ **Positioning the Crosshairs (Micro)**



7.5 Press OK. A check menu is displayed stating `Return BRDG, TRGT, PLSHR, LAMP?`.

7.6 Press YES. The offset position is registered from the micro field. The *Optical System Parameters Menu* is displayed.

8 Press PREVIOUS MENU on the *Optical System Parameters Menu*.

9 Press MAIN MENU. A check menu is displayed asking, `Save Sys information?`

10 Press YES. The probe (chuck) camera macro/micro offset is saved and the *Main Menu* is displayed.

11 Use the following steps to remove the probe card and complete this procedure.

11.1 Press CHANGEOVER.

11.2 Press SACC.

11.3 Press UNLOAD CARD to remove the probe card. Follow the screen prompts until the operation is complete.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

11.4 Press OK on the *SACC Operations Menu*.

11.5 Press MAIN MENU on the *Changeover Menu*.

11.6 Press DIAGNOSTICS on the *Main Menu*.

11.7 Press INITIALIZE on the *Diagnostics Menu*.

11.8 Press SYSTEM. The system is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

11.9 Press MAIN MENU on the *Diagnostics Menu*. The *Main Menu* is displayed.

6.50 Checking the Probe (Chuck) Camera Pixel Size 1449.2

Introduction

Purpose:

To check the probe (chuck) camera pixel size.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Camera Pixel Size Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

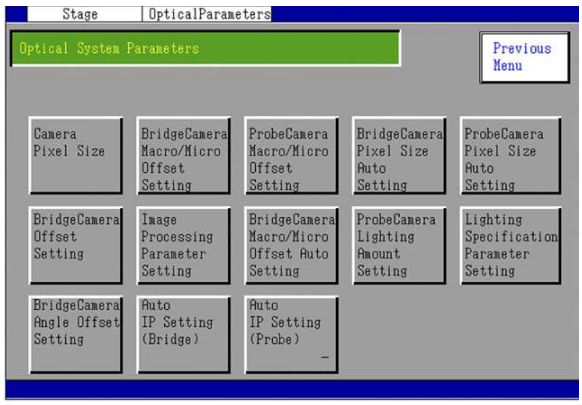
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

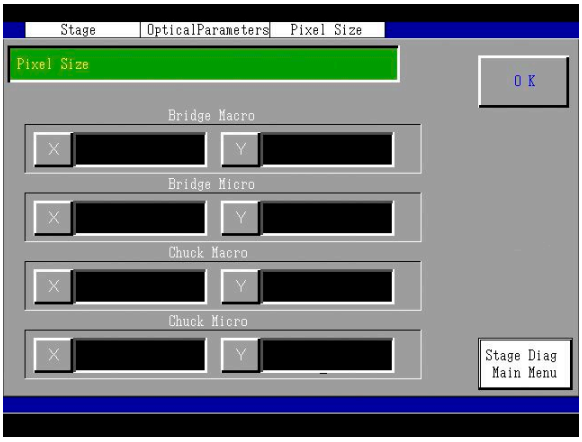
2.5 Press OPTICAL SYSTEM PARAMETERS on the *Stage Adjustments Menu*. The *Optical System Parameters Menu* is displayed.

Optical System Parameters Menu



2.6 Press CAMERA PIXEL SIZE. The *Camera Pixel Size Menu* is displayed.

Camera Pixel Size Menu



3 Verify that the parameters are within the following specifications:

For VIP PCB:

- Chuck Macro pixel sizes:
  X = 11.875000 to 13.125000 µm
  Y = 11.875000 to 13.125000 µm
- Chuck Micro pixel sizes:
  X = 0.772000 to 0.853000 µm
  Y = 0.772000 to 0.853000 µm

If any of the values is outside the specification, go to **6.51 Adjusting the Probe (Chuck) Camera Pixel Size (see page 436)**.

4 Press STAGE DIAG MAIN MENU on the *Pixel Size Menu*.

5 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO.

6.51 Adjusting the Probe (Chuck) Camera Pixel Size 1450.2

Introduction

Purpose:

To adjust the probe (chuck) camera pixel size.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Probe card

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **TEL recommends the use of a tungsten wire probe card to ensure accurate adjustment.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to install a probe card.

2.1 Press CHANGEOVER on the *Main Menu*.

2.2 Press SACC on the *Changeover Menu*.

2.3 Press CARD LOAD on the *SACC Operations Menu*.

2.4 Follow the screen prompts to load the probe card using the SACC.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

2.5 When the operation is complete, press OK on the *SACC Operations Menu*.

3 Press MAIN MENU on the *Changeover Menu*.

4 Use the following steps to display the *Optical System Parameters Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*.

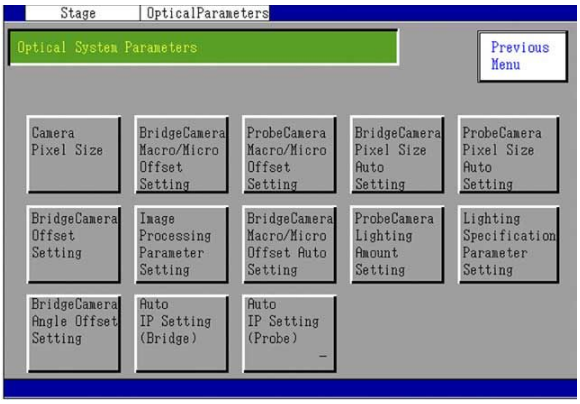
4.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

4.3 Input your password on the numeric keypad and press INPUT.

4.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK

4.5 Press OPTICAL SYSTEM PARAMETERS on the *Stage Adjustments Menu*. The *Optical System Parameters Menu* is displayed.

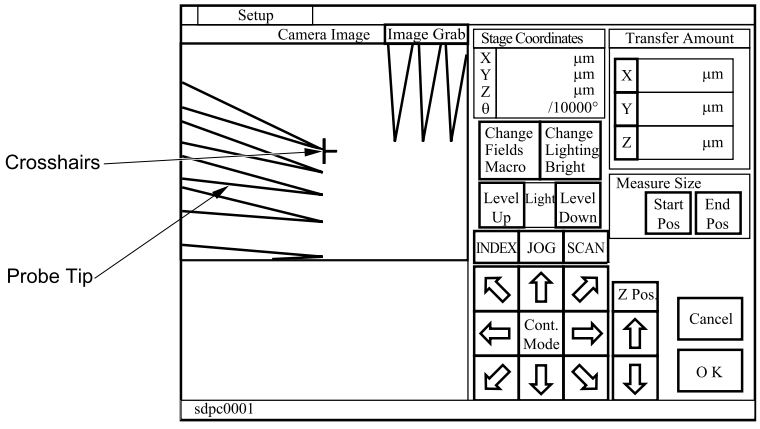
▼ **Optical System Parameters Menu**



5 Press PROBE CAMERA PIXEL SIZE AUTO SETTING on the *Optical System Parameters Menu*. A check menu is displayed stating, `Stage transfer (need card)`. Press YES. The *Stage Control Menu* is displayed and the camera image is displayed in the macro field view.

6 Follow the directions on the *Stage Control Menu* to position the crosshairs over the center of the probe tip.

▼ **Positioning the Crosshairs (Macro)**



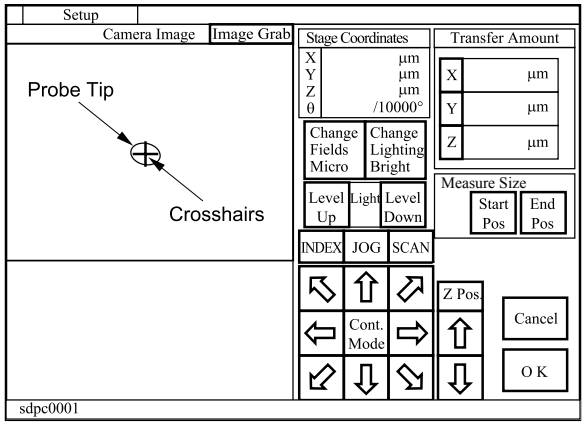
7 Press OK. A check menu is displayed stating `Execute automatic setting.`

8 Press YES. The prober obtains the pixel information in the macro field. A check menu is displayed stating, `Transfer stage?`

9 Press YES. The camera image switches to the micro field.

10 Follow the directions on the *Stage Control Menu* to position the crosshairs on the center of the probe tip.

Positioning the Crosshairs (Micro)



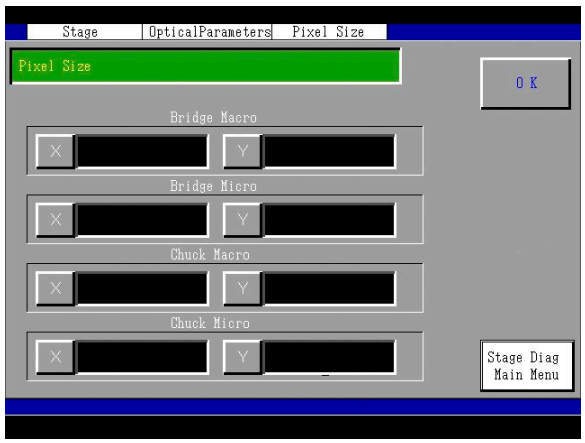
11 Press OK. A check menu is displayed stating `Execute automatic setting.`

12 Press YES. The prober obtains the pixel information in the micro field. A check menu is displayed stating `Return BRDG, TRGT, PLSHR, LAMP?`.

13 Press YES. The *Optical System Parameters Menu* is displayed.

14 Press CAMERA PIXEL SIZE. The *Camera Pixel Size Menu* is displayed.

Camera Pixel Size Menu



15 Verify that the parameters are within the following specifications:

For VIP PCB:

- Chuck Macro pixel sizes:
  X = 11.875000 to 13.125000 µm

Y = 11.875000 to 13.125000 µm

- Chuck Micro pixel sizes:
  X = 0.772000 to 0.853000 µm
  Y = 0.772000 to 0.853000 µm

16 Use the following steps to save the data to the system information.

16.1 Press STAGE DIAG MAIN MENU on the *Optical System Parameters Menu*.

16.2 Press MAIN MENU. A check menu is displayed asking, `Save Sys information?`

16.3 Press YES. The probe (chuck) camera macro/micro offset is saved and the *Main Menu* is displayed.

17 Use the following steps to remove the probe card and complete this procedure.

17.1 Press CHANGEOVER.

17.2 Press SACC.

17.3 Press UNLOAD CARD to remove the probe card. Follow the screen prompts until the operation is complete.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

17.4 Press OK on the *SACC Operations Menu*.

17.5 Press MAIN MENU on the *Changeover Menu*.

17.6 Press DIAGNOSTICS on the *Main Menu*.

17.7 Press INITIALIZE on the *Diagnostics Menu*.

17.8 Press SYSTEM. The system is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

17.9 Press MAIN MENU on the *Diagnostics Menu*. The *Main Menu* is displayed.

6.52 Checking the Contact Position 1452.2

Introduction

Purpose:

To check the contact position.

Verify that there is a probe mark on the wafer when the overdrive amount is set between 1 and 5 µm.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Probe card with one probe Wafer

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to install the probe card with only one probe.

2.1 Press CHANGEOVER on the *Main Menu*.

2.2 Press SACC on the *Changeover Menu*.

2.3 Press CARD LOAD on the *SACC Operations Menu*.

2.4 Follow the screen prompts to load the probe card using the SACC.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

NOTE **If this probe card is being used for the first time, verify the contact height so that the probe card and the prober will not collide and cause damage.**

2.5 When the operation is complete, press OK on the *SACC Operations Menu*.

3 Use the following steps to display the *Stage Adjustments Menu*.

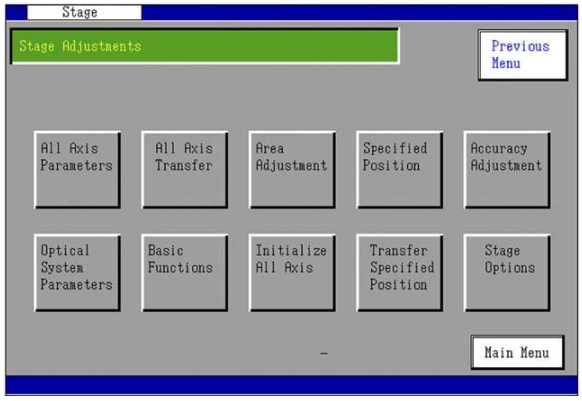
3.1 Press DIAGNOSTICS on the *Main Menu*.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

3.3 Input your password on the numeric keypad and press INPUT.

3.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK The *Stage Adjustments Menu* is displayed.

Stage Adjustments Menu



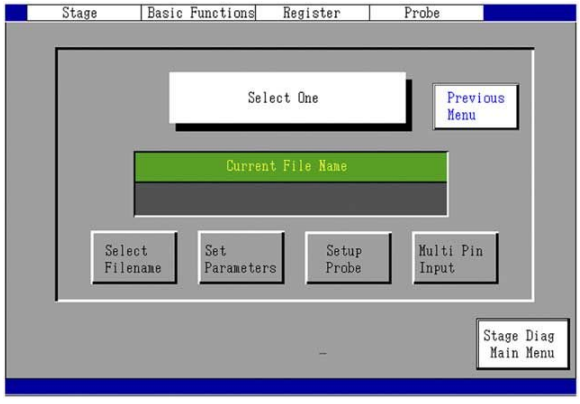
4 Use the following steps to create a new probe card file.

4.1 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

4.2 Press INPUT on the *Stage Functions Menu*.

4.3 Press PROBE on the *Register Menu*. The *Probe Card Input Menu* is displayed.

Probe Card Input Menu



5 Press SETUP PROBE on the *Probe Card Input Menu* and press YES to the message. The *Stage Control Menu* is displayed. Follow the directions on the menu to register the probe.

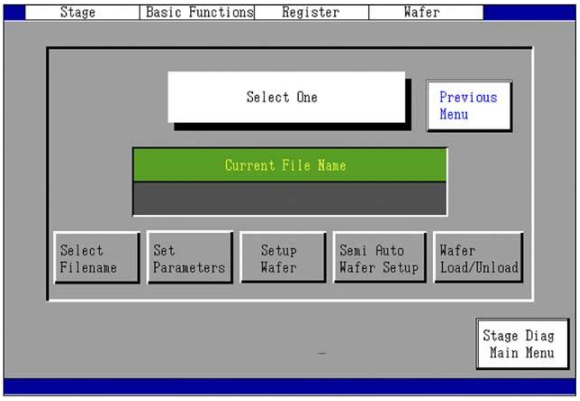
NOTE **Refer to the P-12XL Advanced Operations Manual for information about registering the probe.**

6 Use the following steps to create a new wafer file.

6.1 Press PREVIOUS MENU on the *Probe Card Input Menu*.

6.2 Press WAFER on the *Register Menu*. The *Wafer Menu* is displayed.

Wafer Menu



6.3 Press SELECT FILENAME on the *Wafer Menu*. Create a new file.

7 Press SET PARAMETERS on the *Wafer Menu*. Set the parameters for the wafer being used.

8 Press WAFER LOAD/UNLOAD on the *Wafer Menu*. Load a wafer onto the chuck top.

9 Press SEMI AUTO WAFER SETUP on the *Wafer Menu* and press YES to the message. Follow the directions on the menu to register the wafer data and the reference pad.

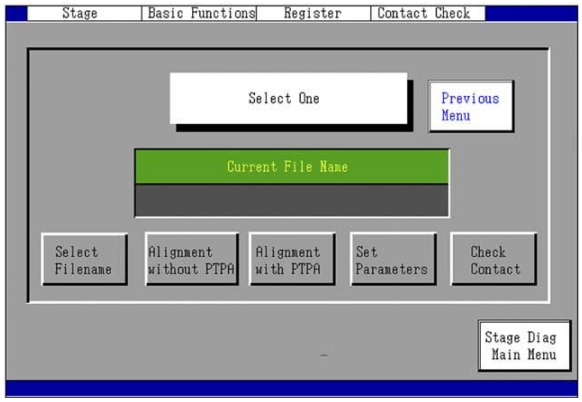
NOTE **Refer to the P-12XL Advanced Operations Manual for information about registering the probe.**

NOTE **The registered position of the reference pad (the position that the probe contacts) can be a pad or a street.**

10 Press PREVIOUS MENU on the *Wafer Menu*.

11 Press CHECK CONTACT on the *Register Menu*. The *Contact Check Menu* is displayed.

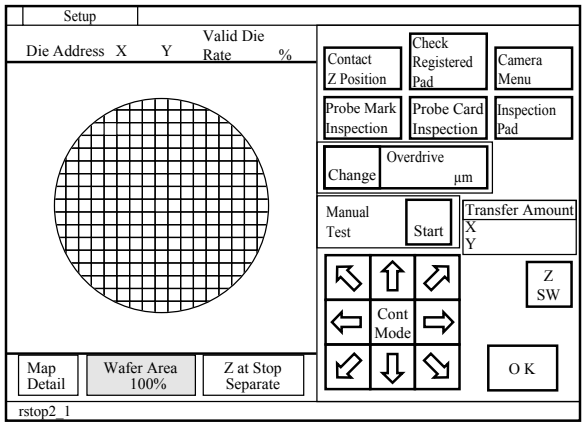
▼ **Contact Check Menu**



12 Press ALIGNMENT WITHOUT PTPA on the *Contact Check Menu*. Alignment is performed.

13 Press CHECK CONTACT on the *Contact Check Menu*. The *Contact Down Position Menu* is displayed.

▼ **Contact Down Position Menu**

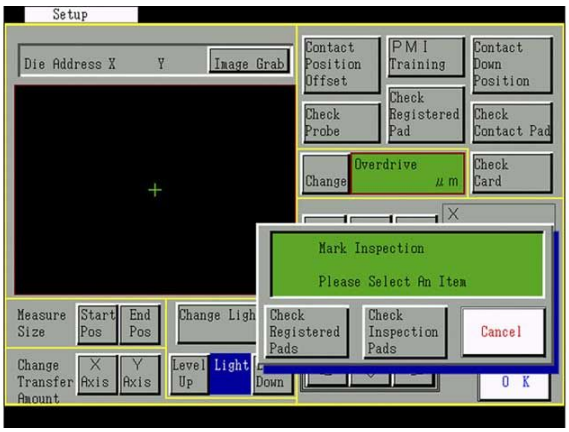


14 Use the following steps to check that there is no probe mark on the position that will be contacted.

14.1 Press CHECK REGISTERED PAD on the *Contact Down Position Menu*. A message menu is displayed stating, `Mark Inspection. Please Select an Item.`

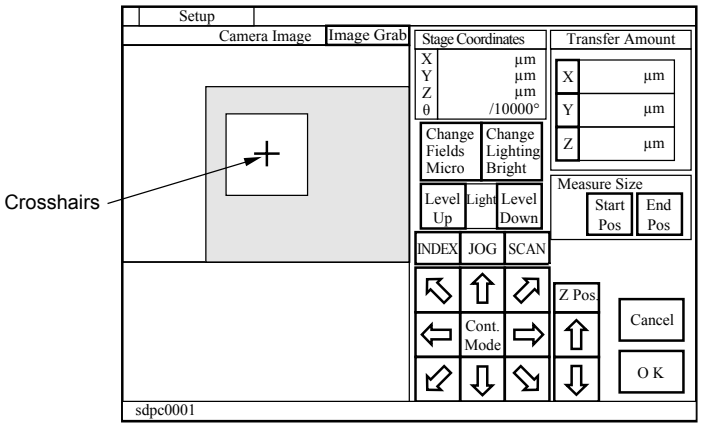
NOTE **Select a contact position that is near the center of the wafer.**

▼ **Message Menu**



14.2 Press CHECK REGISTERED PADS. The contact position is displayed in the camera image on the *Stage Control Menu*.

▼ **Stage Control Menu**



14.3 Verify that there is no probe mark on the contact position.

If there is no probe mark, return to the *Contact Down Position Menu* repeat steps 14.1 through 14.3 to select another die address to check.

15 Press OK on the *Stage Control Menu*. The *Contact Down Position Menu* is displayed.

16 Use the following steps to verify that a probe mark **is not** created when contact is performed with an overdrive amount setting of **0 µm** .

16.1 Set the overdrive amount to 0 µm.

16.2 Press Z SW. The chuck top rises to the contact position.

16.3 Press Z SW. The chuck top lowers to the separated position.

16.4 Press REGISTERED PAD on the *Contact Down Position Menu*. A message menu is displayed stating, `Mark Inspection. Please select an Item.`

16.5 Press CHECK REGISTERED PADS. The contact position is displayed in the camera image on the *Stage Control Menu*.

16.6 Verify that there is no probe mark on the contact position.

If there is a probe mark, go to **6.53 Adjusting the Contact Position (see page 447)**.

17 Press OK on the *Stage Control Menu*. The *Contact Down Position Menu* is displayed.

18 Use the following steps to verify that a probe mark **is** created when contact is performed with an overdrive amount setting of **5 µm** .

18.1 Set the overdrive amount to 5 µm.

18.2 Press Z SW. The chuck top rises to the contact position.

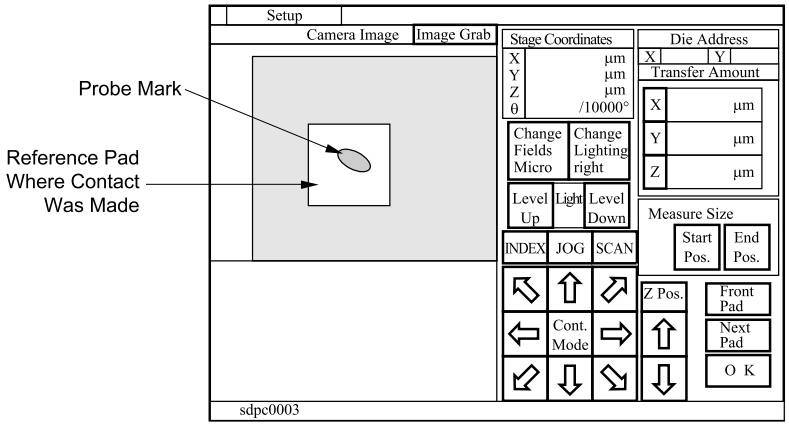
18.3 Press Z SW. The chuck top lowers to the separated position.

18.4 Press REGISTERED PAD on the *Contact Down Position Menu*. A message menu is displayed stating, `Mark Inspection. Please select an Item.`

18.5 Press CHECK REGISTERED PADS. The contact position is displayed in the camera image on the *Stage Control Menu*.

18.6 Verify that there is a probe mark on the contact position.

Stage Control Menu



If there is no probe mark, go to **6.53 Adjusting the Contact Position (see page 447)**.

19 Use the following steps to return to the *Stage Functions Menu*.

19.1 Press OK on the *Stage Control Menu*.

19.2 Press OK on the *Contact Down Position Menu*.

19.3 Press PREVIOUS MENU on the *Contact Check Menu*.

19.4 Press PREVIOUS MENU twice on the *Register Menu*. The *Stage Functions Menu* is displayed.

20 Use the following steps to unload the wafer.

20.1 Press WAFER TRANSFER on the *Stage Functions Menu*.

20.2 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

21 Use the following steps to return to the *Main Menu*.

21.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

21.2 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO. The *Main Menu* is displayed.

22 Use the following steps to remove the probe card and complete this procedure.

22.1 Press CHANGEOVER.

22.2 Press SACC.

22.3 Press UNLOAD CARD to remove the probe card. Follow the screen prompts until the operation is complete.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

22.4 Press OK on the *SACC Operations Menu*.

22.5 Press MAIN MENU on the *Changeover Menu*.

22.6 Press DIAGNOSTICS on the *Main Menu*.

22.7 Press INITIALIZE on the *Diagnostics Menu*.

22.8 Press SYSTEM. The system initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

22.9 Press MAIN MENU on the *Diagnostics Menu*. The *Main Menu* is displayed.

6.53 Adjusting the Contact Position 1453.2

Introduction

Purpose:

To adjust the contact position.

Adjust the contact position so that there is a probe mark on the wafer when the overdrive amount setting is between 1 and 5 µm.

This adjustment will affect all wafer files that have been registered.

Required Resources:

Time:	60 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Probe card with one probe Wafer

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to install the probe card with only one probe.

2.1 Press CHANGEOVER on the *Main Menu*.

2.2 Press SACC on the *Changeover Menu*.

2.3 Press CARD LOAD on the *SACC Operations Menu*.

2.4 Follow the screen prompts to load the probe card using the SACC.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

NOTE **If this probe card is being used for the first time, verify the contact height so that the probe card and the prober will not collide and cause damage.**

2.5 When the operation is complete, press OK on the *SACC Operations Menu*.

3 Use the following steps to display the *Stage Adjustments Menu*.

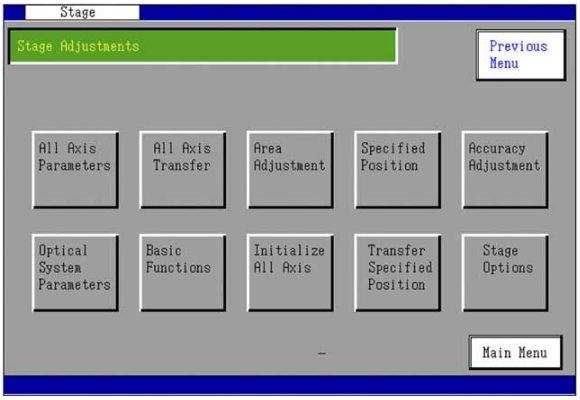
3.1 Press DIAGNOSTICS on the *Main Menu*.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

3.3 Input your password on the numeric keypad and press INPUT.

3.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK The *Stage Adjustments Menu* is displayed.

Stage Adjustments Menu



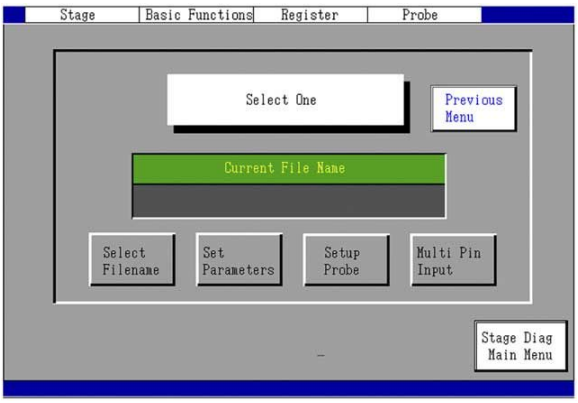
4 Use the following steps to create a new probe card file.

4.1 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

4.2 Press INPUT on the *Stage Functions Menu*.

4.3 Press PROBE on the *Register Menu*. The *Probe Card Input Menu* is displayed.

Probe Card Input Menu



5 Press SETUP PROBE on the *Probe Card Input Menu* and press YES to the message. The *Stage Control Menu* is displayed. Follow the directions on the menu to register the probe.

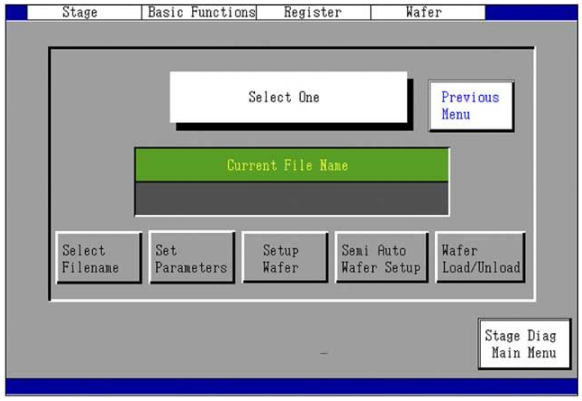
NOTE **Refer to the P-12XL Advanced Operations Manual for information about registering the probe.**

6 Use the following steps to create a new wafer file.

6.1 Press PREVIOUS MENU on the *Probe Card Input Menu*.

6.2 Press WAFER on the *Register Menu*. The *Wafer Menu* is displayed.

Wafer Menu



6.3 Press SELECT FILENAME on the *Wafer Menu*. Create a new file.

7 Press SET PARAMETERS on the *Wafer Menu*. Set the parameters for the wafer being used.

8 Press WAFER LOAD/UNLOAD on the *Wafer Menu*. Load a wafer onto the chuck top.

9 Press SEMI AUTO WAFER SETUP on the *Wafer Menu* and press YES to the message. Follow the directions on the menu to register the wafer data and the reference pad.

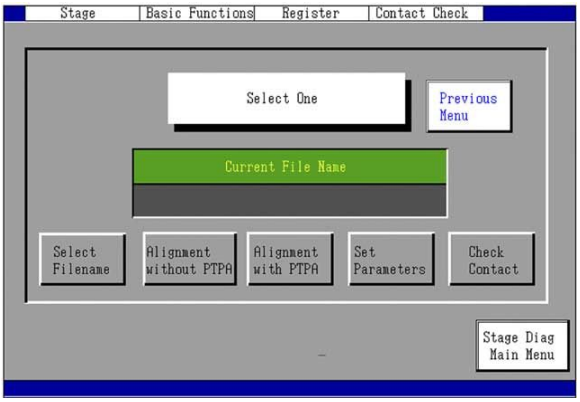
NOTE **Refer to the P-12XL Advanced Operations Manual for information about registering the probe.**

NOTE **The registered position of the reference pad (the position that the probe contacts) can be a pad or a street.**

10 Press PREVIOUS MENU on the *Wafer Menu*.

11 Press CHECK CONTACT on the *Register Menu*. The *Contact Check Menu* is displayed.

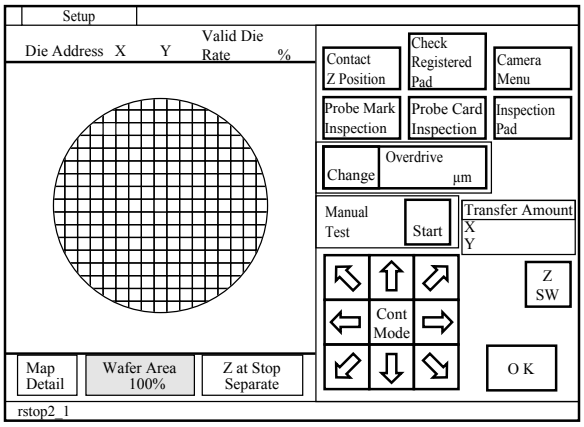
Contact Check Menu



12 Press ALIGNMENT WITHOUT PTPA on the *Contact Check Menu*. Alignment is performed.

13 Press CHECK CONTACT on the *Contact Check Menu*. The *Contact Down Position Menu* is displayed.

Contact Down Position Menu

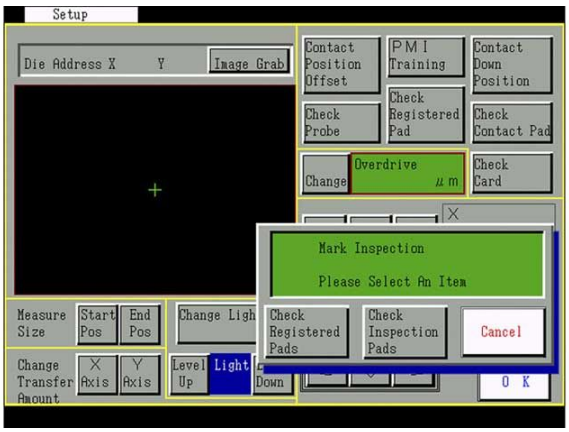


14 Use the following steps to check that there is no probe mark on the position that will be contacted.

14.1 Press CHECK REGISTERED PAD on the *Contact Down Position Menu*. A message menu is displayed stating, `Mark Inspection. Please Select an Item.`

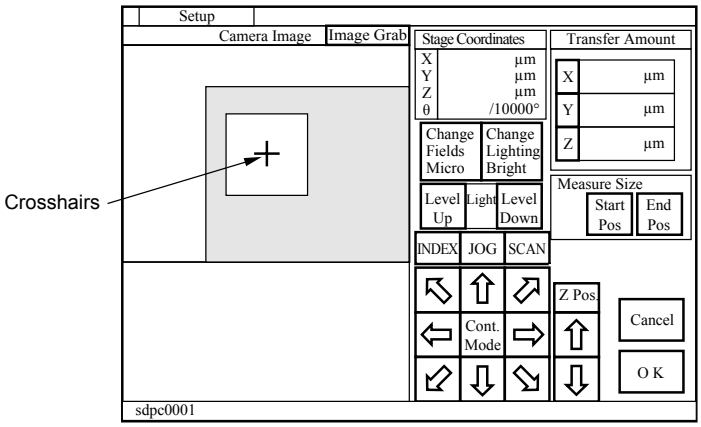
NOTE **Select a contact position that is near the center of the wafer.**

Message Menu



14.2 Press CHECK REGISTERED PADS. The contact position is displayed in the camera image on the *Stage Control Menu*.

Stage Control Menu



14.3 Verify that there is a probe mark on the contact position.

If there is no probe mark, return to the *Contact Down Position Menu* repeat steps 14.1 through 14.3 to select another die address to check.

15 Press OK on the *Stage Control Menu*. The *Contact Down Position Menu* is displayed.

16 Use the following steps to verify that a probe mark **is not** created when contact is performed with an overdrive amount setting of **0 µm** .

16.1 Set the overdrive amount to 0 µm.

16.2 Press Z SW. The chuck top rises to the contact position.

16.3 Press Z SW. The chuck top lowers to the separated position.

16.4 Press REGISTERED PAD on the *Contact Down Position Menu*. A message menu is displayed stating, `Mark Inspection. Please select an Item.`

16.5 Press CHECK REGISTERED PADS. The contact position is displayed in the camera image on the *Stage Control Menu*.

16.6 Check whether there is a probe mark on the contact position.

17 Press OK on the *Stage Control Menu*. The *Contact Down Position Menu* is displayed.

18 If you found a probe mark in step 16.6, select the second die address and check for a probe mark. Repeat step 13 to check that there is no probe mark.

19 Use the following steps to change the over drive amount setting and contact the probe.

19.1 Change the overdrive amount.

- If you **did not** find a probe mark in step 16.6, then **increase** µm.
- If you **did** find a probe mark in step 16.6, then **decrease** µm.

19.2 Press Z SW. The chuck top rises to the contact position.

19.3 Press Z SW. The chuck top lowers to the separated position.

19.4 Press REGISTERED PAD on the *Contact Down Position Menu*. A message menu is displayed stating, `Mark Inspection. Please select an Item.`

19.5 Press CHECK REGISTERED PADS. The contact position is displayed in the camera image on the *Stage Control Menu*.

19.6 Check whether there is a probe mark.

- If you **did not** find a probe mark in step 16.6, then repeat steps 19.1 through 19.6 until there is a probe mark on the pad.
  When the probe mark is made, record the overdrive used to contact the probe.
- If you **did** find a probe mark in step 16.6, then select a die address that has no probe mark and repeat steps 19.1 through 19.6 until there is no probe mark on the pad.
  When this occurs, record the overdrive amount used to contact the probe.

20 Use the following steps to display the *Contact Position Accuracy Offset Menu*.

20.1 Press OK on the *Stage Control Menu*.

20.2 Press OK on the *Contact Down Position Menu*.

20.3 Press STAGE DIAG MAIN MENU on the *Contact Check Menu*.

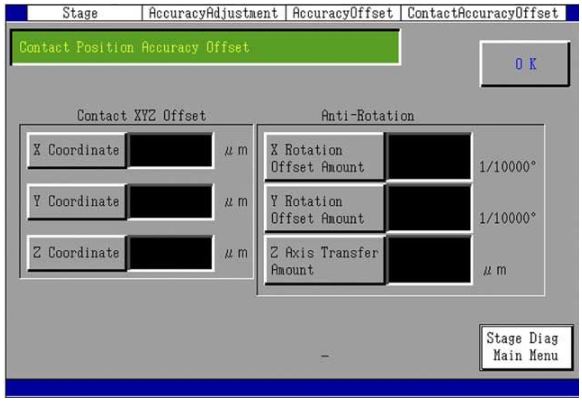
20.4 Press ACCURACY ADJUSTMENT on the *Stage Adjustments Menu*.

20.5 Press OFFSET AMOUNT CHECK/REVISE on the *Stage Accuracy Adjustment Menu*.

20.6 Press CONTACT POSITION ACCURACY OFFSET on the *Stage Accuracy Offset Check/Revise Menu*.

20.7 Press NORMAL TEMPERATURE on the *Contact Position Accuracy Offset Menu*. The *Contact Position Accuracy Offset Menu* is displayed.

▼ **Contact Position Accuracy Offset Menu**



21 Use the following steps to change the Z coordinate.

21.1 Record the current `Z coordinate` value.

21.2 Calculate the amount to change the value.

Apply that numerical value to the following equation:

New `Z coordinate` value = (Current `Z coordinate`– (Overdrive amount recorded in step 19.6)

21.3 Input the value calculated in step 21.2 as the `Z coordinate`.

22 Use the following steps to display the *Contact Down Position Menu*.

22.1 Press STAGE DIAG MAIN MENU on the *Contact Position Accuracy Offset Menu*.

22.2 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

22.3 Press INPUT on the *Stage Functions Menu*.

22.4 Press CONTACT CHECK on the *Register Menu*.

22.5 Press ALIGNMENT WITHOUT PTPA on the *Contact Check Menu*. The alignment is performed.

22.6 Press CHECK CONTACT on the *Contact Check Menu*. The *Contact Down Position Menu* is displayed.

23 Use the following steps to check the contact position. Perform step 23 of the probe mark does not appear on the wafer correctly.

23.1 Set the overdrive amount to 0 µm and contact the probe using steps 14 through 17 to verify that no probe mark is made on the wafer.

23.2 Set the overdrive amount to 5µm and contact the probe using steps 14 through 17 to verify that a probe mark is made on the wafer.

24 Use the following steps to change the offset amount and check the contact position.

24.1 Press OK on the *Contact Down Position Menu*.

24.2 Press STAGE DIAG MAIN MENU on the *Contact Check Menu*.

24.3 Press ACCURACY ADJUSTMENT on the *Stage Adjustments Menu*.

24.4 Press OFFSET AMOUNT CHECK/REVISE on the *Stage Accuracy Adjustment Menu*.

24.5 Press CONTACT POSITION ACCURACY OFFSET on the *Stage Accuracy Offset Check/Revise Menu*.

24.6 Press NORMAL TEMPERATURE on the *Contact Position Accuracy Offset Menu*. The *Contact Position Accuracy Offset Menu* is displayed.

24.7 Change the `Z coordinate` value.

If there was a probe mark on the wafer in step 23.1, then decrease the current Z coordinate by 3 µm.

If there was not a probe mark on the wafer in step 23.2, then increase the current Z coordinate by 3 µm.

24.8 Press STAGE DIAG MAIN MENU on the *Contact Position Accuracy Offset Menu*.

24.9 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

24.10 Press INPUT on the *Stage Functions Menu*.

24.11 Press CONTACT CHECK on the *Register Menu*.

24.12 Press ALIGNMENT WITHOUT PTPA on the *Contact Check Menu*. The alignment is performed.

24.13 Press CHECK CONTACT on the *Contact Check Menu*. The *Contact Down Position Menu* is displayed.

24.14 Repeat steps 23 and 24 until the probe mark is made correctly on the wafer.

25 Use the following steps to return to the *Stage Functions Menu*.

25.1 Press OK on the *Contact Down Position Menu*.

25.2 Press PREVIOUS MENU on the *Contact Check Menu*.

25.3 Press PREVIOUS MENU on the *Register Menu*. The *Stage Functions Menu* is displayed.

26 Use the following steps to unload the wafer.

26.1 Press WAFER TRANSFER on the *Stage Functions Menu*.

26.2 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

27 Use the following steps to return to the *Main Menu*.

27.1 Press PREVIOUS MENU on the *Stage Functions Menu*.

27.2 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press YES. The *Main Menu* is displayed.

28 Use the following steps to remove the probe card and complete this procedure.

28.1 Press CHANGEOVER.

28.2 Press SACC.

28.3 Press UNLOAD CARD to remove the probe card. Follow the screen prompts until the operation is complete.

NOTE **For instructions on using the SACC, refer to 4.11 Changing Probe Cards Using the SACC (see page 156).**

28.4 Press OK on the *SACC Operations Menu*.

28.5 Press MAIN MENU on the *Changeover Menu*.

28.6 Press DIAGNOSTICS on the *Main Menu*.

28.7 Press INITIALIZE on the *Diagnostics Menu*.

28.8 Press SYSTEM. The system is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

28.9 Press MAIN MENU on the *Diagnostics Menu*. The *Main Menu* is displayed.

C H A P T E R 7

Loader Unit Inspections and Adjustments

This chapter provides the procedures for performing advanced loader calibrations on the P-12XL prober. **7.1 Loader Calibrations: Overview (see page 458)** outlines each inspection, potential failure results, and corrective actions. This chapter also provides each loader calibration procedure, as well as the steps to access the appropriate screens to perform the procedure and any actions required for adjustment and completion.

7.1 Loader Calibrations: Overview 0801.1

Several loader inspections should be performed. The loader calibrations are listed below.

- **7.2 Checking the Upper/Lower Arm Home Position (see page 460)**
  Inspections: When the upper/lower arm is transferred to the home position, and the arm home positioning fixture is set, the tip of the arm touches the arm home positioning fixture.
  Failure Results: The arm could be damaged when transferring the wafer to the chuck top or taking the wafer from the FOUP.
  Corrective Action: Refer to **7.3 Adjusting the Upper/Lower Arm Home Positions (see page 466)** to correct.

- **7.4 Checking the Loader Z Home Position (see page 477)**
  Inspections: Distance from the upper surface of the loader frame to the bottom of the loader base plate is 84 mm when the loader Z is transferred to the home position.
  Failure Results: Wafer hand-over can not be performed correctly.
  Corrective Action: Refer to **7.5 Adjusting the Loader Z Home Position (see page 482)** to correct.

- **7.6 Checking Arm-to-FOUP Hand-over Position (see page 490)**
  Inspections: The following conditions are met when the arm is moved to the wafer hand-over check position with the load port (a 44000 µm high position from the normal Z axis hand-over position). The arm tip is at the 300/200 mm position on the arm insertion position fixture. The gap between the arm and fixture is the same on both the left and the right. The fixture upper surface and the arm upper surface should be the same height. Checking the gap between the lower arm and the fixture is not required.
  Failure Results: Load port, wafers, and arms could be damaged.
  Corrective Action: Refer to **7.7 Adjusting the Arm-to-FOUP Hand-over Position (see page 508)** to correct.

- **7.8 Checking the Mapping Arm Insertion Position (see page 534)**
  Inspections: There is no gap between the mapping sensor positioning fixture and the arm insertion position fixture, and between the mapping sensor positioning fixture and the mapping arm.
  Failure Results: Mapping can not be performed correctly.
  Corrective Action: Refer to **7.9 Adjusting the Mapping Arm Insertion Position (see page 545)** to correct.

- **7.10 Checking the Mapping Sensor Level (see page 550)**
  Inspections: The value for `RUN`±10% of the value marked on the label.
  Inspections: The value for `ADJ` on the amplifier is equal to the value marked in the label.
  If you are using the prober to test 300 mm wafers, the value of amplifier is 1000 or more. For the prober to test 200 mm wafers, the value of amplifier is 1200 or more.
  Failure Results: Recognition judgment errors will occur during mapping.
  Corrective Action: Refer to **7.12 Adjusting the Mapping Sensor Threshold (300 mm Position) (see page 564)** to correct.

- **7.11 Checking the Mapping Sensor Threshold (300 mm Position) (see page 555)**
  When scanning the wire block on the Wafer Search Position Adjustment Menu, the values for `Wire Thickness` and `Search Position` are within the specification indicated in the procedure.
  Failure Results: Errors will occur, and wafer thickness cannot be measured correctly.
  Corrective Action: Refer to **7.12 Adjusting the Mapping Sensor Threshold (300 mm Position) (see page 564)** to correct.

- **7.14 Checking the Wafer Table Hand-Over Position (see page 579)**
  Inspections: The following conditions are met when the arm is transferred to the wafer table hand-over position: The tip of the arm is even with the edge of the wafer table alignment fixture. The gap between the arm and fixture is the same on both the left and the right. The fixture upper surface and the arm upper surface should be the same height. For the lower arm, verify only that the fixture upper surface and the arm upper surface are the same height.
  Failure Results: Wafer table, wafers, and arms could be damaged.
  Corrective Action: Refer to **7.15 Adjusting the Wafer Table Hand-Over Position (see page 587)** to correct.

- **7.16 Checking the Prealign Sensor Voltage and Position (see page 597)**
  Inspections: The prealign sensor is attached parallel to the arm. When looking from directly above, the prealign sensor cover positioning hole and the fixture positioning hole are in the same position. The prealign sensor is attached vertically when looking from the load port. The voltage conversion values of the 200 and 300 `Prealign LED` are 4.75 V (-0.05/+0 V).
  Failure Results: If the sensor voltage is incorrect, prealignment is performed incorrectly. Any deviation or error that occurs during prealignment could affect total wafer alignment.
  Corrective Action: Refer to **7.17 Adjusting the Prealign Sensor Voltage and Position (see page 605)** to correct.

- **7.18 Checking the Autoloading Position (see page 617)**
  Inspections: When wafers are loaded to the chuck top, they are loaded to the center of the chuck top correctly.
  Failure Results: Wafer alignment may not be performed.
  Corrective Action: Refer to **7.19 Adjusting the Specified Stage Position (see page 619)** to correct if the displacement amount is small. Refer to **7.20 Setting the Autoloading Position (see page 623)** to correct if the displacement amount is large.

- **7.21 Checking and Adjusting the FOUP Opener Presence Sensor (see page 650)**
  The `Present` and `Placed` sensors for the load port are `ON` on the *Sensor Check Menu* when the FOUP is set to the load port, and the PRESENCE and PLACEMENT LEDs on the Load Port are illuminated.
  Failure Results: The prober does not recognize that the FOUP is set, and the FOUP, wafers, and arms could be damaged.
  Corrective Action: Refer to the procedures provided for adjustment.

- **7.23 Checking the Prealignment Accuracy (see page 668)**
  Inspections: After entering the macro pattern on the *Wafer Menu*, the theta axis stage coordinate is -5000 to 5000/10000°.
  Failure Results: Wafer alignment may not be performed correctly.
  Corrective Action: Refer to **7.24 Adjusting the Prealignment Accuracy (see page 671)** to correct.

7.2 Checking the Upper/Lower Arm Home Position 1454.2

Introduction

Purpose:

To check the upper/lower arm home positions so that wafers are transferred correctly.

The arm home position is the point from which the arms start all movements. If the home position is incorrect, the wafers or arms could be damaged during transfer.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	Arm home positioning fixture Screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to position the loader Z.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

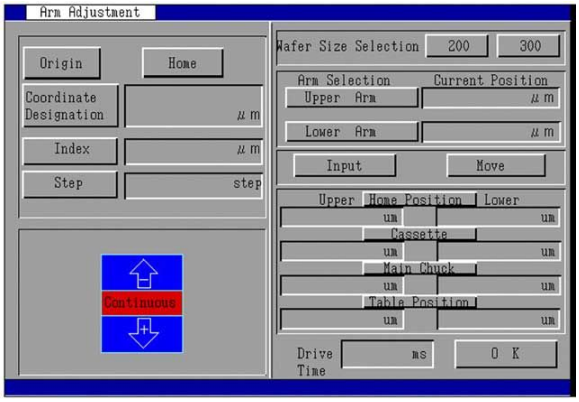
2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

2.5 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

2.6 Press ARM (UPPER/LOWER) on the *Loader Item Selection Menu*. The *Arm (Upper/Lower) Adjustment Menu* is displayed.

Arm Adjustment Menu



3 Use the following steps to position the upper and lower arms.

3.1 Press UPPER ARM on the *Arm (Upper/Lower) Adjustment Menu*.

3.2 Press ORIGIN. The upper arm moves to the origin position.

3.3 Press HOME. The upper arm moves to the home position.

3.4 Press LOWER ARM on the *Arm (Upper/Lower) Adjustment Menu*.

3.5 Press ORIGIN. The lower arm moves to the origin position.

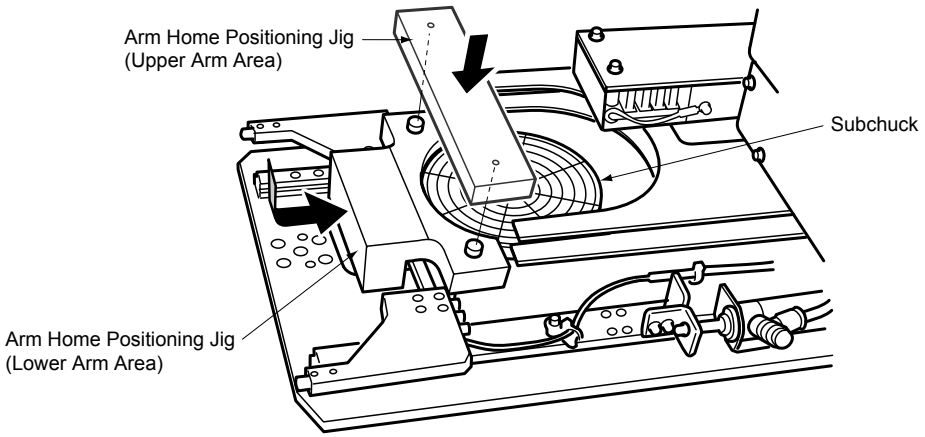
3.6 Press HOME. The lower arm moves to the home position.

4 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

5 Place the arm home positioning fixture on the loader. Hold down the positioning fixture to press it lightly against the subchuck.

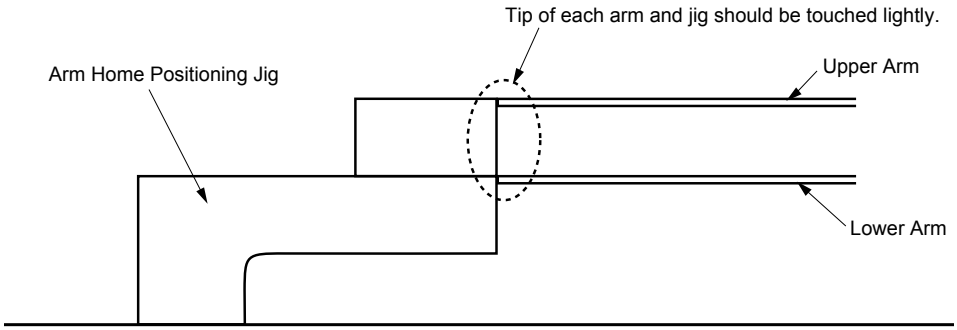
NOTE **If you are using the prober to test 200 mm wafers, move the mapping arms to the 300 mm position while performing this procedure.**

Arm Home Positioning Fixture



6 Check that the tip of each arm touches the arm home positioning device.

Checking the Arm Position



If the arm position is incorrect, remove the positioning device and perform an adjustment by following the procedure described in **7.3 Adjusting the Upper/Lower Arm Home Positions (see page 466)**.

7 Remove the arm home positioning device.

8 Press OK on the *Arm Adjustments Menu*, then press PREVIOUS MENU.

NOTE **If you are using the prober to test 200 mm wafers, return the mapping arms to the 200 mm position.**

9 Replace the loader side panel.

Checking the Dual Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to move the loader to the arm unit maintenance position.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

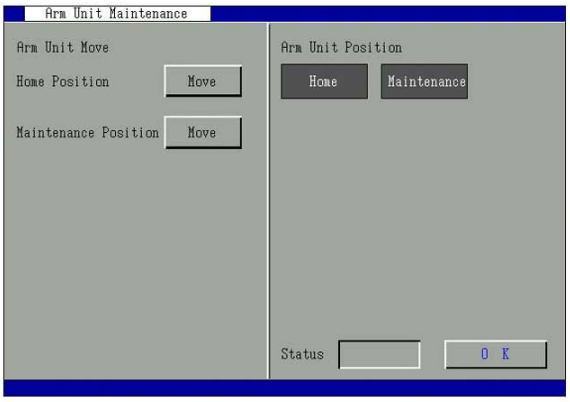
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

2.5 Press ARM UNIT MAINTENANCE on the *Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

▼ Arm Unit Maintenance Menu



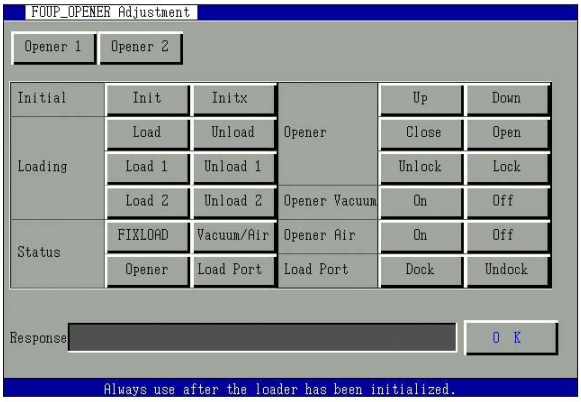
2.6 Under `Arm Unit Move`, press MOVE for the `Maintenance Position`. The arm unit moves to the maintenance position.

3 Use the following steps to open FOUP opener 1.

3.1 Press OK on the *Arm Unit Maintenance Menu*. The *Item Selection Menu* is displayed.

3.2 Press FOUP_OPENER ADJUSTMENT on the *Item Selection Menu*.

▼ FOUP_OPENER Adjustment Menu



3.3 Press OPENER 1.

3.4 Press OPEN under `Opener`. The FOUP opener opens.

3.5 Press DOWN. The FOUP opener descends.

3.6 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

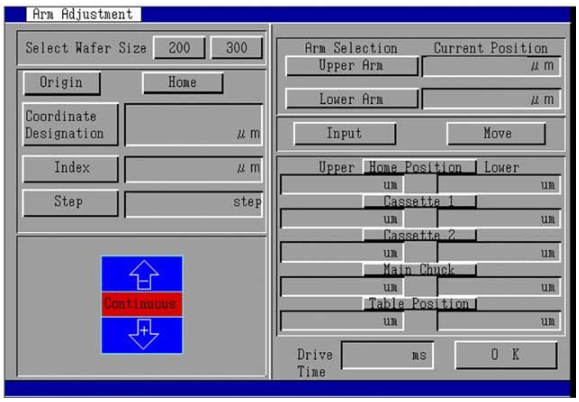
3.7 Press NO.

4 Use the following steps to access the *Arm Adjustment Menu*.

4.1 Press ALL AXES ADJUSTMENT on the *Item Selection Menu*.

4.2 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

Arm Adjustment Menu



5 Use the following steps to position the upper and lower arms.

5.1 Press UPPER ARM on the *Arm (Upper/Lower) Adjustment Menu*.

5.2 Press ORIGIN. The upper arm moves to the origin position.

5.3 Press HOME. The upper arm moves to the home position.

5.4 Press LOWER ARM on the *Arm (Upper/Lower) Adjustment Menu*.

5.5 Press ORIGIN. The lower arm moves to the origin position.

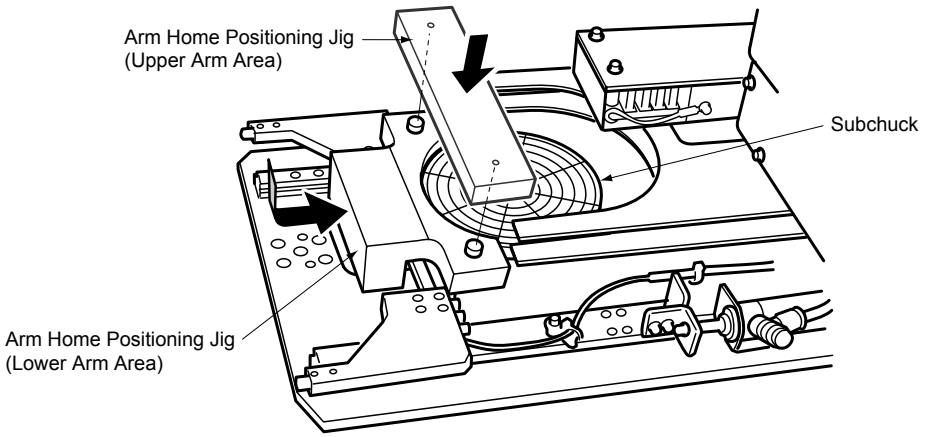
5.6 Press HOME. The lower arm moves to the home position.

6 Remove loader rear panel 1 by following the procedure described in **4.7.1 Removing and Attaching the Loader Right Side Panels (Dual Port) (see page 131)**.

7 Place the arm home positioning fixture on the loader. Hold down the positioning fixture to press it lightly against the subchuck.

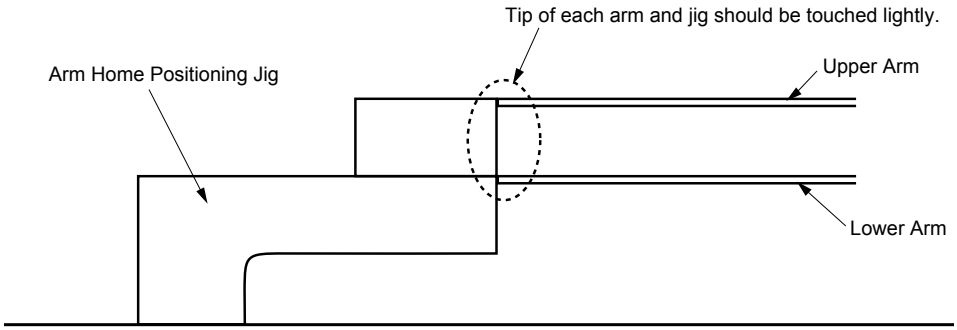
NOTE **If you are using the prober to test 200 mm wafers, move the mapping arms to the 300 mm position while performing this procedure.**

Arm Home Positioning Fixture



8 Check that the tip of each arm touches the arm home positioning device.

Checking the Arm Position



If the arm position is incorrect, remove the positioning device and perform an adjustment by following the procedure described in **7.3 Adjusting the Upper/Lower Arm Home Positions (see page 466)**.

9 Remove the arm home positioning device.

10 Press OK on the *Arm Adjustments Menu*..

NOTE **If you are using the prober to test 200 mm wafers, return the mapping arms to the 200 mm position.**

11 Replace loader rear panel 1.

7.3 Adjusting the Upper/Lower Arm Home Positions 1455.2

Introduction

Purpose:

To adjust the arm home position so that the wafers are transferred correctly.

The arm home position is the point from which the arms start all movements. If the home position is incorrect, the arms or the wafers could be damaged during transfer. If the prober is still out of specification when the adjustment is complete, contact TEL Field Service Support.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	Arm home positioning fixture Screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Adjusting the Single Port Loader Specification

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

1 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

2 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

3 Use the following steps to position the loader Z.

3.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

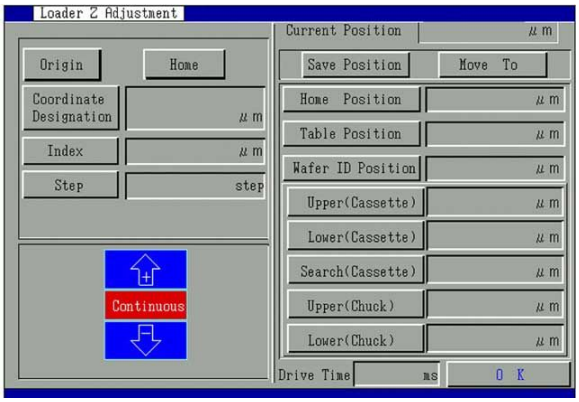
3.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3.5 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

3.6 Press LOADER Z on the *All Axes Adjustment Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



4 Use the following steps to position the loader Z.

4.1 Press ORIGIN. The loader Z moves to the origin position.

4.2 Press HOME. The loader Z moves to the home position.

4.3 Press MOVE TO.

4.4 Press TABLE POSITION. A check menu is displayed with the message `Do you want to move?`

4.5 Press YES on the check menu. The loader Z moves up to the table position.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the loader area before initiating diagnostic move commands.

4.6 Press OK on the *Loader Z Adjustment Menu*.

4.7 Press PREVIOUS MENU.

5 Use the following steps to open the FOUP Door.

5.1 Press FOUP_OPENER ADJUSTMENT on the *Item Selection Menu*.

▼ **FOUP_OPENER Adjustment Menu**

5.2 Press OPEN under `Opener`. The FOUP opener opens.

5.3 Press DOWN under `Opener`. The FOUP opener descends.

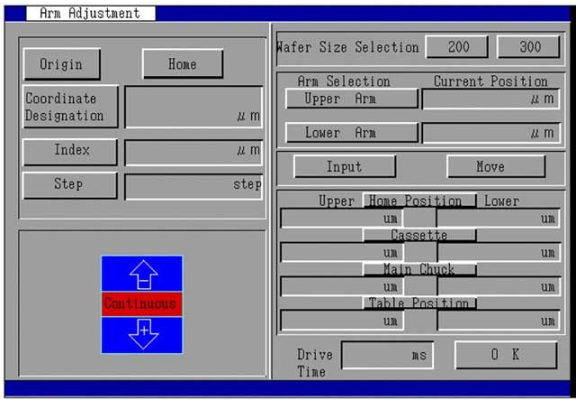
5.4 Press OK. A check menu is displayed with the message `Initialize FOUP_OPENER?`.

