

## CorkSport Lightweight Crank Pulley 2007 - 2011 MazdaSpeed3



**WARNING:** You will be removing several parts (including the valve cover and fuel pump) and unplugging numerous electrical and fuel components. Only proceed with this install if are comfortable with removing these components and reinstalling them.



**WARNING:** Improper installation will cause a check engine light (CEL) on your vehicle. Please proceed with caution and take your time to ensure everything is installed correctly.



**NOTE:** When working on your car, you should be wearing mechanics gloves or other form of hand protection as well as ANSI Approved Safety Glasses.



**NOTE:** These instructions were written as a general guide only on a 2010 model year and the use of a factory service manual is highly recommended. Please read these instructions thoroughly prior to starting installation. If you have a different model year, the pictures and steps may vary slightly, but the overall installation process will remain the same.

Part Number: Ax1-6-310 Time Estimate: 150-180 min. Wrench Rating: 4/5	Model Mazda 3	Year 2007 - 2011	Trim MazdaSpeed 3
<b>TOOLING LIST:</b> 3/8 Drive Ratchet 1/2" Impact Gun 8 mm Socket 10 mm Socket 14mm Socket 17mm Socket 21 mm (1/2" drive) Socket Small Zip-tie		<b>PARTS LIST:</b> 1x CorkSport Blue Anodized Aluminum Lightweight Crank Pulley 1x CorkSport Top Dead Center Timing Pin 1x CorkSport Camshaft Alignment Tool 1x Genuine Mazda Crank Pulley Bolt 1x Small Zip Tie	





For help with installation, call 360-260-CORK (2675)

# Installation Instructions:

## CorkSport Lightweight Crank Pulley

### 2007 - 2011 MazdaSpeed 3

#### How the Instructions Work

To best cover all of our customers experience levels and familiarity with the systems on their Mazda, we have broken our instructions down into numbered steps, each of which has the core information in the header with additional detail as needed depending on your experience. If you have a high level of experience, you can just use the checklist below and then skip to the step number where you need help or assistance. Video assistance may also be available for certain steps and is indicated by the HD icon:  Areas where there is a safety concern are indicated by the warning icon:  Cautionary areas (where parts are fragile, etc) are indicated by the caution icon:  Key tips are indicated with the light bulb icon: 

#### Overview/Checklist:

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



#### 1. Support car on Floor Jack/ Jackstands or Lift

- Use a floor jack or jackstands to gain access to the underside of the vehicle.

#### 2. Installing the Lightweight Crank Pulley

- 1a) Remove the front passenger's side wheel
- 1b) Remove the inner fender well splash guard
- 1c) Set the vehicle's engine to Top Dead Center (TDC)
- 1d) Using a 1/2" impact gun and a 21mm socket, loosen the crank pulley bolt
- 1e) Remove the belt from the crank pulley by loosening the auto-tensioner and removing the belt
- 1f) Remove the crank pulley bolt and crank pulley from the vehicle.
- 1g) Install the CorkSport Lightweight Crank Pulley using the supplied Mazda crank bolt (hand tight)
- 1h) Loosen the auto-tensioner and reinstall the belt over the crank pulley

#### 3. Setting the Timing of the Lightweight Crank Pulley

- 2a) The following steps outline how to time the engine. Please proceed with caution
- 2b) Remove the battery, battery box, intake and turbo inlet pipe (TIP) from your engine bay
- 2c) Remove the spark plug wires and unclip the cam position sensor
- 2d) Unclip and move any wires that may be in the way of removing the valvecover from the vehicle
- 2e) Remove any and all brackets, wiring and hoses attached to the top and sides of the fuel pump
- 2f) Place a small zip tie below the fuel pump hardline connection and remove it from the fuel pump
- 2g) Unclip the two (2) top fuel lines from the pump and carefully move them out of the way
- 2h) Remove the four (4) 10mm bolts holding the fuel pump to the engine
- 2i) Carefully remove the fuel pump and lay it on it's side to avoid spilling any oil
- 2j) Align the two (2) cam gear slots using the cam alignment tool to lock the cams in place
- 2k) Remove the 10mm bolt (shown in **Figure 2H**) and install the TDC timing bolt hand tight to ensure that the vehicle is at top dead center. If not aligned, spin the engine 180 degrees and reinstall
- 2l) Align the crank pulley hole and align the tooth and timing sensor







