



Microlab Prep

User's Manual

P/N 6602850-01, Revision D



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1 About

1.1 About this Manual

Revision History:

Version	Revision	Release Date	Description
01	A	05/2019	Initial release
01	B	01/2021	Format updated
01	C	10/2022	CO-RE information updated
01	D	12/2023	HHC section was added

This manual describes the components and functionality of the Microlab® Prep™ Liquid Handling System and will guide users to correctly and safely program and run protocols on the Prep.

All efforts have been made to ensure the accuracy of the contents of this manual.

Hamilton Company can assume no responsibility for any errors in this manual or their consequences. If any errors are found, please contact Hamilton Company.

Reproduction of any part of this manual in any form whatsoever without the express written consent of Hamilton Company is forbidden. The contents of this manual are subject to change without notice.

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Microlab® is a registered trademark of Hamilton Company.

Prep™ is a trademark of Hamilton Company.

The Microlab® Prep™ will be referred to as the Prep for the remainder of this manual.

For the latest revision of the Prep User's Manual and software, visit HamiltonCompany.com/prephelp.

1.2 Intended Use of the Prep

The Prep is a low-cost, entry-level pipetting instrument. It can be equipped with 2 independent channels, an 8-Probe Head, or both. The Prep is intended for liquid transfers, hit-picking, serial dilution, reagent dispensing, and PCR prep applications.

The Prep can be integrated with the Hamilton Heater Shaker or Hamilton Heater Cooler.

The Prep is small enough to fit inside select fume hoods. Placing the Prep inside a hood may affect laminar airflow. Hamilton issues no guarantee of the resulting hood performance—this must be checked by the laboratory.

The Prep is designed to be serviced without the help of Hamilton Trained Field Service Engineers. Users can perform routine preventative maintenance and parts replacement in addition to daily and weekly maintenance. The software comes with video tutorials to aid users in servicing the Prep. Additional resources and support can be found at HamiltonCompany.com/prephelp.

1.3 Product Identification


Figure 1–1 shows the location of the product identification label on the Prep.





Figure 1–1: Locating the product identification label



Figure 1-2: Product label detail

	<p>EC Declaration of Conformity</p> <p>The CE marking is the manufacturer's declaration that allows sale of product in the EU that the product meets the requirements of the applicable EC directives. It is a mandatory conformity marking for certain products sold within the European Economic Area (EEA).</p> <p>ROHS Directive 2011/65/EU</p>
	<p>This device complies with part 15 of the FCC Rules and Part VI, Interference, of the Canadian Radiocommunication Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.</p>
	<p>The CSA C/US mark signifies that the product is certified for both the U.S. and Canadian markets, to the applicable U.S. and Canadian standards.</p>

	<p>CHINA-RoHS</p> <p>All Electronic Information Products (EIP). Extensive list was published which includes many products not covered by EU RoHS such as radar attached to aircraft or ships, medical equipment, measurement instruments, some production equipment, batteries, and most types of components.</p> <p>The number is the Environmentally Friendly (safe use) Period or EFUP, denoting the number of years before any substance is likely to leak out into the environment. Orange is preferred but any prominent color may be used.</p>
	<p>WEEE (Waste of Electrical and Electronic Equipment)</p> <p>This directive represents recycling, sorting, and handling of products. The symbol for separated collecting of electrical and electronic equipment shows a crossed-out bin on wheels.</p>

1.4 Disposal

1.4.1 Americas/Pacific Rim

After the life cycle of the Prep has ended, disposal must be considered. The customer is responsible for proper disposal of electronic devices per local regulations.

1.4.2 European

WEEE Declaration

Recycling of Hamilton Prep Instruments in accordance to EC directive WEEE.

The European Community requires from manufacturers to organize the disposal and Waste of Electrical and Electronic Equipment (WEEE). For this reason, Hamilton Bonaduz AG took part in an initiative to organize the disposal of Prep products through a European disposal network called RENE. RENE is the largest recycling network for the disposal of electronic equipment in Europe.

The mission of RENE is a European-wide, WEEE-compliant, high-quality recycling for electrical and electronic equipment through a dense network with both innovative and SMB-sized partner companies. As a consequence, Hamilton Bonaduz AG gets a turn-key-solution that includes all processes from treatment of incoming orders over collection, logistics and recycling down to reporting and the according management of material flows.

Hamilton offers a WEEE process in collaboration with Toolpoint and RENE AG:

- Request for the collection of the Hamilton instrument via Toolpoint Home Page (www.toolpoint.ch).
- Completion of the decontamination confirmation form
- Preparation for transport: packing
- Activation of the recycling order
- Archiving of the decontamination confirmation
- Disposal of instrument

Responsibilities	
Ordering Party	Decontamination Preparation for transport Note: The cost for decontamination and preparation for shipment is paid for by the ordering party. On request, Hamilton offers to take care of that part of the recycling process.
RENE	Transport Disposal
Toolpoint	Registration Invoice the disposal to Hamilton
Hamilton Company	Organize the disposal in accordance with the WEEE directive

Recycling process

1. **Request the disposal of the instrument.** Access to the order registration is given by the Toolpoint homepage www.toolpoint.ch.

☒ Recycling ☒ Order registration form
2. **Complete the decontamination form.** Once the form has been completed, the request for disposal is automatically activated and transferred to Toolpoint. The confirmation of the order will be sent to the registered contact person.
3. **Decontaminate the instrument.** The ordering party is responsible for decontamination. It is mandatory to sign the decontamination form and send an electronic copy to Toolpoint. Toolpoint forwards the documentation to RENE, which is responsible for instrument disposal.

4. **Pack and prepare the instrument for shipping.** Instruments with a weight of over 30 kg need to be fixed on a euro pallet. Instruments below 30 kg can be packed in a cardboard or plastic box. A signed copy of the decontamination form needs to be added to the outer part of the shipping box or instrument.

2 Safety

2.1 Safety Symbols



The general Warning symbol indicates the possibility of damaging the instrument or compromising the results of a method.



The Electrical Hazard symbol indicates the presence of electrical components that can be harmful to the operator if handled incorrectly.



The Mechanical Hazard symbol indicates the presence of moving mechanical parts that can be harmful to the operator if handled incorrectly.



The Hazardous Materials symbol indicates the presence of materials that are toxic or otherwise harmful to the operator if handled incorrectly.



The Biohazard symbol indicates the presence of biological samples that can be harmful to the operator if handled incorrectly.

2.2 Operation



WARNING: When using the Prep, Good Laboratory Practices (GLP) must be observed. Suitable protective clothing, safety glasses, and protective gloves must be worn.



WARNING: Observe and perform the appropriate cleaning and decontamination procedures for any biohazardous samples. Wear gloves when handling the pipetting arm, labware, and tips. Avoid touching discarded tips. Any surfaces on which liquid is spilled must be decontaminated using the procedure in [section 6.4.3](#).



WARNING: If the instrument crashes and is not user-recoverable, refer to [section 9.2](#) to view the warranty.



WARNING: Refer to the warranty in [section 9.2](#) if at any time the instrument has lost accuracy or precision in any motion axis.



WARNING: The user is obligated to validate all protocols.

2.3 Maintenance



WARNING: If the Prep becomes contaminated with biohazardous or chemical material, clean it in accordance with the maintenance procedures given in [section 6.4.3](#).

2.4 Programming



WARNING: Perform initial tests with tap water prior to routine use with final liquids. The protocol programmer should supervise the run.



WARNING: Before using any newly created or modified protocols for routine test purposes, they must be validated according to laboratory protocols.

2.5 Electrical



WARNING: For reasons of data security and integrity, the use of an uninterrupted power supply (UPS) is recommended, since a loss of power may cause data to be lost or corrupted.

2.6 Computer



WARNING: Any manipulation of the Prep data or application files can result in erroneous test results or instrument failure.

3 Instrument Overview

3.1 Pipetting Features of the Prep

The Prep performs pipetting operations on liquids in containers. Containers can be tubes, vials, microplate wells, or reagent reservoirs. A pipetting operation is defined as aspirating liquid from one container and then dispensing it into another container.

3.1.1 Air Displacement Pipetting

The Prep uses air displacement pipette heads to perform the pipetting operations. The pipetting heads work similarly to hand-held pipettes. A disposable tip is attached to the pipetting head, and the liquid is aspirated into and dispensed from that disposable tip. No system liquid is used in the instrument. A plunger within the pipetting head enables the movement of the liquid. The liquid in the tip never contacts the pipetting head.

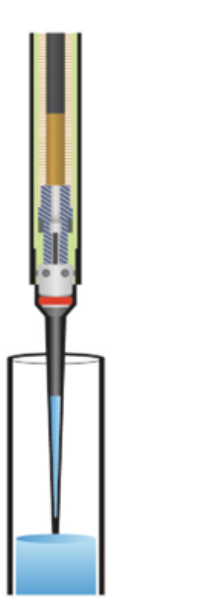


Figure 3-1: Air displacement pipetting principle

3.1.2 Disposable Tip Attachment with CO-RE Technology

Tips are picked up using Hamilton's patented¹ Compression-induced O-Ring Expansion (CO-RE) technology. CO-RE technology enables low force but high precision tip attachment, as well as gentle tip ejection.

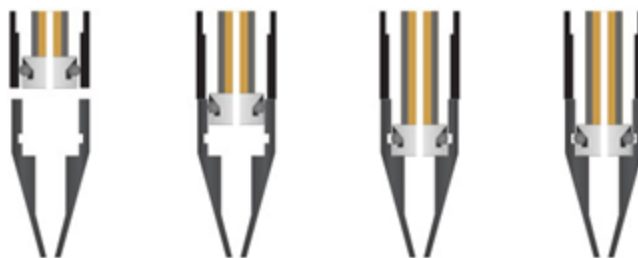


Figure 3-1: CO-RE technology tip pickup

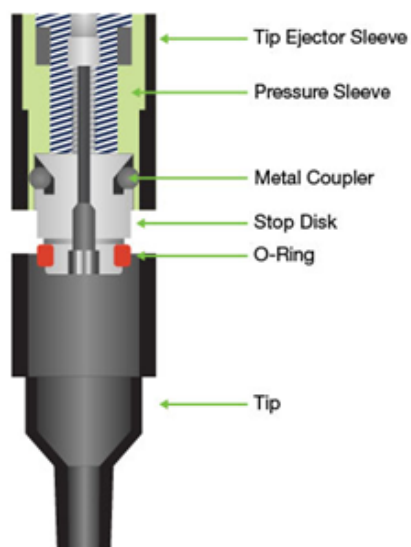


Figure 3-2: CO-RE technology components

The advantages of CO-RE technology include the ability to use multiple disposable tip sizes along with various tools during the same run.

3.1.3 Tip-On Recognition

The Prep detects when a tip is attached to the channels. When a tip is picked up, the tip eject sleeve is pushed upward, triggering a sensor. To eject tips, the tip eject sleeve moves downward, and the sensor indicates the tip has been released. This security feature prevents the accidental aspiration of liquid without a tip attached to the pipetting head.

3.1.4 Tip Size Recognition

Hamilton tips feature unique geometries that the Prep's machine vision technology can detect, allowing the platform to determine different tip sizes.

This prevents the accidental pick-up of 300 μ L tips, for example, when 1000 μ L tips are expected. The Prep also uses the camera and software to help identify and manage other types of labware on the deck; refer to [section 3.2.4](#) for details.

The Prep cannot differentiate between the 300 μ L and 50 μ L tips, or between filtered and non-filtered tips. When using these kinds of tips, make sure the deck layout accurately reflects the correct tips.

3.1.5 Capacitive Liquid Level Detection (cLLD)

The capacitive sensors on the Prep's channels detect the liquid surface. Capacitive LLD is used to detect the liquid level of conductive fluids while pipetting with conductive tips.