5.5 Press NO.

6 Press ALL AXES ADJUSTMENT on the *Item Selection Menu*.

7 Press ARM (UPPER/LOWER) on the *All Axes Adjustment Menu*. The *Arm Adjustment Menu* is displayed.

▼ **Arm Adjustment Menu**



8 Use the following steps to transfer the arm to the home position.

8.1 Press UPPER ARM.

8.2 Press ORIGIN.

8.3 Press HOME.

8.4 Press LOWER ARM.

8.5 Press ORIGIN.

8.6 Press HOME.

9 Use the following steps to adjust the lower arm.

NOTE **When adjusting both the upper and lower arms, always adjust the lower arm first.**

9.1 Press LOWER ARM on the *Arm Adjustment Menu*.

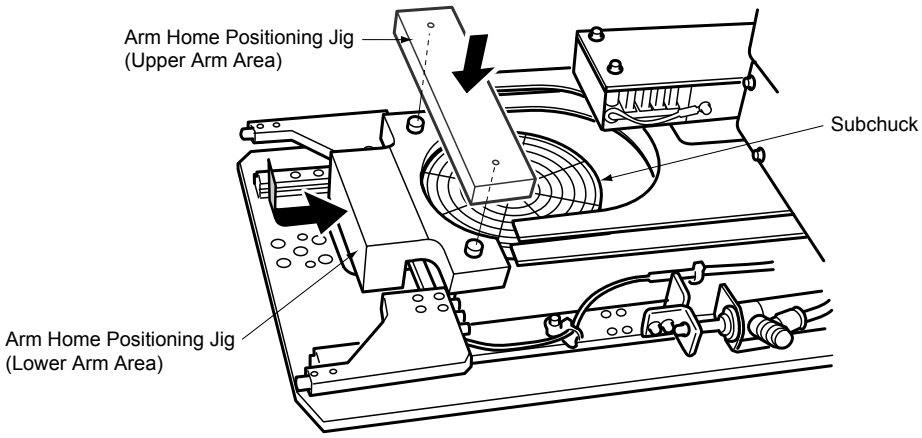
9.2 Press INDEX twice. A numeric keypad is displayed. Input 100µm and press OK.

9.3 Press OK.

9.4 Press PREVIOUS MENU to exit to a passive screen.

9.5 Place the arm home positioning fixture on the loader. Hold down the positioning fixture to press it lightly against the subchuck.

▼ Arm Home Positioning Fixture



NOTE **If the arm and arm home positioning fixture interfere with each other, transfer the arm to the position where there is no interference.**

9.6 Press ALL AXIS ADJUSTMENT.

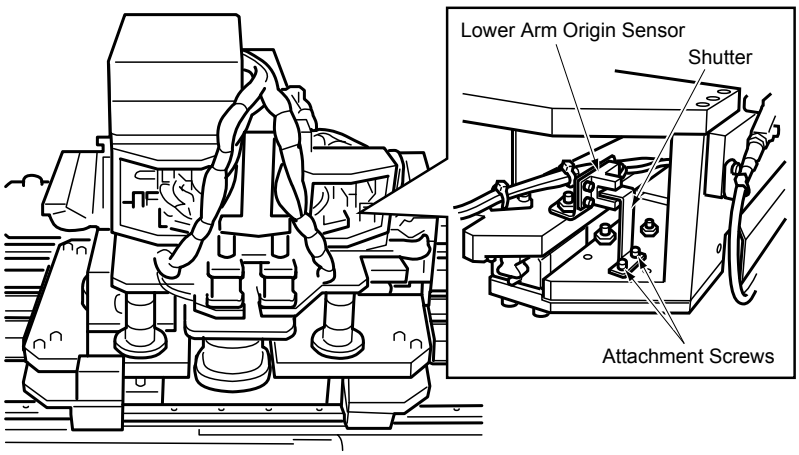
9.7 Press Arm (Upper/Lower)

9.8 Press Lower Arm

9.9 Press the arrow buttons to move the lower arm so that its tip touches the arm home positioning device.

9.10 Verify that the current position of the lower arm is between -4000 and -5000 µm. If the value is outside the specification, contact TEL Field Service.

▼ **Lower Arm Origin Sensor and Shutter**



9.11 Press INPUT.

9.12 Press HOME POSITION. A check menu is displayed stating, `Do you want to save?` Press YES.

CAUTION **Property Damage Hazard**

Check the following items when saving the specified position of the arm. Failure to check these items could result in damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is pressed. The upper or lower arm is selected correctly.

10 Use the following steps to adjust the upper arm.

NOTE **When adjusting both the upper and lower arms, always adjust the lower arm first.**

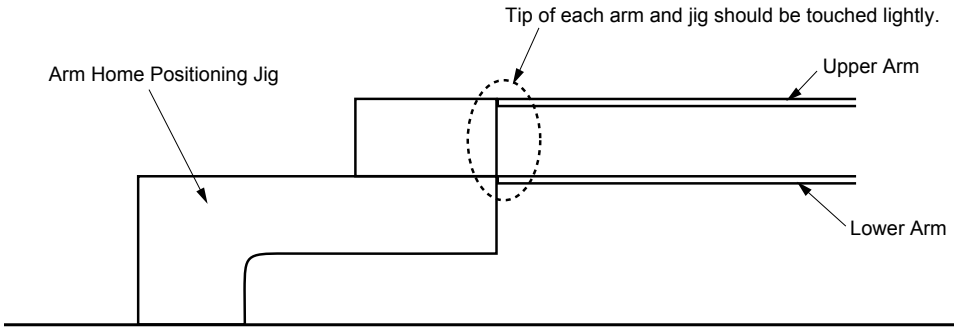
10.1 Press UPPER ARM on the *Arm Adjustment Menu*.

10.2 Press INDEX twice. A numeric keypad is displayed. Input 100µm and press OK.

10.3 Press the arrow buttons to move the upper arm so that its tip touches the arm home positioning device.

10.4 Verify that the current position of the upper arm is between -4000 and -5000 µm. If the value is outside the specification, contact TEL Field Service.

▼ **Checking the Arm Position**



10.5 Press INPUT.

10.6 Press HOME POSITION. A check menu is displayed stating, `Do you want to save?` Press YES.

> **CAUTION** **Property Damage Hazard**
> **Check the following items when saving the specified position of the arm. Failure to check these items could result in damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is pressed. The upper or lower arm is selected correctly.**

11 Press OK.

12 Press PREVIOUS MENU to exit to a passive menu.

13 Remove the positioning fixture.

14 Check the home position of each arm again by following the procedure described in **7.2 Checking the Upper/Lower Arm Home Position (see page 460)**.

15 Enable the interlock.

> **WARNING** **Mechanical Hazard**
> **Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.**

16 Initialize the loader.

Adjusting the Dual Port Loader Specification

> **WARNING** **Mechanical Hazard**
> **The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.**

1 Remove loader rear panel 1 by following the procedure described in **4.7.1 Removing and Attaching the Loader Right Side Panels (Dual Port) (see page 131)**.

2 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

3 Use the following steps to move the loader to the arm unit maintenance position.

3.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

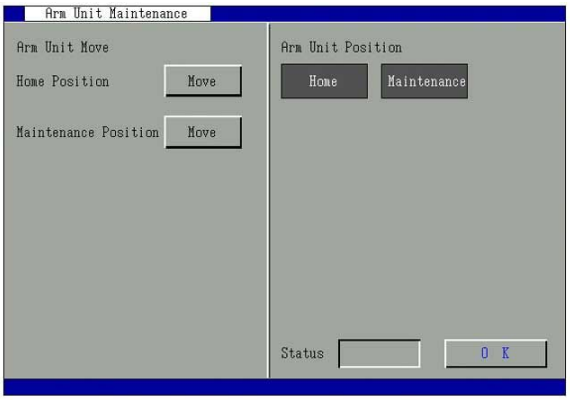
3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

3.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3.5 Press ARM UNIT MAINTENANCE on the *Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

Arm Unit Maintenance Menu



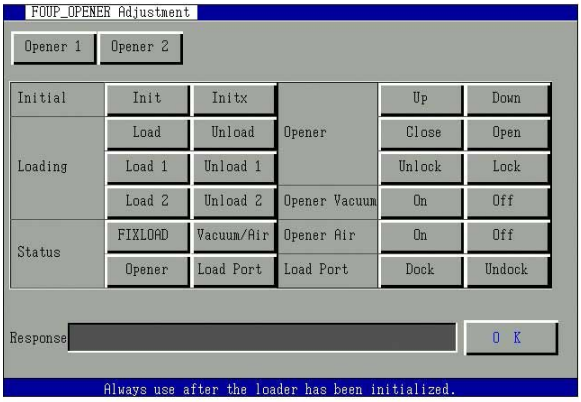
3.6 Under `Arm Unit Move`, press MOVE for the `Maintenance Position`. The arm unit moves to the maintenance position.

4 Use the following steps to open FOUP opener 1.

4.1 Press OK on the *Arm Unit Maintenance Menu*. The *Item Selection Menu* is displayed.

4.2 Press FOUP_OPENER ADJUSTMENT on the *Item Selection Menu*.

FOUP_OPENER Adjustment Menu



4.3 Press OPENER 1.

4.4 Press OPEN under `Opener`. The FOUP opener opens.

4.5 Press DOWN. The FOUP opener descends.

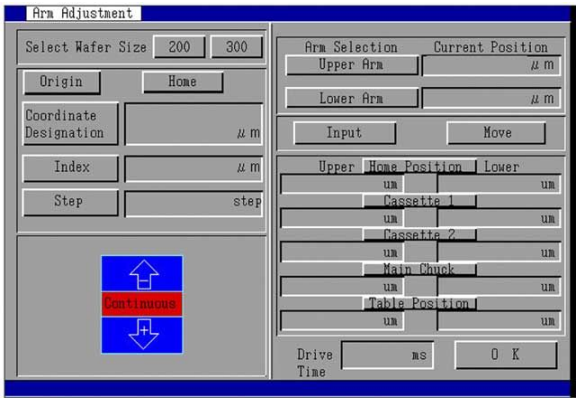
4.6 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

4.7 Press NO.

5 Press ALL AXES ADJUSTMENT on the *Item Selection Menu*.

6 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

Arm Adjustment Menu



7 Use the following steps to position the upper and lower arms.

7.1 Press UPPER ARM on the *Arm (Upper/Lower) Adjustment Menu*.

7.2 Press ORIGIN. The upper arm moves to the origin position.

7.3 Press HOME. The upper arm moves to the home position.

7.4 Press LOWER ARM on the *Arm (Upper/Lower) Adjustment Menu*.

7.5 Press ORIGIN. The lower arm moves to the origin position.

7.6 Press HOME. The lower arm moves to the home position.

8 Use the following steps to adjust the lower arm.

NOTE **When adjusting both the upper and lower arms, always adjust the lower arm first.**

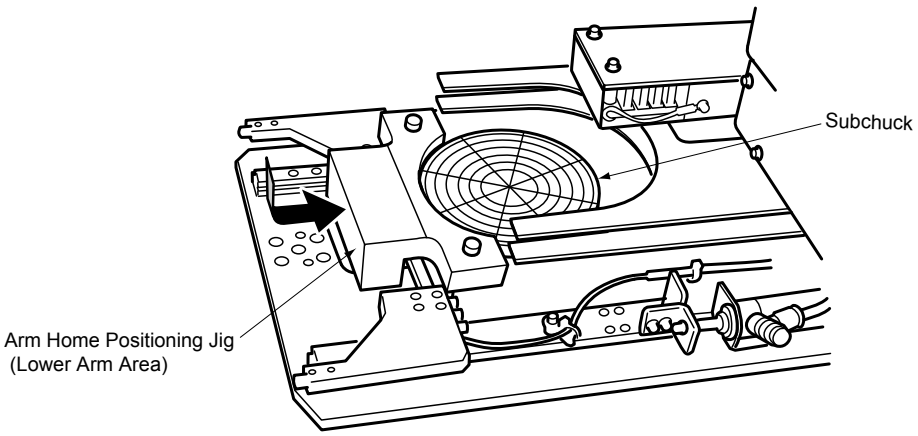
8.1 Press LOWER ARM on the *Arm Adjustment Menu*.

8.2 Press INDEX twice. A numeric keypad is displayed. Input 100μm and press OK.

8.3 Press OK.

8.4 Place the arm home positioning fixture on the loader. Hold down the positioning fixture to press it lightly against the subchuck.

▼ **Arm Home Positioning Fixture**

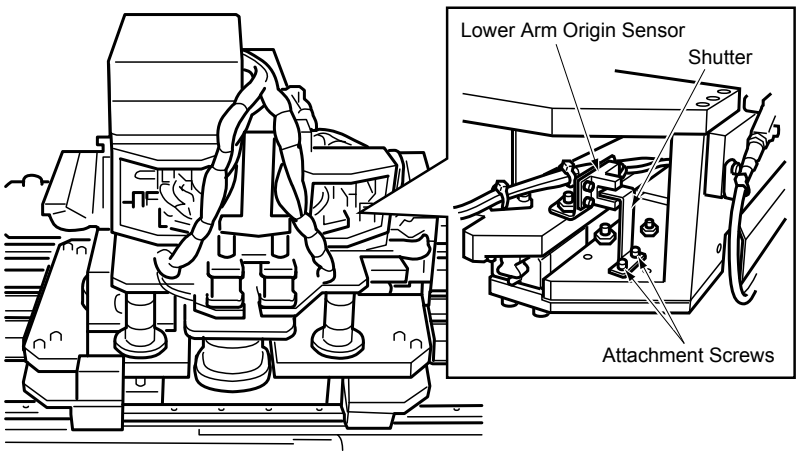


NOTE **If the arm and arm home positioning jig interfere each other, transfer the arm to the position where there is no interference.**

8.5 Press the down arrow button (↓) to move the lower arm so that its tip touches the arm home positioning device.

8.6 Verify that the current position of the lower arm is between -4000 and -5000 µm. Adjust the origin sensor shutter position if the value is outside the specification.

▼ **Lower Arm Origin Sensor and Shutter**



8.7 Remove the positioning device.

8.8 Press INPUT.

8.9 Press HOME POSITION. A check menu is displayed stating, `Do you want to save?` Press YES.

CAUTION **Property Damage Hazard**

Check the following items when saving the specified position of the arm. Failure to check these items could result in damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is pressed. The upper or lower arm is selected correctly.

9 Use the following steps to adjust the upper arm.

NOTE **When adjusting both the upper and lower arms, always adjust the lower arm first.**

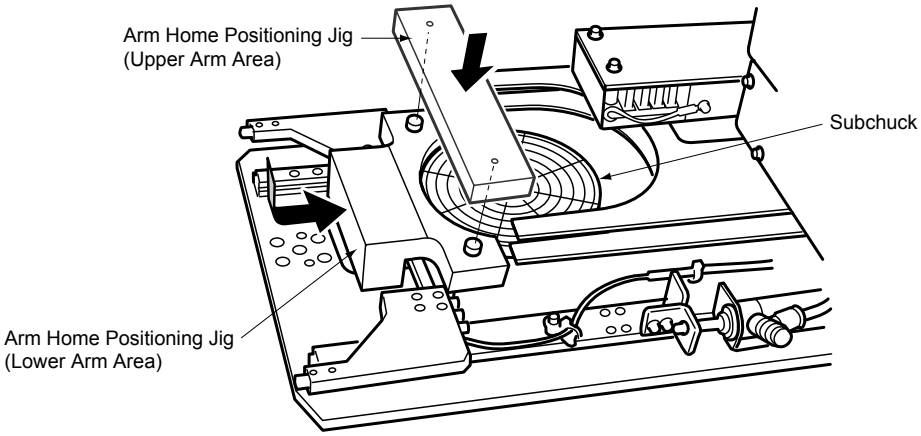
9.1 Press UPPER ARM on the *Arm Adjustment Menu*.

9.2 Press INDEX twice. A numeric keypad is displayed. Input 100µm and press OK.

9.3 Press OK.

9.4 Place the arm home positioning fixture on the loader.

Arm Home Positioning Fixture

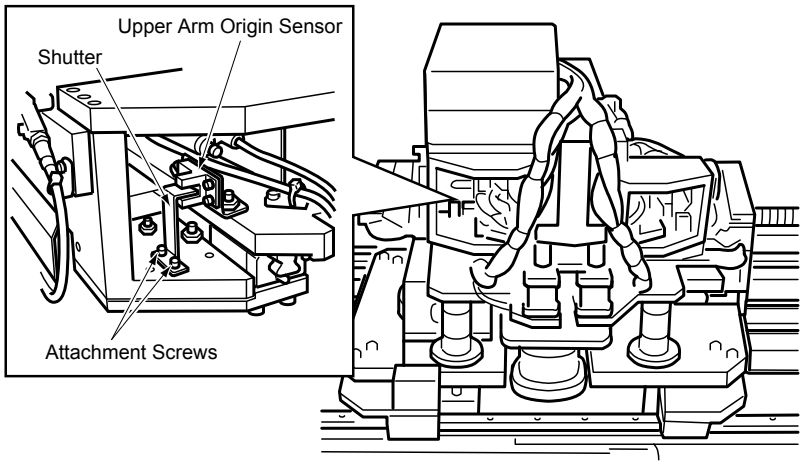


NOTE **If the arm and arm home positioning jig interfere each other, transfer the arm to the position where there is no interference.**

9.5 Press the down arrow button (↓) to move the upper arm so that its tip touches the arm home positioning device.

9.6 Verify that the current position of the upper arm is between -4000 and -5000 µm. Adjust the origin sensor shutter position if the value is outside the specification.

Upper Arm Origin Sensor and Shutter



9.7 Remove the positioning device.

9.8 Press INPUT.

9.9 Press HOME POSITION. A check menu is displayed stating, `Do you want to save?` Press YES.

> **CAUTION** **Property Damage Hazard**
> **Check the following items when saving the specified position of the arm. Failure to check these items could result in damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is pressed. The upper or lower arm is selected correctly.**

10 Press OK. The *Item Selection Menu* is displayed.

11 Check the home position of each arm again by following the procedure described in **7.2 Checking the Upper/Lower Arm Home Position (see page 460)**.

12 Use the following steps to close the FOUP opener 1.

12.1 Press FOUP_OPENER ADJUSTMENT on the *Item Selection Menu*.

12.2 Press OPENER 1.

12.3 Press UP under `Opener`. The FOUP opener 1 rises.

12.4 Press CLOSE under `Opener`. The FOUP opener closes.

12.5 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

12.6 Press NO.

13 Enable the interlock.

> **WARNING** **Mechanical Hazard**
> **Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.**

7.4 Checking the Loader Z Home Position 1456.2

Introduction

Purpose:

To check the loader Z home position.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Scaled rule
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Mechanical Hazard**
Keep clear of the FOUP and loader areas when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to position the loader Z.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

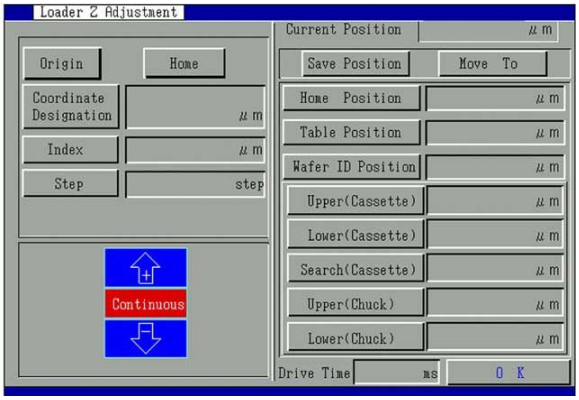
2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press LOADER on the *Adjustments Menu*.

2.5 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

2.6 Press LOADER Z on the *All Axes Adjustment Menu*. The *Loader Z Adjustment Menu* is displayed.

▼ **Loader Z Adjustment Menu**



2.7 Press ORIGIN. The loader Z moves to the origin position.

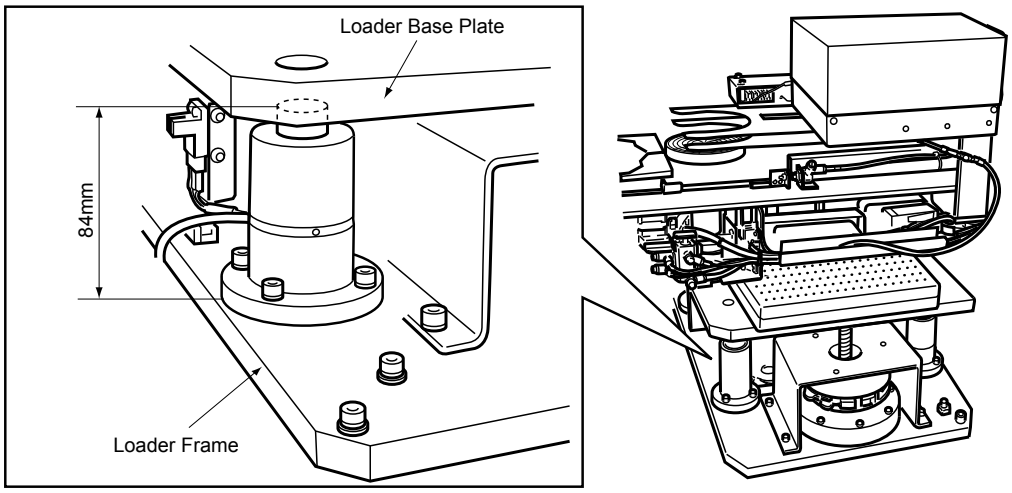
2.8 Press HOME. The loader Z moves to the home position. Note the home position for future reference.

2.9 Press OK, then press PREVIOUS MENU to exit the *Loader Z Adjustment Menu*.

3 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

4 Use a scaled rule to measure the distance from the surface of the loader frame to the bottom of the loader base plate.

▼ **Verifying Loader Z Home Position**



5 Verify that the distance measured is 84 mm and that the value of the `Home Position` is 10,000 µm.

- If the values are correct, continue with the next step.
- If the values are incorrect, perform the procedure described in **7.5 Adjusting the Loader Z Home Position (see page 482)**.

6 Reattach the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

7 Press ALL AXIS ADJUSTMENT.

8 Initialize the loader.

9 Press PREVIOUS MENU.

10 Press PREVIOUS MENU.

11 Press MAIN MENU.

Checking the Dual Port Loader Specification

1 Use one of the following methods to begin the procedure.

> **⚠ CAUTION** **Mechanical Hazard**
> **Keep clear of the FOUP and loader areas when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to move the loader to the arm unit home position.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

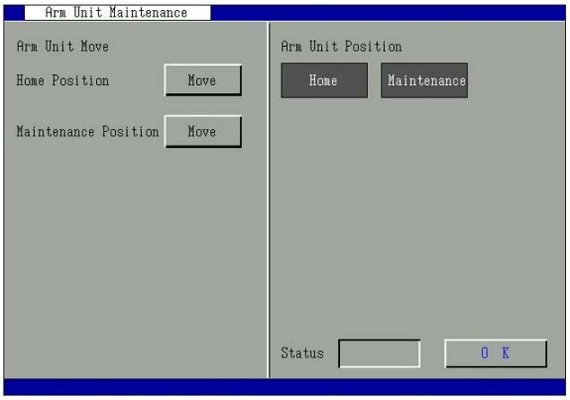
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

2.5 Press ARM UNIT MAINTENANCE on the *Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

▼ Arm Unit Maintenance Menu



2.6 Under `Arm Unit Move`, press MOVE for the `Home Position`. The arm unit moves to the maintenance position.

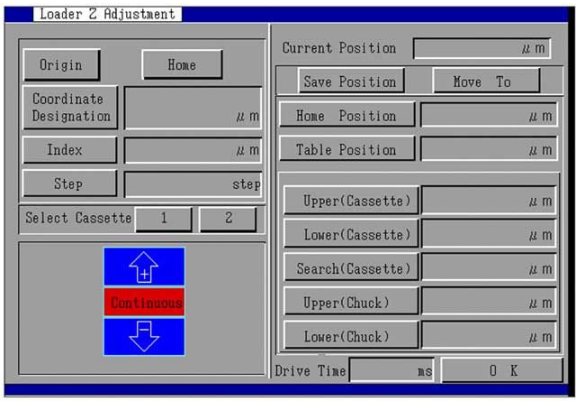
3 Use the following steps to transfer the loader Z.

3.1 Press OK on the *Arm Unit Maintenance Menu*. The *Item Selection Menu* is displayed.

3.2 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

3.3 Press LOADER Z on the *All Axes Adjustment Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



4 Press ORIGIN. The loader Z moves to the origin position.

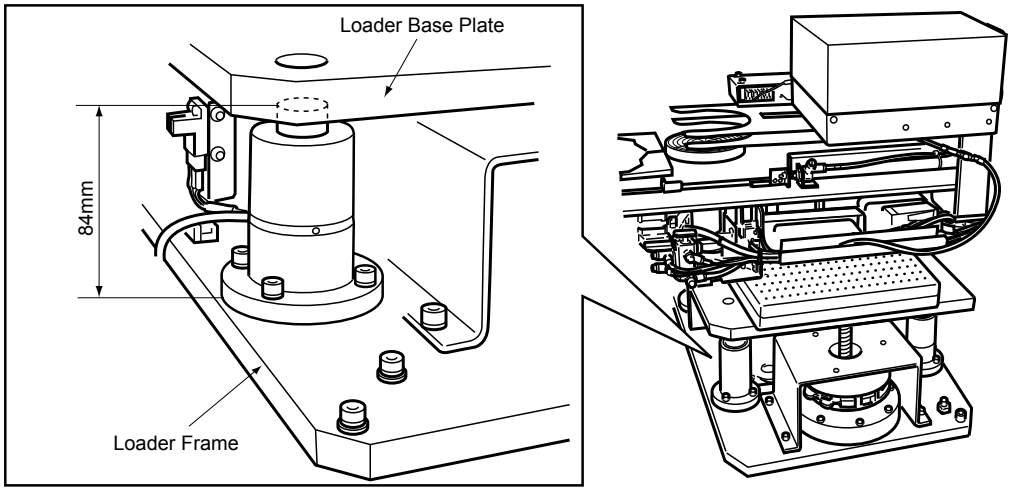
5 Press HOME. The loader Z moves to the home position.

6 Press OK to exit the *Loader Z Adjustment Menu*.

7 Remove loader rear panels 1 and 3 by following the procedure described in **4.7.1 Removing and Attaching the Loader Right Side Panels (Dual Port) (see page 131)**.

8 Use a scaled rule to measure the distance from the surface of the loader frame to the bottom of the loader base plate.

Verifying Loader Z Home Position



9 Verify that the distance measured is 84 mm and that the value of the `Home Position` is 10,000 µm.

- If the values are correct, continue with the next step.
- If the values are incorrect, perform the procedure described in **7.5 Adjusting the Loader Z Home Position (see page 482)**.

10 Replace loader rear panels 1 and 3.

7.5 Adjusting the Loader Z Home Position 1457.2

Introduction

Purpose:

To adjust the loader Z home position.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Scaled rule
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Adjusting the Single Port Loader Specification

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

1 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

2 Disable the loader side panel interlock.

3 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Mechanical Hazard**

Keep clear of the FOUP and loader areas when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

4 Use the following steps to position the loader Z.

4.1 Press DIAGNOSTICS on the *Main Menu*.

4.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

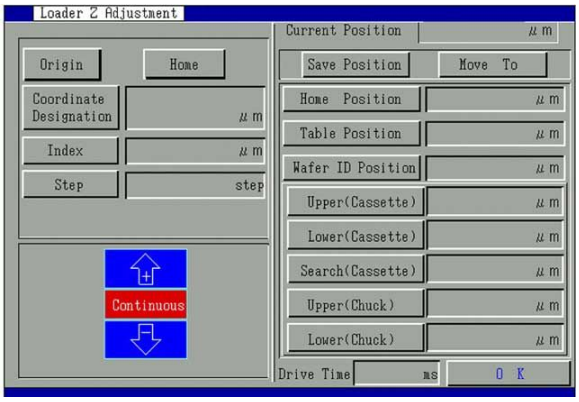
4.3 Input your password on the numeric keypad and press INPUT.

4.4 Press LOADER on the *Adjustments Menu*.

4.5 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

4.6 Press LOADER Z on the *All Axes Adjustment Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



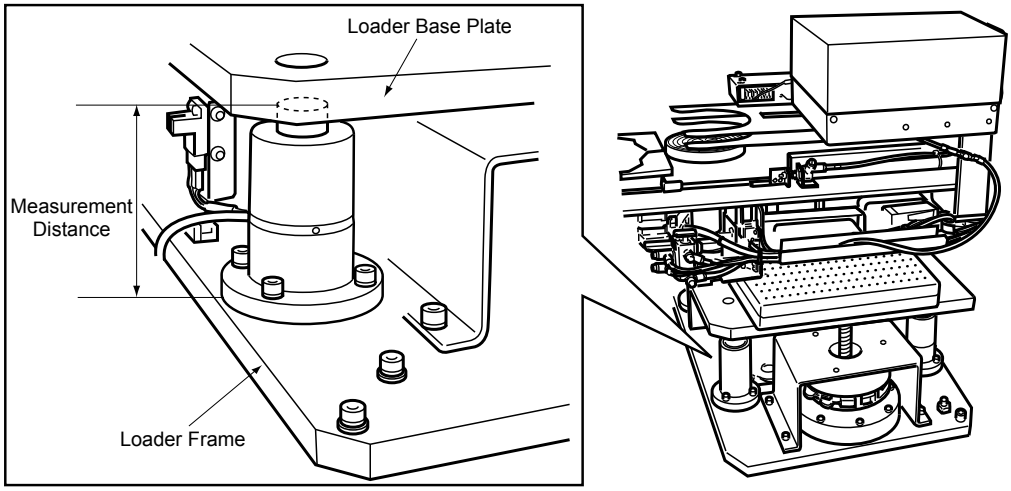
4.7 Press ORIGIN. The loader Z moves to the origin position.

4.8 Press OK, then press PREVIOUS MENU to exit to a passive screen.

5 With the loader Z in the origin position, the adjustment should be performed so that the distance from the surface of the loader frame to the loader base plate is 94 mm. Use the following steps to perform the adjustment.

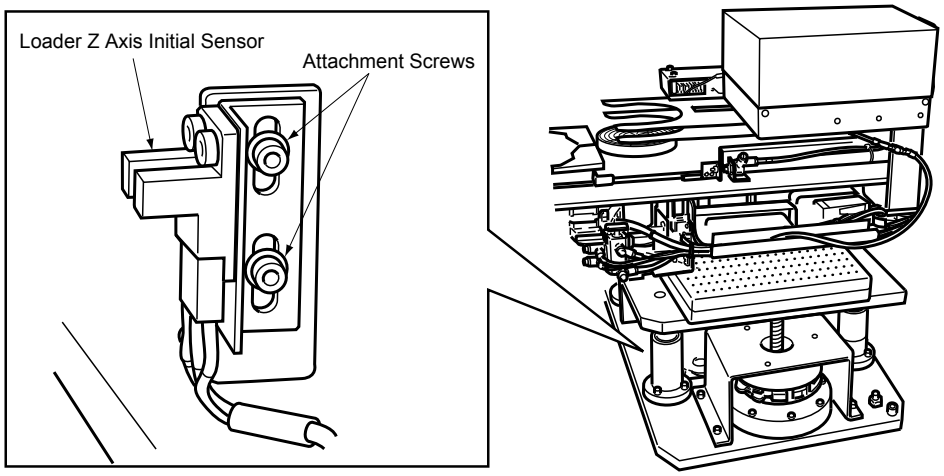
5.1 Use the scaled rule to measure the distance from the surface of the loader frame to the bottom of the loader base plate. Record the value.

Measuring the Distance



5.2 Loosen the two loader Z axis initial sensor attachment screws.

▼ **Loader Z Axis Initial Sensor**



5.3 Adjust the loader Z axis initial sensor position by moving it up or down depending on the value you measured in step 5.1.

NOTE **The loader Z axis initial position is the point where the loader Z axis initial sensor turns ON.**

5.4 Tighten the attachment screws on the sensor.

5.5 Press ALL AXES ADJUSTMENT.

5.6 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

5.7 Press ORIGIN.

5.8 Press OK.

5.9 Press PREVIOUS MENU to exit to a passive screen.

5.10 Using the scale, check that the distance from the surface of the loader frame to the bottom of the loader base plate is 94 mm.

If the distance is not correct, repeat the adjustment beginning with step 5.1.

6 Use the following steps to set the loader Z home position.

6.1 Press ALL AXES ADJUSTMENT.

6.2 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

6.3 Press COORDINATE DESIGNATION twice and enter —10,000 µm.

6.4 Press the down arrow once.

6.5 Press SAVE POSITION.

6.6 Press HOME POSITION. A check menu is displayed stating, `Do you want to save?` Press YES. The current position is saved as the home position.

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for the axis being saved is selected. SAVE POSITION **is selected.**

6.7 Press OK.

7 Press INITIALIZE LOADER. The loader is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

8 Press PREVIOUS MENU to exit to a passive screen.

9 Use a scaled rule to check that the distance from the surface of the loader frame to the bottom of the loader base plate is 84 mm.

If the value is outside the specification, repeat steps 4 through 9.

10 Enable the interlock for the loader side panel, then reattach the panel.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

Adjusting the Dual Port Loader Specification

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

1 Remove loader rear panel 1 by following the procedure described in **4.7.1 Removing and Attaching the Loader Right Side Panels (Dual Port) (see page 131)**.

2 Use one of the following methods to begin the procedure.

CAUTION **Mechanical Hazard**

Keep clear of the FOUP and loader areas when powering on and initializing the prober. Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

3 Use the following steps to move the loader to the arm unit home position.

3.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

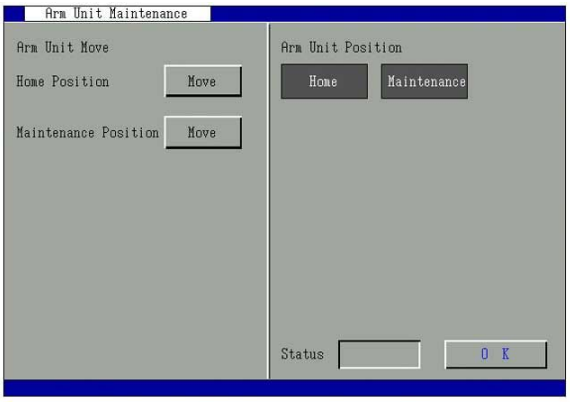
3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

3.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3.5 Press ARM UNIT MAINTENANCE on the *Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

▼ **Arm Unit Maintenance Menu**



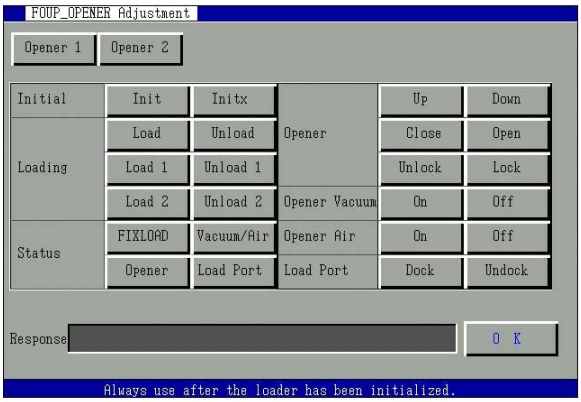
3.6 Under `Arm Unit Move`, press MOVE for the `Home Position`. The arm unit moves to the maintenance position.

4 Use the following steps to open FOUP opener 1.

4.1 Press OK on the *Arm Unit Maintenance Menu*. The *Item Selection Menu* is displayed.

4.2 Press FOUP_OPENER ADJUSTMENT on the *Item Selection Menu*.

▼ **FOUP_OPENER Adjustment Menu**



4.3 Press OPENER 1.

4.4 Press OPEN under `Opener`. The FOUP opener opens.

4.5 Press DOWN. The FOUP opener descends.

4.6 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

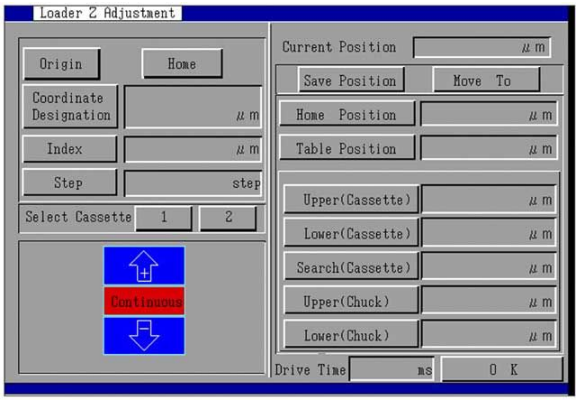
4.7 Press NO.

5 Use the following steps to transfer the loader Z.

5.1 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

5.2 Press LOADER Z on the *All Axes Adjustment Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



6 Press ORIGIN. The loader Z moves to the origin position.

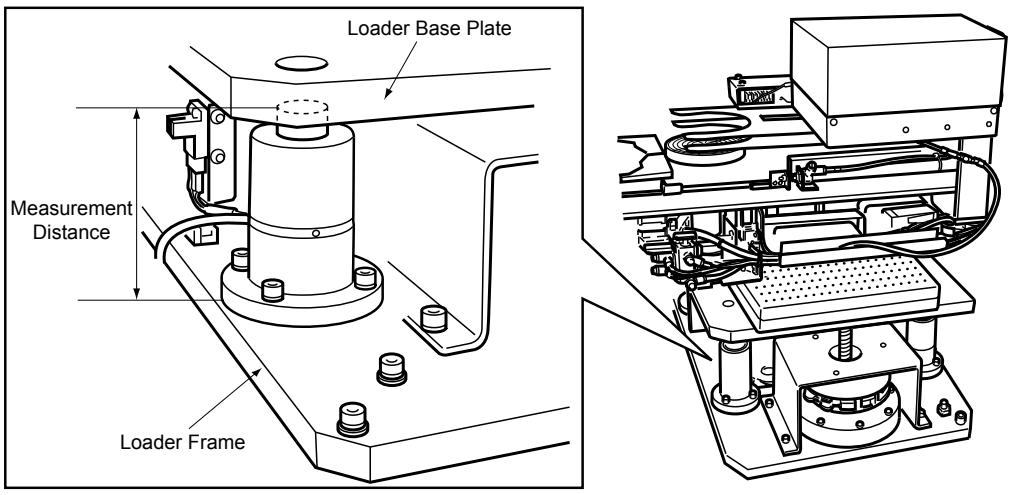
7 Press OK.

8 Remove loader rear panels 3 by following the procedure described in **4.7.1 Removing and Attaching the Loader Right Side Panels (Dual Port) (see page 131)**.

9 With the loader Z in the home position, the adjustment should be performed so that the distance from the surface of the loader frame to the loader base plate is 94 mm. Use the following steps to perform the adjustment.

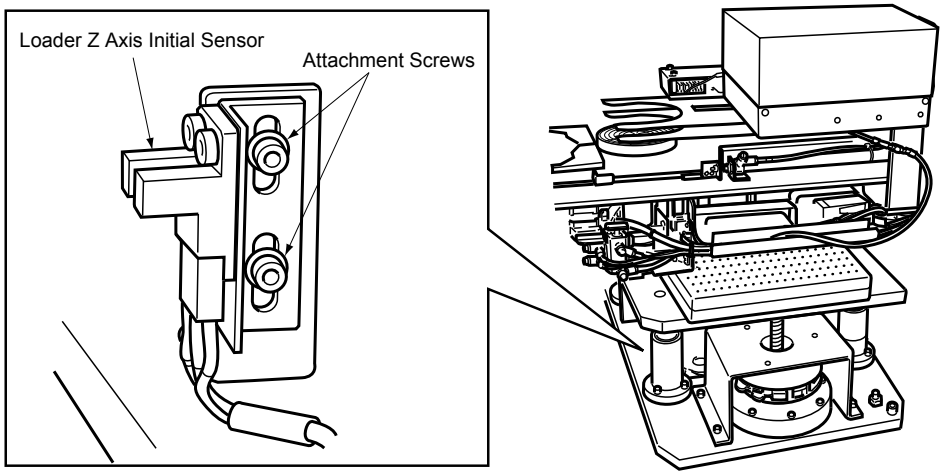
9.1 Use the scaled rule to measure the distance from the surface of the loader frame to the bottom of the loader base plate. Record the value.

▼ **Measuring the Distance**



9.2 Loosen the two loader Z axis initial sensor attachment screws.

▼ **Loader Z Axis Initial Sensor**



9.3 Adjust the loader Z axis initial sensor position by moving it up or down depending on the value you measured in step 9.1.

NOTE **The loader Z axis initial position is the point where the loader Z axis initial sensor turns ON.**

9.4 Tighten the attachment screws on the sensor.

9.5 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

9.6 Press ORIGIN on the *Loader Z Adjustment Menu*. The loader Z moves to the origin position adjusting in step 9.3.

9.7 Press OK.

9.8 Using the scale, check that the distance from the surface of the loader frame to the bottom of the loader base plate is 94 mm.

If the distance is not correct, repeat the adjustment beginning with step 5.1.

10 Use the following steps to set the loader Z home position.

10.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

10.2 Press COORDINATE DESIGNATION twice and enter –10,000 µm.

10.3 Press the down arrow once.

10.4 Press SAVE POSITION.

10.5 Press HOME POSITION. A check menu is displayed stating, `Do you want to save?` Press YES. The current position is saved as the home position.

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for the axis being saved is selected.** SAVE POSITION **is selected.**

10.6 Press OK.

11 Press PREVIOUS MENU on the *Item Selection Menu*.

12 Press INITIALIZE LOADER. The loader is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

13 Use a scaled rule to check that the distance from the surface of the loader frame to the bottom of the loader base plate is 84 mm.

If the value is outside the specification, repeat steps 6 through 13.

14 Enable the interlock.

> **WARNING** **Mechanical Hazard**
> **Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.**

15 Replace loader rear panels 3.

7.6 Checking Arm-to-FOUP Hand-over Position 1458.2

Introduction

Purpose:

To check the hand-over position from the loader arm to the FOUP.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	Arm insertion position fixture
Parts or Consumables:	None

Checking the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Loader Item Selection Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu* to display the *Diagnostics Menu*.

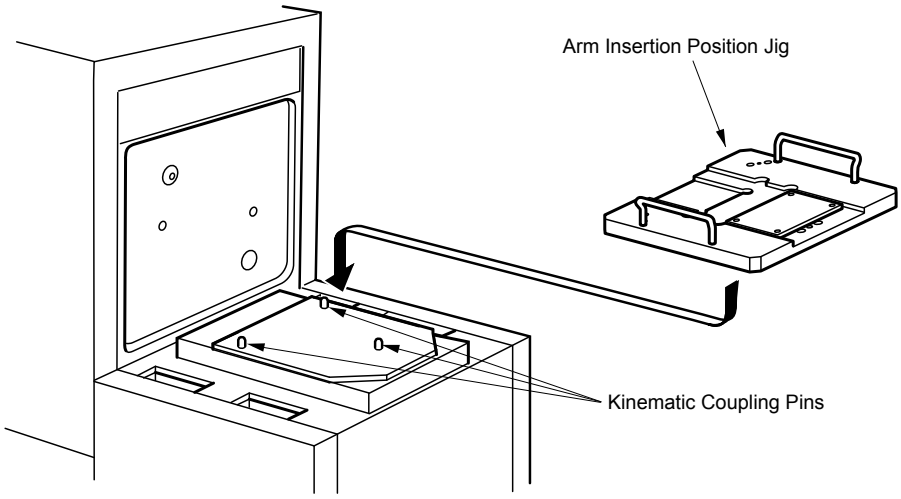
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A password menu is displayed.

2.3 Input your password on the numeric keypad and press INPUT to display the *Adjustments Menu*.

2.4 Press LOADER on the *Adjustments Menu* to display the *Loader Item Selection Menu*.

3 Place the arm insertion position fixture on the load port, using the load port kinematic coupling pins as a guide.

▼ **Arm Insertion Position Fixture**



NOTE **FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

4 Use the following steps to position the load port and open the FOUP door.

4.1 Press FOUP_OPENER ADJUSTMENT on page 2 of the *Loader Item Selection Menu* to display the *FOUP_OPENER Adjustment Menu*.

▼ **FOUP_OPENER Adjustment Menu**

4.2 Press DOCK under `Loadport`. The load port moves toward the FOUP door and docks the FOUP.

4.3 Press OPEN under `Opener` on the *FOUP_OPENER Adjustment Menu*. The FOUP door opens.

4.4 Press DOWN under `Opener`. The FOUP door lowers so that it is not obstructing the loader operation.

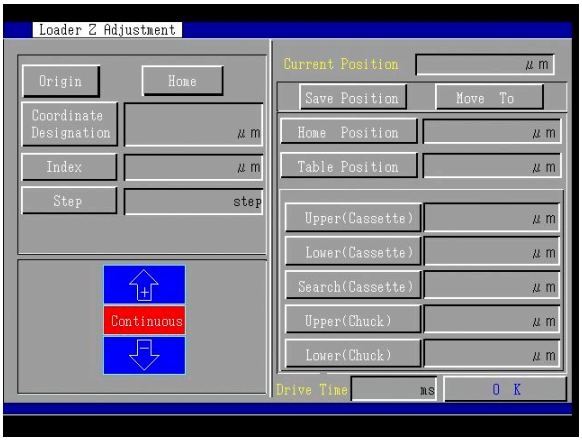
4.5 Press OK to exit. A check menu is displayed with the message `Initialize FOUP_OPENER?` Press No on the check menu to display the *Loader Item Selection Menu*.

5 Use the following steps to position the loader Z.

5.1 Press ALL AXES ADJUSTMENT on the page 1 of the *Loader Item Selection Menu* to display the *All Axes Adjustment Menu*.

5.2 Press LOADER Z on the *All Axes Adjustment Menu* to display the *Loader Z Adjustment Menu*.

Loader Z Adjustment Menu



5.3 Press ORIGIN on the *Loader Z Adjustment Menu*.

5.4 After the loader moves to the origin position, press HOME.

6 Use the following steps to transfer the loader Z to the upper arm check position.

6.1 Press MOVE TO.

6.2 Press UPPER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

6.3 Press YES. The loader Z moves to the upper (cassette) position.

6.4 Set the INDEX value to 44,000 µm.

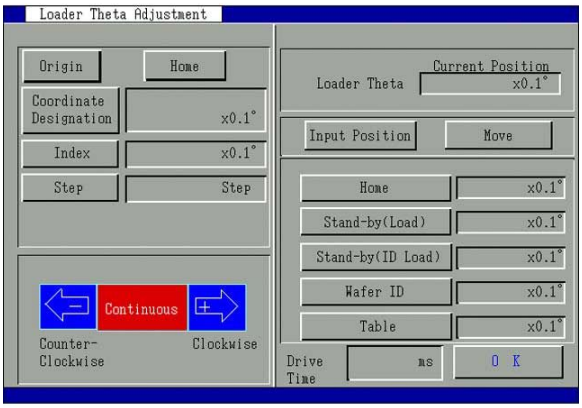
6.5 Press the up arrow one time. The loader Z rises 44000 µm from the upper (cassette) position.

6.6 Press OK. The *Loader Item Selection Menu* is displayed.

7 Use the following steps to transfer the loader theta to the home position.

7.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

▼ **Loader Theta Adjustment Menu**



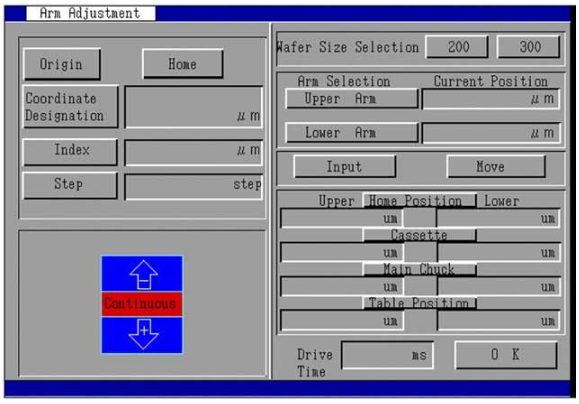
7.2 Press ORIGIN.

7.3 Press HOME.

7.4 Press OK. The *Item Selection Menu* is displayed.

8 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

▼ **Arm Adjustment Menu**



9 Use the following steps to transfer the upper arm to the home position.

9.1 Press UPPER ARM for `Arm Selection`.

9.2 Press ORIGIN.

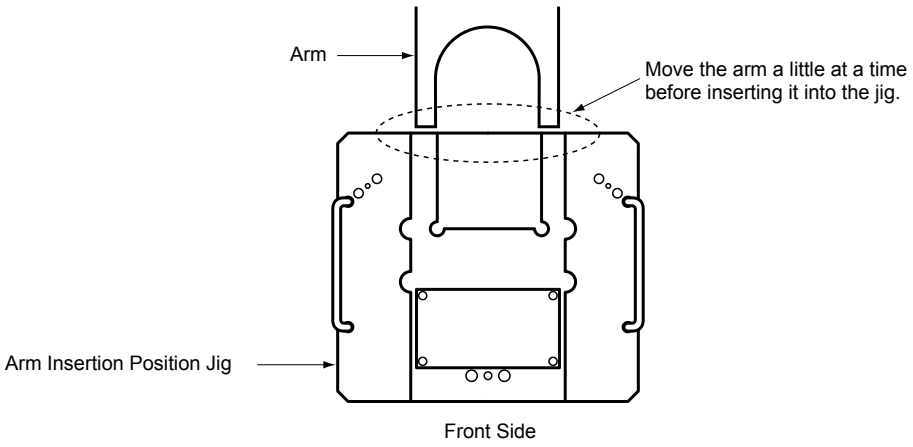
9.3 Press HOME.

9.4 Select INDEX and use the down arrow to slowly insert the upper arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

Moving Upper Arm



10 Check that there is no interference with the upper arm inserted into the fixture.

11 Use the following steps to transfer the upper arm to the 300 mm wafer hand-over position.

11.1 Press 300 under `Wafer Size Selection`.

11.2 Press MOVE.

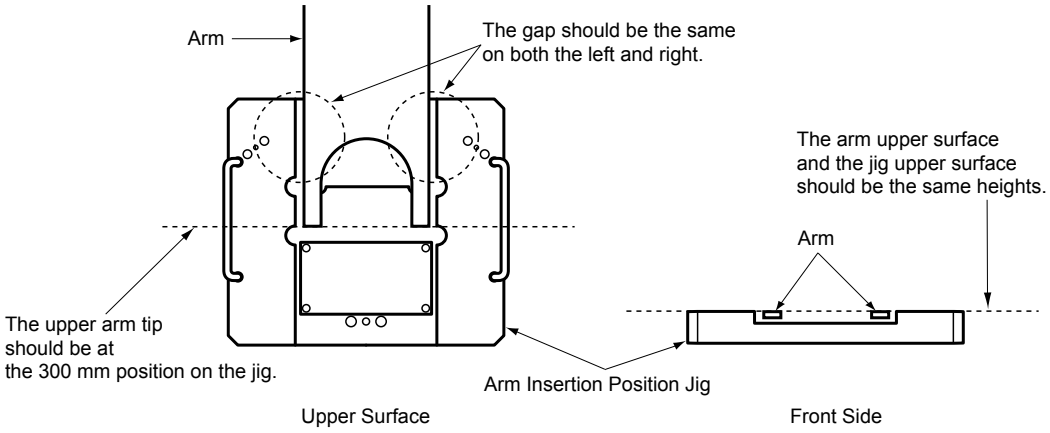
11.3 Press CASSETTE. A check menu is displayed stating `Do you want to move?`

11.4 Press YES. The upper arm moves to the 300 mm wafer hand-over position.

12 Check the upper arm position and check that all of the following conditions are met:

- The tip of the upper arm should be at the 300 mm position.
- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

Checking the Arm Insertion Position (300 mm)



13 Use the following steps to transfer the upper arm to the 200 mm wafer hand-over position.

> **CAUTION** **Property Damage Hazard**
> **Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.**

13.1 Press 200 under `Wafer Size Selection`.

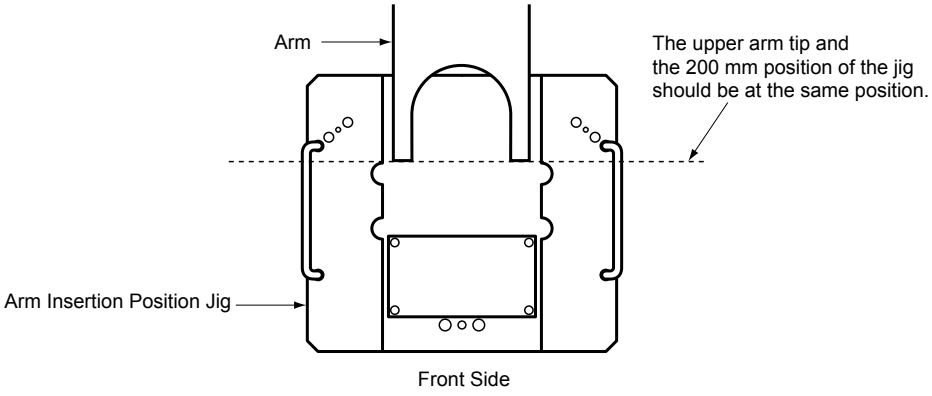
13.2 Press MOVE.

13.3 Press CASSETTE. A check menu is displayed stating `Do you want to move?`

13.4 Press YES. The upper arm moves to the 200 mm wafer hand-over position.

14 Check that the tip of the upper arm is at the 200 mm position on the fixture.

Checking the Arm Insertion Position (200 mm)



15 Press HOME. The upper arm returns to the home position.

16 Press OK. The *Loader Item Selection Menu* is displayed.

17 Use the following steps to transfer the loader Z to the lower arm check position.

17.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

17.2 Press MOVE TO.

17.3 Press LOWER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

17.4 Press YES. The loader Z moves to the lower (cassette) position.

17.5 Set the INDEX value to 44,000 µm.

17.6 Press the up arrow one time. The loader Z rises 44000 µm from the lower (cassette) position.

17.7 Press OK. The *Loader Item Selection Menu* is displayed.

18 Use the following steps to transfer the lower arm to the home position.

18.1 Press ARM (UPPER/LOWER).

18.2 Press LOWER ARM for `Arm Selection`.

18.3 Press ORIGIN.

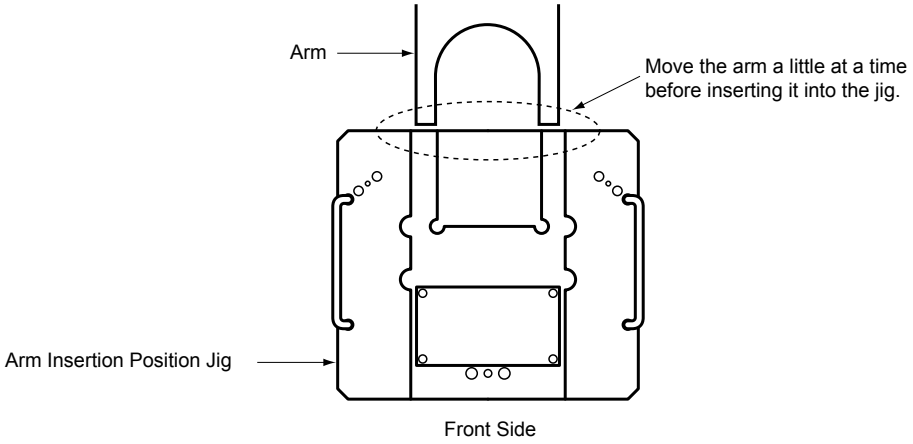
18.4 Press HOME.

18.5 Select INDEX and use the down arrow to slowly insert the lower arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

Moving Upper Arm



19 Check that there is no interference with the lower arm inserted into the fixture.

20 Use the following steps to transfer the lower arm to the 300 mm wafer hand-over position.

20.1 Press 300 under `Wafer Size Selection`.

20.2 Press MOVE.

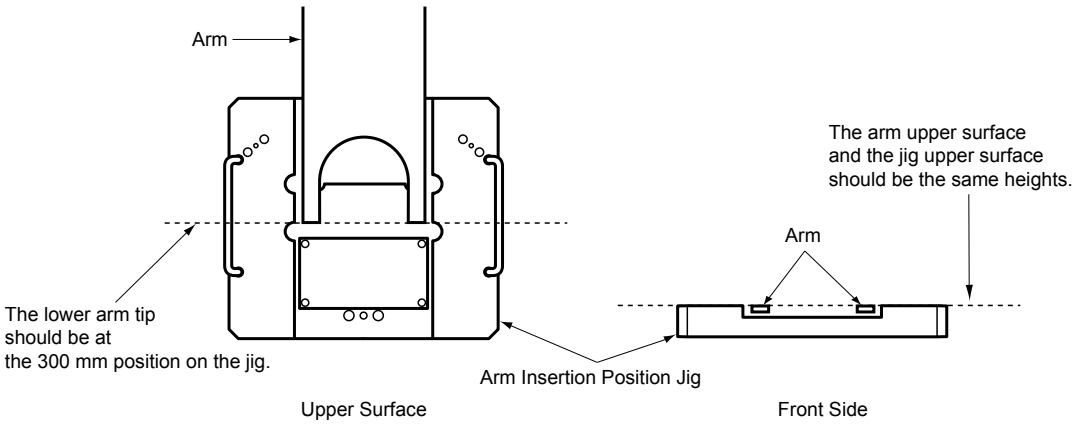
20.3 Press CASSETTE. A check menu is displayed stating `Do you want to move?`

20.4 Press YES. The lower arm moves to the 300 mm wafer hand-over position.

21 Check the lower arm position and check that all of the following conditions are met:

- The tip of the lower arm should be at the 300 mm position.
- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

Checking the Arm Insertion Position (300 mm)



22 Use the following steps to transfer the lower arm to the 200 mm wafer hand-over position.

CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

22.1 Press 200 under `Wafer Size Selection`.

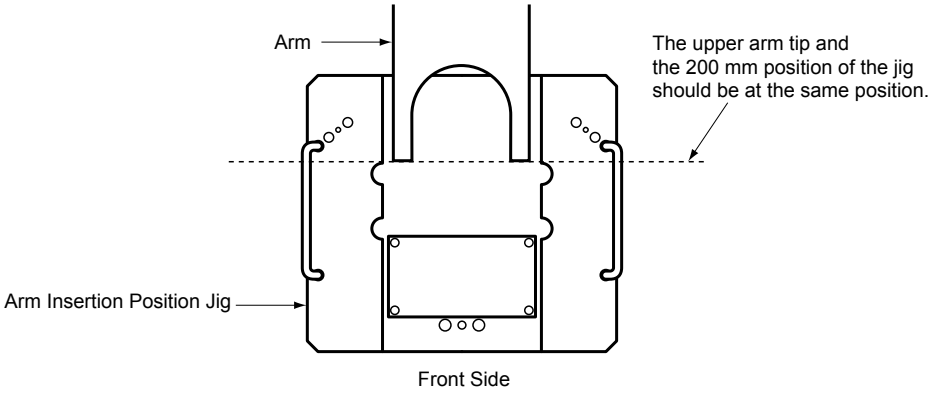
22.2 Press MOVE.

22.3 Press CASSETTE. A check menu is displayed stating `Do you want to move?`

22.4 Press YES. The lower arm moves to the 200 mm wafer hand-over position.

23 Check that the tip of the lower arm is at the 200 mm position on the fixture.

Checking the Arm Insertion Position (200 mm)



24 Press HOME. The lower arm returns to the home position.

25 Remove the arm insertion position fixture.

26 Press OK. The *Loader Item Selection Menu* is displayed.

27 Press INITIALIZE LOADER. The loader is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

28 Press PREVIOUS MENU twice.

29 Press MAIN MENU.

Checking the Dual Port Loader Specification

1 Use one of the following methods to begin the procedure.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Loader Item Selection Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu* to display the *Diagnostics Menu*.

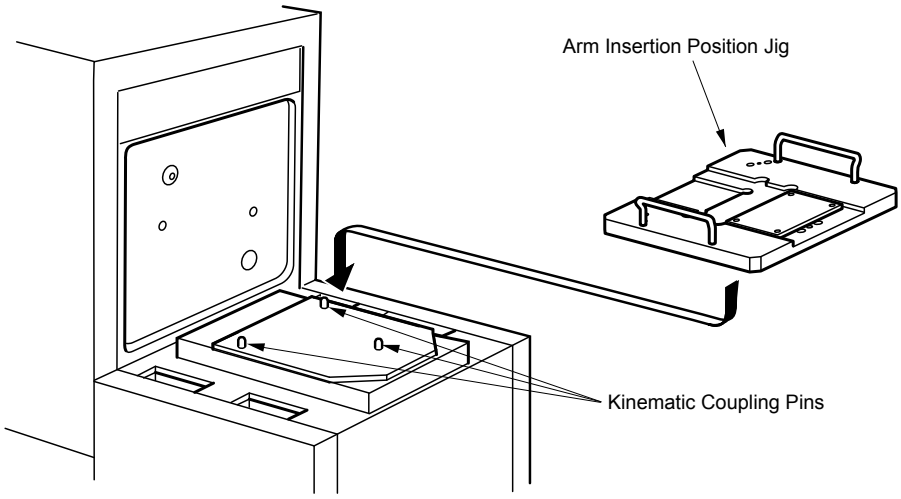
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A password menu is displayed.

