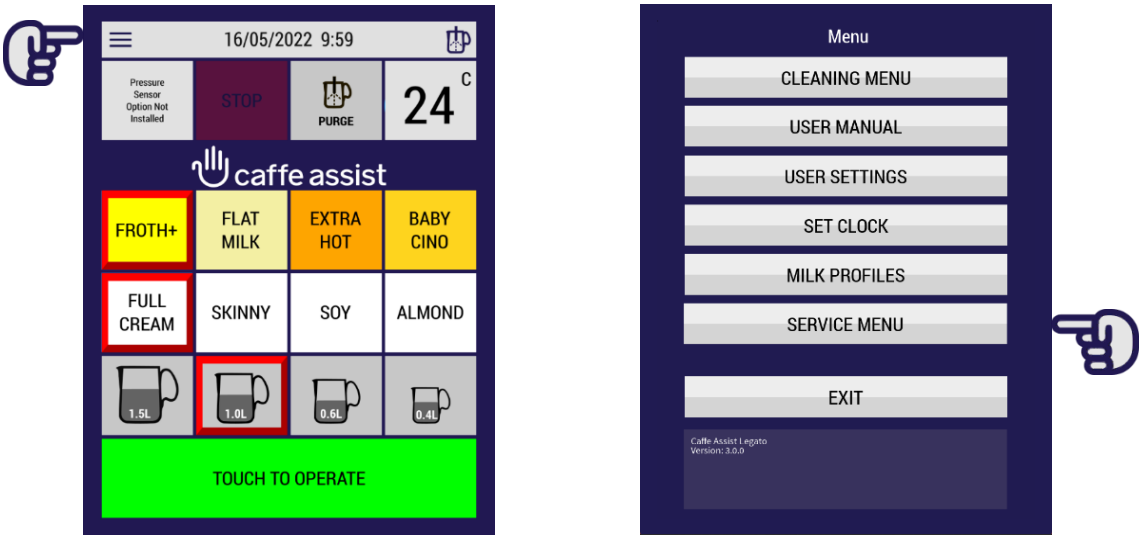
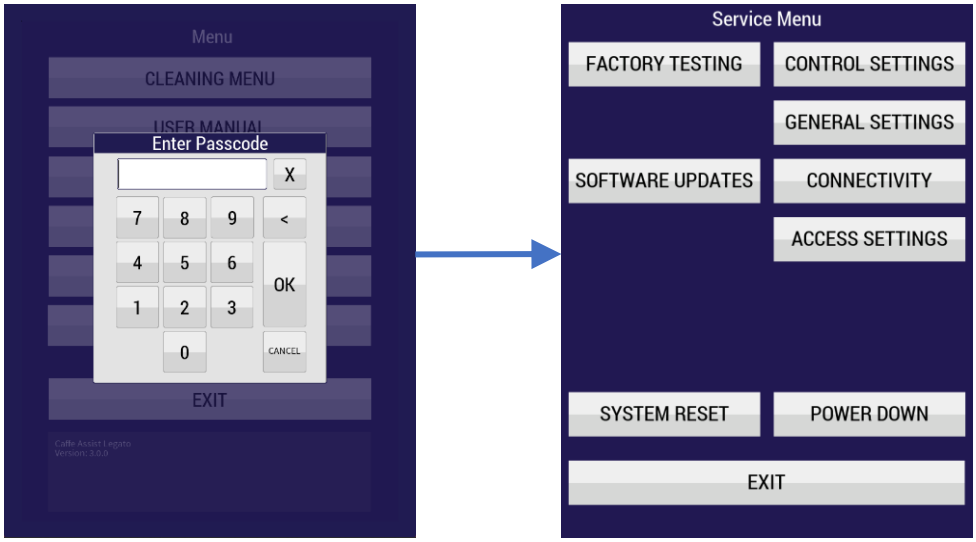
6 SERVICE AND REPAIR

6.1 SERVICE MENU ACCESS

This section is restricted to licenced technicians.





- Select the ***MENU.***
- Press the ***SERVICE MENU.***
- Enter the Passcode and press "OK".
- Select from *SERVICE MENU* options.

DETAILS ON EACH OPTION ARE PROVIDED DURING TECHNICIAN TRAINING UNLESS SPECIFICALLY NOTED IN OTHER SECTIONS OF THIS DOCUMENT.

6.2 DISASSEMBLY

The dismantling of the machine must be carried out by an authorised technician.

Internal features of the Caffe Assist® with the covers off, clearly labelled components and sub-assemblies can be found in the appendix as exploded views.

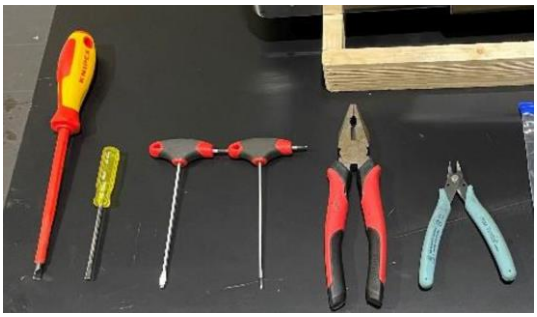
6.3 TOOLS

IMPORTANT INFORMATION!

NO ELECTRIC POWER TOOLS TO BE USED – ASSEMBLY AND DISASSEMBLY WITH HAND TOOLS ONLY.

TOOLS REQUIRED:

- 2.5 mm hex key
- 3.0 mm hex key
- Pliers
- Circlip Pliers
- Small side-cutters
- Large flat blade screwdriver
- Small flat blade screwdriver
- Phillips #2 screwdriver (PH2)
- Pozidrive #2 screwdriver (PZ2)
- Adjustable wrench (x2)
- Black marking pen
- Wire Brush
- Retractable Blade Knife (for trimming purge tube)
- Small container, or glass, to hold a diluted solution of mild detergent.
- ESD Wrist Strap and Mat (for ESD Protected Area servicing of PLC/Screen)







6.4 SIDE INFILL PANELS

6.4.1 OVERVIEW

The plastic side infill panels are designed to allow quick access to the plc, wiring loom, wand, wand carrier assembly and cleaning head inner.

Each panel has a vertical, or trailing, edge (REAR) and an oblique, or leading, edge (FRONT) while both upper and lower edges are parallel.

The front, or leading, edge of both the left and right panels are aligned with the sloping plane of the user interface screen assembly. On removal and installation the panels must be ***ROTATED*** about the front edge and opened and closed like a door which is hinged at that front edge.

6.4.2 REMOVAL OF THE SIDE INFILL PANELS

Remove the two cap screws from the upper and lower positions on the infill panel face.

1. Using your fingertips only, grip the rear, or trailing, edge of the infill panel and rotate outwards as if the front edge of the panel is hinged. Once the rear of the panel is free, continue to rotate it until it is half-open before removing the panel entirely.

Figure 19: The correct removal of side infill panels

6.4.3 INSTALLATION OF THE SIDE INFILL PANELS

1. Place the front edge of the infill panel against the front of the opening nearest the screen assembly.
2. Holding the front edge in position, rotate the panel as if the front edge is hinged closing it like a door.
3. Make sure that the flanges at the edges of the panel fit OVER the outer metal panels - top and bottom - and locate the rear edge loosely into position but ***DO NOT FORCE*** it all the way home.
4. Finally, grip the centres of the panel, both top and bottom simultaneously, between thumb and fingers and squeeze inwards towards the opposite panel.
5. Once the panels are installed, align the holes with the clinch nuts and loosely fit the screws in both the upper and lower positions before tightening to ensure correct alignment. DO NOT over-tighten.

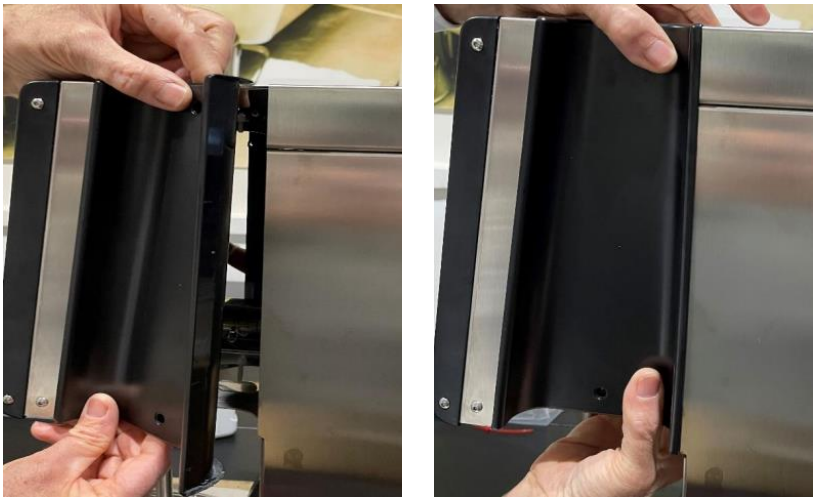


Figure 20: The correct installation of the side infill panels

IMPORTANT INFORMATION!

DO NOT ATTEMPT TO INSTALL A SIDE-INFILL PANEL WITHOUT FIRST LOCATING THE FRONT EDGE OF THE PANEL AND THEN ROTATING IT INTO POSITION. ATTEMPTING TO INSTALL THE INFILL PANELS DIRECTLY INTO POSITION WITHOUT ROTATION WILL CAUSE THE FLANGES TO CRACK, OR BREAK, AND POSSIBLY ALLOW STEAM TO DAMAGE THE PLC LOCATED BEHIND THE SCREEN.

6.5 SIDE AND REAR PANELS

To remove the side and rear panels:

1. Remove 2x screws at base of the side panel.
2. Unscrew steam input adaptor cover, if removing the steam input panel.
3. Remove 2x screws located through the top panel, to enable removal of the rear panel.

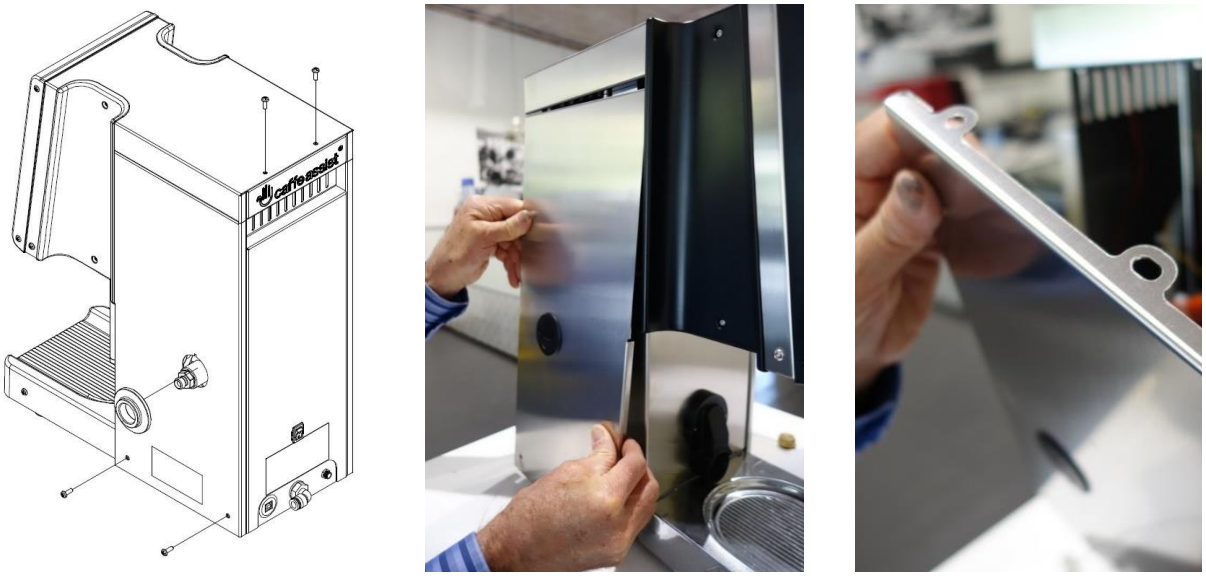


Figure 21: The screws required to remove the side and rear panels

6.5.1 REAR PANEL LOCATING FEATURES

The following diagrams show the rear panel screw fixed/free variations:

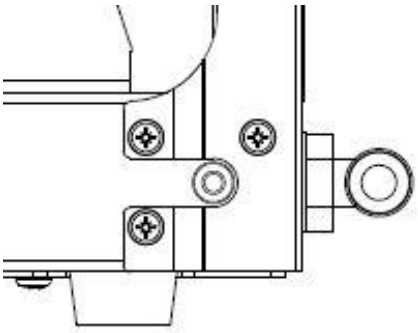


Figure 22: Screw fixed

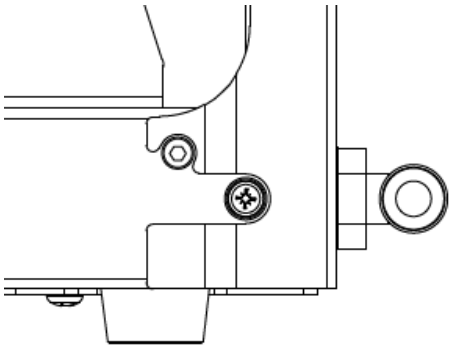
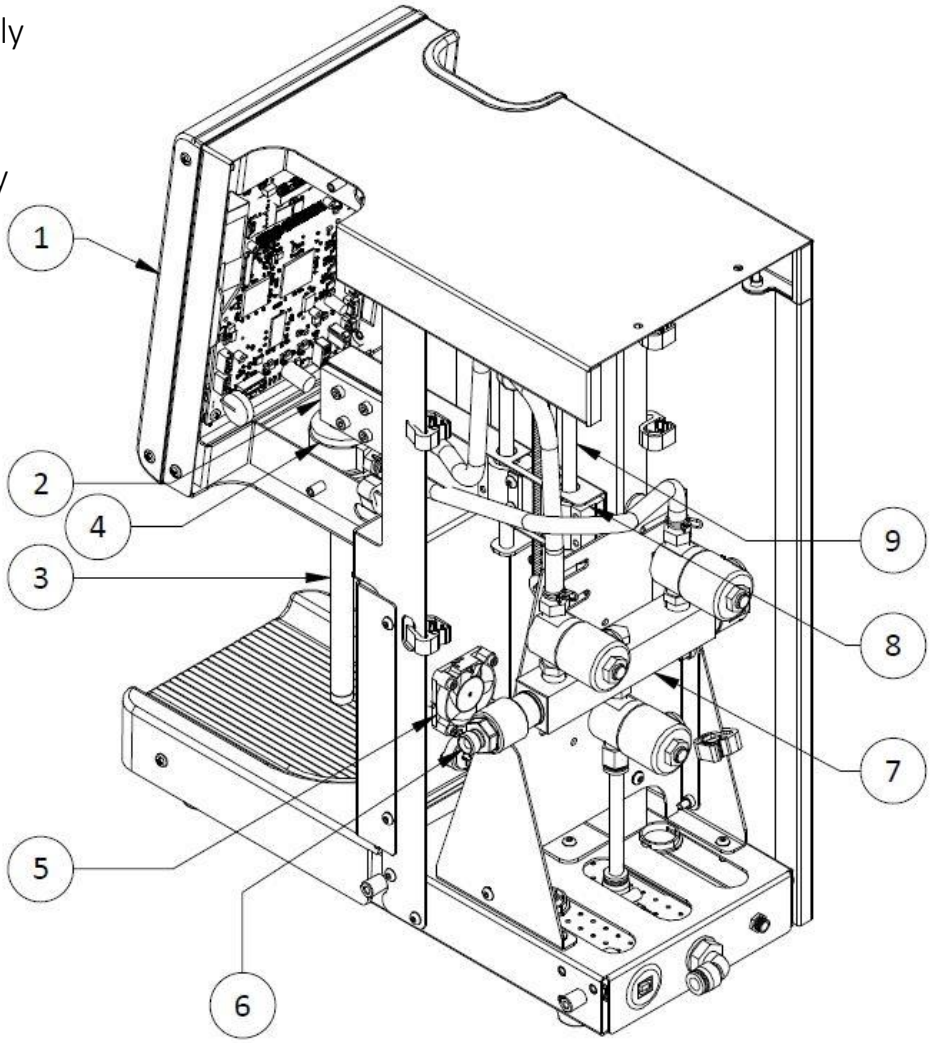


Figure 23: Slotted Screw free

6.5.2 MACHINE WITH PANELS REMOVED

The following diagram identifies the machine component sub-assemblies:

1. Display Module Assembly
2. Steam Wand Nest
3. Steam Wand Assembly
4. Cleaning Head Assembly
5. Fan
6. Steam Inlet
7. Manifold Assembly
8. Linear Bearing
9. Linear Rail



6.6 MANIFOLD VARIATIONS

The following diagram shows the manifold variations:

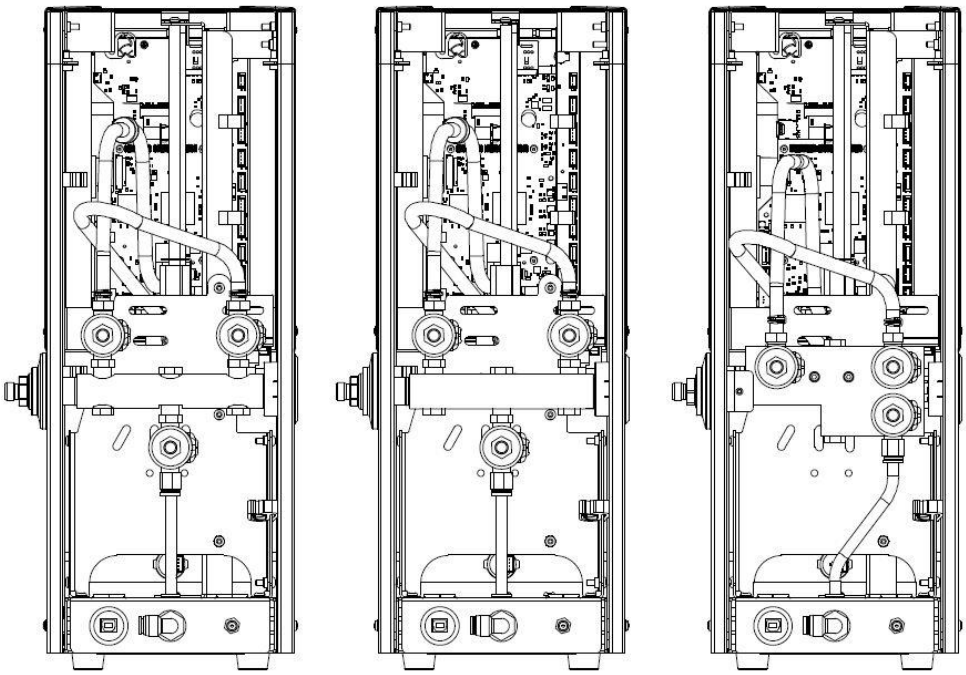


Figure 24: The 3-Body Types – Cylindrical, Square Section and Combined Manifold/Solenoid Block

6.7 LEFT/RIGHT (SIDE INPUT) AND UNDER BENCH CONFIGURATIONS

The following diagram shows the steam input variations:

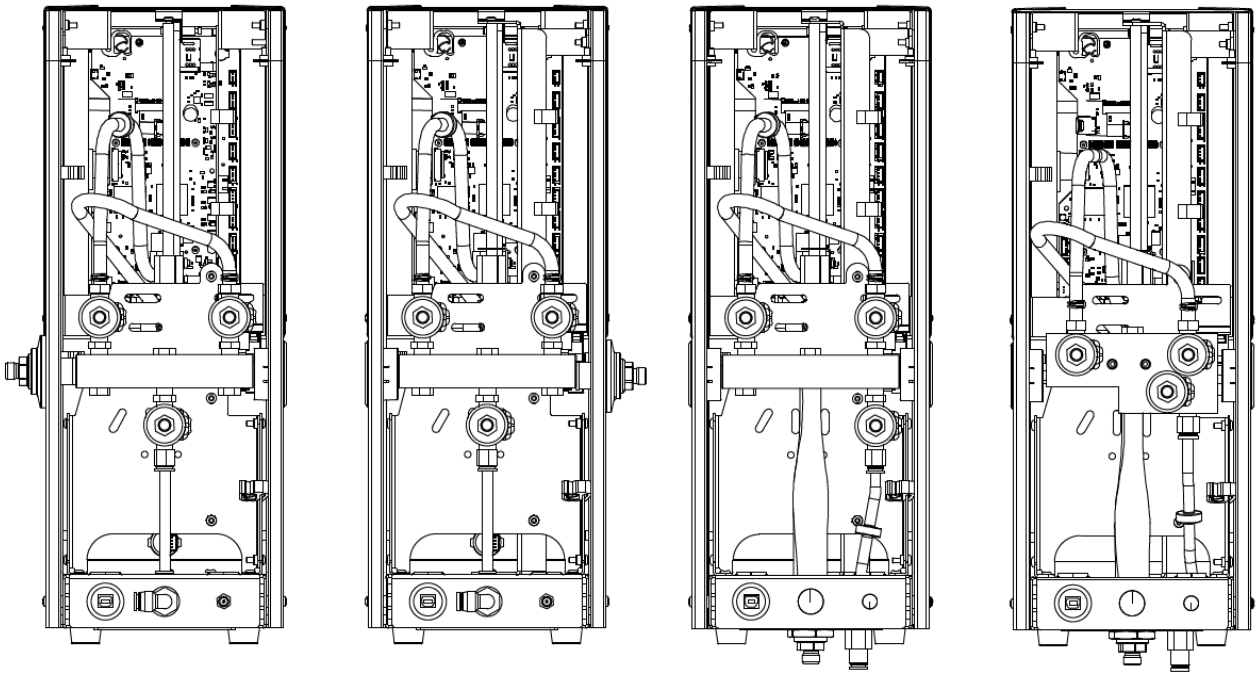


Figure 25: The LEFT, RIGHT and UNDER BENCH configurations

6.8 BENCH TESTING AND CALIBRATION

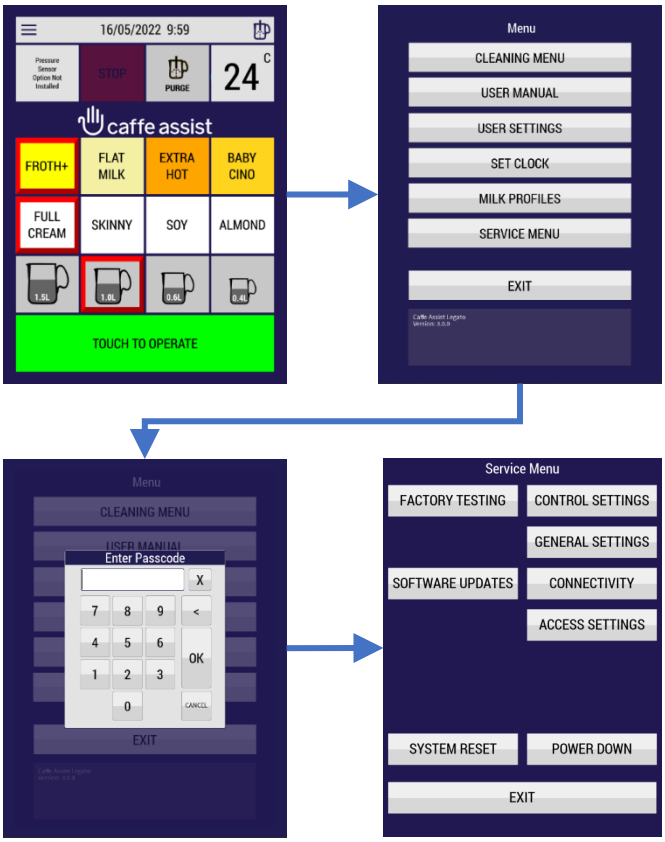
To test the mechanics, electronics and operation software of the Caffe Assist® prior to installation at a customer site and after repair.

