

Part # Gen-6-999

## CorkSport Fuel Pump Internals

2007-2013 Mazdaspeed 3, 2006-2007 Mazdaspeed 6 & 2007-2012 CX-7



**Thank you for purchasing the CORKSPORT Max Flow Fuel Pump Internals.**

With well over 2 years of research and development, you can count on CorkSport to bring innovation to the high pressure fuel pump on your Mazdaspeed. With hardening surface treatments, high strength coatings and a machined tolerance that is the best on the market, our pump internals are ready to give you the most performance available for your dollar.

<http://www.corksport.com/corksport-mzr-high-flow-fuel-pump-internals.html>



### Pre-Installation Notes:



**Make sure your vehicle is completely cooled down** prior to starting installation. If you are going to work on your car within an hour or two of having driven it, use a fan to cool off the car.



**Use extreme caution while releasing fuel under pressure!** Ensure that your work space is well ventilated and that there are no open sparks or flame sources. Have a fire extinguisher on hand for emergencies.



**During the pump internals installation process, cleanliness is of the upmost importance.** Debris inside of the pump may cause pump failure resulting in engine damage.



**These instructions were written for reference only** and the use of a factory service manual is recommended. Please read these instructions thoroughly prior to starting installation.



**How our instructions work:** To best cover all of our customers experience levels, we have included an overview checklist for the more technically advanced users along with step-by-step instructions for customers that require additional detail.



**These installation instructions were written using a 2013 Mazdaspeed 3.** Other years and models will be similar.

### Materials and Time:



#### General Info.

**Part #:** Gen-6-999  
**Time Est:** 2 hours  
**Wrench Rating:** 3/5



#### Tooling List

¼" Ratchet  
¼" Short Extension  
¼" 10mm Socket  
¼" E8 (reverse Torx) Socket  
3/8" Long Handle Ratchet  
3/8" Torque Wrench  
3/8" 18mm Deep Socket  
17mm wrench  
19mm Wrench

Flat Blade Screw Driver  
Clean lint free rags  
Clean motor oil  
Bench Vice  
Small fuel safe container  
Long Magnet or Zip Tie  
Disposable gloves



#### Parts List

One (1) Installation Pipe  
One (1) Installation Tool  
One (1) High Rate Fuel Pump Spring  
One (1) Spring Retainer Tappet  
One (1) CS Fuel Pump Piston  
One (1) Spring Retainer  
One (1) CS Fuel Pump Sleeve



Watch our Install Video Here:

<http://youtu.be/cPctt1QC4eE>












Need Help With Your Installation?

Call (360) 260-CORK

## Checklist

This is an overview of each step in the build. You can use this as a reference and a checklist as you button up the work on your car

### 1. Remove the Factory Fuel Pump Housing

- a) Remove the battery cover. (Red arrows in Figure 1a)
  -  Skip this step for the CX7 and Mazdaspeed6
- b) Use a 10mm socket to remove the negative battery terminal (negative shown in Figure 1a).
  -  For MS3 it is recommended to replace the battery cover back over the battery with the negative terminal tucked away outside of the battery box.
- c) Remove the intercooler cover by removing the two (2) 10 mm bolts (red circles in Figure 1b)
  -  For CX7, you will first need to remove the vent shroud by unclipping the two push style clips (shown by the red circles in Figure 1c) and pulling towards the front of the engine bay.
- d) Locate the high pressure fuel pump (red arrow in Figure 1d).
- e) Remove Electrical Connector on the top of the Fuel Pump (red circle in Figure 1e).
  -  Use extreme caution while releasing fuel under pressure! Ensure that your work space is well ventilated and that there are no open sparks or flame sources.
  -  Use eye protection!! When opening the MZR fuel lines, fuel tends to shoot upward when still under pressure!!! Use a rag while releasing fuel pressure to capture spray, and the use of disposable gloves is highly recommended.
- f) Loosen the high pressure fuel line underneath the fuel pump housing (Figure 1f). Remember to hold the 17mm nut while loosening.
  -  Use a magnet to keep the flange nut from falling down behind the motor. This will aid in pump re-installation.
- g) Remove low pressure return line from the top of the fuel pump (Figures 1g and 1h).
- h) Remove low pressure fuel supply line from the top of the fuel pump (Figures 1g and 1h).
  -  Both the yellow and blue fuel line locking clips stay on the fuel connectors, **do NOT remove** the clips from their connectors all the way. Doing so may result in breaking the clips and needing to replace the fuel lines.
- i) Remove the three (3) E8 screws (also known as reverse Torx 40) evenly in a pattern (green circles in Figure 1h).
  -  It helps to wiggle the pump housing gently while releasing the three screws to keep the housing from binding while removing it. There is an internal spring pushing the pump housing out of the head.
  -  Binding the pump housing may cause internal damage to the engine or pump.
- j) Carefully remove the fuel pump housing from the car. Make sure the lifter stays in the motor (Figure 1i).