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#### Overview/Checklist:



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#### 3. Setting the Timing of the Lightweight Crank Pulley - Continued

- 2m) Remove the TDC tool and tighten the crank pulley (make sure that the pulley is still aligned correctly)
-  Note: The crank pulley bolt needs to be tightened to 120 ft-lbs to ensure it will not come loose
- 2n) Reinstall the 10mm bolt in the back of the engine

#### 4. Reinstalling your valvecover & Fuel Pump

- 4a) Reinstall the inner fender liner in the passenger's side wheel well
- 4b) Remove the cam alignment tool and carefully reinstall the fuel pump and four (4) 10mm bolts
-  Note: Be sure that the cam follower inside the fuel pump is fully seated and the hardline is lined up
- 4c) Reconnect the fuel pump hardline along with the two (2) top lines being sure to re-clip them
- 4d) Carefully reinstall the valvecover and reinstall the 8mm bolts holding it secure to the engine
-  Note: An improperly installed valvecover will leak oil. Be sure it is properly seated and installed
- 4e) Reinstall the top bracket on the fuel pump and reconnect all wires and hoses
- 4f) Reinstall the spark plug wires into the engine and tighten the four (4) 10mm bolts. Also plug in the cam sensor
- 4g) Get in the vehicle, hold the throttle to the floor and turn over the engine roughly five (5) times and then turn the ignition off. This will repressurize your fuel system
- 4h) Start your vehicle and take it for a short drive. Once you return, check for any oil/fuel leaks. If any exist, recheck all fuel connections and fuel pump/valvecover gaskets. Reinstall if necessary
- 4i) If any check engine lights (CEL's) appear, obtain the trouble code and troubleshoot the CEL. Most of the time it will be due to a loose or unplugged connection.





# Installation Instructions:

## CorkSport Lightweight Crank Pulley

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#### 1: Support Car on Floor Jack/Jackstands or Lift

Use a floor jack and jackstands to gain access to the underside of the vehicle.

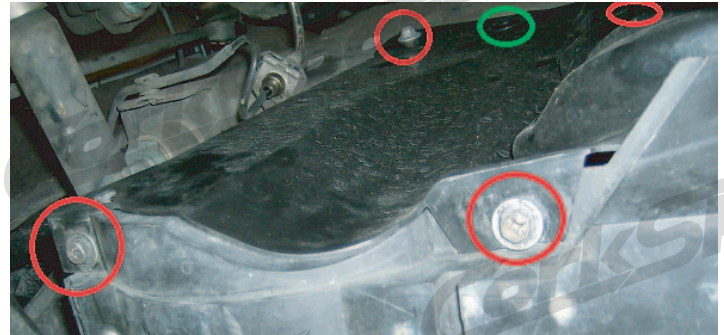
⚠ Always refer to the floor jack and jackstand manufacturers instructions as well as the factory owners manual for your vehicle to determine jacking points and support points. Alternately, use an automotive lift to gain access to the underside of the vehicle. Redundant support mechanisms are recommended.

🔍 Note: CS Pulley shown in all images.

#### 2: Installing the Lightweight Crank Pulley

A) Remove the front passenger's side wheel.

B) Remove the side splash guard from the wheel well by removing the two (2) 10mm bolts (top **red circles** in **Figure 1A**) and one (1) push type clip (top **green circle** in **Figure 1A**) from the wheel well along with the two (2) 10mm bolts holding the splash guard to the undertray (bottom **red circles** in **Figure 1A**).



**Figure 1A**

C) Make sure the vehicle's engine is at Top Dead Center. You can do this by lining up the white crank pulley timing tooth with the timing sensor (see the **red circle** in **Figure 1B**).