See installation section for connection of steam, power and waste prior to commencement of bench testing.

HOT SURFACE!

HOT! AVOID CONTACT WITH THE WAND DURING OPERATION; DO NOT PLACE YOUR HANDS OR OTHER BODY PARTS NEAR THE NOZZLE TIP.

1. Place an empty 0.6 litre (600 ml) jug on the jug rest.
2. Press the *MENU* button located on the top LHS of the main operator screen and select *SERVICE MENU*. Enter the Passcode and press "OK".

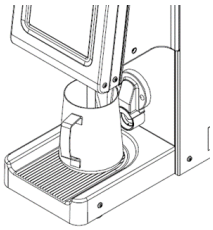


3. Remove the plastic infill panels and the sheet-metal side and rear panels to be able to observe the machine's inner workings: 6.4 and 6.5.
4. Select "Factory Testing"
5. The 'OUTPUT CONTROL' panel contains direct override buttons for each solenoid valve. Pressing the button will toggle the solenoid open, a second press will turn the solenoid off.

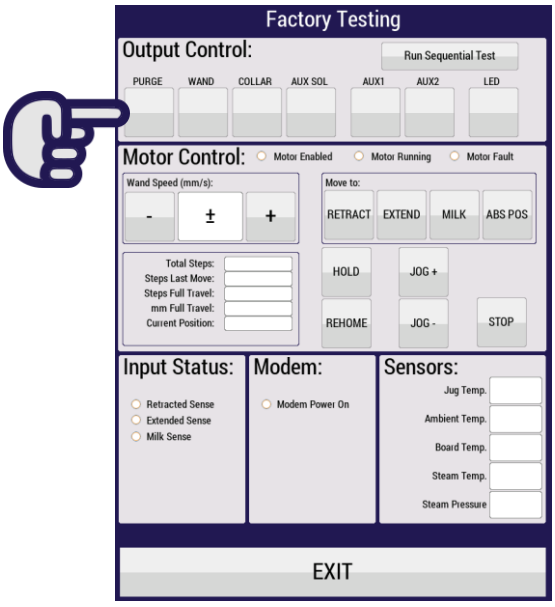
MANUAL STEAM CONTROL MAY CAUSE SURFACES TO BECOME HOT.

AVOID DIRECT CONTACT WITH STEAM

ENSURE THE FOLLOWING SOLENOID VALVE OPERATIONS ARE CONDUCTED WITH A JUG ON THE JUG REST



6. Press the button under the 'Purge' label, allow the solenoid to stay open for at least 2 seconds and press the button again to turn it off.



7. Repeat this step 2 times. This will purge the system through the waste connection.

8. Ensure that steam is running through the manifold and tubing by checking that steam is coming out of the external waste purge tube.

9. When the 'Purge' button is off, check the purge hose inside the machine for possible leaks around the one-way valve and the male/female tube connectors.

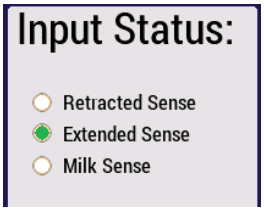
10. Also check that no residual steam or condensed water vapor is still draining from the lowest solenoid valve.

11. If any leaks are detected, ***NO MATTER HOW SMALL***, or the solenoid valve appears not to have completely shut off, as evidenced by steam still flowing through the purge line, please refer to troubleshooting: 8.6.5, 8.6.6, 8.6.7.

12. Under the 'MOTOR CONTROL' panel, press the 'Extend' button. The wand will descend from the home position to its fully extended position.

13. If the wand cannot complete its full extension, "Motor Movement Error" will be displayed on the screen. Please refer to troubleshooting: 8.5.1, 8.5.2.

14. Observe the 'Input Status' panel and check that the 'Extended Sense' is lit up green.



15. With the wand now fully extended, refer to the 'OUTPUT CONTROL' panel and open the 'Wand' solenoid valve for 2 seconds, then close it.

16. While the solenoid valve is open, observe the wand and ensure steam is coming out of the wand tip.

17. Repeat step 15 twice.

18. Closely observe the joint between the steam wand and steam wand carrier, checking for any steam or water vapour leaks. The joint is located at the top of the wand where it is screwed into the wand carrier assembly and partially hidden under the hose clamp which secures the terminal end of the yellow milk sensing wire to the wand and the wand carrier assembly. The hose clamp also prevents the wand from being accidentally unscrewed during normal operation or cleaning processes.

19. After the 'Wand' button is switched off, check that there is no residual steam coming through the solenoid valve (#2) and leaking into the silicon tubing. If steam or condensed water vapour continues to flow, please refer to troubleshooting: 8.6.5, 8.6.6, 8.6.7.

20. Refer to the 'OUTPUT CONTROL' panel and select the 'Collar' (Cleaning Head) button. Turn it on for 2 seconds and then off.

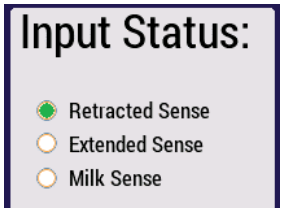
21. Check that steam is coming out of the cleaning head.

22. Repeat step 20 twice.

23. After the 'Collar' button is switched off check that the solenoid valve (#3) has completely closed. If steam continues to flow though the valve or if there is water in the silicon tube, please refer to troubleshooting: 8.6.5, 8.6.6, 8.6.7.

24. Select the 'Retract' button and wait for the wand to return to the home position before removing the jug.

25. Observe the 'INPUT STATUS' panel and check that the 'Retracted Sense' is lit up green.



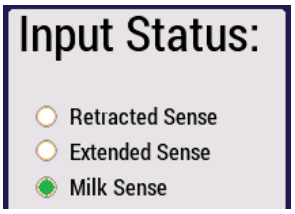
26. Fill a 0.6 Litre jug to the line with cold water and place it on the jug rest.

IT IS IMPORTANT TO USE WATER RATHER THAN MILK IN THIS TEST AS THE AUTOMATIC CLEANING FUNCTION WILL NOT OPERATE.

27. Under the 'MOTOR CONTROL' panel the button labelled 'Milk', located on the RHS of the screen, tests the milk level sensing circuit of the Caffe Assist®. Press 'Milk' and the wand will descend to the level of the water and should stop precisely at the junction formed between the metal of the wand and the black plastic tip, leaving the tip just below the water surface.

28. Verify that the wand has stopped at the water surface and did not continue to its fully extended position.

29. Observe the 'INPUT STATUS' panel and check that the 'Milk Sense' is lit up green and the 'Extended Sense' is not lit up and stays white.

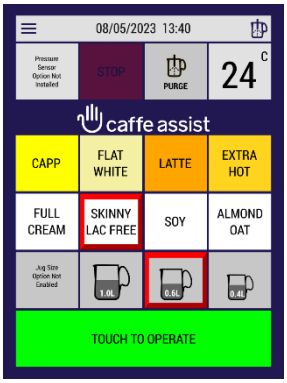


30. Select 'Retract' and press 'Milk' once more. If the wand doesn't stop with only the tip submerged, please refer to troubleshooting: 8.5.1, 8.5.2..

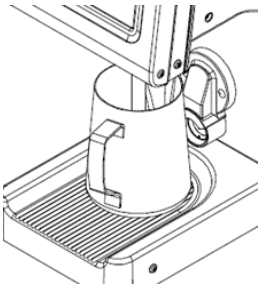
31. Select the 'Retract' button and wait for the wand to return to the home position before removing the jug.

32. Remove the jug from the jug rest.

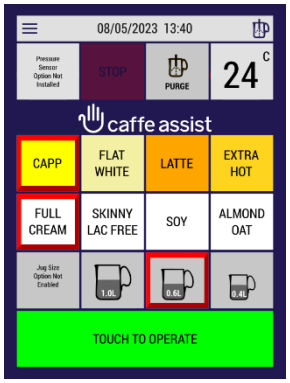
33. Press ***EXIT*** out of each menu level until back on to the main screen.



34. Fill up a 0.6 Litre jug to the line with cold milk (or cold water with a drop of detergent if there is no milk available). Place the jug on the jug rest, pushing it all the way forward with the pouring lip nearest the temperature sensor window.



35. Select 'CAPP' and the '0.6 L' jug symbol on the operator screen and make the appropriate **Milk Type** selection (Full Cream, Skim, etc). If you are using a weak water and detergent mixture for testing, select the 'FULL CREAM' option.

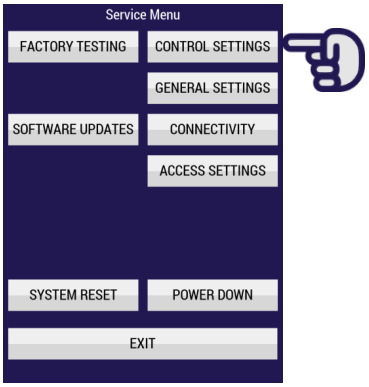


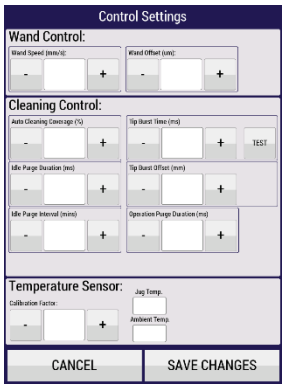
36. Press 'TOUCH TO OPERATE'.

37. After the machine has steamed the milk (or water/detergent mixture), leave the jug on the jug rest. Place a digital thermometer into the jug and note the temp, leaving the thermometer in the jug. Compare the temperature of the digital thermometer in the jug with the temperature displayed on the top RHS of the operator screen. The two temperatures should be the same or within +/-1 (one) degree C of each other.

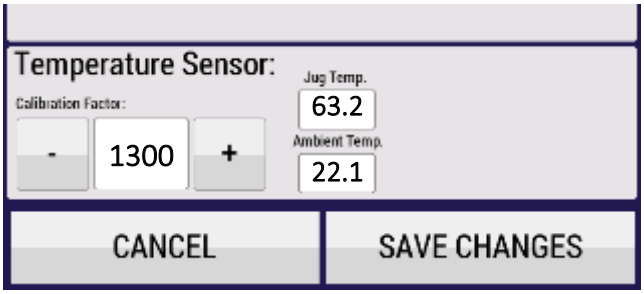
38. If the temperature is within +/-1 (one) degree C or less, re-calibration is **NOT** required, and the following steps can be skipped.

39. If the temperature is not within +/-1 (one) degree C or less, re-calibration is required. Select the ***MENU*** button on the top LHS of the screen. Select ***SERVICE MENU*** and type the passcode and press '**OK**'. Select "**Control Settings**" on the top RHS of the screen.

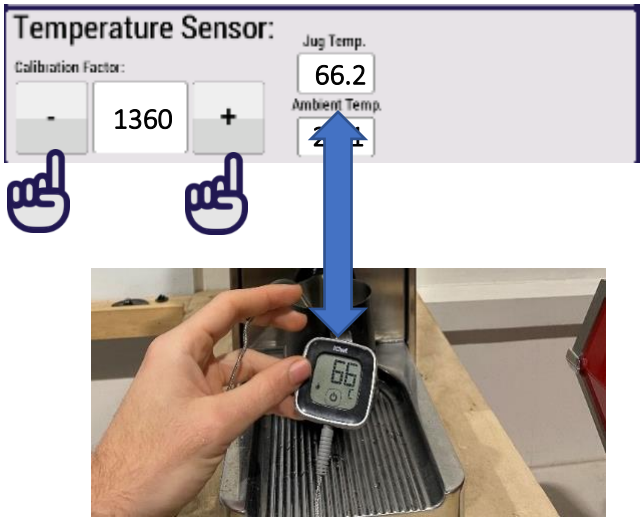




40. Under the heading 'TEMPERATURE SENSOR' there is numeric display on the LHS labelled 'Calibration Factor' with -/+ buttons either side. In addition, there are two smaller boxes located to the RHS of the 'Calibration Factor': the upper box is labelled 'Jug Temp' and the lower box is labelled 'Ambient Temp'.



41. Using the +/- buttons next to the calibration factor, increase or decrease the 'Calibration Factor' so that the 'Jug Temp' box displays the same temperature as the digital thermometer in the jug within +/- 1 degree C.



42. Press 'Save Changes', then press ***EXIT*** in each menu level until back on the main screen.

43. Now compare the reading of the operator screen display with the reading of the digital thermometer. They should be reading within 1 degree C of each other. The machine is now calibrated.

44. Once back at the main screen, run a couple jugs of milk (or water with a drop of detergent) for each jug size. It is recommended that two (2) complete frothing cycles of each jug size are performed. While frothing these jugs, check along the manifold to make sure there are no leaks after extended use.

45. If there are any leaks from the manifold, refer to 6.8 REPLACING A SOLENOID PLUNGER, 6.10 UNDERBENCH MANIFOLD REPLACEMENT and 6.11 MANIFOLD ASSEMBLY VARIATIONS.

6.9 REPLACING A SOLENOID PLUNGER

Guide to replacing a solenoid plunger:

1. Turn off the steam to the Caffe Assist®.

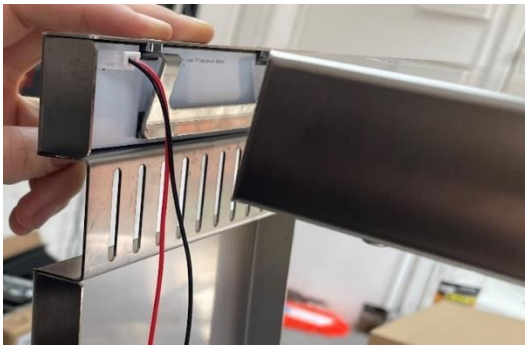
2. Place an empty jug on the jug rest in the normal operating position with the pouring lip facing forward.

3. Press the ***MENU*** button and select ***MANUAL CLEAN*** then press "**Clean Wand**". The Caffe Assist® will clean the wand and remove any surplus steam from the manifold,

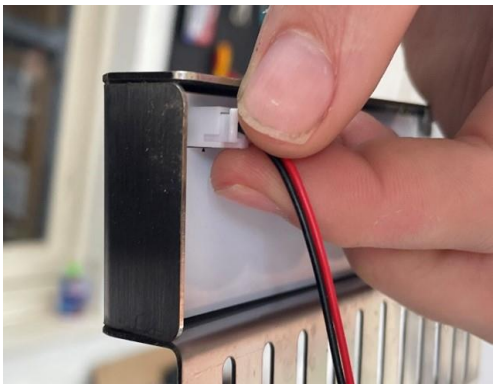
4. Remove the power supply from the power outlet.

5. Remove both the right and left metal side panels. It is **NOT** necessary to remove the black plastic side infill panels.

6. Remove the screws holding the back panel in place and gently pull it back (**7 series machines can skip step 6 & 7**).



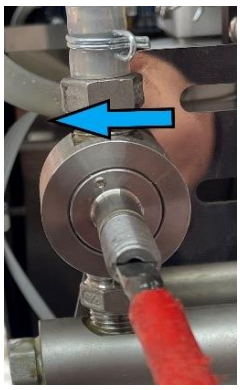
7. Disconnect cable from rear logo PCB.



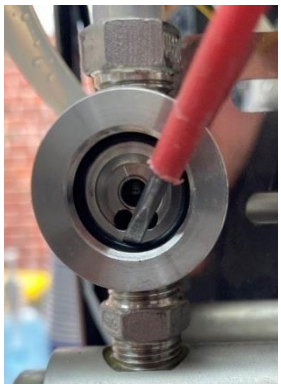
8. Gently rest the rear panel upside down on the side of the machine so as not to put any stress on the rear On/Off switch loom.

9. Remove the coil from the solenoid by holding the black outer casing of the coil and using a spanner to loosen and remove the locking nut.

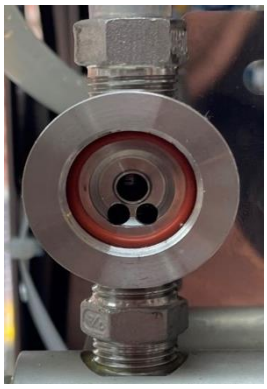
10. Place a large flat bladed screwdriver into the slot on the end of the coil-post. Unscrew the coil-post by turning it anti-clockwise and remove the plunger with its attached spring.




11. Use a fine-point pick, or a fine flat bladed screwdriver, to remove the internal O-ring that seals the bottom of the coil-post to the solenoid body.

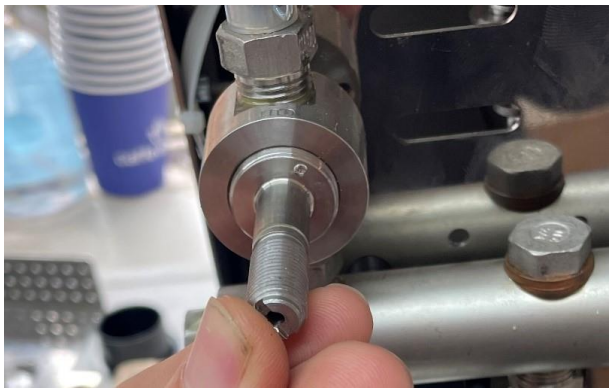



12. Carefully place the new O-ring into the body cavity of the solenoid, using a fine-point pick, or flat bladed screwdriver, to make sure it is correctly seated.

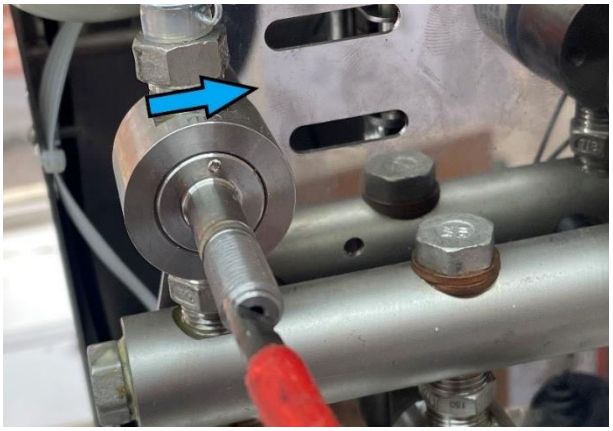



13. Place the new plunger with its attached spring on the solenoid coil-post.

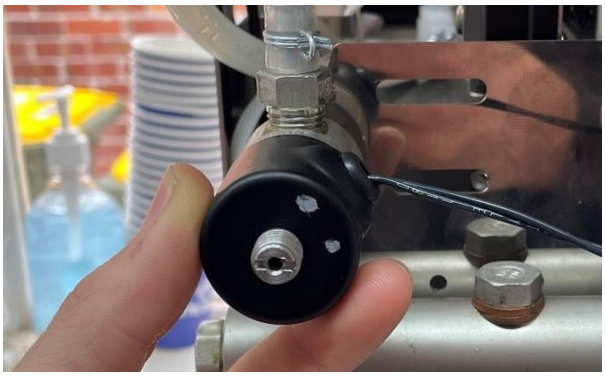

14. Carefully screw the coil-post and plunger into the solenoid body, making it finger tight.



15. Tighten up the coil-post with a flat bladed screwdriver by turning it a further 60 degrees of arc (or from 12 to 2 o'clock).