## Checklist


This is an overview of each step in the build. You can use this as a reference and a checklist as you button up the work on your car

### 1. Remove the Factory Fuel Pump Housing (continued)



If the lifter comes out with the pump, clean it off with a clean rag, lubricate it with clean motor oil, and re-install it back into the head with the flat shiny surface touching the camshaft (correct lifter orientation shown in [Figure 1i](#)).

### 2. Remove the Factory Fuel Pump internals

- a) Place the pump housing, cushioned by a clean lint free rag, into a bench vise ([Figure 2a](#)). Tighten the pump housing in the vise until it is snug.
- b) Loosen the seal screw that fastens the pump internals inside of the housing.
  -  There will be some fuel left in the pump. Pour this into a plastic container for use later. The cap of a spray can works well for this.
- c) Remove the pump internals from the housing.
- d) Pull the piston out of the Seal Screw.
- e) Store OEM piston, sleeve and spring in a clean and safe location.

### 3. Install the CorkSport Fuel Pump Internals



During the pump internals installation process, cleanliness is of the upmost importance. Debris inside of the pump may cause pump failure resulting in engine damage.



Use some of your leftover fuel and a clean rag to clean internal components of the pump from debris and burnt motor oil residue.



You will need clean engine oil for the next steps. To make assembly easier, place a small amount of clean engine oil in a plastic container or again use a spray paint can lid.



Use page cover page as a reference to identify the **Orange** part numbers during this procedure.

- a) Set the spring retainer(6) into the tool(2) as shown in [Figure 3a](#).
- b) Lubricate the keeper end piston(5) with clean engine oil and insert it through the Seal Screw as shown in [Figure 3b](#).
- c) Place the spring(3) over the piston shaft, and Seal Screw as shown in [Figure 3c](#).
- d) Lubricate again with clean engine oil and slide the top of the piston(5) into the slot cut into the spring retainer(6) as shown in [Figure 3d](#).
- e) Place the pump assembly and tool into the provided pipe(1) as shown in [Figure 3e](#).

## Checklist

This is an overview of each step in the build. You can use this as a reference and a checklist as you button up the work on your car

### 3. Install the CorkSport Fuel Pump Internals (continued)

- f) Apply oil to the spring retainer. Place the Tappet(4) domed side up, into the spring retainer.



Makes sure the domed side is up. This will change the operation of the pump if not done correctly.

- g) Seat it down into the spring retainer by tapping it in with the plastic handle of a screw driver.



Pre-assembled tappet/retainers must still be fully pressed together in this step.

- h) Remove the assembly from the pipe, and pull the tool off of the pump internal assembly.



Verify that the tappet is fully seated by trying slide the assembled tappet/retainer off of the top of the piston. A fully seated tappet into the retainer cannot be removed. Repeat the seating process if the tappet/retainer assembly slides off the piston.

### 4. Install the CorkSport Fuel Pump Internals into the Pump Housing



With fuel pump housing in secured in bench vise

- a) Place the CorkSport fuel pump sleeve into the fuel pump housing (Figure 4a).
- b) Lubricate the piston, screw assembly and O-ring with clean motor oil, and carefully place it down into the pump housing.
- c) By hand, thread the piston and seal screw assembly down into the pump housing (Figure 4b).
- d) Tighten the seal screw to 40ft-lbs with a deep 18mm socket and torque wrench.
- e) Remove the pump housing assembly from the vise.