D) Using your 1/2" impact gun and the 21mm socket, loosen the crank pulley bolt.

⚠ Removal of the crank pulley bolt requires a high powered 1/2" impact gun and at least 140 psi of compressed air.

E) Using a ratcheting wrench and a 14mm socket, loosen the auto-tensioner (shown by **red circle** in **Figure 1C**) and remove the belt from the crank pulley (shown by **green circle** in **Figure 1C**).



**Figure 1B**



**Figure 1C**

G) Install the CorkSport Lightweight Crank Pulley using the supplied genuine Mazda crank bolt (only hand tight) and line up the timing mark with the sensor (**red circle** in **Figure 1D**). The timing tooth is 20th tooth if you count counter-clockwise from the timing gap.

H) Reinstall the belt over the crank pulley by loosening the auto-tensioner and sliding the belt back over the pulley. Your belt and pulley should now look like **Figure 1D**.



**Figure 1D**



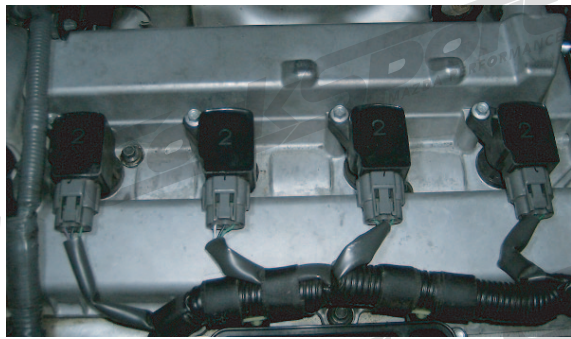
# Installation Instructions: CorkSport Lightweight Crank Pulley 2007 - 2011 MazdaSpeed 3

## 3: Setting the Timing of the Lightweight Crank Pulley

A) Now that the pulley is installed, you will need to align the cam gears to ensure that the engine is at Top Dead Center. You will need to pull off the valve cover, turbo inlet pipe, and the fuel pump to do this. The following is a rough outline of the process and a service manual is highly recommended.

B) Remove your battery, battery box, intake and turbo inlet pipe (TIP) from your engine bay. You can refer to our Short Ram Intake instructions (Axl-6-118) for removal and reinstallation of these components.

C) Remove the spark plug wires by removing the four (4) 10mm bolts holding them in place and pulling up on each one using a twisting motion. Also unclip the cam position sensor. The process can be seen as shown in **Figures 2A & 2B**.



**Figure 2A**



**Figure 2B**

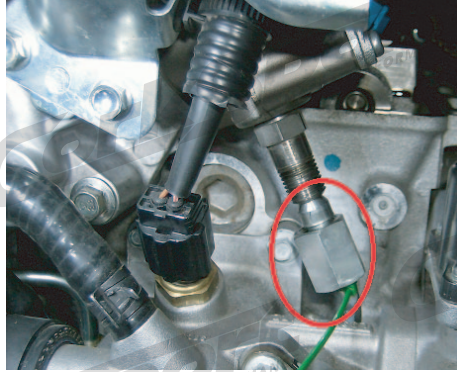
D) Unclip and move out of the way any other wires that may be in the way for removing the valve cover. Remove the fourteen (14) 8mm bolts using a ratcheting wrench, a small extension, and an 8mm socket and carefully remove the valve cover.

E) Remove any and all wiring and hoses attached to the top and sides of the fuel pump. There will also be a bracket mounted to the fuel pump by two (2) 8mm bolts. Remove the bracket. Your engine bay should now look similar to **Figure 2C** on the right.



