

# INSTALLATION INSTRUCTIONS



*PART #: AXL-6-911-10* 

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CORKSPORT.COM





### **CORKSPORT Auxiliary Fuel Tank** 2007-2013 Mazdaspeed 3

#### **PRODUCT DESCRIPTION:**

Thank you for purchasing the CorkSport Auxiliary Fuel Tank. By utilizing rotomolded construction, we were able to cram 2.6 gallons of capacity in front of the driver's side front tire to give you the best in fitment and functionality. Ready for methanol or port injection, the CS aux fuel tank gives you a fantastic starting point for your fuel system. Other features include a low-level sensor, mounting points for methanol or port injection pumps, a sumped feed, billet aluminum cap, and a tank vent.

Please let us know your feedback of the CS Aux Fuel Tank by submitting a review at: <u>https://corksport.com/mazdaspeed-3-fender-mounted-auxiliary-fuel-cell.html</u>

#### PRE-INSTALLATION NOTES:

Verify that 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 driving it, use a fan to cool off the car.

These instructions were written for reference only and the use of a factory service manual is recommended. Most of the installation images shown on 2013 Mazdaspeed 3. Earlier MS3 will be similar.

Due to the location of the CorkSport Auxiliary Fuel Tank, most oil catch can setups will need to be relocated away from the driver's side frame rail.



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NOTE

2007-2009 Mazdaspeed 3 owners will need to drill two small holes for installation.



Failure to follow correct bolt lengths stated in instructions can result in tank damage.



Off-Road/Racing Use Only. Owner assumes all risk when installing this fuel cell/tank.



It is highly recommended to use a pre-pump filter for methanol & ethanol fuel systems to protect the pump and injectors.

#### MATERIALS & TIME:

GENERAL INFO:Image: Select stateImage: Select stateImage: Select stateImage: Select stateTime Est:<br/>2hrDifficulty:<br/>3/5CEL:<br/>NoWarranty:<br/>2-Year

#### TOOLING LIST:

- 8mm Socket
- 10mm Socket
- 3/8" Drive Ratchet
- 3" Extension
- 6" Extension
- 8mm Wrench
- 10mm Wrench
- ½" or 13mm Wrench
- Adjustable Wrench
- Phillips Screwdriver
   Flathead Screwdriver
- Flathead Screwdriv
   Jack Stands
- Jack Stand
   Floor Jack
- Wire & Wiring Supplies
- Cordless Drill
- ¼" Drill Bit

### PARTS LIST: One (1) Cor

- One (1) CorkSport Auxiliary Fuel Tank One (1) CorkSport Auxiliary
- One (1) CorkSport Auxiliary Fuel Tank Cap
- One (1) CorkSport Auxiliary Fuel Tank Vent Hose Assembly
- One (1) CorkSport Auxiliary
   Fuel Tank Top Bracket
- One (1) CorkSport Auxiliary
   Fuel Tank Lower Side
   Bracket
- One (1) CorkSport Auxiliary
   Fuel Tank Upper Side
   Bracket
- One (1) CorkSport Auxiliary
   Fuel Tank Slotted Washer
- One (1) Level Sensor & LED
- One (1) 3/8 NPT Brass Plug
- Twelve (12) M6x1.0x16mm Bolts
- Four (4) M6x1.0x30mm Bolts
- Three (3) M6x1.0mm Flange Nuts
- Four (4) M6 18mm OD Washers
- One (1) Small Tube of O-ring Lube



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### 1. 2007-2009 Mazdaspeed 3 Removing OEM Front Bumper & Headlight

NOTE

2010-2013 Mazdaspeed 3 owners skip to Section 2 on page 8.

- a) Use a floor jack and jack stands to gain access to the underside of the vehicle. You will need to access to the engine bay and the underside of the car.
- b) Lift up the hood and remove four Phillips head push clips from the inlet ducts. Shown circled in red in Figure 1a.
- c) Remove two Phillips head screws from the top of the grill. Shown circled in blue in Figure 1a.
- d) Remove two push clips from near the headlights. Shown circled in green in Figure 1a.



