

[ c o r k s p o r t ]



CorkSport 1.6L and 1.8L "B" Series Engine DOHC Adjustable Camshaft Gears

Tools and Supplies Required

- 10mm Wrench and Socket 3/8 and 1/4 drive
- 12mm Wrench and Socket 3/8 drive
- 14mm Wrench and Socket 3/8 drive
- 1/4 and 3/8 Drive Ratchet
- 1/2" Drive Torque Wrench Ft/Lbs
- 1/2" Drive 21mm Socket
- 1/2" Drive Ratchet
- 1/2" Drive 2" Long Extension
- 10" Adjustable wrench
- Long Needle Nose Pliers
- 3/8" Drive Torque Wrench In/Lbs
- Safety Glasses
- New Valve Cover Gasket
- Silicone Sealant
- Factory Service Manual
- Thread Locker (Red)
- Floor Jack and Jack Stands
- Timing Light

Contents

- CorkSport Adjustable Camshaft Gears
- 16 Page Installation Instructions

Thank you for your purchase. If you have any questions please call Cork Sport at 360 260 CORK

**WARNING:** When installing adjustable camshaft gears on your engine care should be exercised when adjusting camshaft timing. Piston to valve contact could occur if timing is adjusted improperly. This will cause serious engine damage.

**NOTE:** These install instructions were written using a 1990 Mazda Protégé with a 1.8l DOHC engine. Test vehicle was not equipped with A/C, however, instructions for removing the A/C and power steering belt are the same.

Installation on a Mazda Miata, 323, or Ford Escort are similar.

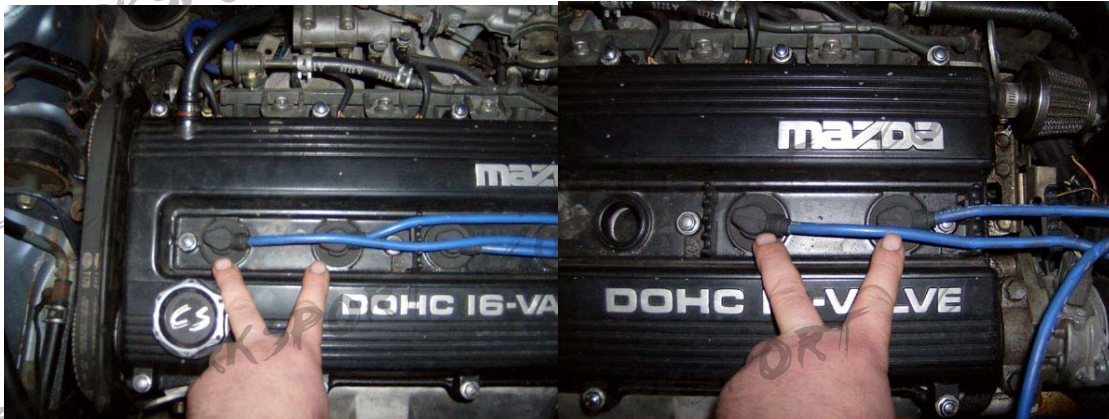
**NOTE:** These install instructions were written to be used as a guide only. The use of a factory service manual is recommended. Please read these instructions thoroughly before proceeding. Installation should take approximately 2 hours.

The installation of these gears should only be performed by an experienced mechanic.

**TIP:** Mazda recommends timing belt replacement at 60,000 mile intervals. If you are close to that interval CorkSport recommends replacement of the timing belt during installation of the gears. These instructions do not cover timing belt replacement.

**WARNING:** Make sure engine is completely cooled down prior to installation as serious injury or burns can occur.

Step 1: Remove spark plug wires from the spark plugs.



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Step 2: Remove PVC and crank case vent hose from valve cover.

NOTE: Test vehicle is equipped with a crank case vent filter (right image).  
Normally a hose is at this connection.



Step 3: Remove eleven (11) 10mm head bolts from valve cover and remove valve cover.