WARNING: Capacitive Liquid Level Detection (cLLD) does not function with clear (non-conductive) tips.



WARNING: Liquid level detection needs to be explicitly tested when working with foamy liquids. Foam may affect the accuracy of liquid-level detection.

3.1.6 Clot Detection

Aspiration is monitored using a pressure sensor in the pipetting head. The pressure is checked against values in the system to detect the aspiration of tip clots.

Clot detection can be enabled or disabled for any pipetting step in a protocol.

3.2 Features of the Base Instrument

This section describes the components that are common to all Prep instruments.

The instrument's power switch is located on the front of the Prep, below and to the left of the door handle. Ports for connecting a USB external drive or a barcode reader are located on the left side of the instrument.

3.2.1 Pipetting Arm

The Prep features pipetting options for 2 independent channels, an 8-Probe Head, or both.

Refer to sections [3.3.1](#) and [3.3.2](#) for details on the channels and 8 MPH. The arm moves left and right over the deck of the Prep to access labware for pipetting and plate transport.

3.2.2 Deck

The deck of the Prep has eight sites for holding ANSI/SLAS footprint labware. Most microplates can be placed directly on the deck, but some labware will require Hamilton

adapters, including tubes and reagent reservoirs. The base plate for each site can be removed for labware that extends below its edges, such as tube pedestals and 1000 μ L tips.

Sites are numbered 1-8 starting from the back-left site and counting toward the front. The Hamilton Heater Shaker (HHS) can be integrated on Site 1. Instructions for installing an HHS on the Prep are included with its installation kit.

3.2.3 Touchscreen

The Prep comes with a touchscreen mounted to the enclosure. Protocols are created, managed, and run using the touchscreen. Refer to [section 5.1](#) for an overview of the Prep's software.

Tilt the touchscreen upward or downward to adjust its angle.

3.2.4 Deck Scan

The Prep is equipped with a camera positioned above the deck to scan labware. This feature helps with building deck layouts and verifying labware before starting a run. Refer to [section 5.2](#) for details on using the camera during a run.

Before adding steps to a protocol, create a deck layout with all necessary labware.

Labware placement is essential for setting up a protocol. It determines the needed equipment and its location, allowing for accurate pipetting. The camera can help create the deck layout, but some labware may need to be specified manually due to their similar appearance. For example, some tips are difficult for the Prep to automatically detect.

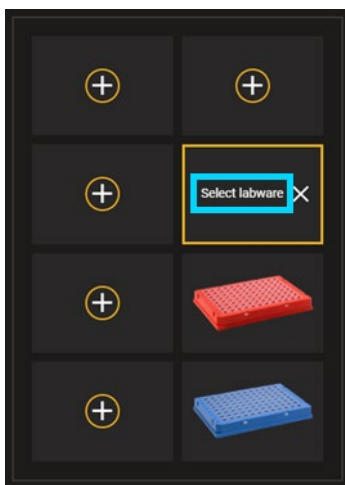


Figure 3-4: Specifying scanned labware

Labware can also be added without scanning. If the deck scan is skipped or there are open sites left after the scan, the sites can be tapped to open a list of labware.

3.2.5 Waste

The waste block is located to the right of the deck. It is equipped with a waste bin, a teaching needle, a liquid waste tub, and CO-RE Paddles.

The waste bin is located to the right of the waste block. The waste bin can hold up to two racks worth of ejected 1000 μ L tips. When the Prep is idle, the user can remove and empty the waste bin. A waste bag can be installed on the wire rack inside the waste bin, ensuring that the edge of the bag does not interfere with the tip eject bar.

A teaching needle is located on the waste block. The teaching needle is used for maintenance and calibration activities.

Liquid waste is dispensed to a tub on the waste block. The liquid waste tub drains to a removable 250 mL bottle in the waste bin, which should be emptied per laboratory protocols with the waste bin after each run.

The waste block has park position brackets for the CO-RE Paddles. Refer to [section 3.3.3](#) for details on CO-RE Paddles. Both the park position brackets and the CO-RE Paddles have magnets that hold them in place.

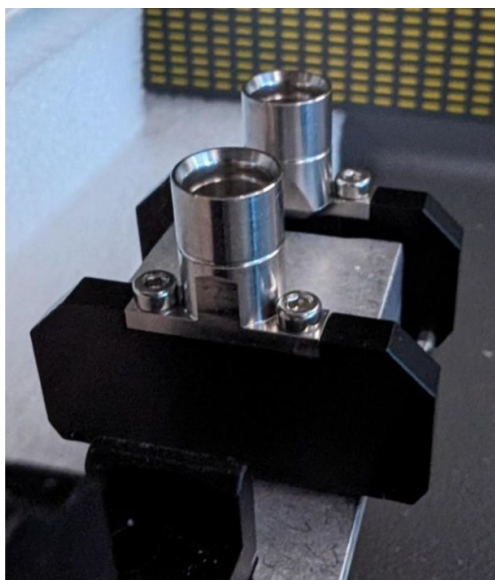


Figure 3-5: CO-RE Paddle park position brackets

3.3 Configuration Options

3.3.1 Independent Channels

The Prep can be equipped with two independent channels. Each channel incorporates a pipetting head with a maximum volume of 1 mL, depending on the tip type used.

The channels have independent spacing, meaning there is no fixed maximum spacing between channels. The channels can access any two labware containers in the same column with greater than 9mm spacing simultaneously.

The channels support the use of 50 μ L, 300 μ L, and 1000 μ L filtered and non-filtered disposable CO-RE tips.

3.3.1.1 Channel

The channel carries the pipetting head, which performs all pipetting steps and moves in the Y- and Z-directions. The front and rear independent channels are built slightly differently to accommodate their 9 mm spacing.

3.3.1.2 Pipetting Head

The pipetting head performs all pipetting steps. The Prep's pipetting heads are designed to be easily replaceable if a pipetting head breaks or loses accuracy. The front and rear channels use different pipetting heads to accommodate their 9 mm spacing. Confirm which head must be replaced before ordering a new pipetting head. Refer to [section 6.4.4](#) for instructions on replacing a pipetting head.

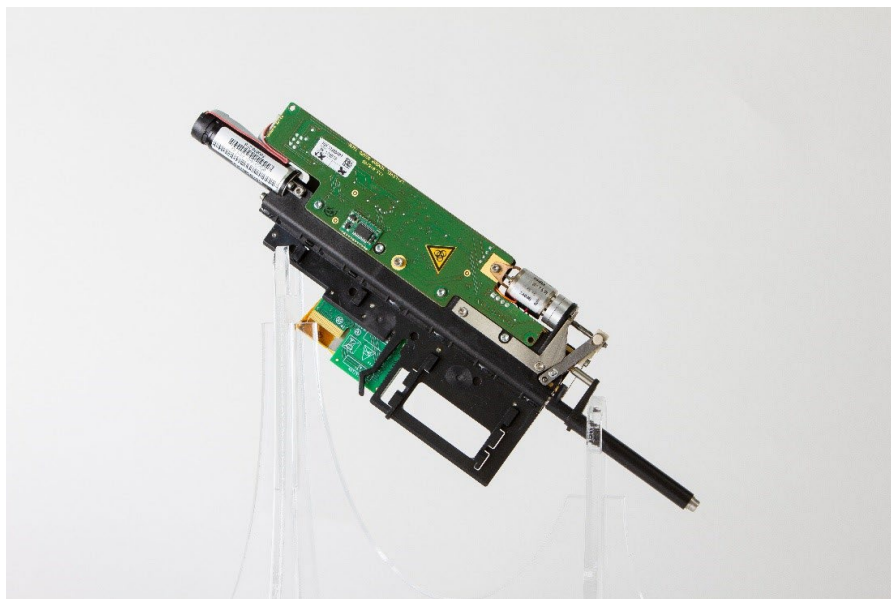


Figure 3-6: Front pipetting head

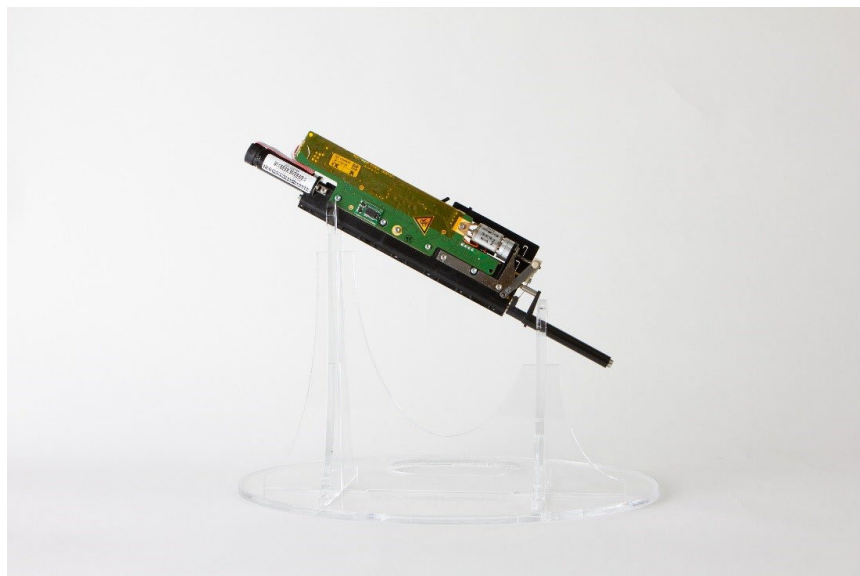


Figure 3-7: Rear pipetting head

3.3.2 8-Probe Head

The Prep can also be equipped with a multi-channel 8-Probe Head (8 MPH). CO-RE technology guarantees fast and accurate pick-up and release of disposable tips.

The 8 MPH is comprised of eight 1 mL channels with a 9 mm raster, combined into a single multi-probe head. The eight channels work simultaneously to pipette the same volume. Capacitive LLD is available on two of the eight channels, 1 and 8.

The 8 MPH supports pipetting with intermediate volume (50 μ L), standard (300 μ L), or high volume (1000 μ L) disposable tips. The multi-probe head is designed to be replaceable if it breaks or loses accuracy. Refer to [section 6.4.4](#) for instructions on replacing a multi-probe head.



Figure 3-8 Multi-probe head

3.3.3 CO-RE Paddles

The Prep's channels can be equipped with CO-RE Paddles for transporting labware on the deck. CO-RE Paddles are magnetically attached to brackets on the waste block. During a transport step, the two channels pick up the CO-RE Paddles and use them to move labware to and from accessories like the HHS or a magnet plate. After transport, the channels return the CO-RE Paddles to their brackets, freeing the pipetting heads to pick up tips and execute pipetting steps.

Plate transport with the CO-RE Paddles is only allowed between the deck's sites. Plate rotation is not possible with the CO-RE Paddles.

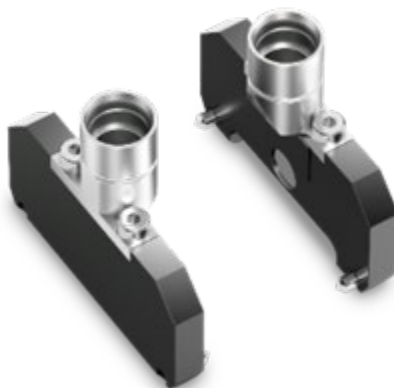


Figure 3-9: CO-RE Paddles

3.4 Pedestals

The Prep requires specially designed pedestals to hold certain kinds of labware on the deck. This section describes the various pedestals available.

3.4.1 Tip Pedestal

Framed tips must be loaded on a framed tip pedestal. If 1000 μ L tips are used, the base plate below the pedestal must be removed before loading the tips.