2.3 Input your password on the numeric keypad and press INPUT to display the *Adjustments Menu*.

2.4 Press LOADER on the *Adjustments Menu* to display the *Loader Item Selection Menu*.

3 Place the arm insertion position fixture on load port 1, using the load port kinematic coupling pins as a guide.

▼ **Arm Insertion Position Fixture**



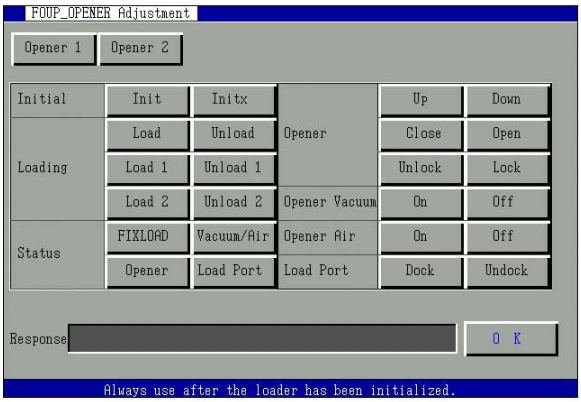
NOTE **FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

NOTE **Place the adjustment fixture on load port 2 when checking the hand-over position for load port 2.**

4 Use the following steps to position the load port and open FOUP opener 1.

4.1 Press FOUP_OPENER ADJUSTMENT on page 2 of the *Loader Item Selection Menu* to display the *FOUP_OPENER Adjustment Menu*.

▼ **FOUP_OPENER Adjustment Menu**



4.2 Press OPENER 1.

NOTE **Press OPENER 2 of checking load port 2.**

4.3 Press DOCK under `Loadport`. The load port moves toward the FOUP door and docks the FOUP.

4.4 Press OPEN under `Opener` on the *FOUP_OPENER Adjustment Menu*. The FOUP door opens.

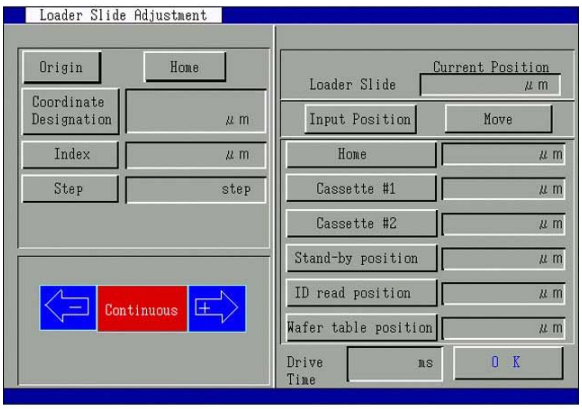
4.5 Press DOWN under `Opener`. The FOUP door lowers so that it is not obstructing the loader operation.

4.6 Press OK to exit. A check menu is displayed with the message `Initialize FOUP_OPENER?` Press NO on the check menu to display the *Loader Item Selection Menu*.

5 Use the following steps to transfer the arm unit to the Y axis load port 1 position.

5.1 Press ALL AXES ADJUSTMENT on the page 1 of the *Loader Item Selection Menu* to display the *All Axes Adjustment Menu*.

5.2 Press LOADER SLIDE. The *Loader Slide Adjustment Menu* is displayed.



5.3 Press ORIGIN. The arm unit moves to the Y axis origin position.

5.4 Press HOME. The arm unit moves to the Y axis home position.

5.5 Press MOVE.

5.6 Press CASSETTE 1. The arm unit moves to the Y axis load port 1 position.

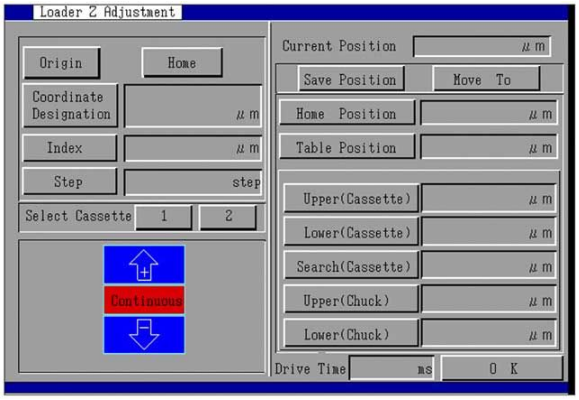
NOTE **Press CASSETTE 2 when checking load port 2.**

5.7 Press OK. The *Item Selection Menu* is displayed.

6 Use the following steps to move the loader Z to the home position.

6.1 Press LOADER Z on the *All Axes Adjustment Menu* to display the *Loader Z Adjustment Menu*.

▼ **Loader Z Adjustment Menu**



6.2 Press ORIGIN on the *Loader Z Adjustment Menu*.

6.3 After the loader moves to the origin position, press HOME.

7 Use the following steps to transfer the loader Z to the upper arm check position.

7.1 Press CASSETTE 1.

NOTE **Press CASSETTE 2 when checking load port 2.**

7.2 Press MOVE TO.

7.3 Press UPPER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

7.4 Press YES. The loader Z moves to the upper (cassette) position.

7.5 Set the INDEX value to 44,000 μm.

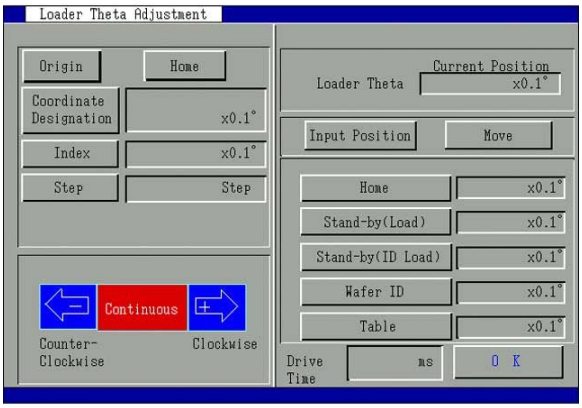
7.6 Press the up arrow one time. The loader Z rises 44000 μm from the upper (cassette) position.

7.7 Press OK. The *Loader Item Selection Menu* is displayed.

8 Use the following steps to transfer the loader theta to the home position.

8.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

▼ **Loader Theta Adjustment Menu**



8.2 Press ORIGIN.

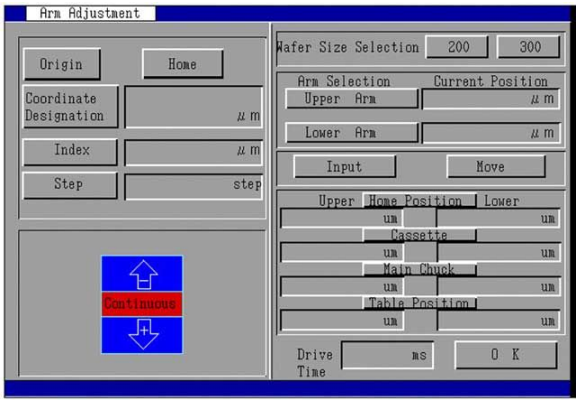
8.3 Press HOME.

8.4 Press OK. The *Item Selection Menu* is displayed.

9 Use the following steps to transfer the upper arm to the home position.

9.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

▼ **Arm Adjustment Menu**



9.2 Press UPPER ARM for `Arm Selection`.

9.3 Press ORIGIN.

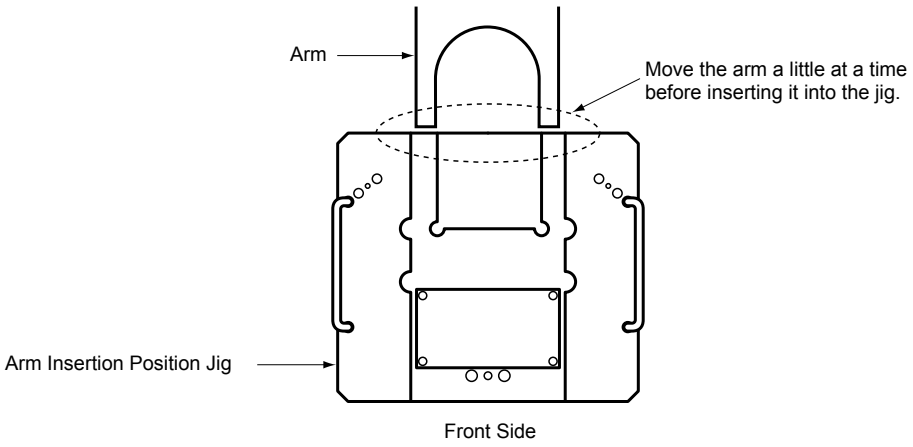
9.4 Press HOME.

9.5 Select INDEX and use the down arrow to slowly insert the upper arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

Moving Upper Arm



10 Check that there is no interference with the upper arm inserted into the fixture.

11 Use the following steps to transfer the upper arm to the 300 mm wafer hand-over position.

11.1 Press 300 under `Wafer Size Selection`.

11.2 Press MOVE.

11.3 Press CASSETTE 1. A check menu is displayed stating `Do you want to move?`

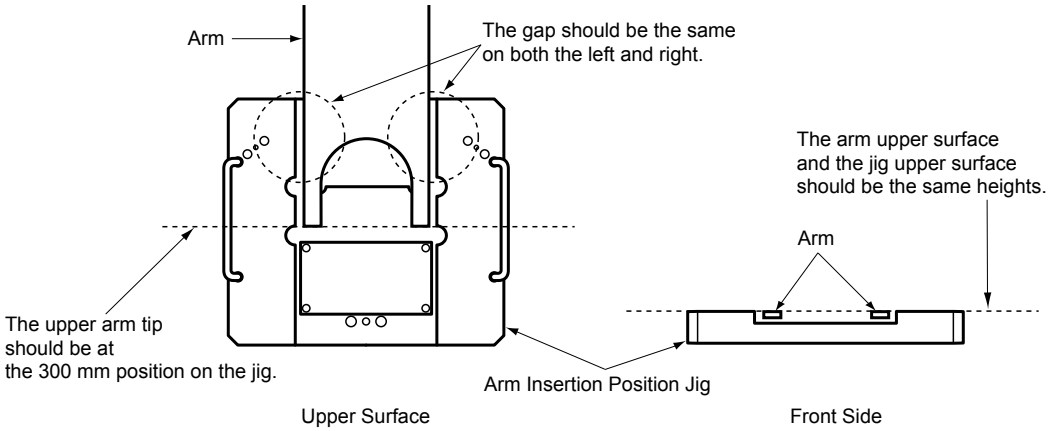
NOTE **Press CASSETTE 2 when checking load port 2.**

11.4 Press YES. The upper arm moves to the 300 mm wafer hand-over position.

12 Check the upper arm position and check that all of the following conditions are met:

- The tip of the upper arm should be at the 300 mm position.
- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

Checking the Arm Insertion Position (300 mm)



13 Use the following steps to transfer the upper arm to the 200 mm wafer hand-over position.

> **CAUTION** **Property Damage Hazard**
> **Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.**

13.1 Press 200 under `Wafer Size Selection`.

13.2 Press MOVE.

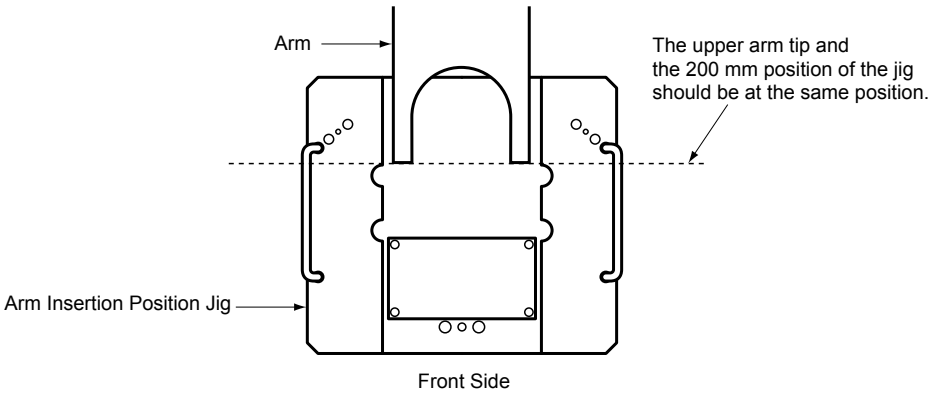
13.3 Press CASSETTE 1. A check menu is displayed stating `Do you want to move?`

> **NOTE** **Press CASSETTE 2 when checking load port 2.**

13.4 Press YES. The upper arm moves to the 200 mm wafer hand-over position.

14 Check that the tip of the upper arm is at the 200 mm position on the fixture.

Checking the Arm Insertion Position (200 mm)



15 Press HOME. The upper arm returns to the home position.

16 Press OK. The *Loader Item Selection Menu* is displayed.

17 Use the following steps to transfer the loader Z to the lower arm check position.

17.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

17.2 Press 1 next to `Select Cassette`.

> **NOTE** **Press CASSETTE 2 when checking load port 2.**

17.3 Press MOVE TO.

17.4 Press LOWER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

17.5 Press YES. The loader Z moves to the lower (cassette) position.

17.6 Set the INDEX value to 44,000 µm.

17.7 Press the up arrow one time. The loader Z rises 44000 µm from the lower (cassette) position.

17.8 Press OK. The *Loader Item Selection Menu* is displayed.

18 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

19 Use the following steps to transfer the lower arm to the home position.

19.1 Press LOWER ARM for `Arm Selection`.

19.2 Press ORIGIN.

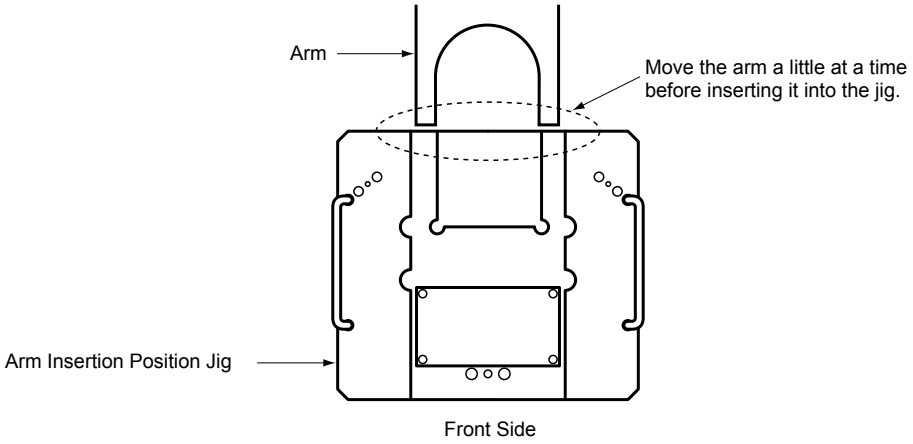
19.3 Press HOME.

19.4 Select INDEX and use the down arrow to slowly insert the lower arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

Moving Upper Arm



20 Check that there is no interference with the lower arm inserted into the fixture.

21 Use the following steps to transfer the lower arm to the 300 mm wafer hand-over position.

21.1 Press 300 under `Wafer Size Selection`.

21.2 Press MOVE.

21.3 Press CASSETTE 1. A check menu is displayed stating `Do you want to move?`

NOTE **Press CASSETTE 2 when checking load port 2.**

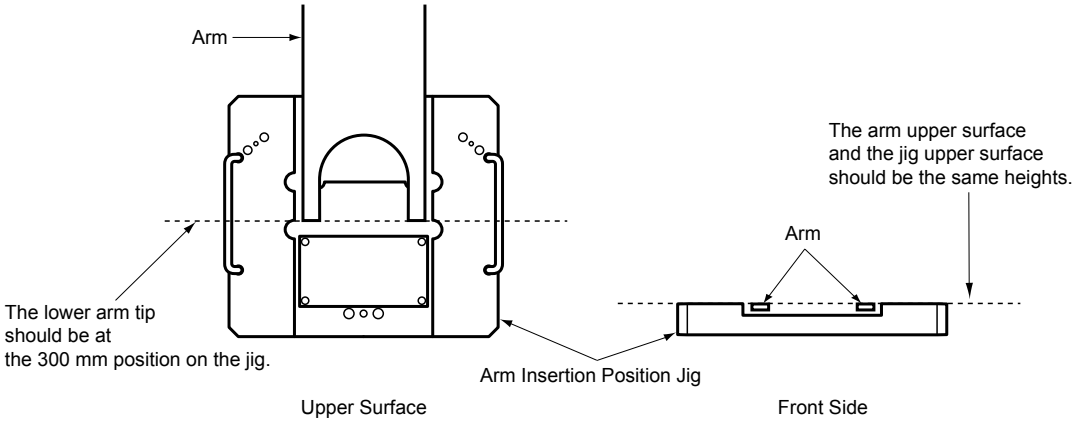
21.4 Press YES. The lower arm moves to the 300 mm wafer hand-over position.

22 Check the lower arm position and check that all of the following conditions are met:

- The tip of the lower arm should be at the 300 mm position.
- The gap between the arm and the fixture should be the same on both sides of the fixture.

- The upper surface of the fixture and the upper surface of the arm should be level with each other.

Checking the Arm Insertion Position (300 mm)



23 Use the following steps to transfer the lower arm to the 200 mm wafer hand-over position.

CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

23.1 Press 200 under `Wafer Size Selection`.

23.2 Press MOVE.

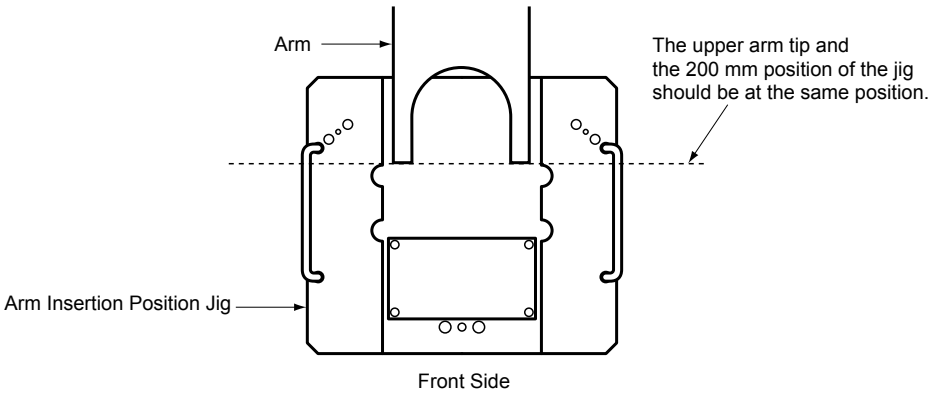
23.3 Press CASSETTE 1. A check menu is displayed stating `Do you want to move?`

NOTE **Press CASSETTE 2 when checking load port 2.**

23.4 Press YES. The lower arm moves to the 200 mm wafer hand-over position.

24 Check that the tip of the lower arm is at the 200 mm position on the fixture.

Checking the Arm Insertion Position (200 mm)



25 Press HOME. The lower arm returns to the home position.

26 Remove the arm insertion position fixture.

27 Repeat steps 4 through 26 to check load port 2.

NOTE **Use the *Loader Slide Adjustment Menu* to move the arm unit to the load port 2 position before checking load port 2.**

28 Press OK. The *Loader Item Selection Menu* is displayed.

29 Press PREVIOUS MENU on the *Item Selection Menu*.

30 Press INITIALIZE LOADER. The loader is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

7.7 Adjusting the Arm-to-FOUP Hand-over Position 1459.2

Introduction

Purpose:

To adjust the hand-over position from the loader arm to the FOUP.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Arm insertion position fixture
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Adjusting the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Loader Item Selection Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu* to display the *Diagnostics Menu*.

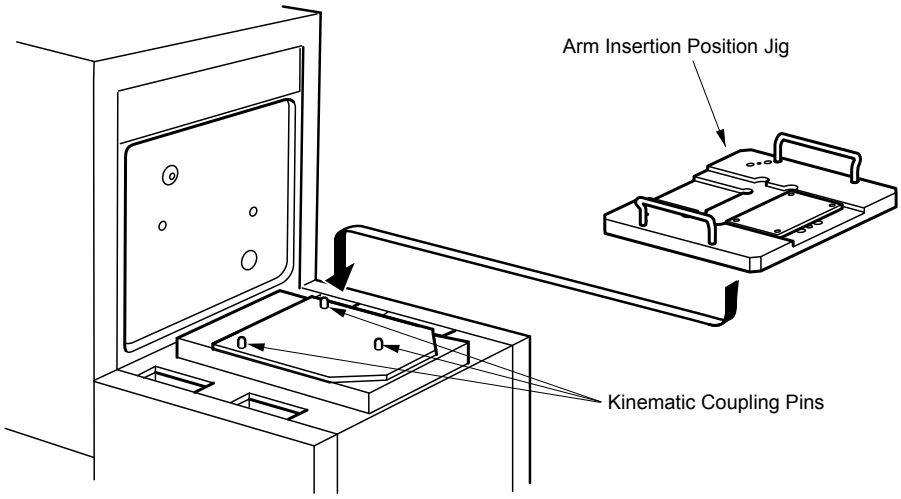
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A password menu is displayed.

2.3 Input your password on the numeric keypad and press INPUT to display the *Adjustments Menu*.

2.4 Press LOADER on the *Adjustments Menu* to display the *Loader Item Selection Menu*.

3 Place the arm insertion position fixture on the load port, using the load port kinematic coupling pins as a guide.

▼ **Arm Insertion Position Fixture**



NOTE **FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

4 Use the following steps to position the load port and open the FOUP door.

4.1 Press FOUP_OPENER ADJUSTMENT on page 2 of the *Loader Item Selection Menu* to display the *FOUP_OPENER Adjustment Menu*.

▼ **FOUP_OPENER Adjustment Menu**

4.2 Press DOCK under `Loadport`. The load port moves toward the FOUP door and docks the FOUP.

4.3 Press OPEN under `Opener` on the *FOUP_OPENER Adjustment Menu*. The FOUP door opens.

4.4 Press DOWN under `Opener`. The FOUP door lowers so that it is not obstructing the loader operation.

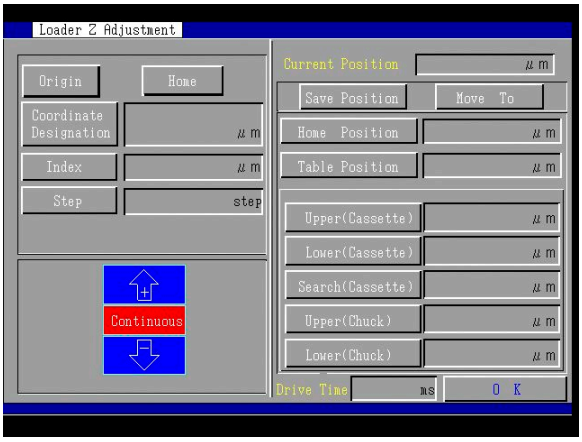
4.5 Press OK to exit. A check menu is displayed with the message `Initialize FOUP_OPENER?` Press No on the check menu to display the *Loader Item Selection Menu*.

5 Use the following steps to position the loader Z.

5.1 Press ALL AXES ADJUSTMENT on the page 1 of the *Loader Item Selection Menu* to display the *All Axes Adjustment Menu*.

5.2 Press LOADER Z on the *All Axes Adjustment Menu* to display the *Loader Z Adjustment Menu*.

Loader Z Adjustment Menu



5.3 Press ORIGIN on the *Loader Z Adjustment Menu*.

5.4 After the loader moves to the origin position, press HOME.

6 Use the following steps to transfer the loader Z to the upper arm adjustment position.

6.1 Press MOVE TO.

6.2 Press UPPER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

6.3 Press YES. The loader Z moves to the upper (cassette) position.

6.4 Set the INDEXamount to 44,000 µm.

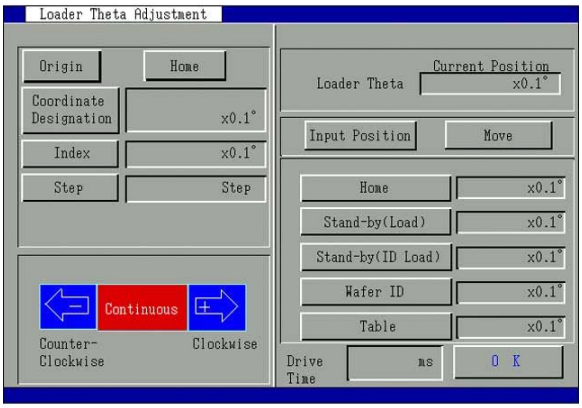
6.5 Press the up arrow one time. The loader Z rises 44000 µm from the upper (cassette) position.

6.6 Press OK. The *Loader Item Selection Menu* is displayed.

7 Use the following steps to transfer the loader theta to the home position.

7.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

▼ **Loader Theta Adjustment Menu**



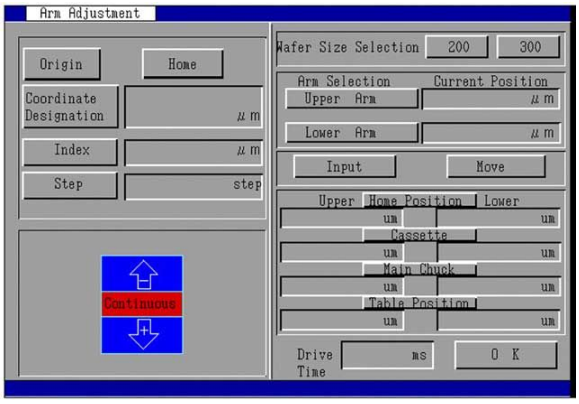
7.2 Press ORIGIN.

7.3 Press HOME.

7.4 Press OK. The *Item Selection Menu* is displayed.

8 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

▼ **Arm Adjustment Menu**



9 Use the following steps to transfer the upper arm to the home position.

9.1 Press UPPER ARM for `Arm Selection`.

9.2 Press ORIGIN.

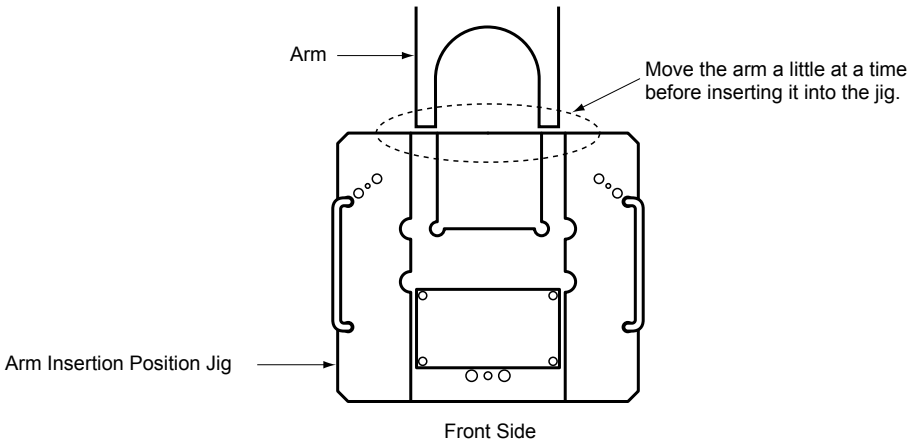
9.3 Press HOME.

9.4 Select INDEX and use the down arrow to slowly insert the upper arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

Moving Upper Arm

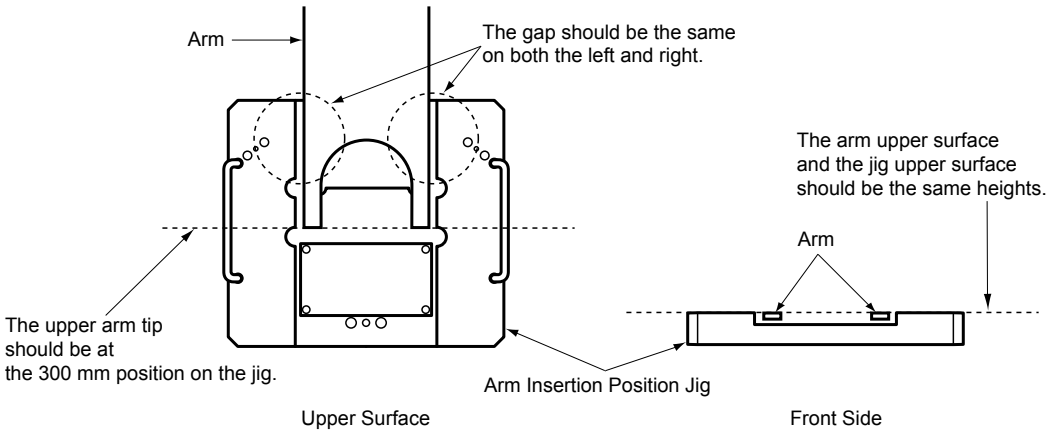


10 Check the upper arm height (Z axis) and the rotation direction (Theta axis).

Measure and record how far apart the fixture upper surface and the upper arm upper surface are, and how much to rotate until the fixture groove side surface and the upper arm side surface distances are the same on both the left and right.

Use rest of the steps in this procedure to adjust the position of the arms until they match the position in the following figure.

Arm Alignment Position



11 Press HOME. The upper arm returns to the home position.

12 Press OK. The *Item Selection Menu* is displayed.

13 Use the following steps to adjust the height of the upper arm (Z axis).

13.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

13.2 Set the INDEX amount to 100 µm.

13.3 Use the up and down arrows to change the Z position so that the surface of the upper arm and the surface of the fixture are level with each other. Refer to the measurements you recorded in step 10.

13.4 Press SAVE POSITION.

13.5 Press UPPER (CASSETTE). A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected.** SAVE POSITION **is selected.**

13.6 Press YES. The upper (cassette) position is saved.

> **NOTE** **The coordinate subtracting the fixture height (44000 µm) from the current position is calculated automatically for the upper (cassette) position coordinate, and is then stored in memory.**

13.7 Press OK. The *Item Selection Menu* is displayed.

14 Use the following steps to adjust the upper arm theta axis.

14.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

14.2 Press STEP

14.3 Use the left and right arrows to change the theta position so that there is the same amount of space on each side of the upper arm between the arm and the inside of the fixture groove.

14.4 Press INPUT POSITION.

14.5 Press HOME on the right side of the menu. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected.** INPUT POSITION **is selected.**

14.6 Press YES. The current position is saved as the home position.

15 Use the following steps to transfer the loader theta to the home position.

15.1 Press MOVE.

15.2 Press STAND-BY (LOAD). A check menu is displayed stating, `Do you want to move?`

15.3 Press YES. The loader theta moves to the stand-by (load) position.

15.4 Press HOME on the right side of the menu. A check menu is displayed stating, `Do you want to move?`

15.5 Press YES. The loader theta moves to the home position.

15.6 Press OK. The *Item Selection Menu* is displayed.

16 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

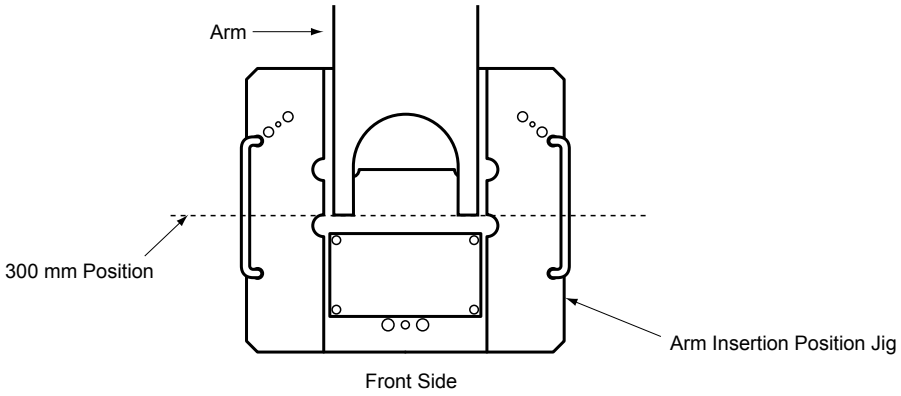
17 Use the down arrow to move the arm in small increments and check that it can be inserted into the fixture without interference. If further adjustments are necessary, repeat steps 13 through 17.

CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

18 Move the upper arm in small increments until the tip of the arm is at the 300 mm position on the fixture.

Checking the Arm Insertion Position (300 mm)

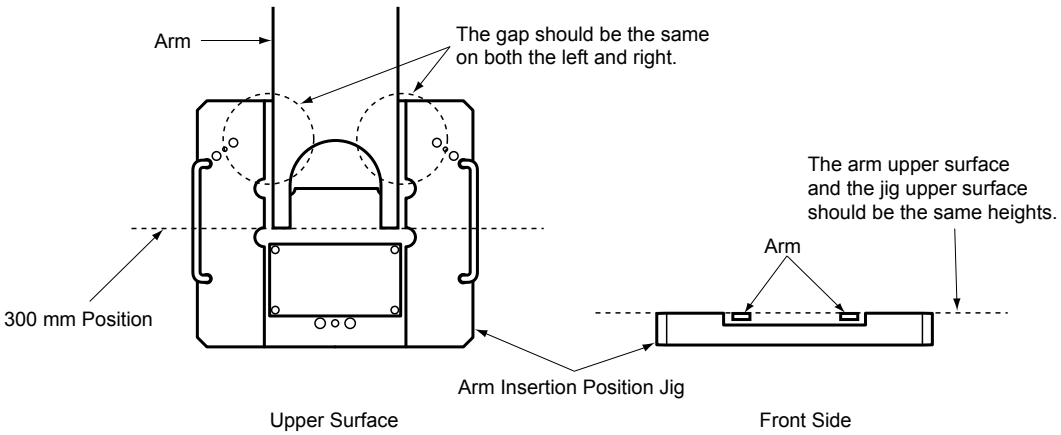


19 Check the upper arm position and check that all of the following conditions are met:

- The tip of the upper arm should be at the 300 mm position.
- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

If further adjustments are necessary, repeat steps 13 through 17.

Checking the Arm Insertion Position (300 mm)



20 Use the following steps to save the upper arm 300 mm wafer hand-over position.

20.1 Press 300 for `Wafer Size Selection`.

20.2 Press INPUT.

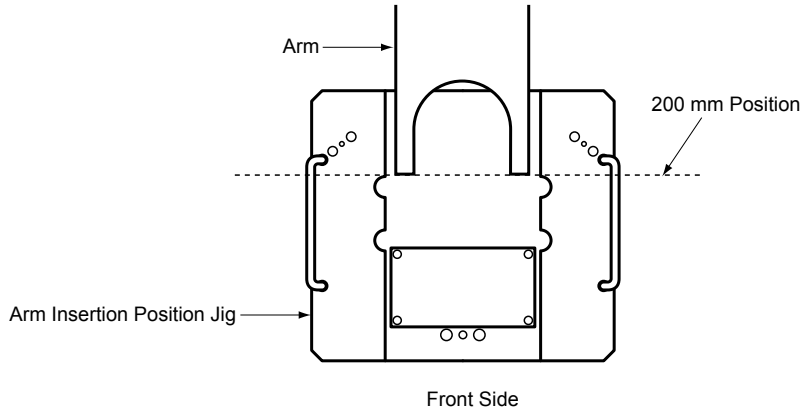
20.3 Press CASSETTE. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.**

20.4 Press YES. The upper arm 300 mm hand-over position is saved.

21 Move the upper arm in small increments until the tip of the arm is at the 200 mm position on the fixture.

Arm Insertion Position (200 mm)



22 Use the following steps to save the upper arm 200 mm wafer hand-over position.

22.1 Press 200 for `Wafer Size Selection`.

22.2 Press INPUT.

22.3 Press CASSETTE. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.**

22.4 Press YES. The upper arm 200 mm hand-over position is saved.

22.5 Press MOVE.

22.6 Press HOME. The upper arm moves to the home position.

22.7 Press OK.

23 Use the following steps to transfer the loader Z to the lower arm adjustment position.

NOTE **Steps 23 and following are used for adjusting the lower arm. Only the arm position and the Z axis height are adjusted for the lower arm. The theta axis position that was adjusted for the upper arm is used for the lower arm as well.**

23.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

23.2 Press MOVE TO.

23.3 Press LOWER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

23.4 Press YES. The loader Z moves to the lower (cassette) position.

23.5 Set the INDEX amount to 44,000 µm.

23.6 Press the up arrow one time. The loader Z rises 44000 µm from the lower (cassette) position.

23.7 Press OK. The *Loader Item Selection Menu* is displayed.

24 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

25 Use the following steps to transfer the lower arm to the home position.

25.1 Press LOWER ARM for `Arm Selection`.

25.2 Press ORIGIN.

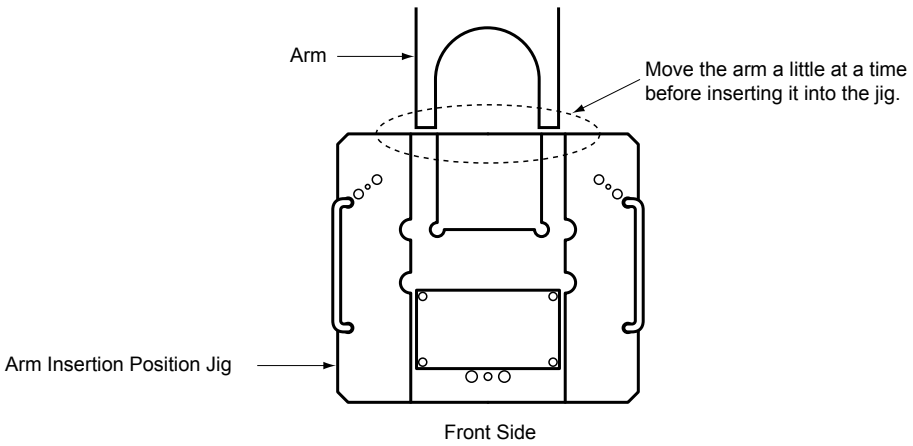
25.3 Press HOME.

25.4 Select INDEX and use the down arrow to slowly insert the lower arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

Moving Upper Arm



26 Check the lower arm height (Z axis).

Measure and record how far apart the fixture upper surface and the upper arm upper surface are.

27 Press HOME. The lower arm returns to the home position.

28 Press OK. The *Item Selection Menu* is displayed.

29 Use the following steps to adjust the height of the lower arm (Z axis).

29.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

29.2 Set the INDEX amount to 100 µm.

29.3 Use the up and down arrows to change the Z position so that the surface of the lower arm and the surface of the fixture are level with each other. Refer to the measurements you recorded in step 26.

29.4 Press SAVE POSITION.

29.5 Press LOWER (CASSETTE). A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected. SAVE POSITION **is selected.**

29.6 Press YES. The lower (cassette) position is saved.

NOTE **The coordinate subtracting the fixture height (44000 µm) from the current position is calculated automatically for the lower (cassette) position coordinate, and is then stored in memory.**

29.7 Press OK. The *Item Selection Menu* is displayed.

30 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

31 Press LOWER ARM for `Arm Selection`.

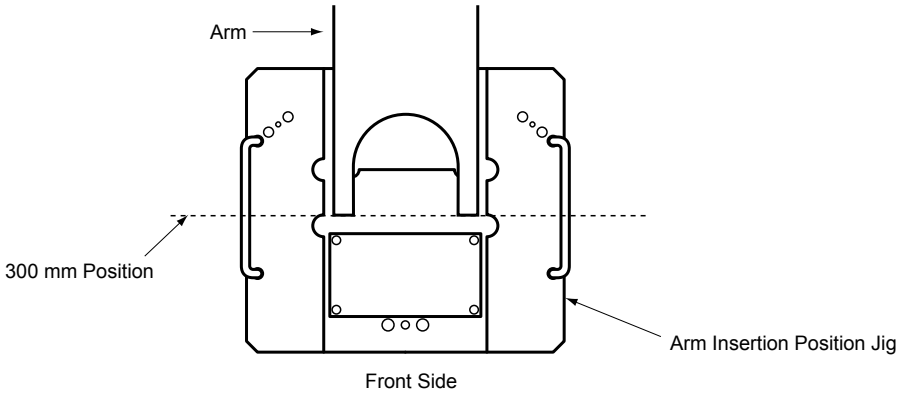
32 Use the down arrow to move the arm in small increments and check that it can be inserted into the fixture without interference. If further adjustments are necessary, repeat step 29.

CAUTION **Property Damage Hazard**

Always check that LOWER ARM **is selected before moving the arm. If** UPPER ARM **is selected, and the lower arm is mistakenly operated, the prober can be damaged.**

33 Move the lower arm in small increments until the tip of the arm is at the 300 mm position on the fixture.

Arm Insertion Position (300 mm)

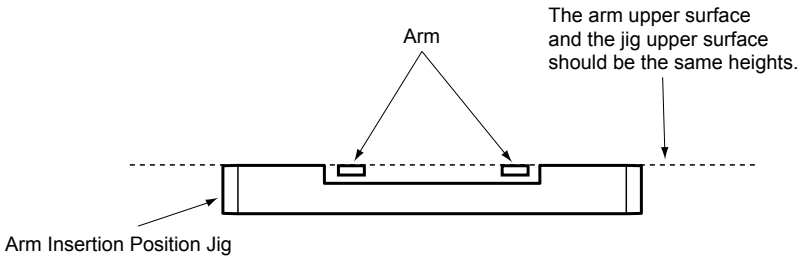


34 Check the lower arm position and check that all of the following conditions are met:

- The tip of the upper arm should be at the 300 mm position.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

If further adjustments are necessary, repeat step 29.

Checking the Arm Height



35 Use the following steps to save the lower arm 300 mm wafer hand-over position.

35.1 Press 300 for `Wafer Size Selection`.

35.2 Press INPUT.

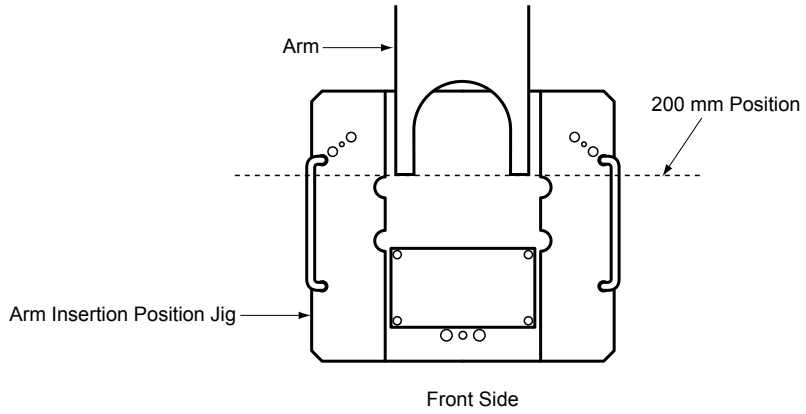
35.3 Press CASSETTE. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.**

35.4 Press YES. The lower arm 300 mm hand-over position is saved.

36 Move the lower arm in small increments until the tip of the arm is at the 200 mm position on the fixture.

▼ **Arm Insertion Position (200 mm)**



37 Use the following steps to save the lower arm 200 mm wafer hand-over position.

37.1 Press 200 for `Wafer Size Selection`.

37.2 Press INPUT.

37.3 Press CASSETTE. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.**

37.4 Press YES. The lower arm 200 mm hand-over position is saved.

37.5 Press MOVE.

37.6 Press HOME. The lower arm moves to the home position.

37.7 Press OK.

38 Remove the fixture from the load port.

39 Press INITIALIZE LOADER. The loader is initialized.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

40 Press PREVIOUS MENU twice.

41 Press MAIN MENU

Adjusting the Dual Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Loader Item Selection Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu* to display the *Diagnostics Menu*.

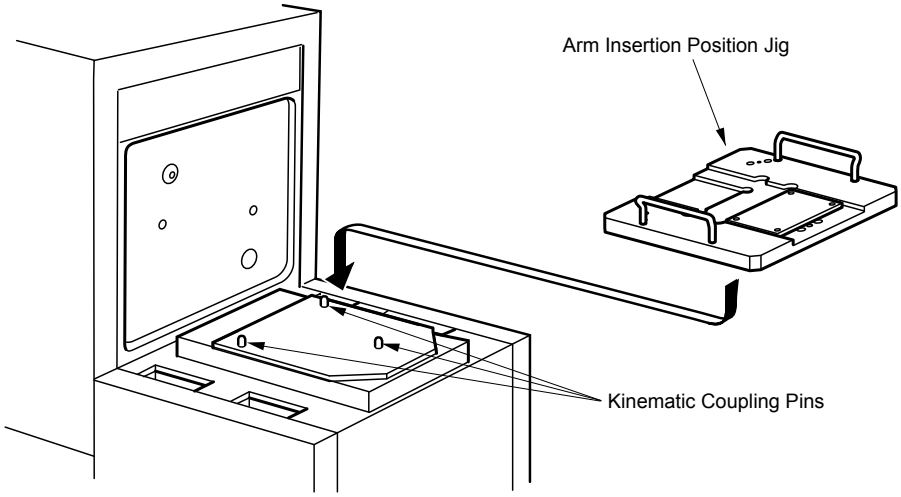
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A password menu is displayed.

2.3 Input your password on the numeric keypad and press INPUT to display the *Adjustments Menu*.

2.4 Press LOADER on the *Adjustments Menu* to display the *Loader Item Selection Menu*.

3 Place the arm insertion position fixture on load port 1, using the load port kinematic coupling pins as a guide.

Arm Insertion Position Fixture



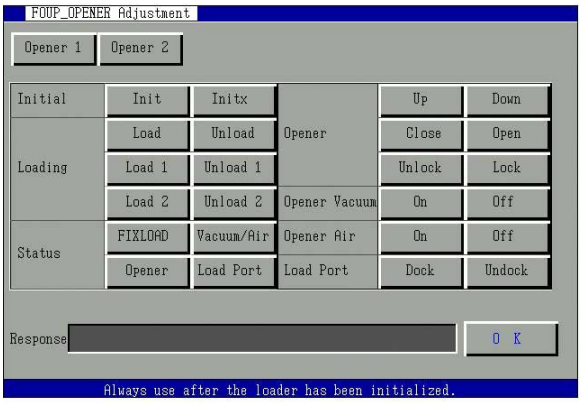
NOTE **FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

NOTE **Place the adjustment fixture on load port 2 when checking the hand-over position for load port 2.**

4 Use the following steps to position the load port and open FOUP opener 1.

4.1 Press FOUP_OPENER ADJUSTMENT on page 2 of the *Loader Item Selection Menu* to display the *FOUP_OPENER Adjustment Menu*.

FOUP_OPENER Adjustment Menu



4.2 Press OPENER 1.

NOTE **Press OPENER 2 of checking load port 2.**

4.3 Press DOCK under `Loadport`. The load port moves toward the FOUP door and docks the FOUP.

4.4 Press OPEN under `Opener` on the *FOUP_OPENER Adjustment Menu*. The FOUP door opens.

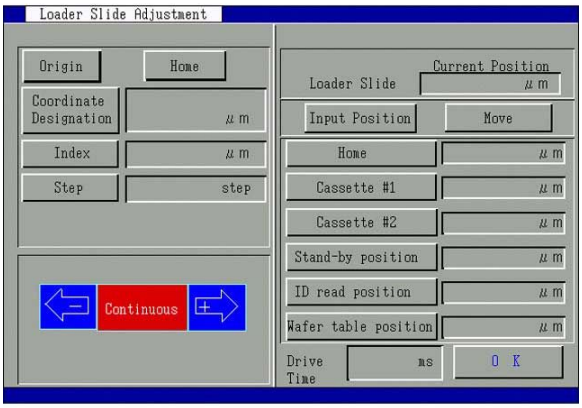
4.5 Press DOWN under `Opener`. The FOUP door lowers so that it is not obstructing the loader operation.

4.6 Press OK to exit. A check menu is displayed with the message `Initialize FOUP_OPENER?` Press NO on the check menu to display the *Loader Item Selection Menu*.

5 Use the following steps to transfer the arm unit to the Y axis load port 1 position.

5.1 Press ALL AXES ADJUSTMENT on the page 1 of the *Loader Item Selection Menu* to display the *All Axes Adjustment Menu*.

5.2 Press LOADER SLIDE. The *Loader Slide Adjustment Menu* is displayed.



5.3 Press ORIGIN. The arm unit moves to the Y axis origin position.

5.4 Press HOME. The arm unit moves to the Y axis home position.

5.5 Press MOVE.

5.6 Press CASSETTE 1. The arm unit moves to the Y axis load port 1 position.

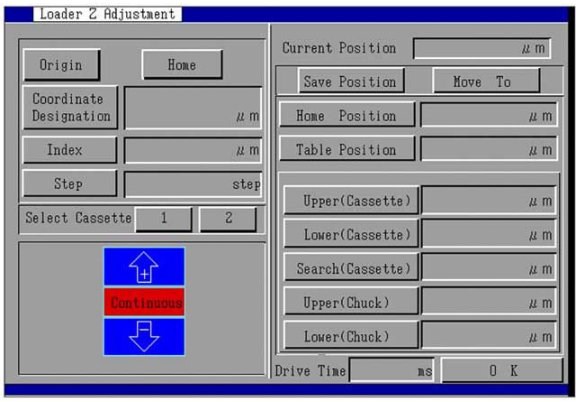
NOTE **Press CASSETTE 2 when checking load port 2.**

5.7 Press OK. The *Item Selection Menu* is displayed.

6 Use the following steps to move the loader Z to the home position.

6.1 Press LOADER Z on the *All Axes Adjustment Menu* to display the *Loader Z Adjustment Menu*.

Loader Z Adjustment Menu



6.2 Press ORIGIN on the *Loader Z Adjustment Menu*.

6.3 After the loader moves to the origin position, press HOME.

7 Use the following steps to transfer the loader Z to the upper arm check position.

7.1 Press CASSETTE 1.

NOTE **Press** CASSETTE 2 **when checking load port 2.**

7.2 Press MOVE TO.

7.3 Press UPPER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

7.4 Press YES. The loader Z moves to the upper (cassette) position.

7.5 Set the INDEX amount to 44,000 µm.

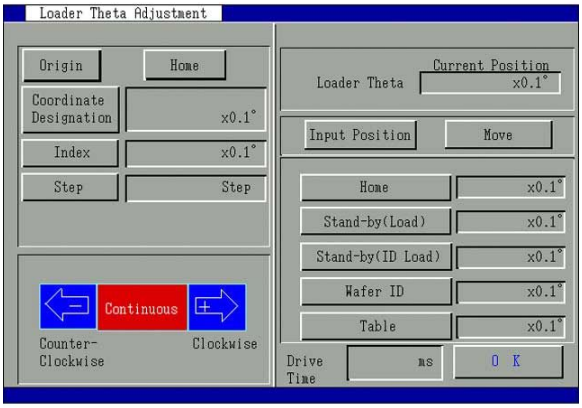
7.6 Press the up arrow one time. The loader Z rises 44000 µm from the upper (cassette) position.

7.7 Press OK. The *Loader Item Selection Menu* is displayed.

8 Use the following steps to transfer the loader theta to the home position.

8.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

Loader Theta Adjustment Menu



8.2 Press ORIGIN.

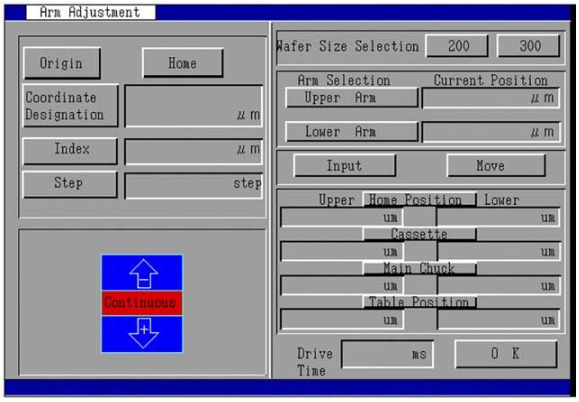
8.3 Press HOME.

8.4 Press OK. The *Item Selection Menu* is displayed.

9 Use the following steps to transfer the upper arm to the home position.

9.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

▼ **Arm Adjustment Menu**



9.2 Press UPPER ARM for `Arm Selection`.

9.3 Press ORIGIN.

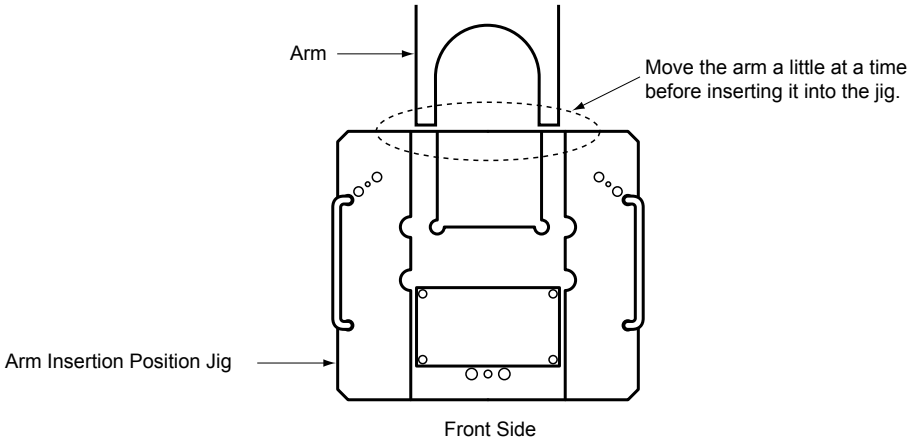
9.4 Press HOME.

9.5 Select INDEX and use the down arrow to slowly insert the upper arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

▼ **Moving Upper Arm**

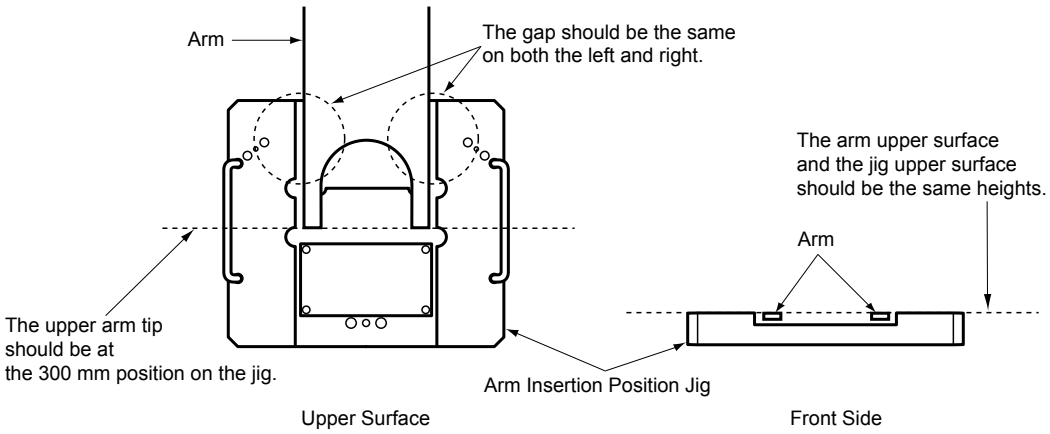


10 Check the upper arm height (Z axis) and the rotation direction (Theta axis).

Measure and record how far apart the fixture upper surface and the upper arm upper surface are, and how much to rotate until the fixture groove side surface and the upper arm side surface distances are the same on both the left and right.

Use rest of the steps in this procedure to adjust the position of the arms until they match the position in the following figure.

Arm Alignment Position



11 Press HOME. The upper arm returns to the home position.

12 Press OK. The *Item Selection Menu* is displayed.

13 Use the following steps to adjust the height of the upper arm (Z axis).

13.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

13.2 Press 1 for `Select Cassette`.

NOTE **Press 2 when you are adjusting load port 2.**

13.3 Set the INDEX amount to 100 µm.

13.4 Use the up and down arrows to change the Z position so that the surface of the upper arm and the surface of the fixture are level with each other. Refer to the measurements you recorded in step 10.

13.5 Press SAVE POSITION.

13.6 Press UPPER (CASSETTE). A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected. SAVE POSITION **is selected.**

13.7 Press YES. The upper (cassette) position is saved.

NOTE **The coordinate subtracting the fixture height (44000 µm) from the current position is calculated automatically for the upper (cassette) position coordinate, and is then stored in memory.**

13.8 Press OK. The *Item Selection Menu* is displayed.

14 Use the following steps to adjust the upper arm theta axis.

14.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

14.2 Press STEP

14.3 Use the left and right arrows to change the theta position so that there is the same amount of space on each side of the upper arm between the arm and the inside of the fixture groove.

14.4 Press INPUT POSITION.

14.5 Press HOME on the right side of the menu. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected.** INPUT POSITION **is selected.**

14.6 Press YES. The current position is saved as the home position.

15 Use the following steps to transfer the loader theta to the home position.

15.1 Press MOVE.

15.2 Press STAND-BY (LOAD). A check menu is displayed stating, `Do you want to move?`

15.3 Press YES. The loader theta moves to the stand-by (load) position.

15.4 Press HOME on the right side of the menu. A check menu is displayed stating, `Do you want to move?`

15.5 Press YES. The loader theta moves to the home position.

15.6 Press OK. The *Item Selection Menu* is displayed.

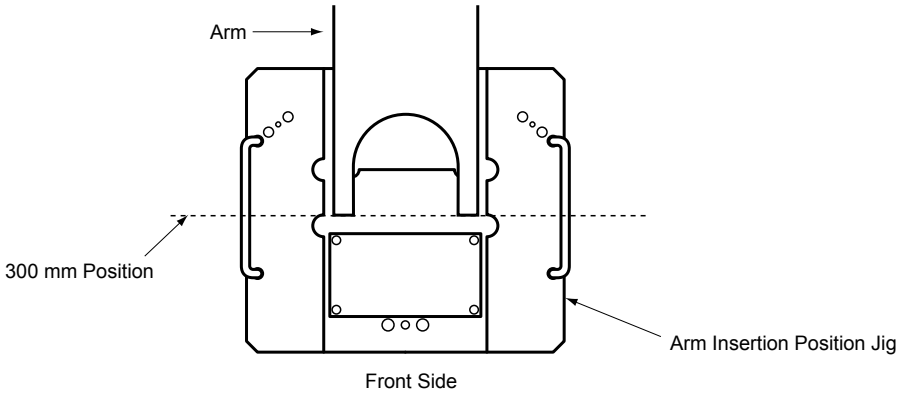
16 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

17 Use the down arrow to move the arm in small increments and check that it can be inserted into the fixture without interference. If further adjustments are necessary, repeat steps 13 through 17.

> **CAUTION** **Property Damage Hazard**
> **Always check that** UPPER ARM **is selected before moving the arm. If** LOWER ARM **is selected, and the lower arm is mistakenly operated, the prober can be damaged.**

18 Move the upper arm in small increments until the tip of the arm is at the 300 mm position on the fixture.

Checking the Arm Insertion Position (300 mm)

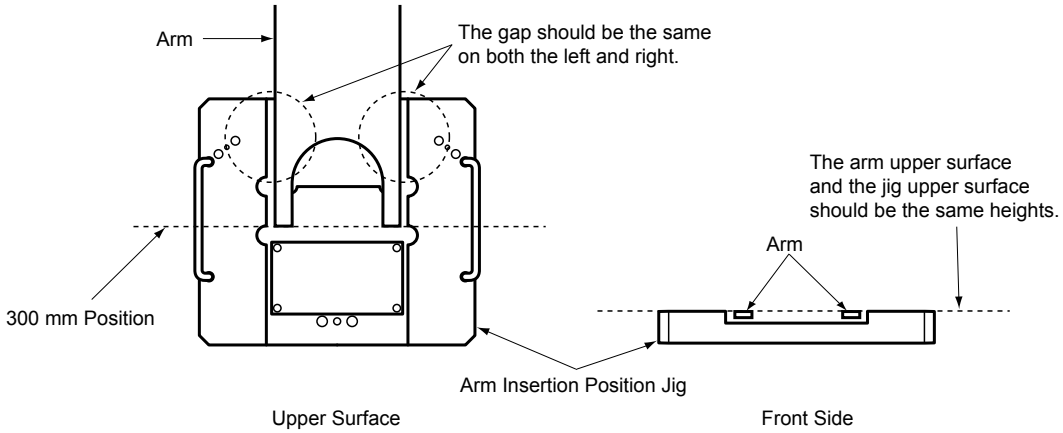


19 Check the upper arm position and check that all of the following conditions are met:

- The tip of the upper arm should be at the 300 mm position.
- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

If further adjustments are necessary, repeat steps 13 through 17.

Checking the Arm Insertion Position (300 mm)



20 Use the following steps to save the upper arm 300 mm wafer hand-over position.

20.1 Press 300 for `Wafer Size Selection`.

20.2 Press INPUT.

20.3 Press CASSETTE 1. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

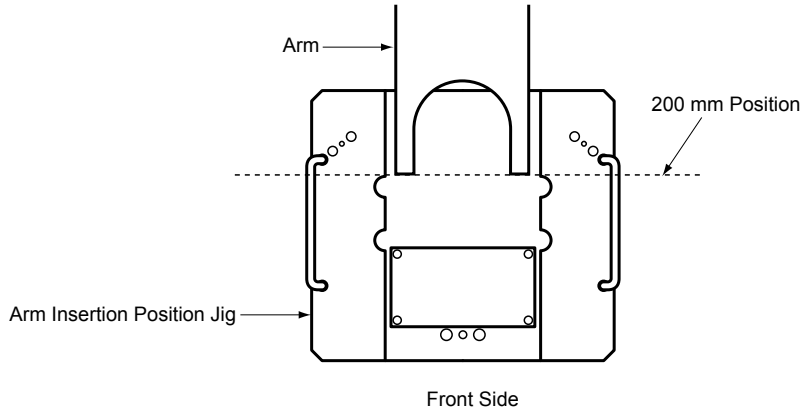
Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.