### 5. Install the Fuel Pump Housing into the Vehicle

- a) Inspect the pump housing O-ring for wear or defects and apply clean motor oil to the o-ring (Figure 4b).
- b) Carefully push the pump housing back into the engine.
- c) By hand, use the E8 socket to thread the three (3) Torx screws back into the engine while pushing the pump into place (Figure 5a).



You will be pushing the pump against the spring. Take care not to bind the pump housing, and tighten the screws in small increments.





Do not force the pump into place by tightening the screws. Serious engine damage could occur.

## Checklist

This is an overview of each step in the build. You can use this as a reference and a checklist as you button up the work on your car

### 5. Install the Fuel Pump Housing into the Vehicle (continued)


- d) Once the pump is seated, tighten the three (3) Torx screws (green circles in Figure 5a) to 8ft-lbs.
- e) Thread the high pressure fuel line flange nut back onto the pump housing output, and tighten with a 17mm and 19mm wrench to 35ft-lbs (Figure 1f).
- f) Re-install the low pressure fuel supply and return lines to the fuel pump.
- g) Re-connect the Electrical Connector on the top of the Fuel Pump (green arrow in Figure 5b).
- h) Install the intercooler cover shown in Figure 1b for Mazdaspeed3 and Mazdaspeed6. Cover shown in Figure 1c for CX7.
- i) Remove the battery cover.
- j) Use a 10mm socket to reinstall the negative battery terminal (negative shown in Figure 1a).
-  k) Cycle the key to the ON position before starting the vehicle to prime the low pressure pump connections and inspect for fuel leaks.
-  l) After properly connected low pressure lines are verified, start the engine briefly and verify there are no fuel leaks coming from the high pressure side of the pump.



**This completes the installation of your CorkSport Fuel Pump Internals. Start the engine and visually inspect the fuel pump connections before test driving .**

**During the install process fuel may have been spilled onto the top of the engine. You may smell fuel until all residual fuel spilled onto the motor has evaporated. Always inspect for leaking fuel lines visually. If leaks are found tighten loose fittings.**

## Detailed Instructions

 These instructions were written using a 2013 Mazdaspeed 3. Other model and year vehicles will be similar.

 Watch our Install Video Here:  
<http://youtu.be/cPctt1QC4eE>



### 1. Remove the Factory Fuel Pump Housing

- a) **Remove the battery cover.** Remove the plastic battery cover by prying out the two tabs on the sides (red arrows in Figure 1a), and lift the cover upward.

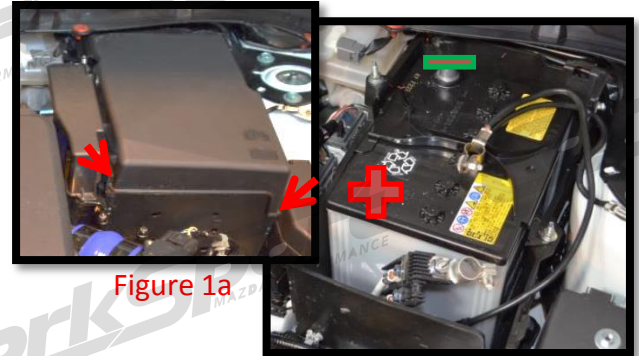



Figure 1a

 Skip this step for the CX7 and Mazdaspeed6

- b) **Use a 10mm socket to loosen the negative battery terminal** (negative shown in Figure 1a). Remove the terminal from the battery and tuck it away safely.

 **For MS3** it is recommended to replace the battery cover back over the battery with the negative terminal tucked away outside of the battery box.

- c) **Remove the intercooler cover** by removing the two (2) 10mm bolts (red circles in Figure 1b) (MS3 cover shown) using the 1/4" drive ratchet and 10mm socket.