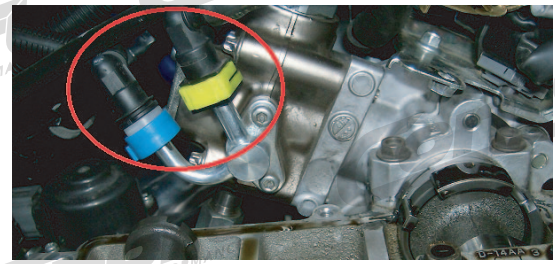
**Figure 2C**

F) Place a small zip tie right below the fuel pump hardline connection (this will keep the nut from sliding down the hardline) and remove the hardline from the fuel pump using a 17mm open ended wrench.



**Figure 2C**

G) Unclip the two (2) top fuel lines from the fuel pump by unclipping the blue and yellow clips and pulling up and off the fuel pump (shown in **Figure 2D** to the right).



**Figure 2D**



# Installation Instructions: CorkSport Rear Chassis Brace Set 2004 - 2011 MazdaSpeed 3 & Mazda 3

## 3: Setting the Timing of the Lightweight Crank Pulley - Continued

H) Remove the four (4) 10mm bolts holding the fuel pump to the engine using a ratcheting wrench, a small extension, and a 10mm socket.

I) Carefully remove the fuel pump (there will be oil in the cam driven side of the pump, so use caution to try and not spill the oil) and lay it on its side to avoid spilling any oil (oil will be in the cavity shown by the red oval in Figure 2E).

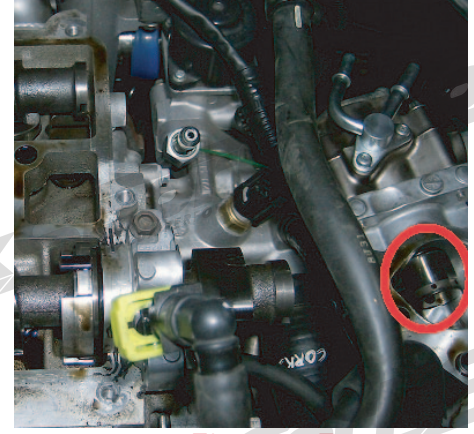


Figure 2E

J) Align the two (2) cam slots as shown by the red lines in Figures 2F & 2G (You will need to turn the motor by putting it in gear to align the cams) and insert the cam alignment tool to lock the cams.

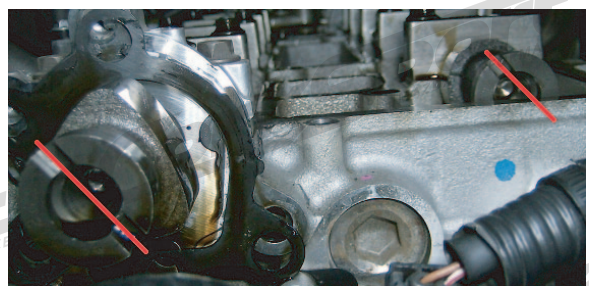


Figure 2F

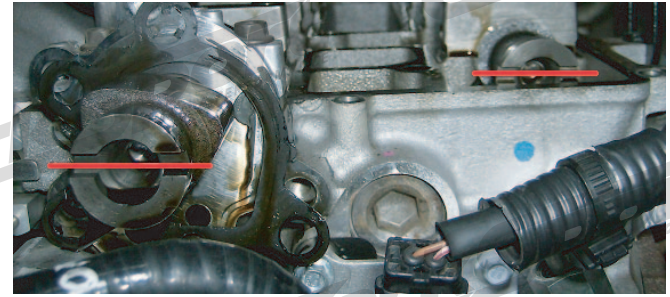


Figure 2G

K) Down by the pulley, remove the 10mm bolt shown in Figure 2H and insert the TDC timing bolt and hand tighten to ensure that the vehicle is at top dead center. If not, then you need to turn the engine 180 degrees by removing the cam alignment tool and rotating the engine 180 degrees until the cam slots line up and reinstall the tool.