NOTE **Press CASSETTE 2 when you are adjusting load port 2.**

20.4 Press YES. The upper arm 300 mm hand-over position is saved.

21 Move the upper arm in small increments until the tip of the arm is at the 200 mm position on the fixture.

▼ **Arm Insertion Position (200 mm)**



22 Use the following steps to save the upper arm 200 mm wafer hand-over position.

22.1 Press 200 for `Wafer Size Selection`.

22.2 Press INPUT.

22.3 Press CASSETTE 1. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.

NOTE **Press CASSETTE 2 when you are adjusting load port 2.**

22.4 Press YES. The upper arm 200 mm hand-over position is saved.

22.5 Press MOVE.

22.6 Press HOME. The upper arm moves to the home position.

22.7 Press OK.

23 Use the following steps to transfer the loader Z to the lower arm adjustment position.

NOTE **Steps 23 and following are used for adjusting the lower arm. Only the arm position and the Z axis height are adjusted for the lower arm. The theta axis position that was adjusted for the upper arm is used for the lower arm as well.**

23.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

23.2 Press 1 for `Select Cassette`.

NOTE **Press 2 when you are adjusting load port 2.**

23.3 Press MOVE TO.

23.4 Press LOWER (CASSETTE). A check menu is displayed with the message `Do you want to move?`

23.5 Press YES. The loader Z moves to the lower (cassette) position.

23.6 Set the INDEX amount to 44,000 µm.

23.7 Press the up arrow one time. The loader Z rises 44000 µm from the lower (cassette) position.

23.8 Press OK. The *Loader Item Selection Menu* is displayed.

24 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

25 Use the following steps to transfer the lower arm to the home position.

25.1 Press LOWER ARM for `Arm Selection`.

25.2 Press ORIGIN.

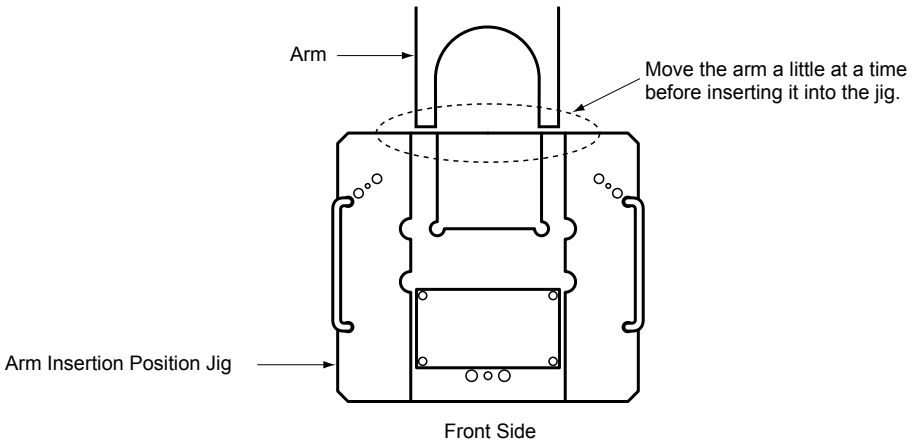
25.3 Press HOME.

25.4 Select INDEX and use the down arrow to slowly insert the lower arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

Moving Upper Arm



26 Check the lower arm height (Z axis).

Measure and record how far apart the fixture upper surface and the upper arm upper surface are.

27 Press HOME. The lower arm returns to the home position.

28 Press OK. The *Item Selection Menu* is displayed.

29 Use the following steps to adjust the height of the lower arm (Z axis).

29.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

29.2 Press 1 for `Select Cassette`.

NOTE **Press 2 when you are adjusting load port 2.**

29.3 Set the INDEX amount to 100 µm.

29.4 Use the up and down arrows to change the Z position so that the surface of the lower arm and the surface of the fixture are level with each other. Refer to the measurements you recorded in step 26.

29.5 Press SAVE POSITION.

29.6 Press LOWER (CASSETTE). A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected. SAVE POSITION **is selected.**

29.7 Press YES. The lower (cassette) position is saved.

NOTE **The coordinate subtracting the fixture height (44000 µm) from the current position is calculated automatically for the lower (cassette) position coordinate, and is then stored in memory.**

29.8 Press OK. The *Item Selection Menu* is displayed.

30 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

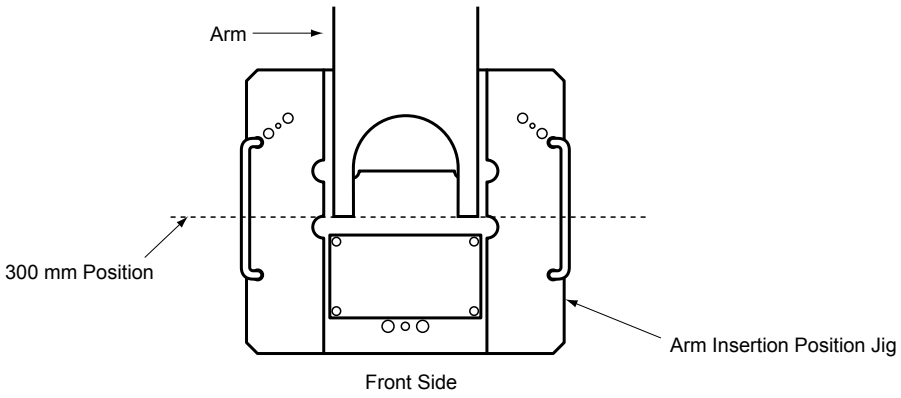
31 Press LOWER ARM for `Arm Selection`.

32 Use the down arrow to move the arm in small increments and check that it can be inserted into the fixture without interference. If further adjustments are necessary, repeat step 29.

> **CAUTION** **Property Damage Hazard**
> **Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.**

33 Move the lower arm in small increments until the tip of the arm is at the 300 mm position on the fixture.

Arm Insertion Position (300 mm)

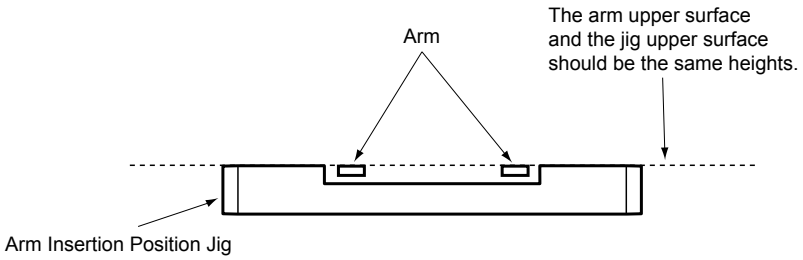


34 Check the lower arm position and check that all of the following conditions are met:

- The tip of the upper arm should be at the 300 mm position.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

If further adjustments are necessary, repeat step 29.

Checking the Arm Height



35 Use the following steps to save the lower arm 300 mm wafer hand-over position.

35.1 Press 300 for `Wafer Size Selection`.

35.2 Press INPUT.

35.3 Press CASSETTE 1. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

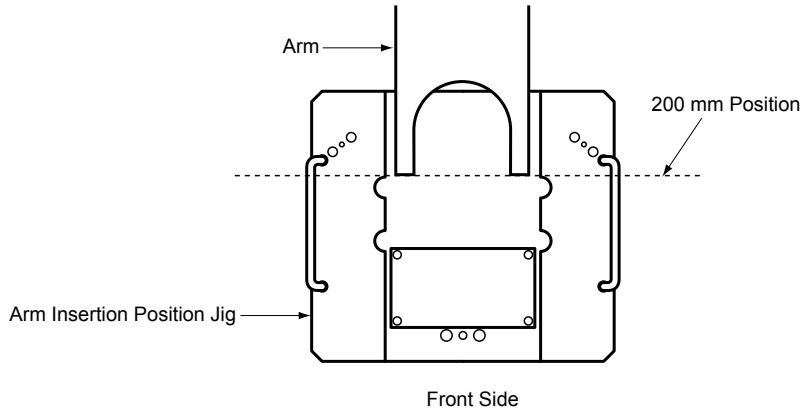
Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.

NOTE **Press CASSETTE 2 when you are adjusting load port 2.**

35.4 Press YES. The lower arm 300 mm hand-over position is saved.

36 Move the lower arm in small increments until the tip of the arm is at the 200 mm position on the fixture.

Arm Insertion Position (200 mm)



37 Use the following steps to save the lower arm 200 mm wafer hand-over position.

37.1 Press 200 for `Wafer Size Selection`.

37.2 Press INPUT.

37.3 Press CASSETTE 1. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.

NOTE **Press CASSETTE 2 when you are adjusting load port 2.**

37.4 Press YES. The lower arm 200 mm hand-over position is saved.

37.5 Press MOVE.

37.6 Press HOME. The lower arm moves to the home position.

37.7 Press OK.

38 Remove the fixture from the load port.

39 Repeat steps 2 through 38 to adjust load port 2.

NOTE **Move the arm unit to the load port 2 position on the *Loader Slide Menu* before adjusting load port 2.**

40 Press PREVIOUS MENU on the *Item Selection Menu*.

41 Press INITIALIZE LOADER. The loader is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

7.8 Checking the Mapping Arm Insertion Position 0814.2

Introduction

Purpose:

Check the mapping arm search position.

The mapping arm is used to measure the presence and the thickness of wafers located in the FOUP. If the search position is not set correctly, an error will occur resulting in damage to FOUP, wafer, and arm.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Arm insertion position fixture Mapping sensor positioning fixture
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking a Single Port Loader

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Loader Item Selection Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

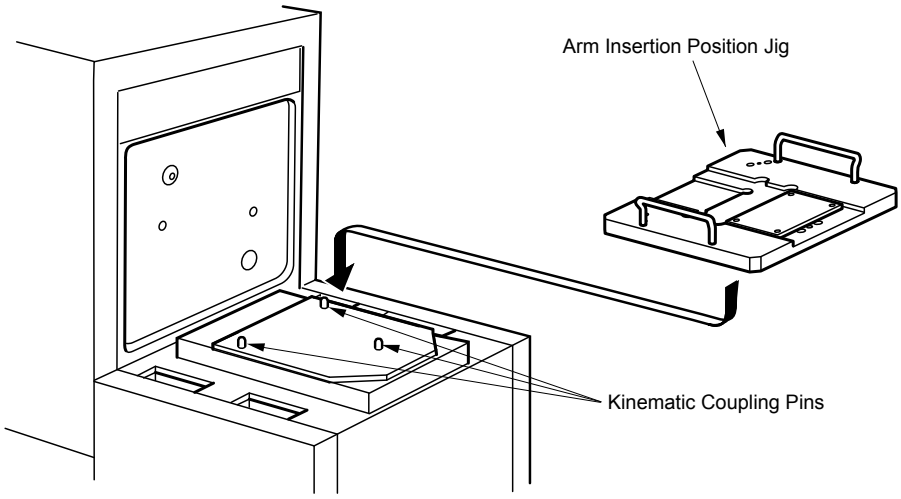
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3 Place the arm insertion position fixture on the load port. Position the load port kinematic coupling pins in the groove located on the bottom of the fixture.

Load Platform Adjustment Fixture



NOTE **FOUP specifications and open cassette specifications may vary for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

4 Use the following steps to position the load port and open the FOUP door.

4.1 Press FOUP_OPENER ADJUSTMENT on the *Loader Item Selection Menu*. The *FOUP_Opener Adjustment Menu* is displayed.

FOUP_Opener Adjustment Menu

4.2 Press DOCK next to `Load Port` to move the load port toward the loader.

4.3 Press OPEN next to `Opener` to open the FOUP opener.

4.4 Press DOWN next to `Opener` to move the FOUP opener down.

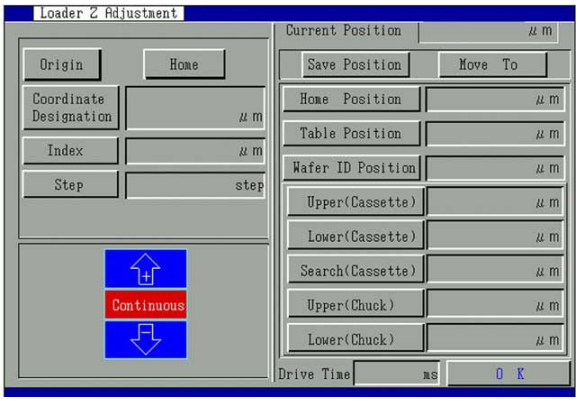
4.5 Press OK to exit. A check menu is displayed stating `Initialize FOUP_OPENER?` Press NO. The *Loader Item Selection Menu* is displayed.

5 Use the following steps to position the loader Z.

5.1 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*. The *All Axes Adjustment Menu* is displayed.

5.2 Press LOADER Z on the *All Axes Adjustment Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



5.3 Press ORIGIN. The loader Z moves to the origin position.

5.4 Press HOME. The loader Z moves to the home position.

5.5 Press COORDINATE DESIGNATION twice and input 155,000μm on the numeric keypad. Press OK.

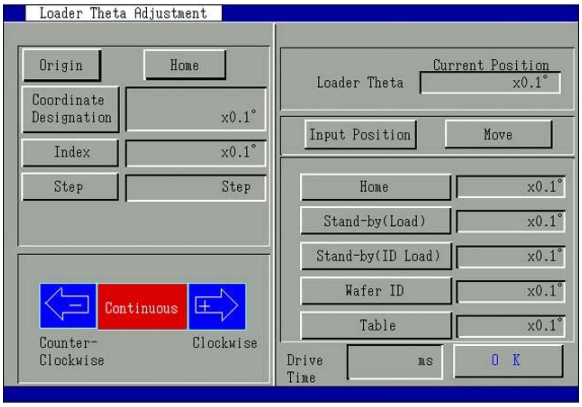
5.6 Press the blue UP arrow once. The loader moves to the designated coordinate.

5.7 Press OK.

6 Use the following steps to transfer the loader theta to the home position.

6.1 Press LOADER THETA on the *Loader Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

Loader Theta Adjustment Menu



6.2 Press ORIGIN. The loader theta moves to the origin position.

6.3 Press HOME. The loader theta moves to the home position.

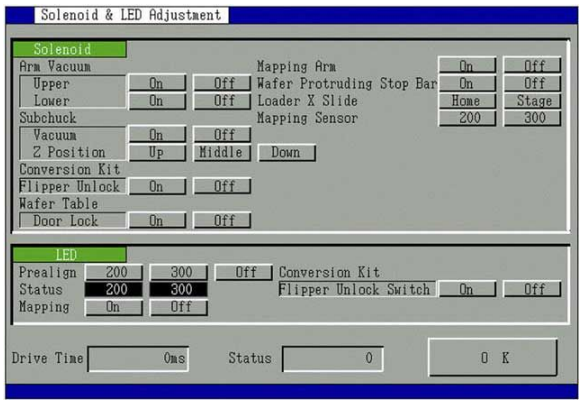
6.4 Press OK.

7 Use the following steps to extend the mapping arm to the mapping arm search position.

7.1 Press PREVIOUS MENU. The *Loader Item Selection Menu* is displayed.

7.2 Press SOLENOID AND LED ADJUSTMENT on the *Loader Item Selection Menu*. The *Solenoid and LED Adjustment Menu* is displayed.

Solenoid and LED Adjustment Menu



7.3 Press ON for `Mapping Arm` on the *Solenoid and LED Adjustment Menu* to extend the mapping arm to the search position.

CAUTION **Property Damage Hazard**

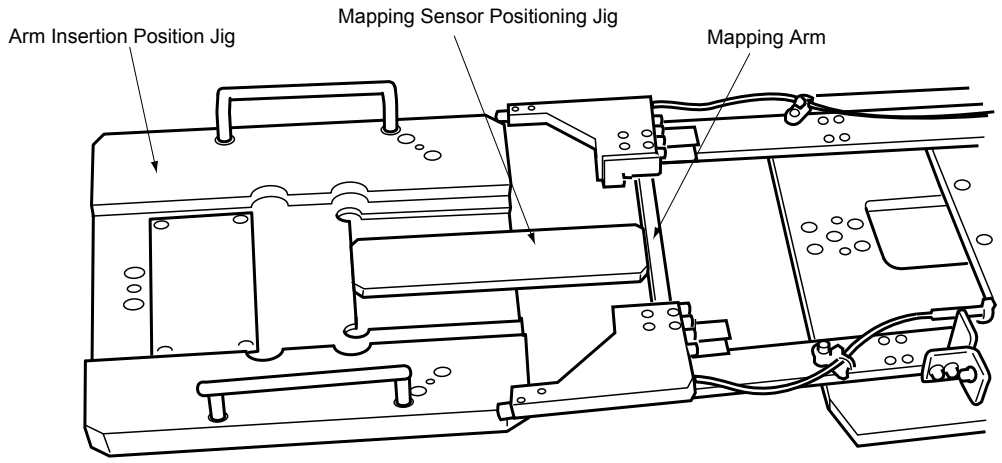
If the FOUP opener is closed when the mapping arm is moved, the arm will contact the opener and cause damage to the prober. Be sure that the FOUP opener is open before pressing ON **for `Mapping Arm`.**

7.4 Press OK on the *Solenoid and LED Adjustment Menu*.

NOTE **If you are using the prober to test 200 mm wafers, move the mapping arms to the 300 mm position before placing the mapping sensor positioning fixture on the load port.**

8 Place the mapping sensor positioning fixture onto the load platform adjustment fixture with one end resting against the mapping sensor.

Mapping Sensor Positioning Fixture



9 Check the following points of inspection:

- There is no space between the mapping sensor positioning fixture and the arm insertion position fixture.
- There is no space between the mapping sensor positioning fixture and the mapping arm.
- The mapping arm is placing no excessive strain on the mapping sensor positioning fixture.

If the mapping arm position is correct, based on these points of inspection, continue with the next step.

If the positioning of the alignment tool and mapping arm are incorrect, go to **7.9 Adjusting the Mapping Arm Insertion Position (see page 545)**.

10 Remove the mapping sensor positioning fixture and the arm insertion position fixture from the load port.

NOTE **If you are using the prober to text 200 mm wafers, move the mapping arms to the 200 mm position before retracting the mapping arm.**

11 Press SOLENOID & LED ADJUSTMENT on the *Loader Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

12 Press OFF next to `Mapping Arm` to retract the mapping arm.

13 Press OK on the *Solenoid & LED Adjustment Menu*.

14 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

15 Press INITIALIZE LOADER. The loader is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

16 Press PREVIOUS MENU on the *All Axes Adjustment Menu*.

17 Press PREVIOUS MENU on the *Item Selection Menu*.

18 Press MAIN MENU on the *Adjustments Menu*.

Checking a Dual Port Loader

1 Use one of the following methods to begin the procedure.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to access the *Loader Item Selection Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

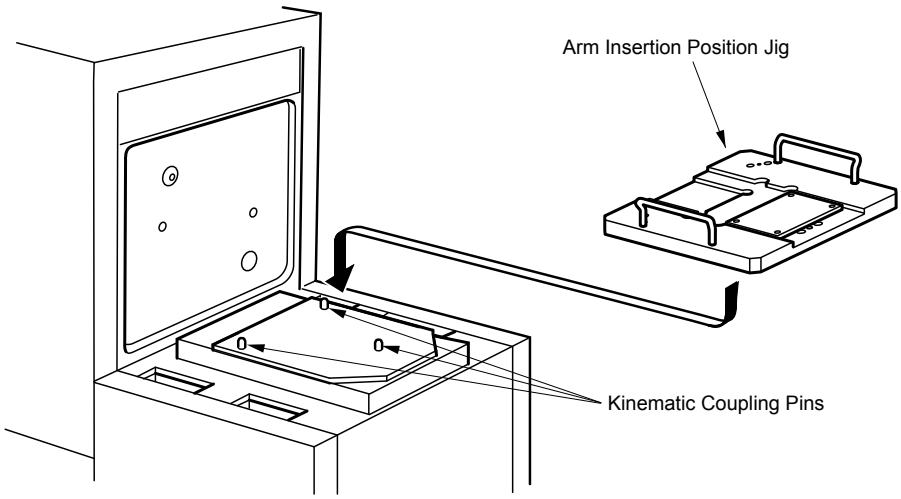
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3 Place the arm insertion position fixture on the load port. Position the load port kinematic coupling pins in the groove located on the bottom of the fixture.

Load Platform Adjustment Fixture

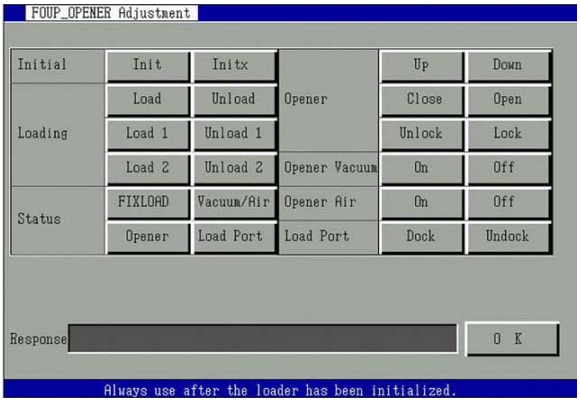


> **NOTE** **FOUP specifications and open cassette specifications may vary for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

4 Use the following steps to position the load port and open FOUP opener 1.

4.1 Press FOUP_OPENER ADJUSTMENT on the *Loader Item Selection Menu*. The *FOUP_Opener Adjustment Menu* is displayed.

▼ **FOUP_Opener Adjustment Menu**



4.2 Press OPENER 1.

4.3 Press DOCK next to `Load Port` to move load port 1 toward the loader.

4.4 Press OPEN next to `Opener` to open FOUP opener 1.

4.5 Press DOWN next to `Opener` to move FOUP opener 1 down.

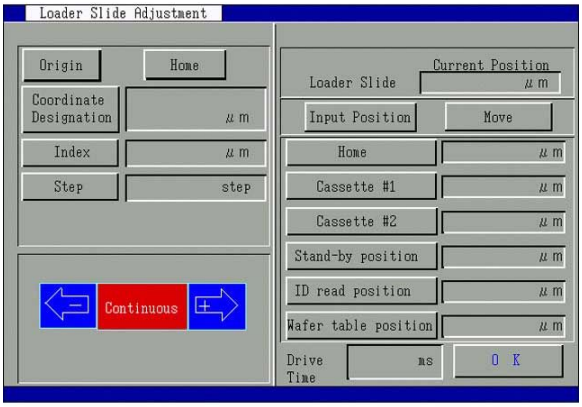
4.6 Press OK to exit. A check menu is displayed stating `Initialize FOUP_OPENER?`. Press NO. The *Loader Item Selection Menu* is displayed.

5 Use the following steps to move the arm unit to the Y axis load port 1 position.

5.1 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

5.2 Press LOADER SLIDE. The *Loader Slide Adjustment Menu* is displayed.

▼ **Loader Slide Adjustment Menu**



5.3 Press ORIGIN. The arm unit moves to the Y axis origin position.

5.4 Press HOME. The arm unit moves to the Y axis home position.

5.5 Press MOVE.

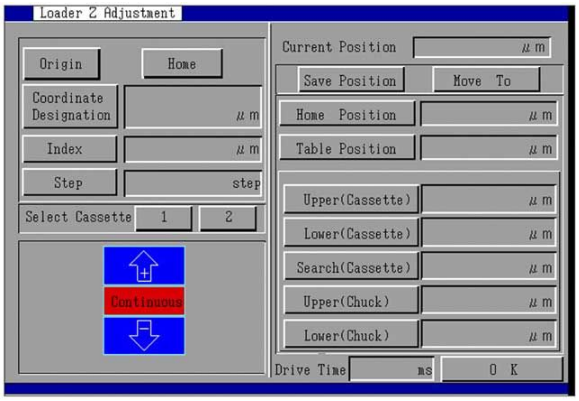
5.6 Press CASSETTE 1. The arm unit moves to the Y axis load port 1 position.

5.7 Press OK

6 Use the following steps to position the loader Z.

6.1 Press LOADER Z on the *All Axes Adjustment Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



6.2 Press ORIGIN. The loader Z moves to the origin position.

6.3 Press HOME. The loader Z moves to the home position.

6.4 Press COORDINATE DESIGNATION twice and input 155,000μm on the numeric keypad. Press OK.

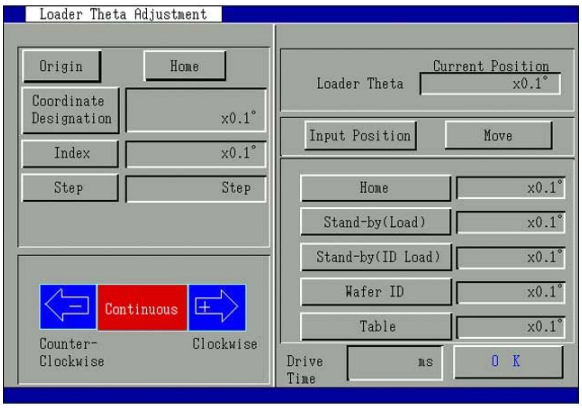
6.5 Press the blue UP arrow once. The loader moves to the designated coordinate.

6.6 Press OK.

7 Use the following steps to transfer the loader theta to the home position.

7.1 Press LOADER THETA on the *Loader Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

▼ **Loader Theta Adjustment Menu**



7.2 Press ORIGIN. The loader theta moves to the origin position.

7.3 Press HOME. The loader theta moves to the home position.

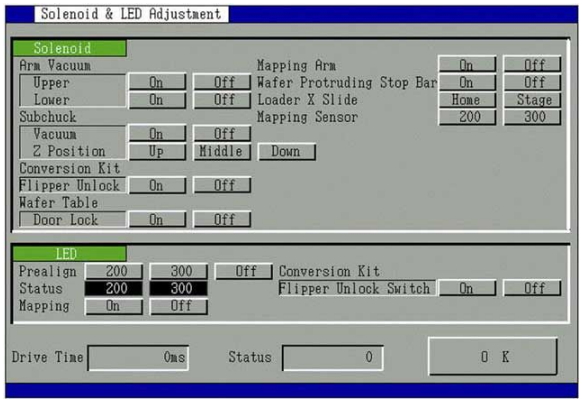
7.4 Press OK.

8 Use the following steps to extend the mapping arm to the search position.

8.1 Press PREVIOUS MENU. The *Loader Item Selection Menu* is displayed.

8.2 Press SOLENOID AND LED ADJUSTMENT on the *Loader Item Selection Menu*. The *Solenoid and LED Adjustment Menu* is displayed.

▼ **Solenoid and LED Adjustment Menu**



8.3 Press ON for `Mapping Arm` on the *Solenoid and LED Adjustment Menu* to extend the mapping arm to the search position.

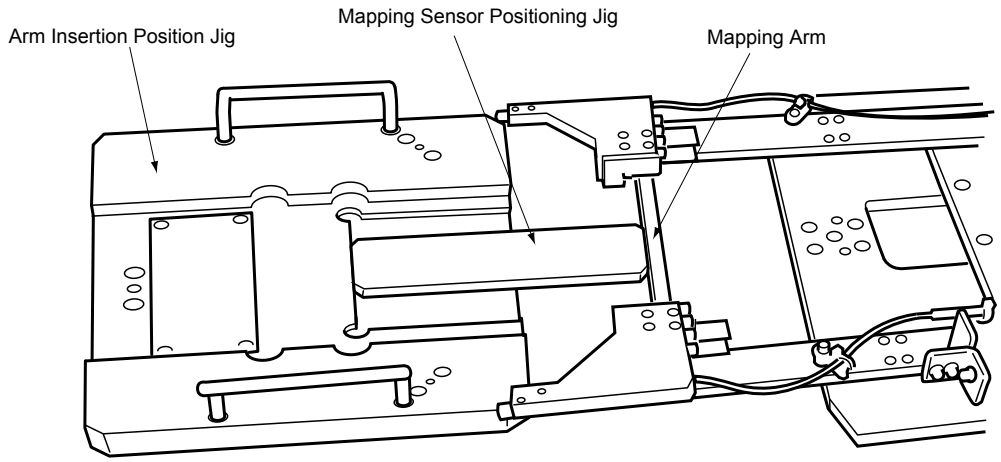
> **CAUTION** **Property Damage Hazard**
> **If the FOUP opener is closed when the mapping arm is moved, the arm will contact the opener and cause damage to the prober. Be sure that the FOUP opener is open before pressing ON for `Mapping Arm`.**

8.4 Press OK on the *Solenoid and LED Adjustment Menu*.

NOTE **If you are using the prober to test 200 mm wafers, move the mapping arms to the 300 mm position before placing the mapping sensor positioning fixture on the load port.**

9 Place the mapping sensor positioning fixture onto the load platform adjustment fixture with one end resting against the mapping sensor.

▼ **Mapping Sensor Positioning Fixture**



10 Check the following points of inspection:

- There is no space between the mapping sensor positioning fixture and the arm insertion position fixture.
- There is no space between the mapping sensor positioning fixture and the mapping arm.
- The mapping arm is placing no excessive strain on the mapping sensor positioning fixture.

If the mapping arm position is correct, based on these points of inspection, continue with the next step.

If the positioning of the alignment tool and mapping arm are incorrect, go to **7.9 Adjusting the Mapping Arm Insertion Position (see page 545)**.

11 Remove the mapping sensor positioning fixture and the arm insertion position fixture from the load port.

NOTE **If you are using the prober to text 200 mm wafers, move the mapping arms to the 200 mm position before retracting the mapping arm.**

12 Press SOLENOID & LED ADJUSTMENT on the *Loader Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

13 Press OFF next to `Mapping Arm` to retract the mapping arm.

14 Press OK on the *Solenoid & LED Adjustment Menu*.

15 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

16 Press INITIALIZE LOADER. The loader is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

17 Press PREVIOUS MENU on the *All Axes Adjustment Menu*.

18 Press PREVIOUS MENU on the *Item Selection Menu*.

19 Press MAIN MENU on the *Adjustments Menu*.

7.9 Adjusting the Mapping Arm Insertion Position 0815.1

Introduction

Purpose:

To adjust the mapping arm search position.

The mapping arm measures the presence and thickness of wafers in the FOUP. If the position is not set correctly, an error will occur resulting in damage to the FOUP, wafer, and arm.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Arm insertion position fixture 8 mm open-end wrench Mapping sensor positioning fixture
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

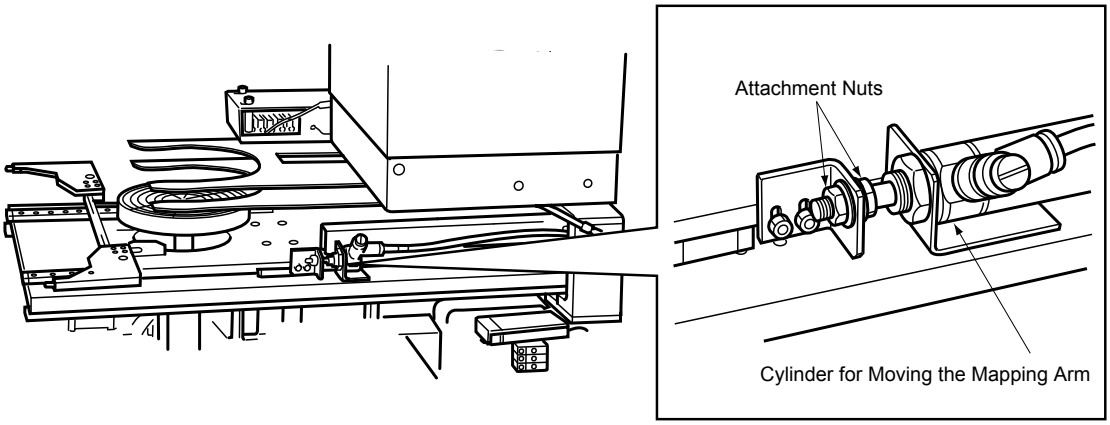
Adjusting a Single Port Loader

NOTE **The following adjustment procedure begins from the point at which 7.8 Checking the Mapping Arm Insertion Position (see page 534) failed to meet specification.**

1 Remove the loader side panel by following the procedure described in **Removing the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

2 Loosen the 2 attachment nuts on the mapping arm cylinder.

Mapping Arm Cylinder Attachment Nuts



NOTE **The pitch of the cylinder threads and adjustment nuts is equal to 0.70 mm. One complete revolution will move the linear travel 0.70 mm.**

3 Adjust the position of the mapping arm position until it meets the following inspection criteria:

- There is no space between the mapping sensor positioning fixture and the arm insertion position fixture.
- There is no space between the mapping sensor positioning fixture and the mapping arm.
- The mapping arm is placing no excessive strain on the mapping sensor positioning fixture.

4 Partially tighten the 2 attachment nuts by hand.

5 Remove the mapping sensor positioning fixture.

6 Press SOLENOID & LED ADJUSTMENT.

7 Press OFF next to `Mapping Arm` to retract the mapping arm.

8 Tighten the 2 attachment nuts completely using the wrench.

9 Use the following steps to check the mapping arm movement and the search position.

9.1 Press ON for `Mapping Arm` on the *Solenoid and LED Adjustment Menu* to extend the mapping arm to the search position.

CAUTION **Property Damage Hazard**

If the FOUP opener is closed when the mapping arm is moved, the arm will contact the opener and cause damage to the prober. Be sure that the FOUP opener is open before pressing ON **for `Mapping Arm`.**

9.2 Press OK on the *Solenoid and LED Adjustment Menu*.

NOTE **If you are using the prober to test 200 mm wafers, move the mapping arms to the 300 mm position before placing the mapping sensor positioning fixture on the load port.**

9.3 Place the mapping sensor positioning fixture onto the load platform adjustment fixture with one end resting against the mapping sensor.

10 Check the following points of inspection:

- There is no space between the mapping sensor positioning fixture and the arm insertion position fixture.
- There is no space between the mapping sensor positioning fixture and the mapping arm.
- The mapping arm is placing no excessive strain on the mapping sensor positioning fixture.

If the mapping arm position is correct, based on these points of inspection, continue with the next step.

If the positioning of the alignment tool and mapping arm are incorrect, repeat steps 1 through 8.

11 Remove the mapping sensor positioning fixture and the arm insertion position fixture from the load port.

NOTE **If you are using the prober to text 200 mm wafers, move the mapping arms to the 200 mm position before retracting the mapping arm.**

12 Reattach the loader side panel.

13 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

14 Press INITIALIZE LOADER. The loader is initialized.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

15 Press PREVIOUS MENU on the *All Axes Adjustment Menu*.

16 Press PREVIOUS MENU on the *Item Selection Menu*.

17 Press MAIN MENU on the *Adjustments Menu*.

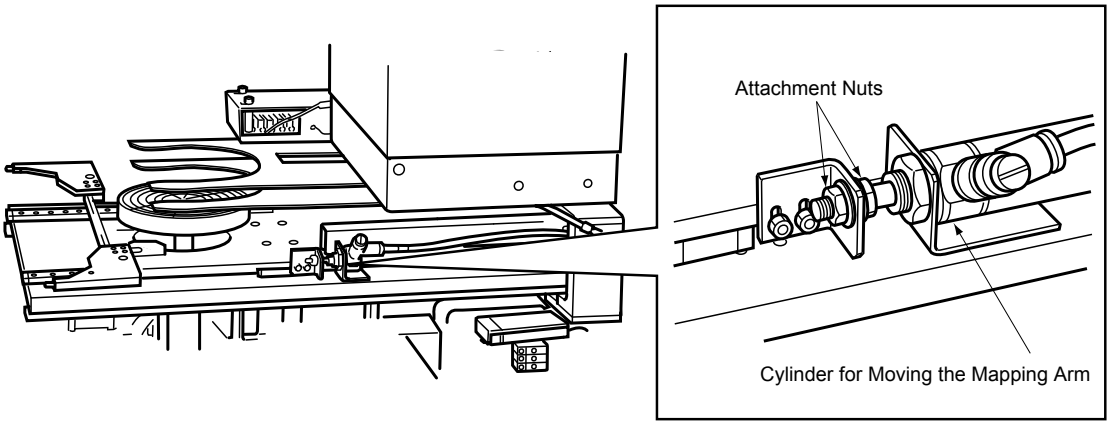
Adjusting a Dual Port Loader

NOTE **The following adjustment procedure begins from the point at which Checking a Dual Port Loader (see page 539) failed to meet specification.**

1 Remove loader rear panels 1 and 3 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

2 Loosen the 2 attachment nuts on the mapping arm cylinder.

Mapping Arm Cylinder Attachment Nuts



NOTE **The pitch of the cylinder threads and adjustment nuts is equal to 0.70 mm. One complete revolution will move the linear travel 0.70 mm.**

3 Adjust the position of the mapping arm position until it meets the following inspection criteria:

- There is no space between the mapping sensor positioning fixture and the arm insertion position fixture.
- There is no space between the mapping sensor positioning fixture and the mapping arm.
- The mapping arm is placing no excessive strain on the mapping sensor positioning fixture.

4 Partially tighten the 2 attachment nuts by hand.

5 Remove the mapping sensor positioning fixture.

6 Press SOLENOID & LED ADJUSTMENT.

7 Press OFF next to `Mapping Arm` to retract the mapping arm.

8 Tighten the 2 attachment nuts completely using the wrench.

9 Use the following steps to check the mapping arm movement and the search position.

9.1 Press ON for `Mapping Arm` on the *Solenoid and LED Adjustment Menu* to extend the mapping arm to the search position.

CAUTION **Property Damage Hazard**

If the FOUP opener is closed when the mapping arm is moved, the arm will contact the opener and cause damage to the prober. Be sure that the FOUP opener is open before pressing ON **for `Mapping Arm`.**

9.2 Press OK on the *Solenoid and LED Adjustment Menu*.

NOTE **If you are using the prober to test 200 mm wafers, move the mapping arms to the 300 mm position before placing the mapping sensor positioning fixture on the load port.**

9.3 Place the mapping sensor positioning fixture onto the load platform adjustment fixture with one end resting against the mapping sensor.

10 Check the following points of inspection:

- There is no space between the mapping sensor positioning fixture and the arm insertion position fixture.
- There is no space between the mapping sensor positioning fixture and the mapping arm.
- The mapping arm is placing no excessive strain on the mapping sensor positioning fixture.

If the mapping arm position is correct, based on these points of inspection, continue with the next step.

If the positioning of the alignment tool and mapping arm are incorrect, repeat steps 1 through 8.

11 Remove the mapping sensor positioning fixture and the arm insertion position fixture from the load port.

NOTE **If you are using the prober to text 200 mm wafers, move the mapping arms to the 200 mm position before retracting the mapping arm.**

12 Reattach loader rear panels 1 and 3.

13 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

14 Press INITIALIZE LOADER. The loader is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

15 Press PREVIOUS MENU on the *All Axes Adjustment Menu*.

16 Press PREVIOUS MENU on the *Item Selection Menu*.

17 Press MAIN MENU on the *Adjustments Menu*.

7.10 Checking the Mapping Sensor Level 1462.1

Introduction

Purpose:

To check that the mapping sensor level indicated on the amplifier is correct. This ensures that mapping is performed correctly.

Required Resources:

Time:	5 minutes
Personnel:	1 person
Tools:	Screwdriver
Parts or Consumables:	None

Prerequisite Skills:

Tokyo Electron's P-12XL Operations and Maintenance training course.

Any local test floor required training for dealing with the hazards described in this procedure.

WARNING Electrical Hazard
The work performed in this procedure is classified as Hot Work Type 3. Refer to 2.1 Types of Hot Work (see page 48) for details.

Checking the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION Property Damage Hazard
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

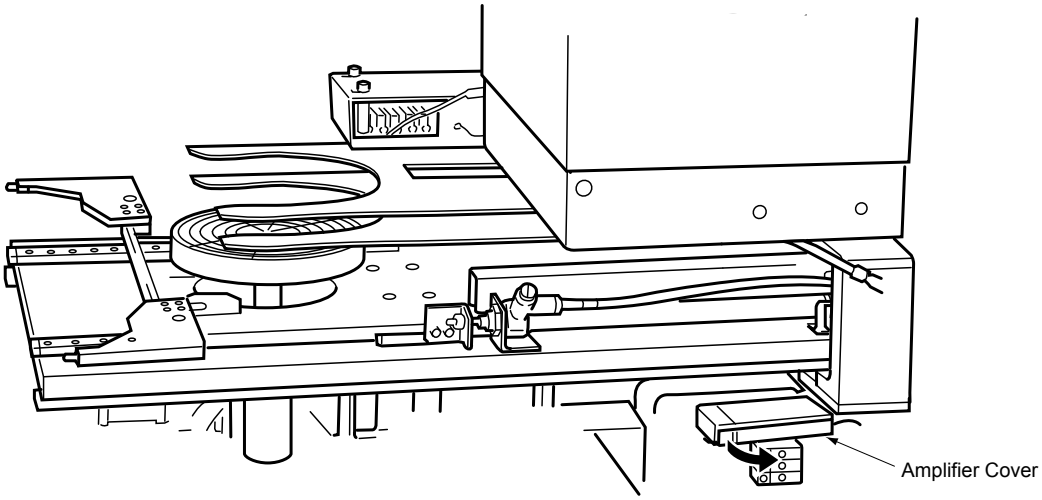
2 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

NOTE The interlock will engage when the loader side panel is removed; therefore, the arm unit cannot be moved. Although the buzzer will sound if an interlock error occurs, work can be continued after the buzzer is stopped.

3 Open the amplifier cover.

> **WARNING** **Electrical Hazard**
> **The boards inside the loader are electrically charged. To avoid a short circuit or electrical shock, to not touch any of the boards.**

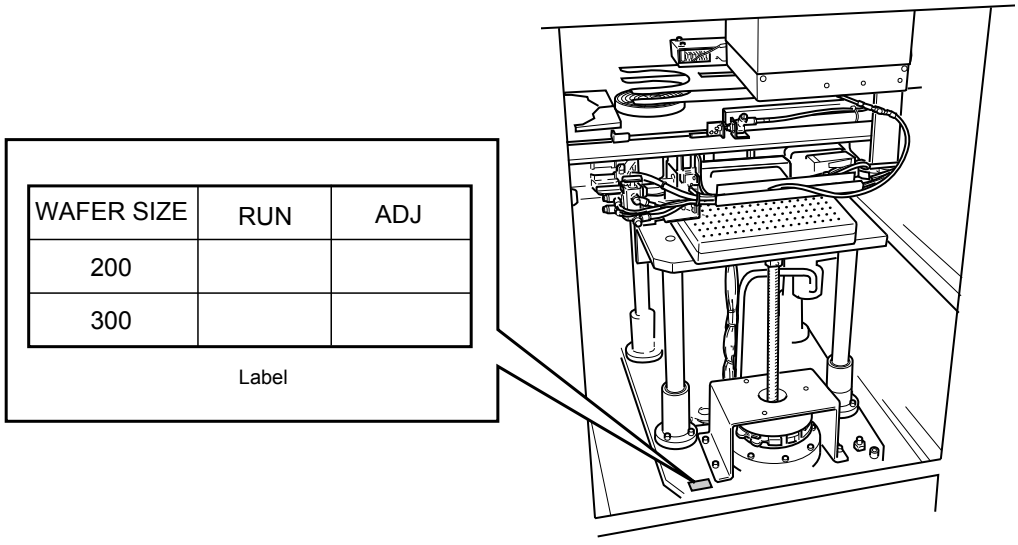
Amplifier Cover



4 Check that the mapping sensor level indicated on the amplifier matches the following conditions:

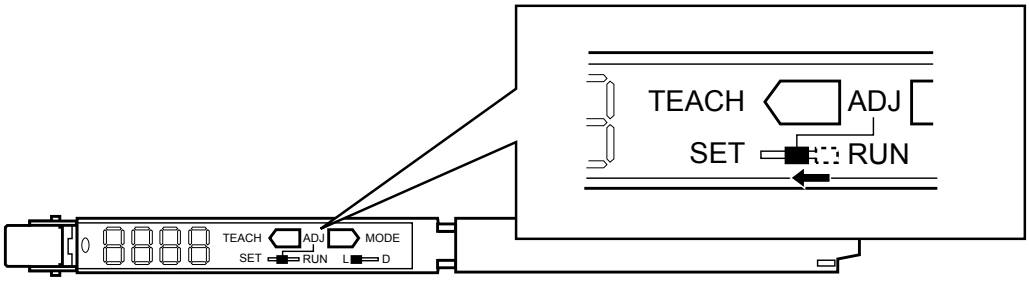
- The mapping sensor level must be greater than or equal to 1000.
- The amplifier level display should be within ±10% of the value listed in the **RUN** box for **WAFER SIZE 300** on the label affixed to the base.
- If you are using the prober to test 200 mm wafers, the mapping sensor level should be greater than or equal to 1200 and the amplifier level display should be within ±10% of the value listed in the **RUN** box for **WAFER SIZE 200** on the label affixed to the base.

Checking the Mapping Sensor Level



5 Switch the mode from **RUN** to **ADJ** .

Switching the Mode



6 Check that the mapping sensor level indicated on the amplifier is equal to the value listed in the **ADJ** box for **WAFER SIZE 300** on the label affixed to the base.

If you are using the prober to test 200 mm wafers, check that the mapping sensor level indicated on the amplifier is equal to the value listed in the **ADJ** box for **WAFER SIZE 200** on the label affixed to the base.

7 Switch the mode from **ADJ** to **RUN** .

8 Close the amplifier cover.

9 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

10 Replace the loader side panel.

Checking the Dual Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Arm Unit Maintenance Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

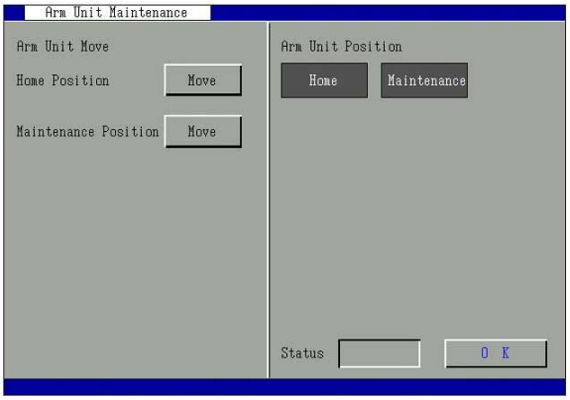
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

2.5 Press ARM UNIT MAINTENANCE on the *Loader Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

▼ **Arm Unit Maintenance Menu**



3 Under `Arm Unit Move`, press MOVE for the `Maintenance Position`. The arm unit moves to the maintenance position.

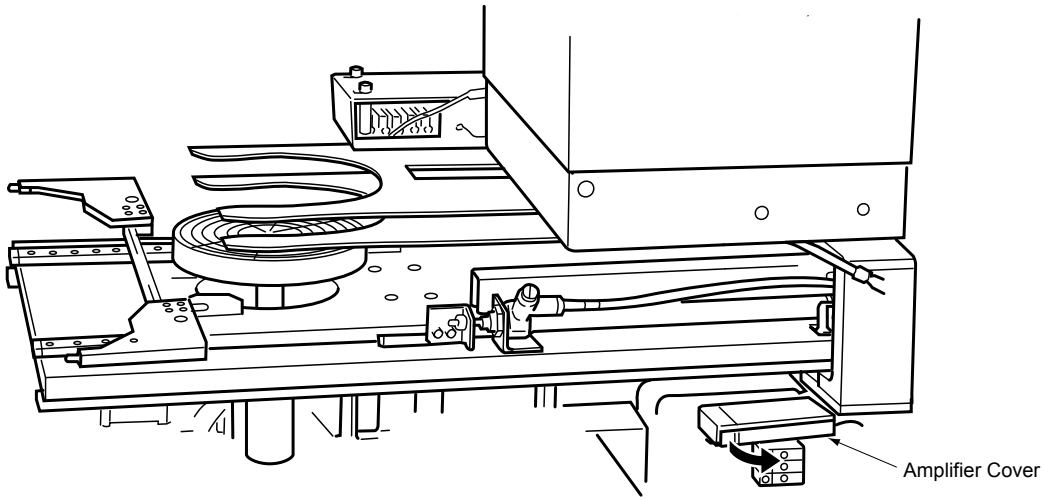
4 Press OK on the *Arm Unit Maintenance Menu*.

5 Remove the loader left side panel 1 by following the procedure described in **4.7.2 Removing and Attaching the Loader Left Side Panels (Dual Port) (see page 133)**.

6 Open the amplifier cover.

> **⚠WARNING Electrical Hazard**
> **The boards inside the loader are electrically charged. To avoid a short circuit or electrical shock, to not touch any of the boards.**

▼ **Amplifier Cover**

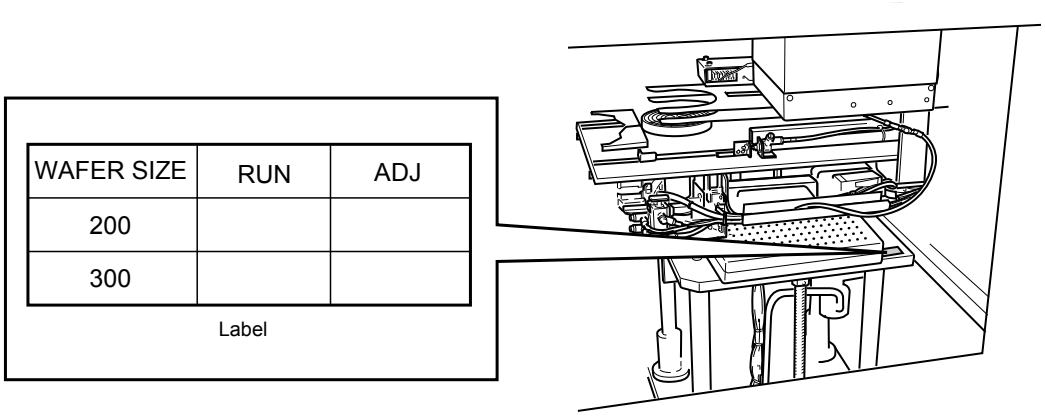


7 Check that the mapping sensor level indicated on the amplifier matches the following conditions:

- The mapping sensor level must be greater than or equal to 1000.
- The amplifier level display should be within ±10% of the value listed in the **RUN** box for **WAFER SIZE 300** on the label affixed to the base.

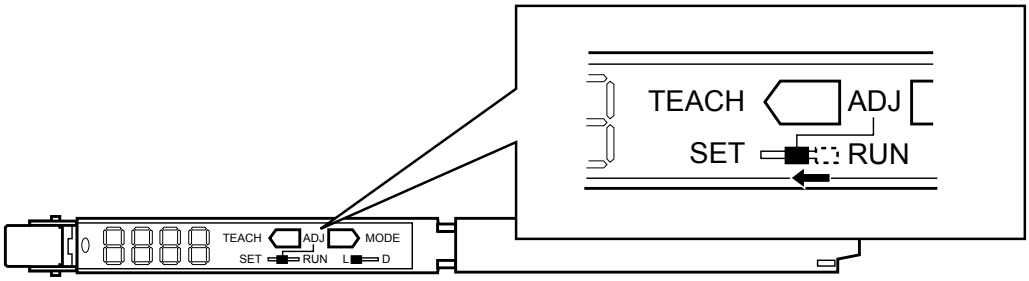
- If you are using the prober to test 200 mm wafers, the mapping sensor level should be greater than or equal to 1200 and the amplifier level display should be within ±10% of the value listed in the **RUN** box for **WAFER SIZE 200** on the label affixed to the base.

Checking the Mapping Sensor Level



8 Switch the mode from **RUN** to **ADJ** .

Switching the Mode



9 Check that the mapping sensor level indicated on the amplifier is equal to the value listed in the **ADJ** box for **WAFER SIZE 300** on the label affixed to the base.

If you are using the prober to test 200 mm wafers, check that the mapping sensor level indicated on the amplifier is equal to the value listed in the **ADJ** box for **WAFER SIZE 200** on the label affixed to the base.

10 Switch the mode from **ADJ** to **RUN** .

11 Close the amplifier cover.

12 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

13 Replace the loader left side panel 1.

7.11 Checking the Mapping Sensor Threshold (300 mm Position) 1464.2

Introduction

Purpose:

To check the mapping sensor and set the search position so that the prober can perform the mapping from the correct position.

If the search position is incorrect, then the arm, wafer, and FOUP could be damaged.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Arm insertion position fixture Wire block
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **Perform this procedure with the prober set up to probe 300 mm wafers.**

Checking the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Wafer Search Position Adjustment Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

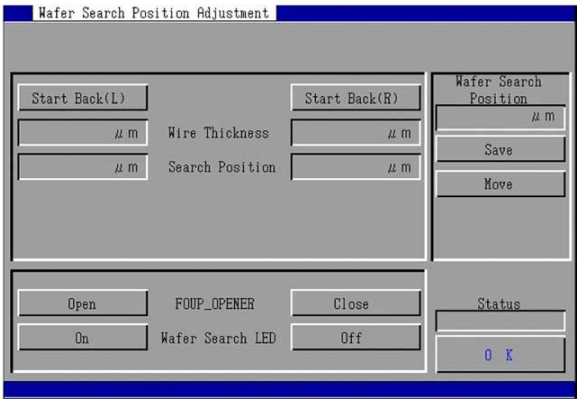
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

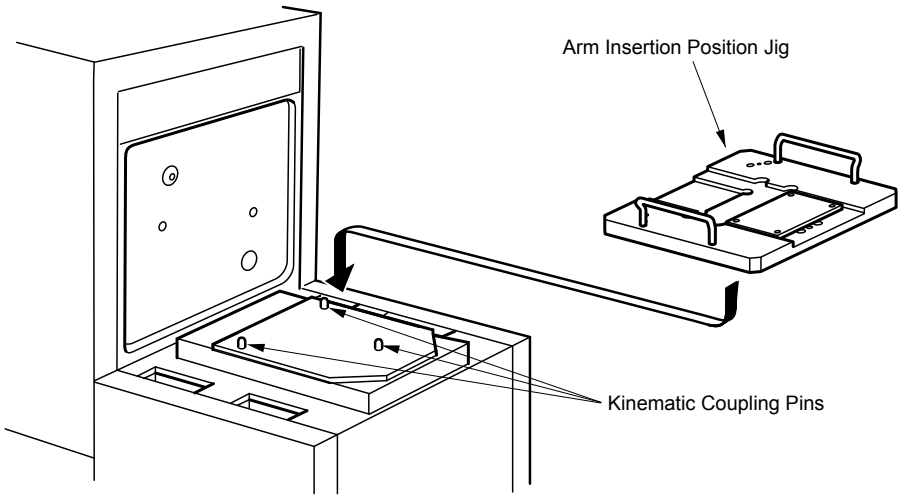
2.5 Press MAPPING ARMPOSITION ADJUST on the *Loader Item Selection Menu*. The *Wafer Search Position Adjustment Menu* is displayed.

Wafer Search Position Adjustment Menu



3 Place the arm insertion position fixture onto the load port. Use the kinematic coupling pins as a guide and align them with the grooves on the bottom of the fixture.

Arm Insertion Position Fixture



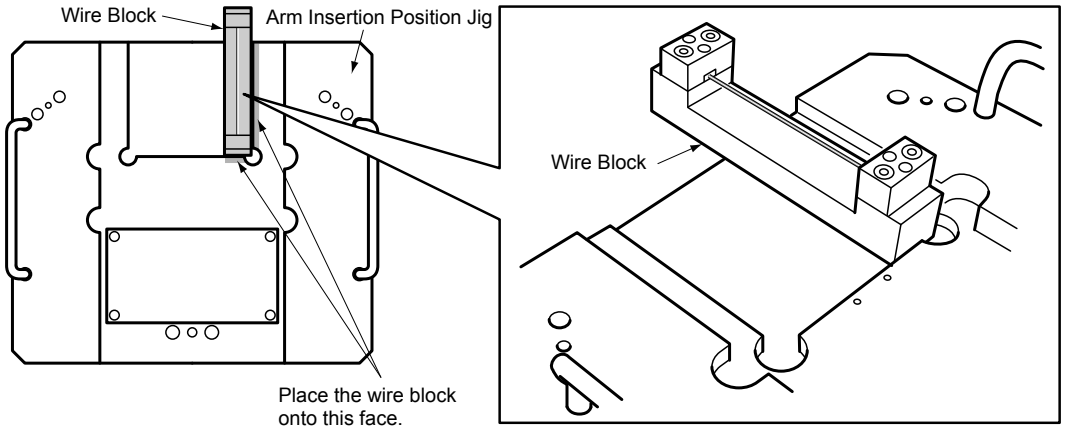
NOTE **FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

4 Press OPEN for FOUP_OPENER on the *Wafer Search Position Adjustment Menu*. The load port to the docked position. The FOUP door opens and then descends.

5 Use the following steps to detect the wire block using the mapping sensor.

5.1 Place the wire block onto the load platform adjustment device along the right side.

▼ **Wire Block Placement (Right Side)**

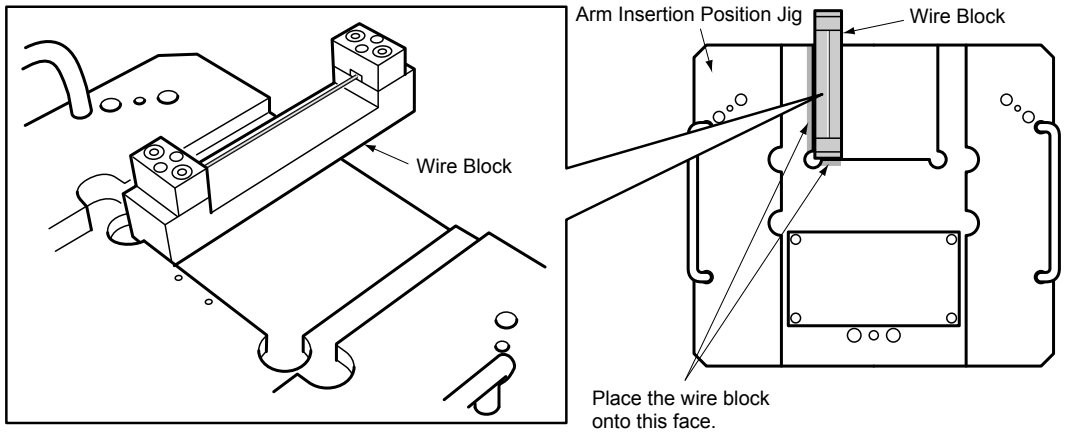


5.2 Press START BACK (R) on the *Wafer Search Position Adjustments Menu*. The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

CAUTION **Property Damage Hazard**
The arm unit will move. Remove any tools, wipes, or other objects from the loader area.

5.3 Place the wire block along the left side of the fixture.

▼ **Wire Block Placement (Left Side)**



5.4 Press START BACK (L). The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

CAUTION **Property Damage Hazard**
The arm unit will move. Remove any tools, wipes, or other objects from the loader area.

6 Check that the values you recorded meet the following specifications:

- Verify that the values for the `Wire Thickness` are between 250 and 350 µm.
- Verify that the two values displayed for the `Search Position` differ by less than 200µm.

If the values are out of specification, go to **7.12 Adjusting the Mapping Sensor Threshold (300 mm Position) (see page 564)**.

NOTE **Do not press SAVE for the wafer search position when you are checking the mapping sensor threshold. If you press SAVE, you will have to enter the cassette parameters.**

7 Remove the wire block.

8 Press CLOSE for `FOUP_OPENER` on the *Wafer Search Position Adjustment Menu*. The FOUP door rises and closes. The load port moves to the undocked position.

9 Remove the arm insertion position fixture.

10 Press OK to on the *Wafer Search Position Adjustments Menu*. A check menu is displayed stating `Initialize FOUP_OPENER?` Press YES. The FOUP Opener initializes.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

11 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

12 Press INITIALIZE LOADER. The loader initializes. The *Loader Item Selection Menu* is displayed.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

13 Press PREVIOUS MENU twice on the *Loader Item Selection Menu*.

14 Press MAIN MENU on the *Adjustments Menu*. The *Main Menu* is displayed.

Checking the Dual Port Loader Specification

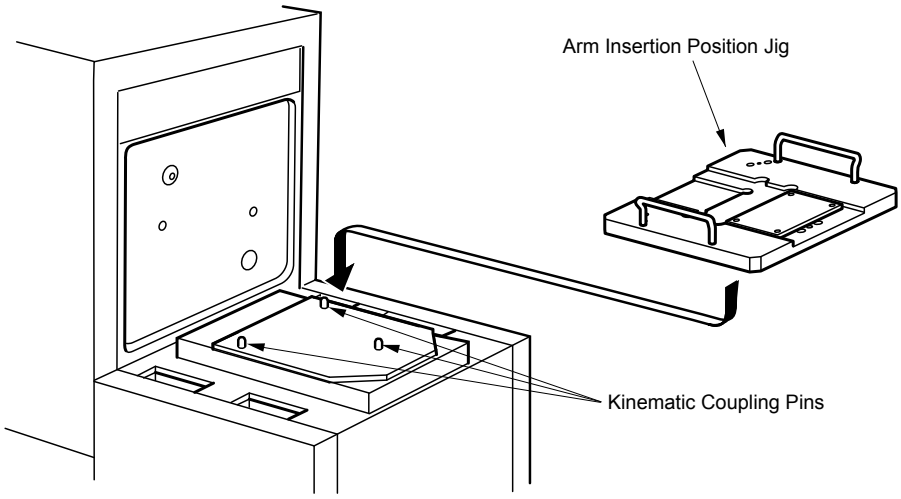
1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Place the arm insertion position fixture onto load port 1. Use the kinematic coupling pins as a guide and align them with the grooves on the bottom of the fixture.