Figure 3-10: Framed tip pedestal

3.4.2 Tube Pedestal

Tube pedestals can hold up to 24 sample tubes of the same type. The large tube pedestal is loaded by removing the base plate on a site.

Large and small tube pedestals are available, depending on the type of tube used.



Figure 3-11: Large tube pedestal

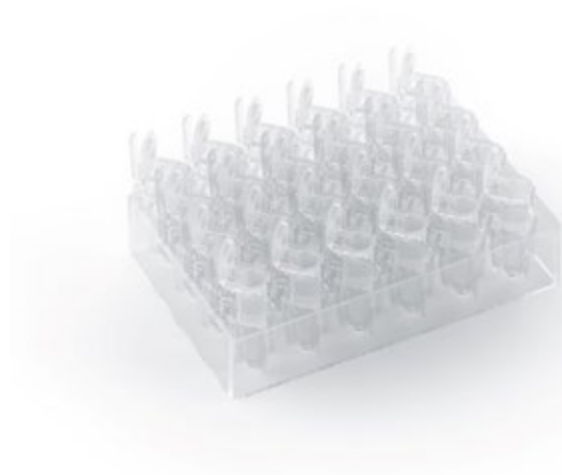


Figure 3-12: Small tube pedestal



Figure 3-13: 15 mL Conical tube pedestal

3.4.3 Reagent Reservoir Pedestals

Reagent reservoir pedestals can hold up to five 50 mL reagent reservoirs. The reservoirs are made in a clean room environment (ISO 14644-1, class 8) and are pyrogen-, RNase- and DNase-free. They are self-standing and come with lids for reagent storage. Compatible reagent reservoirs are part numbers 56694-02 and 56694-03. The center rib must be removed from these reservoirs before use on the Prep as indicated in Figure 3-13. Use of pliers and some force may be needed to remove the rib. Failure to do so can result in instrument damage.

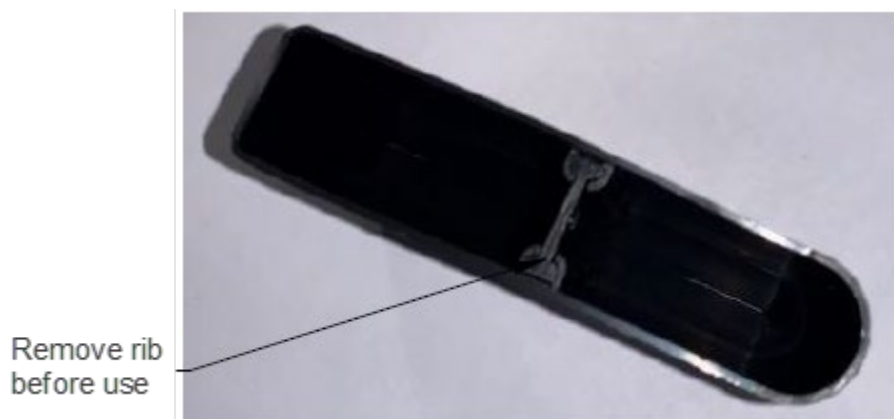


Figure 3-14: Reagent reservoir with rib

Note: The reagent reservoir pedestal can only be placed on the front two sites to avoid obstruction of other labware.



Figure 3-15: Reagent reservoir pedestal

3.5 Disposable CO-RE Tips

Disposable CO-RE tips come in multiple sizes, with or without a filter, in conductive black or non-conductive clear, and sterile or non-sterile. All tips are produced under clean room conditions (ISO 14644-1, class 8) and are pyrogen-, RNase-, and DNase-free. Disposable tips for the Prep are only available through Hamilton.



WARNING: Only use Hamilton tips on the Prep. Using other disposable tips can result in inaccurate pipetting and cross-contamination.



Figure 3-16: Disposable tips

The 50 µL and 300 µL unfiltered tips are available in nested and framed formats. Larger tips, or tips that are filtered, are only available in frames.

3.5.1 Nestable Tips

Nestable tips are loaded directly onto deck sites. Nested tips come in a package of 5 stacks of 4 each.



WARNING: Do not stack tips on the deck.



Figure 3-17: Nestable tips

3.5.2 Framed Tips

Framed tips are loaded with a framed tip pedestal on the deck. All tip types come in frame format, but 1000 µL tips and filtered tips are only available in frames.



Figure 3-18: Framed tips

3.6 Accessories

A variety of accessories and other devices are available for use with the Prep. This section describes the most common items. These items come with their own documentation describing their installation and use in detail.

3.6.1 Hamilton Heater Shaker (HHS)

The Prep can be equipped with a Hamilton Heater Shaker. The HHS can heat to 105°C and has a circular orbit of either 2 or 3 mm. The HHS installs on site 1 at the back-left corner of the deck. A Heat/Shake step must be used to heat or shake a plate during a protocol. A Prep must have independent channels to integrate an HHS, as they are used with the CO-RE Paddles to transport labware to and from the HHS.



Figure 3-19: Hamilton Heater Shaker (HHS)

3.6.2 Hamilton Heater Cooler (HHC)

The Prep can be equipped with a Hamilton Heater Cooler. The HHC can cool to 0°C and heat to 110°C depending on the adapter used and environmental conditions. Please refer to [HamiltonCompany.com/prephelp](https://www.hamiltoncompany.com/prephelp) for supported adapters. The HHC installs on site 1 at the back-left corner of the deck. A Heat/Cool step must be used to heat or cool a plate during a protocol. The HHC can also be controlled outside a protocol from the Prep home screen for pre-cooling or heating of the device.



Figure 3-20: Hamilton Heater Cooler

3.6.3 cLLD Adapter Plates

cLLD Adapter plates can be used with certain PCR plate formats to improve cLLD functionality at low volumes. Part numbers for available adapters are listed in the Accessories [section 7.5](#).

3.6.4 Barcode Reader

A handheld USB barcode reader can be used with the Prep for sample tracking. A user must read labware barcodes during a Read Barcodes step in a protocol.

3.6.5 Magnet Plates

The Prep supports the use of a variety of magnet plates for magnetic bead-based applications. A Prep must have independent channels to integrate a magnet plate, as they are used with the CO-RE Paddles to transport labware to and from magnet plates on the deck.

Check the [online help center](#) for a list of supported labware, including magnet plates and cLLD adapter plates.

4 Installation

4.1 Site Consideration

The Prep must be on a stable surface that can accommodate the instrument's weight and dimensions and strain from the movement of the pipetting arm, without bowing or swaying. Refer to [section 8.1](#) for the full specifications; contact Hamilton support for specific questions.



WARNING: Use at least two people to move the Prep, which weighs 91.5 lbs. Remove all labware before moving the platform.



WARNING: If the pipetting arm is not secured, it may slide during transportation.

Protect the Prep from direct sunlight, excessive vibrations, and fluctuating temperatures or humidity. This is especially critical for low-volume (< 10 µL) applications that require highly accurate pipetting.

Provide sufficient space for documentation, labware, and maintenance materials. For optimum serviceability, it is best to position the Prep on an island location within the laboratory.

Provide power outlets for the Prep. Refer to [section 8.1](#) for the power input requirements.



WARNING: Main power voltage supply fluctuations are not to exceed 10% of the nominal supply voltage.

Examine the packaging for any signs of damage. If the crate or instrument has been damaged, refer to [section 9.1](#).

Verify the contents of the package with the packing checklist. Each instrument comes with an accessory box with any ordered pedestals, as well as a set of tools packaged inside of the Prep. Refer to [section 9.1](#) if any items are missing.

4.2 Setup

Instructions for installing the Prep are linked on the info card packaged with the instrument. The linked installation packet also includes ordering information for tips and other consumables. If the info card is lost or misplaced, refer to [section 9.1](#) or the [online help center](#).

Before using the Prep, some basic settings need to be configured. The first time the Prep is powered on, a startup wizard will guide the user through the settings required to set up the instrument.

1. Tap “Next” on the welcome page to begin setup.

2. **Select the laboratory's time zone and enter the date and time.** This information is included in run reports and used to track when protocols were last run or edited.
3. **Enter the admin username, password, and password recovery questions.** Tap the numbered buttons to navigate between recovery questions. Other users can be added later; user management can also be disabled if it is not needed.
4. Wait while the Prep imports the labware catalog.
5. **Select labware from the library as favorites.** Tap the favorite toggle to the right of the desired labware to mark it as a favorite. If the desired labware is not present, contact Hamilton.
 - a. Tap "Skip" to choose favorites later.
6. **Tap "Next" after selecting favorites.** Favorites can be added or removed at any time from the File Manager.
7. **Wait for the Prep to calibrate.** Follow the instructions onscreen to complete calibration.
8. **Tap "Finish" to complete setup.** The Prep is now ready to use. Tips may be unloaded if they have not been removed already.

5 Operation

5.1 Software Overview

The Prep features intuitive, user-friendly software that can be accessed through the instrument's touchscreen. Protocols, settings, and maintenance are all accessed through this software.

Tap a protocol on the touchscreen to open it for editing, simulating, or running. Up to eighteen favorite protocols are shown on the home page; view a list of all protocols by tapping “Browse”. New protocols are automatically added to favorites until no more spaces are available. Favorites are managed in the File Manager under Settings. If no protocols exist, the Prep will prompt the user to create a new protocol.

Controls for accessing settings and related activities are located at the top-right corner of the page:

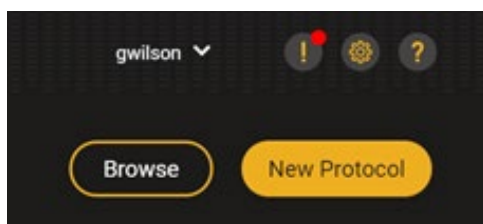


Figure 5-1: Home page buttons

- **Users can sign out or change their password using the drop-down menu.** Passwords can also be changed from the User settings page.

Users can set up password recovery in case they forget their password. Up to three recovery questions can be added.
- **Prep maintenance can be accessed through a shortcut using the alert button.** Protocols cannot be run if maintenance is required. Refer to sections [6.4.1](#) and [6.4.2](#) for instructions on daily and weekly maintenance, and sections [6.4.3](#) and [6.4.4](#) for details on preventative maintenance.
- **Access settings by selecting the gear icon button.** Information on maintenance, tutorials, and file management are all available through settings, as well as software and instrument settings.
- **Most pages have contextual help available.** Tap the help button in the upper-right corner to view information specific to the current page. Information about other pages may also be accessed through the table of contents.

5.2 Running a Protocol

- **Turn on the Prep.** Log in if user management is enabled.

- **To open the door if needed**, pull the door handle upward until it stops in place.
- **Make sure the waste bin is empty before initiating a run.**
- **If using light-sensitive reagents**, confirm global lighting settings.
- **If an HHC is installed and pre-heating/cooling is required**, set the HHC to the desired temperature from the home screen.
- **Tap the desired protocol.** The overview page appears. Navigate to the Labware tab to view the number and type of labware required to run the protocol.
- **Tap Run to begin setup.** Protocols may also be simulated from this page.
- If the protocol has a “How Many Samples” step, select the wells or tubes to use for the highlighted labware and tap “Next”. Any steps that use the highlighted labware will be restricted to the selected containers.
- **If the protocol has a “Read Barcodes” step, scan or enter each expected barcode, then tap “Next”.** The barcodes are used for sample tracking only. If the Prep has a handheld barcode reader connected by USB, use it to scan the barcodes. Otherwise, enter the barcode(s) manually using the virtual keyboard.
- If prompted, tap “Browse” to select a worklist with the required data for any Hit Picking steps, then tap “Next”. Double-check the requirements for the worklist before selecting a file.
- **Load the labware and consumables specified onscreen, then tap “Scan”.** Load labware, tips, samples, and reagents onto their designated site, including any cLLD adapters as needed, using pedestals as necessary for tips, tubes, and reagent reservoirs. Make sure there are enough tips to run the protocol.