Figure 1a

# DETAILED INSTRUCTIONS:

Cork Spor

### 1. 2007-2009 Mazdaspeed 3 Removing OEM Front Bumper & Headlight (cont.)

- e) Remove three 10mm bolts from the OEM splash shield using a 10mm socket and ratchet. Shown circled in red in Figure 1b.
- f) Remove three push clips from the OEM splash shield using a flat head screwdriver or push clip removal tool.. Shown circled in blue in Figure 1b. The center push clip is hidden underneath the rear section of the splash shield but is still shown below.
- g) Remove five 8mm bolts from the front section of the OEM splash shield using an 8mm socket & ratchet or Phillips screwdriver. Shown circled in green in Figure 1b.
- h) The front section of the OEM splash shield can then be removed and set out of the way.





i) Using an 8mm socket or Philips screwdriver, remove three (3) screws from <u>each side</u> of the vehicle that attach the inner fender liner to the front bumper. Circled in red in Figure 1c.



Figure 1c

# CORKSPORTA

### 1. 2007-2009 Mazdaspeed 3 Removing OEM Front Bumper & Headlight (cont.)

- j) Unplug the wiring harness from each fog light and unclip the wiring from the bumper. Circled in red in Figure 1d.
- Remove the Philips head screw from the air temperature sensor bracket. Unclip the wiring harness from the bumper and position out of the way. Wiring shown circled in red in Figure 1e.
- I) Remove two (2) Philips head push clips from <u>each side</u> of the inner fender liner. Shown circled in red in Figure 1f.
- m) Gently pull the inner fender liner to locate and remove one (1) 8mm/phillips head screw from <u>each side</u>. The screw is located where the bumper connects to the front fender. Pull in the direction shown with the <u>blue arrow</u> in Figure 1f. The location is circled in blue in Figure 1f.
- n) Remove the bumper from the vehicle.
  - Gently pull on the sides of the bumper to release it from the clips located around the headlights and fenders.
  - Pull up and out on the middle of the bumper to release the two (2) clips . If they will not release, they can be accessed from behind the grill.

Apply some blue painters tape to the fender and headlight near the bumper to prevent damage to the paint.



NOTE

Set the bumper on a soft towel or large piece of cardboard to avoid damaging the paint.



Figure 1d



Figure 1e



Figure 1f

# CORKSPRESE

### 1. 2007-2009 Mazdaspeed 3 Removing OEM Front Bumper & Headlight (cont.

- o) Remove one Phillips head push clip from the corner of the driver's side headlight. Shown circled in red in Figure 1g.
- p) Remove three 10mm bolts from the headlight. Shown circled in blue in Figure 1g.





Figure 1g

q) Gently pull on the headlight to release it from its mounting. Then, remove the four (4) electrical connectors from the backside of the headlight. Shown circled in red in Figure 1h. It will now be free to remove from the vehicle.





### 2. 2010-2013 Mazdaspeed 3 Removing OEM Front Bumper & Headlight

NOTE

2007-2009 Mazdaspeed 3 owners skip to Section 3 on page 12.

- a) Use a floor jack and jack stands to gain access to the underside of the vehicle. You will need to access to the engine bay and the underside of the car.
- b) Lift up the hood and remove six push clips from the top of the front bumper. Shown circled in red in Figure 2a.
- c) Remove two Phillips head screws from the top of the front bumper. Shown circled in blue in Figure 2a.