Arm Insertion Position Fixture



NOTE FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.

3 Use the following steps to transfer the arm unit to the Y axis load port 1 position.

3.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

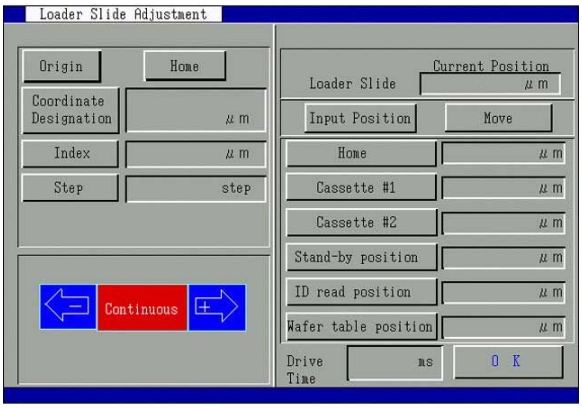
3.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3.5 Press ALL AXES ADJUSTMENT on the page 1 of the *Loader Item Selection Menu* to display the *All Axes Adjustment Menu*.

3.6 Press LOADER SLIDE. The *Loader Slide Adjustment Menu* is displayed.

Loader Slide Adjustment Menu



3.7 Press ORIGIN. The arm unit moves to the Y axis origin position.

3.8 Press HOME. The arm unit moves to the Y axis home position.

3.9 Press MOVE.

3.10 Press CASSETTE 1. The arm unit moves to the Y axis load port 1 position.

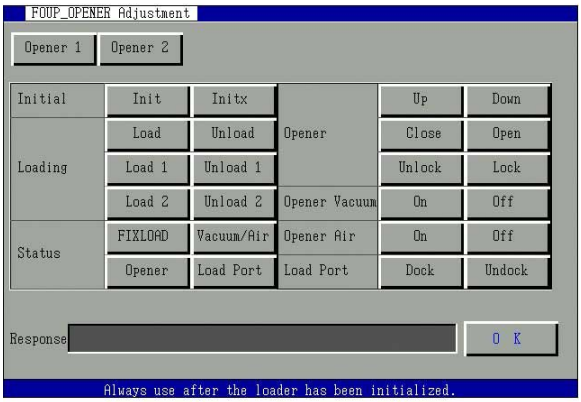
3.11 Press OK. The *Item Selection Menu* is displayed.

4 Use the following steps to open FOUP opener 1.

4.1 Press PREVIOUS MENU on the *Item Selection Menu*.

4.2 Press FOUP_OPENER ADJUSTMENT on page 2 of the *Loader Item Selection Menu* to display the *FOUP_OPENER Adjustment Menu*.

FOUP_OPENER Adjustment Menu



4.3 Press OPENER 1.

4.4 Press DOCK under `Load Port`. The load port moves to the docked position.

4.5 Press OPEN under `Opener`. The FOUP door opens.

4.6 Press DOWN under `Opener`. The FOUP door descends.

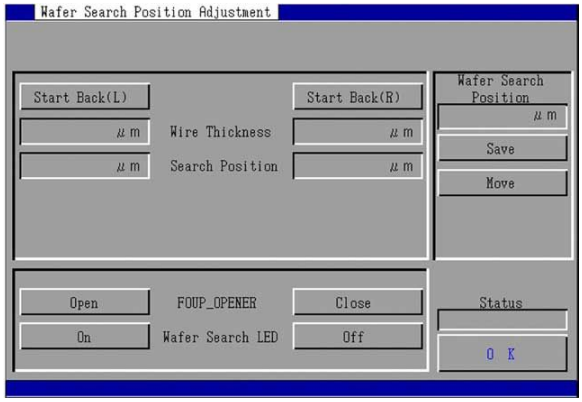
4.7 Press OK to exit. A check menu is displayed with the message `Initialize FOUP_OPENER?` Press No on the check menu to display the *Loader Item Selection Menu*.

5 Use the following steps to display the *Wafer Search Position Adjustment Menu*.

5.1 Press PREVIOUS MENU. The *Loader Item Selection Menu* is displayed.

5.2 Press WAFER SEARCH POSITION ADJUST on the *Loader Item Selection Menu*. The *Wafer Search Position Adjustment Menu* is displayed.

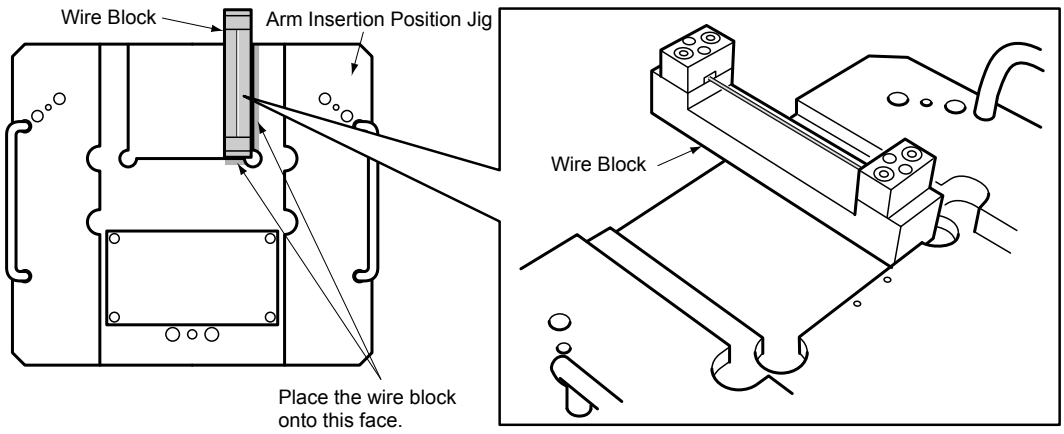
Wafer Search Position Adjustment Menu



6 Use the following steps to detect the wire block using the mapping sensor.

6.1 Place the wire block onto the load platform adjustment device along the right side.

Wire Block Placement (Right Side)

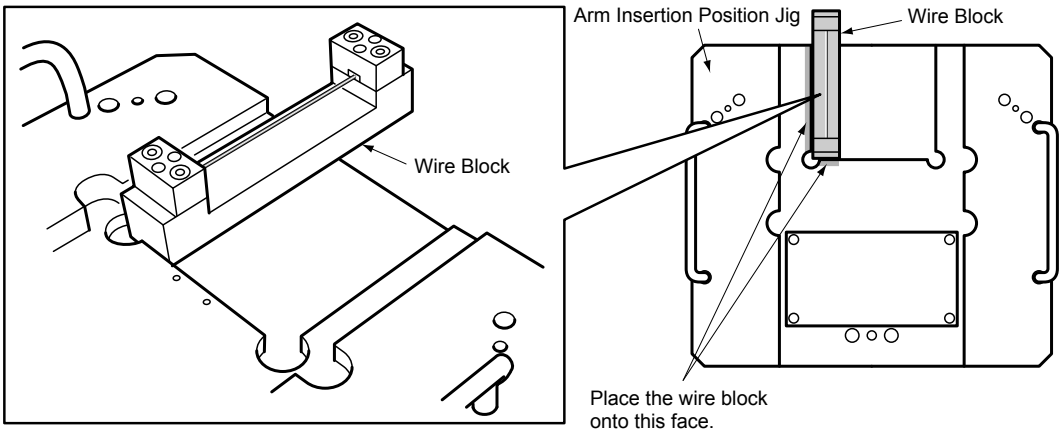


6.2 Press START BACK (R) on the *Wafer Search Position Adjustments Menu*. The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

CAUTION **Property Damage Hazard**
The arm unit will move. Remove any tools, wipes, or other objects from the loader area.

6.3 Place the wire block along the left side of the fixture.

▼ **Wire Block Placement (Left Side)**



6.4 Press START BACK (L). The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

CAUTION **Property Damage Hazard**
The arm unit will move. Remove any tools, wipes, or other objects from the loader area.

7 Check that the values you recorded meet the following specifications:

- Verify that the values for the `Wire Thickness`µm.
- Verify that the two values displayed for the `Search Position`µm of each other.

If the values are out of specification, go to **7.12 Adjusting the Mapping Sensor Threshold (300 mm Position) (see page 564)**.

NOTE **Do not press SAVE for the wafer search position when you are checking the mapping sensor threshold. If you press SAVE, you will have to enter the cassette parameters.**

8 Remove the wire block.

9 Press CLOSE for `FOUP_OPENER` on the *Wafer Search Position Adjustment Menu*. The FOUP door rises and closes. The load port moves to the undocked position.

10 Remove the arm insertion position fixture.

11 Press OK to on the *Wafer Search Position Adjustments Menu*. A check menu is displayed stating `Initialize FOUP_OPENER?` Press YES. The FOUP Opener initializes.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

12 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

13 Repeat steps 2 through 12 to check load port 2.

NOTE **Move the arm unit to the load port 2 position using the *Loader Slide Adjustment Menu* before checking load port 2.**

14 Press INITIALIZE LOADER. The loader initializes. The *Loader Item Selection Menu* is displayed.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

15 Press PREVIOUS MENU on the *Loader Item Selection Menu*.

16 Press MAIN MENU on the *Adjustments Menu*. The *Main Menu* is displayed.

7.12 Adjusting the Mapping Sensor Threshold (300 mm Position) 1466.2

Introduction

Purpose:

To adjust the mapping sensor threshold.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Arm insertion position fixture Wire block
Parts or Consumables:	None

WARNING **Electrical Hazard**

The work performed in this procedure is classified as Hot Work Type 3. Refer to 2.1 Types of Hot Work (see page 48) for details.

NOTE **Perform this procedure with the prober set up to probe 300 mm wafers.**

Checking the Single Port Loader Specification

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

1. Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.
2. Disable the loader side panel interlock.
3. Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

4 Use the following steps to display the *Wafer Search Position Adjustment Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

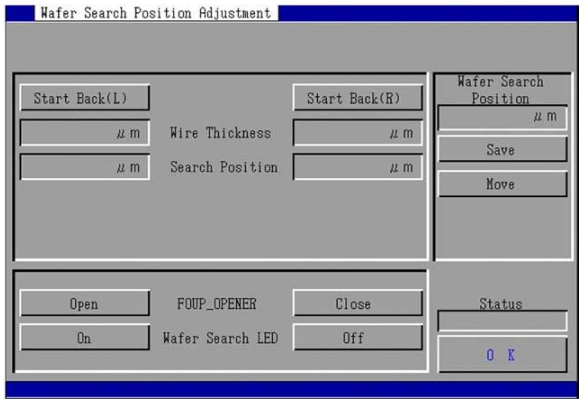
4.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

4.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

4.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

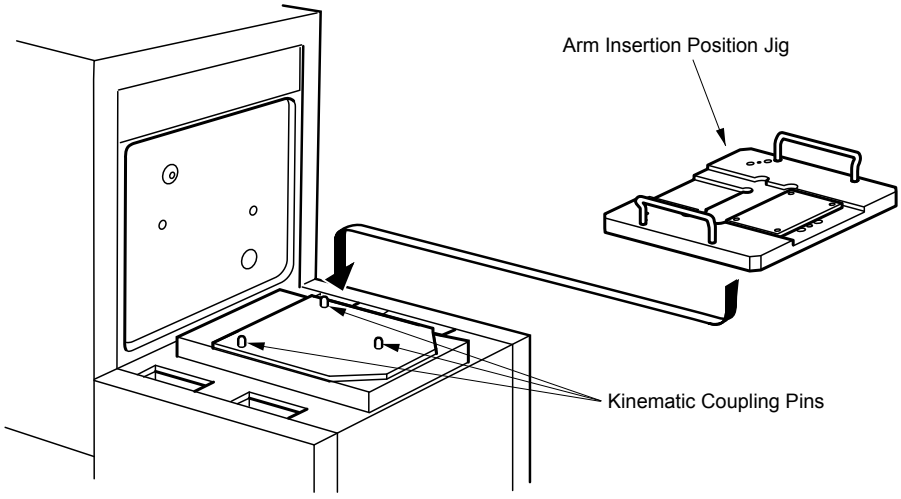
4.5 Press MAPPING ARM POSITION ADJUST on the *Loader Item Selection Menu*. The *Wafer Search Position Adjustment Menu* is displayed.

▼ **Wafer Search Position Adjustment Menu**



5 Place the arm insertion position fixture onto the load port. Use the kinematic coupling pins as a guide and align them with the grooves on the bottom of the fixture.

▼ **Arm Insertion Position Fixture**



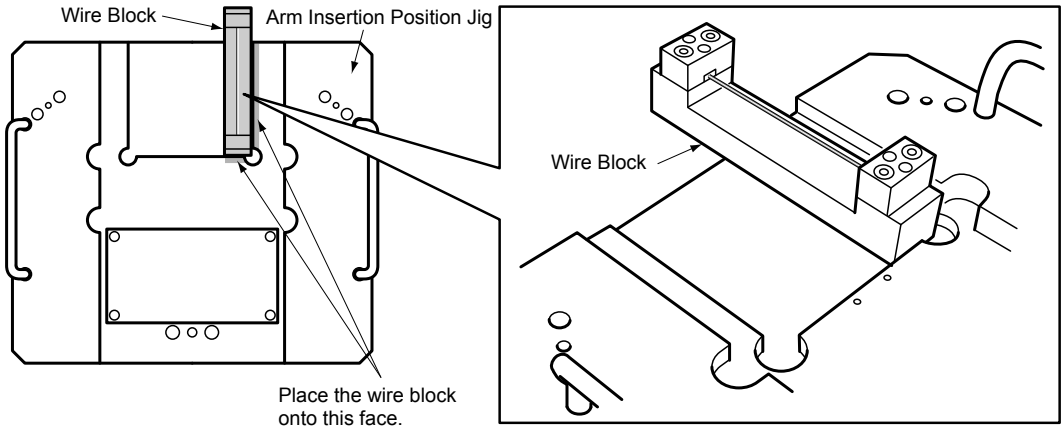
NOTE **FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

6 Press OPEN for `FOUP_OPENER` on the *Wafer Search Position Adjustment Menu*. The load port to the docked position. The FOUP door opens and then descends.

7 Use the following steps to detect the wire block using the mapping sensor.

7.1 Place the wire block onto the load platform adjustment device along the right side.

Wire Block Placement (Right Side)

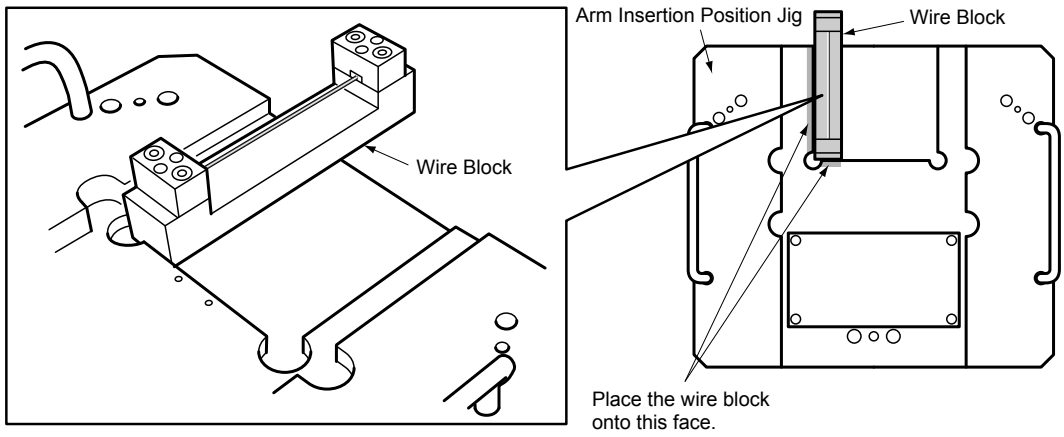


7.2 Press START BACK (R) on the *Wafer Search Position Adjustments Menu*. The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

CAUTION **Property Damage Hazard**
The arm unit will move. Remove any tools, wipes, or other objects from the loader area.

7.3 Place the wire block along the left side of the fixture.

Wire Block Placement (Left Side)



7.4 Press START BACK (L). The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

CAUTION **Property Damage Hazard**

The arm unit will move. Remove any tools, wipes, or other objects from the loader area.

8 Use the following steps to adjust the values of the wire thickness and search position so that they fall within the following range.

WARNING **Electrical Hazard**

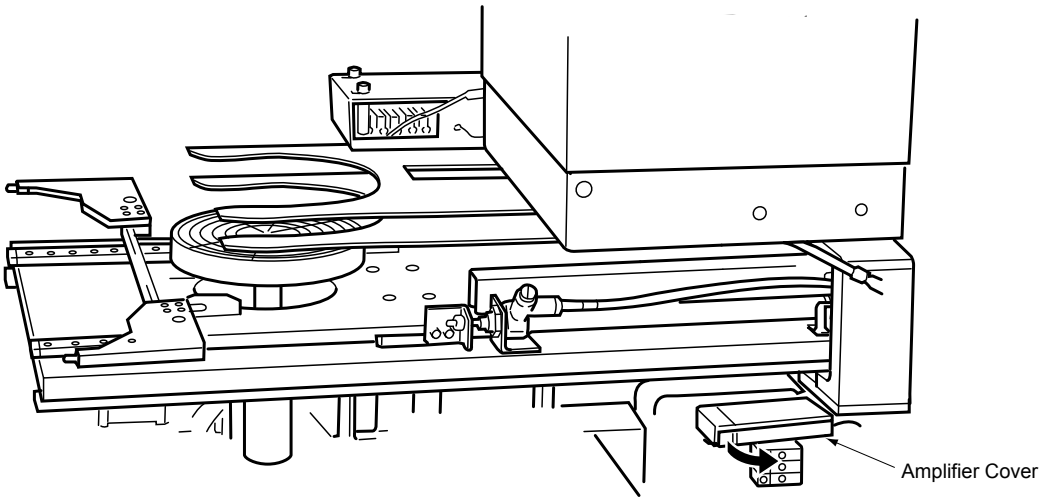
The boards inside the loader are electrically charged. To avoid a short circuit or electrical shock, to not touch any of the boards.

▼ **Specified Range**

Wire Thickness	250 to 350 µm
Wafer Search Position	Difference between the left and right side vales is less than or equal to 200 µm.

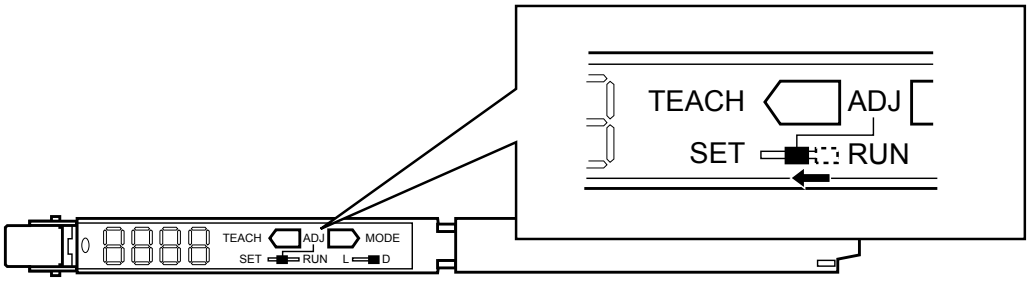
8.1 Open the amplifier cover.

▼ **Amplifier Cover**



8.2 Switch the mode from **RUN** to **ADJ** .

▼ **Switching the Mode**

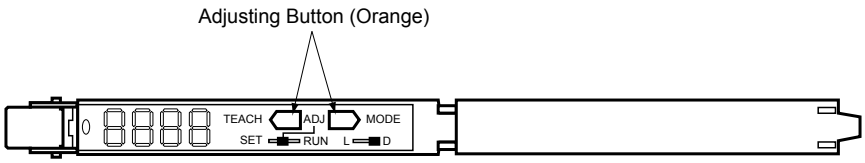


8.3 Adjust the sensor threshold using the button on the amplifier.

- If the values for the wire thickness are too large, decrease the amplifier threshold value.

- If the values for the wire thickness are too small, increase the amplifier threshold value.

Adjustment Button



8.4 Switch the mode from **ADJ** to **RUN** .

8.5 Close the amplifier cover.

8.6 Repeat step 7 to check the wire thickness and wafer search position again. If necessary, repeat steps 8.1 through 8.5 to adjust the values again.

9 Press SAVE for the wafer search position. The wafer search position is saved.

10 Remove the wire block.

11 Press CLOSE for `FOUP_OPENER` on the *Wafer Search Position Adjustment Menu*. The FOUP door rises and closes. The load port moves to the undocked position.

12 Remove the arm insertion position fixture.

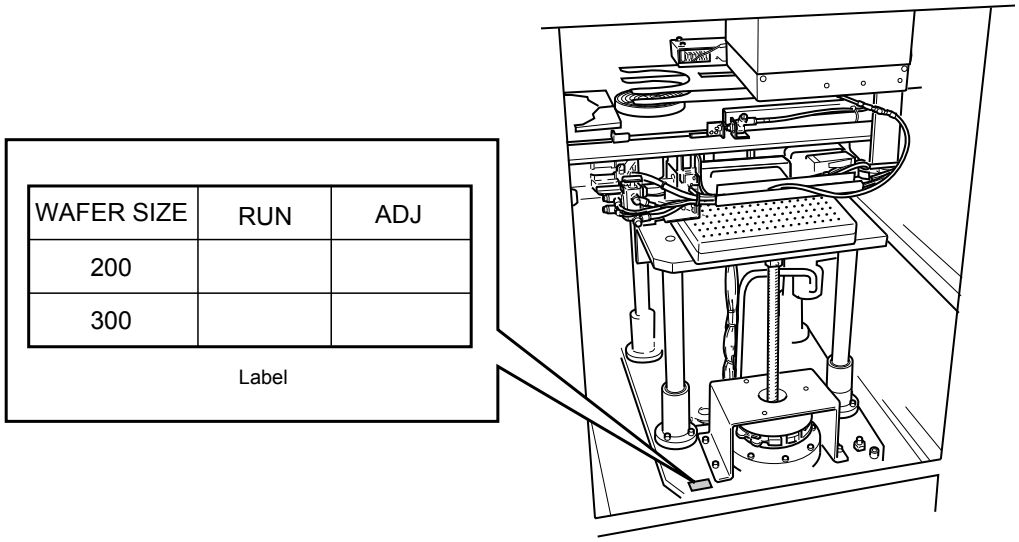
13 Press OK to on the *Wafer Search Position Adjustments Menu*. A check menu is displayed stating `Initialize FOUP_OPENER?` Press YES. The FOUP Opener initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

14 Update the label affixed to the base of the loader.

Updating the Mapping Sensor Level Information



15 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

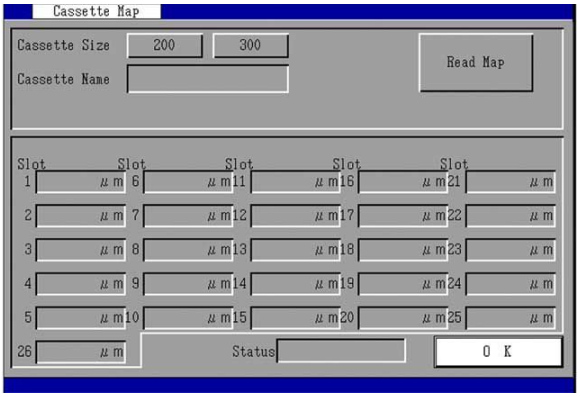
16 Press INITIALIZE LOADER. The loader initializes. The *Loader Item Selection Menu* is displayed.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

17 Press PREVIOUS MENU.

18 Press TAKING CASSETTE MAP on the *Item Selection Menu*. The *Cassette Map Menu* is displayed.

Cassette Map Menu



19 Perform mapping by following the procedure described in **7.13 Checking the Mapping Operation (see page 577)**.

Check the following points of inspection on the *Cassette Map Menu* after performing mapping.

- The wafer is in the correct slot.
- The value of `Wafer Thickness` is within +500 µm of the wafer thickness.

20 Press OK on the *Cassette Map Menu*.

21 Press PREVIOUS MENU on the *Loader Item Selection Menu*.

22 Press MAIN MENU on the *Adjustments Menu*. The *Main Menu* is displayed.

23 Enable the loader side panel interlock, then attach the loader side panel.

> **WARNING** **Mechanical Hazard**
> **Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.**

Checking the Dual Port Loader Specification

WARNING **Mechanical Hazard**

The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE **You should repeat this procedure to adjust load port 2 after adjusting load port 1.**

1 Remove loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**, then release the interlock for loader rear panel 1.

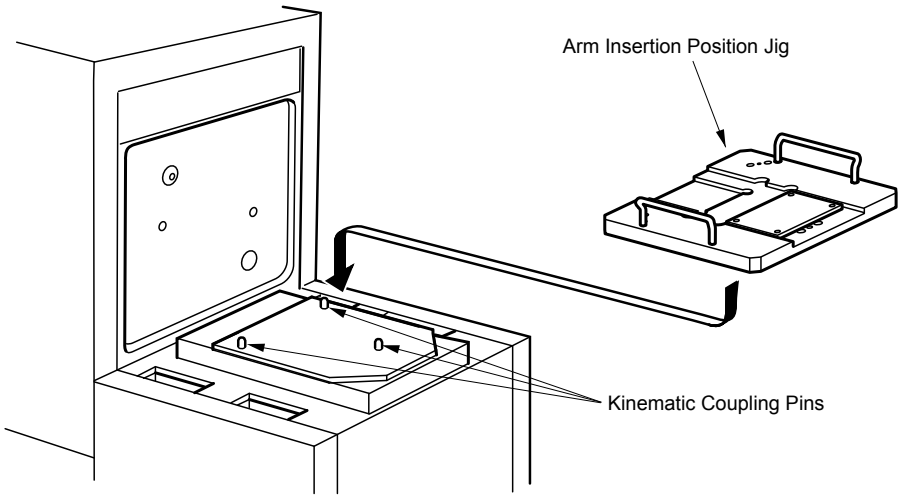
2 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

3 Place the arm insertion position fixture onto load port 1. Use the kinematic coupling pins as a guide and align them with the grooves on the bottom of the fixture.

Arm Insertion Position Fixture



NOTE **FOUP specifications and open cassette specifications differ for the arm insertion position fixture. Check the specification of the fixture before placing it on the load port.**

4 Use the following steps to transfer the arm unit to the Y axis load port 1 position.

4.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

4.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

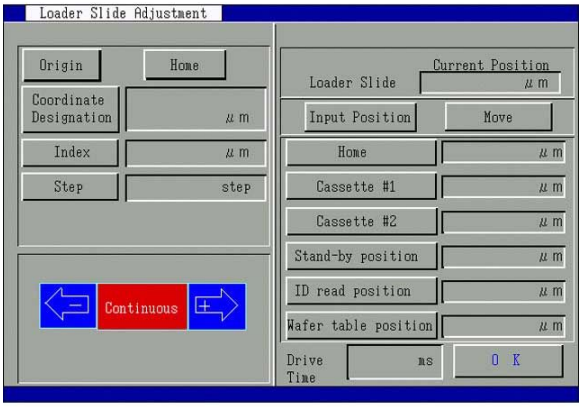
4.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

4.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

4.5 Press ALL AXES ADJUSTMENT on the page 1 of the *Loader Item Selection Menu* to display the *All Axes Adjustment Menu*.

4.6 Press LOADER SLIDE. The *Loader Slide Adjustment Menu* is displayed.

▼ **Loader Slide Adjustment Menu**



4.7 Press ORIGIN. The arm unit moves to the Y axis origin position.

4.8 Press HOME. The arm unit moves to the Y axis home position.

4.9 Press MOVE.

4.10 Press CASSETTE 1. The arm unit moves to the Y axis load port 1 position.

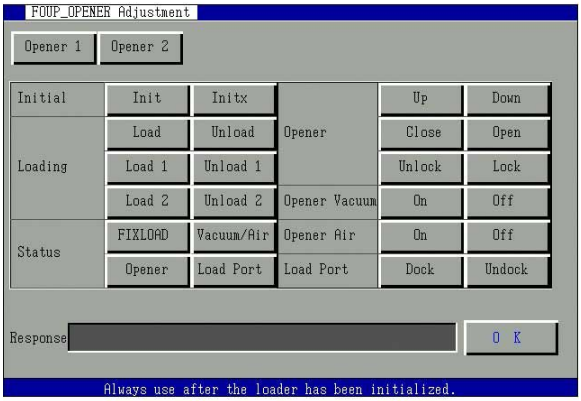
4.11 Press OK. The *Item Selection Menu* is displayed.

5 Use the following steps to open FOUP opener 1.

5.1 Press PREVIOUS MENU on the *Item Selection Menu*.

5.2 Press FOUP_OPENER ADJUSTMENT on page 2 of the *Loader Item Selection Menu* to display the *FOUP_OPENER Adjustment Menu*.

▼ **FOUP_OPENER Adjustment Menu**



5.3 Press OPENER 1.

5.4 Press DOCK under `Load Port`. The load port moves to the docked position.

5.5 Press OPEN under `Opener`. The FOUP door opens.

5.6 Press DOWN under `Opener`. The FOUP door descends.

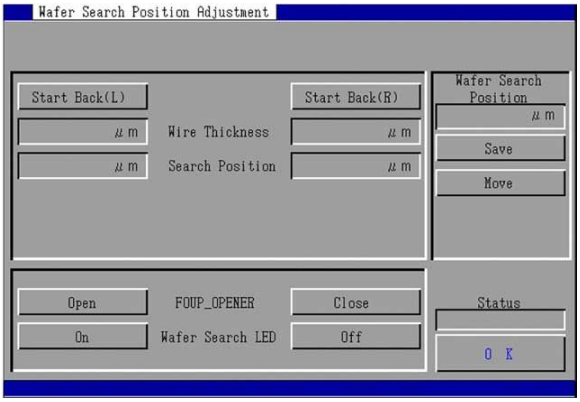
5.7 Press OK to exit. A check menu is displayed with the message `Initialize FOUP_OPENER?` Press No on the check menu to display the *Loader Item Selection Menu*.

6 Use the following steps to display the *Wafer Search Position Adjustment Menu*.

6.1 Press PREVIOUS MENU. The *Loader Item Selection Menu* is displayed.

6.2 Press WAFER SEARCH POSITION ADJUST on the *Loader Item Selection Menu*. The *Wafer Search Position Adjustment Menu* is displayed.

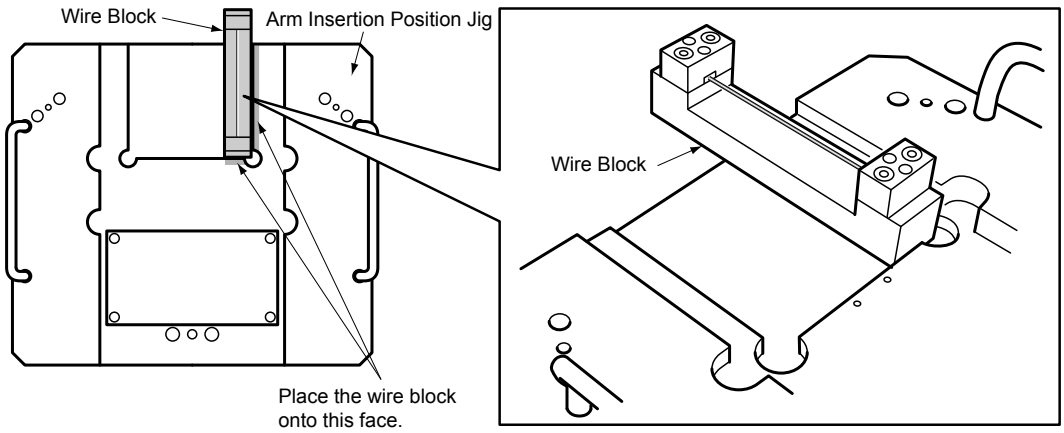
Wafer Search Position Adjustment Menu



7 Use the following steps to detect the wire block using the mapping sensor.

7.1 Place the wire block onto the load platform adjustment device along the right side.

Wire Block Placement (Right Side)

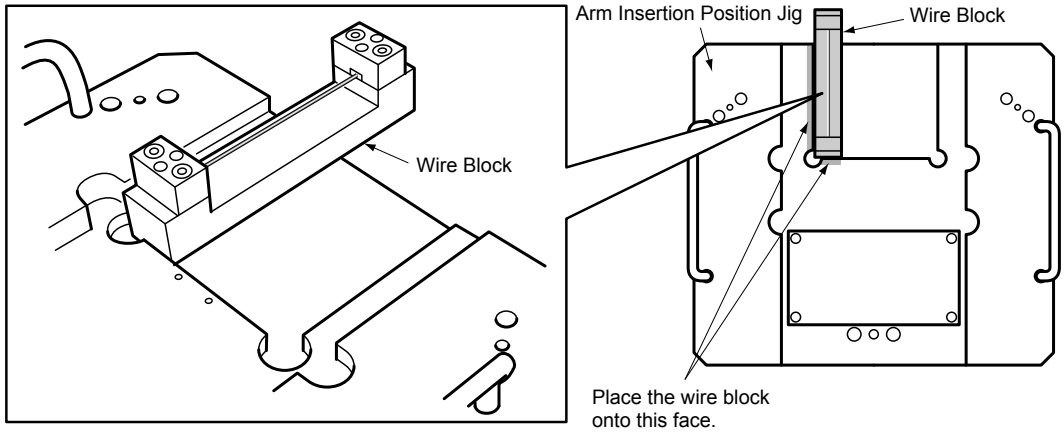


7.2 Press START BACK (R) on the *Wafer Search Position Adjustments Menu*. The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

> **CAUTION** **Property Damage Hazard**
> **The arm unit will move. Remove any tools, wipes, or other objects from the loader area.**

7.3 Place the wire block along the left side of the fixture.

▼ **Wire Block Placement (Left Side)**



7.4 Press START BACK (L). The loader and mapping arm moves to the search position and automatically scans the wire block. A value will be displayed for `Wire Thickness` and `Search Position`. Record the values.

> **CAUTION** **Property Damage Hazard**
> **The arm unit will move. Remove any tools, wipes, or other objects from the loader area.**

8 Use the following steps to adjust the values of the wire thickness and search position so that they fall within the following range.

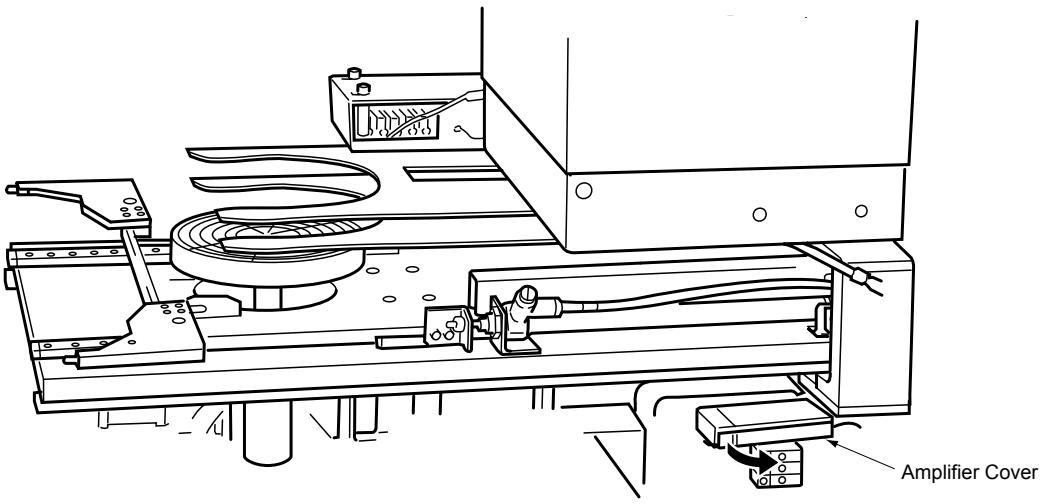
> **WARNING** **Electrical Hazard**
> **The boards inside the loader are electrically charged. To avoid a short circuit or electrical shock, to not touch any of the boards.**

▼ **Specified Range**

Wire Thickness	250 to 350 µm
Wafer Search Position	Difference between the left and right side vales is less than or equal to 200 µm.

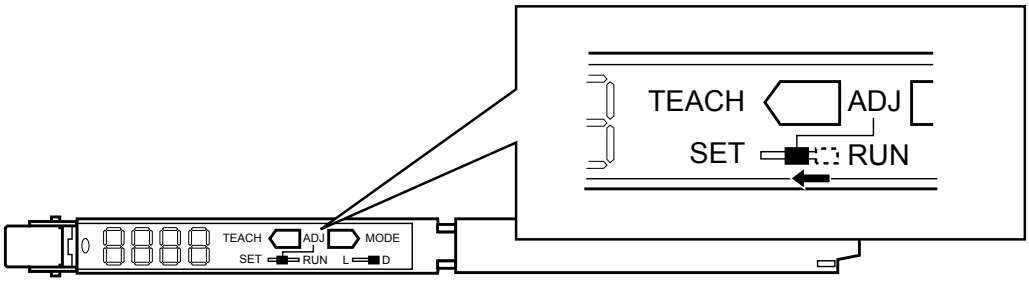
8.1 Open the amplifier cover.

Amplifier Cover



8.2 Switch the mode from **RUN** to **ADJ** .

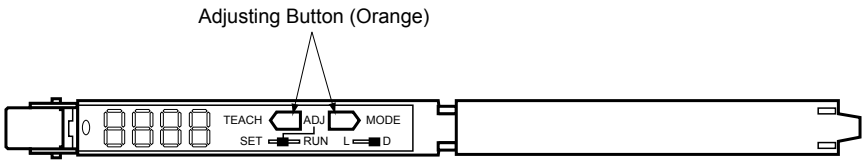
Switching the Mode



8.3 Adjust the sensor threshold using the button on the amplifier.

- If the values for the wire thickness are too large, decrease the amplifier threshold value.
- If the values for the wire thickness are too small, increase the amplifier threshold value.

Adjustment Button



8.4 Switch the mode from **ADJ** to **RUN** .

8.5 Close the amplifier cover.

8.6 Repeat step 7 to check the wire thickness and wafer search position again. If necessary, repeat steps 8.1 through 8.5 to adjust the values again.

9 Press SAVE for the wafer search position. The wafer search position is entered.

10 Remove the wire block.

11 Press CLOSE for `FOUP_OPENER` on the *Wafer Search Position Adjustment Menu*. The FOUP door rises and closes. The load port moves to the undocked position.

12 Remove the arm insertion position fixture.

13 Press OK to on the *Wafer Search Position Adjustments Menu*. A check menu is displayed stating `Initialize FOUP_OPENER?` Press YES. The FOUP Opener initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

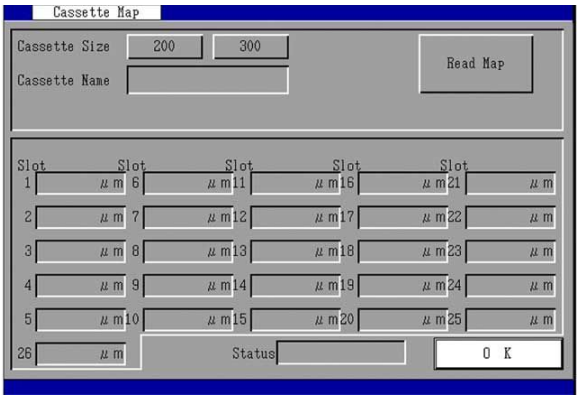
14 Press ALL AXES ADJUSTMENT on the *Loader Item Selection Menu*.

15 Press INITIALIZE LOADER. The loader initializes. The *Loader Item Selection Menu* is displayed.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

16 Press TAKING CASSETTE MAP on the *Item Selection Menu*. The *Cassette Map Menu* is displayed.

Cassette Map Menu



17 Perform mapping by following the procedure described in **7.13 Checking the Mapping Operation (see page 577)**.

Check the following points of inspection on the *Cassette Map Menu* after performing mapping.

- The wafer is in the correct slot.
- The value of `Wafer Thickness` is within +500 µm of the wafer thickness.

18 Press OK on the *Cassette Map Menu*.

19 Press PREVIOUS MENU on the *Loader Item Selection Menu*.

20 Press MAIN MENU on the *Adjustments Menu*. The *Main Menu* is displayed.

21 Repeat steps 3 through 7 to scan the wire block on load port 2.

NOTE **Move the arm unit to the load port 2 position using the *Loader Slide Adjustment Menu* before setting the load port 2.**

22 Save the mapping position for load port 2 and verify that mapping performed correctly using steps 8 through 17.

23 Enable the loader side panel interlock, then attach the loader side panel.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

7.13 Checking the Mapping Operation 1467.2

Introduction

Purpose:

To check that mapping is performed correctly.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	FOUP Wafers (3 or more)

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Load the FOUP onto the load port. The FOUP should contain wafers in slots 1, 12 and 25.

NOTE **The FOUP should contain at least 3 wafers to perform the mapping check.**

NOTE **For 200 mm wafers, use the conversion kit.**

3 Use the following steps to display the *Cassette Map Menu*.

3.1 Press DIAGNOSTICS on the *Main Menu*.

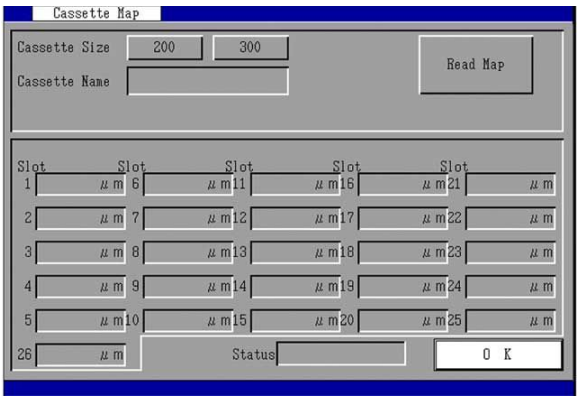
3.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

3.3 Input your password on the numeric keypad and press INPUT.

3.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3.5 Press TAKING CASSETTE MAP on the *Loader Item Selection Menu*. The *Cassette Map Menu* is displayed.

Cassette Map Menu



4 Use the following steps to perform the mapping.

4.1 Press 200 or 300 on the *Cassette Map Menu* to select the cassette type.

4.2 Press READ MAP. The mapping arm performs mapping. The mapping operation measures the thickness of wafers located in the slots and the values are displayed on the menu.

4.3 Check the following points of inspection:

- The values for slot 1, 12, and 25 are measured and displayed on the menu.
- The values for `Wafer Thickness` are within +500 µm of the wafer thickness.

5 Press OK on the *Cassette Map Menu*.

6 Press FOUP_OPENER ADJUSTMENT on the *Item Selection Menu*. The *FOUP_OPENER Adjustment Menu* is displayed.

7 Press OK on the *FOUP_OPENER Adjustment Menu*. A check menu is displayed stating, `Initialize FOUP_OPENER?`

8 Press YES. The FOUP opener is initialized.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

9 Remove the FOUP from the load port.

7.14 Checking the Wafer Table Hand-Over Position 1468.2

Introduction

Purpose:

To check the wafer hand-over position between wafer table and arm.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	Wafer table alignment fixture Screwdriver
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Loader Item Selection Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS. A password menu is displayed.

2.3 Input your password on the menu and press INPUT.

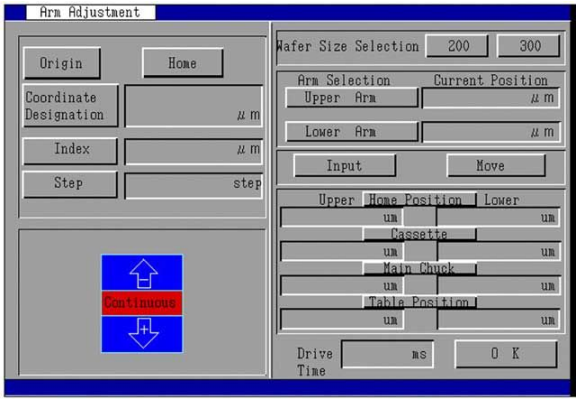
2.4 Press LOADER on the *Adjustments Menu* to display the *Loader Item Selection Menu*.

3 Use the following steps to transfer the arm (upper/lower) to the home position.

3.1 Press ALL AXES ADJUSTMENTS on the *Item Selection Menu*.

3.2 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

Arm Adjustment Menu



3.3 Press UPPER ARM.

3.4 Press ORIGIN. The upper arm moves to the origin position.

3.5 Press HOME. The upper arm moves to the home position.

3.6 Press LOWER ARM.

3.7 Press ORIGIN. The lower arm moves to the origin position.

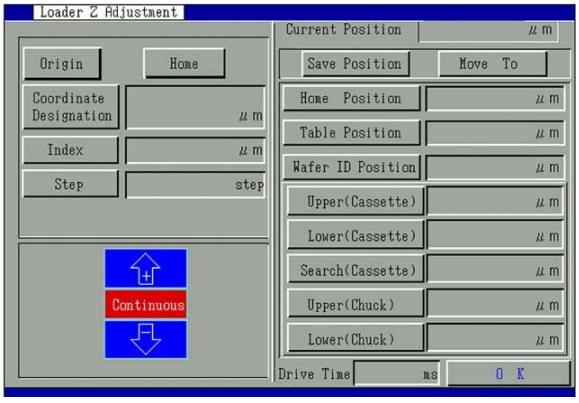
3.8 Press HOME. The lower arm moves to the home position.

3.9 Press OK. The *Item Selection Menu* is displayed.

4 Use the following steps to transfer the loader Z to the table position.

4.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



4.2 Press ORIGIN. The loader Z moves to the origin position.

4.3 Press HOME. The loader Z moves to the home position.

4.4 Press MOVE TO.

4.5 Press TABLE POSITION. A check menu is displayed stating, `Do you want to move?`

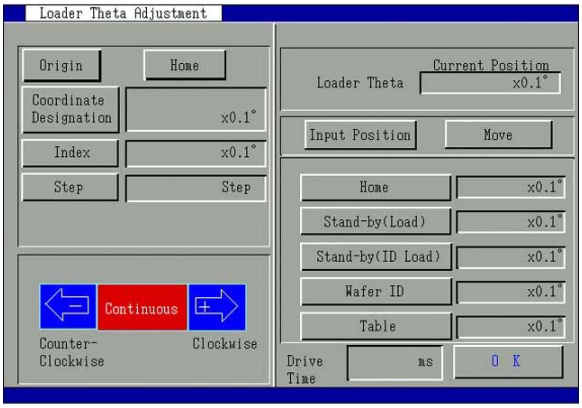
4.6 Press YES. The loader Z moves to the table position.

4.7 Press OK.

5 Use the following steps to transfer the loader theta to the table position.

5.1 Press LOADER THETA on the *Loader Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

Loader Theta Adjustment Menu



5.2 Press ORIGIN. The loader theta moves to the origin position.

5.3 Press HOME. The loader theta moves to the home position.

5.4 Press MOVE.

5.5 Press TABLE. A check menu is displayed stating, `Do you want to move?`

5.6 Press YES. The loader theta moves to the table position.

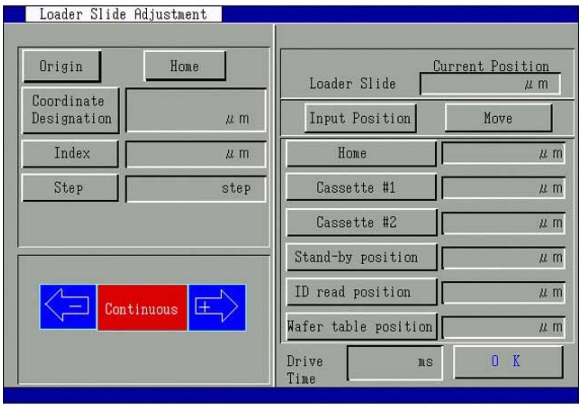
5.7 Press OK.

6 Use the following steps to transfer the arm unit to the Y axis table position.

NOTE **This step is used with the dual port loader specification.**

6.1 Press LOADER SLIDE on the *Item Selection Menu*. The *Loader Slide Adjustment Menu* is displayed.

Loader Slide Adjustment Menu.



6.2 Press MOVE.

6.3 Press TABLE. The arm unit moves to the Y axis table position.

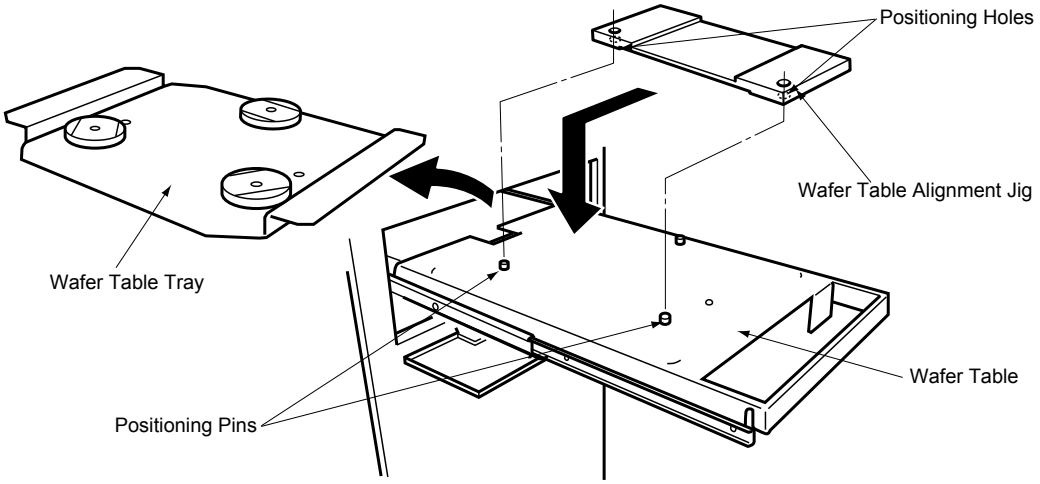
6.4 Press OK.

7 Open the wafer table access door and pull out the slide tray to the fully extended position.

8 Remove the wafer tray and place the alignment fixture on the slide tray. Align the wafer table positioning pins with the positioning holes on the bottom of the alignment fixture.

NOTE **The wafer table tray is made of either aluminum (black) or plastic (white). The thickness of the wafer table adjustment fixture varies according to the type of wafer table tray. Check the specification of the wafer table tray, and then use the correct fixture.**

Placing the Alignment Fixture



9 Slide the wafer table inside the loader and then close the wafer table door.

10 For the single port loader specification, remove the loader rear panel (upper) by following the procedure described in **4.6.4 Removing and Attaching the Loader Rear Panel (Upper) (see page 120)**.

For the dual port loader specification, remove the loader front side panel by following the procedure described in **4.7.4 Removing and Attaching the Loader Front Right Panel (Dual Port) (see page 136)**, and then remove the loader rear panel 2 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

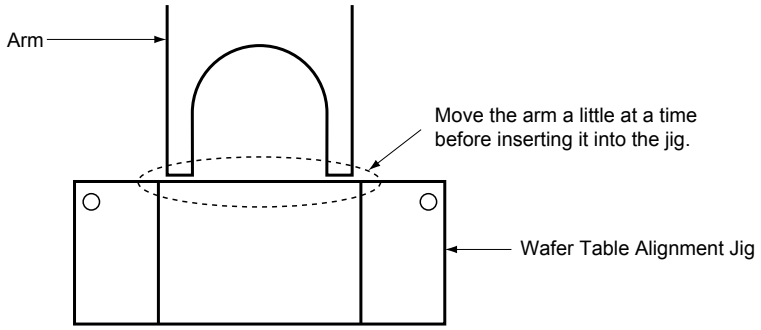
11 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

12 Select INDEX and use the down arrow to slowly insert the upper arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is operated, the prober can be damaged.

Moving Upper Arm



13 Check that there is no interference with the upper arm inserted into the fixture.

14 Use the following steps to transfer the upper arm to the table position.

14.1 Press MOVE.

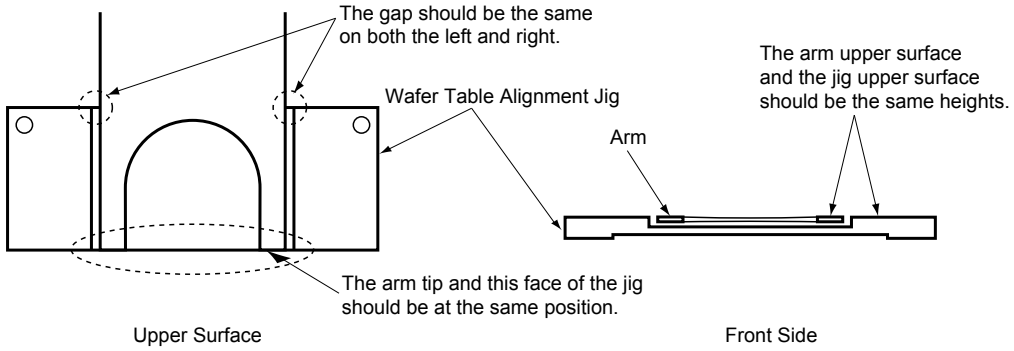
14.2 Press TABLE POSITION. A check menu is displayed stating `Do you want to move?`

14.3 Press YES. The upper arm moves to the table position.

15 Check the upper arm position and check that all of the following conditions are met:

- The tip of the upper arm should be even with the edge of the alignment fixture as shown in the following graphic.
- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

Checking the Wafer Table Hand-Over Position (Upper Arm)



16 Press HOME. The upper arm returns to the home position.

17 Press OK. The *Item Selection Menu* is displayed.

18 Use the following steps to move the loader Z.

18.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

18.2 Set the INDEX amount to 16,000 µm.

NOTE **The gab between the upper arm and lower arm is approximately 16000 µm.**

18.3 Press the up arrow once. The loader Z rises by 16000 µm.

CAUTION **Property Damage Hazard**

Always check that the arm is at the home position before moving the loader. If the arm is not at the home position, the prober may be damaged.

18.4 Press OK.

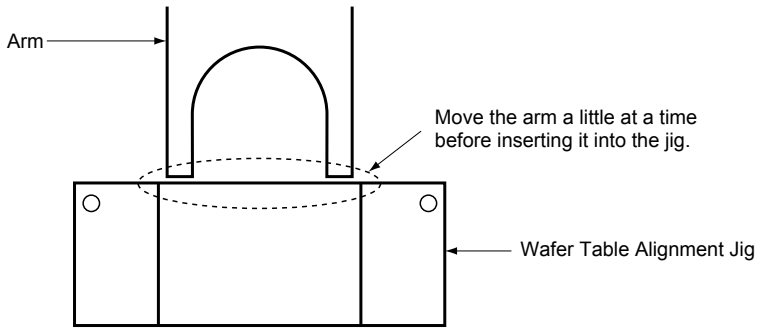
19 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

20 Select INDEX and use the down arrow to slowly insert the lower arm into the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is operated, the prober can be damaged.

Moving Upper Arm



21 Check that there is no interference with the lower arm inserted into the fixture.

22 Use the following steps to transfer the lower arm to the table position.

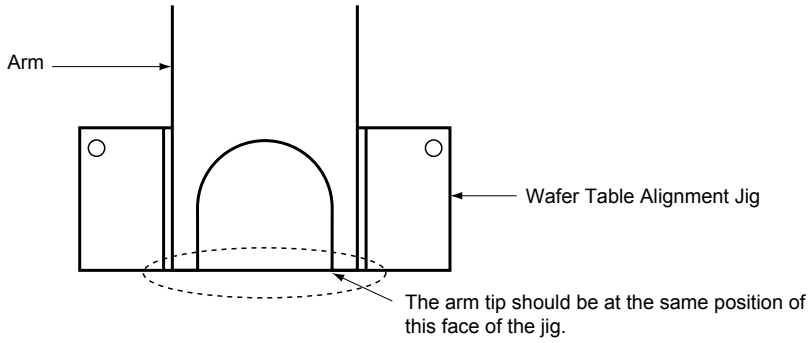
22.1 Press MOVE.

22.2 Press TABLE POSITION. A check menu is displayed stating `Do you want to move?`

22.3 Press YES. The lower arm moves to the table position.

23 Check that the tips of the lower arm are even with the edge of the alignment fixture as shown in the following graphic.

Checking the Wafer Table Hand-Over Position (Lower Arm)



NOTE **The gap between the fixture and the arm and the arm height do not need to be checked for the lower arm.**

24 Press HOME. The upper arm returns to the home position.

25 Press OK. The *Item Selection Menu* is displayed.

26 Open the wafer table door.

27 Remove the alignment fixture and install the wafer table tray.

28 Close the wafer table door.

29 For the single port and wide loader specifications, reattach the loader rear panel (upper).

For the dual port loader specification, reattach the loader front right side panel and loader rear panel 2.

30 Press INITIALIZE LOADER on the *Item Selection Menu*. The loader is initialized.

31 Press PREVIOUS MENU twice.

32 Press MAIN MENU.

7.15 Adjusting the Wafer Table Hand-Over Position 1469.2

Introduction

Purpose:

To check the wafer hand-over position between wafer table and arm.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	Wafer table alignment fixture Screwdriver
Parts or Consumables:	None

WARNING Mechanical Hazard
The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

NOTE The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.

1 For the single port loader specification, remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**, then defeat the interlock for the loader side panel.

For the dual port loader specification, remove loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**, then disable the interlock for the loader rear panel 1.

2 For the single port loader specification, remove the loader rear panel (upper) by following the procedure described in **4.6.4 Removing and Attaching the Loader Rear Panel (Upper) (see page 120)**.

For the dual port loader specification, remove the loader front side panel by following the procedure described in **4.7.4 Removing and Attaching the Loader Front Right Panel (Dual Port) (see page 136)**, and then remove the loader rear panel 2 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

3 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

4 Use the following steps to display the *Loader Item Selection Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*.

4.2 Press ADJUSTMENTS. A password menu is displayed.

4.3 Input your password on the menu and press INPUT.

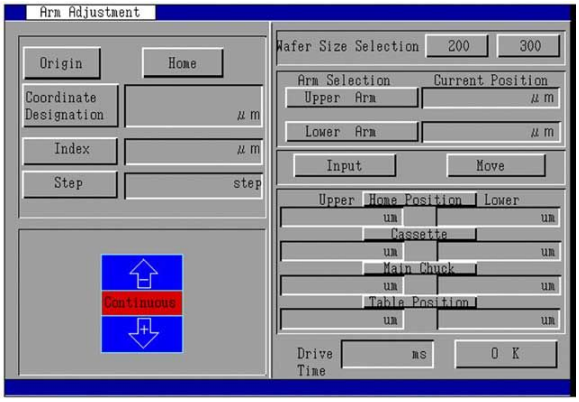
4.4 Press LOADER on the *Adjustments Menu* to display the *Loader Item Selection Menu*.

5 Press ALL AXES ADJUSTMENTS on the *Item Selection Menu*.

6 Use the following steps to transfer the arm (upper/lower) to the home position.

6.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

Arm Adjustment Menu



6.2 Press UPPER ARM.

6.3 Press ORIGIN. The upper arm moves to the origin position.

6.4 Press HOME. The upper arm moves to the home position.

6.5 Press LOWER ARM.

6.6 Press ORIGIN. The lower arm moves to the origin position.

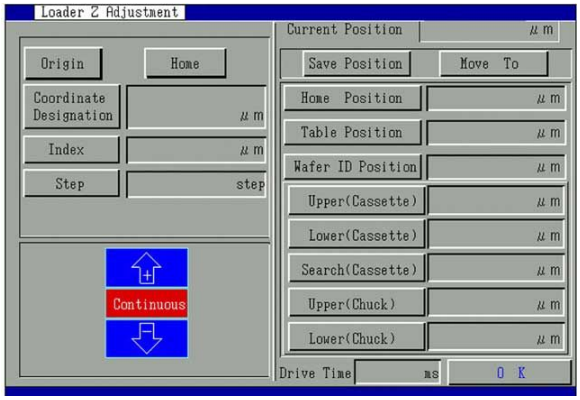
6.7 Press HOME. The lower arm moves to the home position.

6.8 Press OK. The *Item Selection Menu* is displayed.

7 Use the following steps to transfer the loader Z to the table position.

7.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

▼ **Loader Z Adjustment Menu**



7.2 Press ORIGIN. The loader Z moves to the origin position.

7.3 Press HOME. The loader Z moves to the home position.

7.4 Press MOVE TO.

7.5 Press TABLE POSITION. A check menu is displayed stating, `Do you want to move?`

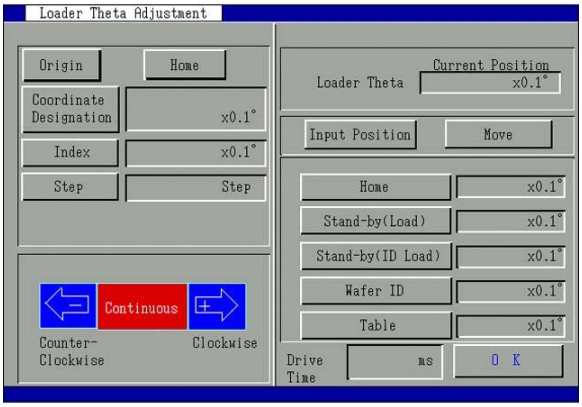
7.6 Press YES. The loader Z moves to the table position.