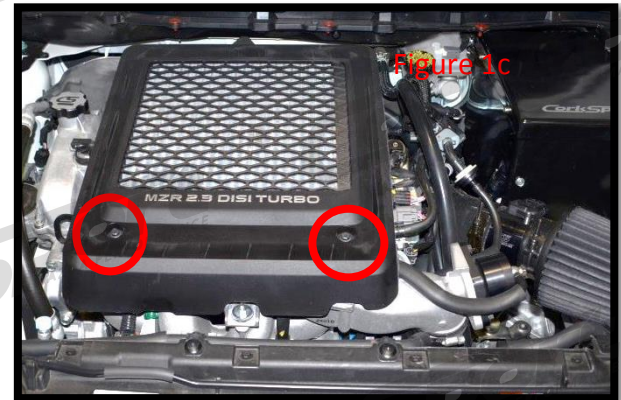



Figure 1b

 **For CX7**, you will first need to remove the vent shroud by unclipping the two push style clips (shown by the red circles in Figure 1c) and pulling towards the front of the engine bay.

- d) **Locate the high pressure fuel pump** (red arrow in Figure 1d). It is located behind the top of the engine, to the right of the intercooler.

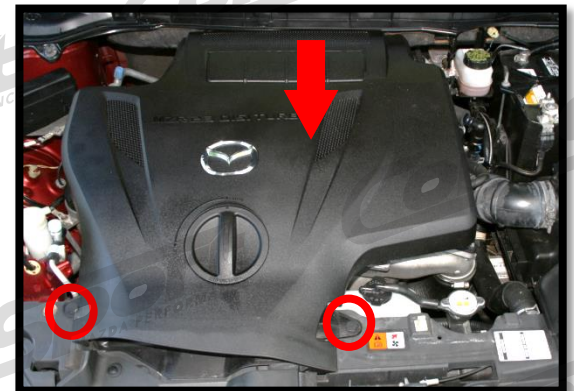


Figure 1c

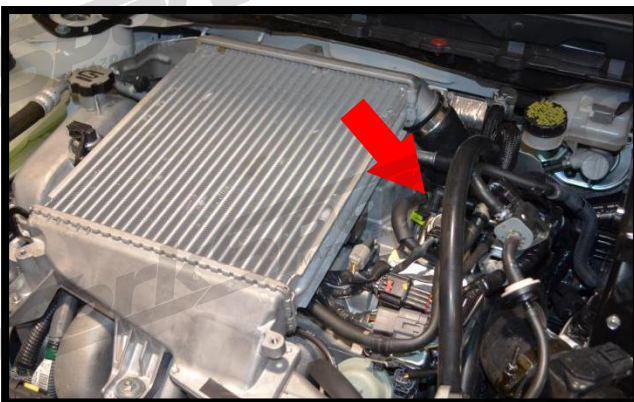


Figure 1d

- e) **Remove the electrical connector on the top of the Fuel Pump** (red circle in Figure 1e). Squeeze the small tab on the bottom of the connector and pull.

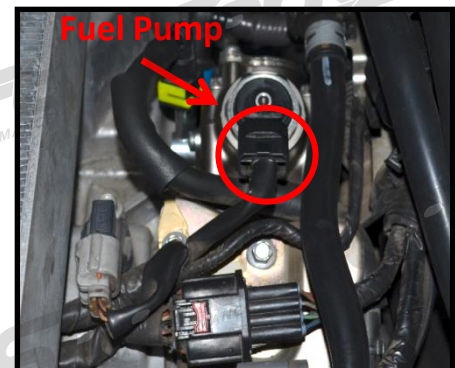


Figure 1e

## Detailed Instructions

### 1. Remove the Factory Fuel Pump Housing (continued)



Use extreme caution while releasing fuel under pressure! Ensure that your work space is well ventilated and that there are no open sparks or flame sources.

Use eye protection!! When opening the MZR fuel lines, fuel tends to shoot upward when still under pressure!!! Use a rag while releasing fuel pressure to capture spray, and the use of disposable gloves is highly recommended.

- f) Loosen the high pressure fuel line underneath the fuel pump housing (Figure 1f). Place a 17mm wrench onto the pump outlet and a 19mm wrench on the fuel line flange nut and loosen the connection.



Use a magnet to keep the flange nut from falling down behind the motor. This will aid in pump re-installation.

- g) Remove low pressure return line from the top of the fuel pump (Figures 1g and 1h). Use a flat blade screw driver to gently pry the yellow clip partially out of the connector and pull the fuel line from the pump.

- h) Remove low pressure fuel supply line from the top of the fuel pump (Figures 1g and 1h). By hand, gently pry back the blue circular clip until the fuel line will release from the pump.