Figure 1a

# DETAILED INSTRUCTIONS:

Cork Sport

### 2. 2010-2013 Mazdaspeed 3 Removing OEM Front Bumper & Headlight (cont.)

- d) Remove five 10mm bolts from the OEM splash shield using a 10mm socket and ratchet. Shown circled in red in Figure 2b.
- e) Remove three push clips from the OEM splash shield using a flat head screwdriver or push clip removal tool.. Shown circled in blue in Figure 2b. The center push clip is hidden underneath the rear section of the splash shield but is still shown below.
- f) Remove five 8mm bolts from the front section of the OEM splash shield using an 8mm socket & ratchet or Phillips screwdriver. Shown circled in green in Figure 2b.
- g) The front section of the OEM splash shield can then be removed and set out of the way.



Figure 2b

 b) Using an 8mm socket or Philips screwdriver, remove two screws from <u>each side</u> of the vehicle that attach the inner fender liner to the front bumper. Circled in red in Figure 2c.



### **DETAILED INSTRUCTIONS:** 2. 2010-2013 Mazdaspeed 3 Removing OEM Front Bumper & Headlight (cont.)

Cork Sport

- i) Disconnect the fog light wires and remove wiring from the bumper. Disconnect the fog light connectors and use a small flat head screwdriver to disengage the clips that hold the wiring to the bumper. Shown with the red circles in Figure 2d and 2f.
- j) Follow the wire across the vehicle and disconnect it from the retaining clips that hold it to the bumper. Shown with red circles in Figure 2e.



Figure 2d: Driver's Side



Figure 2e: Center



Figure 2f: Passenger's Side

# DETAILED INSTRUCTIONS:

Cork Sport

### 2. 2010-2013 Mazdaspeed 3 Removing OEM Front Bumper & Headlight (cont.)

- j) Remove three push clips from <u>each side</u> of the inner fender liner. Shown circled in red in Figure 2g.
- Remove one 8mm/phillips head screw from <u>each side</u>. Shown circled in blue in Figure 2g.
- I) Remove the bumper from the vehicle.
  - Gently pull on the sides of the bumper to release it from the clips located around the headlights and fenders.
  - Pull up and out on the middle of the bumper to release the two (2) clips.
- Apply some blue painters tape to the fender and headlight near the bumper to prevent damage to the paint.



Figure 2g

- Set the bumper on a soft towel or large piece of cardboard to avoid damaging the paint.
- Remove one Phillips head push clip from the corner of the driver's side headlight. Shown with red arrow in Figure 2h.

NOTE

- n) Remove three 10mm bolts from the headlight. Shown in blue in Figure 2h.
- Disconnect the electrical connector for the headlight. Shown circled in green in Figure 2h.
- p) The headlight can now be removed from the vehicle.



Figure 2h



### 3. 2007-2009 Mazdaspeed 3 Installation Preparation



2010-2013 Mazdaspeed 3 owners skip to Section 4 on page 15.

NOTE

If you have an OCC mounting in the location shown in Figure 3a, you will need to relocate it at this time.

- a) Remove one 10mm bolt from the bottom of the frame rail. Shown removed and circled in red in Figure 3a.
- b) Install the supplied lower side bracket as shown in Figure 3b with one of the supplied M6x1.0x16mm bolts. Ensure the bracket is in the orientation shown and the bolt is all the way to the end of the slot as shown.



**Figure 3a** 



Figure 3b

- c) Using the bracket as your guide, mark a position to drill an additional hole for mounting. The hole should be near the end of the other slot as shown. You can also use the "dimple" present in the stamping of the frame rail. Your hole position should be slightly above and forward of the "dimple". The "dimple" can be seen in Figure 3b with the green arrow.
- d) Once confident with hole position, drill a hole through the bottom of the frame rail with a ¼" drill bit. Shown completed in Figure 3b with blue arrow.
- NOTE If you had an OCC mounted in the location shown, this hole may already be present and may be able to be used. Verify correct location of the hole using the supplied bracket and Figure 3b above.