7.7 Press OK.

8 Use the following steps to transfer the loader theta to the table position.

8.1 Press LOADER THETA on the *Loader Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

▼ **Loader Theta Adjustment Menu**



8.2 Press ORIGIN. The loader theta moves to the origin position.

8.3 Press HOME. The loader theta moves to the home position.

8.4 Press MOVE.

8.5 Press TABLE. A check menu is displayed stating, `Do you want to move?`

8.6 Press YES. The loader theta moves to the table position.

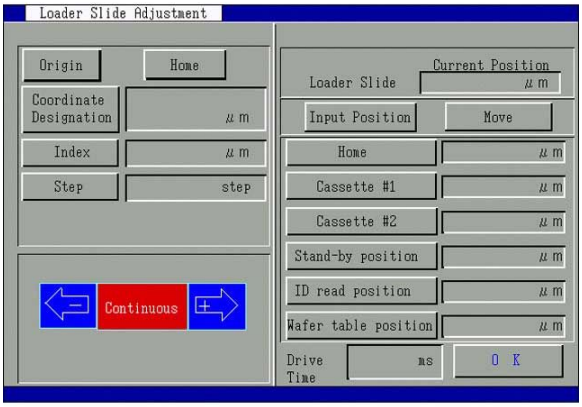
8.7 Press OK.

9 Use the following steps to transfer the arm unit to the Y axis table position.

NOTE **This step is used with the dual port loader specification.**

9.1 Press LOADER SLIDE on the *Item Selection Menu*. The *Loader Slide Adjustment Menu* is displayed.

Loader Slide Adjustment Menu.



9.2 Press MOVE.

9.3 Press TABLE. The arm unit moves to the Y axis table position.

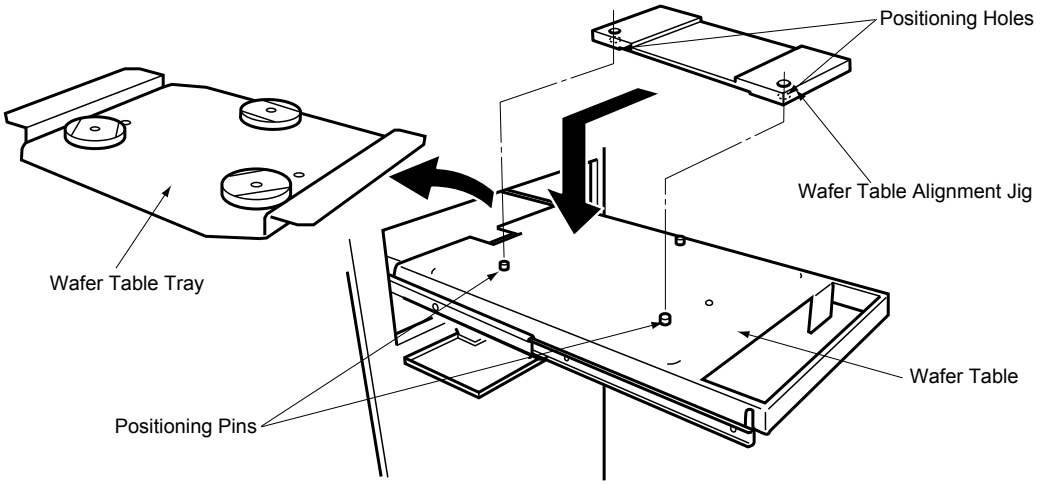
9.4 Press OK.

10 Open the wafer table access door and pull out the slide tray to the fully extended position.

11 Remove the wafer tray and place the alignment fixture on the slide tray. Align the wafer table positioning pins with the positioning holes on the bottom of the alignment fixture.

NOTE **The wafer table tray is made of either aluminum (black) or plastic (white). The thickness of the wafer table adjustment fixture varies according to the type of wafer table tray. Check the specification of the wafer table tray, and then use the correct fixture.**

Placing the Alignment Fixture



12 Slide the wafer table inside the loader and then close the wafer table door.

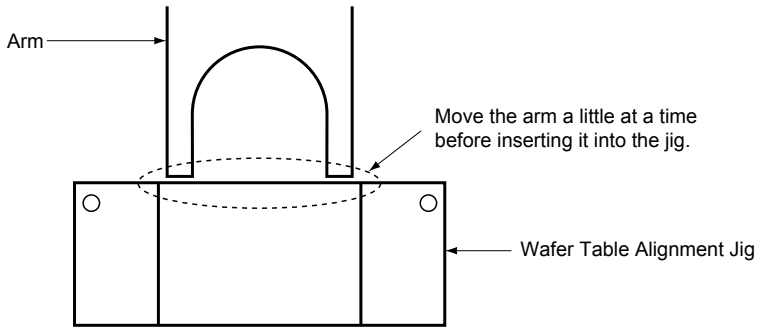
13 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

14 Select INDEX and use the down arrow to move the arm close to the arm insertion position fixture

CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is operated, the prober can be damaged.

Moving Upper Arm

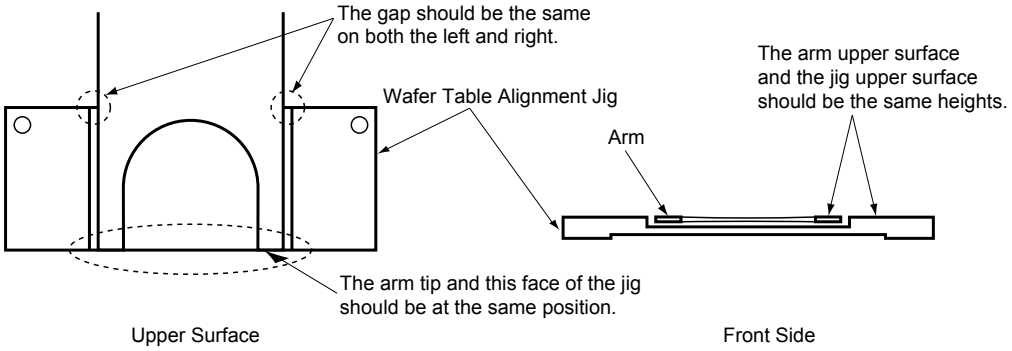


15 Check the upper arm height (Z axis) and the rotation direction (Theta axis).

Measure and record how far apart the fixture upper surface and the upper arm upper surface are, and how much to rotate until the fixture groove side surface and the upper arm side surface distances are the same on both the left and right.

Use rest of the steps in this procedure to adjust the position of the arms until they match the position in the following figure.

Checking the Upper Arm



16 Press HOME. The upper arm returns to the home position.

17 Press OK. The *Item Selection Menu* is displayed.

18 Use the following steps to adjust the height of the upper arm (Z axis).

18.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

18.2 Set the INDEX amount to 100 µm.

18.3 Use the up and down arrows to change the Z position so that the surface of the upper arm and the surface of the fixture are level with each other. Refer to the measurements you recorded in step 15.

> **CAUTION** **Property Damage Hazard**
> **Always check that the arm is at the home position before moving the loader. If the arm is not at the home position, the prober may be damaged.**

18.4 Press SAVE POSITION.

18.5 Press TABLE POSITION. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected.** SAVE POSITION **is selected.**

18.6 Press YES. The current position is saved as the table position.

18.7 Press OK.

19 Use the following steps to adjust the upper arm theta axis.

19.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

19.2 Press STEP

19.3 Use the left and right arrows to change the theta position so that there is the same amount of space on each side of the upper arm between the arm and the inside of the fixture groove.

19.4 Press INPUT POSITION.

19.5 Press TABLE on the right side of the menu. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected.** INPUT POSITION **is selected.**

19.6 Press YES. The current position is saved as the table position.

20 Use the following steps to transfer the loader theta to the home position.

20.1 Press MOVE.

20.2 Press STAND-BY (LOAD). A check menu is displayed stating, `Do you want to move?`

20.3 Press YES. The loader theta moves to the stand-by (load) position.

20.4 Press TABLE on the right side of the menu. A check menu is displayed stating, `Do you want to move?`

20.5 Press YES. The loader theta moves to the table position.

20.6 Press OK.

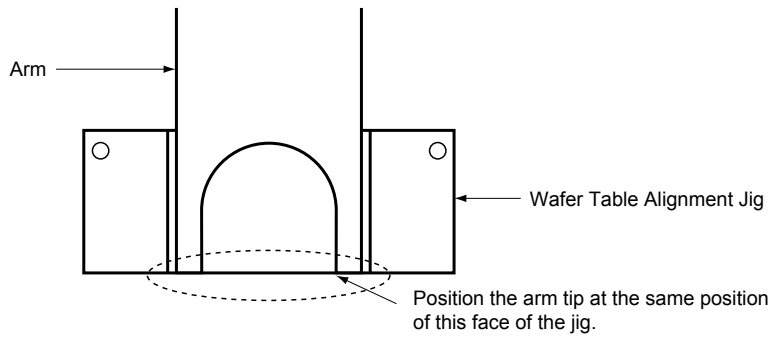
21 Press ARM (UPPER/LOWER). The *Arm Adjustment Menu* is displayed.

22 Use the down arrow to move the arm in small increments and check that it can be inserted into the fixture without interference. If further adjustments are necessary, repeat steps 16 through 22.

> **CAUTION** **Property Damage Hazard**
> **Always check that** UPPER ARM **is selected before moving the arm. If** LOWER ARM **is selected, and the lower arm is mistakenly operated, the prober can be damaged.**

23 Move the upper arm in small increments of 100 µm until the tips of the arm are even with the edge of the fixture.

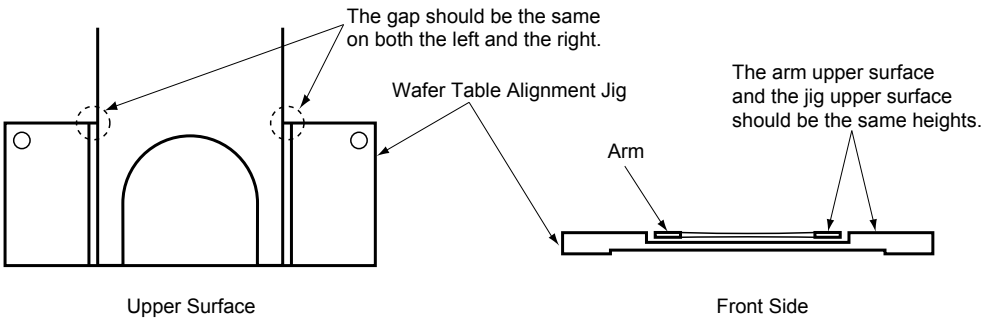
▼ Upper Arm Position



24 Check the upper arm position and check that all of the following conditions are met:

- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

Checking the Arm Insertion Position (300 mm)



25 Use the following steps to save the upper arm wafer table hand-over position.

25.1 Check that UPPER ARM is selected.

25.2 Press INPUT.

25.3 Press TABLE POSITION. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**
Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.

25.4 Press YES. The upper arm wafer table hand-over position is saved.

25.5 Press MOVE.

25.6 Press HOME. The upper arm moves to the home position.

25.7 Press OK.

NOTE **Steps 26 through 32 are used for adjusting the lower arm. Only the arm position is adjusted for the lower arm.**

26 Use the following steps to move the loader Z.

26.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

26.2 Set the INDEX amount to 16,000 µm.

NOTE **The gap between the upper arm and lower arm is approximately 16000 µm.**

26.3 Press the up arrow once. The loader Z rises by 16000 µm.

CAUTION **Property Damage Hazard**

Always check that the arm is at the home position before moving the loader. If the arm is not at the home position, the prober may be damaged.

26.4 Press OK.

27 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

28 Press LOWER ARM.

29 Select INDEX and use the down arrow to move the arm close to the arm insertion position fixture

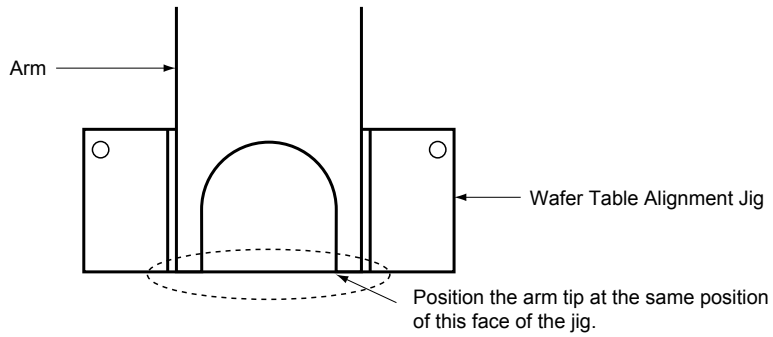
CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the lower arm is operated, the prober can be damaged.

30 Check that there will be no interference when the lower arm is inserted into the fixture.

31 Move the upper arm in small increments of 100 µm until the tips of the arm are even with the edge of the fixture.

Upper Arm Position



32 Use the following steps to save the lower arm wafer table hand-over position.

32.1 Check that LOWER ARM is selected.

32.2 Press INPUT.

32.3 Press TABLE POSITION. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.

32.4 Press YES. The lower arm wafer table hand-over position is saved.

32.5 Press HOME. The lower arm moves to the home position.

32.6 Press OK.

33 Open the wafer table door.

34 Remove the alignment fixture and install the wafer table tray.

35 Close the wafer table door.

36 For the single port and wide loader specifications, reattach the loader rear panel (upper).

For the dual port loader specification, reattach the loader front right side panel and loader rear panel 2.

37 For the single port loader specification, enable the interlock for the loader side panel and reattach the loader side panel.

⚠WARNING Mechanical Hazard

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

For the dual port loader specification, enable the interlock for loader rear panel 1 and reattach loader rear panel 1.

38 Press INITIALIZE LOADER.

39 Press PREVIOUS MENU twice.

40 Press MAIN MENU.

7.16 Checking the Prealign Sensor Voltage and Position 1471.1

Introduction

Purpose:

To check that the prealign sensor voltage and position are correct.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Hexagonal wrench Prealign sensor positioning fixture
Parts or Consumables:	None

⚠ WARNING Electrical Hazard

The work performed in this procedure is classified as Hot Work Type 3. Refer to 2.1 Types of Hot Work (see page 48) for details.

Checking the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION Property Damage Hazard

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Solenoid & LED Adjustment Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

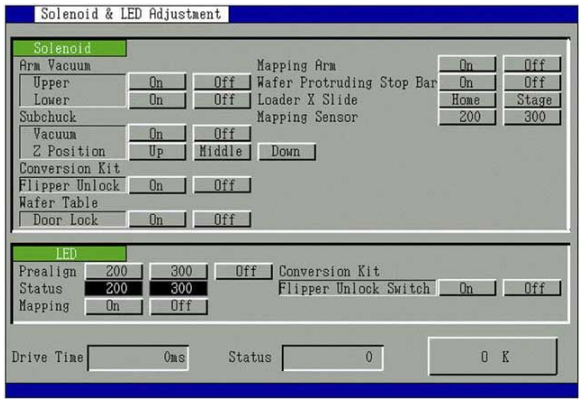
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* will be displayed.

2.5 Press SOLENOID & LED ADJUSTMENT on the *Loader Item Selection Menu*. The*Solenoid & LED Adjustment Menu* is displayed.

Solenoid & LED Adjustment Menu



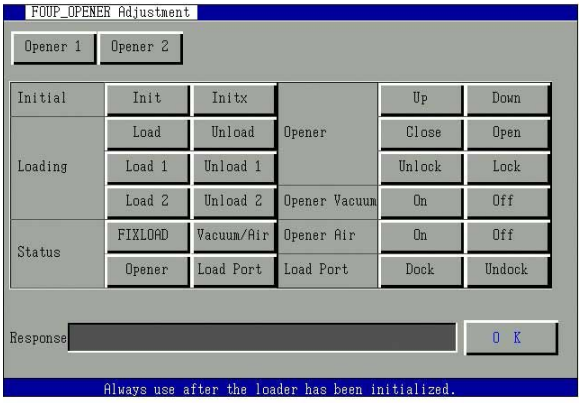
3 Under `Subchuck`, press MIDDLE for `Z Position`.

4 Press OK.

5 Use the following steps to open the FOUP opener.

5.1 Press FOUP_OPENER ADJUSTMENT on the *Loader Item Selection* menu. The *FOUP_OPENER Adjustment* menu is displayed.

FOUP_OPENER Adjustment Menu



5.2 Press DOCK next to `Load Port`. The load port moves to the docked position.

5.3 Press OPEN next to `Opener`. The FOUP opener opens.

5.4 Press DOWN next to `Opener`. The FOUP opener descends.

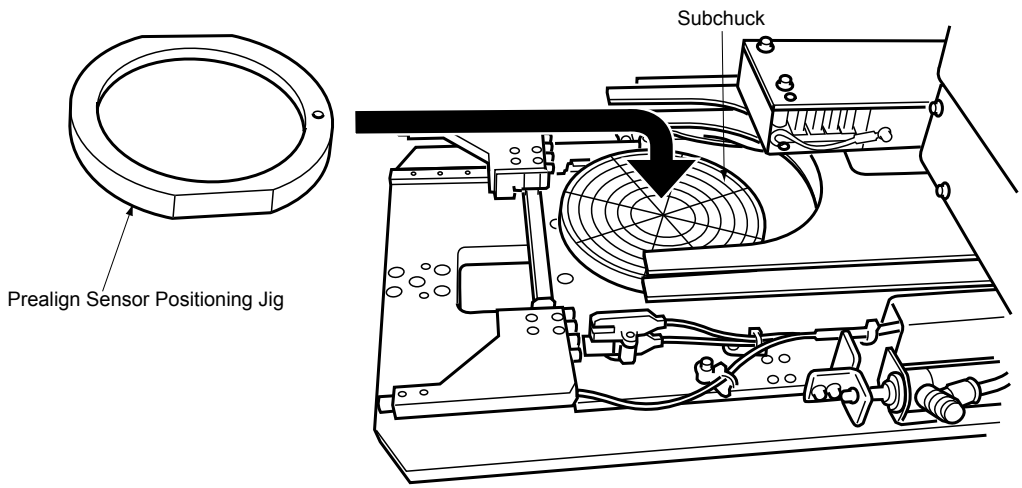
5.5 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

5.6 Press NO. The *Item Selection Menu* is displayed.

6 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

7 Place the prealign sensor positioning fixture on the subchuck.

Prealign Sensor Positioning Fixture

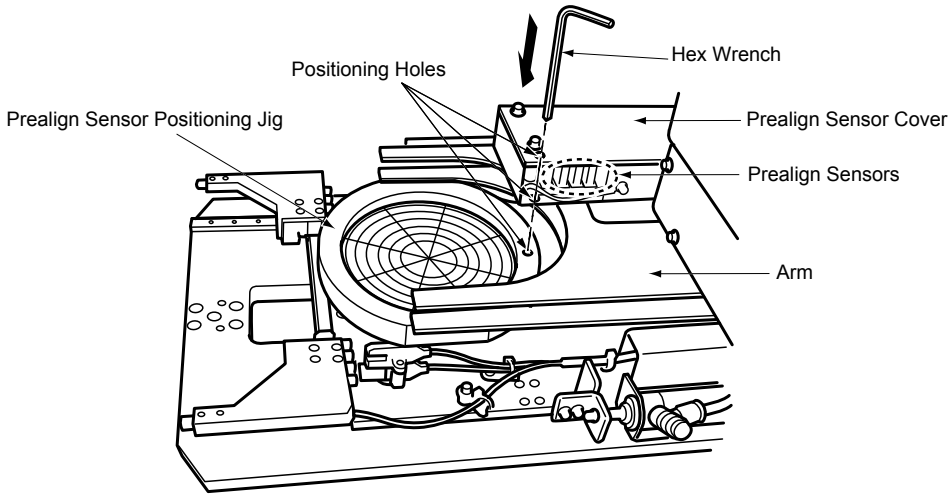


NOTE **Use the hexagonal wrench to check the prealign sensor position.**

8 Check the following points of inspection for the prealign sensor position:

- When viewed from directly above, the prealign sensor cover positioning hole and the alignment fixture positioning hole are in the same position and a hexagonal wrench fits smoothly into the fixture positioning hole.
- The prealign sensor is parallel to the arm.
- When the hexagonal wrench is inserted into the fixture positioning hole, the wrench is vertical when viewed from the load port.

Checking the Prealign Sensor Position

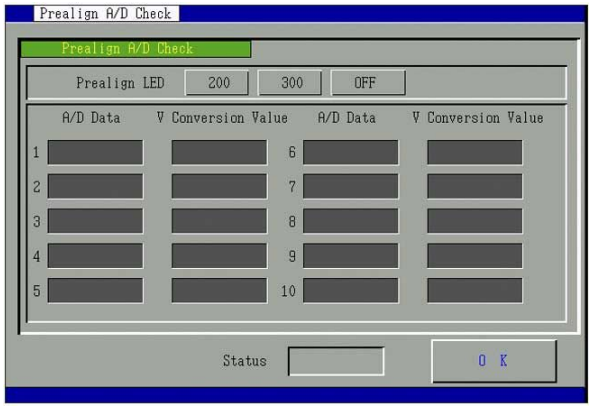


If the sensor position is incorrect, perform the adjustment by following the procedure described in **7.17 Adjusting the Prealign Sensor Voltage and Position (see page 605)**.

9 Remove the hexagonal wrench and the positioning fixture.

10 Press PREALIGNMENT A/D CHECK on the *Loader Item Selection Menu*. The *Prealignment A/D Check Menu* is displayed.

Prealignment A/D Check Menu



11 Press 200 for `Prealign LED`. The voltage conversion value is displayed in the column labeled `V Conversion Value`.

12 Check that the voltage conversion value (V) is between 4.70 and 4.75 V.

If the voltage conversion value is outside the specification, perform the adjustment by following the procedure described in **7.17 Adjusting the Prealign Sensor Voltage and Position (see page 605)**.

13 Press 300 for `Prealign LED`. The voltage conversion value is displayed in the column labeled `V Conversion Value`.

14 Check that the voltage conversion value (V) is between 4.70 and 4.75 V.

If the voltage conversion value is outside the specification, perform the adjustment by following the procedure described in **7.17 Adjusting the Prealign Sensor Voltage and Position (see page 605)**.

15 Press OFF on the *Prealign A/D Check Menu*.

16 Press OK on the *Prealign A/D Check Menu*.

17 Reattach the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

18 Press INITIALIZE LOADER on the *Item Selection Menu* to initialize the loader.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

19 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

Checking the Dual Port Loader Specification

1 Use one of the following methods to begin the procedure.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Arm Unit Maintenance Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

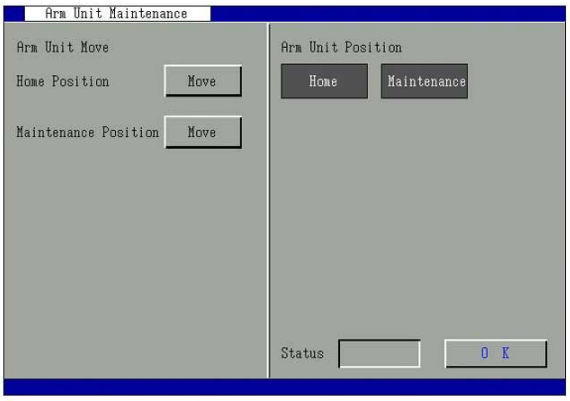
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* will be displayed.

2.5 Press ARM UNIT MAINTENANCE on the *Loader Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

Arm Unit Maintenance Menu



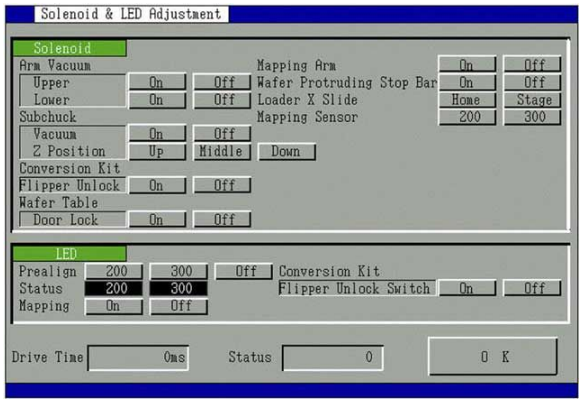
3 Under `Arm Unit Move`, press MOVE for the `Maintenance Position` on the *Arm Unit Maintenance Menu*. The arm unit moves to the maintenance position.

4 Use the following steps to display the *Solenoid & LED Adjustment Menu*.

4.1 Press OK on the *Arm Unit Maintenance Menu*.

4.2 Press SOLENOID & LED ADJUSTMENT on the *Loader Item Selection Menu*. The*Solenoid & LED Adjustment Menu* is displayed.

▼ **Solenoid & LED Adjustment Menu**



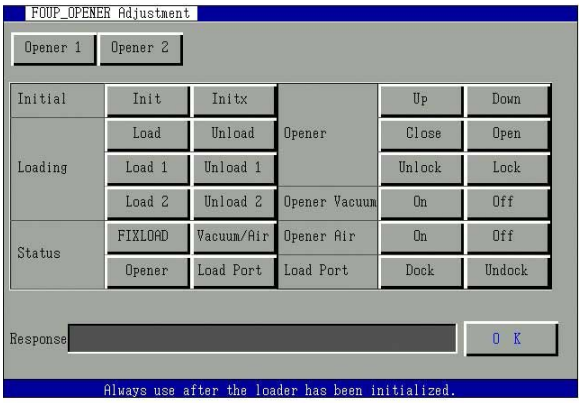
5 Under `Subchuck`, press MIDDLE for `Z Position`.

6 Press OK.

7 Use the following steps to open the FOUP opener.

7.1 Press FOUP_OPENER ADJUSTMENT on the *Loader Item Selection* menu. The *FOUP_OPENER Adjustment* menu is displayed.

▼ **FOUP_OPENER Adjustment Menu**



7.2 Press OPENER 1.

7.3 Press DOCK next to `Load Port`. The load port moves to the docked position.

7.4 Press OPEN next to `Opener`. FOUP opener 1 opens.

7.5 Press DOWN next to `Opener`. FOUP opener 1 descends.

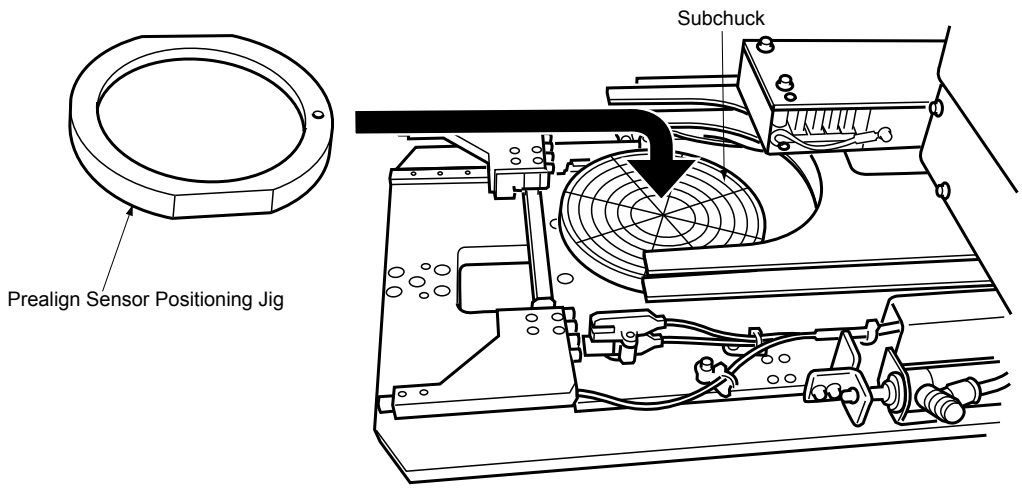
7.6 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

7.7 Press NO. The *Item Selection Menu* is displayed.

8 Remove loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

9 Place the prealign sensor positioning fixture on the subchuck.

Prealign Sensor Positioning Fixture

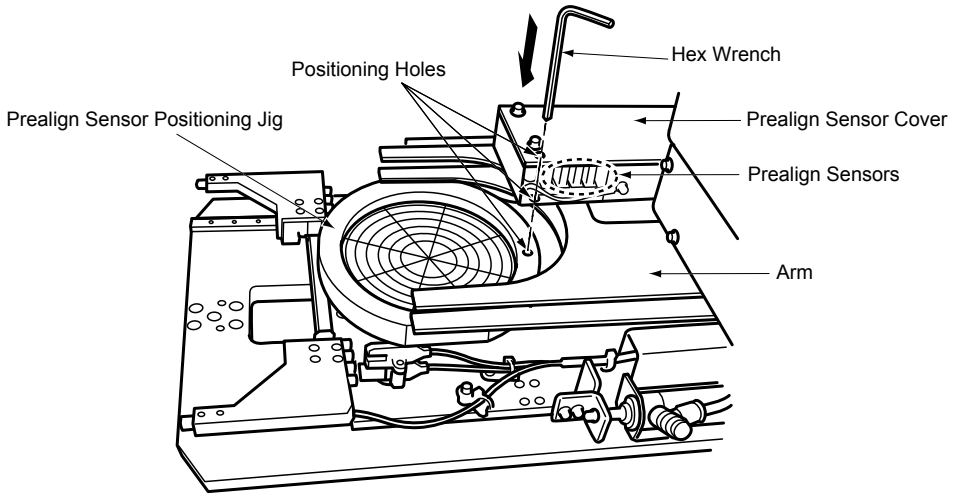


NOTE **Use the hexagonal wrench to check the prealign sensor position.**

10 Check the following points of inspection for the prealign sensor position:

- When viewed from directly above, the prealign sensor cover positioning hole and the alignment fixture positioning hole are in the same position and a hexagonal wrench fits smoothly into the fixture positioning hole.
- The prealign sensor is parallel to the arm.
- When the hexagonal wrench is inserted into the fixture positioning hole, the wrench is vertical when viewed from the load port.

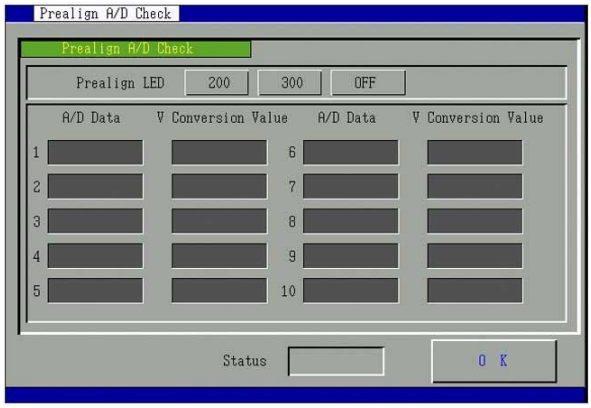
Checking the Prealign Sensor Position



If the sensor position is incorrect, perform the adjustment by following the procedure described in **7.17 Adjusting the Prealign Sensor Voltage and Position (see page 605)**.

11 Remove the hexagonal wrench and the positioning fixture.

12 Press PREALIGNMENT A/D CHECK on the *Loader Item Selection Menu*. The *Prealignment A/D Check Menu* is displayed.



13 Press 200 for `Prealign LED`. The voltage conversion value is displayed in the column labeled `V Conversion Value`.

14 Check that the voltage conversion value (V) is between 4.70 and 4.75 V.

If the voltage conversion value is outside the specification, perform the adjustment by following the procedure described in **7.17 Adjusting the Prealign Sensor Voltage and Position (see page 605)**.

15 Press 300 for `Prealign LED`. The voltage conversion value is displayed in the column labeled `V Conversion Value`.

16 Check that the voltage conversion value (V) is between 4.70 and 4.75 V.

If the voltage conversion value is outside the specification, perform the adjustment by following the procedure described in **7.17 Adjusting the Prealign Sensor Voltage and Position (see page 605)**.

17 Press OFF on the *Prealign A/D Check Menu*.

18 Press OK on the *Prealign A/D Check Menu*.

19 Reattach loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

20 Press INITIALIZE LOADER on the *Item Selection Menu* to initialize the loader.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

21 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7.17 Adjusting the Prealign Sensor Voltage and Position 1472.1

Introduction

Purpose:

To verify that the prealign sensor voltage is within specification.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Hexagonal wrench Lint-free cleanroom wipes Prealign sensor positioning fixture Precision screwdriver
Parts or Consumables:	Lock-tite (Three Bond 1401B)

⚠WARNING Electrical Hazard

The work performed in this procedure is classified as Hot Work Type 3. Refer to 2.1 Types of Hot Work (see page 48) for details.

Adjusting the Single Port Loader Specification

1 Use one of the following methods to begin the procedure.

CAUTION Property Damage Hazard

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Solenoid & LED Adjustment Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

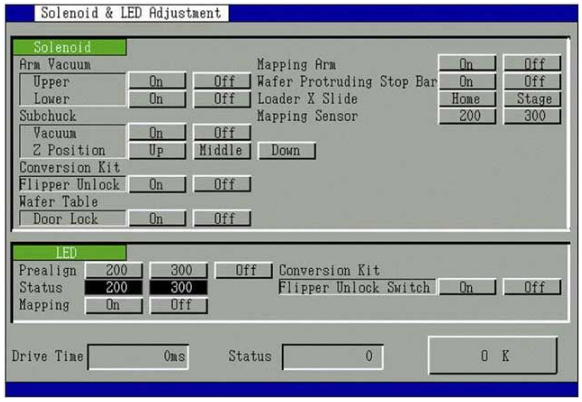
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

2.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

2.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* will be displayed.

2.5 Press SOLENOID & LED ADJUSTMENT on the *Loader Item Selection Menu*. The*Solenoid & LED Adjustment Menu* is displayed.

Solenoid & LED Adjustment Menu



3 Under `Subchuck`, press MIDDLE for `Z Position`.

4 Press OK.

5 Use the following steps to open the FOUP opener.

5.1 Press FOUP_OPENER ADJUSTMENT on the *Loader Item Selection* menu. The *FOUP_OPENER Adjustment* menu is displayed.

FOUP_OPENER Adjustment Menu

5.2 Press DOCK next to `Load Port`. The load port moves to the docked position.

5.3 Press OPEN next to `Opener`. The FOUP opener opens.

5.4 Press DOWN next to `Opener`. The FOUP opener descends.

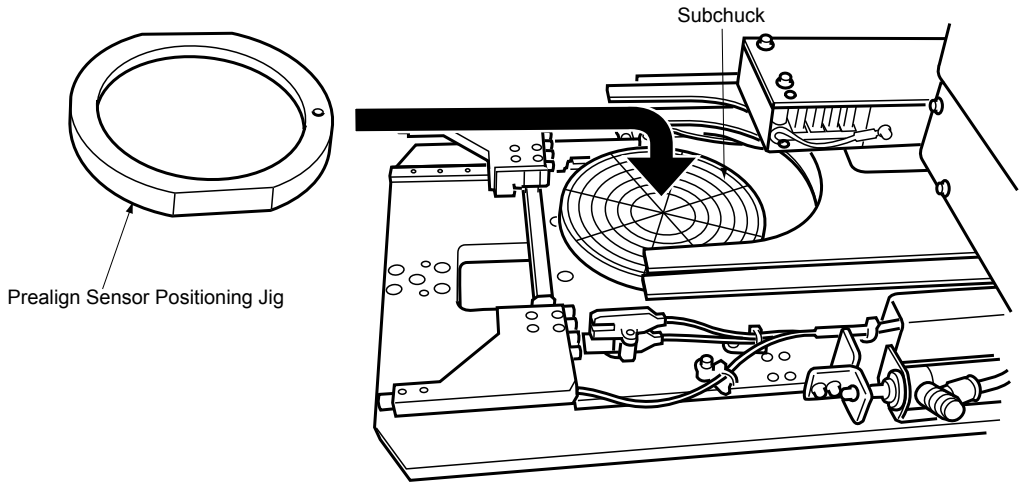
5.5 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

5.6 Press NO. The *Item Selection Menu* is displayed.

6 Remove the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

7 Place the prealign sensor positioning fixture on the subchuck.

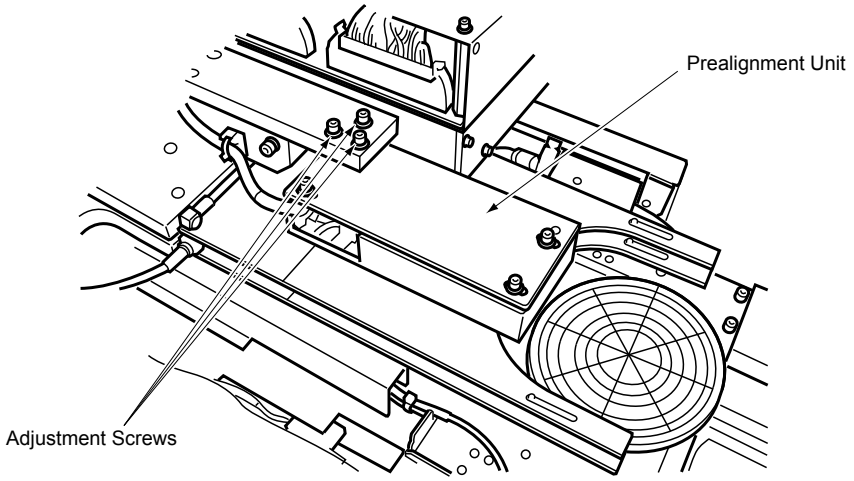
Prealign Sensor Positioning Fixture



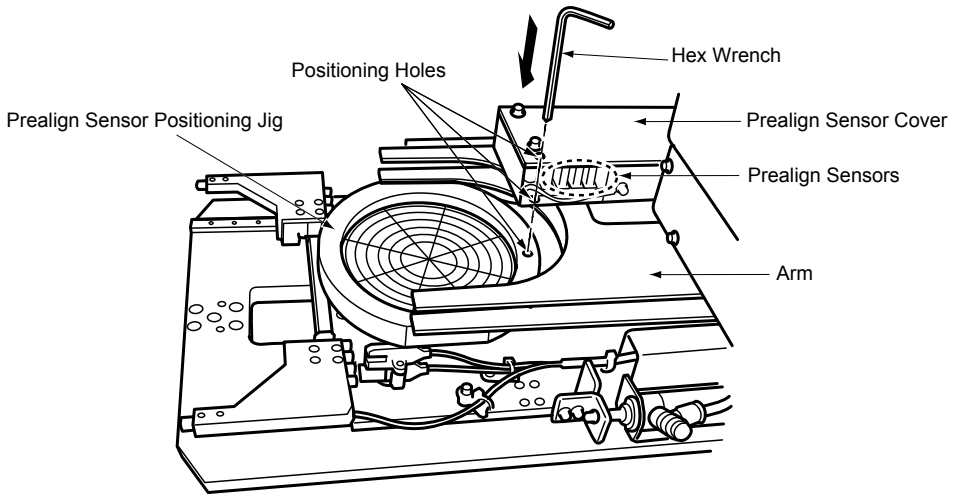
8 Adjust the prealignment unit position using the 3 adjustment screws. Adjust the unit position until it meets the following conditions

- When viewed from directly above, the prealign sensor cover positioning hole and the alignment fixture positioning hole are in the same position and a hexagonal wrench fits smoothly into the fixture positioning hole.
- The prealign sensor is parallel to the arm.
- When the hexagonal wrench is inserted into the fixture positioning hole, the wrench is vertical when viewed from the load port.

Adjustment Screws



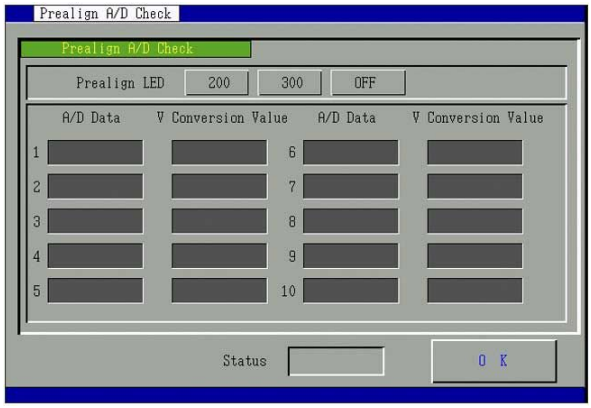
Adjusting the Alignment Unit Position



9 Remove the hexagonal wrench and the positioning fixture.

10 Press PREALIGNMENT A/D CHECK on the *Loader Item Selection Menu*. The *Prealignment A/D Check Menu* is displayed.

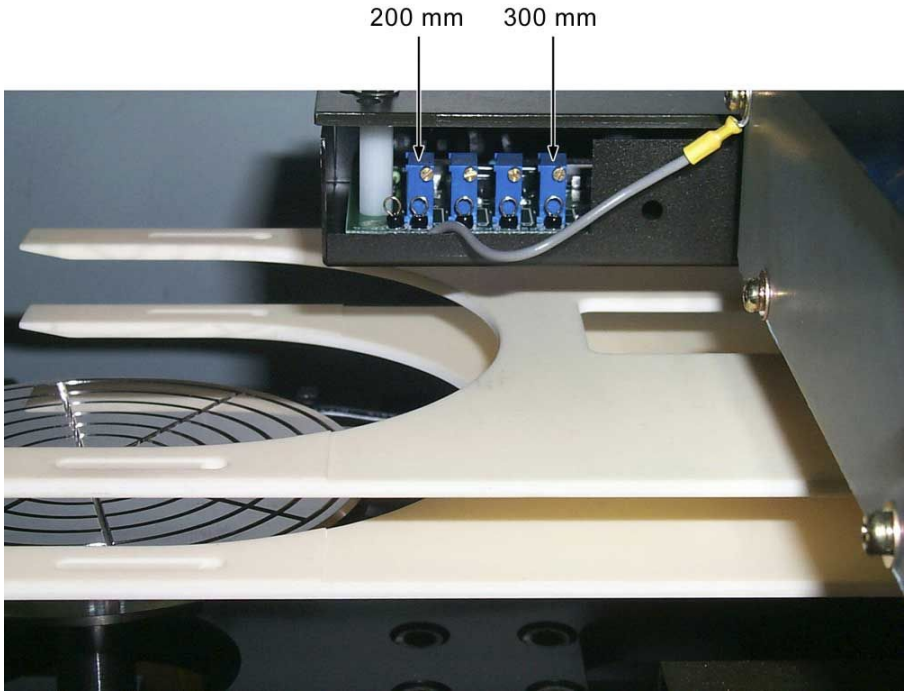
Prealign A/D Check Menu



11 Press 200 or 300 next to `Prealign LED`. The voltage conversion value (V) is displayed. Designate a wafer size to adjust.

12 Turn the prealign unit trimmer for the specific wafer size until the voltage conversion value is between 4.70 and 4.75 V.

Prealign Unit Trimmers



13 Check the conversion value for each wafer size.

- If the conversion value is within specification, go to step 19.
- If the voltage conversion value is still outside specification after you adjust the trimmer, continue with step 14.

14 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

15 Use a lint-free cleanroom wipe dampened with cleaning fluid to carefully wipe down the prealign LED.

NOTE **Always dispose of cleaning fluid and other items such as lint-free cleanroom wipes and foam-tip applicators according to the guidelines and regulations of your local fab facility.**

16 Release lockout and tagout, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

17 Use the following steps to display the *Prealignment A/D Check Menu*.

17.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

17.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

17.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

17.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* will be displayed.

17.5 Press PREALIGNMENT A/D CHECK on the *Loader Item Selection Menu*. The *Prealignment A/D Check Menu* is displayed.

Prealignment A/D Check Menu

18 Perform this adjustment again, repeating steps 11 and 12 to check the conversion value.

If the voltage conversion is still outside specification after you adjust the trimmer, contact TEL Field Service Support.

19 When the adjustment is complete, apply lock-tite (Three Bond 1401B) to the trimmers.

20 Press OFF on the *Prealign A/D Check Menu*.

21 Press OK on the *Prealign A/D Check Menu*.

22 Reattach the loader side panel by following the procedure described in **4.6.2 Removing and Attaching the Loader Side Panel (Single Port and Wide Loader) (see page 116)**.

23 Press INITIALIZE LOADER on the *Item Selection Menu* to initialize the loader.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

24 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

Adjusting the Dual Port Loader Specification

25 Use one of the following methods to begin the procedure.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.**

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

26 Use the following steps to display the *Arm Unit Maintenance Menu*.

26.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

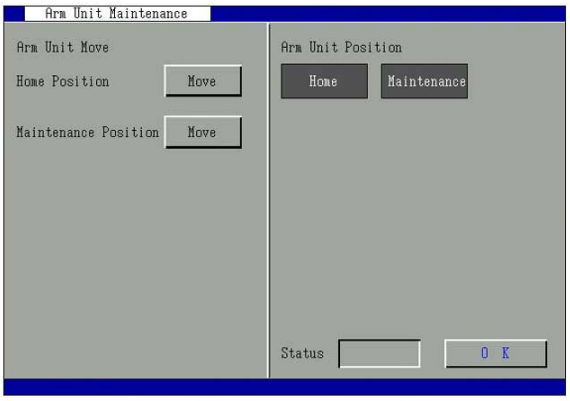
26.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

26.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

26.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* will be displayed.

26.5 Press ARM UNIT MAINTENANCE on the *Loader Item Selection Menu*. The *Arm Unit Maintenance Menu* is displayed.

▼ Arm Unit Maintenance Menu



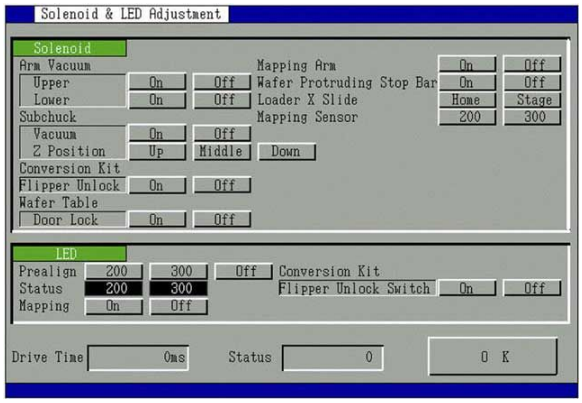
27 Under `Arm Unit Move`, press MOVE for the `Maintenance Position` on the *Arm Unit Maintenance Menu*. The arm unit moves to the maintenance position.

28 Use the following steps to display the *Solenoid & LED Adjustment Menu*.

28.1 Press OK on the *Arm Unit Maintenance Menu*.

28.2 Press SOLENOID & LED ADJUSTMENT on the *Loader Item Selection Menu*. The*Solenoid & LED Adjustment Menu* is displayed.

Solenoid & LED Adjustment Menu



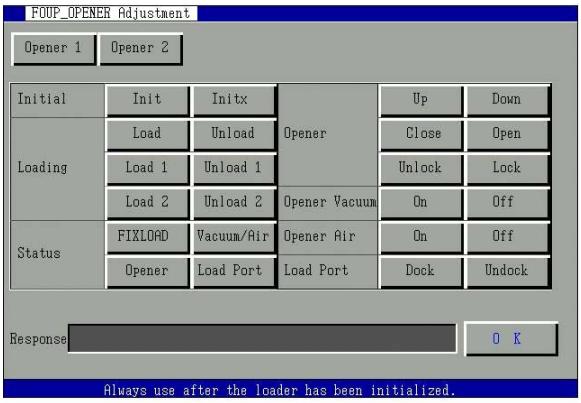
29 Under `Subchuck`, press MIDDLE for `Z Position`.

30 Press OK.

31 Use the following steps to open the FOUP opener.

31.1 Press FOUP_OPENER ADJUSTMENT on the *Loader Item Selection* menu. The *FOUP_OPENER Adjustment* menu is displayed.

FOUP_OPENER Adjustment Menu



31.2 Press OPENER 1.

31.3 Press DOCK next to `Load Port`. The load port moves to the docked position.

31.4 Press OPEN next to `Opener`. FOUP opener 1 opens.

31.5 Press DOWN next to `Opener`. FOUP opener 1 descends.

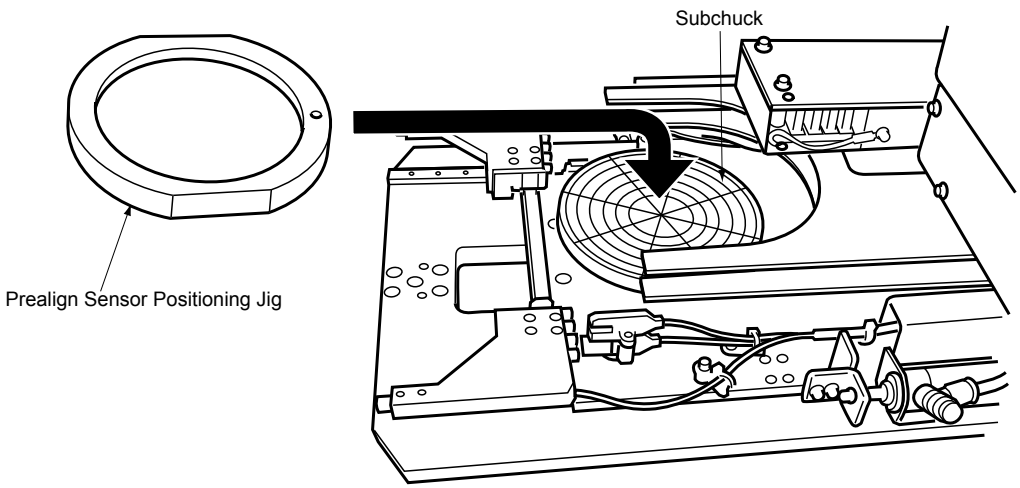
31.6 Press OK. A check menu is displayed stating, `Initialize FOUP_OPENER?`

31.7 Press NO. The *Item Selection Menu* is displayed.

32 Remove loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

33 Place the prealign sensor positioning fixture on the subchuck.

Prealign Sensor Positioning Fixture

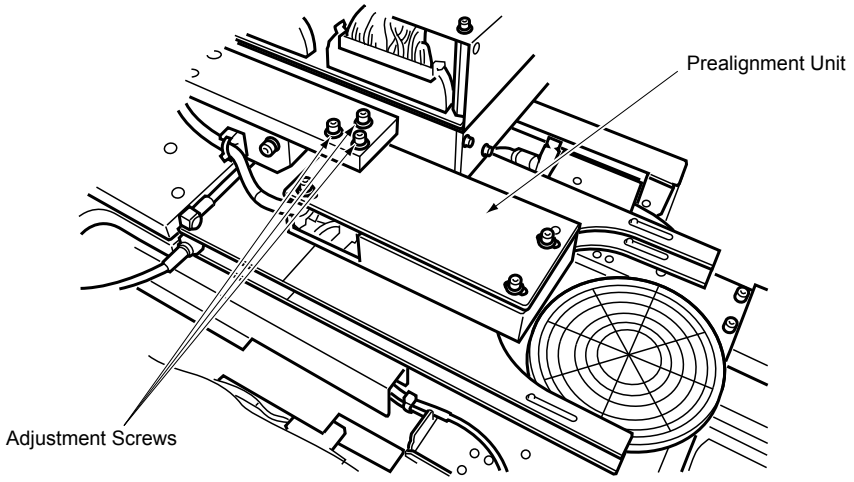


NOTE **Use the hexagonal wrench to check the prealign sensor position.**

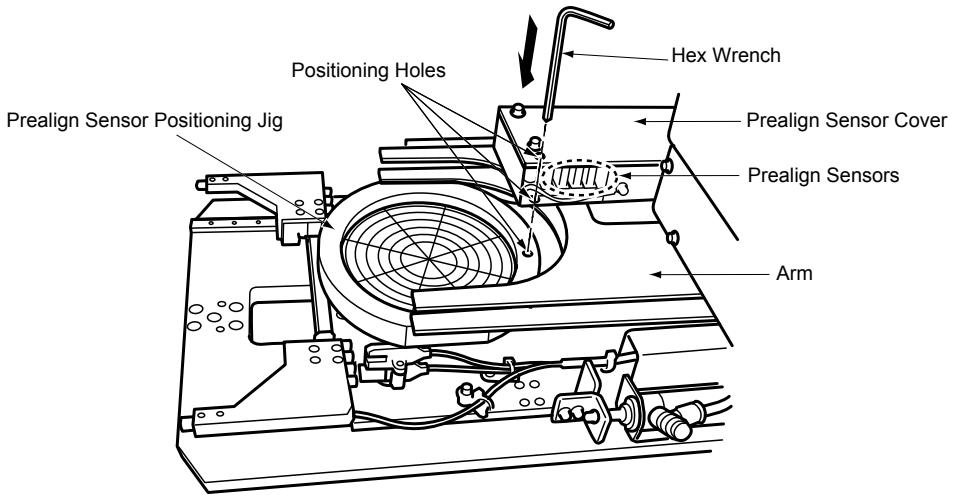
34 Adjust the prealignment unit position using the 3 adjustment screws. Adjust the unit position until it meets the following conditions

- When viewed from directly above, the prealign sensor cover positioning hole and the alignment fixture positioning hole are in the same position and a hexagonal wrench fits smoothly into the fixture positioning hole.
- The prealign sensor is parallel to the arm.
- When the hexagonal wrench is inserted into the fixture positioning hole, the wrench is vertical when viewed from the load port.

Adjustment Screws



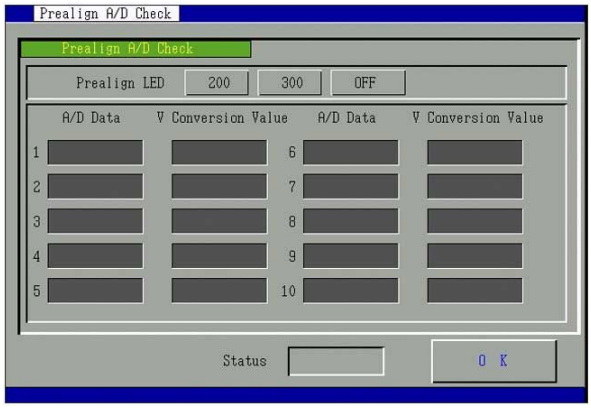
Adjusting the Alignment Unit Position



35 Remove the hexagonal wrench and the positioning fixture.

36 Press PREALIGNMENT A/D CHECK on the *Loader Item Selection Menu*. The *Prealignment A/D Check Menu* is displayed.

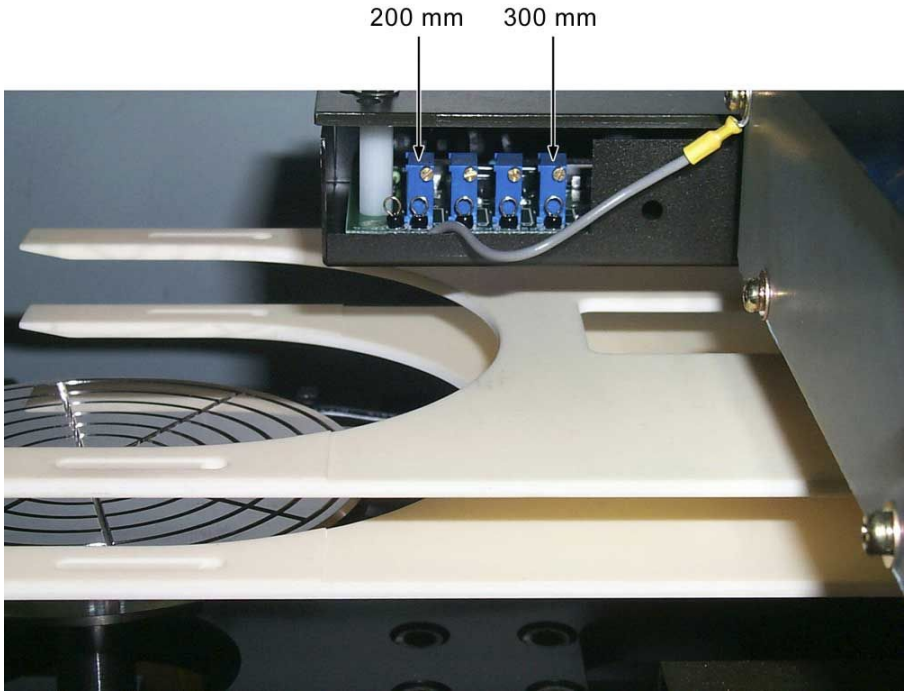
Prealign A/D Check Menu



37 Press 200 or 300 next to `Prealign LED`. The voltage conversion value (V) is displayed. Designate a wafer size to adjust.

38 Turn the prealign unit trimmer for the specific wafer size until the voltage conversion value is between 4.70 and 4.75 V.

Prealign Unit Trimmers



39 Check the conversion value for each wafer size.

- If the conversion value is within specification, go to step 21.
- If the voltage conversion value is still outside specification after you adjust the trimmer, continue with step 16.

40 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

41 Use a lint-free cleanroom wipe dampened with cleaning fluid to carefully wipe down the prealign LED.

NOTE **Always dispose of cleaning fluid and other items such as lint-free cleanroom wipes and foam-tip applicators according to the guidelines and regulations of your local fab facility.**

42 Release lockout and tagout, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

43 Use the following steps to display the *Prealignment A/D Check Menu*.

43.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

43.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

43.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

43.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* will be displayed.

43.5 Press PREALIGNMENT A/D CHECK on the *Loader Item Selection Menu*. The *Prealignment A/D Check Menu* is displayed.

44 Perform this adjustment again, repeating steps 13 and 14 to check the conversion value.

If the voltage conversion is still outside specification after you adjust the trimmer, contact TEL Field Service Support.

45 When the adjustment is complete, apply lock-tite (Three Bond 1401B) to the trimmers.

46 Press OFF on the *Prealign A/D Check Menu*.

47 Press OK on the *Prealign A/D Check Menu*.

48 Reattach loader rear panel 1 by following the procedure described in **4.7.5 Removing and Attaching the Loader Rear Panels (Dual Port) (see page 138)**.

49 Press INITIALIZE LOADER on the *Item Selection Menu* to initialize the loader.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

50 Perform a system shutdown and lockout and tagout the prober following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

7.18 Checking the Autoloading Position 1473.2

Introduction

Purpose:

To check the position (the autoloading position) where the wafer is loaded to the chuck top.

Required Resources:

Time:	10 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers FOUP

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking the Autoloading Position

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Load a FOUP containing wafers onto the load port.

3 Use the following steps to load a wafer to the chuck top.

3.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A *Password Menu* is displayed.

3.3 Input your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exists, press OK.

3.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

3.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

3.7 Press LOAD WAFER. A wafer is transferred to the chuck top.

4 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.**

5 Visually inspect that the wafer is centered on the chuck top.

- If no errors occurred during wafer transfer and the wafer is properly centered on the chuck top with the notch oriented in the correct position, continue with Step 6.
- If the wafer is not centered on the chuck top correctly during the wafer transfer, go to **7.19 Adjusting the Specified Stage Position (see page 619)**.

6 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

7 Press INITIALIZE STAGE on the *Basic Functions Menu* and press YES to the message. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage areas when powering on or initializing the prober.**

8 Use the following steps to unload the wafer.

8.1 Press TRANSFER WAFER on the *Basic Functions Menu*.

8.2 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is transferred from the chuck top to the FOUP.

8.3 Press PREVIOUS MENU.

8.4 Press MAIN MENU and press NO to the message.

7.19 Adjusting the Specified Stage Position 1474.2

Introduction

Purpose:

To adjust the autoloading position by changing the specified stage position.

Required Resources:

Time:	15 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers FOUP

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Load a FOUP containing wafers onto the load port.

3 Use the following steps to load a wafer to the chuck top.

3.1 Press DIAGNOSTICS on the *Main Menu*.

3.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

3.3 Input the password on the numeric keypad and press INPUT.

3.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exists, press OK.

3.5 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

3.6 Press WAFER TRANSFER on the *Stage Functions Menu*. The *Wafer Transfer Menu* is displayed.

3.7 Press LOAD WAFER. The wafer is transferred to the chuck top.

4 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.**

5 Visually inspect how much the wafer is off center on the chuck top. From that inspection, estimate which axis needs adjustment and how much movement is needed. Use the following to correct the load position offsets in X and Y:

6 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

7 Press INITIALIZE STAGE on the *Basic Functions Menu*. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage areas when powering on or initializing the prober.**

8 Use the following steps to unload the wafer.

8.1 Press TRANSFER WAFER on the *Basic Functions Menu*.

8.2 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is transferred from the chuck top to the FOUP.

9 Press PREVIOUS MENU. The *Stage Adjustments Menu* is displayed.

10 Press SPECIFIED POSITION on the *Stage Adjustments Menu*.

11 Press SPECIFIED POSITION OFFSET AMOUNT on the *Specified Stage Position Menu*. The *Specified Position Offset Amount Menu* is displayed.

Specified Position Offset Menu

12 Set the X/Y axis offsets for the upper arm. Input the offset amounts under `Upper Arm` in the `X Axis` and `Y Axis` fields.

CAUTION **Property Damage Hazard**

Increase or decrease the offsets within a range of 1000 µm from the current position to avoid any interference between the arm and the 3-pins.

NOTE **For the purposes of the following adjustment, the term increase refers to a number retreating from 0, while the term decrease refers to a number approaching 0.**

- If the wafer is shifted towards the **left** side of the main chuck, increase the X axis offset amount.
- If the wafer is shifted towards the **right** side of the main chuck, decrease the X axis offset amount.
- If the wafer is shifted towards the **front** of the main chuck, decrease the Y axis offset amount.
- If the wafer is shifted towards the **back** of the main chuck, increase the Y axis offset amount.

NOTE **Do not change the Z axis offset.**

13 Record the X and Y axis offsets you input for the upper arm, and input the same values for the lower arm offsets.

NOTE **Do not change the Z axis offset.**

14 Press PREVIOUS MENU. A check menu is displayed with the message `Validate this data?` Press YES.

15 Use the following steps to initialize the stage.

15.1 Press PREVIOUS MENU and press YES to the message. The *Basic Functions Menu* is displayed.

15.2 Press BASIC FUNCTIONS.

15.3 Press INITIALIZE STAGE on the *Basic Functions Menu* and press YES to the message. The stage initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage areas when powering on or initializing the prober.

