

710SHARK

Preventative Maintenance Manual



710Shark PM Manual

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1. Preventative Maintenance

Performing regular preventative maintenance through visual inspection and part replacement will help keep the 710Shark-US working at its full capacity. Failure to properly follow the recommended PM schedule may result in uneven fills and most likely, damage to the injector head.

IMPORTANT

1) CLEAN THE MACHINE IMMEDIATELY FOLLOWING PRODUCTION. This is the single most important step which can be taken to ensure the longest lifespan of the machine.

2) Always change the entire 10 x 10 grid of gaskets, o-rings, and/or needles to ensure proper sealing.

3) A change of ALL gaskets is required anytime the needle plate is removed from the injector head.

Recommended PM Schedule

# of cycles OR # of hrs		Check for:	Action
10	1 hr	<ul style="list-style-type: none"> - Leaks @ gaskets - Damaged needles - Volume calibration 	- Replace gaskets/needles (if needed)
			- Calibrate volume (if needed)
150	8 hrs	<ul style="list-style-type: none"> - Leaks @ gaskets - Damaged needles - Volume calibration 	- Clean surfaces with 99% IPA
			- Replace gaskets/needles (if needed)
			- Calibrate volume (if needed)
500	40 hrs	<ul style="list-style-type: none"> - Leaks @ gaskets - Damaged needles 	- Clean surfaces with 99% IPA
			- Replace o-rings
			- Calibrate volume
			- Grease linear bearings
1500	80 hrs	<ul style="list-style-type: none"> - Damaged needles 	- Replace o-rings
			- Replace gaskets
			- Replace needles (if needed)
			- Calibrate volume

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Post-production Injector Head Cleaning

1. Purge the injector head of remaining product

- a. Leave the oil basin which contains product in the machine.
- b. On the “Manual” screen, press the Oil Basin button to bring the oil basin up to the injector heads.
- c. Loosen the four screws securing the needle wipe plate to the oil basin.
- d. Press the oil basin button to bring the oil basin back down.
- e. Press the Oil Inject button to open the injector plates.
- f. Wait at least 1 min to allow residual oil to collect at the bottom of the reservoirs in the injector head.
- g. Press the Oil Inject button to close the injector plates (at fill speed).
- h. Repeat steps **e** through **g** until product no longer drips into the oil basin from the needles.

2. Remove needle wipe kit and oil basin

- a. After purging the injector head of residual product, press the Oil Basin button on the “Manual” screen to bring the oil basin up to the needles.
- b. Tighten the 4 screws which secure the needle wipe plate to the oil basin.
- c. Press the Oil Basin button to bring the oil basin and needle wipe kit back down from the needles.

3. Flush the Injector Head

- a. Replace the oil basin which contains product with an empty oil basin containing at least 300ml of either ethanol or IPA ($\geq 90=1\%$) ONLY. A needle wipe kit is not required.
- b. On the “Manual” screen, press the Oil Basin button to bring basin up to the needles.
- c. Press the “Oil Inject” button to absorb cleaning fluid into the injector head.
- d. Wait 5 minutes to allow the cleaning fluid to warm up. During this time, open the Oil Inject DOWN valve (on the right side of the upper cabinet) all of the way. This is done to increase the injection speed.
- e. After 5 mins has passed, press the Oil Inject button to dispense the cleaning solution currently in the injector head (this can be done while the oil basin is up).
- f. Repeat the flush cycle (absorb, then dispense) at least 5 times.
- g. Replace the dirty cleaning fluid with a fresh batch and repeat steps **i** through **vi** until the cleaning product is running clear.
- h. Press the Oil Basin button to bring the basin back down from the needles

4. Purge the injector head of residual cleaning fluid.

- a. Purging the injector head will help increase drying time.
- b. Press the Oil Inject button (while the oil basin is down).
- c. Wait 1 min for residual cleaning fluid to collect at the bottom of each reservoir.
- d. Close the Oil Inject DOWN valve and return injection speed to filling speed.
- e. Press the Oil Inject button.
- f. Repeat steps **ii** through **v** until cleaning fluid no longer drips from the needles.

5. Dry the injector head

- a. Drying the injector head is REQUIRED.
- b. Remove any oil basins from the machine.
- c. Navigate to the “Auto” screen and set the Injector Head temperature to 85°C.
- d. Allow the machine to dry for at least 45-60 minutes.

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- e. Once drying is complete, perform a purge of the injector head to remove any residual cleaning fluid vapors still present in the injector head.

Removing the Injector Head for Maintenance

1. Removing the Injector Head

Make sure that the oil basin platform and injector head are both cool to the touch before attempting to remove the injector head!

Tools Required:

- #4 Allen
- #5 Allen
- Small adjustable crescent wrench
- Needle change foam block

****Note:** If the injector head is being removed for O-ring maintenance, make sure to adjust the fill volume hard-stop to its lowest value (>3.0ml) and open the injection plates by press Oil Inject on the “Manual” screen.