16. Replace the coil on the coil-post, but do not install the locknut.



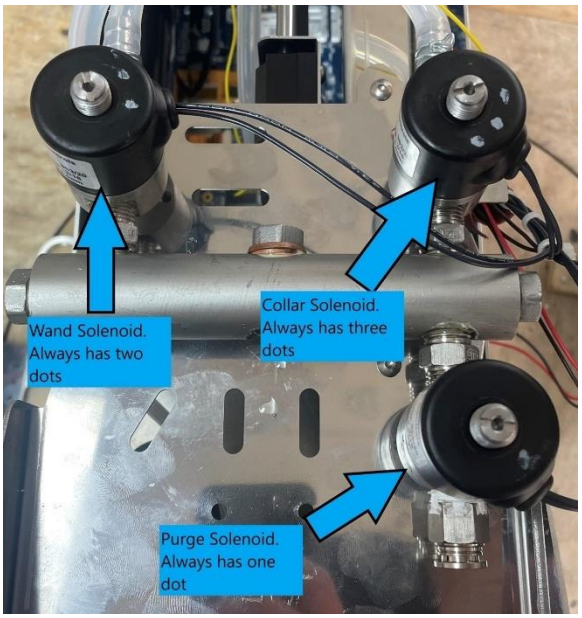
17. Power up the Caffe Assist® and turn on the external steam supply.

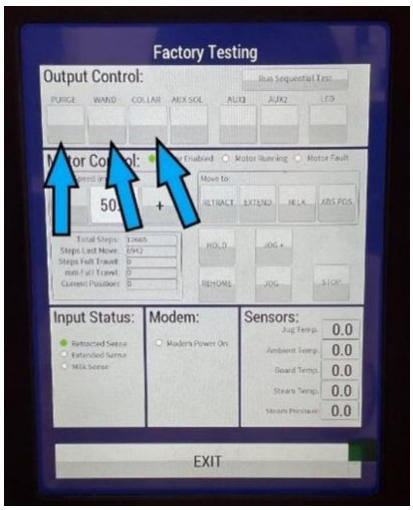
18. On the screen press the top left menu button (three horizontal lines).

19. Select the ***SERVICE MENU*** and enter the Passcode and press "**OK**". Then select the button "**Factory Testing**".

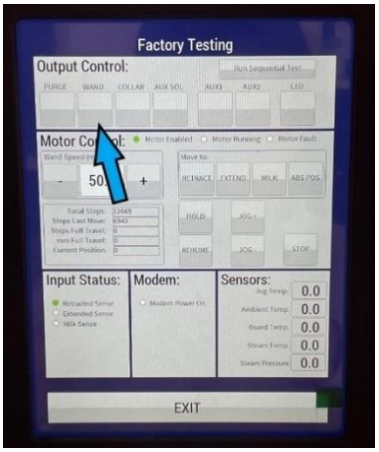
20. Go to the top line on the "**Factory Testing**" page and test the solenoid which has had its plunger replaced. Please note that 'COLLAR' refers to the cleaning head solenoid.

    The physical solenoid coils are marked with 1, 2 or 3 dots. Viewed from the rear, Bottom-right (1 dot) is the purge solenoid, Top-left (2 dots) is the wand solenoid, Top-right (3 dots) is the cleaning-head (collar) solenoid.



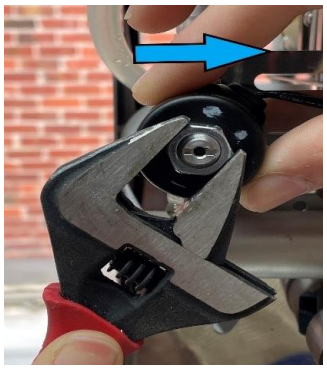


21. To test a particular solenoid, press the button which correlates to the plunger that was replaced. For this example, the wand solenoid plunger was replaced. Once pressed, observe whether steam issues from the wand tip.



22. Look for any evidence of steam or water leakage between the coil-post and the solenoid body by removing the coil from the coil-post.

23. If there is no evidence of steam or water leakage replace the coil on the coil-post, set the coil wires at the 2 o'clock position and replace the locking nut while still holding the black plastic casing of the coil so that it does not move.



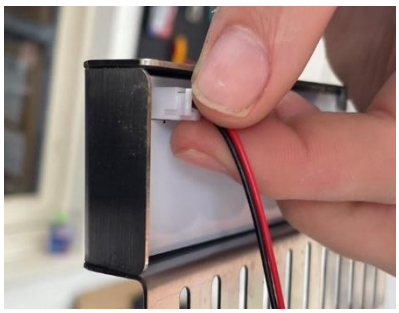
24. Reassemble the Caffe Assist by following steps 7, 6 and 5 and see 6.5 SIDE AND REAR PANELS.

6.10 LEFT-RIGHT TO UNDERBENCH CONVERSION

Guide to converting a LEGATO LEFT-RIGHT to an UNDERBENCH manifold:

1. Follow work instructions 6.4 SIDE INFILL PANELS and 0 SIDE AND REAR PANELS to remove plastic infills, side and rear panels.

2. Disconnect cable from rear logo PCB.

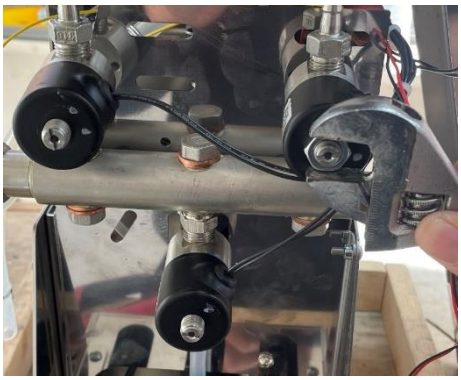


3. Gently rest the rear panel upside down on the side of the machine as to not put any stress on the looms.

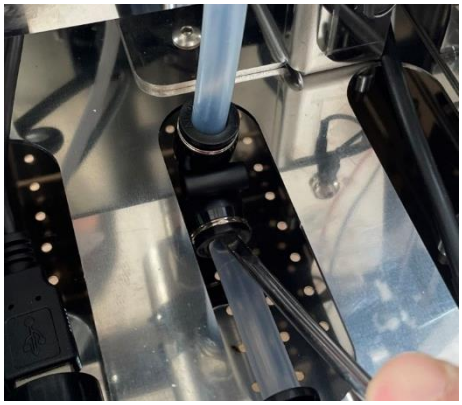
4. Remove the wire clips over the silicon tubing on top of the solenoids using pliers.

5. Use a skinny flathead screwdriver to remove the silicon tubing from the hose tails being careful not to damage the silicon tubing.

6. Remove the locknuts that hold the solenoids in place by turning them anti-clockwise and put the solenoids to the side of the machine.

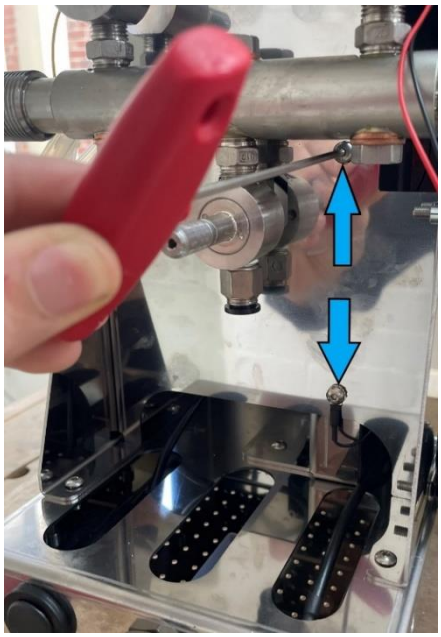


7. Using a flat bladed screwdriver, or your finger, push the 90-degree push-lock fitting towards the front of the machine to remove it.



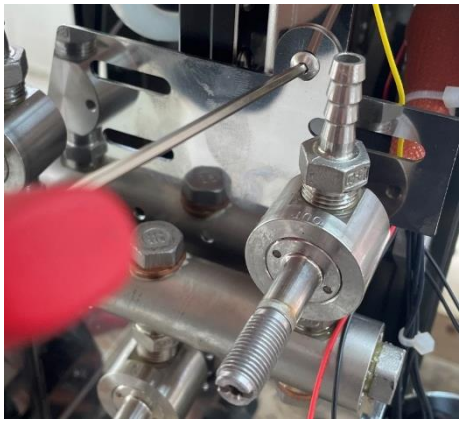
8. Remove the Teflon tubing from the male tube connector located at the bottom purge solenoid by putting pressure on the male tube connector and pulling the Teflon tubing down.

9. Remove the bottom 2 screws on the manifold plate (middle and bottom).

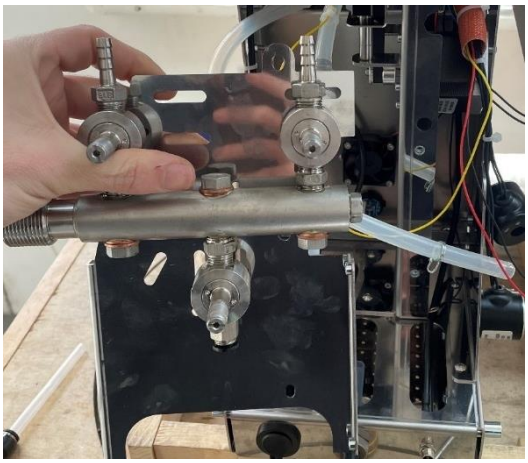


10. Remove the 2 screws on the side of the manifold plate that hold it in place on each side of the machine.

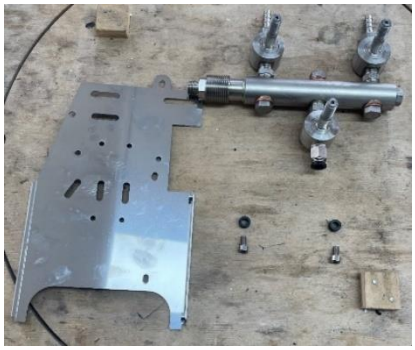
11. Remove the last screw on the manifold plate located at the top of the plate.



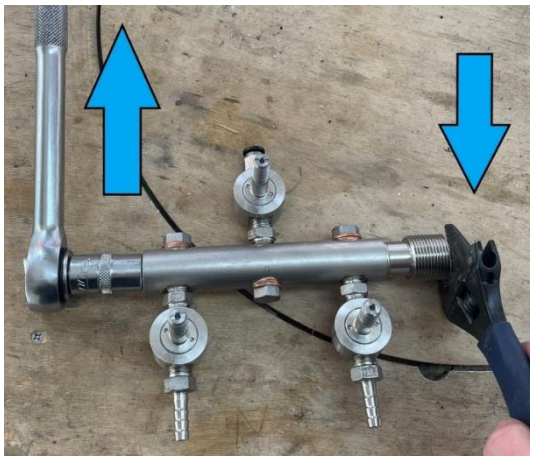
12. Take out the plate and manifold from the machine and place it face down (with solenoids facing down).



13. Using a 4mm hex key remove the back screws from the manifold plate.

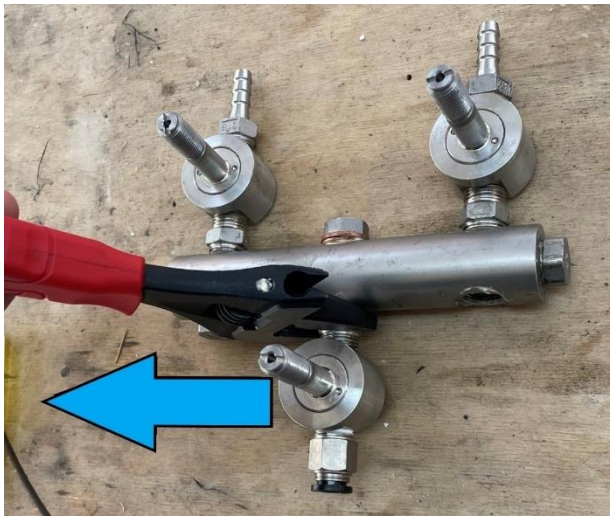
14. Using two spanners, or spanner and socket wrench combination, remove the threaded adaptor from whichever side is being converted (LHS or RHS). To remove the threaded adaptor, support the other end of the manifold by holding the hex nut with the other spanner and twist against each other.



15. If the nut which was used in taking off the threaded adaptor is loosened, you ***MUST*** take it off and use Loxeal thread sealant before putting it back on.

16. Remove the hex nut plug that is located to the right of the Purge Solenoid using either a spanner, or socket wrench, and turning anticlockwise.

17. Remove the Purge Solenoid by taking it off by the hex nipple which connects the solenoid and manifold. Turn the nipple anticlockwise.



18. Clean any dried thread sealant from the hex nut plug which was taken from the right of the Purge Solenoid.

19. Put thread sealant on the hex nut which was taken off and screw it into the threaded adaptor's place.

20. If there is a plastic male tube connector on the purge solenoid replace it with a metal male tube connector. First remove the plastic male tube connector by using two spanners. One supporting the body of solenoid and the second turning the tube connector anticlockwise.


21. Using Teflon tape, go around the thread of the metal male tube connector three times.

22. Put the metal male tube connector with Teflon tape back on the Purge Solenoid valve using two spanners. One spanner to hold and support the body of the solenoid valve and the second spanner to turn the male tube connector clockwise into the thread.



23. Put thread sealant on the hex nipple which is connected to the Purge Solenoid valve (THESE SHOULD BE TOGETHER).

24. Screw the solenoid valve into the bottom right side of the manifold. Use a spanner on the hex nipple (the connecting part between valve and manifold) and turn it clockwise until it is tight. You ***MUST*** turn the solenoid until it is facing upwards, as the other two solenoid valves are positioned.

25. Place the manifold face down. Put the spacers on the back where the screw holes are.

26. Put the manifold backing plate on top of the manifold lining up the two middle holes with the two spacers. Using the screws tighten them finger-tight and then use the 4mm hex key to tighten completely.

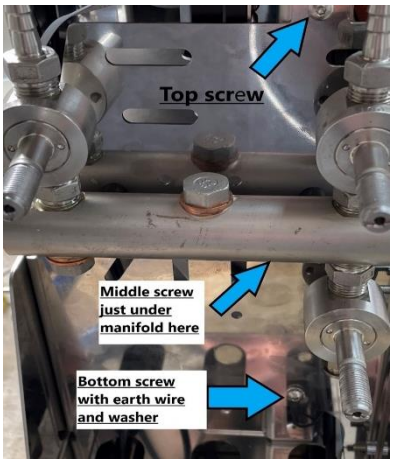
    NOTE: THE BACKING PLATE MUST BE THE SAME ORIENTATION AS IN THE PHOTO, WITH THE TOP SCREW HOLE SITTING TO THE LEFT.

27. Looking back to the machine, use a spanner to take off the locking nut holding the power loom on the back end of the machine by turning it anticlockwise.

28. Take off the bulkhead male elbow fitting (end purge fitting to the left of the power loom). Use a spanner to turn the outside anticlockwise while you use a finger to hold the inside nut.

29. Put the manifold with the plate attached back into the machine. Before screwing in anything make sure the holes on the front and side of the plate are in the correct positions on both sides.

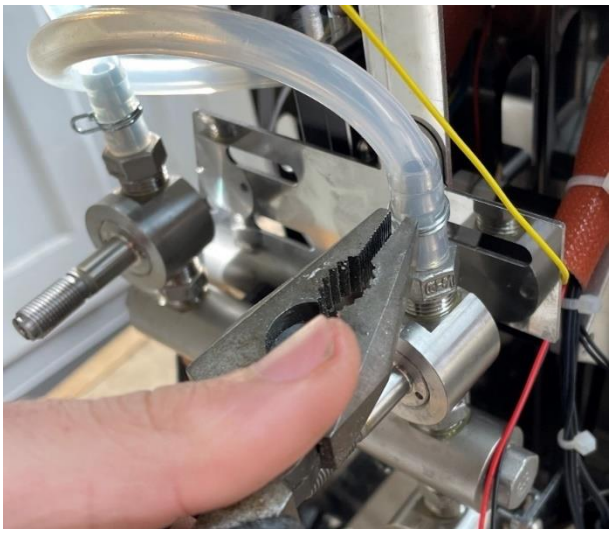
30. Now that the manifold plate is lined up, replace all the screws in their original positions. These include the top screw, the 2 on each side of the plate, the middle screw just under the manifold and lastly the screw with the earth wire. The screw that holds the earth (black) wire ***MUST*** have the original washer on.



31. Using a small amount of dish washing liquid and water, soap up the hose tails located where the silicon tubing was taken off earlier at the top of the solenoids.

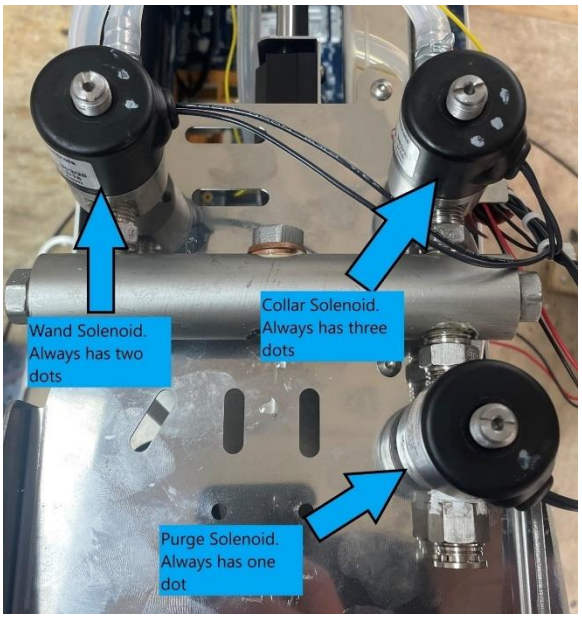
32. Place the silicon tubing from the wand on the Wand Solenoid hose tail (TOP LEFT). After sliding on the tubing use pliers to put the double wire clip over it.

33. Place the cleaning head silicon tubing around the front of the wand tubing and place on the Collar Solenoid (TOP RIGHT).

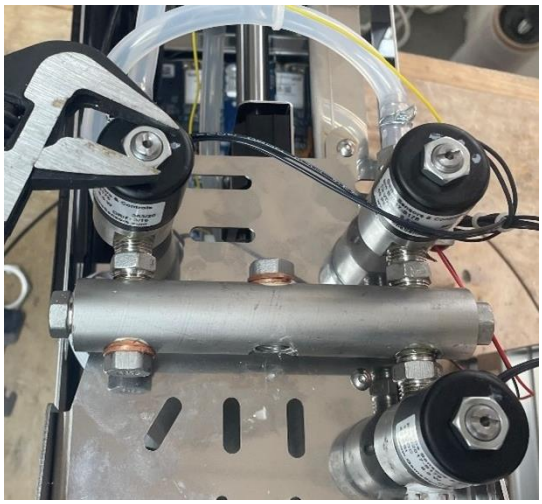


34. Put the solenoid coils back onto the solenoid valves.

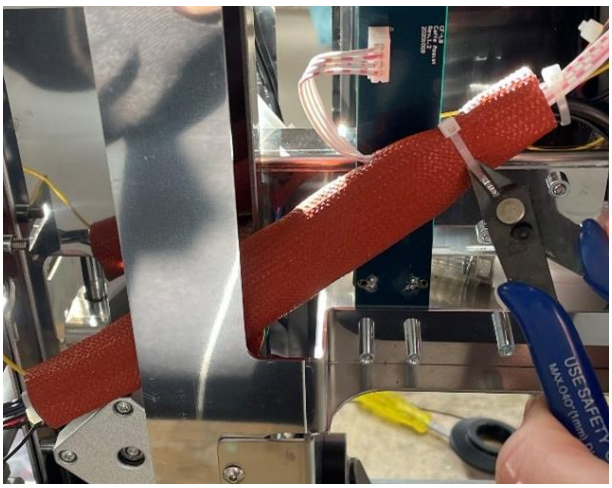
    The physical solenoid coils are marked with 1, 2 or 3 dots. Viewed from the rear, Bottom-right (1 dot) is the purge solenoid, Top-left (2 dots) is the wand solenoid, Top-right (3 dots) is the cleaning-head (collar) solenoid.