16 Use the following steps to load a wafer.

16.1 Press WAFER TRANSFER on the *Basic Functions Menu*.

16.2 Press LOAD WAFER on the *Wafer Transfer Menu*. The wafer is transferred to the chuck top.

17 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

> **⚠ CAUTION** **Mechanical Hazard**
> **When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.**

18 Check the position of the wafer on the chuck to make sure it is centered.

- If the wafer is centered, go to step 20.
- If the wafer is not centered to the chuck, repeat steps 5 through 16 until the wafer is centered on the chuck.

19 Close the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

20 Press INITIALIZE STAGE on the *Basic Functions Menu*. The stage initializes.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage areas when powering on or initializing the prober.**

21 Press WAFER TRANSFER on the *Basic Functions Menu*.

22 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is transferred from the chuck top to the FOUP.

23 Press PREVIOUS MENU on the *Basic Functions Menu*.

24 Press PREVIOUS MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press YES.

25 Press PREVIOUS MENU on the *Adjustments Menu*.

26 Press INITIALIZE.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage areas when powering on or initializing the prober.**

27 Press SYSTEM. The prober initializes.

28 Press MAIN MENU.

7.20 Setting the Autoloading Position 1475.2

Introduction

Purpose:

To set the position for the auto loading position of each axis, and arms of the loader.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	Screwdriver Hexagonal wrench Loading position adjustment fixture Protective Mylar sheet
Parts or Consumables:	None

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Preparing the Prober for Adjustment

WARNING **Mechanical Hazard**
The following procedure is performed after disabling the interlock. Stay clear of the movable range of moving parts when the prober is activated. Serious injury may occur. Interlocks should only be released by authorized personnel who have taken Tokyo Electron's P-12XL Advanced Maintenance training course.

1 Open the head plate by following the procedure described in **4.4 Opening and Closing the Head Plate (see page 100)**.

CAUTION **Mechanical Hazard**
When opening the head plate, check that the lock mechanism is in the fully locked position to avoid a possible mechanical pinch hazard to personnel.

2 Disable the head plate interlock.

3 Restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

4 Use the following steps to display the *Specified Position Offset Menu*.

4.1 Press DIAGNOSTICS on the *Main Menu*. The *Diagnostics Menu* is displayed.

4.2 Press ADJUSTMENTS on the *Diagnostics Menu*. The *Password Menu* is displayed.

4.3 Input your password on the numeric keypad and press INPUT.

4.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating `Not all interference checks are done. Remember this when operating the prober.` Check for any interference with the stage; if none exist, press OK.

4.5 Press SPECIFIED POSITION on the *Stage Adjustments Menu*.

4.6 Press SPECIFIED POSITION OFFSET AMOUNT on the *Specified Stage Position Menu*. The *Specified Position Offset Menu* is displayed.

▼ Specified Position Offset Menu

5 Set the X and Y axis offset amounts for the upper and lower arms. The settings depend on the loader installation position. Contact TEL Field Service Support for the prober specification and values.

NOTE **If the loader installation position is standard, set the X and Y axis to 0.**

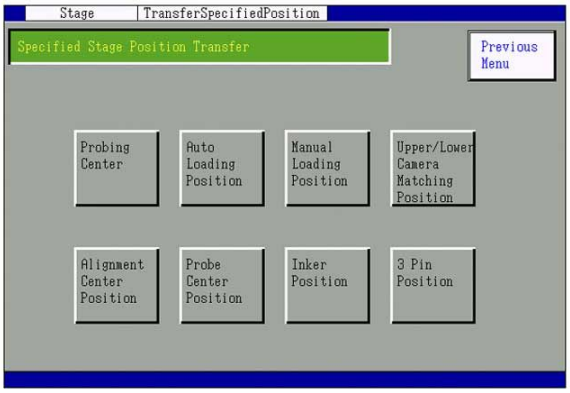
NOTE **Do not change the value for the Z axis.**

6 Press STAGE DIAG MAIN MENU. A check menu is displayed stating `Validate this data?`. Press YES.

7 Use the following steps to transfer the stage to the auto loading position.

7.1 Press TRANSFER SPECIFIED POSITION on the *Stage Adjustments Menu*. The *Transfer Specified Position Menu* is displayed.

▼ **Transfer Specified Position Menu**

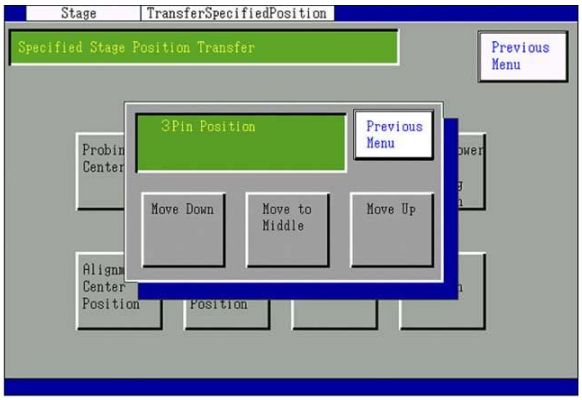


7.2 Press AUTO LOADING POSITION. A check menu is displayed stating, `Transfer Stage?` Check for any physical interference with the stage; if none exists, press YES. The stage moves to the autoloading position.

8 Use the following steps to move the 3-pins to the up position.

8.1 Press 3 PIN POSITION on the *Transfer Specified Position Menu*. The *Specified 3 Pin Position Menu* is displayed.

▼ **Specified 3 Pin Position Menu**



8.2 Press MOVE UP. A check menu is displayed stating `Transfer to UP position?` Press YES. The 3-pins moves to the up position.

9 Use the following steps to access the *Stage Control Menu*.

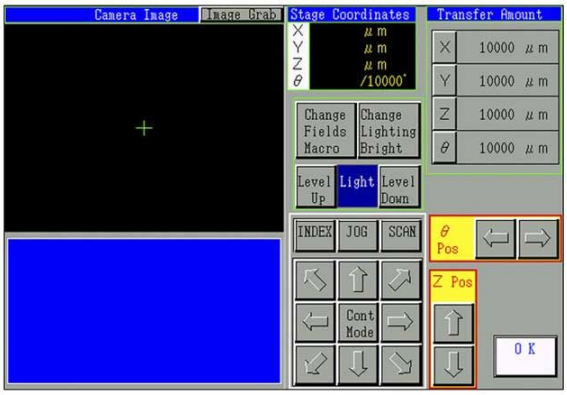
9.1 Press PREVIOUS MENU on the *Specified 3 Pin Position Menu*.

9.2 Press PREVIOUS MENU on the *Transfer Specified Position Menu*.

9.3 Press ALL AXIS TRANSFER on the *Stage Adjustments Menu*.

9.4 Press XYZΘ JOYSTICK TRANSFER on the *Diagnostics Transfer Menu*. The *Stage Control Menu* is displayed.

▼ **Stage Control Menu**



10 Check that the values of the X and Y axis stage coordinates are within specification. The specification depends on the loader installation position. Contact TEL Field Service Support for the prober specifications and settings.

NOTE **If the loader installation position is standard, the value for the X axis should be 3000 µm, and the value for the Y axis should be 122000 µm**

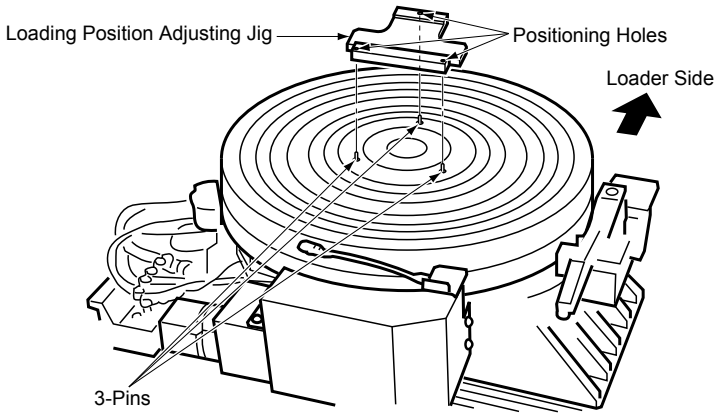
11 Press OK.

12 Place the protective Mylar sheet over the chuck top.

NOTE **Use a protective sheet that has holes for the 3-pins.**

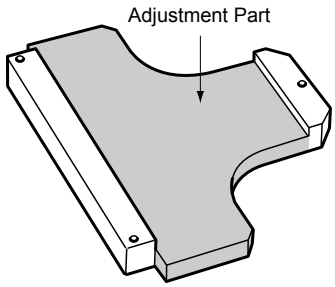
13 Set the loading position adjustment fixture on the chuck top. Align the holes on the adjustment fixture with the 3-pins.

▼ **Setting the Loading Position Adjustment Fixture**



Perform the adjustment using the adjustment portion of the loading position adjustment fixture.

▼ **Loading Position Adjustment Fixture**



14 Use the following steps to access the *Adjustment Menu*.

14.1 Press PREVIOUS MENU on the *Diagnostics Transfer Menu*.

14.2 Press PREVIOUS MENU on the *Stage Adjustments Menu* A check menu is displayed stating, `Save SYS Information?` Press YES. The *Adjustments Menu* is displayed.

NOTE **Go to Adjusting the Upper Arm Position (Stand-by (Load)) (see page 627) to perform the adjustment.**

Adjusting the Upper Arm Position (Stand-by (Load))

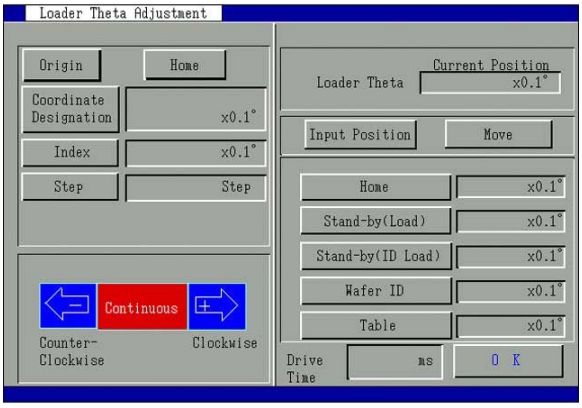
15 Use the following steps to access the *Loader Theta Adjustment Menu*.

15.1 Press LOADER on the *Adjustments Menu*.

15.2 Press ALL AXES ADJUSTMENT on the *Item Selection Menu*.

15.3 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

▼ **Loader Theta Adjustment Menu**



16 Use the following steps to transfer the loader theta to the stand-by (load) position.

16.1 Press ORIGIN. The loader theta moves to the origin position.

16.2 Press HOME. The loader theta moves to the home position.

16.3 Press MOVE.

16.4 Press STAND-BY (LOAD). A check menu is displayed stating, `Do you want to move?`

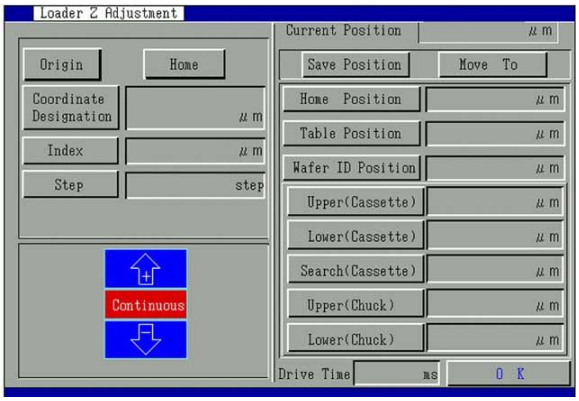
16.5 Press YES. The loader theta moves to the stand-by (load) position.

16.6 Press OK.

17 Use the following steps to transfer the loader Z to the upper (chuck) position.

17.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

Loader Z Adjustment Menu



17.2 Press ORIGIN. The loader Z moves to the origin position.

17.3 Press HOME. The loader Z moves to the home position.

17.4 Press MOVE.

17.5 Press UPPER (CHUCK). A check menu is displayed stating, `Do you want to move?`

17.6 Press YES. The loader Z moves to the upper (chuck) position.

17.7 Press OK.

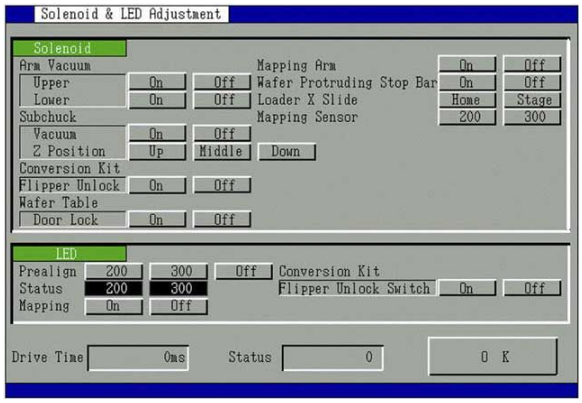
18 Use the following steps to transfer the arm unit to the X axis stage position.

NOTE **The following step is for the wide loader specification.**

18.1 Press PREVIOUS MENU on the *Item Selection Menu*.

18.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

Solenoid & LED Adjustment Menu



18.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

18.4 Press OPEN for Shutter.

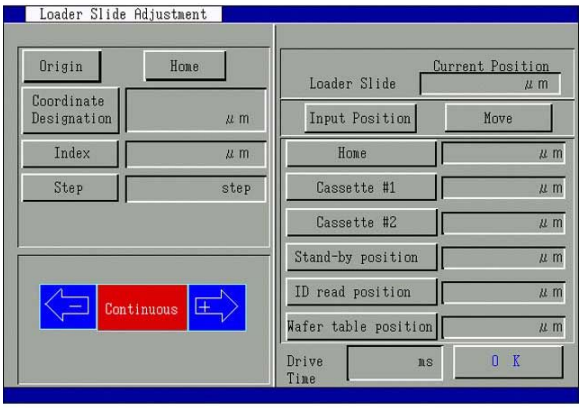
18.5 Press OK.

18.6 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

19 Use the following steps to transfer the arm unit to the Y axis stand-by position.

NOTE **The following step is for the dual port loader specification.**

19.1 Press LOADER SLIDE on the *Item Selection Menu*. The *Loader Slide Adjustment Menu* is displayed.



19.2 Press MOVE.

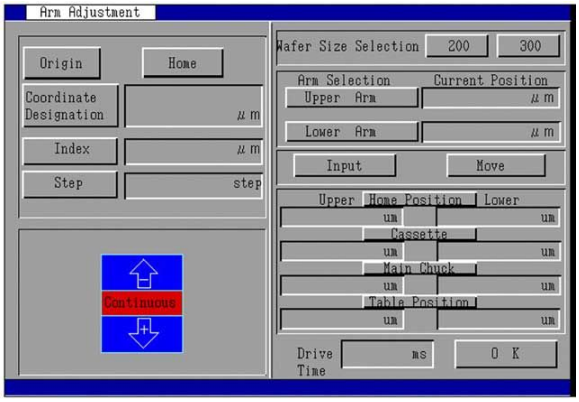
19.3 Press STAND-BY. The arm unit moves to the Y axis stand-by position.

19.4 Press OK. The *Item Selection Menu* is displayed.

20 Use the following steps to transfer the upper arm to the home position.

20.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

▼ **Arm Adjustment Menu**



20.2 Press ORIGIN. The upper arm moves to the origin position.

20.3 Press HOME. The upper arm moves to the home position.

21 Select INDEX and use the down arrow to move the arm in small increments until it reaches the position shown in the following figure.

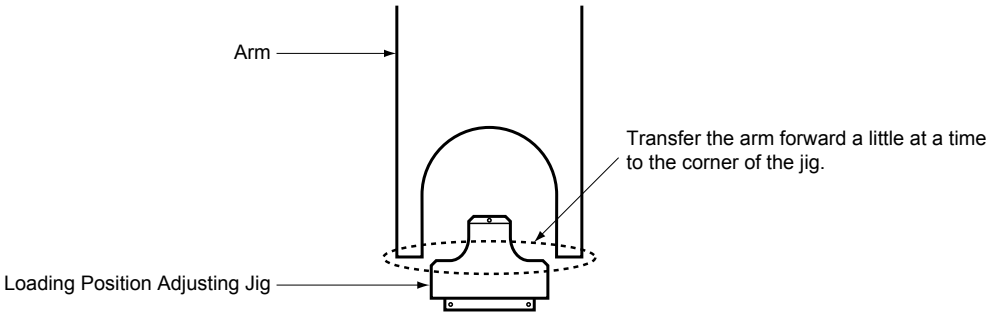
CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is operated, the prober can be damaged.

CAUTION **Property Damage Hazard**

Check that there is no interference between the chuck top or the fixture and the arm when transferring the arm.

▼ **Moving Upper Arm**

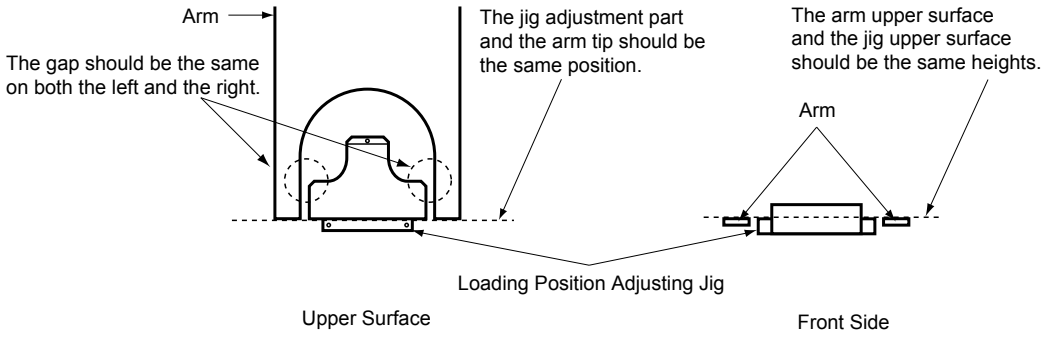


22 Check the upper arm height (Z axis) and the rotation direction (Theta axis).

Measure and record how far apart the fixture upper surface and the upper arm upper surface are, and how much to rotate until the fixture groove side surface and the upper arm side surface distances are the same on both the left and right.

Use rest of the following steps to adjust the position of the arms until they match the position in the following figure.

Upper Arm Alignment Position



23 Press HOME. The upper arm returns to the home position.

24 Press OK.

25 Use the following steps to transfer the arm unit to the X axis home position.

NOTE **The following step is for the wide loader specification.**

25.1 Press PREVIOUS MENU on the Item Selection Menu.

25.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

25.3 Press HOME for `Loader X Slide`. The arm unit moves to the X axis home position.

25.4 Press OK.

25.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

26 Use the following steps to adjust the height of the upper arm (Z axis).

26.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

26.2 Set the INDEX amount to 100 µm.

26.3 Use the up and down arrows to change the Z position so that the surface of the upper arm and the surface of the fixture are level with each other. Refer to the measurements you recorded in step 8.

26.4 Press SAVE POSITION.

26.5 Press UPPER (CHUCK). A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected. SAVE POSITION **is selected.**

26.6 Press YES. The upper (chuck) position is saved.

26.7 Press OK.

27 Use the following steps to adjust the upper arm theta axis.

27.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

27.2 Press STEP

27.3 Use the left and right arrows to change the theta position so that there is the same amount of space on each side of the upper arm between the inside of the arms and the fixture.

27.4 Press INPUT POSITION.

27.5 Press STAND-BY (LOAD) on the right side of the menu. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected.** INPUT POSITION **is selected.**

27.6 Press YES. The new stand-by (load) position is saved.

28 Use the following steps to transfer the loader theta to the home position.

28.1 Press MOVE.

28.2 Press HOME. A check menu is displayed stating, `Do you want to move?`

28.3 Press YES. The loader theta moves to the home position.

28.4 Press STAND-BY (LOAD). A check menu is displayed stating, `Do you want to move?`

28.5 Press YES. The loader theta moves to the stand-by (load) position.

28.6 Press OK.

29 Use the following steps to transfer the arm unit to the X axis stage position.

> **NOTE** **The following step is for the wide loader specification.**

29.1 Press PREVIOUS MENU on the *Item Selection Menu*.

29.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

29.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

29.4 Press OK.

29.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

30 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

31 Select INDEX and use the arrows to move the arm until it is positioned as shown in the following figure.

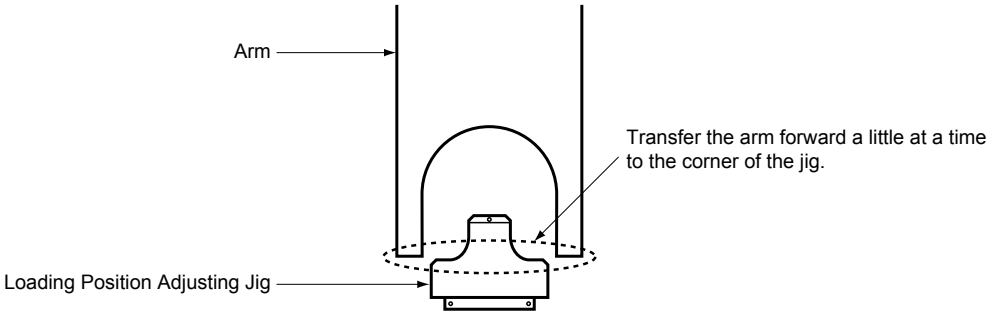
CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is mistakenly operated, the prober can be damaged.

CAUTION **Property Damage Hazard**

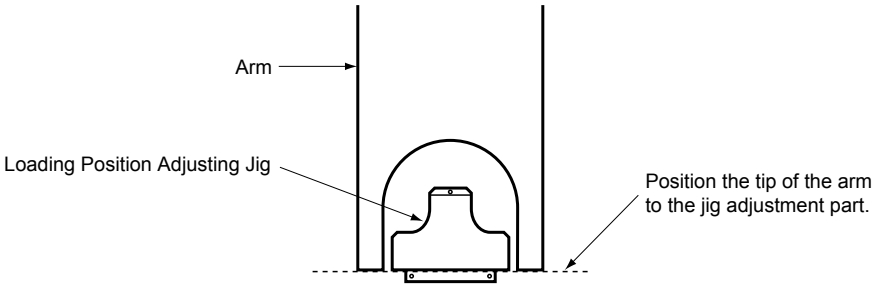
Check that there is no interference between the chuck top or the jig and the arm when transferring the arm.

Upper Arm Position



32 Move the upper arm in small increments of 100 µm until the tips of the arm are even with the edge of the fixture.

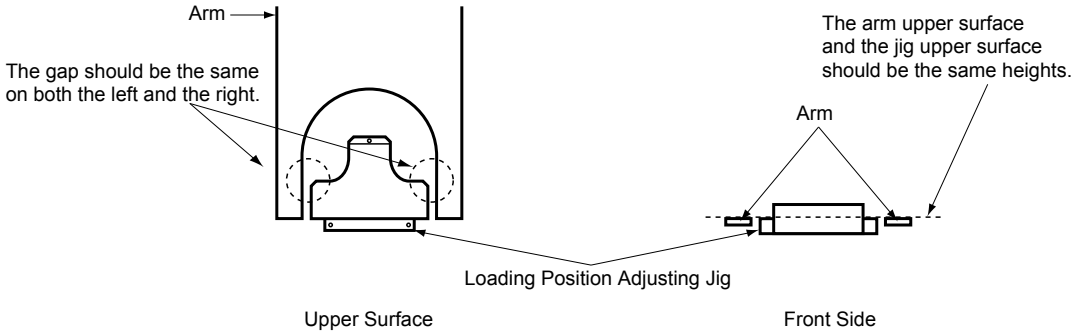
Upper Arm Position



33 Check the upper arm position and check that all of the following conditions are met:

- The gap between the arm and the fixture should be the same on both sides of the fixture.
- The upper surface of the fixture and the upper surface of the arm should be level with each other.

▼ **Checking the Arm Position**



If further adjustments are necessary, as a result of checking, return to step 9 to repeat the adjustment.

34 Use the following steps to save the upper arm loading position.

34.1 Press INPUT.

34.2 Press MAIN CHUCK. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.

34.3 Press YES. The upper arm loading position is saved.

34.4 Press MOVE.

34.5 Press HOME. The upper arm moves to the home position.

34.6 Press OK.

35 Use the following steps to transfer the arm unit to the X axis home position.

NOTE **The following step is for the wide loader specification.**

35.1 Press PREVIOUS MENU on the *Item Selection Menu*.

35.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

35.3 Press HOME for `Loader X Slide`. The arm unit moves to the X axis home position.

35.4 Press OK.

35.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

NOTE **Go to Checking the Upper Arm Position (Stand-by (Load)) (see page 635) to check the adjustment.**

Checking the Upper Arm Position (Stand-by (Load))

36 Use the following steps to transfer the loader theta to the stand-by (load) position.

36.1 Press LOADER THETA on the *Loader Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

36.2 Press ORIGIN. The loader theta moves to the origin position.

36.3 Press HOME. The loader theta moves to the home position.

36.4 Press MOVE.

36.5 Press STAND-BY (LOAD). A check menu is displayed stating, `Do you want to move?`

36.6 Press YES. The loader theta moves to the stand-by (load) position.

36.7 Press OK.

37 Use the following steps to transfer the loader Z to the upper (chuck) position.

37.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

37.2 Press ORIGIN. The loader Z moves to the origin position.

37.3 Press HOME. The loader Z moves to the home position.

37.4 Press MOVE.

37.5 Press UPPER (CHUCK). A check menu is displayed stating, `Do you want to move?`

37.6 Press YES. The loader Z moves to the upper (chuck) position.

37.7 Press OK.

38 Use the following steps to transfer the arm unit to the X axis stage position.

NOTE **The following step is for the wide loader specification.**

38.1 Press PREVIOUS MENU on the *Item Selection Menu*.

38.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

38.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

38.4 Press OK.

38.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

39 Use the following steps to transfer the upper arm to the home position.

39.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

39.2 Press ORIGIN. The upper arm moves to the origin position.

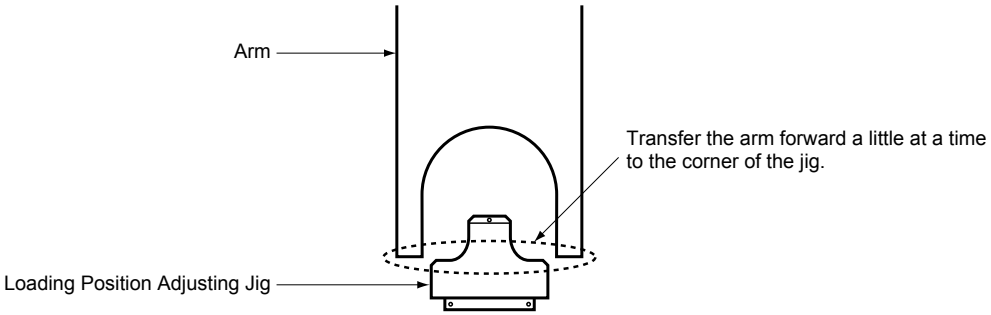
39.3 Press HOME. The upper arm moves to the home position.

40 Use the following steps to transfer the upper arm to the loading position.

> **CAUTION** **Property Damage Hazard**
> **Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is operated, the prober can be damaged.**

40.1 Select INDEX and use the down arrow to move the arm in small increments until it reaches the position shown in the following figure.

▼ **Moving Upper Arm**



40.2 Check that there is no interference with the fixture even if the upper arm is moved forward.

40.3 Press MOVE.

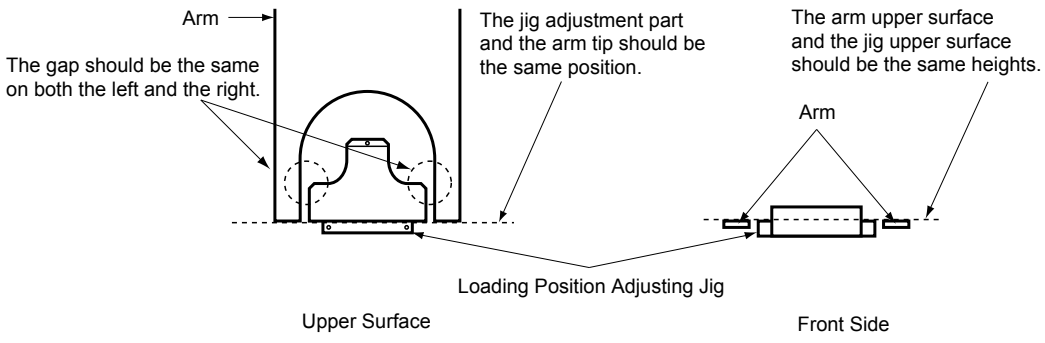
40.4 Press MAIN CHUCK. A check menu is displayed stating, `Do you want to move?`

40.5 Press YES. The upper arm moves to the loading position.

41 Check the position of the fixture and the upper arm. Check that the following conditions are met:

- The gap between the arm and the fixture should be the same on both the left and right.
- The upper surface of the fixture should be level with the upper surface of the arm.
- The tips of the arm should be even with the edge of the adjustment part of the fixture.

▼ **Checking the Upper Arm Position**



If the upper arm position is incorrect, perform adjustment by following the procedure described in **Adjusting the Upper Arm Position (Stand-by (Load)) (see page 627)**.

42 Press HOME. The upper arm returns to the home position.

43 Press OK.

44 Use the following steps to transfer the arm unit to the X axis home position.

NOTE **The following step is for the wide loader specification.**

44.1 Press PREVIOUS MENU on the Item Selection Menu.

44.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

44.3 Press HOME for `Loader X Slide`. The arm unit moves to the X axis home position.

44.4 Press OK.

44.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

NOTE **Go to Adjusting the Upper Arm Position (Stand-by (ID Load)) (see page 637) to perform the adjustment.**

Adjusting the Upper Arm Position (Stand-by (ID Load))

NOTE **The stand-by (ID Load) position checks and adjusts the loader theta position only. Enter the same coordinate as the stand-by (load) position, and check that there is no backlash. Perform the adjustment only if there is backlash. Use the Z axis position that was adjusted in the Adjusting the Upper Arm Position (Stand-by (Load)) (see page 627).**

The arm unit should be at the upper (chuck) position of the Z axis, and at the stand-by (load) position of the theta axis that were adjusted in the Adjusting the Upper Arm Position (Stand-by (Load)) (see page 627).

45 Use the following steps to save the loader theta stand-by (ID load) position.

45.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

45.2 Press INPUT POSITION.

45.3 Press STAND-BY (ID LOAD) on the right side of the menu. A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected. INPUT POSITION is selected.

45.4 Press YES. The new stand-by (ID load) position is saved.

46 Use the following steps to transfer the loader theta to the table position.

46.1 Press MOVE.

46.2 Press TABLE. A check menu is displayed stating, `Do you want to move?`

46.3 Press YES. The loader theta moves to the table position.

46.4 Press STAND-BY (ID LOAD). A check menu is displayed stating, `Do you want to move?`

46.5 Press YES. The loader theta moves to the stand-by (ID load) position.

46.6 Press OK.

47 Use the following steps to transfer the arm unit to the X axis stage position.

NOTE **The following step is for the wide loader specification.**

47.1 Press PREVIOUS MENU on the *Item Selection Menu*.

47.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

47.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

47.4 Press OK.

47.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

48 Use the following steps to transfer the upper arm to the home position.

48.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

48.2 Press ORIGIN. The upper arm moves to the origin position.

48.3 Press HOME. The upper arm moves to the home position.

49 Select INDEX and use the down arrow to move the arm in small increments until it reaches the position shown in the following figure.

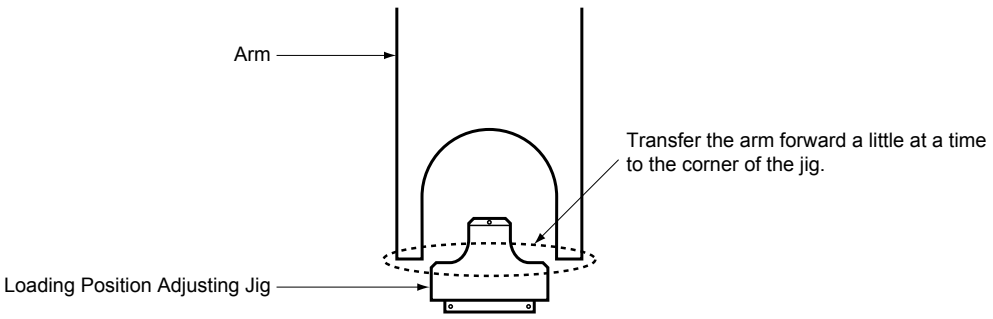
CAUTION **Property Damage Hazard**

Always check that UPPER ARM is selected before moving the arm. If LOWER ARM is selected, and the lower arm is operated, the prober can be damaged.

CAUTION **Property Damage Hazard**

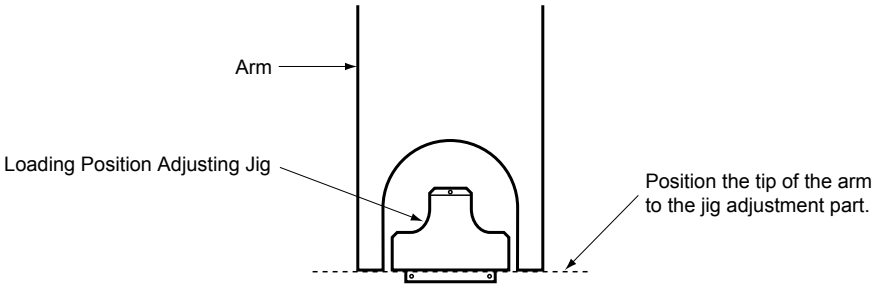
Check that there is no interference between the chuck top or the fixture and the arm when transferring the arm.

Moving Upper Arm



50 Move the upper arm forward in small increments of 100 µm until the tips of the arm are even with the edge of the adjustment part of the fixture.

Upper Arm Position



51 Check the position of the fixture and the upper arm. Check that the following conditions are met:

- The arm does not interfere with the fixture.
- The gap between the arm and the fixture is the same on both the left and right sides.

If the position of the arm is correct, go to step 63.

If the position of the arm is incorrect, go to step 52.

52 Press HOME. The upper arm returns to the home position.

53 Press OK.

54 Use the following steps to transfer the arm unit to the X axis home position.

NOTE **The following step is for the wide loader specification.**

54.1 Press PREVIOUS MENU on the Item Selection Menu.

54.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

54.3 Press HOME for `Loader X Slide`. The arm unit moves to the X axis home position.

54.4 Press OK.

54.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

55 Use the following steps to adjust the upper arm theta axis.

55.1 Press LOADER THETA on the *Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

55.2 Press STEP

55.3 Use the left and right arrows to change the theta position so that there is the same amount of space on each side of the upper arm between the inside of the arms and the fixture.

55.4 Press INPUT POSITION.

55.5 Press STAND-BY (ID LOAD). A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected.** INPUT POSITION **is selected.**

55.6 Press YES. The new stand-by (ID load) position is saved.

56 Use the following steps to transfer the loader theta to the table position.

56.1 Press MOVE.

56.2 Press TABLE. A check menu is displayed stating, `Do you want to move?`

56.3 Press YES. The loader theta moves to the table position.

56.4 Press STAND-BY (ID LOAD). A check menu is displayed stating, `Do you want to move?`

56.5 Press YES. The loader theta moves to the stand-by (ID load) position.

56.6 Press OK.

57 Use the following steps to transfer the arm unit to the X axis stage position.

> **NOTE** **The following step is for the wide loader specification.**

57.1 Press PREVIOUS MENU on the *Item Selection Menu*.

57.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

57.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

57.4 Press OK.

57.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

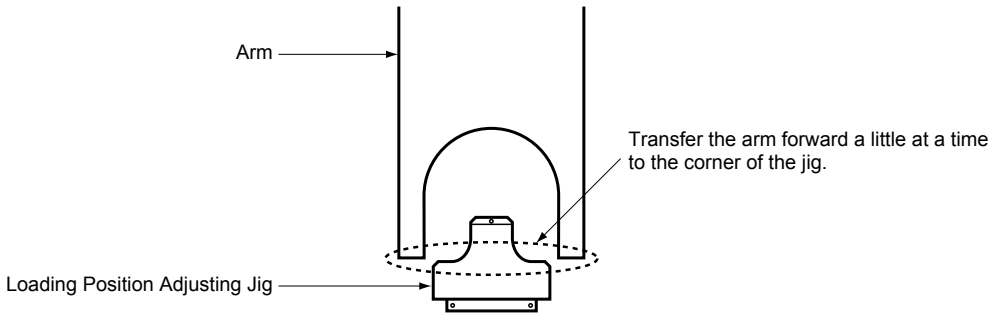
58 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

59 Select INDEX and use the arrows to move the arm until it is positioned as shown in the following figure.

> **CAUTION** **Property Damage Hazard**
> **Always check that** UPPER ARM **is selected before moving the arm. If** LOWER ARM **is selected, and the lower arm is mistakenly operated, the prober can be damaged.**

> **CAUTION** **Property Damage Hazard**
> **Check that there is no interference between the chuck top or the jig and the arm when transferring the arm.**

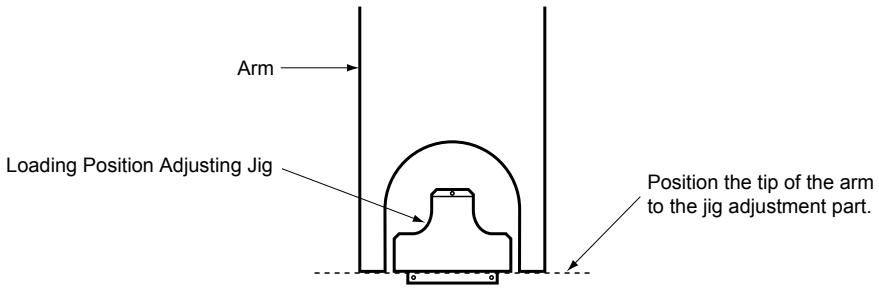
Upper Arm Position



60 Check that there is no interference with the fixture even if the arm is moved forward.

61 Move the upper arm in small increments of 100 µm until the tips of the arm are even with the edge of the fixture.

Upper Arm Position



62 Check the upper arm position and check that all of the following conditions are met:

- The arm does not interfere with the fixture.
- The gap between the arm and the fixture should be the same on both sides of the fixture.

If further adjustments are necessary, as a result of checking, return to step 52 to repeat the adjustment.

63 Press HOME. The upper arm moves to the home position.

64 Press OK.

65 Use the following steps to transfer the arm unit to the X axis home position.

NOTE **The following step is for the wide loader specification.**

65.1 Press PREVIOUS MENU on the *Item Selection Menu*.

65.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

65.3 Press HOME for `Loader X Slide`. The arm unit moves to the X axis home position.

65.4 Press OK.

65.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

NOTE **Go to Adjusting the Lower Arm Position (see page 642) to check the adjustment.**

Adjusting the Lower Arm Position

66 Use the following steps to transfer the loader Z.

66.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

66.2 Set INDEX amount to 16,000 µm.

NOTE **The distance between the upper arm and lower arm is approximately 16000 µm.**

66.3 Press MOVE TO.

66.4 Press the up arrow once. The loader rises 16000 µm.

CAUTION **Property Damage Hazard**

Always check that the arm is at the home position before moving the loader. If the arm is not at the home position, the prober may be damaged.

66.5 Press OK.

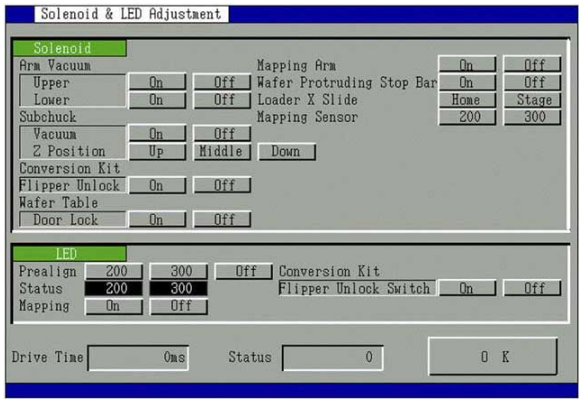
67 Use the following steps to transfer the arm unit to the X axis stage position.

NOTE **The following step is for the wide loader specification.**

67.1 Press PREVIOUS MENU on the *Item Selection Menu*.

67.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

▼ **Solenoid & LED Adjustment Menu**



67.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

67.4 Press OK.

67.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

68 Use the following steps to transfer the lower arm to the home position.

68.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

68.2 Press LOWER ARM.

68.3 Press ORIGIN. The lower arm moves to the origin position.

68.4 Press HOME. The lower arm moves to the home position.

69 Select INDEX and use the down arrow to move the arm in small increments until it reaches the position shown in the following figure.

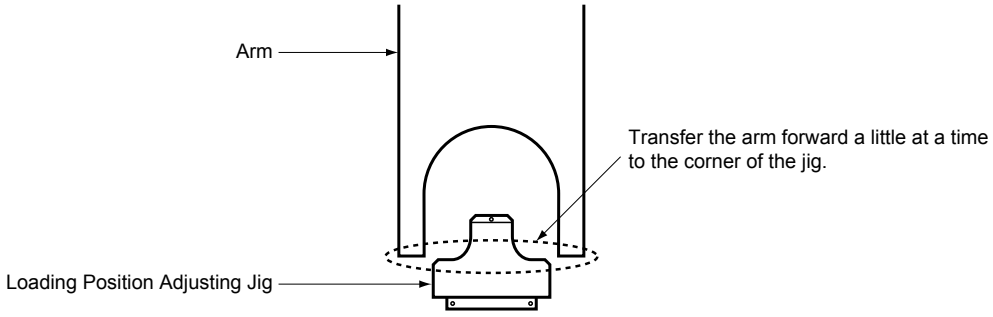
CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the upper arm is operated, the prober can be damaged.

CAUTION **Property Damage Hazard**

Check that there is no interference between the chuck top or the fixture and the arm when transferring the arm.

Moving Lower Arm



70 Check the lower arm height (Z axis).

Measure and record how far apart the fixture upper surface and the lower arm upper surface are.

71 Press HOME. The lower arm returns to the home position.

72 Press OK.

73 Use the following steps to transfer the arm unit to the X axis home position.

NOTE **The following step is for the wide loader specification.**

73.1 Press PREVIOUS MENU on the Item Selection Menu.

73.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

73.3 Press HOME for `Loader X Slide`. The arm unit moves to the X axis home position.

73.4 Press OK.

73.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

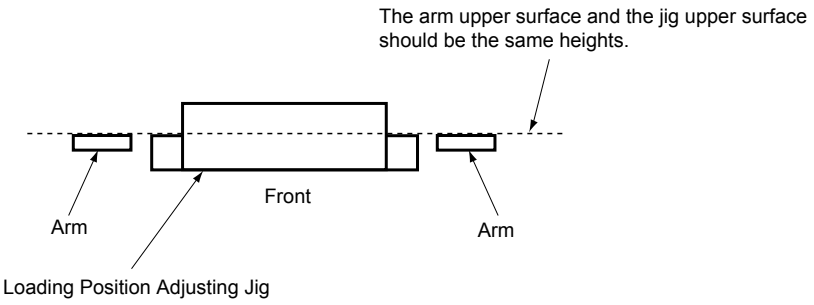
74 Use the following steps to adjust the height of the lower arm (Z axis).

74.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

74.2 Set the INDEX amount to 100 µm.

74.3 Use the up and down arrows to change the Z position so that the surface of the lower arm and the surface of the fixture are level with each other. Refer to the measurements you recorded in step 5.

Adjusting the Lower Arm



74.4 Press SAVE POSITION.

74.5 Press LOWER (CHUCK). A check menu is displayed stating, `Do you want to save?`

CAUTION **Property Damage Hazard**

Verify the following items when saving the specified position in the prober. Failure to verify may cause damage to the prober. The adjustment menu for axis to be saved is selected. SAVE POSITION **is selected.**

74.6 Press YES. The lower (chuck) position is saved.

74.7 Press OK.

75 Use the following steps to transfer the arm unit to the X axis stage position.

NOTE **The following step is for the wide loader specification.**

75.1 Press PREVIOUS MENU on the *Item Selection Menu*.

75.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

75.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

75.4 Press OK.

75.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

76 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

77 Press LOWER ARM.

78 Select INDEX and use the arrows to move the arm until it is positioned as shown in the following figure.

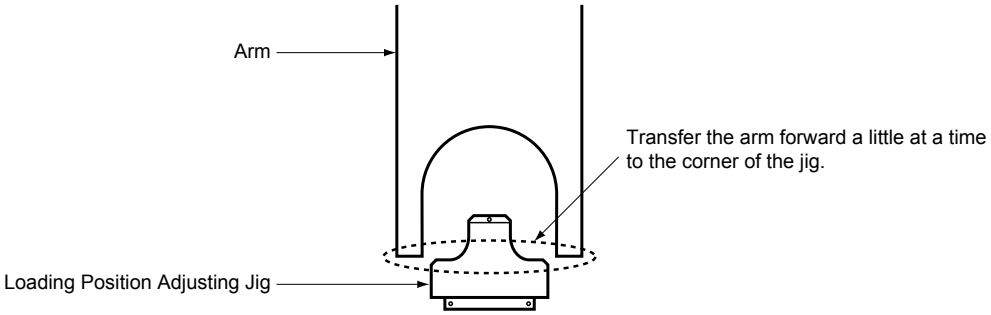
CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the upper arm is mistakenly operated, the prober can be damaged.

CAUTION **Property Damage Hazard**

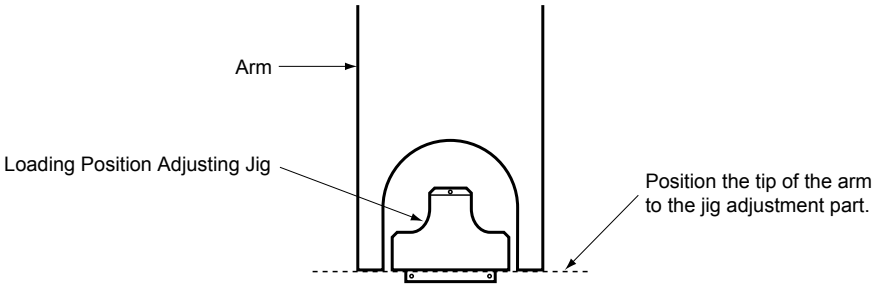
Check that there is no interference between the chuck top or the jig and the arm when transferring the arm.

▼ **Lower Arm Position**



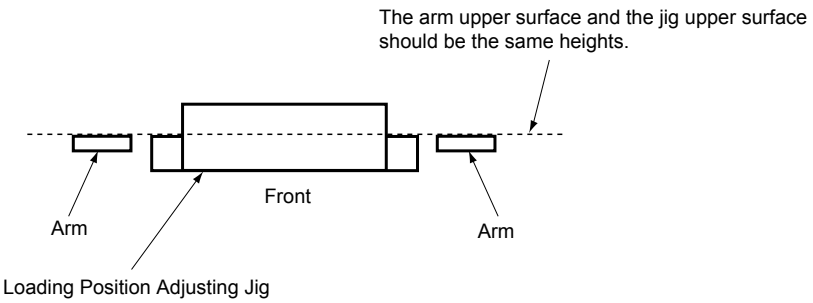
79 Move the lower arm in small increments of 100 µm until the tips of the arm are even with the edge of the fixture.

▼ **Lower Arm Position**



80 Check that the upper surface of the fixture and the upper surface of the arm are level with each other.

▼ **Checking the Arm Position**



If further adjustments are necessary, as a result of checking, return to step 70 to repeat the adjustment.

81 Use the following steps to save the lower arm loading position.

81.1 Make sure that LOWER ARM is selected.

81.2 Press INPUT.

81.3 Press MAIN CHUCK. A check menu is displayed stating, `Do you want to save?`

> **CAUTION** **Property Damage Hazard**
> **Verify the following items when saving the specified position of the arm in the prober. Failure to verify may cause damage to the prober. The *Arm Adjustment Menu* is selected. INPUT is selected. The upper/lower arm is selected correctly.**

81.4 Press YES. The lower arm loading position is saved.

81.5 Press MOVE.

81.6 Press HOME. The lower arm moves to the home position.

81.7 Press OK.

82 Use the following steps to transfer the arm unit to the X axis home position.

NOTE **The following step is for the wide loader specification.**

82.1 Press PREVIOUS MENU on the *Item Selection Menu*.

82.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

82.3 Press HOME for `Loader X Slide`. The arm unit moves to the X axis home position.

82.4 Press OK.

82.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

NOTE **Go to Checking the Lower Arm Position (see page 646) to check the adjustment.**

Checking the Lower Arm Position

83 Use the following steps to transfer the loader theta to the stand-by (load) position.

83.1 Press LOADER THETA on the *Loader Item Selection Menu*. The *Loader Theta Adjustment Menu* is displayed.

83.2 Press ORIGIN. The loader theta moves to the origin position.

83.3 Press HOME. The loader theta moves to the home position.

83.4 Press MOVE.

83.5 Press STAND-BY (LOAD). A check menu is displayed stating, `Do you want to move?`

83.6 Press YES. The loader theta moves to the stand-by (load) position.

83.7 Press OK.

84 Use the following steps to transfer the loader Z to the lower (chuck) position.

84.1 Press LOADER Z on the *Item Selection Menu*. The *Loader Z Adjustment Menu* is displayed.

84.2 Press ORIGIN. The loader Z moves to the origin position.

84.3 Press HOME. The loader Z moves to the home position.

84.4 Press MOVE.

84.5 Press LOWER (CHUCK). A check menu is displayed stating, `Do you want to move?`

84.6 Press YES. The loader Z moves to the lower (chuck) position.

84.7 Press OK.

85 Use the following steps to transfer the arm unit to the X axis stage position.

NOTE **The following step is for the wide loader specification.**

85.1 Press PREVIOUS MENU on the *Item Selection Menu*.

85.2 Press SOLENOID & LED ADJUSTMENT on the *Item Selection Menu*. The *Solenoid & LED Adjustment Menu* is displayed.

85.3 Press STAGE for `Loader X Slide`. The arm unit moves to the X axis stage position.

85.4 Press OK.

85.5 Press ALL AXES ADJUSTMENT. The *Item Selection Menu* is displayed.

86 Use the following steps to transfer the lower arm to the home position.

86.1 Press ARM (UPPER/LOWER) on the *Item Selection Menu*. The *Arm Adjustment Menu* is displayed.

86.2 Press LOWER ARM.

86.3 Press ORIGIN. The lower arm moves to the origin position.

86.4 Press HOME. The lower arm moves to the home position.

87 Use the following steps to transfer the lower arm to the loading position.

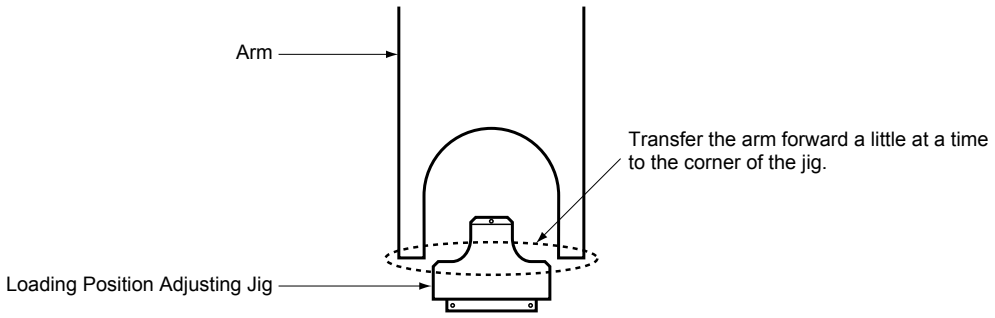
CAUTION **Property Damage Hazard**

Always check that LOWER ARM is selected before moving the arm. If UPPER ARM is selected, and the upper arm is operated, the prober can be damaged.

87.1 Press MOVE.

87.2 Select INDEX and use the down arrow to move the arm in small increments until it reaches the position shown in the following figure.

Moving Lower Arm



87.3 Check that there is no interference with the fixture even if the lower arm is moved forward.

87.4 Press MAIN CHUCK. A check menu is displayed stating, `Do you want to move?`

87.5 Press YES. The lower arm moves to the loading position.

88 Check that the tips of the arm are even with the edge of the adjustment part of the fixture.

If the lower arm position is incorrect, perform adjustment by following the procedure described in **Adjusting the Lower Arm Position (see page 642)**.

89 Press HOME. The lower arm returns to the home position.

90 Press OK.

NOTE **Go to Restoring to Normal Operating Conditions (see page 648) to complete the procedure and restore the prober to normal operating conditions.**

Restoring to Normal Operating Conditions

91 Remove the fixture from the chuck top.

CAUTION **Property Damage Hazard**

Always lift the fixture straight up when you remove it. If you lift the fixture at an angle, you can damage the 3-pins.

92 Remove the protective Mylar sheet from the chuck top.

93 Enable the head plate interlock, then close the head plate.

WARNING **Mechanical Hazard**

Be sure to enable the interlock after completing maintenance. If the interlock is not enabled during operation, serious injury may occur.

94 Press PREVIOUS MENU on the *Item Selection Menu*.

95 Press PREVIOUS MENU on the *Item Selection Menu*.

96 Press PREVIOUS MENU on the *Adjustments Menu*.

97 Press INITIALIZE on the *Diagnostics Menu*.

98 Press SYSTEM on the *Initialize Menu*. The prober initializes.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

7.21 Checking and Adjusting the FOUP Opener Presence Sensor 1325.2

Introduction

Purpose:

To verify that the FOUP opener sensor is operating correctly. If the sensor is not operating correctly, adjust the sensitivity of the presence sensor.

Required Resources:

Time:	30 minutes
Personnel:	1 person
Tools:	#2 Phillips-head screwdriver Flat-blade screwdriver
Parts or Consumables:	FOUP

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

Checking the FOUP Opener Presence Sensor

NOTE **If you are using a dual port loader, repeat this procedure for each load port.**

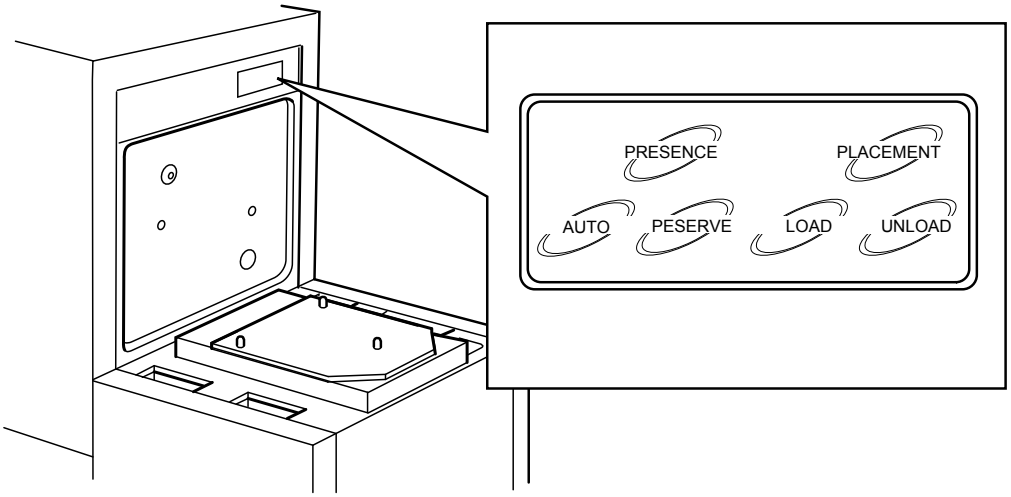
1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.

- If the prober is disabled, release the lockout and tagout and power on the prober by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Check that the **Presence** LED is OFF and is not flashing while there is no FOUP on the load port.

FOUP Set LEDs



3 Use the following steps to display the *Sensor Check Menu*.

3.1 Press DIAGNOSTICS on the *Diagnostics Menu* is displayed.

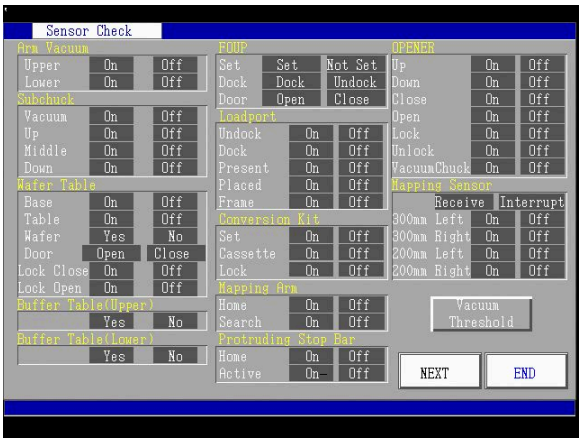
3.2 Press ADJUSTMENTS on the *Diagnostics Menu*. A password menu is displayed.

3.3 Enter your password on the numeric keypad and press INPUT. The *Adjustments Menu* is displayed.

3.4 Press LOADER on the *Adjustments Menu*. The *Loader Item Selection Menu* is displayed.

3.5 Press SENSOR CHECK on the first page of the *Item Selection Menu*. The *Sensor Check Menu* is displayed.

Sensor Check Menu

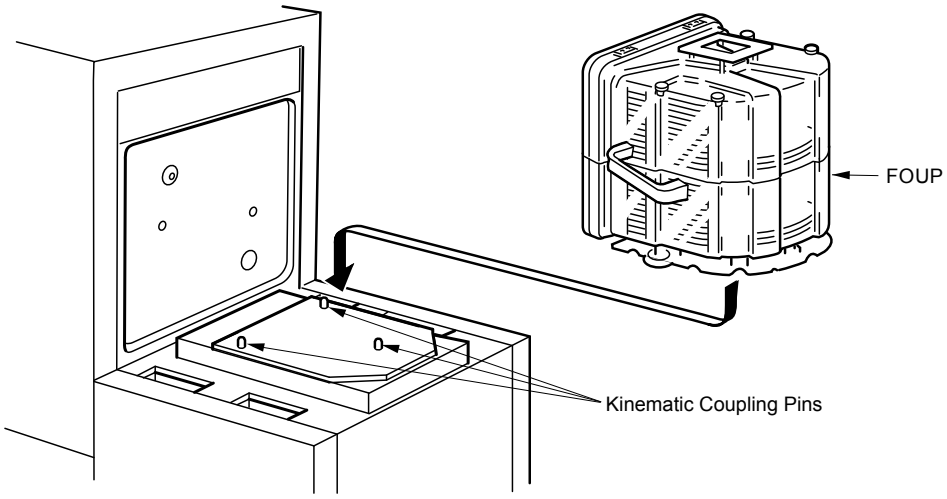


4 Check that `OFF` is highlighted next to the `Present` and `Placed` indicators under `Load Port`.

5 Check that the load port is in the undocked position.

6 Set a FOUP on the load port, being sure to align the kinematic coupling pins on the load port to the holes on the bottom of the FOUP.

Setting the Load Port



NOTE **Be sure that there is no interference between the FOUP lid and the FOUP opener.**

7 Check that the **Presence** and **Placement** LEDs are ON.

On the *Sensor Check Menu*, check that `ON` is highlighted next to the `Present` and `Placed` indicators under `Load Port`.

If either of the sensors do not turn ON, perform the necessary adjustment using the procedure provided.

NOTE **Check that all the LEDs on the FOUP have turned ON for all the products that you will use.**

8 Press END on the *Sensor Check Menu*. The *Loader Item Selection Menu* is displayed.

9 Press PREVIOUS MENU.

10 Press MAIN MENU.

Adjusting the FOUP Opener Presence Sensor

11 Check that there is no FOUP on the load port.

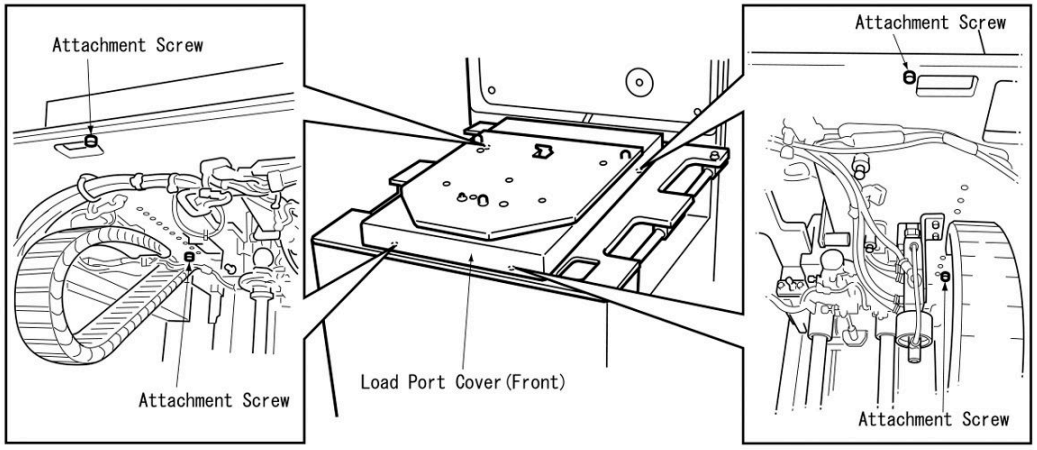
12 Perform a system shutdown by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

13 Remove the loader front cover by following the procedure described in **4.6.7 Removing and Attaching the Loader Front Cover (Single Port and Wide Loader) (see page 126)** or **4.7.3 Removing and Attaching the Loader Front Cover (Dual Port) (see page 135)**.