# CORKSPACE DETAILED INSTRUCTIONS:

### 3. 2007-2009 Mazdaspeed 3 Installation Preparation (cont.)

e) Loosely install the lower side bracket using another supplied M6x1.0x16mm bolt and M6 nut as shown in Figure 3c.

f) Repeat the hole drilling process for the top side of the frame rail. There is another "dimple" in this location. Again, your hole needs to be slightly above and slightly forward of this dimple. See Figure 3c for location circled in red. Once satisfied that the location matches Figure 3c, drill a hole with a ¼" drill bit.







### 3. 2007-2009 Mazdaspeed 3 Installation Preparation (cont.)

g) Locate the two ground wires attached to the fender support arm. Remove the 10mm bolt from each ground wire. Bolts circled in red in Figure 3d.



Figure 3d

- h) Flip the right side ground wire over and line it up with the other ground wire hole as shown in Figure 3e.
- i) Secure both ground wires in the left side hole with one of the 10mm bolts removed earlier as shown in Figure 3e.



Figure 3e

## CORKSPORTE DETAILED INSTRUCTIONS:

### 4. 2010-2013 Mazdaspeed 3 Installation Preparation



2007-2009 Mazdaspeed 3 owners skip to Section 5 on page 16.

NOTE

If you have an OCC mounting in the location shown in Figure 4a, you will need to relocate it at this time.

- a) Remove two 10mm bolts from the frame rail. Shown circled in red in Figure 4a.
- b) Unclip the wiring harness from its mounting point on the frame rail. Location of wiring harness clip circled in blue in Figure 4a.
- c) Install the supplied lower side bracket as shown in Figure 4b with two of the supplied M6x1.0x16mm bolts. Ensure the bracket is in the orientation shown and the bolts are approximately ¾" of the way to the rear of the slot as shown (the end of the slot should be visible past the bolt). Leave these bolts loose for now.



Figure 4a



Figure 4b



a) Install the upper side mounting bracket loosely to the CS aux fuel tank. Use two supplied M6x1.0x16mm bolts threaded in hand tight so the bracket still is free to move slightly. Shown in Figure 5a.



Figure 5a

b) Install the top mounting bracket loosely to the CS aux fuel tank. Use two supplied M6x1.0x16mm bolts threaded in hand tight so the bracket still is free to move slightly. Shown in Figure 5b.



Figure 5b



- c) Lift the CorkSport Auxiliary Fuel Tank into position as shown in Figure 5c.
- For 2010-2013 Mazdaspeed 3 owners, make sure the fill neck of the tank is behind the wiring harness as shown with red arrow in Figure 5c.



2007-2009 owners, the wiring harness sits behind the fill neck, opposite of shown in Figure 5c.

d) Begin securing the tank to the vehicle by loosely attaching the top bracket to the fender support. Use a supplied M6x1.0x16mm bolt and M6 nut threaded together hand tight so the bracket can still move around. The slotted hole to attach to is shown with red arrow in Figure 5d. This is shown completed in Figure 5e on the next page for reference.



Figure 5c



Figure 5d





Figure 5e

Figure 5f

- e) Secure the upper side bracket to the upper frame rail mounting location that was prepared earlier. Use the supplied slotted washer and an M6x1.0x16mm bolt (2007-2009 MS3 owners will also use an M6 nut). Hand tighten this location as shown in Figure 5f.
- The slotted washer has different orientation depending on what generation of Mazdaspeed 3 you have. See Figure 5g below for proper slotted washer orientation. Figure 5g also shows approximate bolt location for best fitment.





Overtightening bolts that mount to the tank can result in damage to the tank.

- f) Secure the lower side bracket to tank using two Móx1.0x16mm bolts. These are easiest to see when viewed from under the car. Hand tighten the nuts in this location. Shown in Figure 5h.
- g) Shift the tank around as needed to give best fitment for your car. Double check fitment with headlight and double check fitment to front bumper (with headlight removed). The positions we found to fit best are shown below in Figure 5i and Figure 5j on the following page. All vehicles are slightly different, your "sweet spot" may vary.
- h) Once happy with fitment, tighten <u>all</u> bolts/nuts until snug (5-8ft-lbs).