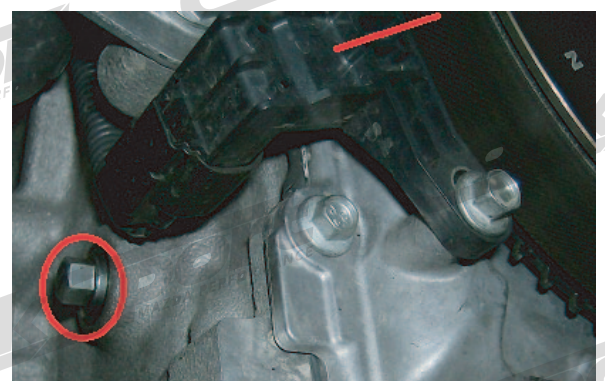


Figure 2H

L) Align the crank pulley hole (red circle in Figure 2I) and align the tooth and timing sensor.

M) Remove the TDC tool and tighten the crank pulley using a 21mm impact socket and 1/2" impact gun. Be sure that the pulley tooth is still lined up with the position sensor (red line shown in Figure 2I). If the pulley tooth is slightly off, you can adjust the sensor by loosening the two (2) 10mm bolts and aligning the sensor with the tooth.

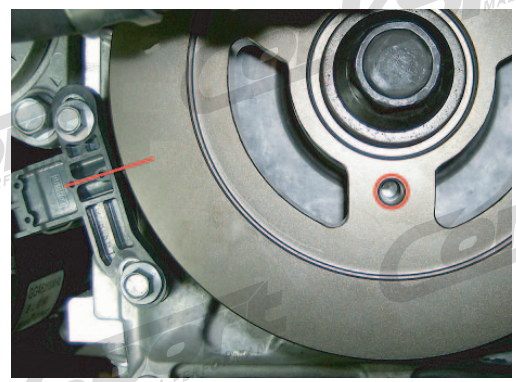


Figure 2I

**Note:** Be sure that the crank pulley bolt is tightened to at least 120 ft-lbs or you may run the risk of the bolt coming loose.

N) Reinstall the 10mm bolt in the back of the engine as shown by the red circle in Figure 2H.



# Installation Instructions:

## CorkSport Lightweight Crank Pulley

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#### 4: Reinstalling your valvecover & Fuel Pump

A) Reinstall the inner fender liner using the four (4) 10mm bolts and one (1) push type clip as shown in **Figure 1A**.

B) Remove the cam alignment tool and carefully reinstall the fuel pump being sure to line up the gasket with the four (4) bolt holes. Reinstall the four (4) 10mm bolts and tighten.

**Note:** Be sure that the cam follower inside the fuel pump is fully seated onto the fuel pump spring assembly before trying to install it back on the cam. Also, be sure that the fuel hardline is lined up with the fuel pump fitting.

C) Reconnect the fuel pump hardline using a 17mm open ended wrench and also reinstall the two (2) top fuel lines by pushing them on to the fuel pump fittings and reseating the clips.

D) Carefully reinstall the valvecover being extra careful to ensure that the rubber gasket is fully seated. Reinstall the 8mm bolts and tighten them in a cross pattern to ensure that the valvecover seals properly.

**Note:** An improperly installed valvecover will leak oil, so be sure that you take your time to ensure that the valvecover is fully sealed.

E) Reinstall the top bracket on the fuel pump and reconnect all wires and hoses that you disconnected during the crank pulley installation.

**Note:** One unplugged wire can/will cause a check engine light. Take your time and ensure that all connections have been securely fastened.

F) Reinstall the spark plug wires into the engine and tighten the four (4) 10mm bolts holding them in place. Also, plug in the cam sensor.

G) Get in the vehicle and get ready to start the engine. Hold your foot to the floor on the throttle and turn over the engine roughly 5 times and turn the key off. This will repressurize the fuel system.

H) Start the vehicle and take it for a short drive. Once you return, shut the car off and check for any oil/fuel leaks. If any exist, recheck that all fuel connections and fuel pump/valvecover gaskets are properly sealed. Remove and reinstall if necessary.

I) If any check engine lights appear, obtain trouble code and troubleshoot CEL. Most of the time it is because one of your wire connections is unplugged or not plugged in correctly.