To load labware like tube pedestals, 1000 µL tips in a framed tip pedestal, and half-skirted PCR plates, remove the site's base plate first. Hold the front edge of the plate down and lift on the back edge to remove the base plate.

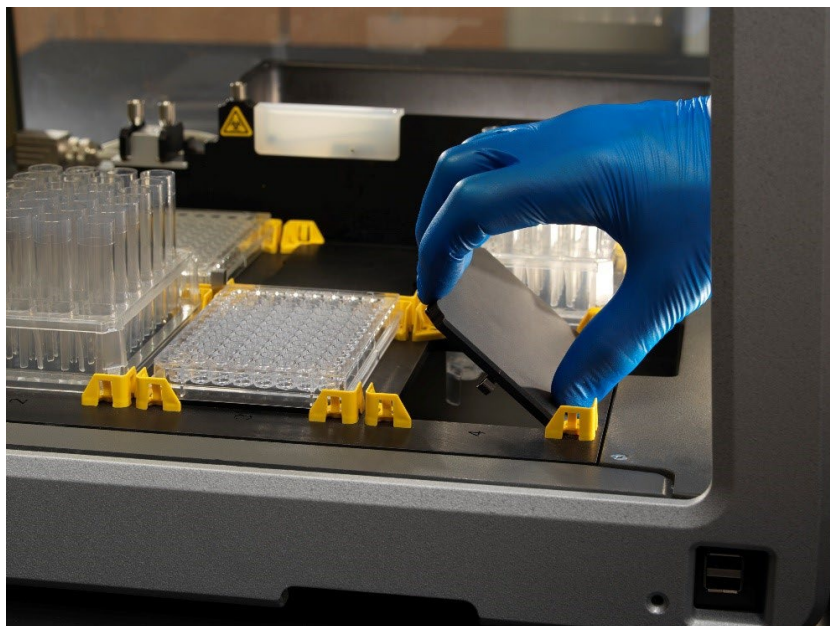


Figure 5-2: Removing a base plate



WARNING: Do not overfill reagent reservoirs, tubes, or other liquid containers.



WARNING: Do not load anything that sits higher than 78 mm above the deck.

- Correct any labware and partial tip racks that do not match the layout, then tap “Confirm”. Labware-like tips may need to be specified before proceeding.



WARNING: When loading labware, pay close attention to the identity and status of the detected labware and the labware specified in the protocol.

- **Monitor the progress of the run on the page.** The estimated time remaining is shown on the run timer. Containers that are being aspirated from and dispensed to will flash purple and blue on the deck layout, respectively. Labware that is being heated or shaken will also flash, and a second timer for that step will be shown.

While simulating, the speed can be changed in the Step View using the slider below the run timer. The speed is set to real-time (1x) by default; it can be changed to 2x, 5x, 10x, or 0.5x the default speed.

- Open the Plate View to display a detail of selected labware.

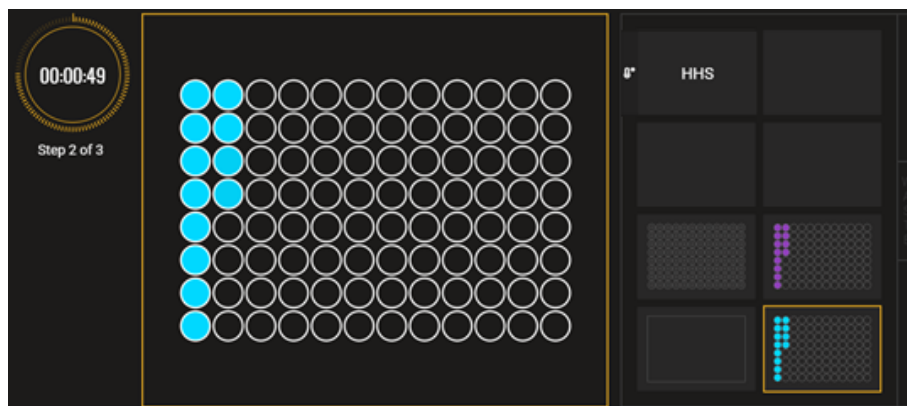


Figure 5-3: Run page plate view

- **Tap “Pause” to pause the run.** The Prep will finish the last command it received and then come to a stop. The door may be opened and closed while the run is paused. Tap “Resume” to continue the run once the door is closed.
- **To abort a run, tap “Stop”.** A confirmation dialog will appear; tap “Abort” to confirm. The Prep will finish the last command it received, come to a stop, and the protocol will be aborted.

Aborted protocols can only be restarted from the beginning step. If a protocol is aborted with tips or CO-RE Paddles attached to the channels or 8 MPH, they will be ejected the next time the pipetting arm is initialized.

- If tips or reagents must be refilled, a dialog will appear listing what is needed to continue the run. Replenish the specified consumables and tap “Finished”.

5.3 After a Run

A dialog box will appear when a run is completed (see Figure 5-4). Tap “View Report” to view the run report for the protocol. Reports can be accessed at any time through the Run History settings page.

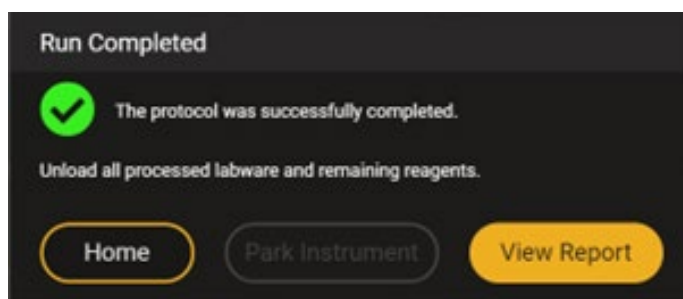


Figure 5-4: Finishing a run

- Remove empty and processed labware.
- **Remove or refill reagents.** Immediately clean any spills. Refer to [section 6.4.3](#) for the recommended decontamination procedure.

- Empty the waste bin and liquid waste bottle.



WARNING: Empty the waste bin as soon as it is full, but only after a run is complete or if the instrument is paused.



WARNING: Waste may contain biohazardous or chemically contaminated material.

- Select the next protocol to run, if required.

5.4 Error Handling

Errors that may occur during a run will generate an error dialog with recovery options. This section describes common recovery options. The available options depend on the type of error occurring.

- **Abort** will abort the current protocol, stopping the instrument in its current position.
- **Air** will raise the tips to a clearance height and aspirate air for aspiration errors.
- **Cancel** will abort the current protocol and park the pipetting arm (but will not eject tips).
- **Exclude Channel** will continue without using the channels that generated the error until the next tip pickup.
- **Move to Next** will make channels pick up tips from the next position(s) for tip pickup errors.
- **Repeat** will retry the action that generated the error.

5.5 Getting Help

Articles addressing frequently asked questions or common issues are available in the [online help center](#). The help center also provides tutorials and other information on how to best use the Prep.

If the available articles do not solve the problem, file a ticket through the Hamilton help center for additional support. Have the following information ready when filing a ticket:

- Name
- Software version (see [section 9.1.3](#) for details)
- Email
- Company
- Serial number
- A description of the problem

6 Maintenance

Periodic maintenance is required in order to ensure the safe and reliable operation of the Prep. Maintenance must be performed by the user to the instrument clean and to maintain proper functionality.

6.1 Intervals

Hamilton recommends that the appropriate maintenance be performed at the following intervals:

- Daily: cleaning and inspection recommended every 24 hours
- Weekly: deck cleaning recommended every seven days
- Yearly: cleaning and lubrication of the Prep's mechanisms recommended every year
- CO-RE I: Replacement of stop discs and O-rings every 20,000 tip eject cycles (approximately every six months)
- CO-RE II: Replacement of O-rings every 40,000 tip eject cycles.



WARNING: Observe and carry out the maintenance procedures given. Failure to do so may impair the reliability or functionality of the Prep.

6.2 Materials Required

6.2.1 Daily Maintenance

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

6.2.2 Weekly Maintenance

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

6.2.3 Yearly Maintenance

Purchased from Hamilton:

- Silicone oil

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water
- Lint-free cotton swabs

6.2.4 Stop Disc and O-Ring Replacement

CO-RE I

Purchased from Hamilton:

- Set of stop discs (2-pack for channels, 8-pack for 8 MPH)
- Stop disc glue (included with stop discs)
- Tips
- Stop disc removal tool

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

CO-RE II (O-ring replacement only)

Purchased from Hamilton:

- Set of O-rings (2-pack for channels, 10-pack for 2 channels + 8 MPH)
- Tips

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Deionized water

6.2.5 Pipetting Head Replacement

Purchased from Hamilton:

- Replacement front/rear pipetting head or multi-probe head
- Pipetting head removal tool (if replacing front/rear pipetting head)

- Tips

Included with Prep:

- 2 mm hex wrench (if replacing front/rear pipetting head)
- 3 mm hex wrench (if replacing multi-probe head)

Supplied by lab:

- Personal protective equipment (gloves, eyewear, lab coat)

6.2.6 Volume Verification

Purchased from Hamilton:

- Volume verification kit
- 2 framed tip pedestals (not included in refill kit)
- Blister of 1000 μ L tips
- Blister of 50 μ L tips
- 4 microplates
- 3 reagent reservoirs
- Volume Verification solutions
- Volume verification spreadsheets
- Channel verification spreadsheet
- 8 MPH verification spreadsheet

Supplied by lab:

- Absorbance reader with 405 nm and 620–650 nm filters
- Balance with 1 mg resolution and accuracy

6.2.7 Decontamination

- Personal protective equipment (gloves, eyewear, lab coat)
- Clean, lint-free towels
- Microcide SQ. This is a cleaner and broad-spectrum disinfectant for use on Hamilton instruments. It is a colorless, low foaming liquid. The concentrate comes with a spray bottle. Dilute the concentrate with deionized water according to the instructions on the bottle.



WARNING: Do not use cleaning or disinfecting solutions that contain hypochlorite, such as bleach, on the instrument.



WARNING: Do not use an acetone-based solution to clean the enclosure. It can cause micro-fractures.

6.3 Accessing Maintenance

When maintenance is due on the Prep, the required routine can be accessed through the **“Alert” button** if maintenance alerts are enabled in the maintenance setting. Users may not be able to run protocols until the required maintenance is completed, depending on the maintenance setting.

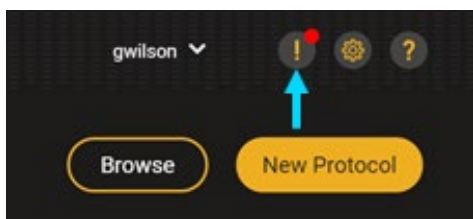


Figure 6-1: Alert button

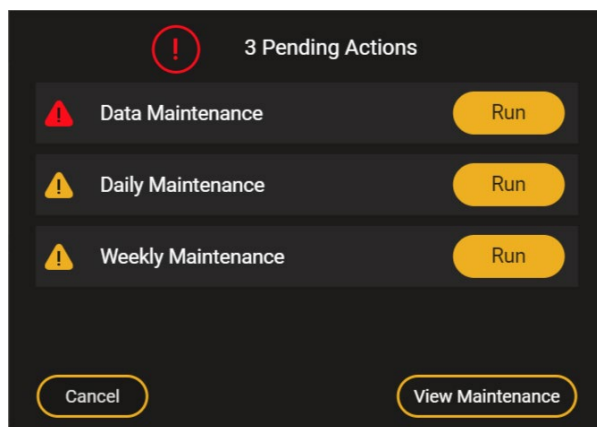


Figure 6-2: Starting maintenance through the alert button

Maintenance is accessible at any time on the “Maintenance Routines” page. Tap the settings button, select the Maintenance tab, and then tap “Maintenance Routines”. All maintenance procedures are listed here with the last date they were completed and when they must be performed next.