1. If an oil basin is installed, remove it at this time.
2. Gently push the needle change foam block on to the 10 x 10 grid of needles, enough so that it sticks.
3. Navigate to the “Manual” screen.
4. Press the Oil Basin button to bring the oil basin platform up to the needles. This will push the foam on to the needles the rest of the way.
5. Use the adjustable crescent wrench to unscrew the thermocouple from the back of the injector head.
6. Remove the heating elements by gently pulling them free from the injector head.
7. Using the #4 Allen, remove the four screws which attach the injector head to the bottom of the 4 guide posts.
8. Using the #5 Allen, remove the 3 screws which attach the injector head to the piston flange.
9. Stabilize the injector head with your hand and press the Oil Basin button to bring the oil basin platform down. This will lower the injector head and make it safely accessible for removal.

Replacing O-rings and Gaskets

1. Gaskets

Tools Required:

- #4 Allen
- #5 Allen
- Small adjustable crescent wrench
- Needle change foam block
- 100 gaskets or 1 gasket sheet

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1. Remove the injector head as outlined in the previous section.
2. Lay the injector head down, needle change foam block side up and make a note on the foam regarding which direction the tapered cut of the needles were facing.
3. Using a #4 Allen, remove the 6 screws which attach the needle plate to the main body of the injector head.
4. Slowly lift off the needle plate.
 - a. If a gasket retainer plate is installed, remove it at this time.
5. Carefully lift gaskets off each nozzle.
6. Use a cleaning fluid such as IPA (<91%) or ethanol to clean the surfaces around the nozzles.
7. Place a new gasket on to each nozzle. Make sure they are pushed down as much as possible.
 - a. If using a gasket sheet, install it by rolling it from one side of the injector head to the other.
8. Press on the gasket retainer plate, if one was removed before installation.
9. Carefully place the needle plate (with needles loaded and heads facing down) on to the nozzles ensuring that the tapered cuts on the needles will be facing to the left once the injector head is installed.
10. Replace the 6 screws removed in step 3. Tighten these in a "star" pattern to ensure the needle plate is secured planar to the injector head.
 - a. If a gasket retainer plate is used, tighten the needle plate until it is flush with the gasket retainer plate.
 - b. If no gasket retainer plate is used, do not overtighten. Needle heads may slip through gasket sheet/gaskets.

2. O-rings

Tools Required:

- #3 Allen
- #4 Allen
- #5 Allen
- Small adjustable crescent wrench
- Needle change foam block
- 200 O-rings
- Molykote 111

1. Remove the injector head. Follow steps outlined in the Removing the Injector Head section
2. Lay the injector head down, needle change foam block side down and make a note of the foam regarding which direction the tapered cut of the needles were facing.
3. Using a #3 Allen wrench, remove the 8-9 screws which attach the piston cover plate to the piston plate.
4. Once all screws are removed, the piston plate should fall free.
5. Remove the 100 pistons from the reservoir body and place them in a separate container. Fill the container with enough cleaning solution to just cover the pistons. Allow them to soak for 5-10mins.
6. While the pistons are soaking, use a cleaning fluid and a brush to clean the piston plate and piston cover plate.
7. Carefully remove the O-rings from the pistons and place the piston into a container with cleaning fluid.
8. Once all O-rings have been removed from the pistons and the pistons have been soaking in a cleaning fluid, use a brush to clean them. Rinse them using fresh cleaning fluid and let them dry.
9. Once the pistons are dry, assemble two new O-rings per piston.
10. Lightly coat the inside surfaces of the piston clearance holes in the piston plate with Molykote 111 and place on top of the reservoir body with the countersunk holes facing upward.

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11. Rub a very small amount of Molykote 111 on the O-rings to provide a thin layer of lubricant and push it through the piston plate into the reservoir body ensuring that the piston head is seated flush with the piston plate.
12. Place the piston cover plate on top and reattach with the screws removed in step 3.

3. Needles

Tools Required:

- #3 Allen
 - #4 Allen
 - #5 Allen
 - Small adjustable crescent wrench
 - Needle change foam block
 - 200 needles
1. Remove the injector head as outlined in the “Removing the Injector Head” section.
 2. Lay the injector head down, needle change foam block side up and make a note on the foam regarding which direction the tapered cut of the needles were facing.
 3. Using a #4 Allen, remove the 6 screws which attach the needle plate to the main body of the injector head.
 4. Slowly lift off the needle plate.
 - a. If a gasket retainer plate is installed, remove it at this time.
 5. Carefully remove the used needles from the needle plate and discard safely. Remember to keep track of which direction the tapered cut on the needles were facing.
 6. Use a cleaning fluid such as IPA (<91%) or ethanol and a brush to clean the needle plate.
 7. Install new needles. Make sure to keep track of the direction the tapered cut of the needle is facing so that when the needle plate is reinstalled, the tapered cut of the needle is facing to the LEFT.
 8. A gasket change is required any time contact between the needle head and gaskets are broken. Perform a gasket change.
 9. Carefully place the needle plate (with needles loaded and heads facing down) on to the nozzles ensuring that the tapered cuts on the needles will be facing to the left once the injector head is installed.
 10. Replace the 6 screws removed in step 3. Tighten these in a “star” pattern to ensure the needle plate is secured planar to the injector head.
 - a. If a gasket retainer plate is used, tighten the needle plate until it is flush with the gasket retainer plate.
 - b. If no gasket retainer plate is used, do not overtighten. Needle heads may slip through gasket sheet/gaskets.