Both the yellow and blue fuel line locking clips stay on the fuel connectors, **do NOT remove** the clips from their connectors all the way. Doing so may result in breaking the clips resulting in permanent damage to the fuel lines.

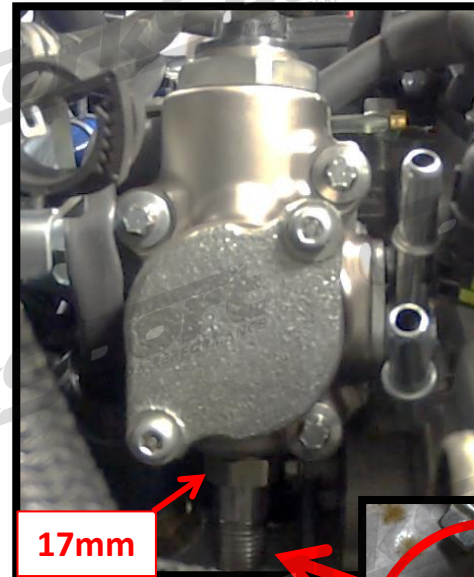
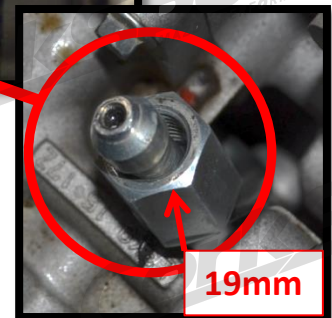


Figure 1f



19mm Fuel line flange nut w/ pump removed.

#### Fuel Return



Figure 1g

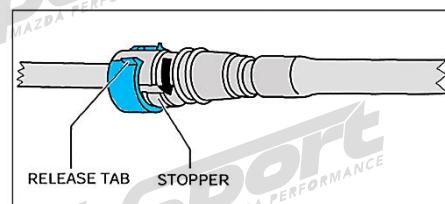
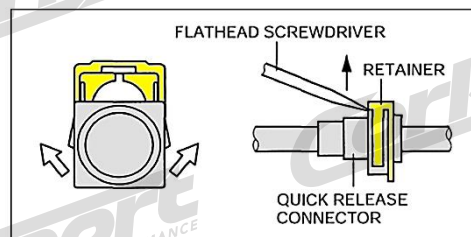


Figure 1h

## Detailed Instructions

### 1. Remove the Factory Fuel Pump Housing (continued)

- h) Remove the three (3) E8 screws (also known as reverse Torx 40) evenly in a pattern (green circles in Figure 1h). Use a ¼" Ratchet, short extension and E8 Socket.



It helps to wiggle the pump housing gently while releasing the three screws to keep the housing from binding while removing it. There is an internal spring pushing the pump housing out of the head.



Binding the pump housing may cause internal damage to the engine or pump.

- i) Carefully remove the fuel pump housing from the car. Between the pump and the camshaft is a lifter, or bucket. Make sure the lifter stays in the motor (Figure 1i).



If the lifter comes out with the pump, clean it off with a clean rag, lubricate it with clean motor oil, and re-install it back into the head with the flat shiny surface touching the camshaft (correct lifter orientation shown in Figure 1i).