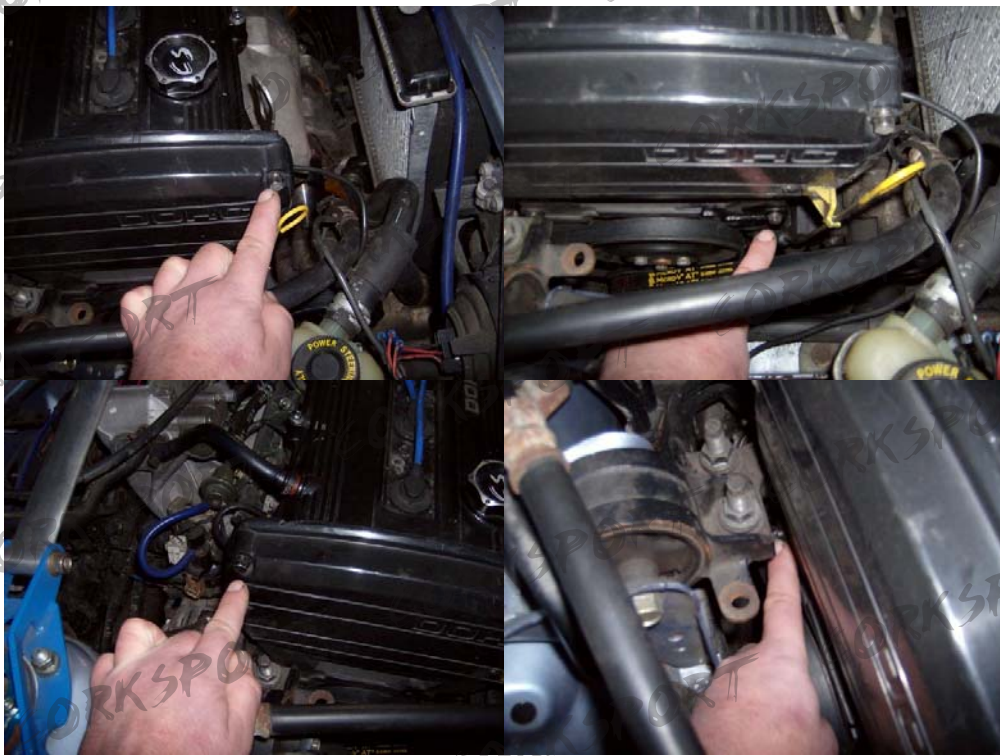


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Step 4: Remove four (4) 10mm head bolts from upper timing cover and remove cover.



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Step 5: Loosen 14mm head power steering pump pivot bolt and 14mm head adjustment hold down nut. Loosen 12mm head adjusting bolt until belt can be removed and remove belt.



Step 6: Loosen three (3) 10mm head bolts from water pump pulley. Loosen 12mm head alternator lock down bolt and 14mm head alternator pivot bolt. Remove belt then remove the three (3) water pump pulley bolts and pulley.



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Step 7: Remove the 10mm head bolt from mid timing cover and remove cover.



Step 8: With a 21mm socket, rotate engine until yellow timing mark on crank pulley lines up with the "T" on the lower timing cover and the "I" and "E" line up with the alignment marks on the backing plate.



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Step 9: Remove timing belt tensioner spring. Loosen 14mm head tensioner pulley bolt and remove timing belt from camshaft gears.



Step 10: Holding the hex portion of the camshaft, remove the 14mm head bolts from the camshaft gears and remove gears.



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Step 11: Install the CorkSport camshaft gears making sure that the “I” is up on the intake camshaft and the “E” is up on the exhaust camshaft. Use an adjustable wrench on the hex portion of the camshaft to hold it while tightening the 14mm head bolts for the gears. Tighten bolts to 37-44ft/lbs. Make sure the five (5) 6mm Allen head bolts on the cam gears are tight.

NOTE: The cam gears are a snug fit onto the cams, be sure dowel pin is lined up with cam gear slot before tightening center bolt.



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NOTE: The following steps of the instructions are to be used as a guide. Please refer to a factory service manual for the full instructions.

Step 12: Make sure that crank shaft pulley timing marks are still lined up. With a 14mm wrench, rotate the exhaust cam gear in a clockwise direction until the white dot timing mark on the gear is just past the mark on the plate and install the timing belt over the exhaust gear, while making sure to keep tension on the belt. Now rotate the intake camshaft in a counter clockwise direction with a 14mm wrench until the white dot timing mark on the gear is just before the mark on the backing plate and install the belt onto the intake camshaft gear.



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Step 13: Reinstall tensioner pulley spring. While holding tension in a counter clockwise direction of the camshaft gear, tighten the idler pulley bolt.