Select the required routine and tap “Run”. Each routine has a set of dialogs to guide the user through the required tasks.

6.4 Routine Maintenance

6.4.1 Daily Maintenance

Daily maintenance requires the following tasks to be performed:

- Inspect tip eject sleeves and O-rings
- Inspect deck and calibration post
- Inspect the waste block and liquid waste
- Inspect the thermal device if installed
- Empty waste bin and liquid waste
- Clean tip eject sleeves and O-rings

The following procedure describes each task in detail:

1. Make sure to wear appropriate PPE for the lab.
2. **Run the daily maintenance protocol.** Refer to [section 6.3](#) for instructions on locating and running maintenance protocols.
3. **Inspect the tip eject sleeves and O-rings.** Make sure the tip eject sleeves can move up and down freely, and that the stop discs are undamaged and aligned with the tip eject sleeves.

If a stop disc is damaged, refer to [section 6.4.4](#) for instructions on how to replace it.

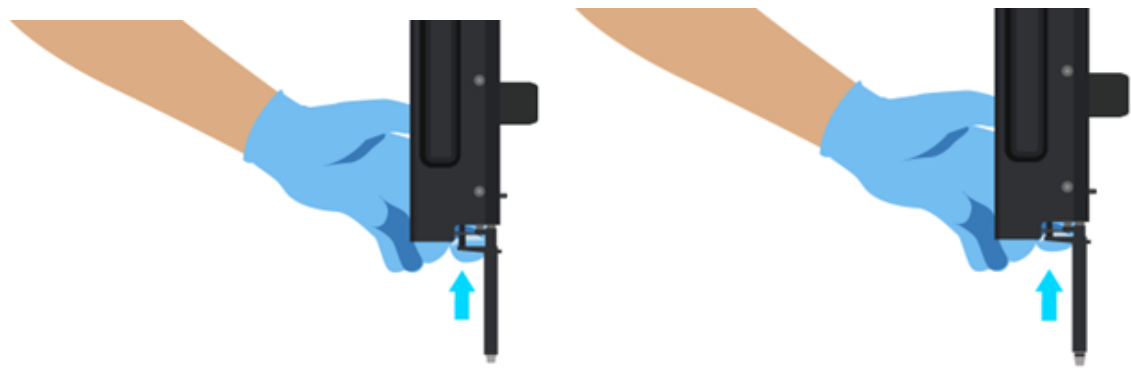


Figure 6-3: Checking the tip eject sleeve

4. **Inspect the deck.** Make sure the following components are secure and undamaged:
 - a. Corner brackets



Figure 6-4: Corner locator brackets

b. Calibration post



Figure 6-5: On-deck calibration post

c. Waste block



Figure 6-6: Liquid waste block

d. Liquid waste bottle

e. **Thermal device** (if no devices are installed, check the cover for the connector)

5. **Empty the waste bin and liquid waste bottle.** Clean the waste bin and liquid waste bottle according to laboratory procedures.
6. **Spray a clean, lint-free towel with deionized water and wipe down the tip eject sleeves.**
7. **Spray a clean, lint-free towel with deionized water and wipe down the stop discs.** Lift the tip eject sleeve to expose the stop discs and O-rings.

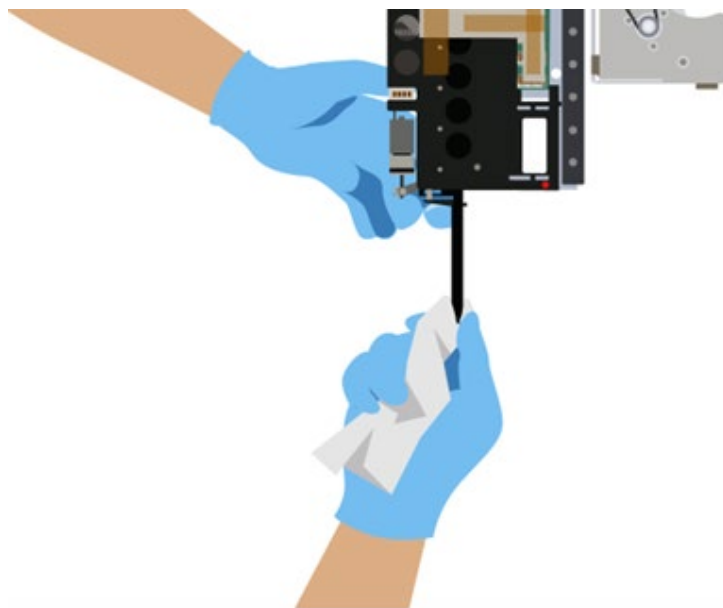


Figure 6-7: Cleaning stop discs and O-rings

8. **Clear the deck and close the door when prompted.** The pipetting tools will each pick up the teaching needle and perform their tightness and cLLD checks, after which maintenance is completed.

6.4.2 Weekly Maintenance

Weekly maintenance consists solely of cleaning the deck and any devices. Daily maintenance should be run along with weekly maintenance when required.

1. Make sure to wear appropriate PPE for the lab.
2. **Run the weekly maintenance protocol.** Refer to [section 6.3](#) for instructions on locating and running maintenance protocols.
3. **Spray a clean, lint-free towel with deionized water and wipe down the following components.** Do not spray the Prep with water directly.
 - a. Deck area
 - b. Waste block
 - c. Calibration post

6.4.3 Yearly Maintenance

Once a year, the Prep must be cleaned and lubricated to maintain best performance. The following procedure describes the steps for cleaning and lubrication in detail. Refer to [section 6.3](#) for information on accessing maintenance routines.

1. **Make sure to wear appropriate PPE for the lab.** Gloves are especially important for cleaning and lubrication.
2. **Run the yearly maintenance protocol.** Refer to [section 6.3](#) for instructions on locating and running maintenance protocols.
3. **Clear any labware from the deck and close the door.** The Prep will move either the front channel or the 8 MPH into position for cleaning.

If the Prep does not have independent channels, skip to step 11. If the Prep does have channels, continue to step 4.

4. **Open the door and wipe down the front channel's lead screw with a clean, dry cloth.** Wrap the cloth around the lead screw, then pull gently on each end to clean the lead screw.

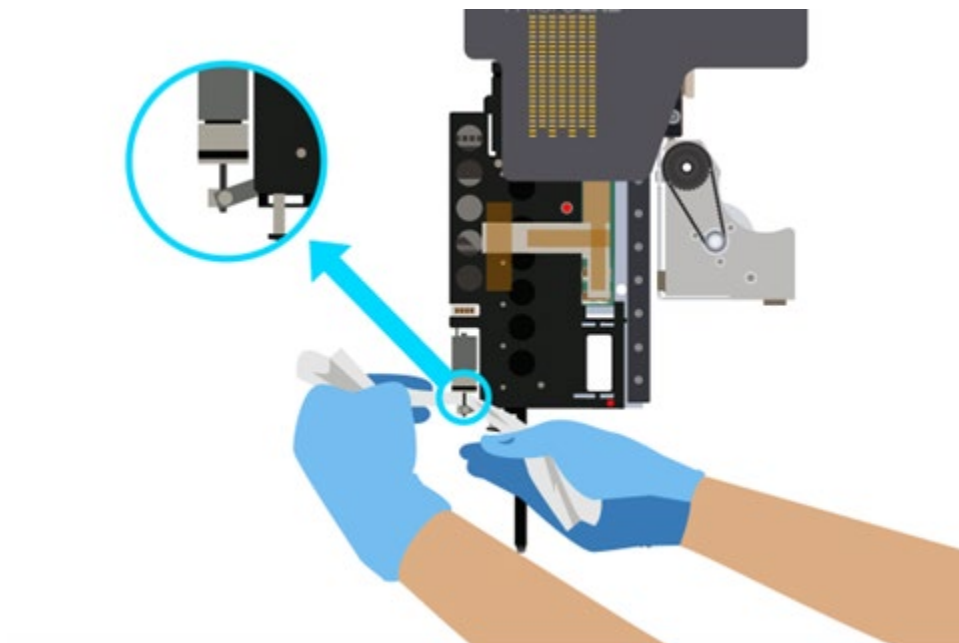


Figure 6-8: Cleaning the front channel's lead screw

5. **Apply a small amount of silicone oil to the front channel's lead screw using a clean, lint-free cotton swab.**

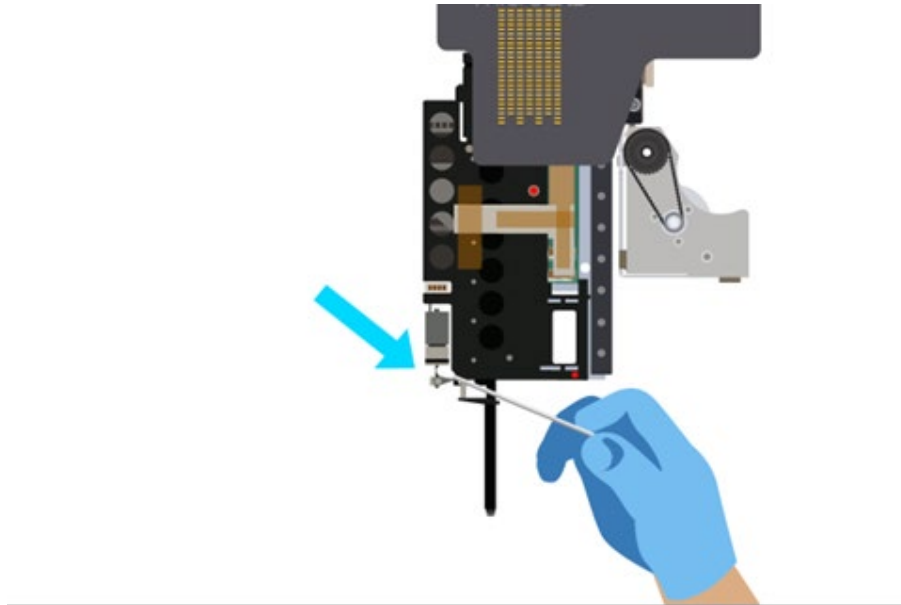


Figure 6-9: Oiling the front channel's lead screw



WARNING: Only use a few drops of oil when lubricating the Prep's lead screws to prevent contamination.

6. **Close the door when finished with the front channel.** The Prep will position the rear channel for cleaning.
7. **Repeat steps 4 through 6 for the rear channel.** Note that the lead screw is located to the right of the tip eject sleeve.

If the Prep does not have an 8 MPH, skip to step 11. If the Prep does have an 8 MPH, continue to step 8.

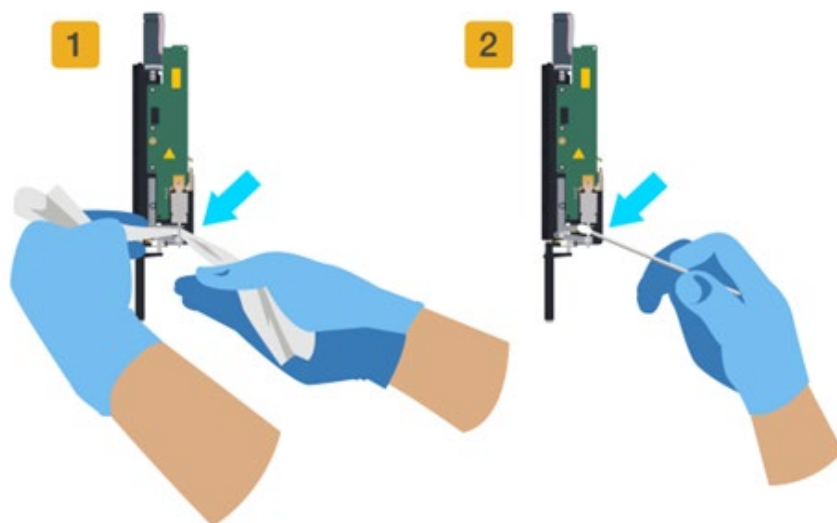


Figure 6-10: Cleaning and lubricating the rear channel

8. **Wipe down the 8 MPH's lead screw with a clean, dry cloth.** The lead screw can be difficult to access if the Prep has channels; wipe down as much of the lead screw as possible.
9. Apply a small amount of silicone oil to the 8 MPH's lead screw using a clean, lint-free cotton swab.