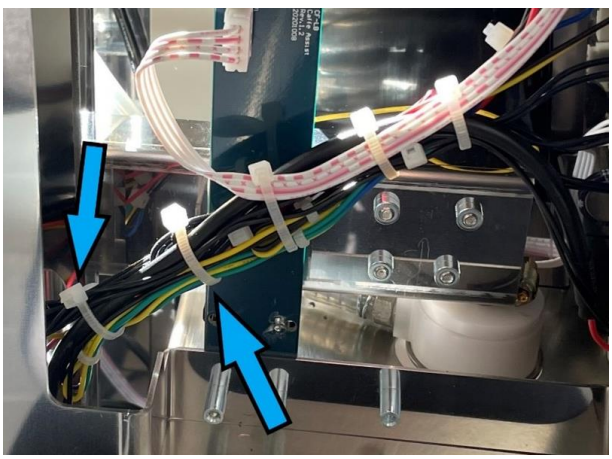
35. Using your fingers screw on the locknuts that hold the solenoids to finger tight. Change the orientation of the solenoids so that they are all facing 2 o'clock. After changing the orientation of the solenoids tighten the nuts with a spanner.



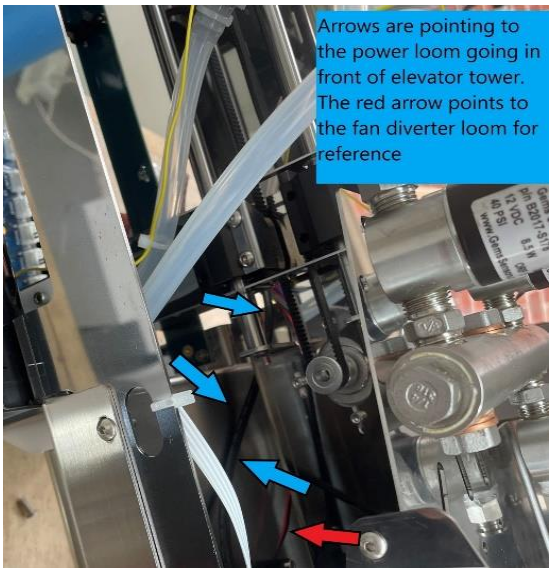
36. Cut off the cable ties around the wiring loom cover.

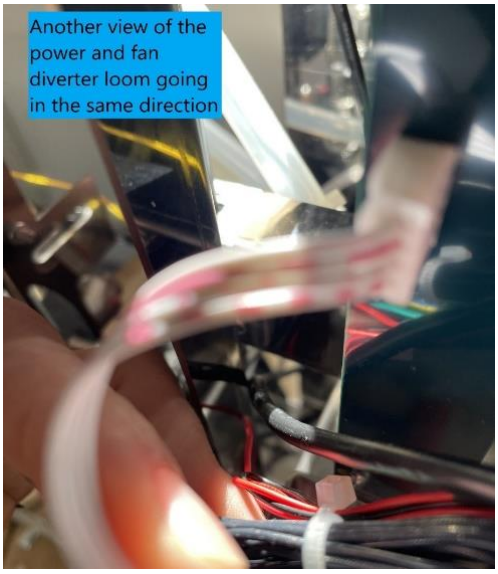


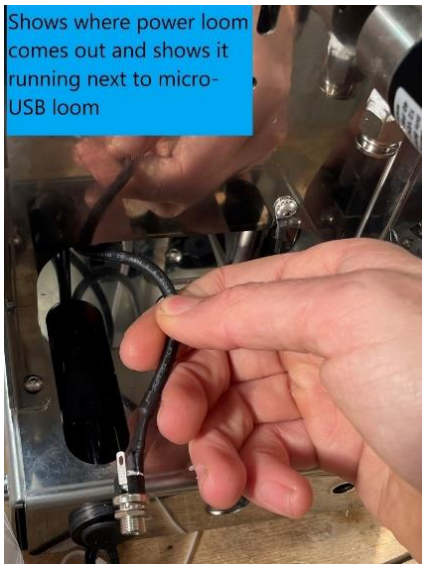
37. Cut off the cable ties that hold the power loom.



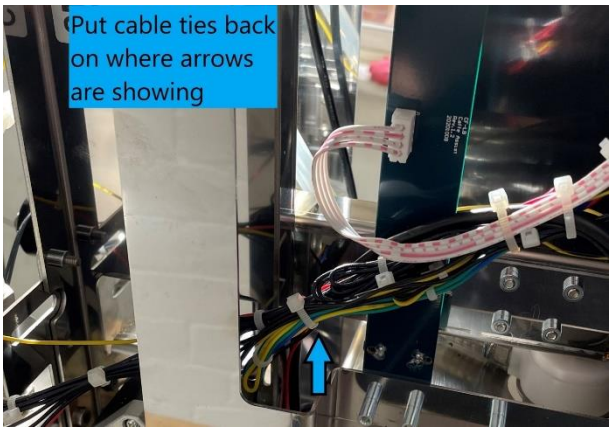
38. Change the orientation of the power loom by putting it in front of the elevator tower (where the red and black loom wiring goes to the fan diverter) and run it next to the internal micro-USB cord.

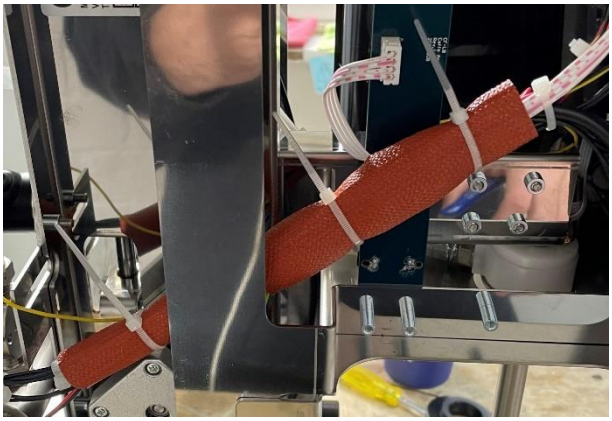






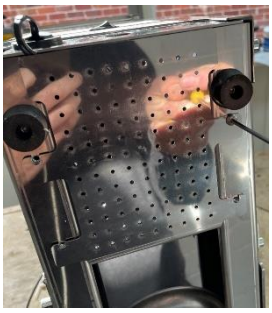
39. Place the cable ties that were taken off back on the looms. Put the loom cover back over the looms and cable tie it on.

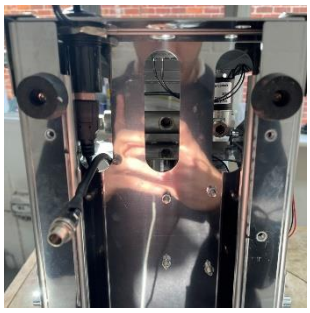




40. Place the back panel on the machine without screwing it on.

41. Place machine on its face, remove screws holding on the base plate.





42. Put in the one-way valve purge assembly and place the back panel on the side of the machine so you can see the back components.

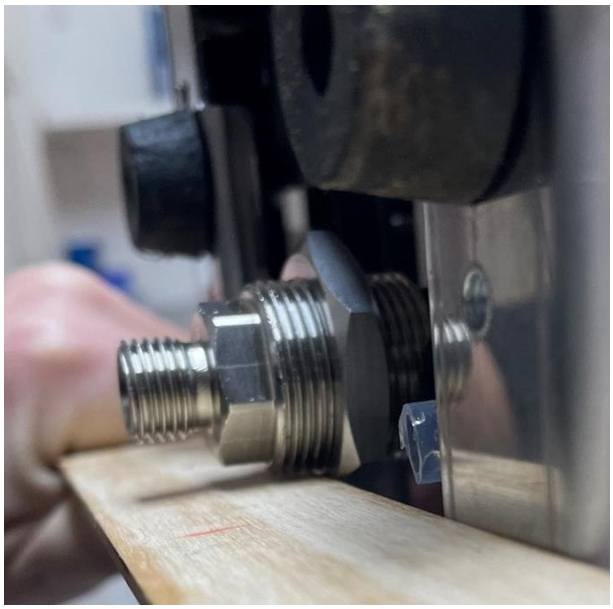

43. Screw on the UB (Under Bench) adaptor by hand until it's finger tight. Next use a spanner to firmly tighten the adaptor to the steam tube, once fully tightened, continue to turn to simultaneously tighten the steam tube into the manifold body.

44. Check the length of the one-way valve compared to the end of the metal bottom of machine. If the Teflon tubing is going past the metal, cut it until its flush against it.

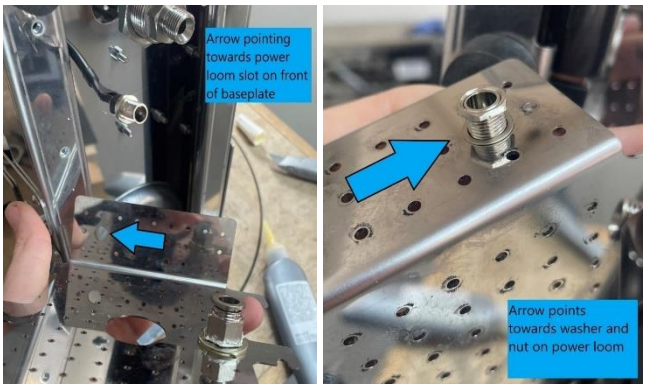
45. Put thread sealant on top of the stainless-steel tube and screw it into the middle bottom hole of manifold until finger tight.


46. Place the 18cm nylon sleeve around the stainless-steel tube and place thread sealant around the bottom of the tube.

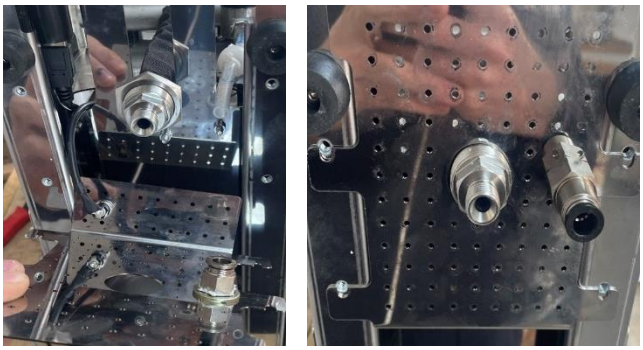

47. Take 1 x M25 locking nut and screw it onto the UB adaptor. After screwing it on, use a ruler or flat piece of material and put it against the locking nut and the base of the machine. Screw the M25 locking nut until it is flush with the bottom of the machine.



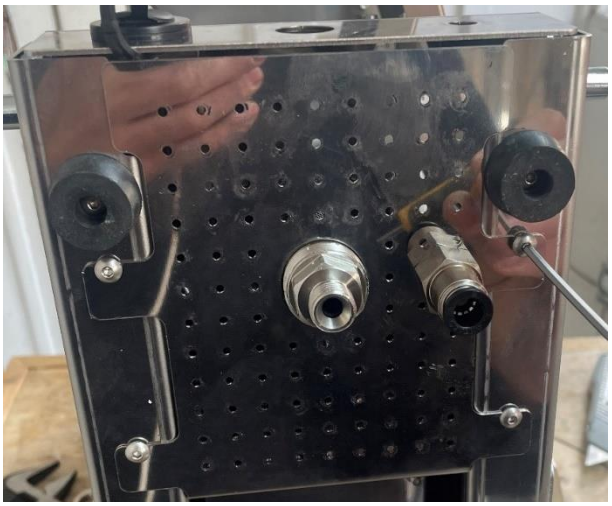
48. Take the Under Bench base plate and put the power loom through the front edge. Then use the washer and locknut to secure the power loom. Screw the locknut up finger tight and then finish by using a spanner.



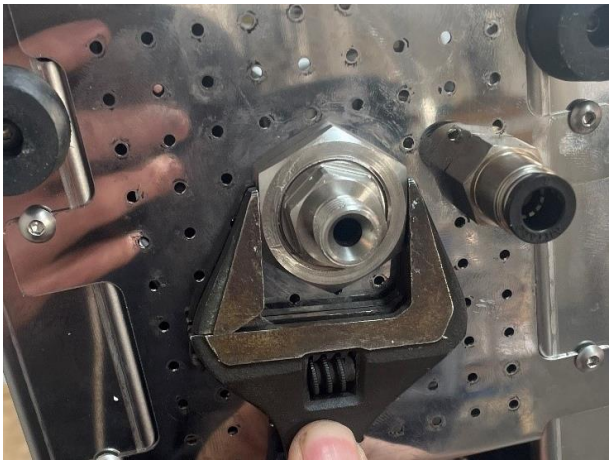
49. Place the base plate onto the bottom of the machine with the one-way purge line placed into the male tube connector and the Under Bench adaptor fitted into the large hole in the middle of the base plate.



50. Use grease on the screws and then screw on the base plate.



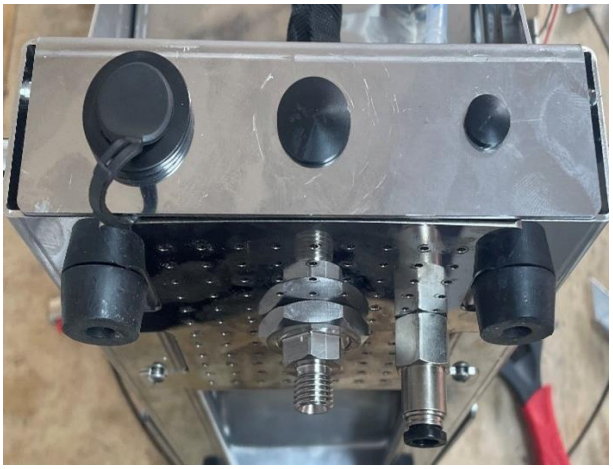
51. Screw on the other M25 locking nut finger tight. Then tighten it with a spanner.



IMPORTANT INFORMATION!

YOU MUST WAIT 8 HOURS BEFORE RUNNING STEAM THROUGH THE MACHINE SO THE THREAD SEALANT CAN DRY

52. Put the 16 mm and 8 mm hole caps in the back of the machine.



53. Reinstall the side and rear panels (6.5) and the plastic side infills (6.4).

6.11 UNDERBENCH MANIFOLD REPLACEMENT

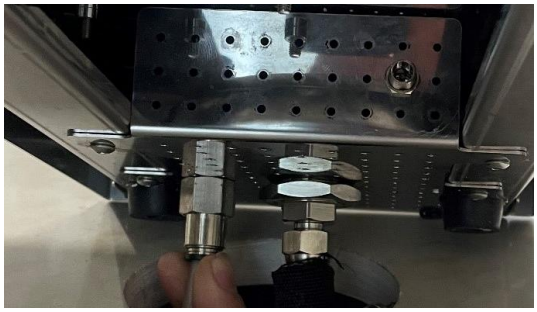
Guide to replacing a LEGATO UNDERBENCH manifold:

1. Turn off the steam supply to the Caffe Assist® unit. Purge any remaining steam from the unit by running a ***MANUAL CLEAN***, which can be found at the top of the menu after selecting the ***MENU*** button (three horizontal lines at the top left of the screen).

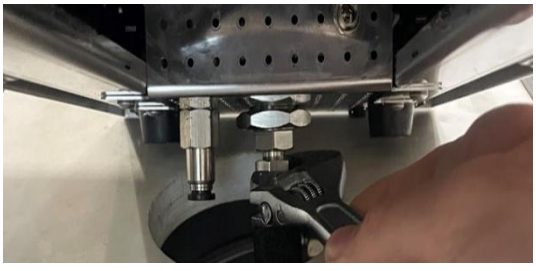
2. Carefully tilt the front of the Caffe Assist® machine backwards by raising the jug rest approx. 70mm from the bench, allowing access to the power input plug located in the base plate.

3. Unscrew the power plug locking ring and remove the plug.

4. Remove the Teflon purge tubing from the push-in fitting located on the perforated base plate.



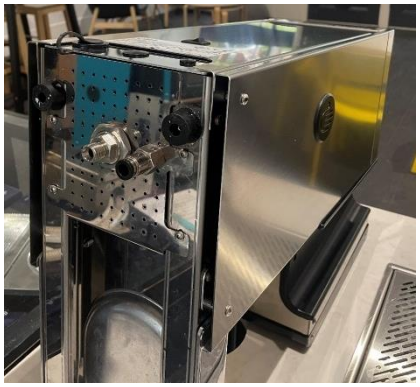
5. Use a 17mm, or adjustable, spanner to remove the steam supply tube from the base of the Caffe Assist® machine.



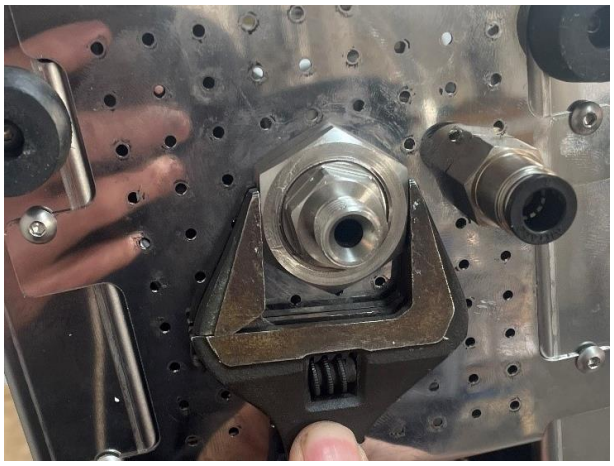
6. Remove the two metal side panels from the unit. It is NOT necessary to remove the plastic side infill panels.

7. Remove the dome-head screws (2) located on the top panel towards the rear. ***ENSURE*** use of short M4x6mm screws to secure the top panel because a screw of a longer length will penetrate and damage the rear logo light assembly.

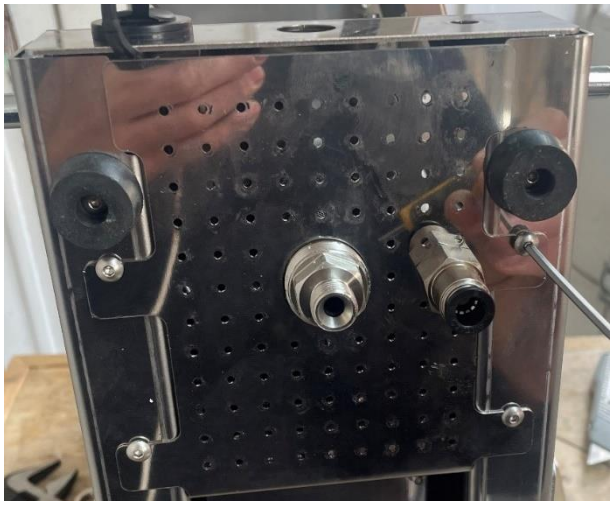
8. Carefully lift the Caffe Assist® machine clear of the hole in the bench and place it screen side down on a clean, level surface with the base of the machine facing towards you.



9. Use a 32mm, or adjustable, spanner to remove the locking nut from the manifold adaptor.

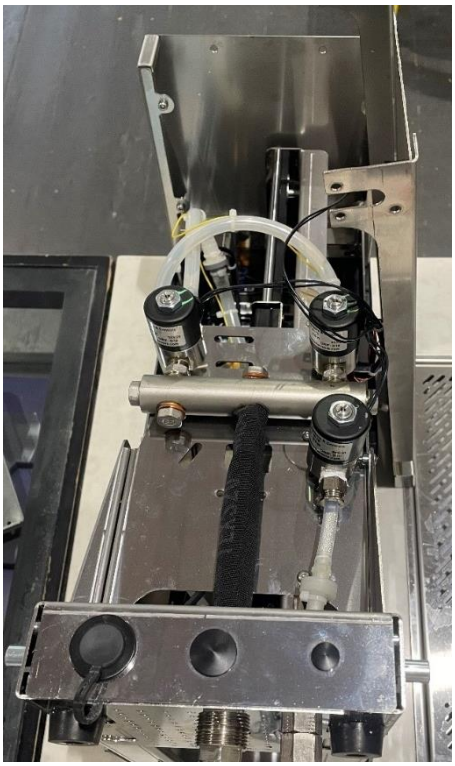


10. Remove the dome-head screws (4) securing the perforated base plate.

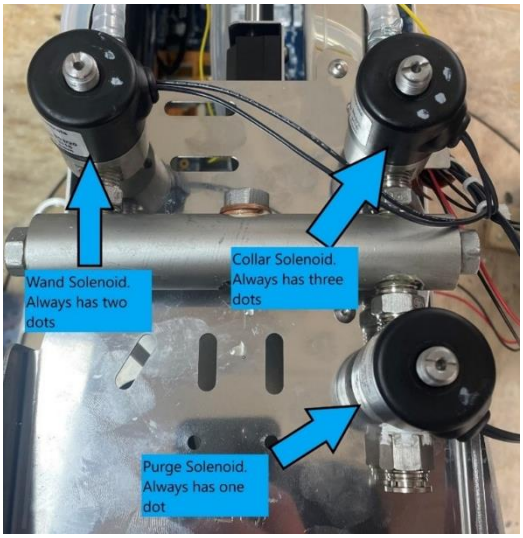


11. Remove the dome-head screws (3) securing each side of the rear panel to the chassis.

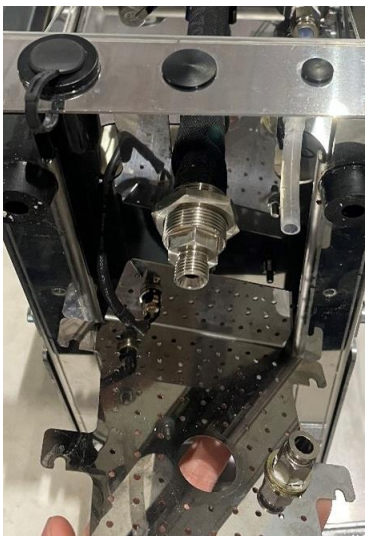
12. Carefully lift off the rear panel then disconnect the two-pin plug from the rear logo light assembly and lean the panel against the side of the unit. Make sure that the fixed wires to the ON/OFF switch in the rear panel are NOT put under tension as they may break off or cause an intermittent connection with the switch.