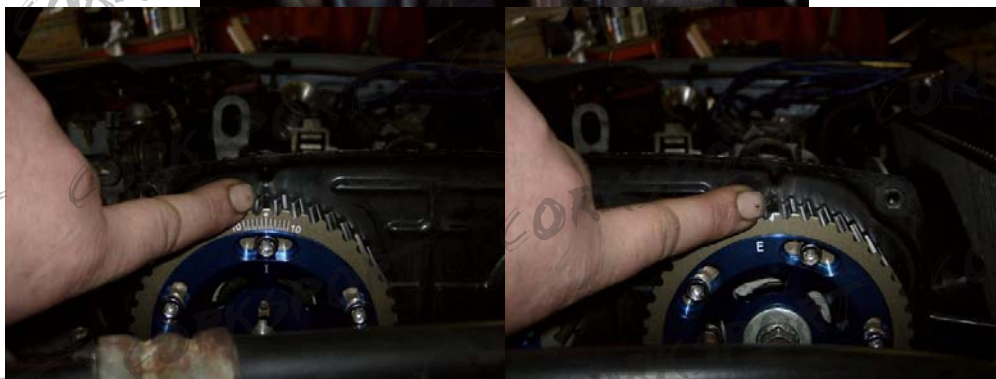


Step 14: With a 21mm socket, rotate the crankshaft 2 full revolutions and double check that all timing marks are lined up.

NOTE: If timing marks do not line up, you will need to go back to step 10 and start over.



Crank timing marks lined up.



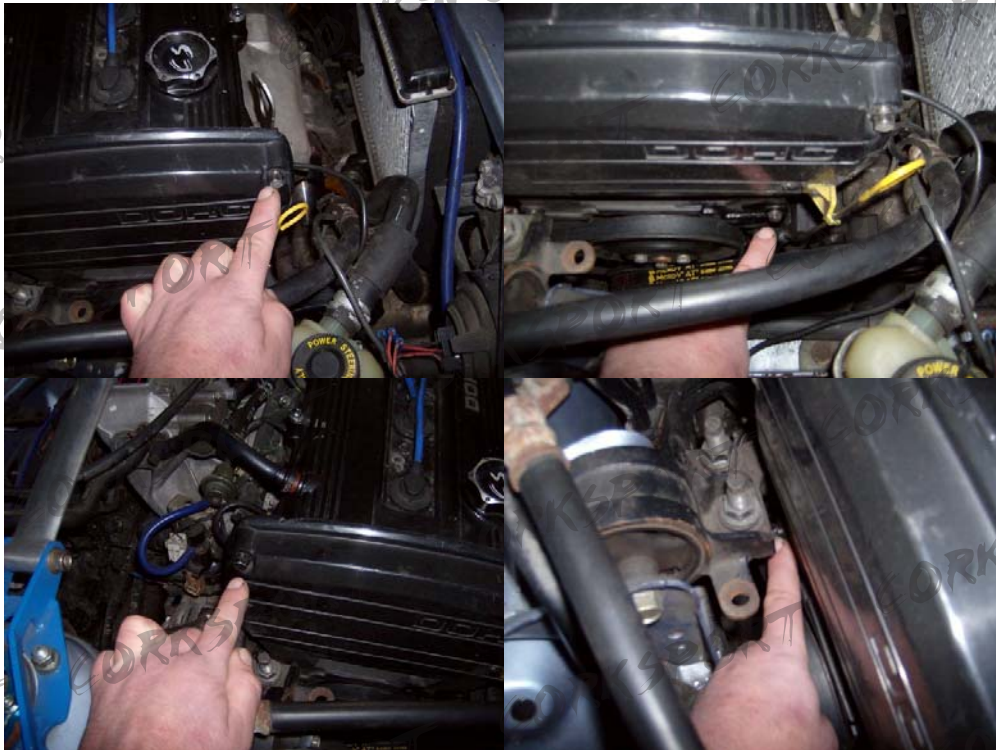
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Step 15: Reinstall the middle plastic timing belt cover with its original 10mm head bolt.



Step 16: Reinstall upper timing belt cover with its original four (4) 10mm head bolts.

NOTE: You may leave this cover off, however, it is possible for foreign objects to fall into the timing belt area with the cover off. Therefore it is not recommended that it be left off.



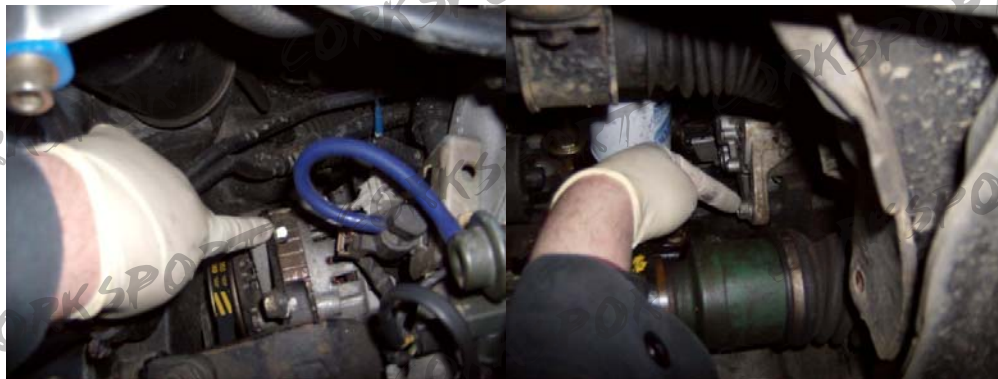
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Step 17: Reinstall water pump pulley with its original three (3) 10mm head bolts.