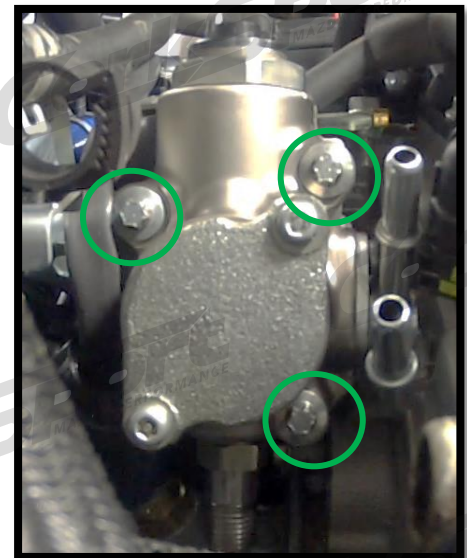


Figure 1h

Pump side

Lifter

Engine side

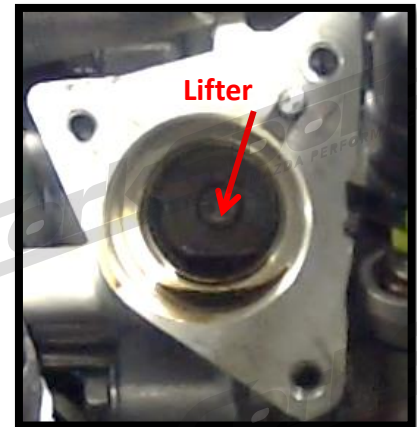


Figure 1i

### 2. Remove the Factory Fuel Pump internals

- a) Place the pump housing, cushioned by a clean lint free rag, into a bench vise (Figure 2a). Tighten the pump housing in the vise until it is snug.
- b) Loosen the seal screw (Page 4) that fastens the pump internals inside of the housing. Use a deep 18mm socket and long handle 3/8" socket wrench to break free the seal screw, and then unthread by hand.



There will be some fuel left in the pump. Pour this into a plastic container for use later. The cap of a spray can works well for this.

- c) Remove the pump internals from the housing. Lift the piston and seal screw out, and remove the piston sleeve from inside of the pump housing.



Figure 2a



## Detailed Instructions

### 2. Remove the Factory Fuel Pump Internals (continued)

- d) Pull the piston out of the seal screw. You will be using the seal screw to install the new pump internals in the next section.
- e) Store OEM piston, sleeve and spring in a clean and safe location.

Piston Sleeve



Seal Screw



Piston

### 3. Install the CorkSport Fuel Pump Internals



During the pump internals installation process, cleanliness is of the utmost importance. Debris inside of the pump may cause pump failure resulting in engine damage.



Use some of your leftover fuel and a clean rag to clean internal components of the pump from debris and burnt motor oil residue.



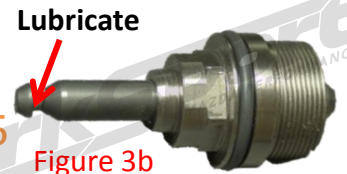
You will need clean engine oil for the next steps. To make assembly easier, place a small amount of clean engine oil in a plastic container or again use a spray paint can lid.



Use page cover page as a reference to identify the Orange part numbers during this procedure.



Figure 3a



Lubricate

Figure 3b



Figure 3c

- a) Set the spring retainer(6) into the tool(2) as shown in Figure 3a.
- b) Lubricate the keeper end piston(5) with clean engine oil and insert it through the seal screw as shown in Figure 3b.
- c) Place the spring(3) over the piston shaft, and seal screw as shown in Figure 3c.
- d) Lubricate again with clean engine oil and slide the top of the piston(5) into the slot cut into the spring retainer(6) as shown in Figure 3d.
- e) Place the pump assembly and tool into the provided pipe(1) as shown in Figure 3e.

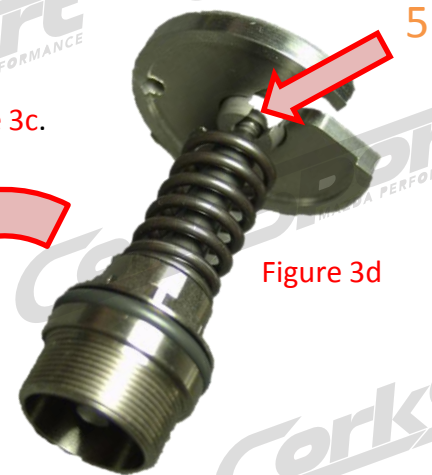


Figure 3d



Figure 3e

## Detailed Instructions

### 3. Install the CorkSport Fuel Pump Internals (continued)

- f) Apply oil to the spring retainer. Place the Tappet(4) domed side up, into the spring retainer (Figure 3f).



Make sure the domed side is up. Incorrect orientation could result in pump or motor damage.

- g) Seat it down into the spring retainer by tapping it in with the plastic handle of a screw driver. A properly installed tappet and retainer shown in Figure 3g.