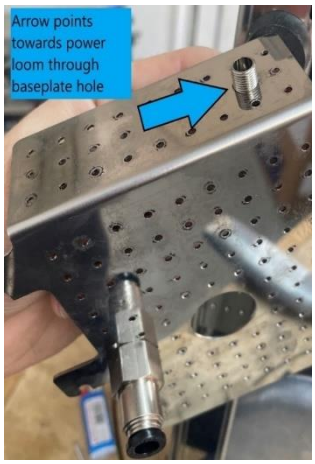
13. Use a 14mm, or adjustable, spanner to remove the solenoid coils from each of the solenoid coil-posts by first undoing the locking nuts. Please ensure that you retain the metal seating washer for each coil as these will be needed when installing the NEW manifold assembly.



14. Remove the internal one-way valve assembly and the perforated base plate from the Caffe Assist® machine by locating the push-in fitting attached to the Purge Solenoid. Press the locking ring of the push-in fitting while simultaneously pulling the perforated base plate away from the chassis.

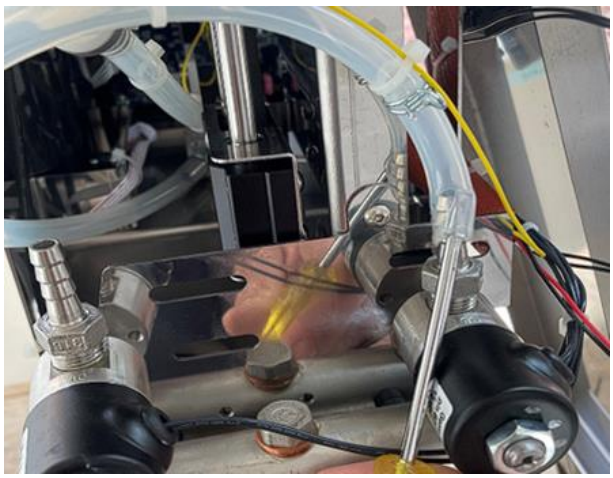



15. Disconnect the power input plug from the perforated base plate by removing the locking nut and washer. Once removed from the plate, reassemble the nut and washer onto the plug so that it not misplaced. With the perforated base plate removed it is now possible to remove and replace the full manifold assembly.

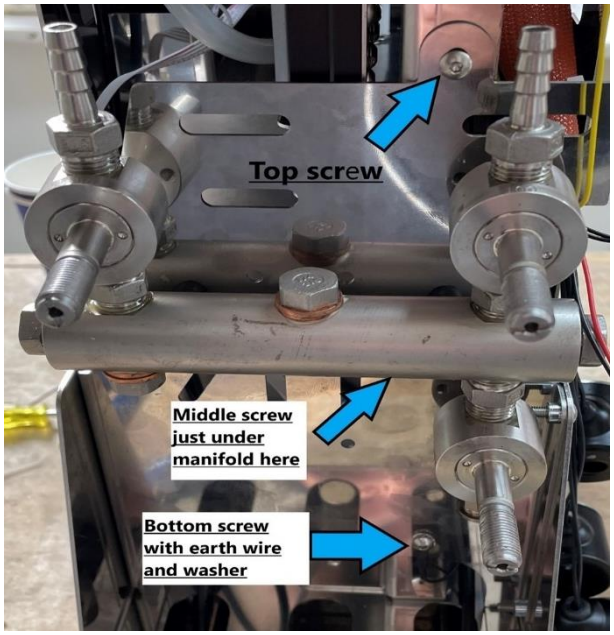
16. Use pliers to squeeze and open the two double-wire hose clips which hold the silicone tubing onto the hose-barbs attached to the Wand Solenoid #2 and the Cleaning Head Solenoid #3. Slide the hose clips upwards, so they remain clear of the hose barbs, but still attached to the silicone tubing.

17. Use a small flat blade screwdriver to carefully loosen the silicone tubing from the hose barbs; you do this by gently inserting the blade of the screwdriver between the metal of the hose barb and the inner surface of the silicone tubing. Once loosened, pull the silicone tubing off each hose barb. Take special care to not damage the silicone tubing as this will cause a steam leak which may be difficult to detect.

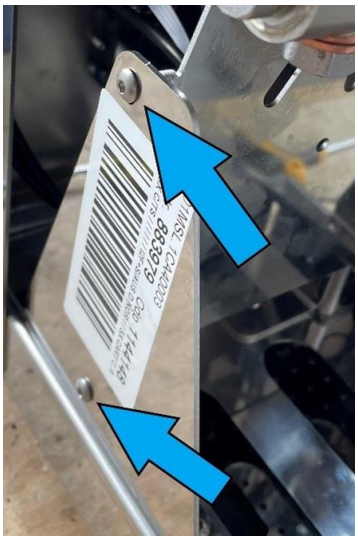


18. Use a 19mm, or adjustable, spanner to unscrew the Under Bench adaptor located on the end of the steam input tube. It is necessary to remove the Under Bench adaptor first to allow the steam tube to be removed from the chassis. Typically, either the Under Bench adaptor will unscrew from the steam tube or the tube itself will unscrew directly from the manifold – either way, the manifold can now be removed from the Caffe Assist®. Be sure to retain the black woven Nylon burst sleeve for later use when installing the NEW manifold assembly.

19. Remove the dome-head screws (3) which fix the manifold assembly and backing plate to the elevator tower. Please note, there is a black earth wire attached to lowest screw along with a serrated washer.



20. Remove the dome-head screws (2) from each of the triangular side panels.



21. Remove the backing plate with manifold attached.

22. Remove the manifold from the manifold backing plate. Use a 4mm hex key to remove socket-head screws (2) and the stand-off bosses (2).

23. Place the NEW Manifold assembly onto the Manifold backing plate, making sure that you install the stand-off bosses between the manifold body and the manifold backing plate.

24. Continue re-assembly of the unit. Refer back to steps 7, 6 and 5 of 6.8 REPLACING A SOLENOID PLUNGER and also 6.5 SIDE AND REAR PANELS and 3.4.3 PLACING THE UNDERBENCH UNIT.

6.12 MANIFOLD ASSEMBLY VARIATIONS

The following diagram shows the LEFT / RIGHT, UNDERBENCH & COMBINATION manifold variations:

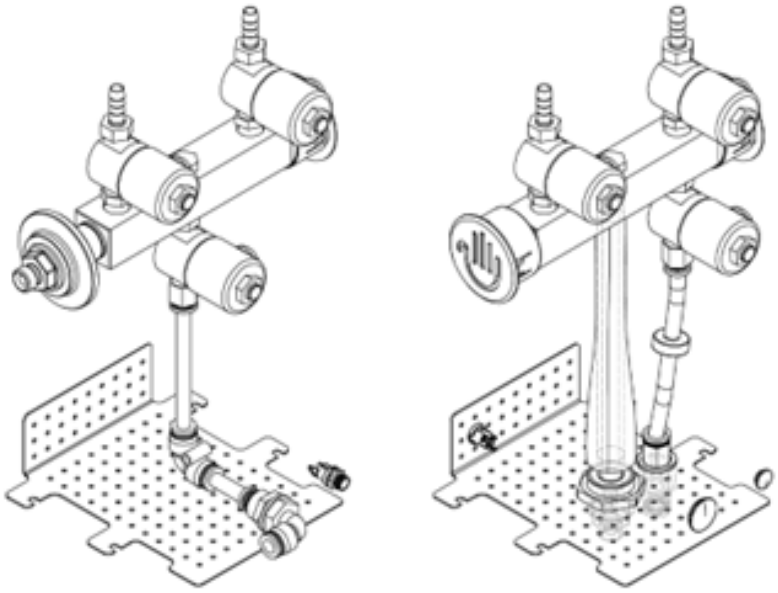


Figure 26: Legato Standard Manifold LEFT / RIGHT and UNDER BENCH

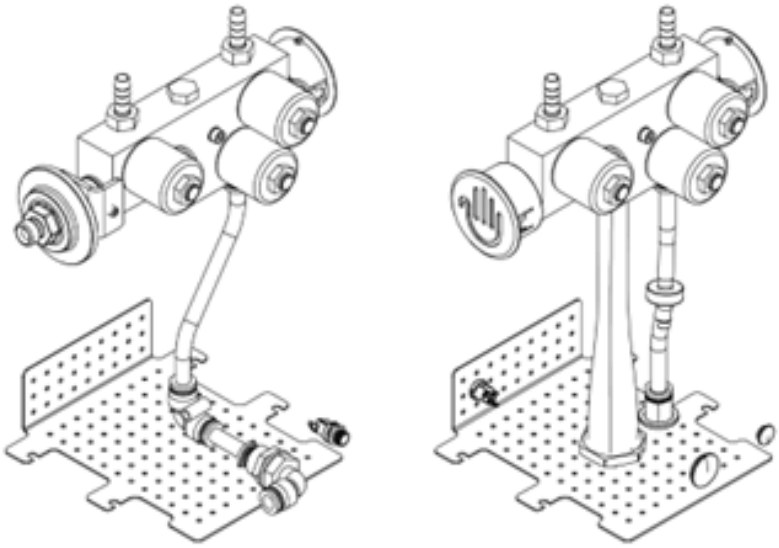


Figure 27: COMBINATION Manifold variations

Refer to the following for exploded views and parts lists of manifold variations:

- 10.20 APPENDIX R – LEGATO LEFT/RIGHT MANIFOLD
- 10.21 APPENDIX S – LEGATO UNDER BENCH MANIFOLD
- 10.22 APPENDIX T – UNDER BENCH CONVERSION KIT (CA-UBKIT).

6.13 CLEANING HEAD SERVICING

Guide to accessing and servicing the cleaning head:

1. Remove the double-wire clip from the silicone tube attached to the hose-barb screwed into the cleaning head body by squeezing the ends of the clip together and sliding the clip up the silicone tubing away from the barb.
2. Remove the silicone tubing from the hose barb by first loosening it with a small flat blade screwdriver and then easing it off the barb.
3. Use a small 14mm, or adjustable, spanner to remove the hose-barb from the cleaning head body and then remove the cleaning head body from the horizontal portion of the front panel.

   Refer to 10.13 APPENDIX M - CLEANING HEAD ASSEMBLY

IMPORTANT INFORMATION!

SWAP OUT CLEANING HEAD INNER EVERY 12 MONTHS

6.13.1 STEPS TO REMOVE STEAM WAND & CARRIER

1. Ideal servicing height shown using disposable cup.
2. Remove nest 4 screws.
3. Pull steam carrier and wand assembly out of the nest.
4. Raise assembly out of the cleaning head.
5. Take wand assembly out of the rear RHS of the Caffe Assist® unit.

NOTE: <u>DO NOT</u> DISCONNECT WAND ASSEMBLY FROM THE SILICON TUBE

Figure 28: Ideal servicing height. Use an upturned cup for easy access of the wand carrier assembly

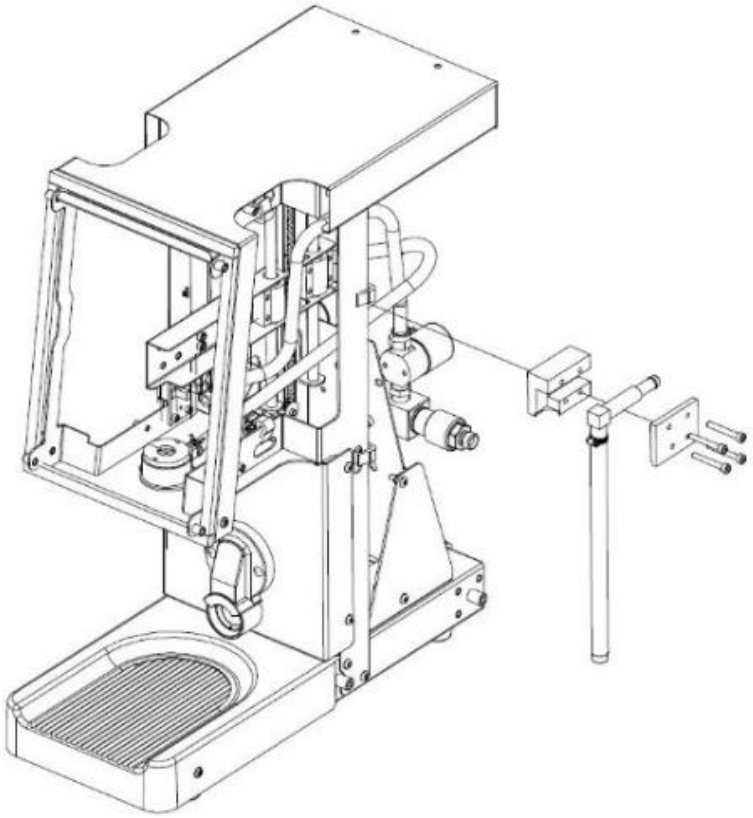


Figure 29: Exploded view of steam wand and carrier out of machine

6.13.2 STEPS TO REPLACE, OR CLEAN, THE CLEANING HEAD INNER

1. Use a 2-pin spanner, or circlip pliers, to loosen the cleaning head inner.
2. Unscrew and remove from the cleaning head body.
3. Change the cleaning head inner and screw into position.

Note: The cleaning head inner can be cleaned by soaking in cleaning solution for 30 minutes, then reused. Use a fine needle to clean the nozzles around the cleaning head circumference.

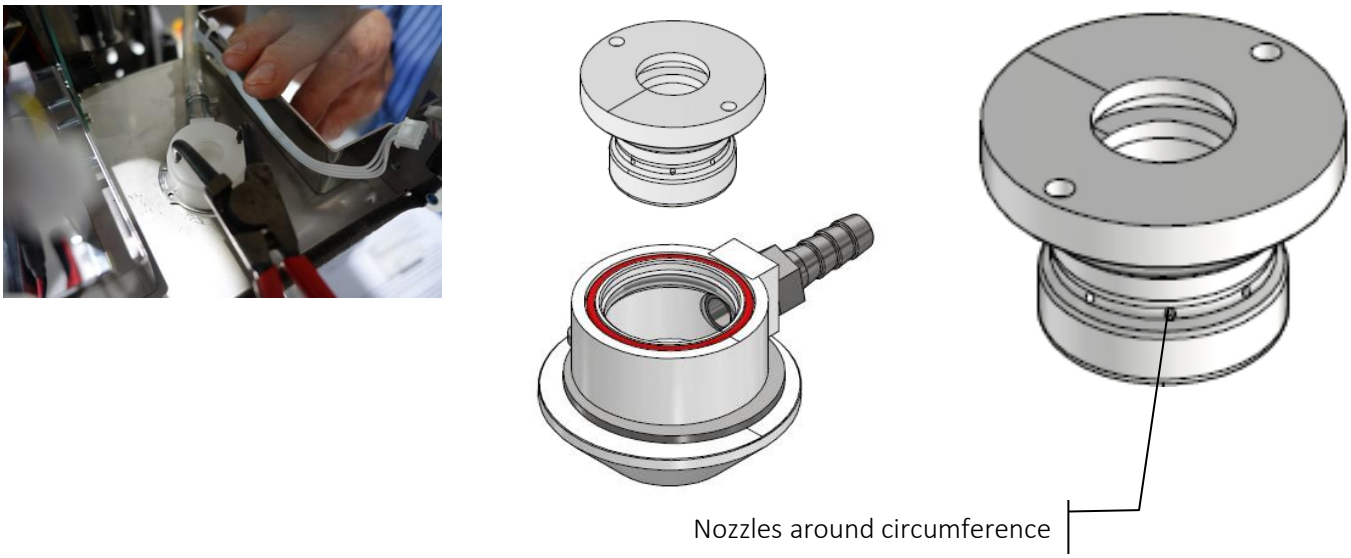


Figure 30: Removal of cleaning head inner

6.13.3 STEPS TO REPLACE CLEANING HEAD INNER O-RING

1. Legato spare parts: CA-003-CHP CLEANING HEAD PACK.
2. Use circlip pliers to remove cleaning head inner.
3. Replace O-ring.
4. Re-fit cleaning head inner into cleaning head until finger tight, then an extra half turn with the circlip pliers.

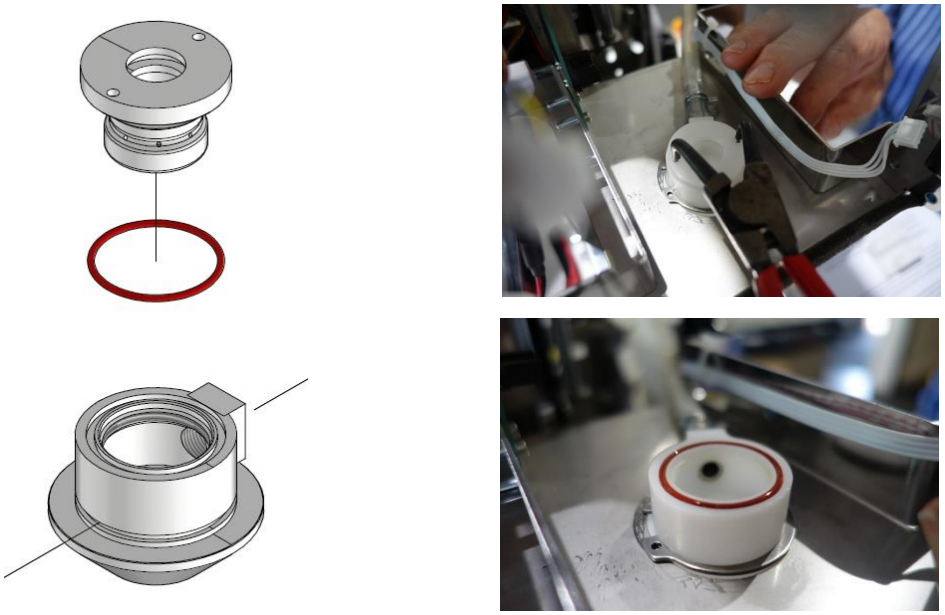


Figure 31: Removal of cleaning head inner and O-ring

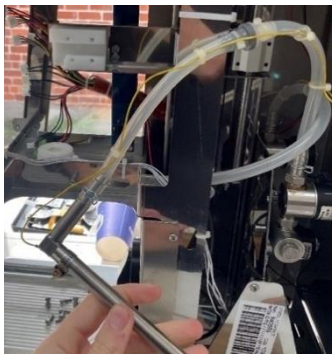
6.13.4 CORRECT PROCEDURE TO REMOVE & INSTALL A CIRCLIP

1. Follow 6.4.2 REMOVAL OF THE SIDE INFILL PANELS.

2. Follow 6.14.2 REMOVING THE DISPLAY ASSEMBLY.

3. Follow 6.13 STEAM WAND ASSEMBLY KIT INSTALLATION to STEP 7.

4. Pull out the wand towards the back of the machine and out the side, ensuring that it is out of the way.



5. Using pliers remove the wire clip from the cleaning head silicon tubing.

6. Using a small flat bladed screwdriver lever between the silicon tubing and the hose tail. Use forward pressure to remove the silicon and always go parallel with the hose tail. ***BE CAREFUL*** not to put a hole in the tubing.

7. Using the circlip pliers, or a flat bladed screwdriver, orientate the circlip so the middle gap is on each side of the cleaning head hose tail.

8. Using the circlip pliers place one prong in each hole of the circlip and open it up.

9. Lift the circlip off the cleaning head.

10. Using the same method open the new circlip and place it on the cleaning head body.

11. Push the circlip down until it seats in the groove. If it isn't going down with the circlip pliers use a flat bladed screwdriver.

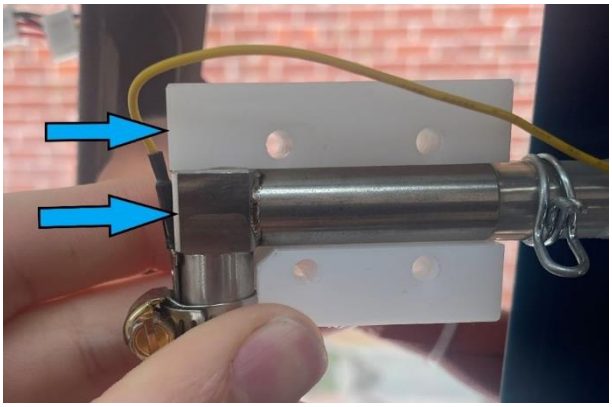
12. Using circlip pliers, or a flat bladed screwdriver, push the circlip so the orientation of the circlip is facing 8 o'clock.