WARNING: Only use a few drops of oil when lubricating the Prep's lead screws to prevent contamination.

10. **Close the door.** The Prep will move the channels and/or 8 MPH out of the way for the next step.
11. Open the door and wipe down the following parts with a clean, dry cloth:
 - a. The pipetting arm's lead screw
 - b. Both pipetting arm rails

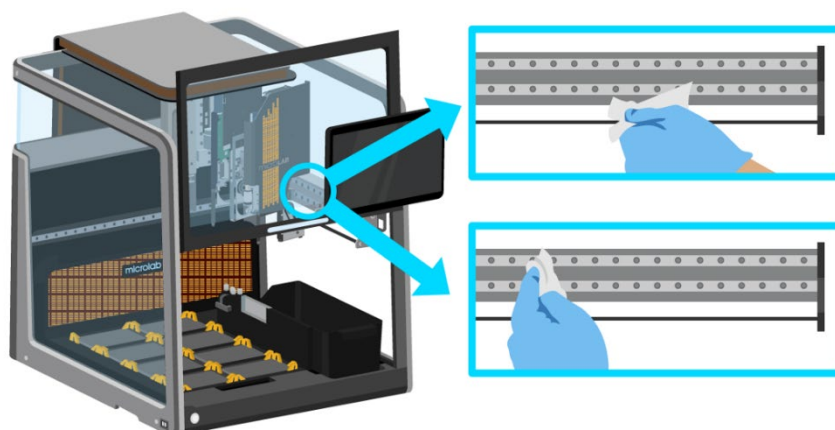


Figure 6-11: Cleaning the pipetting arm's lead screw and rails

- c. The two rails at the back of the Prep

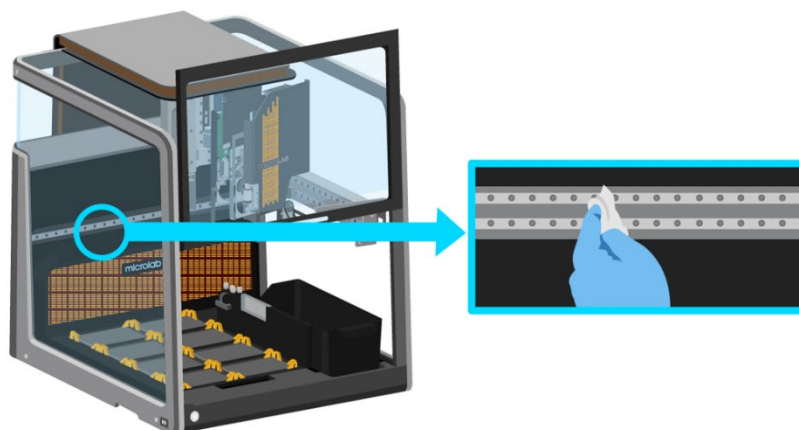


Figure 6-12: Cleaning the rails at the back of the Prep

12. Apply a small amount of silicone oil to the front, middle, and back of the pipetting arm's lead screw using a clean, lint-free cotton swab.



WARNING: Only use a few drops of oil when lubricating the Prep's lead screws to prevent contamination.



WARNING: Do not apply oil to any parts other than the specified lead screws.

13. **Close the door and tap "Finish".** The Prep will move the channels and pipetting arm to spread the oil.

6.4.4 CO-RE I Stop Disc and O-Ring Replacement

The Prep requires new stop discs and O-rings after 20,000 tip eject cycles, which occurs approximately every six months depending on the Prep's tip usage.

The following procedure describes the steps for stop disc and O-ring replacement in detail. Refer to [section 6.3](#) for information on accessing preventative maintenance routines.

1. **Make sure to wear appropriate PPE for the lab.** Goves are required for stop disc and O-ring replacement.
2. **Run the appropriate "Replace stop discs and O-rings" protocol.** Refer to [section 6.3](#) for instructions on locating and running maintenance protocols.
3. **Clear any labware on the deck and close the door.** The Prep will move the pipetting arm and tools into position. Open the door again when prompted.
4. **Use the stop disc removal tool to unscrew the old stop disc** from the pipetting head or multi-probe head, along with the old O-ring and washer.

5. **Apply glue to 2–3 threads of the new stop disc.** The new stop disc requires a small amount of glue on its threads to hold it in place.



WARNING: Avoid glue from touching the washer, the O-ring, or inside the stop disc. Replace any stop discs that have glue on them.

6. Pull the new stop disc out of its rubber strip. Twisting the stop disc may help remove it.
7. **Make sure the O-ring and washer are properly attached to the new stop disc.** The O-ring should rest between the top of the stop disc and the washer. Double-check that there is no glue on the washer or O-ring before proceeding.



Figure 6-13: Checking the stop disc assembly

8. Screw the new stop disc onto the pipetting head or multi-probe head by hand. The washer may need to be adjusted slightly to fit it properly in place.



WARNING: Do not use any tools to tighten the new stop disc. Doing so will damage the pipetting head.

9. **Wipe down the new stop disc** with a clean, lint-free towel sprayed with deionized water.
10. **Repeat steps 4–9 as necessary.** All eight stop discs on the multi-probe head must be replaced. The pipetting heads for the channels only have one stop disc each, but they should be replaced at the same time for consistent performance.
11. **Close the door when prompted.** The Prep will start the calibration procedure for the new stop discs and O-rings. Follow the instructions onscreen to complete calibration.

6.4.5 CO-RE II O-Ring replacement

The following procedure describes the steps for O-ring replacement in detail.

1. **Make sure to wear appropriate PPE for the lab.** Gloves are required for stop disc and O-ring replacement.
2. **Turn on the Prep** if it is not already on. Sign in if required.

3. **Tap the settings button** with the gear icon at the top-right corner of the home page.
4. **Run the appropriate “Replace stop discs and O-rings” protocol.** Each channel has its own routine, as well as the 8-channel MPH.
5. **Clear any labware on the deck and close the door.** The Prep will move the pipetting arm and tools into position. Open the door again when prompted.
6. **Once prompted, select “O-rings to be replaced”. Select “Next”.**
7. **Follow onscreen instructions to replace O-rings using included pick tool.**
8. **Wipe down the new stop disc** with a clean, lint-free towel sprayed with deionized water.
9. **Repeat steps 4–8 as necessary.** All eight O-rings on the multi-probe head must be replaced. The pipetting heads for the channels only have one stop disc each, but they should be replaced at the same time for consistent performance.
10. **Close the door when prompted.** The Prep will start the calibration procedure for the new stop discs and O-rings. Follow the instructions onscreen to complete calibration.
11. **When prompted, open the door and place tips on site 7.** Preps with independent-only channels require two tips in positions A1 and B1. Other setups need a full column of tips in column 1.
12. **Specify which tips are loaded onscreen, then tap “Next”.**
13. **Close the door and wait until calibration is finished.** Remove the tips once calibration is finished.

6.4.6 CO-RE II Stop Disc Replacement

The following procedure describes the steps for stop disc replacement in detail. **CO-RE II stop discs do not need to be replaced as part of normal preventative maintenance but instructions are provided should the need arise.**

1. **Make sure to wear appropriate PPE for the lab.** Gloves are required for stop disc and O-ring replacement.
2. **Run the appropriate “Replace stop discs and O-rings” protocol.**
3. **Clear any labware on the deck and close the door.** The Prep will move the pipetting arm and tools into position. Open the door again when prompted.
4. **Use the 12cNm torque driver and 2mm hex bit to unscrew the old stop disc** from the pipetting head or multi-probe head, along with the old O-ring and drive ring.
5. **Remove rubber sleeve from top of CO-RE II stop disc.**



Figure 6-14: CO-RE II stop disc

6. **Make sure the drive ring is properly attached to the new stop disc.** The drive ring should sit on top of the stop-disc.



Figure 6-15: Checking the stop disc assembly

7. **Screw the new stop disc onto the pipetting head or multi-probe head using the 12cNm torque driver and 2mm hex bit.** The drive ring may need to be adjusted slightly to fit properly in place.



WARNING: Do not use any other tools to tighten the new stop disc. Doing so may damage the pipetting head.

8. **Wipe down the new stop disc** with a clean, lint-free towel sprayed with deionized water.
9. **Repeat steps 4–8 as necessary.** All eight stop discs on the multi-probe head must be replaced. The pipetting heads for the channels only have one stop disc each, but they should be replaced at the same time for consistent performance.
10. **For the multi probe-head, ensure all stop discs are flush.**

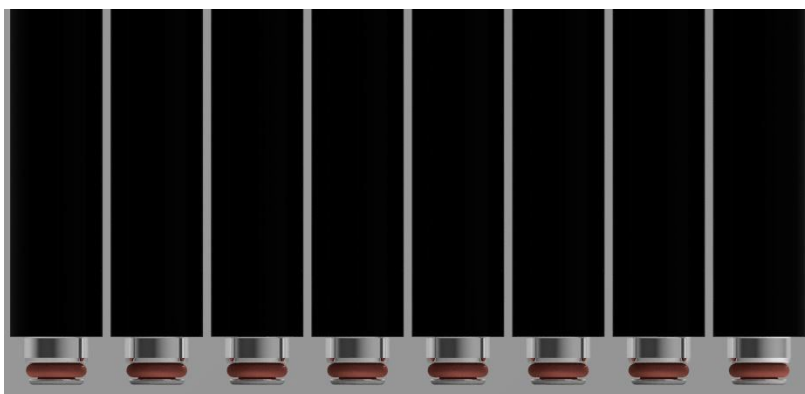


Figure 6-16: 8MPH Stop Disc alignment

11. **Close the door when prompted.** The Prep will start the calibration procedure for the new stop discs and O-rings. Follow the instructions onscreen to complete calibration.

6.4.7 Data Maintenance

Traces and other data stored on the Prep must be regularly archived or deleted. Data maintenance is required when the amount stored reaches a certain size (or recommended, depending on the level of maintenance warnings in the Prep's settings; refer to the Maintenance page help for details).

6.4.8 Data Backup

Regularly back up the Prep's database in the event of a software issue. These backups can be viewed, managed, or restored in the Prep's settings. Refer to the Maintenance page help for details.

6.5 Volume Verification

The Prep features built-in protocols to verify liquid handling performance. The channels and 8 MPH each have two protocols: one for high-volume verification, and one for low-volume verification. The protocols pipette reagents to a plate, which is measured in an off-deck absorbance reader and balance. The measurements are used with spreadsheets supplied by Hamilton to verify the Prep's pipetting accuracy and precision.

Verification kits are available for purchase through Hamilton. One kit includes two framed tip pedestals, while the other includes only the consumables. Each kit comes with consumables to run both low- and high-volume verification protocols for the channels and 8 MPH.

6.6 Pipetting Head Replacement

1. Users can replace a pipetting head if it loses accuracy or functionality. Ensure it is the correct head before replacing it. Wear appropriate lab PPE.
2. Make sure the Prep is turned off and disconnected from power.