14 Remove the FOUP opener inside panel by following the procedure described in **4.6.8 Removing and Attaching the FOUP Opener Inside Panel (Single Port and Wide Loader) (see page 128)**.

15 Remove the 4 load port cover attachment screws from the inside of the loader, then remove the load port cover (front).

▼ **Load Port Cover**



16 Perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.

CAUTION **Property Damage Hazard**

Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

17 Check that the load port is in the undocked position.

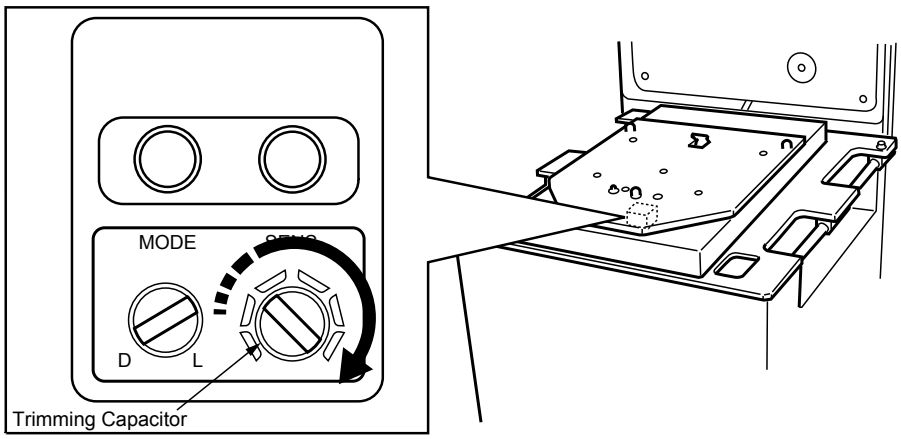
18 Set a FOUP on the load port, being sure to align the kinematic coupling pins on the load port to the holes on the bottom of the FOUP.

NOTE **Be sure that there is no interference between the FOUP lid and the FOUP opener.**

19 Use the following steps to adjust the sensor.

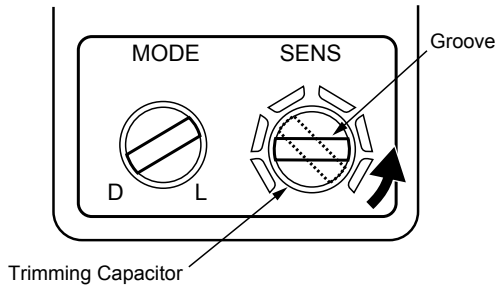
19.1 Use a flat-tipped screwdriver to rotate the trimmer capacitor clockwise until it stops.

▼ **Trimming Capacitor**



19.2 Rotate the trimming capacitor counterclockwise approximately 45° so that the groove of the trimming capacitor is in the horizontal position.

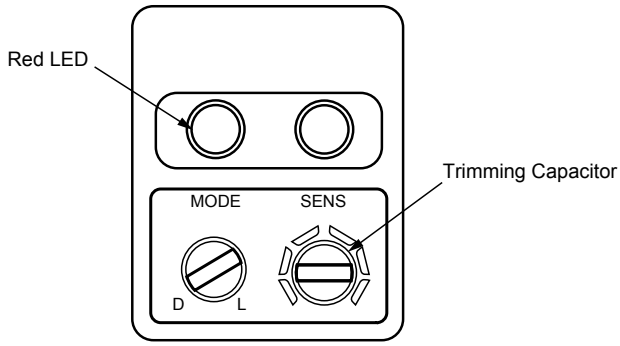
Trimming Capacitor (Horizontal Position)



19.3 Gently turn the trimming capacitor counterclockwise until the red LED above the trimming capacitor is OFF.

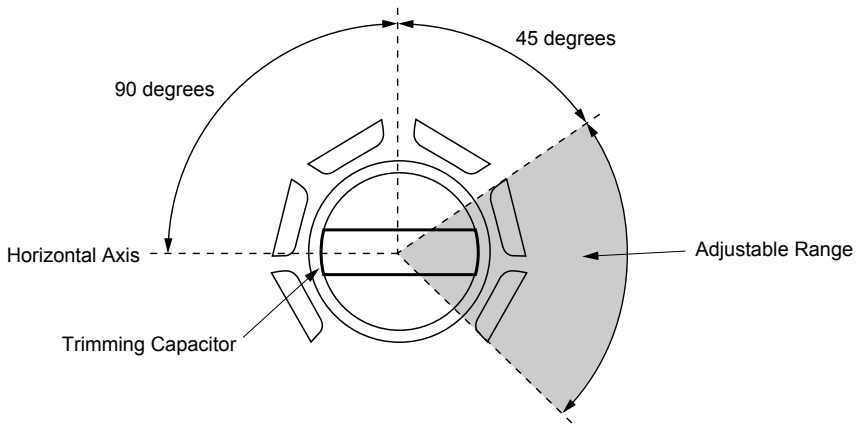
NOTE **If you rotate the groove beyond the adjustable range, contact TEL Field Service Support.**

LED



Rotate the groove of the trimming capacitor within the adjustable range indicated in the following graphic.

Adjustable Range



NOTE **Turning the trimming capacitor clockwise causes the light to shine more brightly. Alternately, turning the trimming capacitor counterclockwise causes the light to shine less brightly.**

20 After adjusting the trimming capacitor, place the FOUP in the following positions and check that the **Presence** LED is ON and the **Placement** LED is OFF.

- Shift the FOUP approximately 7 cm to the right of the normal position.
- Shift the FOUP approximately 7 cm to the left of the normal position.
- Shift the FOUP approximately 3 cm to the forward of the normal position.
- Rotate the FOUP approximately 90° clockwise from the normal position.
- Rotate the FOUP approximately 120° clockwise from the normal position.
- Rotate the FOUP approximately 180° clockwise from the normal position.

21 After checking the FOUP placement, perform a system shutdown and lockout and tagout the prober by following the procedure described in **2.2 Performing Lockout and Tagout on the Prober (see page 49)**.

22 Reattach the load port cover (front) using the 4 attachment screws.

23 Reattach the FOUP opener inside panel by following the procedure described in **4.6.8 Removing and Attaching the FOUP Opener Inside Panel (Single Port and Wide Loader) (see page 128)**.

24 Reattach the loader front cover by following the procedure described in **4.6.7 Removing and Attaching the Loader Front Cover (Single Port and Wide Loader) (see page 126)** or **4.7.3 Removing and Attaching the Loader Front Cover (Dual Port) (see page 135)**.

7.22 Performing FOUP Indexer Registration 0565.2

Introduction

Purpose:

Any FOUP that does not conform to SEMI standards must be registered manually. This section describes how to perform FOUP indexer registration. This procedure describes how to access and save the settings in the *Cassette Input Menu*, and provides a table describing and explaining each menu option. This procedure also describes how to access and save the settings in the *Raise Indexer Z Menu*, and provides a table describing and explaining each menu option.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Non-SEMI standard FOUP

Performing FOUP Indexer Registration

1 Load the FOUP that needs to be registered onto the load port. The FOUP must contain at least one wafer.

2 Use the following steps to access the *Cassette Input Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

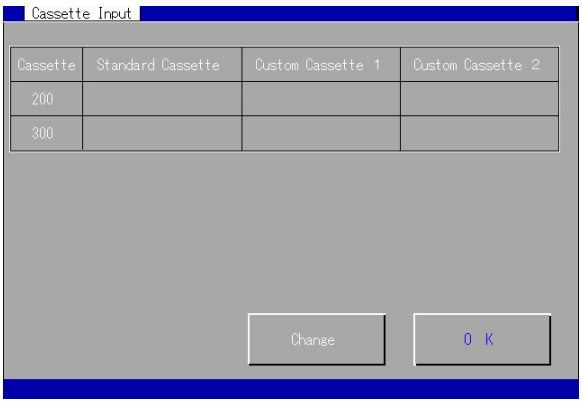
2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press LOADER on the *Adjustments Menu*.

2.5 Press REGISTER CASSETTE on the *Loader Item Selection Menu*. If REGISTER CASSETTE is not displayed on the list, use the scroll arrows to change the display. The *Cassette Input Menu* is displayed.

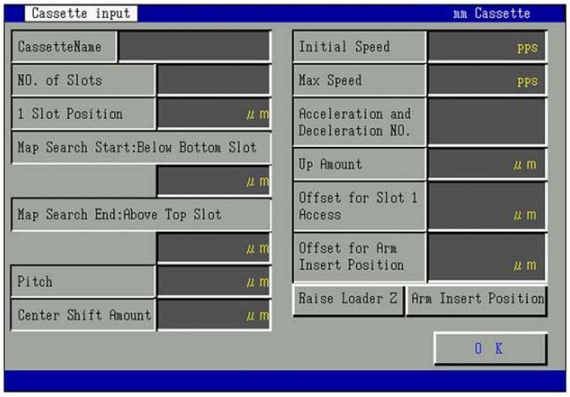
▼ **Cassette Input Menu**



3 Press the display area corresponding to the correct FOUP size and location (in either custom Cassette 1 or custom Cassette 2). The designated area is displayed in a yellow frame.

4 Press CHANGE. The *Cassette Input Parameters Menu* is displayed.

▼ **Cassette Input Parameters Menu**

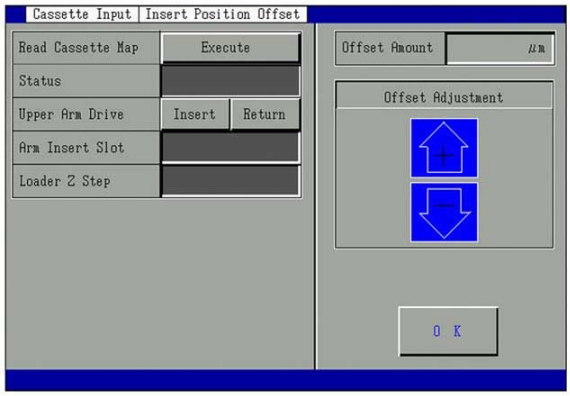


5 Record the current `Up Amount` value.

6 Set each parameter on the *Cassette Input Parameters Menu*. Refer to the **Cassette Input Parameters Tables** in **Cassette Input Parameters (see page 660)** for a description and an explanation of each menu option.

7 Press RAISE LOADER Z. The *Raise Indexer Z Menu* is displayed. Refer to the **Raise Loader Z Parameters Table** in **Raise Loader Z Parameters (see page 666)** for a description and an explanation of each menu option.

Raise Indexer Z Menu



8 Press EXECUTE for `Read Cassette Map`. A wafer search is performed. The result of the wafer search is displayed in `Status`.

9 Verify that `Status` displays 0.

- If 0 is displayed in `Status`, go to Step 10.
- If a number other than 0 is displayed in `Status`, an error has occurred with the wafer search. Check the values input in step 5 and retry the wafer search.

10 Press the display area adjacent to `Arm Insert Slot`. A numeric keypad is displayed. Input the slot number for the wafer to be used in this calibration. Press OK on the numeric keypad.

11 Press INSERT for `Upper Arm Drive`. The loader Z lowers and the upper arm is inserted into the slot specified in the previous step.

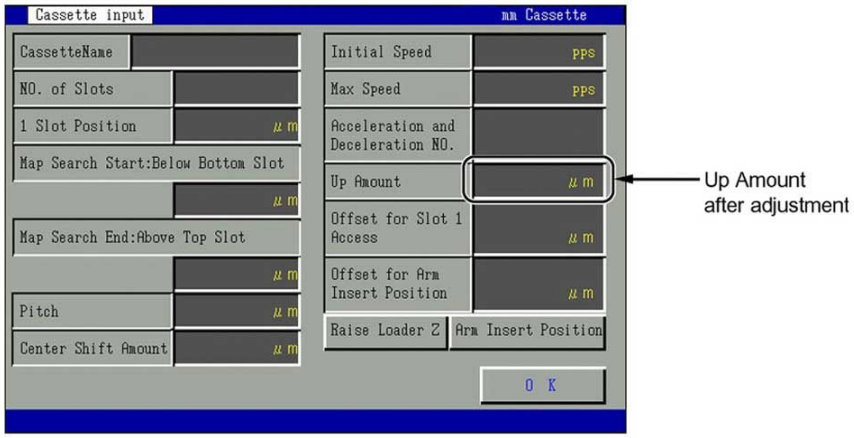
12 Use the arrow buttons to adjust the wafer up position. Raise the loader Z until the wafer is in the middle of its slot.

- Press the DOWN arrow for `Rise Adjustment` to lower the loader Z.
- Press the UP arrow for `Rise Adjustment` to raise the loader Z.

13 After adjusting the position, press RETURN. The upper arm moves to its original position.

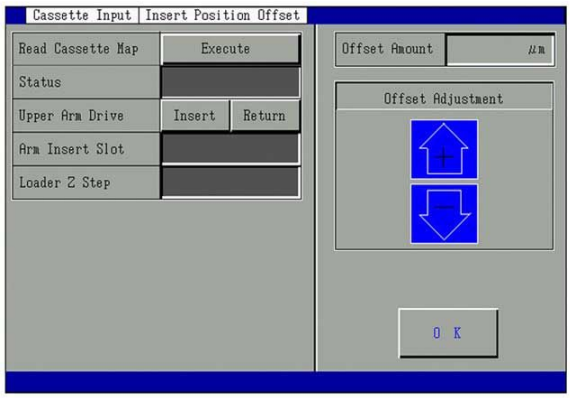
14 Press OK. The new `Up Amount` is displayed on the *Cassette Input Parameter Menu*.

Cassette Input Parameter Menu



15 Press ARM INSERT POSITION. The *Insert Position Offset Menu* is displayed. Refer to the **Insert Position Offset Menu Table** in **Insert Position Offset Menu (see page 667)** for a description and an explanation of each menu option.

Insert Position Offset Menu



16 Press EXECUTE for `Read Cassette Map`. A wafer search is performed. The result of the wafer search is displayed in `Status`.

CAUTION **Mechanical Hazard**

The load port will move and can pose a pinch hazard to personnel. Stay clear of the load port when it is moving.

17 Verify that `Status` displays 0.

If a number other than 0 is displayed in `Status`, an error has occurred with the wafer search. Check the values input in step 5 and retry the wafer search.

18 Press INSERT for `Upper Arm Drive`. The loader Z lowers and the upper arm is inserted into the slot (default = 1) displayed in `Arm Insert Slot`.

19 Press OFFSET ADJUSTMENT to adjust the up position of the wafer.

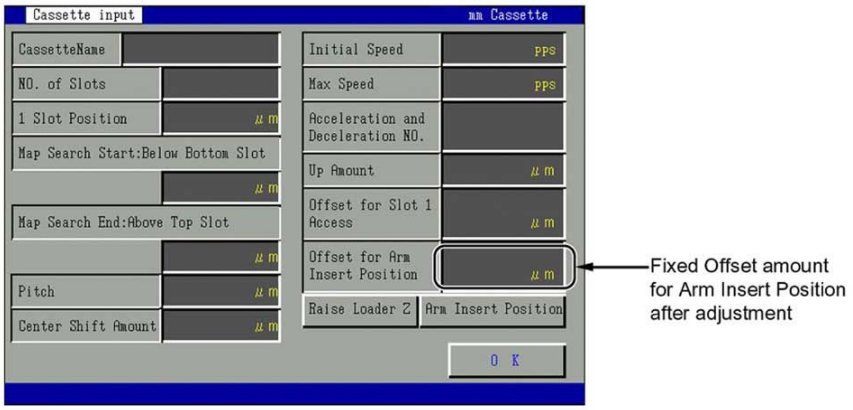
- Press the DOWN arrow for `Offset Adjustment` to lower the loader Z.
- Press the UP arrow for `Offset Adjustment` to raise the loader Z.

Raise or lower the arm so that it will not contact the wafer above or below it.

20 After adjusting the position, press RETURN for `Upper Arm Drive`. The upper arm moves to its original position.

21 Press OK. The new `Up Amount` is displayed on the *Cassette Input Parameter Menu*.

Cassette Input Parameters Menu



22 Use the following steps to initialize the stage and loader.

22.1 Press OK twice on the *Cassette Input Parameters Menu*. The *Loader Item Selection Menu* is displayed.

22.2 Press PREVIOUS MENU on the *Loader Item Selection Menu*.

22.3 Press MAIN MENU on the *Adjustments Menu*.

22.4 Press DIAGNOSTICS on the *Main Menu*.

22.5 Press INITIALIZE on the *Diagnostics Menu*.

22.6 Press SYSTEM on the *Initialize Menu*. The stage and loader initialize.

> **CAUTION** **Property Damage Hazard**
> **Always remove any tools, wipes, or other objects from the stage area when powering on or initializing the prober.**

22.7 Unload the FOUP.

Cassette Input Parameters

23 Use the following steps to display the *Cassette Input Menu*.

23.1 Press DIAGNOSTICS on the *Main Menu*.

23.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

23.3 Input your password on the numeric keypad and press INPUT.

23.4 Press LOADER on the *Adjustments Menu*.

23.5 Press REGISTER CASSETTE on the *Loader Item Selection Menu*. If REGISTER CASSETTE is not displayed on the list, use the scroll arrows to change the display.

24 Press the display area for the correct FOUP size and location (in either custom FOUP 1 or custom FOUP 2). The designated area is displayed in a yellow frame.

25 Press CHANGE. The *Cassette Input Parameters Menu* is displayed.

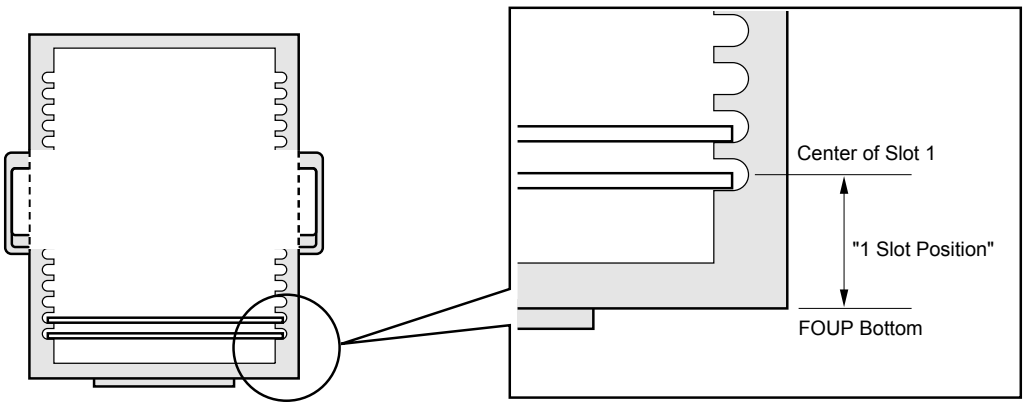
▼ **Cassette Input Parameters Menu**

26 Set the parameters. Use the following tables for descriptions and explanations of each menu option.

▼ **Cassette Input Parameters**

Parameter Name	Setting/Range	Contents
Cassette Name	20 alphanumeric characters	Sets the name for inputting the FOUP data.
No. of Slots	0–99	Sets the number of slots on the FOUP.
1 Slot Position	0–99,999 μm	Sets the dimensions from the bottom of the FOUP to the center of slot 1. Use the numeric keypad to input the dimensions (based on the FOUP design drawings) and press OK.

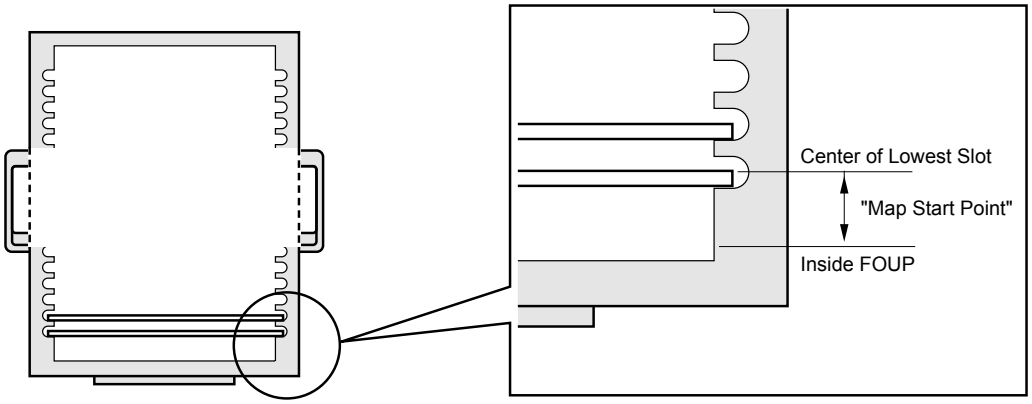
Slot 1 Positions Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Map Search End: Below Bottom Slot	0–99,999 µm	This parameter determines where the wafer search sensors should start looking for wafers in the FOUP. The value input is the distance between the wafer in slot one and the bottom of the inside of the FOUP. (Refer to the drawing.) Use the numeric keypad to input the dimensions based on FOUP design drawings OK. **NOTE** **If the start position is set outside of the range, problems could occur or the arm could be damaged.**

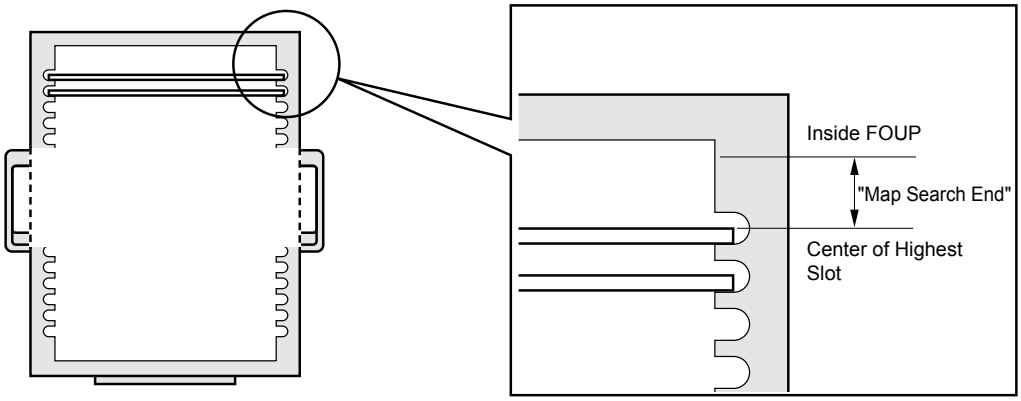
Map Ending Point Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Map Search End: Above Top Slot	-9,999–9,999 µm	Displays the end position of the map search. The wafer search ending point is the setting from the center of the highest slot in the FOUP to the top surface of the inside of the FOUP. Use the numeric keypad to input the dimensions based on the FOUP design drawings and press OK. **NOTE** **If the starting position is set outside of the range, problems could occur or the arm could be damaged.**

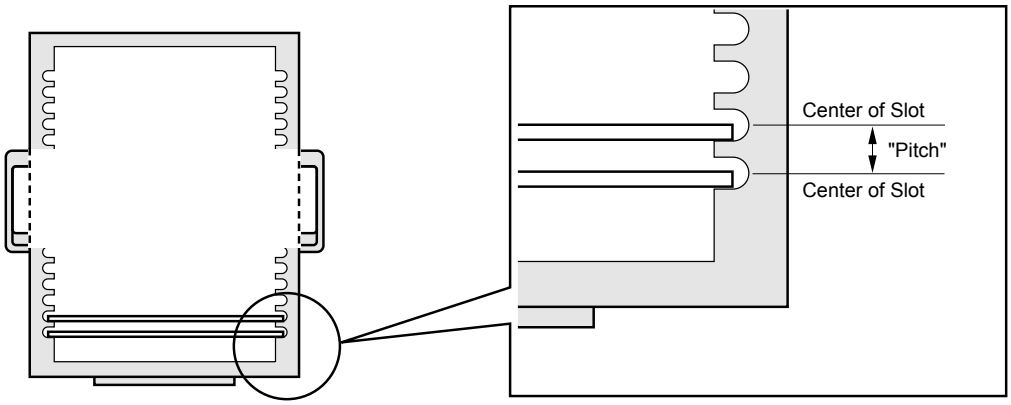
Map Ending Point Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Pitch	0–99,999 µm	Sets the dimensions between each slot center. Use the numeric keypad to input the dimensions based on the FOUP design drawings and press OK.

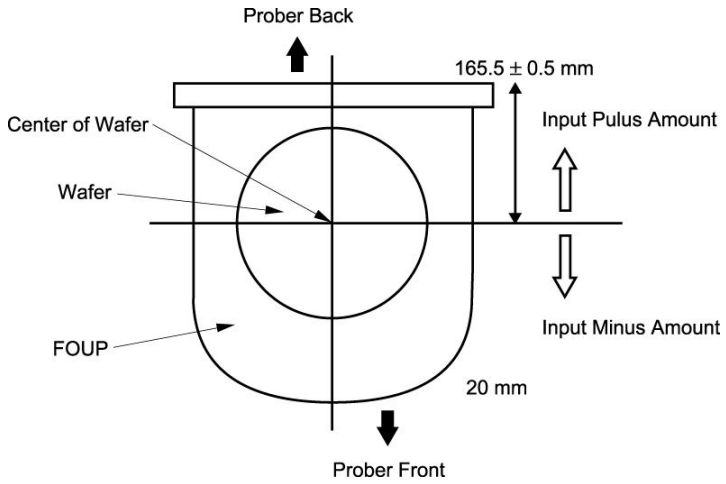
Pitch Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Center Shift Amount	-6000–9,999 µm	Displays the wafer center position for wafers stored in a non-SEMI standard FOUP. If the H bar on the FOUP is shifted forward or backward, input a positive or negative shift amount so the arm will know how to retrieve the wafer. • If the wafer center position is toward the front of the prober when compared to the center of the FOUP, input a negative value. • If the wafer center position is toward the back of the prober when compared to the center of the FOUP, input a positive value.

Center Shift-Amount Setting Value



FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Initial Speed	0–99,999 pps (Pulse Per Second)	Displays the motor initial drive speed for moving the loader Z.
Max. Speed	0–99,999 pps	Displays the maximum speed of the motor for moving the loader Z.
Acceleration and Deceleration NO.	0–19	Displays the acceleration and deceleration speeds of the loader Z motor. Input the acceleration and deceleration speeds and press OK. The speeds shown are in ms/1000 pps. **NOTE** **Refer to the Acceleration/Deceleration Codes Table below when inputting the speeds.**

Acceleration/Deceleration Codes Table

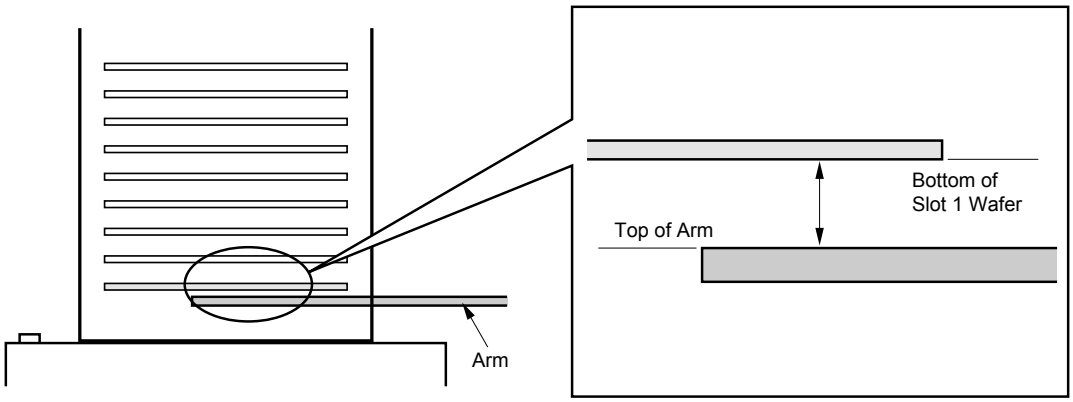
Acceleration/Deceleration Codes										
Code	0	1	2	3	4	5	6	7	8	9

Acceleration/Deceleration Codes										
Acceleration/Deceleration Speed (ms/1000 pps)	1000	800	600	500	400	300	200	150	125	100
Code	10	11	12	13	14	15	16	17	18	19
Acceleration/Deceleration Speed (ms/1000 pps)	75	50	30	20	15	10	7.5	5.0	4.0	2.0

FOUP Input Parameters

Parameter Name	Setting/Range	Contents
Up Amount	0–9,999 µm	Displays the rising amount of the loader Z when the upper arm takes the wafer from the FOUP.
Offset for Slot 1 Access/ Arm Insertion Position	0–9,999 µm	Displays the slot insertion position for the upper arm. The arm should enter the slot slightly below the wafer being removed. This parameter determines the gap between the bottom of the wafer and the upper surface of the arm.

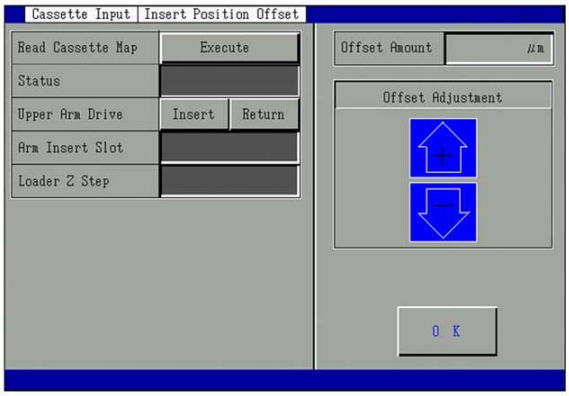
Slot 1 Access Position Offset Amount



Raise Loader Z Parameters

27 Press RAISE INDEXER Z on the *Raise Indexer Z Menu*. The *Raise Loader Z Menu* is displayed.

▼ **Raise Loader Z Menu**



28 Set each parameter. Refer to the table below for a description and explanation of each menu option.

▼ **Raise Loader Z Parameters**

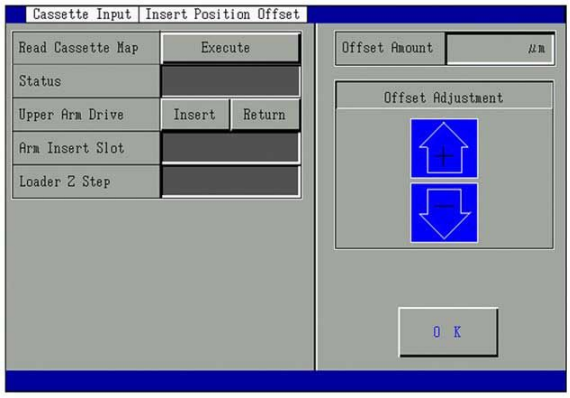
Parameter Name	Setting/Range	Contents
Read Cassette Map	EXECUTE	Initiates the wafer search.
Status	Mapping Result	Displays the results of the wafer search. If 0 is displayed as a result, mapping will be performed normally. If a nonzero value is displayed as a result, an error will occur in mapping.
Upper Arm Drive	INSERT, RETURN	Press INSERT to move the upper arm into the arm insert slot; press RETURN to drive the upper arm to its home position.
Arm Insert Slot	0–99	Displays the slot position when adjusting the "up" amount. Input the slot number.
Loader Z Step	0–99	Displays the loader Z movement amount when the rise adjustment arrows are pressed. Use the numeric keypad to input the preferred Z movement amount (1 step equals a 10 µm Z movement) and press OK.

29 After confirming all of the settings, press OK on the *Raise Loader Z Menu*. A check menu is displayed stating Write the Options? If the settings are correct, press YES. The settings are input and the *Hardware Options Item Selection Menu* is displayed.

Insert Position Offset Menu

30 Press ARM INSERT POSITION on the *Cassette Input Parameter Menu*. The *Insert Position Offset Menu* is displayed.

▼ **Insert Position Offset Menu**



31 Set the parameters. Refer to the following table for descriptions and explanations of each menu option.

▼ **Raise Loader Z Parameters**

Parameter Name	Setting/Range	Contents
`Read Cassette Map`	EXECUTE	Initiates the wafer search.
`Status`	Mapping Result	Displays the results of the wafer search. If `0` is displayed as a result, mapping will be performed normally. If a nonzero value is displayed as a result, an error will occur in mapping.
`Upper Arm Drive`	INSERT, RETURN	Press INSERT to move the upper arm into the arm insert slot; press RETURN to drive the upper arm to its home position.
`Arm Insert Slot`	0–99	Displays the slot position when adjusting the "up" amount. Input the slot number.
`Loader Z Step`	0–99	Displays the loader Z movement amount when the rise adjustment arrows are pressed. Use the numeric keypad to input the preferred Z movement amount (1 step equals a 10 μm Z movement) and press OK.

32 After confirming all of the settings, press OK on the *Insert Position Offset Menu*. A check menu is displayed stating `Write the Options?` If the settings are correct, press YES. The settings are input and the *Hardware Options Item Selection Menu* is displayed.

7.23 Checking the Prealignment Accuracy 1480.2

Introduction

Purpose:

To check the prealignment accuracy.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers (one of each type)

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **Perform the following procedure for each type of wafer to be tested. There are four wafer types:**

300 mm wafer with a notch;

300 mm wafer with an orientation flat;

200 mm wafer with a notch;

200 mm wafer with an orientation flat.

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Stage Adjustments Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK. The *Stage Adjustments Menu* is displayed.

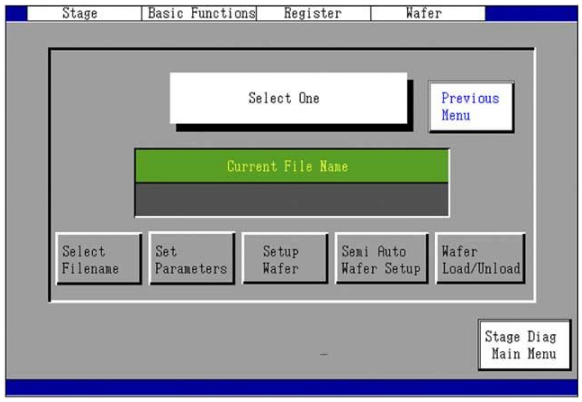
3 Use the following steps to create a new wafer file name.

3.1 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

3.2 Press INPUT on the *Basic Functions Menu*.

3.3 Press WAFER on the *Register Menu*. The *Wafer Menu* is displayed.

Wafer Menu



3.4 Press SELECT FILENAME on the *Wafer Menu*.

4 Press SET PARAMETERS on the *Wafer Menu*. Set the parameters for the wafer to be used.

5 Press WAFER LOAD/UNLOAD on the *Wafer Menu*.

6 Select the wafer location to load the wafer.

7 Press SEMI AUTO WAFER SETUP on the *Wafer Menu*. Follow the directions on the menu to enter the macro pattern. The prober performs the wafer alignment in the macro field view after the macro pattern is entered.

NOTE **Refer to the procedure for creating a basic setup file in the P-12XL Advanced Operations Manual for information on how to enter the macro pattern.**

8 Check that the theta axis stage coordinate is between -5000 and 5000/10000°. If the value is outside the specification, press CANCEL, then perform the adjustment by following the procedure described in **7.24 Adjusting the Prealignment Accuracy (see page 671)**.

9 Press CANCEL. Press PREVIOUS MENU on the *Wafer Menu*.

10 Use the following steps to unload the wafer.

10.1 Press WAFER LOAD/UNLOAD on the *Stage Functions Menu*.

10.2 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

11 Use the following steps to display the *Main Menu*.

11.1 Press STAGE DIAG MAIN MENU on the *Wafer Transfer Menu*.

11.2 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO. The *Main Menu* is displayed.

7.24 Adjusting the Prealignment Accuracy 1481.2

Introduction

Purpose:

To adjust the prealignment accuracy.

Required Resources:

Time:	20 minutes
Personnel:	1 person
Tools:	None
Parts or Consumables:	Wafers (one of each type)

NOTE **The work performed in this procedure is classified as Hot Work Type 2. Refer to 2.1 Types of Hot Work (see page 48) for details.**

NOTE **Perform the following procedure for each type of wafer to be tested. There are four wafer types:**

300 mm wafer with a notch;

300 mm wafer with an orientation flat;

200 mm wafer with a notch;

200 mm wafer with an orientation flat.

1 Use one of the following methods to begin the procedure.

CAUTION **Property Damage Hazard**
Always remove any tools, wipes, or other objects from the FOUP and loader areas when powering on or initializing the prober.

- If the power is disabled, restore power and perform system startup by following the procedure described in **2.3 Releasing Lockout and Tagout on the Prober (see page 52)**.
- If the prober is powered on, perform a system initialization by following the procedure described in **4.3 Initializing the Prober (see page 98)**.

2 Use the following steps to display the *Stage Adjustments Menu*.

2.1 Press DIAGNOSTICS on the *Main Menu*.

2.2 Press ADJUSTMENTS on the *Diagnostics Menu*.

2.3 Input your password on the numeric keypad and press INPUT.

2.4 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK. The *Stage Adjustments Menu* is displayed.

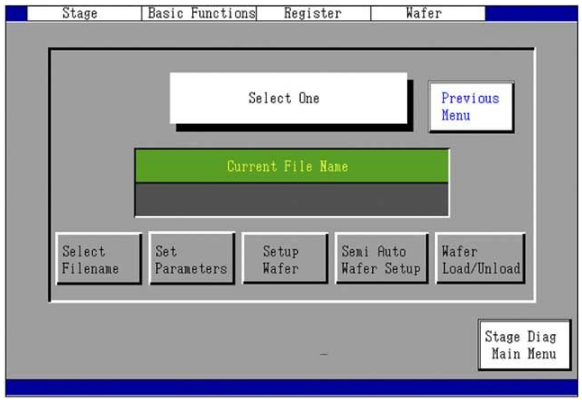
3 Use the following steps to create a new wafer file name.

3.1 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

3.2 Press INPUT on the *Basic Functions Menu*.

3.3 Press WAFER on the *Register Menu*. The *Wafer Menu* is displayed.

Wafer Menu



3.4 Press SELECT FILENAME on the *Wafer Menu*.

4 Press SET PARAMETERS on the *Wafer Menu*. Set the parameters for the wafer to be used.

5 Press WAFER LOAD/UNLOAD on the *Wafer Menu*.

6 Select the wafer location to load the wafer.

7 Press SEMI AUTO WAFER SETUP on the *Wafer Menu*. Follow the directions on the menu to enter the macro pattern. The prober performs the wafer alignment in the macro field view after the macro pattern is entered.

NOTE **Refer to the procedure for creating a basic setup file in the P-12XL Advanced Operations Manual for information on how to enter the macro pattern.**

8 Record the value of the theta axis stage coordinate.

9 Use the following steps to unload the wafer.

9.1 Press CANCEL on the *Stage Control Menu*.

9.2 Press WAFER LOAD/UNLOAD on the *Wafer Transfer Menu*.

9.3 Unload the wafer.

10 Use the following steps to display the *Prealign Adjustment Menu*.

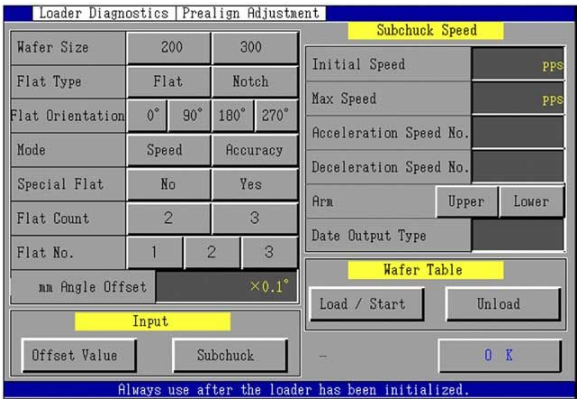
10.1 Press STAGE DIAG MAIN MENU on the *Wafer Menu*.

10.2 Press PREVIOUS MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?` Press NO.

10.3 Press LOADER on the *Diagnostics Menu*.

10.4 Press PREALIGN ADJUSTMENT on the *Item Selection Menu*. The *Prealign Adjustment Menu* is displayed.

Prealign Adjustment Menu



11 Select the WAFER SIZE, FLAT TYPE, and FLAT ORIENTATION for the wafer to be adjusted.

12 Record the value for the `300/200 mm Angle Offset`.

13 Find the new offset amount using the following equation. Use the theta coordinate recorded in step 7 as "theta a" and the value of the `300/200 mm Angle Offset` recorded in step 11 as "theta b".

Equation: (theta b) + (theta a/1000) = New offset amount

For example, if the theta coordinate is -12000, and the offset amount is 18, the equation is as follows: 18 + (-12000/1000) = 6 (new offset amount)

14 Input the value calculated in step 12 as the `300/200 mm Angle Offset`.

15 Press OFFSET VALUE for `Input`. A check menu is displayed stating, `Update this Data?` Press YES.

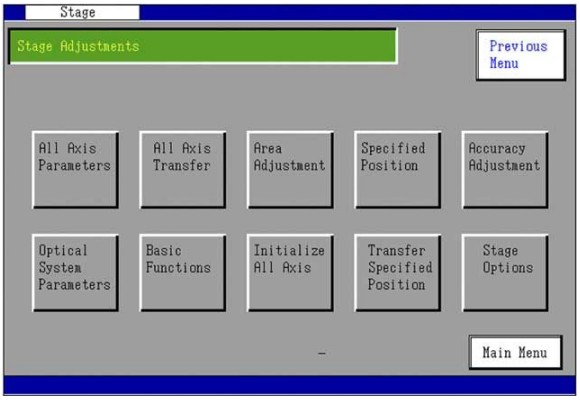
16 Use the following steps to display the *Stage Adjustments Menu*.

16.1 Press OK on the *Prealign Adjustment Menu*.

16.2 Press PREVIOUS MENU on the *Item Selection Menu*. The *Adjustments Menu* is displayed.

16.3 Press STAGE on the *Adjustments Menu*. A message menu is displayed stating, `Not all interference checks are done. Remember this when operating the probe.` Press OK. The *Stage Adjustments Menu* is displayed.

Stage Adjustments Menu



17 Repeat steps 3 through 6 and follow the directions on the menu to enter the macro pattern.

18 Verify that the theta axis stage coordinate is between -5000 and 5000/10000°. If the value is outside of the specification, press CANCEL, then unload the wafer and perform the adjustment from the beginning.

19 Press CANCEL.

20 Press STAGE DIAG MAIN MENU on the *Wafer Menu*.

21 Press BASIC FUNCTIONS on the *Stage Adjustments Menu*.

22 Use the following steps to unload the wafer.

22.1 Press WAFER TRANSFER on the *Stage Functions Menu*.

22.2 Press UNLOAD WAFER on the *Wafer Transfer Menu*. The wafer is unloaded from the chuck top.

23 Use the following steps to display the *Main Menu*.

23.1 Press PREVIOUS MENU on the *Basic Functions Menu*.

23.2 Press MAIN MENU on the *Stage Adjustments Menu*. A check menu is displayed stating, `Save SYS Information?`

23.3 Press YES. The *Main Menu* is displayed.

APPENDIX A

Software Hierarchy

This appendix presents the P-12XL Software Hierarchy for version Rzz02–R014.04.

A.1 Software Hierarchy softwarehierarchy.1

The hierarchy flows from left to right, with each arrow pointing to the available menu options displayed on the screen. The main menu paths (*Setup Menu*, *Changeover Menu*, *Run Menu*, *Diagnostics Menu* and *Stage Adjustment Menu*) are color-coded to illustrate menu options displayed on the touch screen. Each successive branch in the hierarchy displays a unique pattern to facilitate menu navigation.

Appendix Contents

The software hierarchy is broken into three pages. Use the following list to locate the necessary software screen or menu branch.

- **Figure 1** : *Setup Menu*, *Changeover Menu*, and *Run Menu*
- **Figure 2** : *Diagnostics Menu*
- **Figure 3** : *Diagnostics Menu* > *Adjustments Menu* > *Stage Adjustment Menu*

P-12XL Software Hierarchy (Software Ver. Rzz02-R014.04)

Page 1

- Main Menu
  - Setup
    - Setup New Wafer
    - Operation Parameters
      - Alignment
      - Buzzer
      - Measure Menu
      - Map File
      - First Chip Stop
      - Card/Wafer Blow
      - Probe Alignment
      - Lamp Control
      - Last Chip Stop
      - Index Unit
      - Cumulative Contact Count
      - Contact Correction at High Temp
      - Z Position at Stop
      - Inker Setup
      - Machine No.
      - Cumulative Inking Count
      - RGV Mode
      - File Status
      - Erase Disk
      - Loader Transfer Condition
      - Z Down Amount
      - GPIB
      - Unload Stop
      - Unload Flat Position
      - Sample Wafer
      - Inker
      - Format Disk
      - GMS Data Print
      - BIN Input
      - Select Cassette Type
      - Cons. Fail Initial
      - Enable Loader Operation
      - Stage Movement Limit
      - FDI
    - Testing Procedures
    - Option
      - GMS Disk Management
        - File Status
        - Format Disk
        - Erase Disk
        - GMS Data Print
      - ID File Management
        - ID Setup File
        - Image File
        - Log File
    - Change Setup Wafer Data
      - Transfer Wafer
      - Probe Area
      - Setup Wafer
        - Select Filename
        - Set Parameters
        - Semi Auto Setup Wafer
        - Wafer Load/Unload
        - Setup Wafer
      - Probe Area
      - Check Contact
        - Select Filename
        - Alignment without PTPA
        - Alignment with PTPA
        - Set Parameters
        - Check Contact
        - Load Wafer
        - Unload Wafer
        - Cassette Removal
      - Input File
      - Transfer Wafer
      - Setup Inker
      - Wafer Parameter
        - Filenames
        - Parameters
          - Probe Area Select
          - Basic Parameters
          - Skip Die Area Select
          - Overdrive
          - Polish Needle
          - Control Map
          - Reference Die Setting
          - Multi Testing
          - Sample Testing
          - Specific Flat Operation
          - Pad Coordinates
          - Probe Mark Inspection
          - Probe Card Inspection
          - Circumference Marking
          - Stage Control
          - Ink Dot Inspection
          - Bump Alignment
          - OCR Parameters
      - Setup Probe Card
        - Select Filename
        - Setup Probe
        - Set Parameters
    - Copy Wafer Data to FD
      - Format FD
      - Save Wafer Data
      - Load Wafer Data
  - Changeover
    - SACC
    - Auto HF
    - Needle Polish Wafer
    - Pogo Pin Ring
    - Test Head Clamp Mechanism
    - Polisher (WAPP)
  - Run
    - End Lot
    - Set Lot
    - Parameter Check
      - Wafer Parameter
      - Operation Parameter
    - Restart Lot
    - Table Start
    - Setup Start
      - Input File
      - Operation Parameter
    - Start
    - Transfer Wafer
  - Diagnostics

Refer to Page 2

P-12XL Software Hierarchy (Software Ver. Rzz02-R014.04)

Page 2

- **Diagnostics**
  - **Initialize**
    - System
    - Loader
    - Stage
  - **Sensor Status**
    - Loader Status
    - Stage Status
    - Option Status
    - Servo Motor Status
  - **Log**
    - Operation Log
    - Error Log
    - VT Log
    - GPIB Log
    - Copy Log to FD
    - Alignment Log
    - Delete All Logs
    - Event Log
    - Maintenance Flag
    - RGV Log
  - **Temperature Control**
  - **Adjustments**
    - Stage Adjustment Refer to Page 3
    - **Loader**
      - Solenoid & LED Adjustment
      - Sensor Check
      - Register Cassette
      - Mapping Arm Position Adjust
      - Taking Cassette Map
      - ID Loader Offset
      - Circumference Marking
      - Speed Parameter Change
      - FOUP Opener Adjustment
      - Prealign Adjustment
      - All Axes Adjustment
        - Arm (Upper/Lower)
          - Subchuck Theta
          - Loader Z
        - Loader Theta
      - Loader Total Running Test
      - Prealignment A/D Check
      - Solenoid Running Test
      - Checking Table Position
      - Display Parameters
        - Output to Floppy Disk
          - Display on Screen
          - FD Machine Parameter Screen
        - Output to Printer
      - Vacuum Threshold Adjustment
      - Vacuum Off Pos. Adjustment
      - RGV Adjustment
    - Testing Limitation
    - Hardware Options
      - Hard Select (Yes/No) Yes/No
      - Hard Select (Multi) More Than 2
      - BIN Data Group Input
      - Barcode Reader Communication
      - RS232C Tester Setup
      - SACC Setup
      - Auto Leveling Setup
      - Polish Parameter Settings
      - Marker Parameter
      - TTL Parameter Setting
      - GPIB Parameter Setting
      - Tester I/F Data Set (1)
      - Tester I/F Data Set (2)
      - Card Entry
      - E84 Parameters
    - Running
    - Install
      - Format Floppy Disk
      - Install System Software (ZIP)
      - Save/Load Machine Data
      - Install System Sofware (FD)
    - Maintenance
      - Password
      - Stage Accuracy Inspect
      - Delete File
      - Network Parameter
      - Time Setting
      - Task Communication
      - Error Log Printout
      - Hard Option Setting Print
      - Serial Number
    - Check Hardware
      - Printer
      - Buzzer
      - Screen
      - DP Memory
      - Signal Tower
      - TTL Converter
      - TTL I/O Check
        - Tester Interface
        - Bin XY Interface
    - Setup MMI
    - Parameters Limitation
      - Wafer Parameter Mask, Protect
      - FD Save/Load
      - Operation Parameter Mask, Protect
  - **Test Inking**
  - **Needle Polishing**
    - Wafer Parameter Setting
    - Needle Polish
  - **Testing Items**
    - Group Color Menu
    - Load Result Map to FD
    - Save Result Map to FD
  - **Panel Cleaning**

P-12XL Software Hierarchy (Software Ver. Rzz02-R014.04)
Page 3

- **Stage**
  - **All Axis Parameters**
    - Save Parameters
      - Output to FD
      - Display on Screen
      - Output to Printer
      - FD Machine Parameter Screen
    - XY Speed Setting
    - 3Pin Limit
    - Special Drive Speed Setting
    - Z Contact Speed Setting
    - Alignment Drive Setting
    - All Axes Movement Parameters
      - X Axis
      - Y Axis
      - Z Axis
      - Theta Axis
    - All Axis Transfer Area
      - X Axis
      - Y Axis
      - Z Axis
      - Theta Axis
    - Z Axis Limit
    - All Axis Transfer Parameters
      - X Axis
      - Y Axis
      - Z Axis
      - Theta Axis
    - Scan Drive
      - Scan Drive Parameters (XY)
      - Theta Axis
  - **Accuracy Adjustments**
    - Chuck Surface Flatness
    - Cumulative Theta Initial Position Offset
    - Chuck Center
    - Offset Amount Check/Revise
    - Perpendicular Cumulative Offset
    - Needle Polish Flat
    - Deliver Z Speed
  - **Optical System Parameters**
  - **All Axis Transfer**
    - XYZTheta Joystick Transfer
    - XYZTheta Designated Position
    - Solenoid Drive
    - Inker Drive
    - Chuck Vacuum
    - I.P. Control
    - Option Solenoid Drive
  - **Basic Functions**
    - Dummy Wafer Setting
    - Initialize Stage
    - Wafer Transfer
    - Check
    - Input
    - CMS
    - Inspect
  - **Specified Position**
    - 3 Pin Position
    - Upper Arm Position
    - Lower Arm Position
    - Manual Loading Positoin
    - Upper/Lower Camera Matching Position
    - Alignment Center Position
    - Needle Polish Pad Position
    - Specified Position Offset Amount
    - Card Center Position
  - **Transfer Specified Position**
    - Probing Center
    - Auto Loading Position
    - Manual Loading Position
    - Upper/Lower Camera Matching Positoin
    - Alignment Center Position
    - Probe Center Position
    - Inker Position
    - 3 Pin Position
  - **Stage Options**
    - Option Controller
      - Check Temp Control
      - Stage Status Display
      - Auto Leveling
      - WAPP
      - Stage Option Status Display
      - SACC Adjustment
      - Servo Motor Status
      - CMS Remote
    - Tools
      - Read Motor Status
      - I/O Read Write
      - Servo
      - SACC Cycling
  - **Initialize All Axes**
    - Initial Sensor Position
      - XYZTheta Joystick
        - Initialize Stage
        - XYZTheta Designation Position
      - Initialize Axes
    - Limit Sensor Position
      - XYZTheta Joystick
        - Initialize Stage
        - XYZTheta Designation Position
      - Initialize All Axes
      - Y Axis Transfer
        - X Axis Transfer Area
  - **Area Adjustment**
    - X/Y Initial Position
    - Z Initial Position

Glossary glossary.1

Numeric

arm unit Takes wafers from the carriers and places them on the chuck top. Comprised of an upper arm, lower arm, mapping arm, prealignment sensor, mapping, subchuck, vacuum sensor, vacuum solenoid; located on a the Z axis ball screw with four ball splines.

assist An assist situation is one where the prober requires user assistance to continue work.

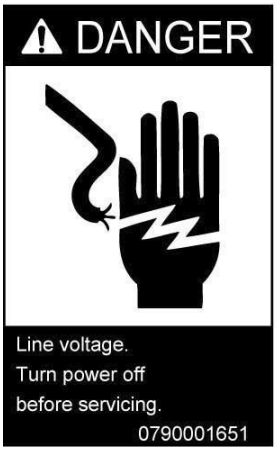
auto HF unit (Automatic High Frequency Balancing Unit). Holds the test head and is used to rotate it onto and off of the prober.

BIN data BIN data are subdivision data for handling categorized pass and fail test results. BIN data are converted by the prober to category symbols. These are grouped into the pass categories and fail categories. Pass categories are symbolized by "1-5" and fail categories are symbolized by "A-S".

bridge unit Moves the alignment bridge in the Y direction. Comprised of the alignment bridge, rodless cylinder, and bridge position detection sensor.

carrier Term used for cassette or FOUP.

caution On the equipment, a user will see caution labels like the ones below:



The symbol displayed below is used to signify a caution notice within this manual.

⚠ CAUTION

Caution notices are used when the hazard posed to equipment or personnel is minor. Examples of minor hazards to personnel include skin irritation, non-ionizing exposure to radiation, minor cuts, etc. Examples of minor hazards to equipment include burned connectors, chemical spills within the equipment, etc. Within manuals, you will see caution notices within line delimited paragraphs containing a caution graphic like the one used in this paragraph.

chuck unit Comprised of the main chuck, which wafers are placed upon for testing, X and Y servo packs, and q and Z stepping motors. These motors allow the chuck to move in X, Y, Z, and theta directions during testing.

contact check Checks the position at which the probes make contact with the wafer.

control map Contains the testing and skip area data that will be used during testing. A map may be created on the PC or on the prober itself.

Cu Copper.

danger The symbol displayed below is used to signify a danger notice within this manual.

DANGER

Danger notices are used when the hazard posed to equipment or personnel is catastrophic and/or severe. Examples of severe hazards posed to personnel include extensive burns, eye damage, loss of limb, bone damage, etc., or death. Examples of catastrophic hazards posed to equipment include loss of the entire tool, loss of the FAB, systems within the tool destroyed, etc. Within manuals, you will see danger notices within line delimited paragraphs containing a danger graphic like the one used in this paragraph.

DP Dew Point.

EMO Emergency Machine Off. Located on front and back of prober.

error An error situation is one where the prober requires the user to initialize or perform some other corrective action to enable the prober to function properly.

ESD Electrical Static Discharge.

floppy drive Loads or copies wafer, operational, and prober parameters to and from floppy disks. Located near bottom front of stage next to the motor drive unit.

FOUP Front Opening Unified Pod; used for loading wafer boats.

GFCI Ground Fault Circuit Interrupter.

hazard signs See Danger, Warning, and Caution.

hazardous energy Energy of 20 Joules or more, or an available continuous power level of 240 VA or more, at a potential of 2V or more.

head plate The top cover of the prober; the probe card is attached to it and the tester rests on top of it. Four cap screws, which hold the head plate in place, are located on top of it.

hot chuck monitor Displays the current temperature of the chuck top, the set temperature, and the temperature control status. Located directly above the touch screen panel.

interlock Interlocks are activated when a cover is not completely closed or is opened during probing. When activated, an interlock cuts the power supply to stage and/or loader motors stopping their movement and preventing injury.

IPA Isopropyl Alcohol. (Ch3)2CHOH. A volatile flammable liquid secondary alcohol made by hydration of propylene by means of sulfuric acid. Used as a solvent and as a source of rubbing alcohol. Often mixed with water for dilution.

keyboard Displayed upon the touch screen; resembles PC keyboard.

kPa Kilo (thousand) Pascals. 1 kPa is equal to 1,000 (103) Pascals or 0.145 psi (pounds per square inch).

LED Light Emitting Diode. A specially designed semiconductor p-n junction that, when forward biased, emits incoherent optical radiation. In some applications, these devices are used in place of light bulbs as indicators. In other applications, LEDs are paired with photodiodes to provide electrical feedback to an input circuit. In such applications, the light is typically in the infrared spectrum and not visible.

LM guide Linear Motion Guide; a V-groove type rail located on either side of the X stage and Y stage that ensures motion is parallel to the ball screw drive. The mapping arm is operated by a rodless cylinder. Term is used interchangeably with linear way.

loader unit Removes wafers from their FOUPs and loads them onto the stage. Comprised of the FOUP and arm unit.

loader Z axis stepping motor Five-phase stepping motor with four ball splines.

lock out device Located on the back of the prober, this device stops power flow to the prober when activated. Utilized during maintenance work on the prober to ensure safety.

MAGIC Pattern matching method.

main controller Stores the computer boards which control various prober functions.

MPa Mega (million) Pascals. 1 MPa is equal to 1,000,000 (106) Pascals or 145.04 psi (pounds per square inch).

MSDS Material Safety Data Sheet. A published specification that provides details on a particular chemical or chemical compound. FABs have these sheets on-hand for all chemicals used within the facility.

NFB Non-Fused Breaker. This is another term for circuit breaker.

numeric keypad Displayed on the touch screen; resembles standard ten key touch pad.

PBET Performance-based equipment training.

PCB Printed Circuit Board; located in the bottom, rear of loader.

PCI Probe Card Inspection.

photodiode A specially designed p-n junction that exhibits alterations in conductance in response to photons.

PMI Probe Mark Inspection.

pogo pin ring Gold ring on the top of the prober that locks down the test head.

PTPA Probe-to-Pad Alignment.

OCR Optical Character Recognition.

RDP Robin Duling Protocol.

RTWM Real-Time Wafer Map.

running test Selection in the Adjustments Menu. Runs every major process of the prober in a demonstration mode (e.g., no wafers are actually probed). Allows for a visual and general inspection of the prober to ensure that it is operating normally.

SACC Semi-Automatic Card Changer.

SACC cover lock Locks for lifting and lowering the tray and moving inside the prober.

SEMI hot work level SEMI has defined four Hot Work Levels to indicate the type and severity of electrical hazards that are present to personnel while working on a particular piece of equipment. The following is a description of each Hot Work Level:

- Type 1
  Equipment is fully de-energized (electrically cold). This includes all uninterrupted power supplies.
- Type 2
  Equipment is energized. Live circuits are covered or insulated. Work is performed at a remote location to preclude accidental shock.
- Type 3
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Potential exposures are less than 30 VRMS, 42.2 volts peak, 240 volt-amps, and 20 Joules. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.
- Type 4
  Equipment is energized. Live circuits are exposed and accidental contact is possible. Voltage potentials are higher than 30 VRMS, 42.2 volts peak, 240 volt-amps, 20 Joules, or radio frequency (rf) energy is present. Reference NFPA 79-14.3, IEC 204, UL 1950 & 1262, IEC 950.

side loader tray Holds individual wafers and polishes wafers.

stage unit Properly aligns wafers for probing, and then transfers them to the main chuck for testing. Comprised of the chuck and bridge units.

stage vacuum sensors Sensors are grouped together on the front of the X stage next to the vacuum sensor grouping.

touch screen The main Graphic User Interface (GUI) for the tool located on the far left if the prober. The touch screen provides feedback information of the prober and accepts command inputs from the user to control and program the prober's operation.

VME Virsa Modular European. This is a busing standard.

VT log Visual Terminal Code Log.

WAPP Wide Area Polish Plate.

WC Tungsten Carbide.

W PC Tungsten Probe Card.

warning The symbol displayed below is used to signify a warning notice within this manual.

⚠WARNING

Warning notices are used when the hazard posed to equipment or personnel is moderate. Examples of moderate hazards to personnel include electrical shock, strains/sprains, less extensive burns, etc. Examples of moderate hazards to equipment include major component loss, utility lines becoming contaminated, broken wires, etc. Within manuals, you will see warning notices within line delimited paragraphs containing a warning graphic like the one used in this paragraph.

XY stage unit Moves the chuck in the X and Y directions. Comprised of the solenoid box, X axis servo motor, and Y axis servo motor.

Z axis stepping motor Two-phase stepping motor that moves the chuck top in Z axis direction.

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Symbols and Numerics

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Revision History

Revision No.	Description of Document Changes	Date
5	Revised content per TEA trainers.	2006-06-26
4	Removed chapter, Safety. Added chapter, Hazard Control.	2005-03-18
3	Converted from SGML to XML, and from TEA DTD v2 to the GTP DTD v1 with no change to content.	2003-07-08

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World Headquarters
TBS Broadcast Center, 3-6 Akasaka 5-chome
Minato-ku, Tokyo 107-8481, Japan
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