13. Use a lubricant (preferably dishwashing liquid and water) for the cleaning head hose tail and place the silicon tubing back on.

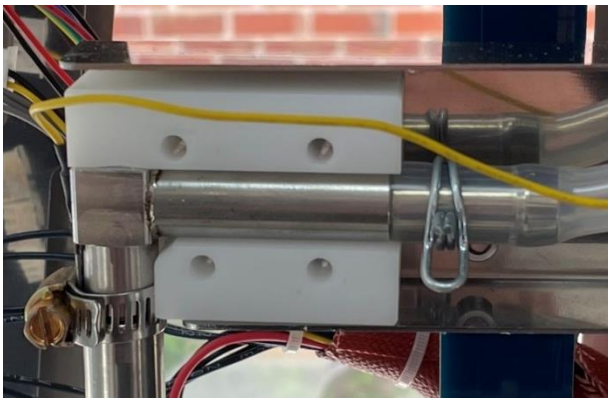
14. Use pliers to place the wire clip back on the hose tail.

15. Place the wand back into the cleaning head and seat it back in the wand nest.

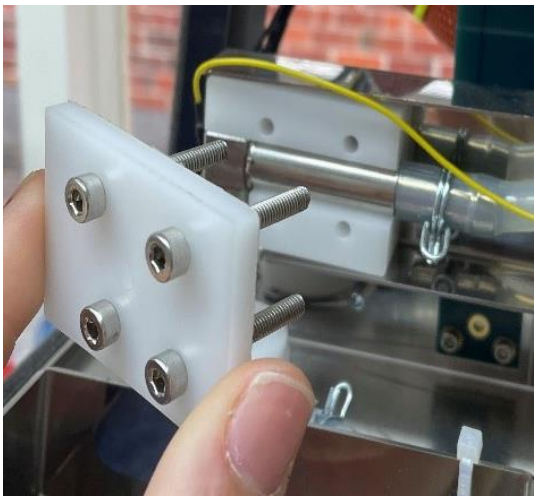
16. Make sure the front of the wand is seated flush against the front of the wand nest.

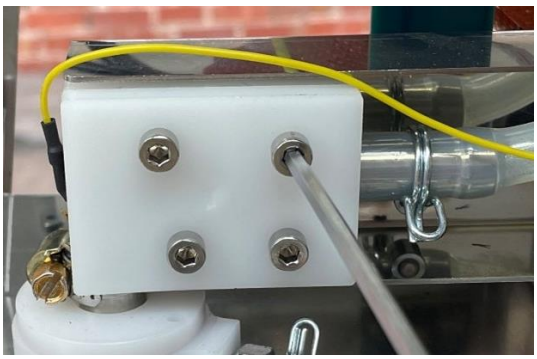


17. Place the wand in the wand nest back into its slot in the tower and line up the holes with the screw threads.



18. Place the wand nest cover, with the screws in it, back onto the wand nest. Tighten up the screws using a 3mm Allen key.





19. Place the display assembly back onto the machine and screw it in place.

20. Replace the plugs back into the PCB board in the order which they were removed.

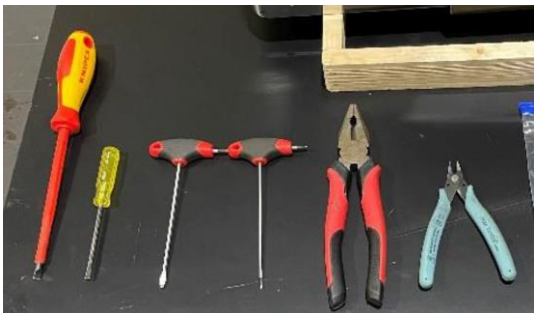
21. Reinstall the side and rear panels (6.5) and the plastic side infills (6.4).

6.14 STEAM WAND ASSEMBLY KIT INSTALLATION

Guide to installing a CA-003-SWK STEAM CARRIER & WAND PACK:

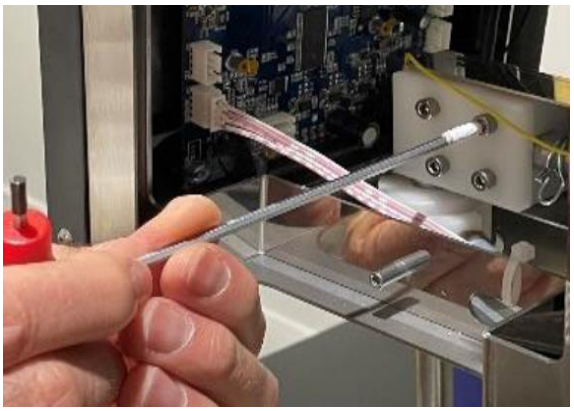
TOOLS REQUIRED:

- 2.5mm hex key
- 3.0mm hex key
- Pliers
- Small side-cutters
- Large flat blade screwdriver
- Small flat blade screwdriver
- Small container, or glass, to hold a diluted solution of mild detergent.
- Black marking pen

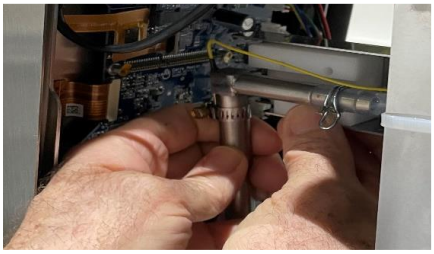


1. Follow work instructions 6.4 SIDE INFILL PANELS and 6.5 SIDE AND REAR PANELS to remove plastic infills, side and rear panels.

2. Remove the long screws (4) from the white plastic block (wand nest) that holds the wand assembly using a 3mm hex key.



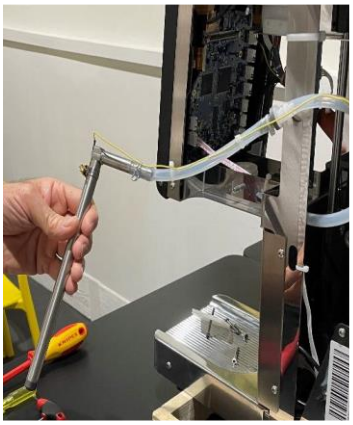
3. Lift the elevator boom with the wand to its highest position and ***CAREFULLY*** separate the wand assembly from the white plastic wand nest.



4. Pass the wand assembly, which is still attached to the silicone tube, out through the back of the machine behind the vertical sheet-metal strut.

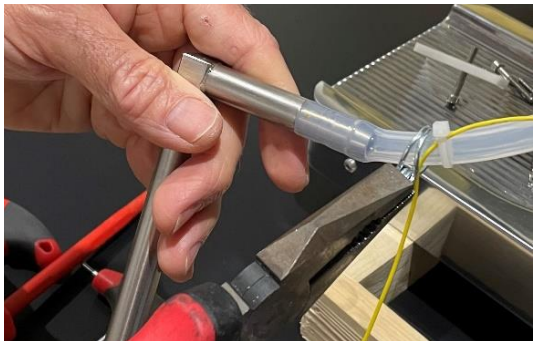
IMPORTANT INFORMATION!

PLEASE NOTE THE YELLOW WIRE WHICH IS HELD AGAINST THE WAND ASSEMBLY WITH THE CIRCULAR HOSE CLAMP – THIS IS THE MOST CRITICAL COMPONENT OF THE WHOLE CAFFE ASSIST® UNIT AS IT IS RESPONSIBLE FOR THE MILK SENSING CIRCUIT



5. Using a large flat blade screwdriver unscrew the hose clamp which holds the terminal clip of the milk sensing circuit to the wand assembly. The hose clamp also prevents the wand itself being unscrewed from the wand carrier which could potentially cause a catastrophic internal steam leak.


6. Use pliers to open the double-wire clip and slide it up the silicone tubing and out of the way.

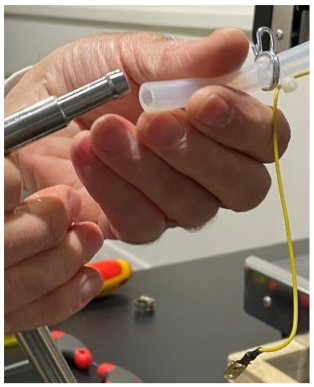


7. Use a SMALL flat blade screwdriver to ***CAREFULLY*** lift and loosen the edge of the silicone tubing from the wand assembly hose barb. Once you have moved the screwdriver around the entire circumference of the metal hose barb, ***BEING CAREFUL*** not to damage the silicone tubing in the process, grasp the silicone tubing as close as is possible to the metal hose barb and ***GENTLY*** pull them apart, so as not to damage the ***CRITICALLY IMPORTANT*** yellow wire of the MILK SENSING CIRCUIT.


8. Open the plastic bag containing the STEAM CARRIER & WAND KIT which comprises a complete steam wand assembly and a white plastic wand nest. ***DO NOT UNSCREW THE WAND FROM THE WAND CARRIER CONTAINED IN THE PLASTIC BAG UNLESS INSTRUCTED –*** install as a single unit.

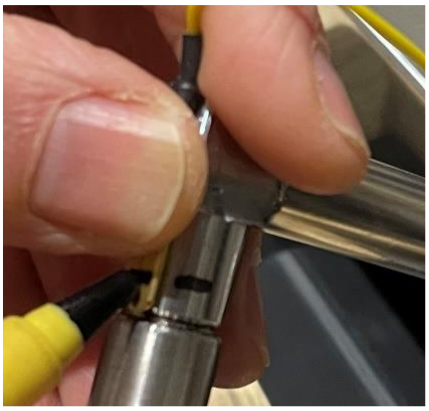
9. Place the old wand assembly you have just removed from the unit and the old white plastic wand nest in the plastic bag to RETURN TO THE CAFFE ASSIST® Melbourne office.

10. Take the new wand assembly and lubricate the barb end with a diluted solution of mild detergent. Insert the barb into the end of the silicone tube and reattach the double-wire clip.


11. Place the wand assembly, which is now attached to the silicone tube, into the base of the wand nest and mark the block at the point where the internal cut-out, or rebate, finishes. Also mark the metal wand assembly to that it lines up with the mark on the white plastic.

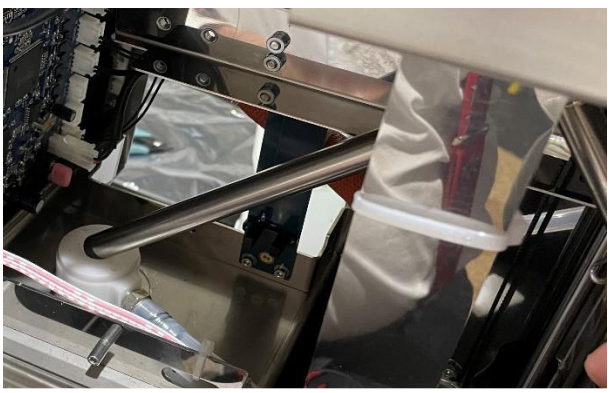
12. Next place the terminal clip attached to the yellow wire of the MILK SENSING CIRCUIT onto the front end of the wand assembly so that the end of the clip rests at the join of the steam wand and carrier assembly. Now mark the terminal clip so that ALL marks line up.



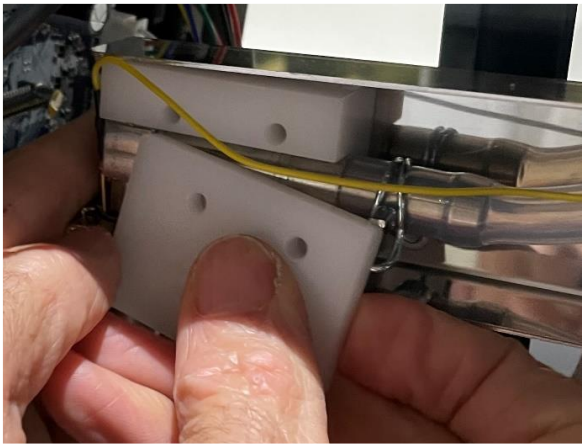
13. Now put the hose clamp back into position, sliding it up the steam wand and over the terminal clip with the yellow wire, so that the top of the hose clamp ***ALIGNS EXACTLY*** with the marks you had previously made on the wand assembly.

14. Tighten the hose clamp into position using the large flat blade screwdriver.

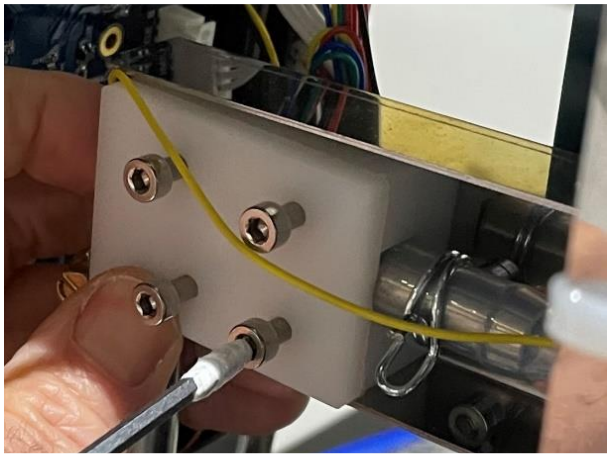
15. Replace the wand back into position, first passing it behind the vertical sheet-metal strut, and tip-first through the central hole white acetal cleaning-head.



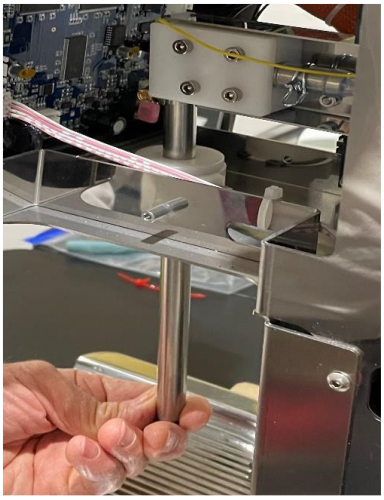
16. Raise the elevator boom to the top position inside the Caffe Assist® machine and place the white acetal base of the wand nest into the front of the elevator boom, aligning the 4 holes. Lift the wand up and fit it neatly into the right-angled slot of the white acetal wand nest, so that the metal body of the wand assembly does not protrude past the front of the wand nest. Only the front of the hose clamp screw mechanism protrudes forward of the white plastic wand nest, so that the screw slot is accessible.



17. Position the wand nest cover with the long screws (4) and tighten the steam nest and wand assembly onto the elevator boom.



18. Check that the elevator moves smoothly by gently lifting it up and down.



19. Reconnect the power and switch on the Caffe Assist® machine for 3.8.4 CALIBRATION AND TESTING OF WAND TRAVEL AND 3.8.5 MILK SENSING PARAMETERS.

20. After successful calibration and testing reinstall the side and rear panels (6.5) and the plastic side infills (6.4).

6.14.1 STEAM WAND & STEAM CARRIER INTERNAL O-RING

SERIES 8 INTERNAL O-RING

1. STEAM WAND CARRIER A & B
2. 0.032" LOCKWIRE NASM / MS20995C32 ASTMA580 - 75.0mm
3. PFA TEFLON TUBING - 175.0mm
4. STEAM WAND RETAINER TUBE R5
5. 8.0 ID X 1.0 SILICON O-RING

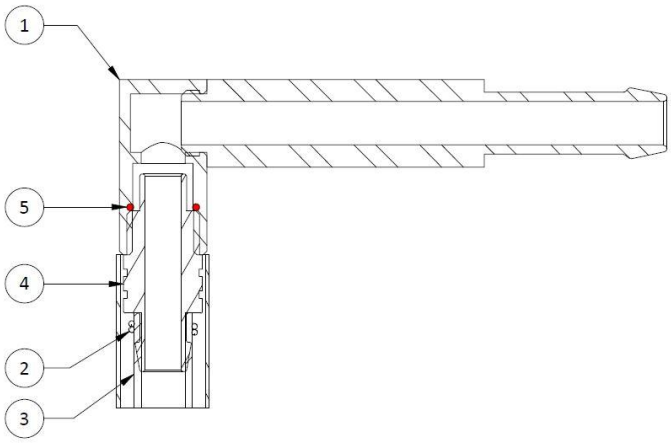


Figure 32: Series 8 Internal O-ring

SERIES 9 EXTERNAL O-RING

1. STEAM WAND CARRIER A & B
6. 6.4 X 1.3 SILICON O RING
7. STEAM WAND RETAINER TUBE R6

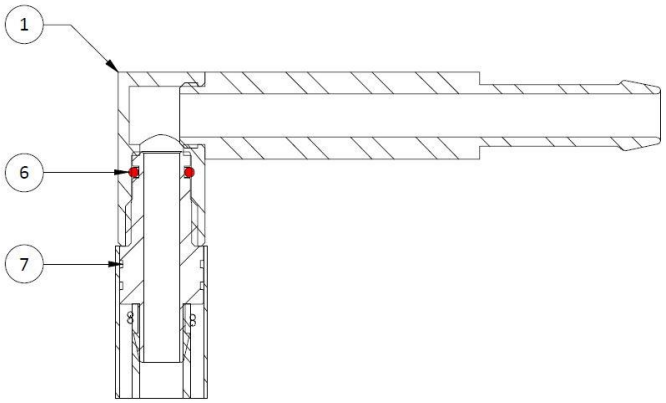


Figure 33: Series 9 External O-ring

6.15 DISPLAY ASSEMBLY

6.15.1 DISPLAY ASSEMBLY SCREW OVER-TIGHTENING

IMPORTANT INFORMATION!

NO ELECTRIC POWER TOOLS[1] TO BE USED - TIGHTENING WITH HAND TOOLS ONLY.

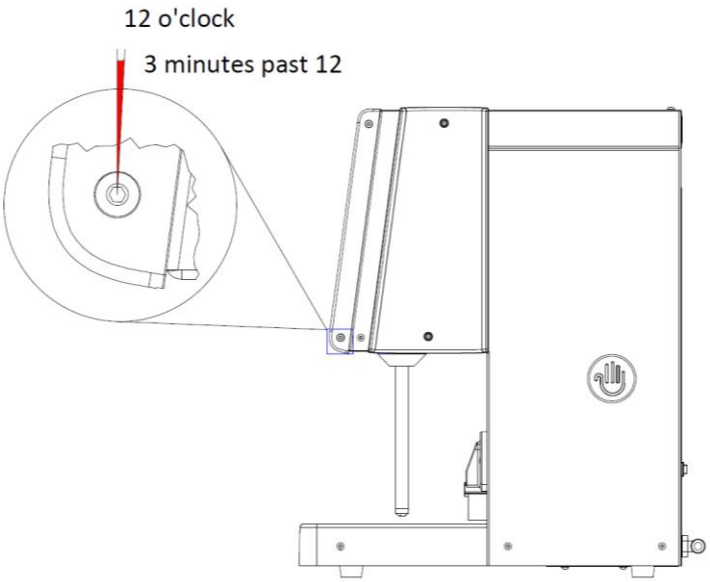
There are 4 dome-head screws that secure the operator screen assembly to the front of the Caffe Assist®. Two screws are located on both vertical sides of the plastic screen surround near the corners.

The maximum effective torque required to correctly set each screw is 0.6 – 0.7 Nm. Exceeding this torque range may cause cracking and failure of the plastic screen surround.

Instruction:

Locate and align the 4 holes at each corner of the screen surround with the 4 metal threaded stand-offs. Do not use screws to align the screen surround holes and the threaded stand-offs. Precisely locate the plastic frame against the CAFFE ASSIST® body to align the holes, then insert the screw and hand tighten with permitted tools only. Install the screws and loosely tighten each screw until it is seated in the rebate and the underside of the screwhead touches the plastic frame. Tighten up by turning the hex key 3-4 degrees.

Figure 34: Examples of over-tightening (extreme cases)



[1] *Accurate torque measurements cannot be guaranteed unless the electric drivers are speed-limited, have a torque adjust and are calibrated according to ISO 6789:2017, are independently certified by a NATA laboratory and have certification that is annually renewed.*

6.15.2 REMOVING THE DISPLAY ASSEMBLY

First ensure that you have access to the back of the display assembly by removing the side-infill panels: 6.4.2 REMOVAL OF THE SIDE INFILL PANELS.

Guide to removing the display assembly:

1. Switch off the machine and disconnect power.
2. Remove the side infill panels to gain access to the mainboard and looms.
3. Disconnect all loom connections going to the main board as shown in Figure 35 below.