3. Open the door and clear any labware from the deck.
4. **Ensure the correct replacement pipetting head or multi-probe head is ordered.** Do not attach a front pipetting head to the rear channel, or vice versa—hardware errors will occur if the wrong pipetting head is installed.
5. **Carefully pull the desired pipetting head near the front of the pipetting arm.** Grip the channel at its base, where it attaches to the rails on the arm—do not touch any electronics or grip the pipetting head with the black tip eject sleeve. Be sure the pipetting head is clear of the waste block.
6. Gently pull the pipetting head or multi-probe head all the way down.
7. If replacing the front or rear channel's pipetting head:
 - a. Remove the two red screws indicated in Figure 6-11 using the 2 mm wrench included with the Prep. The screws are in the same location in both the front and rear pipetting head.

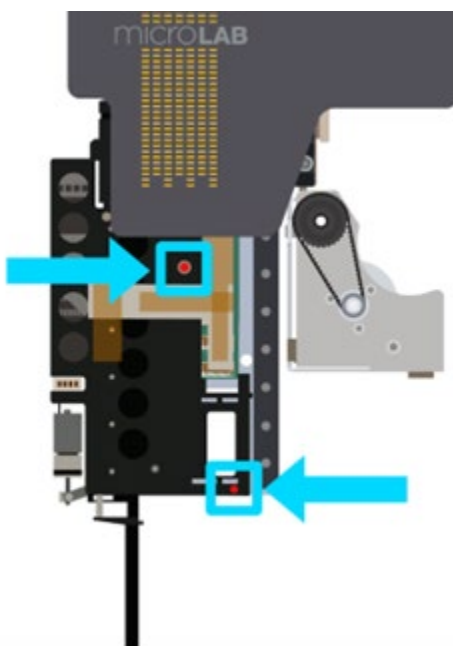


Figure 6-17: Locating pipetting head screws

- b. Examine the back of the channel before proceeding to see how the slots and tabs fit on a correctly installed pipetting head. A pipetting head may “fit” without each of the four tabs lining up properly, which can cause errors.

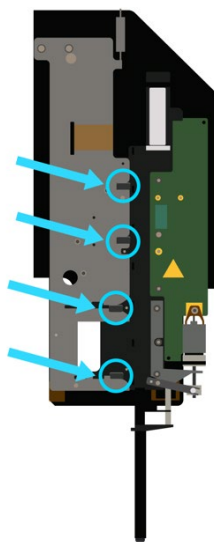


Figure 6-18: Checking the fit of a pipetting head's slot and tabs

- c. **Push the pipetting head removal tool through the hole indicated in Figure 6-13.** The pipetting head will be ejected slightly and can now be removed by pulling it to the left, away from the pipetting arm.

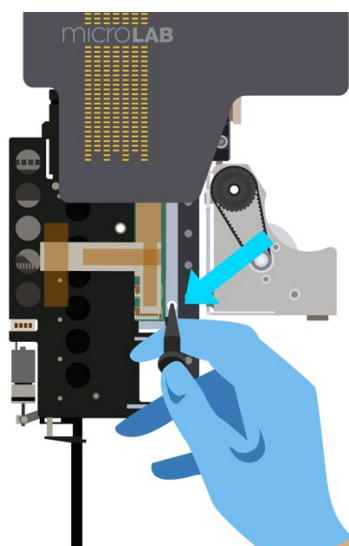


Figure 6-19: Ejecting a pipetting head

- d. **Attach the new pipetting head.** Match the four plastic slots on the pipetting head to the metal tabs on the channel. Then slide the pipetting head onto the channel until it clicks in place.
- e. **Secure the new pipetting head using the same two red screws.** The new pipetting head includes replacement screws if needed.



WARNING: Do not install a front pipetting head on the rear channel, or vice versa. Hardware errors will occur if the wrong pipetting head is installed.

8. If replacing the multi-probe head:
 - a. Loosen the screw indicated in Figure 6-14 by a half-turn using the 3 mm hex wrench included with the Prep.

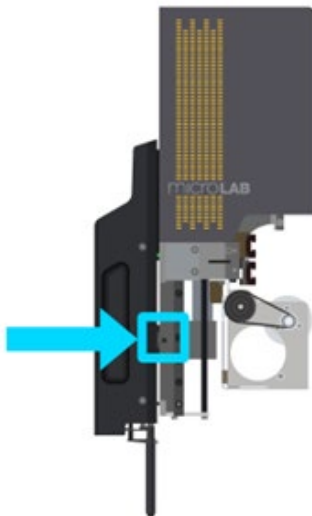


Figure 6-20: Locating the 8 MPH replacement screw

- b. Grab the old multi-probe head by the grip and pull left until it detaches from the channel. Hold the arm in place if necessary.
 - c. **Attach the new multi-probe head.** Match the black prong on the new multi-probe head to the hole on the channel and slide the multi-probe head onto the channel until it clicks in place.
 - d. Secure the new pipetting head by tightening the screw indicated in Figure 6-14.
 - e. **Visually check the alignment of the new multi-probe head.** All eight channels should be level. Push the 8 MPH to the back of the pipetting arm to visually check the alignment using the back edge of the Prep.

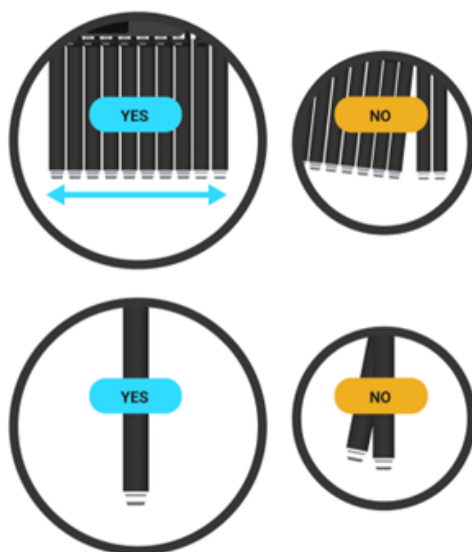


Figure 6-21: Checking a new multi-probe head's alignment

9. **Move the channel with the new pipetting head (or the 8 MPH) to the same position near the front of the pipetting arm.** This ensures the pipetting head does not snag the flat flex cables inside the channel.

Close the door when finished.

10. **Reconnect the Prep's power cable and turn it on.** Sign in if required. The new pipetting head or multi-probe head must be calibrated using the replacement maintenance routine before it can be used.
11. **Open the Maintenance Routines page.** Tap the settings button at the top-right corner of the home page, open the Maintenance tab, then select "Maintenance Routines".
12. Select the "Replace a pipetting head" routine and tap "Run".
13. **When prompted, select the pipetting head/multi-probe head that was replaced.** Tap the front pipetting head, rear pipetting head, or multi-probe head onscreen to select it.

The Prep will begin calibrating the new pipetting head or multi-probe head. Follow the instructions onscreen to complete calibration.

6.7 Decontamination



WARNING: Instruments, defective parts, and disposables must meet disinfectant and decontamination regulations prior to disposal.

These instructions include recommendations and the required materials for cleaning and decontamination. Appropriate decontamination in the event of a hazardous material spill on or inside the instrument is the operator's responsibility.

It is also the user's responsibility to avoid using decontamination or cleaning agents that may cause a reaction with the Prep or with any materials contained within. Hamilton Company or their agent is to be consulted if there is any concern about the compatibility of decontamination or cleaning agents.

The recommended decontamination procedure is as follows:

1. Spray a lint-free cloth with Microcide SQ or Deconex 61 DR.
2. Wipe down the following components:
 - a. The enclosure (inner and outer faces)
 - b. The deck and base plates
 - c. The pipetting channels (not the pipetting heads)
 - d. The waste block, including the waste bin, liquid waste tub, and liquid waste bottle



WARNING: Do not spray cleaning agents directly on the Prep.

6.8 Packing

In the event that the Prep needs to be returned for repair, it must be sent to Hamilton in its original packaging. If the original packaging is damaged or lost, new materials can be ordered from Hamilton. Refer to the [online help center](#) for instructions on packing up the Prep.

7 Parts and Accessories

7.1 Disposable Tips

7.1.1 50 μ L CO-RE Tips

Product Name	Part Number	Tip Type	Tip Color-Conductivity	Quantity per Each
50 μ L Clear Filter Tips	235829	Standard CO-RE Tip	Clear - Non-conductive	Case of 5760 tips (Blister 5 x 96 tips)
50 μ L Conductive Filter Tips	235948	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
50 μ L Conductive Sterile Filter Tips	235979	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
50 μ L Conductive Sterile Tips	235978	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
50 μ L Conductive Tips	235966	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
50 μ L Nested Conductive Sterile Tips	235987	Standard CO-RE Tip	Black – Conductive	Case of 11,520 tips (5 x 4 stack)
50 μ L Nested Clear Tips	235964	Standard CO-RE Tip	Clear – Non-conductive	Case of 11,520 tips (5 x 4 stack)
50 μ L Nested Conductive Tips	235947	Standard CO-RE Tip	Black – Conductive	Case of 11,520 tips (5 x 4 stack)

7.1.2 300 µL CO-RE Tips

Product Name	Part Number	Tip Type	Tip Color-Conductivity	Quantity per Each
300 µL Clear Filter Tips	235830	Standard CO-RE Tip	Clear – Non-conductive	Case of 5760 tips (Blister 5 x 96 tips)
300 µL Clear Tips	235834	Standard CO-RE Tip	Clear – Non-conductive	Case of 5760 tips (Blister 5 x 96 tips)
300 µL Conductive Filter Tips	235903	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
300 µL Conductive Sterile Filter Tips	235938	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
300 µL Conductive Sterile Tips	235937	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
300 µL Conductive Tips	235902	Standard CO-RE Tip	Black – Conductive	Case of 5760 tips (Blister 5 x 96 tips)
300 µL Nested Conductive Sterile Tips	235985	Standard CO-RE Tip	Black – Conductive	Case of 11,520 tips (5 x 4 stack)
300 µL Nested Clear Tips	235965	Standard CO-RE Tip	Clear – Non-conductive	Case of 11,520 tips (5 x 4 stack)
300 µL Nested Conductive Tips	235950	Standard CO-RE Tip	Black – Conductive	Case of 11,520 tips (5 x 4 stack)

7.1.3 1000 µL CO-RE Tips

Product Name	Part Number	Tip Type	Tip Color-Conductivity	Quantity per Each
1000 µL Clear Filter Tips	235820	Standard CO-RE Tip	Clear – Non-conductive	Case of 3840 tips (Blister 5 x 96 tips)
1000 µL Clear Tips	235822	Standard CO-RE Tip	Clear – Non-conductive	Case of 3840 tips (Blister 5 x 96 tips)

Product Name	Part Number	Tip Type	Tip Color-Conductivity	Quantity per Each
1000 µL Conductive Filter Tips	235905	Standard CO-RE Tip	Black – Conductive	Case of 3840 tips (Blister 5 x 96 tips)
1000 µL Conductive Sterile Filter Tips	235940	Standard CO-RE Tip	Black – Conductive	Case of 3840 tips (Blister 5 x 96 tips)
1000 µL Conductive Sterile Tips	235939	Standard CO-RE Tip	Black – Conductive	Case of 3840 tips (Blister 5 x 96 tips)
1000 µL Conductive Tips	235904	Standard CO-RE Tip	Black – Conductive	Case of 3840 tips (Blister 5 x 96 tips)

7.2 Waste

Part Number	Description
6603183-02	Waste bags, 50/roll
6603183-01	Biohazard waste bags, 50/roll
6603149-01	Waste bag wire stand
6600264-01	Liquid waste bottle