 $\bigwedge$ 



Figure 5h



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### 6. CorkSport Auxiliary Fuel Tank Setup

- a) Place the fill cap over the end of the fill neck. Push firmly and it will slide into place as shown in Figure 6a. A snug fit is normal in order to ensure a good seal. NOTE: your fill cap will be black, the silver cap shown was an early prototype.
- Fill cap o-rings will be pre-lubed when shipped to you. We include some o-ring lube (shown below) that can be used on the o-rings if your cap becomes difficult to remove/install down the road.





Figure 6a



### 6. CorkSport Auxiliary Fuel Tank Setup (cont.)

- b) Install your aux fuel tank vent hose assembly into the bung near the fill neck. Hand tighten into the tank, then tighten fully (about 1.5 turns extra) using a ½" or 13mm wrench. Shown in Figure 6b.
- c) Run the vent hose along the top of the fender up to a place where it will be secure and free from any hot engine parts, moisture, or debris. Shown in Figure 6c.
- You do not need to follow this exact path for your vent hose, just keep it away from heat, debris, and moisture.



Figure 6c



Figure 6b

- d) Install the supplied low level sensor into the hole in the front of the tank. Insert it through the hole in the orientation shown in Figure 6d. The arrow on the side of the sensor should point down.
- e) Hand tighten the nut on the low level sensor then tighten ¼" turn past hand tight to ensure a good seal. Do not overtight as it can cause damage to the threads of the sensor.



Figure 6d

# DETAILED INSTRUCTIONS:

Cork Spor

### 6. CorkSport Auxiliary Fuel Tank Setup (cont.)

- f) Connect one wire from the low level sensor to ground. It does not matter which wire goes to ground.
- g) Locate the supplied LED in a place you can easily see it while driving.
- h) Connect the other wire from the low level sensor to the ground (black wire) of the supplied LED. Additional wiring will be required.
- i) Connect the power wire (red wire) of the supplied LED to a switched 12V power source. Switched power means there is only power going to the circuit when the key is in the on position. Fuse taps are an easy method of gaining switched power.
- j) With this setup, the LED will illuminate when there is ~0.8 gallons remaining in the CorkSport aux fuel tank.

#### 7. Auxiliary Fueling Setup Ideas

This section of the install instructions serves as ideas for setting up the rest of your auxiliary fuel system. By no means is it a guide, however it covers some options for pump mounting and line routing using features built into the CS aux fuel tank.

#### Figure 7a: Tank Feed & Return

The tank feed is the sumped section shown with the **red circle**. The tank return is shown with the **blue circle**. Both locations use 3/8" NPT bungs for connection.

We recommend 90° fittings for both locations for the best clearance.

When tightening fittings, only go 1.5 to 2 turns past hand tight **MAX**. This is ~15ft-lbs typically. Further tightening can damage the bungs in the tank and will void the warranty.

# Oil and Fuel safe PTFE thread tape or liquid sealant is required for Feed and Return NPT fittings.

A 3/8" NPT plug is included for the return location for running methanol setups that do not use a return.





### 7. Auxiliary Fueling Setup Ideas (cont.)

#### Figure 7b: E85 or Other Port Injection Fuel Setup

Shown is a standard "044" style pump and pump mounting bracket. They can be mounted as shown with the remaining two M6x1.0x16mm bolts.

The **red lines** on **Figure 7b** show a possible route for the fuel feed line while the <u>blue line</u> shows the return coming in. The pump can also be rotated 180° if desired but getting a connection between the tank sump and the pump inlet may be difficult.

We recommend a -10AN line going into the pump and a -6AN line coming out of the pump. A -6AN return is recommended.

If you run this setup with no filter before the pump, ensure the fuel you use has been filtered prior to putting it in the tank to minimize the risk of pump failure.