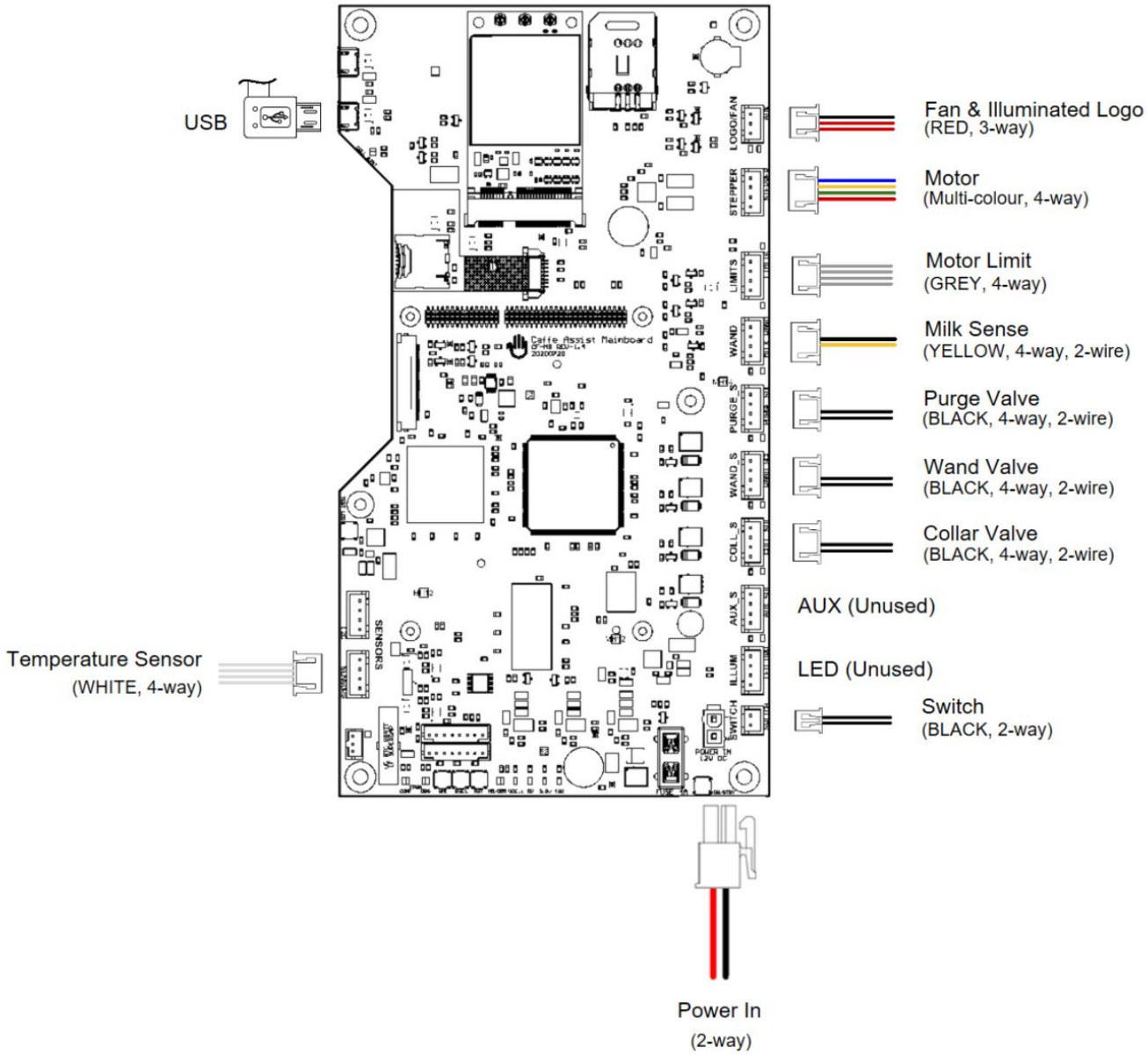


Figure 35: Mainboard Loom Connections (Rear view)

4. Remove the 4 x M4 screws at sides of plastic display surround as shown in Figure 36 below.
5. Gently lift off the display assembly.

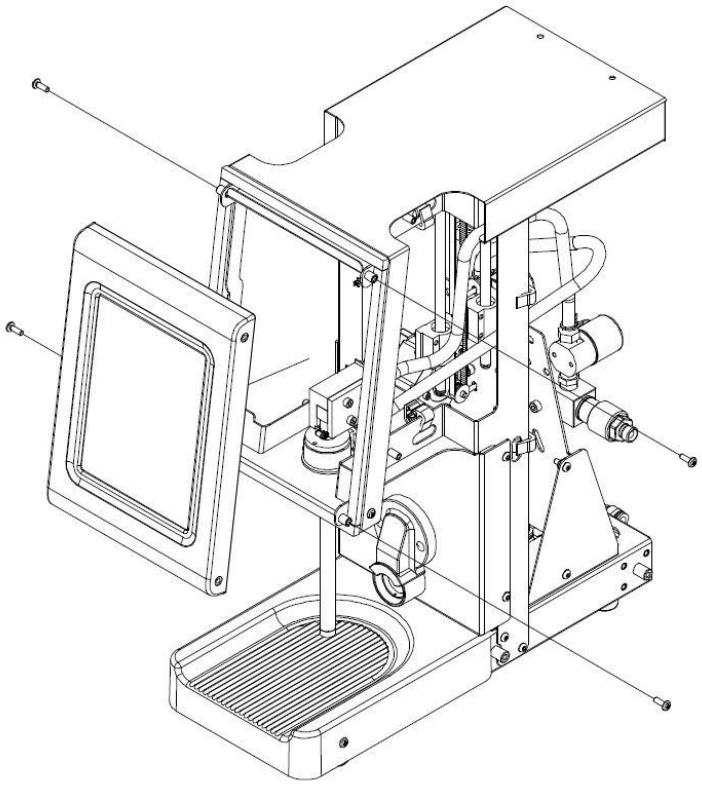


Figure 36: Display Assembly Screw Fixings

6.15.3 DISPLAY ASSEMBLY RP14 FOAM SEALING STRIPS

The following diagram is applicable for Caffe Assist® Legato Series 7.0:

LEGATO SPARE PARTS: CARP14 – RP14 ADHESIVE FOAM SEAL 5.0m

- 1 x RP14-176 – 9 x 6 ADHESIVE FOAM SEAL 176.0mm
- 2 x RP14-238 – 9 x 6 ADHESIVE FOAM SEAL 238.0mm
- 1 x RP14-158 – 9 x 6 ADHESIVE FOAM SEAL 158.0mm

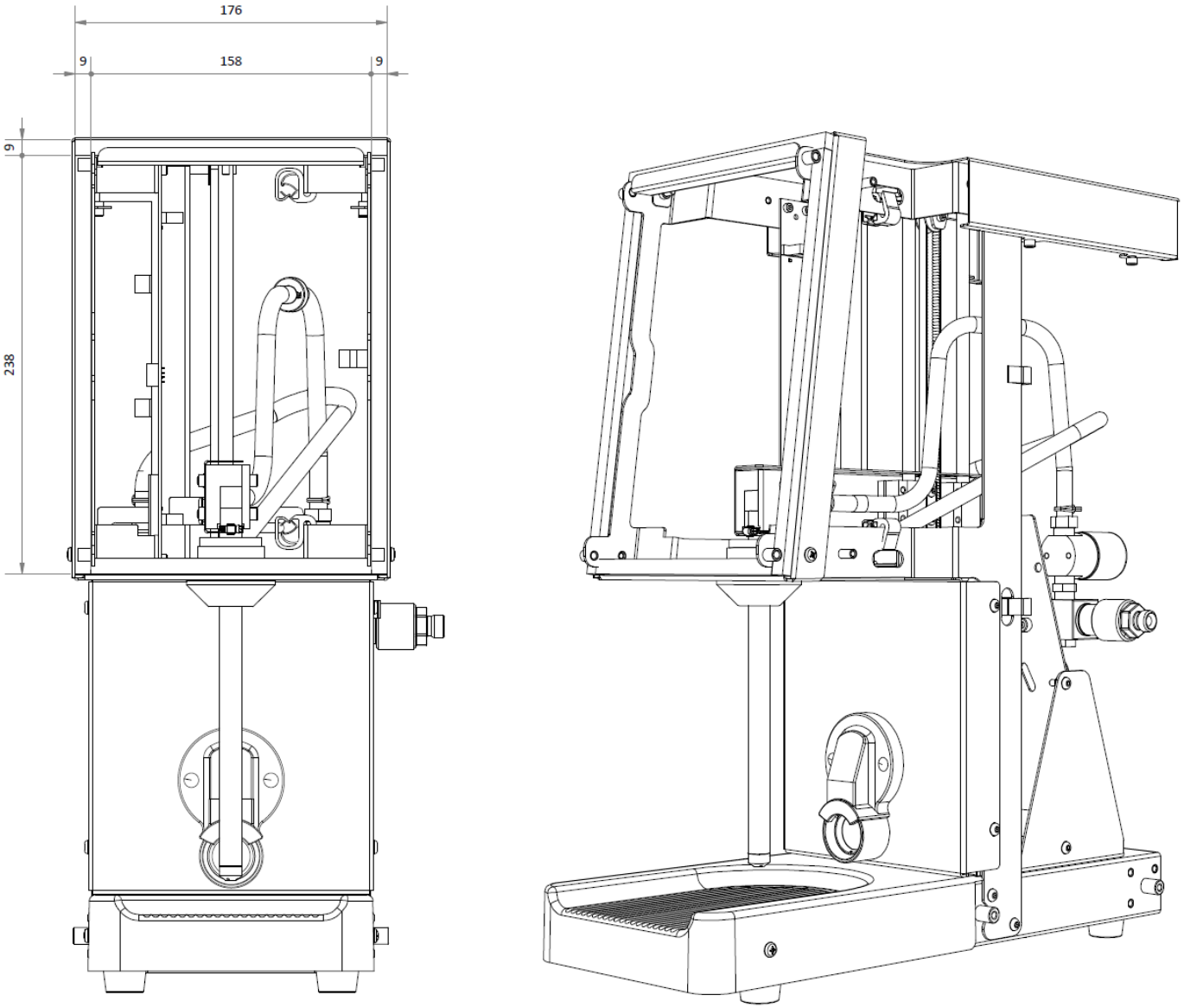


Figure 37: Shows position of adhesive foam seal lengths.

IMPORTANT INFORMATION!

ENSURE RP14 FOAM POSITIONED ON FACE OF FOLDED EDGE AND THAT THERE ARE NO GAPS AT THE CORNERS WHERE THE SEALS MEET.

6.15.4 FITTING ONE-PIECE SILICONE SEALING BOOT

The following diagram is applicable for Caffe Assist® Legato Series 8:

A one-piece silicone sealing boot replaces adhesive foam seals.

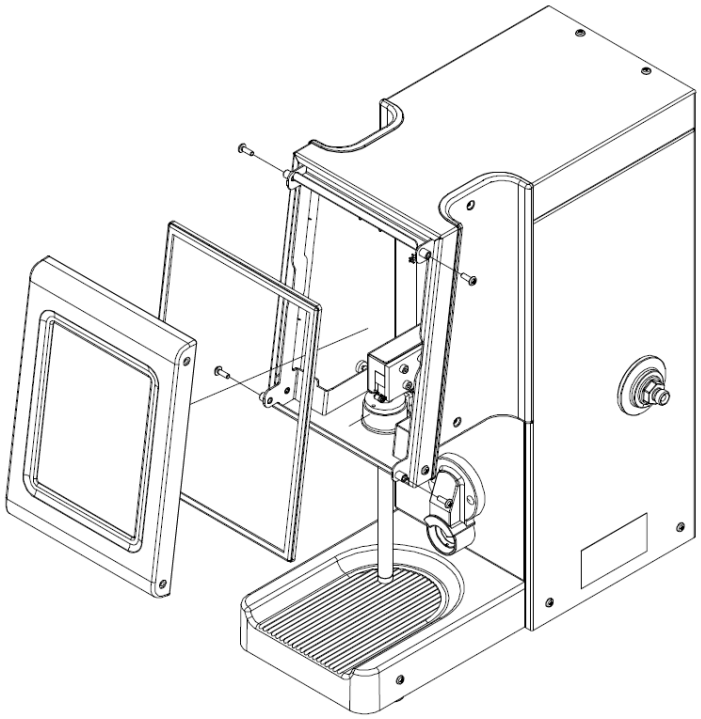


Figure 38: Shows assembly of one-piece silicone sealing boot

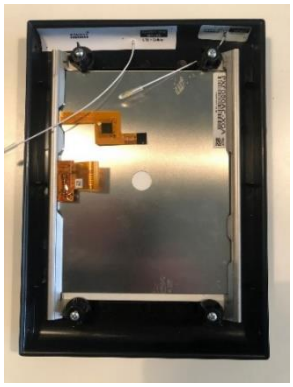
6.16 MAIN BOARD & CAPACITIVE TOUCH SCREEN

Guide to replacing the screen and bezel of the Caffe Assist® and reusing the Caffe Assist® Main Board (CF-MB) with a new screen assembly. To remove the display assembly see 6.15.2 REMOVING THE DISPLAY ASSEMBLY.

IMPORTANT INFORMATION!

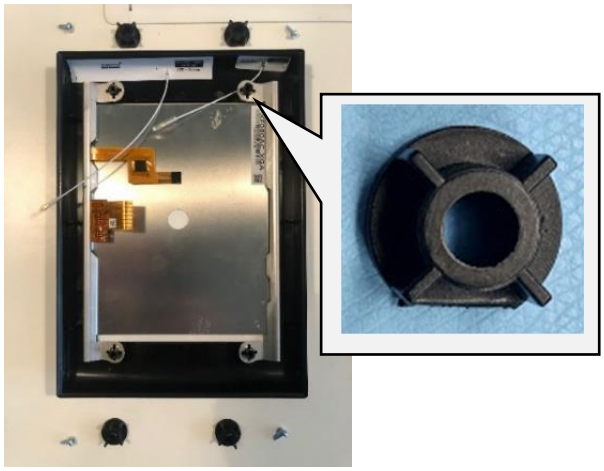
SET UP WORK AT AN ELECTROSTATIC PROTECTED AREA (EPA). SOME OF THE WORK COVERED IN THESE INSTRUCTIONS MUST BE COMPLETED AT AN EPA SAFE STATION WITH A STATIC WRIST STRAP. THE EPA MAT SHOULD BE CLEANED PRIOR TO COMMENCING WORK.

1. Place the new screen assembly with antennas, metal rails, stand-off bosses and screen on the work area mat.



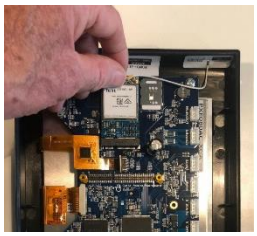
2. Remove the four (4) screws from the new screen assembly and disassemble the components as per the photo below.

   Note: the flat sided bosses (see photo below) need to be installed at the top near the adhesive antennas.

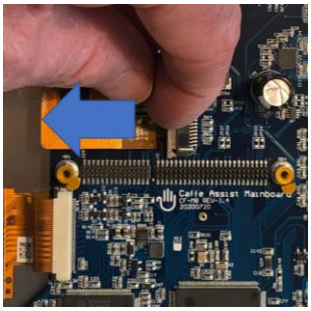


3. Place the original screen assembly on the work area mat face down.

4. Carefully disconnect the antennas from the communications module by lifting them up away from the module at the connector.



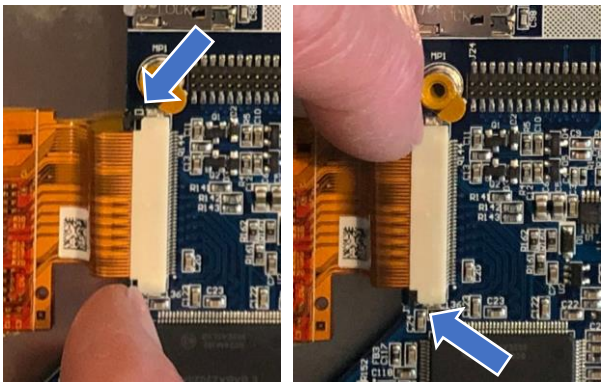
5. Unclip the upper ribbon cable by sliding the locking strip from the right to the left.



6. Gently remove the ribbon cable.

   Note: If it can't be removed with a gentle pull, check that the locking strip is fully pushed across to the left.

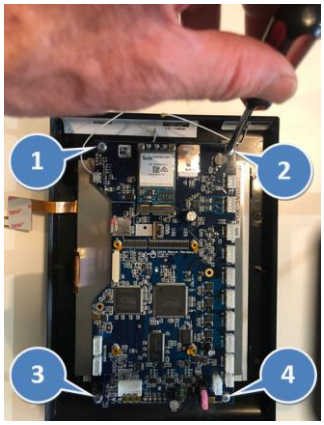
7. Unclip the lower wider ribbon cable by sliding the locking strip from the right to the left at each side of the ribbon cable.



8. Gently remove the ribbon cable.

   Note: If it can't be removed with a gentle pull, check that the locking strip is fully disengaged.

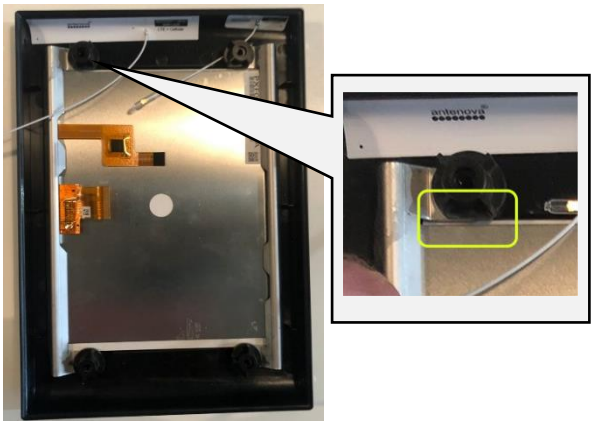
9. Remove the four (4) screws that are holding the Caffe Assist® Main Board to the screen assembly.



10. Gently lift the Caffe Assist® Main Board off the assembly to confirm all cable connections are free.

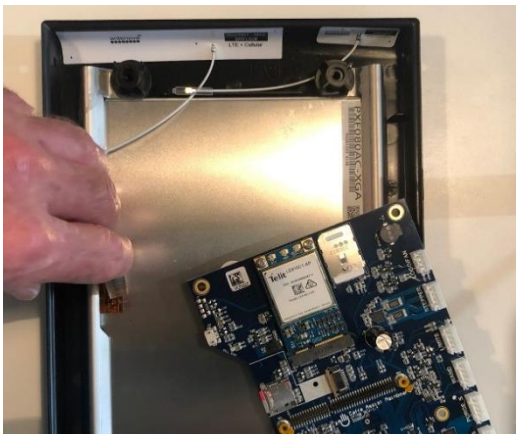
11. On the new screen assembly, place the four (4) stand-off bosses on each end of the metal rails over the mounting posts.

    Note: the flat sided bosses (see photo below right) need to be installed at the top near the adhesive antennas. Align the flat edge of the boss with the top edge of the screen.



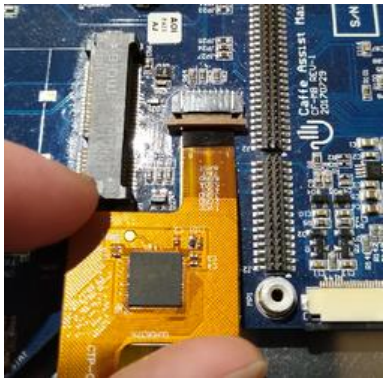
12. Gently hold the LCD Display ribbon cables out of the way and place the Caffe Assist® Main Board on the stand-off bosses.

    Note: Ensure the antenna cables are routed as per the photo below.



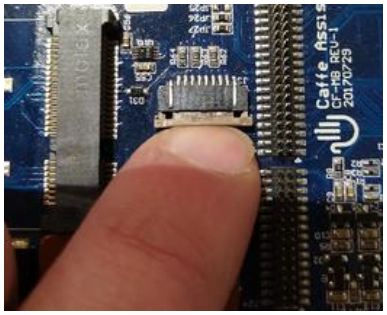
13. Secure the Caffe Assist® Main Board by re-installing the four (4) screws.

14. Align the flat flex cable into connector J3.

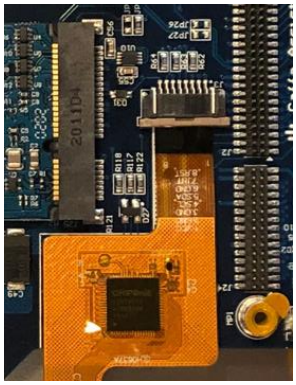


15. Push until fully seated.

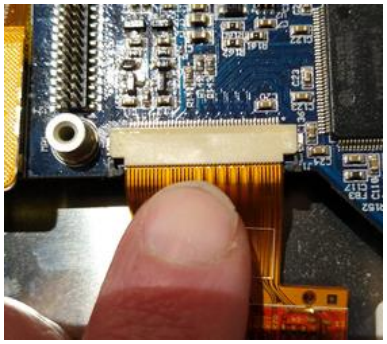
16. Push the locking clip in to secure the ribbon cable.



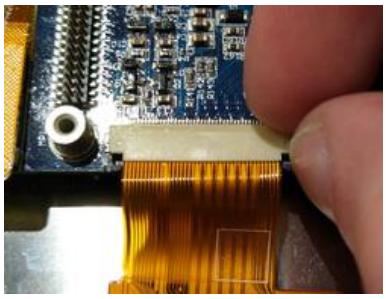
17. Inspect and confirm that the ribbon cable is sitting in the fully seated position.