7.3 Teaching Needles

Part Number	Description
182176	Teaching needle

7.4 Thermal devices

Part Number	Description
6601885-01	Hamilton Heater Shaker 3 mm
6601885-02	Hamilton Heater Shaker 2 mm
6601900-02	Hamilton Heater Cooler

Part Number	Description
6600215-02	7-position deck

7.5 Accessories

Part Number	Description
186105	CO-RE Paddle
6600553-01	Framed tip pedestal
6600555-01	Tube pedestal Holds up to 24 full-size tubes. Tubes can be 10.5–16.0 mm in diameter and 75–125 mm in height.
6605054-01	15 mL Conical tube pedestal Holds up to 24 15 mL conical style tubes or self-standing tubes such as VTM tubes. Tubes can be 14 - 16 mm in diameter and 75 - 125 mm in height for conical bottom falcon-style tubes and 75 - 105 mm in height for self-standing tubes.
6600409-01	Small tube pedestal Holds up to 24 microtubes. Microtubes can be 9.5–11.5 mm in diameter and 30–50 mm in height.
6607478-01	cLLD Adapter 384-Well PCR Plates Adapter to improve cLLD performance for 384-well, full-skirt PCR plates
6607479-01	cLLD Adapter 96-Well, Half-Skirt PCR Plates Adapter to improve cLLD performance for 96-well, half-skirt PCR plate
6607610-01	cLLD Adapter 96-Well, Full-Skirt PCR Plates Adapter to improve cLLD performance for 96-well, full-skirt PCR plates
6600700-01	Reagent reservoir pedestal Holds up to five 50 mL reagent reservoirs.
6603432-01	Handheld barcode reader
6603189-01	Prep fume hood integration kit

7.6 Service Parts

Part Number	Description
6600318-01S	Front pipetting head
6600317-01S	Rear pipetting head
6600140-01S	Multi-probe head
6603039-01	CO-RE I Preventative Maintenance kit, 2 stop discs
6603039-02	CO-RE I Preventative Maintenance kit, 8 stop discs
6607080-01	CO-RE II Preventative Maintenance kit, 2 O-rings
6607080-02	CO-RE II Preventative Maintenance kit, 10 O-rings
6603034-01	CO-RE I Stop disc removal tool
6604125-01	Prep verification kit, with framed tip pedestals
6604125-02	Prep verification kit, no framed tip pedestals
6608001-01	Prep Enclosure

7.7 Maintenance Fluids

Part Number	Description
3995-01	Microcide SQ Kit, consisting of an 8 oz. bottle of Microcide SQ plus an empty spray bottle
3896-01	Microcide SQ, 8 oz. bottle
3896-02	Microcide SQ, 32 oz. bottle
6603044-01	Silicone oil

7.8 Software and Manuals

Part Number	Description
6602850-01	Microlab Prep User's Manual

8 Technical Specifications

8.1 Instrument Specifications

Parameter	Specifications
Power	
Input Power (Primary), Universal Supply	100–240 VAC, 50–60 Hz
Output Power (Secondary)	500 W at 48 V
Physical Dimensions	
Width	21 in / 534 mm
Depth (with screen)	25 in / 635 mm
Height	24 in / 610 mm
Height (door open)	32 in / 813 mm
Weight	91.5 lbs. / 41.6 kg
Operation	
Deck Capacity	Up to 8 positions
Plate Transport Mass	Maximum 300 g filled deep well plate
Communication	USB, Ethernet
Calibrated Positional Accuracy	0.5 mm
Positional Repeatability	0.125 mm
Operating Temperature	15–35°C (59–95°F)
Relative Humidity	15–85% non-condensing
Designed Life	7 years
Storage	
Storage Temperature	-20–70°C
Relative Humidity	10–90% non-condensing
Regulatory Installation Ratings	
CSA Certification Installation Category	II
Pollution Degree	2

Parameter	Specifications
Note: Indoor Operation and Use Only Per Section 3.6.6.2 “pollution degree 2” is defined as “normally only non-conductive pollution occurs (addition of foreign matter, solid, liquid, or gaseous (ionized gasses), that may produce a reduction of dielectric strength or surface resistivity).” Occasionally, however a temporary conductivity cause by condensation must be expected.	

8.2 Pipetting Specifications

The design specifications in the following section are valid under the following conditions, obtained for measurements at Hamilton:

- Test method: Gravimetric testing at Hamilton. The scatter of the test method must be less than 1/6 of the specified precision (for one channel).
- Accuracy/Precision: The values given refer to use of two 1 mL pipetting channels.
- Test size: ≥ 10 single pipettings per channel with disposable CO-RE tips (pick-up and dispense, tip used only once) per channel and specified volume.
- Test mode: Volumes ≥ 20 μL as jet dispense, < 20 μL as (liquid) surface dispense
- Acceptance criteria: Measured values are within specifications if less than the values appearing in the following tables.
- Balance: Mettler Toledo WSX
- Test temperature: $20 \pm 2^\circ\text{C}$
- Relative humidity: $50 \pm 5\%$
- Test fluid deionized water with 0.1% NaCl, 0.01% Tween
- Test liquid temperature within $\pm 0.5^\circ\text{C}$ of room temperature

No warranty can be given that the specifications for trueness and precision are met with any liquid or environment other than the ones specified.

Disposable Tip Size	Pipetting Volume	Accuracy R (%)	Precision CV (%)
50 μL	1 μL^*	5.0*	5.0*
50 μL	5 μL	2.5	2.0
50 μL	50 μL	2.0	1.0
300 μL	30 μL	2.0	1.5
300 μL	300 μL	1.0	1.0
1000 μL	100 μL	2.0	1.0

Disposable Tip Size	Pipetting Volume	Accuracy R (%)	Precision CV (%)
1000 µL	1000 µL	1.0	1.0
For pipetting of less than 10 µL, Hamilton recommends 50 µL volume disposable tips to achieve highest pipetting precision.			
*Independent channels only			

8.3 Barcode Reader

A handheld **USB** barcode reader can be integrated with the Prep.

Parameter	Specification
Mechanical	
Dimensions (W x D x H)	2.4 in x 7.1 in x 2.4 in (6.2 cm x 18 cm x 6 cm)
Weight	4.3 oz. (122 g)
Electrical	
Input Voltage	5 ± 10% VDC at 100 mA
Interface	USB
Environmental	
Operating Temperature	0–50°C (32–122°F)
Storage Temperature	-40–70°C (-40–158°F)
Relative Humidity	5–95% non-condensing
Scan Performance	
Scan Speed	100 scan/s
Scan Type	Bi-directional

8.3.1 Supported Symbolologies

The following barcode symbolologies can be detected by the system:

- UPC-A
- UPC-E
- Code 128-B
- EAN-13

- EAN-8
- Code 39 (no checksum)
- Interleaved 2 of 5 (no checksum)
- Codabar

8.3.2 Barcode Specifications

Parameter	Specification	
Length of string	Maximum 32 characters excluding start, stop and check characters, depending on the code length (see label dimensions).	
Code Density, Tolerance	Minimum module width (X dimension) including a print tolerance: ≥ 0.0065 in (0.1651 mm) Maximum module width (X dimension) including a print tolerance: ≤ 0.02 in (0.508 mm) Best reading performance with X dimension ≥ 0.01 in (0.254 mm)	
Check character	Codabar	None
	Code 39	None
	Code 128	One character
Quiet Zone	≥ 10 times the X dimension, but at least 3 mm	
Print contrast	Minimum contrast between bars and spaces (PCS): $\geq 80\%$ (at 632.8 nm)	
Print quality	The barcode print must be of a high quality. Offset, typographic, intaglio and flexographic printing are suitable. Mechanical dot matrix and thermo matrix printing are not suitable. The surface may be treated, sealed or plastic-coated.	

9 Appendix

9.1 Getting Technical Assistance

If additional assistance with the Prep is required, refer to [section 5.5](#) for details on the [online help center](#).

9.1.1 Support in the Americas and Pacific Rim

Hamilton Company

4970 Energy Way, Reno, Nevada 89502, USA

Toll Free (USA and Canada), General: 800-648-5950

Toll Free (USA and Canada), Service Hotline: 800-527-5269

Telephone: + 1- 775-858-3000

Fax: +1-775-856-7259

E-Mail: tech@hamiltoncompany.com

9.1.2 Support in Europe, Asia, and Africa

Hamilton Bonaduz AG

CH-7402, P.O. Box 26, Bonaduz, Switzerland

Telephone: + 41 81 660 60 60

Fax: +41 81 660 60 70

E-Mail: itechsupport@hamiltoncompany.com

9.1.3 Finding the Software Version

To find the software version, navigate to the Version tab of the Software Configuration settings. The version info is also available on startup from the login page by tapping the help button.

Package	Version
Microlab Prep Server	NLS_0.0.20107.01 / 4d6dfaed
Microlab Prep Client	NLC_0.0.20107.04 / cdea4685
Microlab Prep Core Installer	1.1.0.00078 / 0fc48a6d
Microlab Prep Device Controller	NLN_0.0.20107.02 / 94bfeea2
Microlab Prep Service Software	NLSS_0.0.20107.01 / 00c8d7a5
Microlab Prep Repair Utility	0.0.20105.01 / 77daab0d

Figure 9–1: Viewing software version on startup

9.2 Warranty

Hamilton Company warrants this product to be free of defects in material and workmanship for a period of 12 months from the date of delivery. This warranty is extended to the buyer of record on the original purchase order to Hamilton Company.

Hamilton Company or an authorized Hamilton representative will repair or replace, at its option and free of charge to the buyer at a normal place of business or at a Hamilton repair facility, any part or parts that, under proper and normal use, prove to be defective during the warranty period.*Abuse, unauthorized replacement of parts, modifications, or adjustments made by anyone other than Hamilton Company or an assigned representative voids this warranty.

This warranty gives the owner specific rights. No other warranties, expressed or otherwise, including implications of warranties of merchantability and fitness for a particular product, are made.

This warranty does not apply if:

- The product has not been operated in accordance with the user manual
- The product is not regularly and correctly maintained
- The product is not maintained, repaired, or modified by a Hamilton authorized representative or user
- Parts other than original Hamilton parts are used
- The product and parts thereof have been altered without written authorization from Hamilton
- The product is not returned properly packaged and secured

Hamilton Company endeavors to provide prompt and satisfactory service.

Hamilton Company's liability on the sale of all products shall be limited to repair, replacement, or refund of price of any defective product.

*Hamilton Company reserves the right to refuse to accept the return of any instrument or valve that has been used with radioactive, microbiological, or any other material or substance that may be deemed hazardous to employees of Hamilton Company.

9.3 Regulatory

The following list of regulatory requirements will be maintained for the Prep. The labelling will display the associated marks as listed.

Entity	Directive/Standard	Description	Safety	EMC	Environmental
UL	UL 61010-1 3rd Edition, July 19, 2019	UL Standard for Safety Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements	X		
CSA	CSA C22.2 NO 6101-1 3rd Edition, 2017	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1 General Requirements	X		
FCC	47 CFR Part 15 subchapter B	Unintentional Radiators		X	
European Union	EU Directive 2014/35/EU	Low Voltage Directive	X	X	
WEEE	Directive 2012/19/EU	Directive on waste electrical and electronic equipment			X
RoHS	Directive 2011/65/EU	Restriction of the use of certain hazardous substances			X

Entity	Directive/Standard	Description	Safety	EMC	Environmental
China RoHS	China ROHS 2	GB/T 26572 the requirements for concentration limits for certain restricted substances in electronic and electrical products.			X

9.3.1 Declaration of Conformity

The EU Declaration of Conformity is part of the delivery of the Prep. It validates that the instrument listed meets all required EU Directives.