#### Figure 7c: Methanol Injection Setup

Shown in **Figure 7c** is a standard methanol pump. It can be mounted directly to the tank as shown using the four supplied M6x1.0x30mm bolts.

You can run a methanol pump as shown or rotated 180° depending on what is easier for your setup.

We recommend using AN lines for your methanol to reduce the chance of leaks. ¼" OD nylon push lock tubing can also be used, however it may be more difficult to connect to the pump from the tank feed.

There are fittings readily available to connect from the 3/8" NPT feed to -4AN, -6AN, or even to 1/4" push lock at prometh.com.

The supplied 3/8" NPT plug is shown (with red circle) installed in the return port as methanol systems do not typically use a return line.



It is highly recommended to use a pre-pump filter for methanol & ethanol fuel systems to protect your fuel pump & injectors



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### 8. Double Checks & Vehicle Reassembly

- a) Before filling the tank, verify that the low level sensor LED is ON and that you can easily see it from the driver's seat. As you fill the tank in the next step, it can be helpful having a friend watch the LED to make sure the low level sensor is operating correctly.
- b) Once your fuel system is setup and the tank can be filled, fill the tank with your fuel of choice and check for any leaks. Check the level sensor, tank feed, and tank return to make sure they have all sealed correctly. Troubleshoot any leaks if needed.

It is a good idea at this time to test the rest of your fuel system. Run your methanol or PI pump and verify no leaks at any of your connections and that the injectors/nozzles are supplying fuel.

- c) For 2007-2009 Mazdaspeed 3, follow Section 1 in reverse to reinstall your headlight, bumper, and any other components removed during installation. All bolts for bumper/headlight/splash shield only need to be tightened until snug.
- d) For 2010-2013 Mazdaspeed 3, follow Section 2 in reverse to reinstall your headlight, bumper, and any other components removed during installation. All bolts for bumper/headlight/splash shield only need to be tightened until snug.

This completes the installation of your CorkSport Auxiliary Fuel Tank. We recommend close monitoring of the fuel system for the first few weeks to ensure all is functioning correctly. Enjoy the aux fuel capacity and the potential for more power!



### WHAT'S NEXT?

#### CorkSport CST6 Turbocharger

If you're looking for big power for your Mazdaspeed without the headache of non-OE style fitment, then you have come to the right place. The CorkSport CST6 owns the Mazdaspeed Stock Flange Turbine Record at 684whp all while using stock flange components.

Years of R&D have allowed us to design a highperformance turbocharger that can respond quickly, support 600+whp, and perform with stock style turbine flanges. The CST6 features a Garrett CHRA with a Ceramic Dual Ball Bearing Cartridge for improved response and durability for high boost applications. Testing has pushed the CST6 to 38psi maxing out an auxiliary fuel system flowing 40gph of methanol.



**CorkSport Intake Manifold** 

Reintroducing the CorkSport Intake Manifold V2 for the DISI-MZR engine found in the Mazdaspeed 3 and Mazdaspeed 6. First impressions will quickly tell you this is a very different design and design goal than typically found in the performance aftermarket options for the MS3 and MS6; that's for good reason. The CorkSport Intake Manifold takes performance and OE fitment and combines them to create a combination that performs and fits without compromise. Equal flow, higher flow, tighter packaging, auxiliary fueling support, and TMIC fitment are aspects that define the CorkSport Intake Manifold.



#### CorkSport 13" Big Brake Kit

The Stage 2 CorkSport 13" Big Brake Kit for Mazdaspeed 3 provides a drastic improvement to braking by offering improvements to each component in the system.

Larger rotors, 4-piston calipers, stainless steel brake lines, upgraded pads, and everything you need to install on your Speed 3 is included in this kit. If the CorkSport Big Brake Caliper Kit was not enough for you and your MS3, look no further than the CorkSport 13" BBK.



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