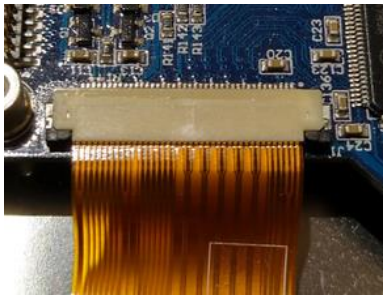
18. Install the lower wider ribbon cable and push until fully seated.



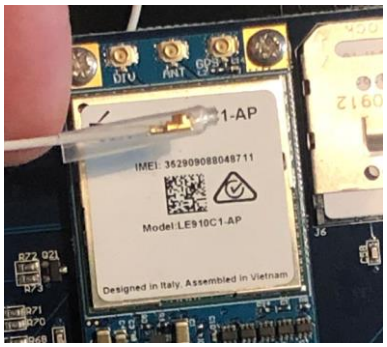
19. Push the locking clip in on both sides.



20. Inspect and confirm that the ribbon cable is sitting in the fully seated position.



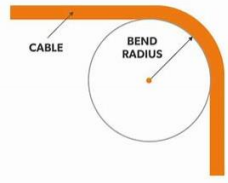
21. Remove the clear sleeve protective covers from the antenna connectors and place on the antenna cables of the old screen assembly.



22. GENTLY and CAREFULLY align the left-hand side (LHS) antenna connection with the "ANT" terminal and press down lightly until it clicks.

23. GENTLY and CAREFULLY align the right-hand side (RHS) antenna connection with the "GPS" terminal and press down lightly until it clicks.

24. Inspect the antenna cables making sure that they are sitting flat (see photos below).



Note: Sharp bends must be avoided when locating the antenna cables.

25. The display assembly should now be fully assembled and ready for installation in the machine (6.15.2 REMOVING THE DISPLAY ASSEMBLY).

6.17 FAN DIVERTER & TEMPERATURE SENSOR HOUSING

Guide to servicing the CA-003-FDP FAN DIVERTER PACK:

1. Side panel access is not required.
2. Remove screw cap covers to reveal screw fixings.
3. Unscrew 2 x M3 socket screws.

Figure 39: Shows fan diverter in situ and O-ring in rear of fan diverter

4. Bayonet fitting – 90-degree rotation to release the temperature sensor housing.

Figure 40: Shows temperature sensor housing

5. Use a dab of silicone on the screw head cavities when replacing the screw cap covers.

6.18 FAN SERVICING

Guide to servicing the CA-LOOM-LF LOOM, LOGO AND FAN:

1. Side panel access is required.
2. Access the fan via 4 x M3 socket screws.

Figure 41: Shows 4 x M3 socket screws securing fan

6.19 TEMPERATURE SENSOR WINDOW

Guide to replacing CA-003-SHP SENSOR HOUSING PACK:

1. Side panel access is not required.
2. Remove locking ring (Item 5) by turning it anti-clockwise via notches.
3. Replace glass (Item 3).

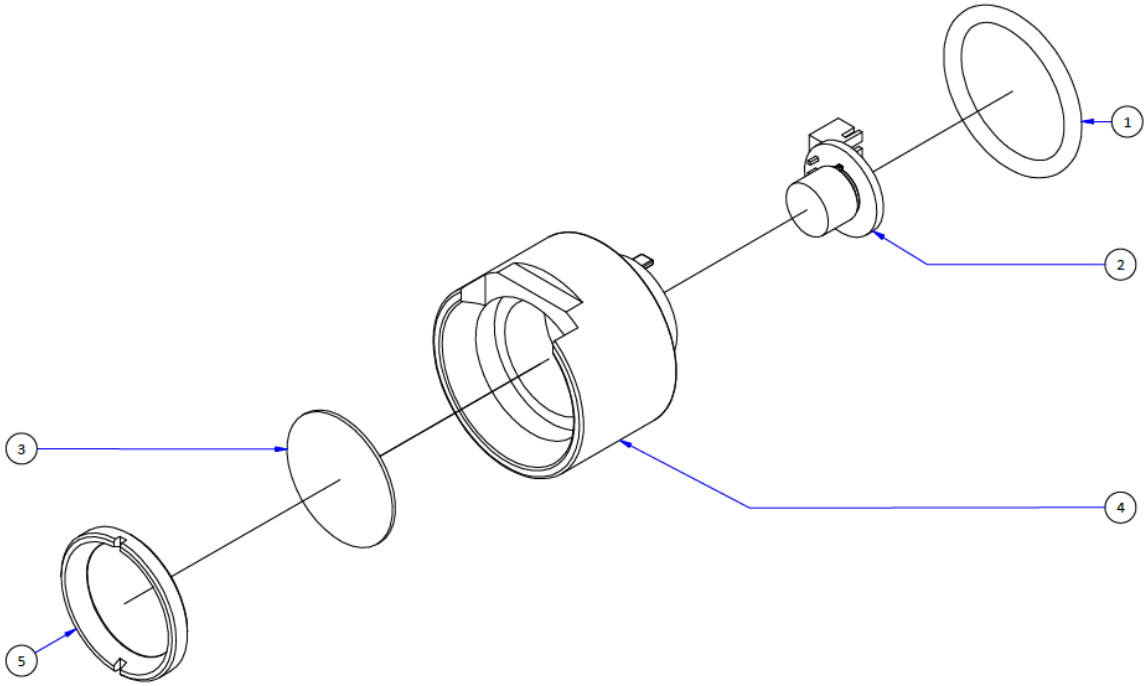


Figure 42: Exploded view of Temperature Sensor Housing

6.20 REAR PANEL USB PORT

Step-by-step guide to replacing the USB rear panel port:

1. To replace USB rear panel port.
2. Remove locking nut access via underside of machine, see Figure 43.
3. Ensure correct pathing of USB cable, see Figure 44.

Figure 43: USB port locking nut from underside of machine

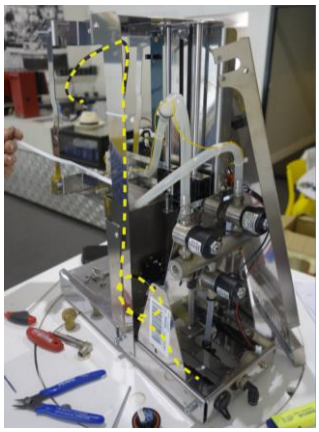


Figure 44: Correct pathway of USB Cable

6.21 REAR PANEL LOGO LED BOARD

Guide to replace the rear logo LED board:

DANGER!

DO NOT DISCONNECT THE POWER SWITCH!
UNDER NO CIRCUMSTANCES ARE USERS AUTHORISED TO REPLACE MACHINE COMPONENTS AND/OR PARTS.

1. Remove side and read panels (0).
2. Disconnect cable from rear logo PCB, see Figure 45.
3. Use a flat blade screwdriver to push the Logo through the rear panel housing.
4. The rear logo PCB is laminated to the rear logo via double-sided tape.

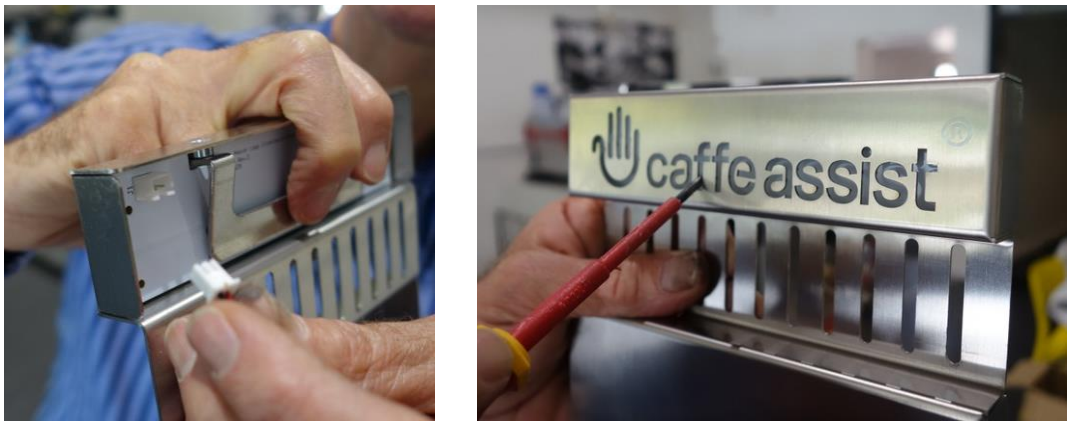


Figure 45: Disconnect logo cable, and removal of logo through rear panel housing

6.21.1 CORRECT FITTING OF THE LED BOARD RETAINER CLIP

Guide to fitting and locating the LED broad retainer clip:

1. Position logo retainer clip as per Figure 46.
2. There are no threads in the logo retainer bracket.
3. Clip holes provide through locations for screws from the top of the machine.

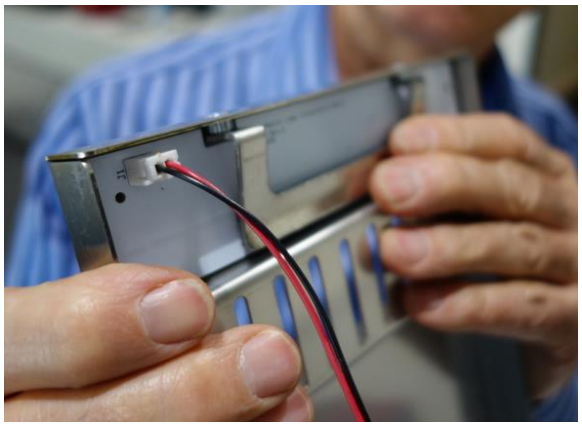


Figure 46: Logo retainer clip position

6.22 STEAM WAND ALIGNMENT

Guide to adjust the alignment of the steam wand:

Adjustment of the steam wand next screws will allow fine angular adjustment of the steam wand.

- Assuming there are no alignment issues, both top and bottom screw rows can be secured equally.
- Bottom row tight, top row loose – will tilt the wand to the left, when looking from front.
- Top row tight, bottom row loose – will tilt the wand to the right, when looking at face of machine.

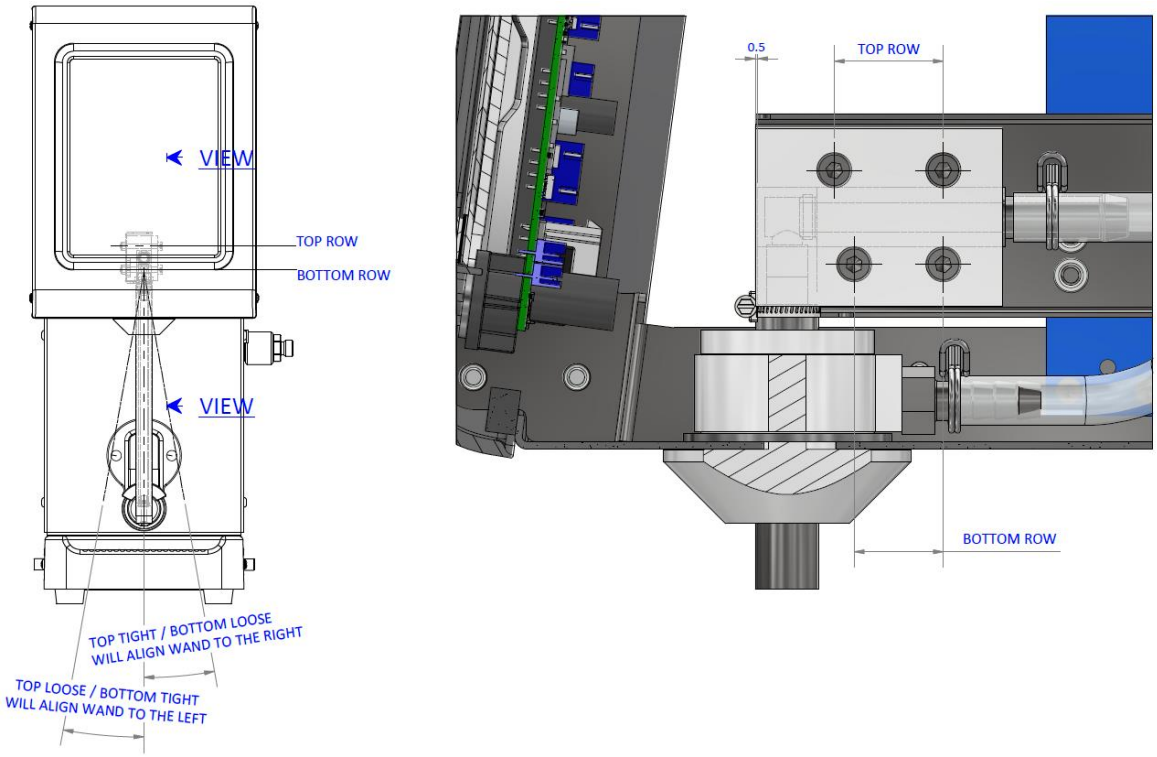


Figure 47: Steam wand alignment

6.23 ACCESS TO LINEAR RAILS & BEARINGS

Guide to access the screws at the top and bottom of the elevator linear rails:

1. Follow 6.14.2 REMOVING THE DISPLAY ASSEMBLY.
2. Remove the top panel, via 2 x M4 screws.
3. Remove the triangular manifold support side plate, via 2 x M4 screws.
4. See **Figure 48: Steps to access linear rails and bearings.**

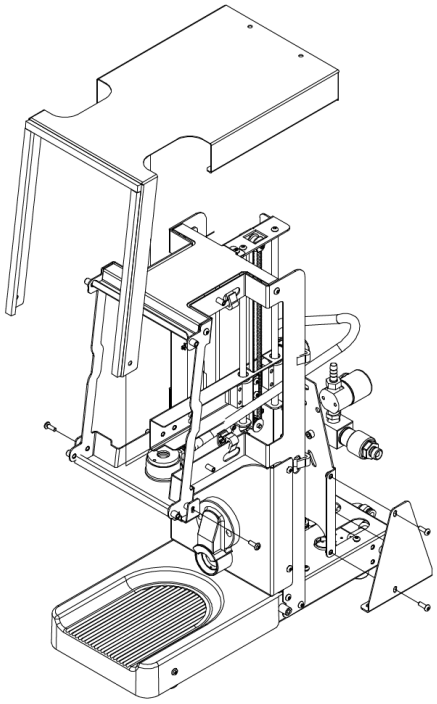


Figure 48: Steps to access linear rails and bearings

6.24 LINEAR RAIL & ELEVATOR BOOM COMPONENTS

Guide to disassembling the linear rails and elevator boom components:

1. Disassemble idler pulley, via 2 x M3 screws both sides.
2. Disassemble linear rails, via 2 x M4 per linear rail.
3. Disassemble linear bearing, via 4 x M4 screws per bearing.
4. Disassemble belt retainer clip, via 2 x M4 screws.

LEGATO SPARE PARTS:

- CA-003-TBPP TOOTHED BELT & PULLEY PACK
- CA-003-LBRP LINEAR BLACK w/ RAIL PACK

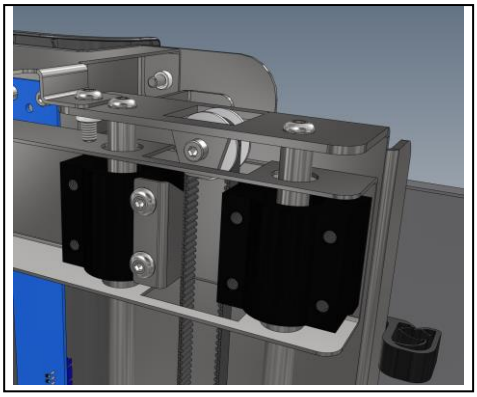


Figure 49: Linear rail & elevator boom components, upper position

IMPORTANT INFORMATION!

RETAINER CLIP SCREWS REQUIRE THREAD SEALANT AS DUE TO THE CONSTANT STRETCHING AND RELAXING OF THE RUBBER DRIVE BELT THEY EVENTUALLY WORK LOOSE AND THE ELEVATOR WILL NOT RISE.

6.25 TOOTHED BELT TENSION ADJUSTMENT

Guide to access to adjusting the toothed belt tension:

1. Loosen the 4 screws that retain the motor to the elevator tower.
2. Using a large flat blade screwdriver, place it between the motor body boss and the elevation elliptical hole in the elevator tower.
3. Lever the motor head from either the top (increase) or the bottom (reduce) to set tension.

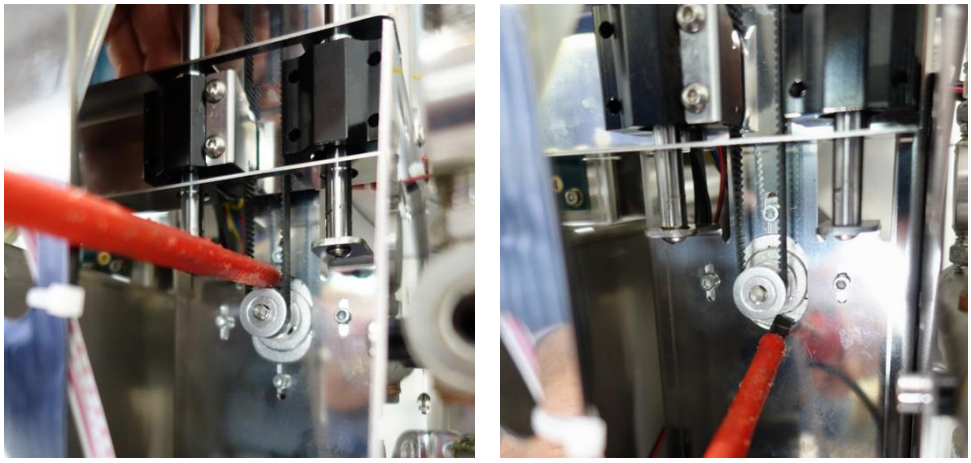


Figure 50: Increasing or reducing the toothed belt tension

6.26 LIMIT SENSOR BOARD

Guide to replacing the limit sensor board:

1. The limit sensor board is secured to the framework via 4 x M3 screws, see Figure 51.

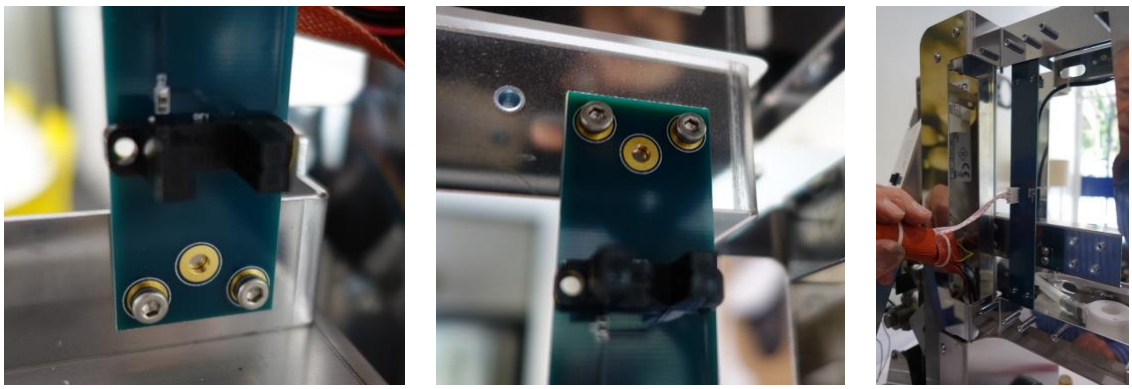


Figure 51: Limit sensor board screws and cable

6.27 BELT RETAINER CLIP ADJUSTMENT

The retainer clip is held on with two (2) screws, see Figure 52: Retainer Clip.

Note: Make sure the upper and lower metal tongues are centred in the middle of the belt between the teeth.

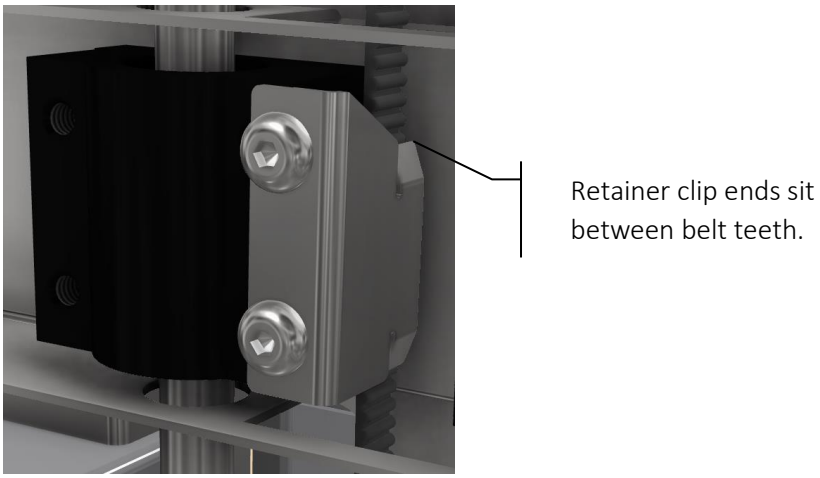


Figure 52: Retainer Clip