**Pre-assembled tappet/retainers** must still be fully pressed together in this step.

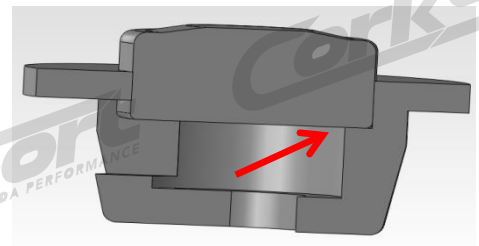
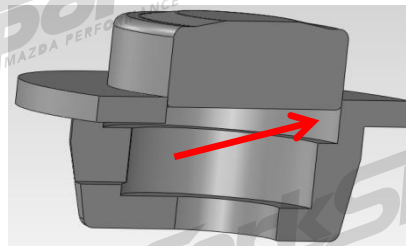


Figure 3g

- h) Remove the assembly from the pipe, and pull the tool off of the pump internal assembly.



Verify that the tappet is fully seated by trying slide the assembled tappet/retainer off of the top of the piston. A fully seated tappet into the retainer cannot be removed. Repeat the seating process if the tappet/retainer assembly slides off the piston.



### 4. Install the CorkSport Fuel Pump Internals into the Pump Housing



With fuel pump housing in secured in bench vise

- a) Place the CorkSport fuel pump sleeve into the fuel pump housing. The smaller diameter end goes down into the housing and the larger diameter faces upward towards the seal screw (Figure 4a).

- b) Lubricate the piston, seal screw and O-ring with clean motor oil. Carefully place it down into the pump housing.



Figure 4a

## Detailed Instructions

### 4. Install the CorkSport Fuel Pump Internals into the Pump Housing (continued)

- c) By hand, thread the piston and seal screw assembly down into the pump housing (Figure 4b).



The seal screw uses a very fine thread that is easy to cross thread!

- d) Tighten the seal screw to 40ft-lbs with a deep 18mm socket and torque wrench.

- e) Remove the pump housing assembly from the vise.

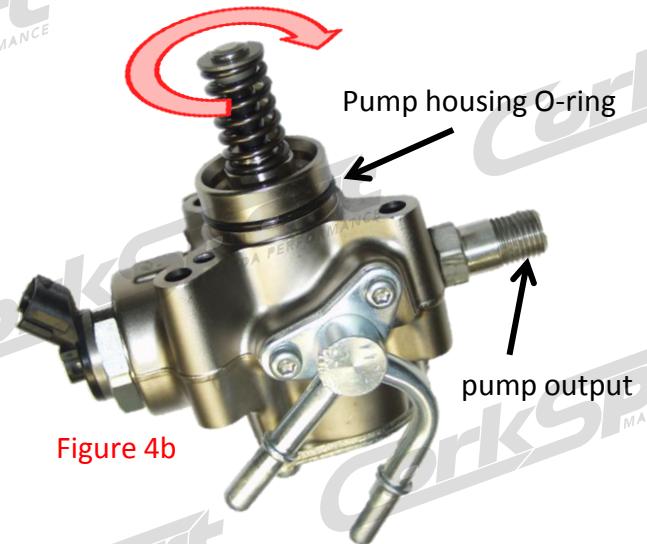


Figure 4b

### 5. Install the Fuel Pump Housing into the Vehicle

- a) Inspect the pump housing O-ring for wear or defects and apply clean motor oil to the o-ring (Figure 4b). Also a small amount of oil on the pump output will help the high pressure fuel line flange nut thread on later in the process.

- b) Carefully push the pump housing back into the engine.

- c) By hand, use the E8 socket to thread the three (3) Torx screws back into the engine while pushing the pump into place (Figure 5a).



Figure 5a



You will be pushing the pump against the spring. Take care not to bind the pump housing, and tighten the screws by small increments in an even pattern.



Do not force the pump into place by tightening the screws. Serious engine damage could occur.

- d) Once the pump is seated, tighten the three (3) Torx screws (green circles in Figure 5a) to 8ft-lbs.

## 5. Install the Fuel Pump Housing into the Vehicle (continued)

e) Thread the high pressure fuel line flange nut back onto the pump housing output, and tighten with a 17mm and 19mm wrench to 35ft-lbs (Figure 1f).

f) Re-install the low pressure fuel supply and return lines to the fuel pump. Push the blue fuel supply connector onto the pump until it "clicks". Push the yellow connector down until it stops, and slide the yellow clip back into position. Pull back up on the fuel line connectors to ensure they fully connected.

g) Re-connect the electrical connector on the top of the fuel pump (green arrow in Figure 5b).

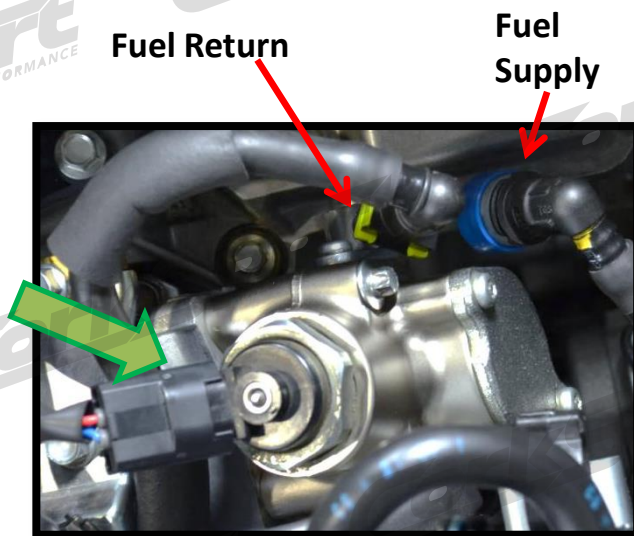


Figure 5b

h) Install the intercooler cover shown in Figure 1b for Mazdaspeed3 and Mazdaspeed6. Cover shown in Figure 1c for CX7.

i) Remove the battery cover. Remove the plastic battery cover by prying out the two tabs on the sides (red arrows in Figure 1a), and lift the cover upward.

j) Use a 10mm socket to reinstall the negative battery terminal (negative shown in Figure 1a).



k) Cycle the key to the ON position before starting the vehicle to prime the low pressure pump connections and inspect for fuel leaks.

l) After properly connected low pressure lines are verified, start the engine briefly and verify there are no fuel leaks coming from the high pressure side of the pump.

**This completes the installation of your CorkSport Fuel Pump Internals. Start the engine and visually inspect the fuel pump connections before test driving.**

**During the install process fuel may have been spilled onto the top of the engine. You may smell fuel until all residual fuel spilled onto the motor has evaporated. Always inspect for leaking fuel lines visually. If leaks are found tighten loose fittings.**

## What's Next:

### [CorkSport Aluminum Oil Catch Can](#)



Enhance the reliability of your engine and improve performance and fuel economy with the **CorkSport Oil Catch Can**. By adding an oil catch can, you will increase the longevity of your engine by helping keep unclean crankcase vapors and oil out of the engines intake. Made of billet aluminum for strength, the Oil Catch Can has no welds to reduce failure points, and includes everything you need for a complete install. Don't let your Mazda get contaminated by sediment, crankcase vapors, or unclean oil. With the CorkSport Oil Catch Can you will remove unwanted debris that would normally contaminate the intake tract.

Add performance and style while protecting your turbo with the Patent Pending **CorkSport Mazdaspeed MZR Bypass Valve**. Using an innovative patent pending design utilizing a wave spring, we were able to reduce the spring height of the OEM Bypass Valve by 50%. This size reduction provides the same amount of force, while accelerating the speed of the valve. By increasing speed the Bypass Valve effectively increases the life of your turbo by preventing premature wear since the BPV can safely move at speeds 33% faster than stock or other valves.

### [CorkSport Mazdaspeed 3 MZR Bypass Valve](#)



### [CorkSport Mazdaspeed 3 Downpipe](#)



Get maximum turbo performance and dramatically increase torque with the Mazdaspeed 3 Power Series Downpipe. The CorkSport downpipe has been expertly designed to replace the restrictive element in the Mazdaspeed 3 stock downpipe. Mandrel bent piping is used to create smooth exhaust flow for dramatic increases in power. For lasting corrosion resistance and reduced heat transfer to the engine bay, the CorkSport MS3 downpipe uses polished 3" 304 stainless steel and features TIG welds that offer superior arc and weld puddle control for a cleaner appearance and precise weld bead control.