TIP: It will be easier to fully tighten bolts after belt is reinstalled. You will need to get them as tight as possible before belt is reinstalled.



Step 18: Reinstall water pump/ alternator belt. Tension belt and tighten 12mm hold down bolt and 14mm pivot bolt on alternator.



Step 19: Reinstall power steering/ A/C belt. Tighten 12mm head tensioner bolt until belt is tensioned. Tighten 14mm head hold down bolt and 14mm head pivot bolt.

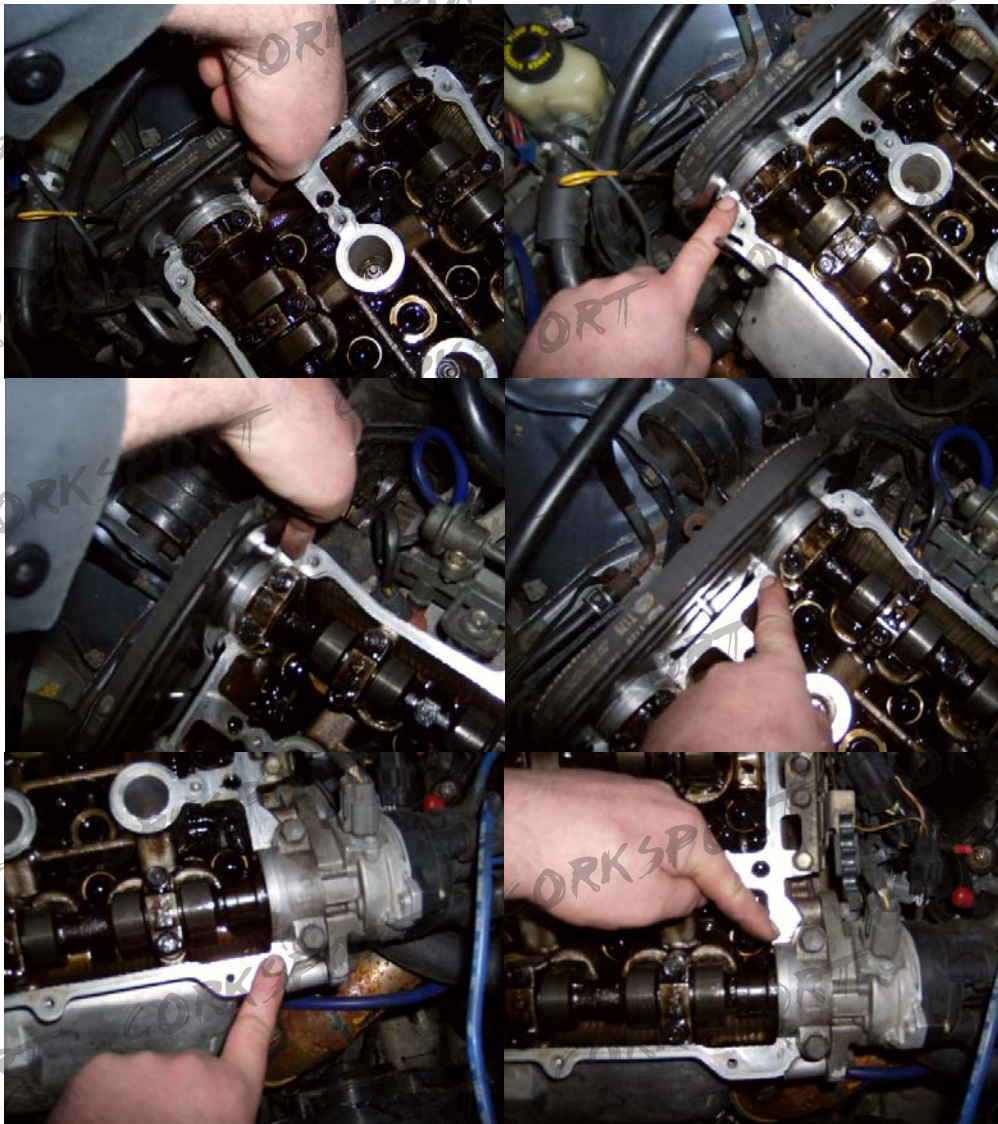


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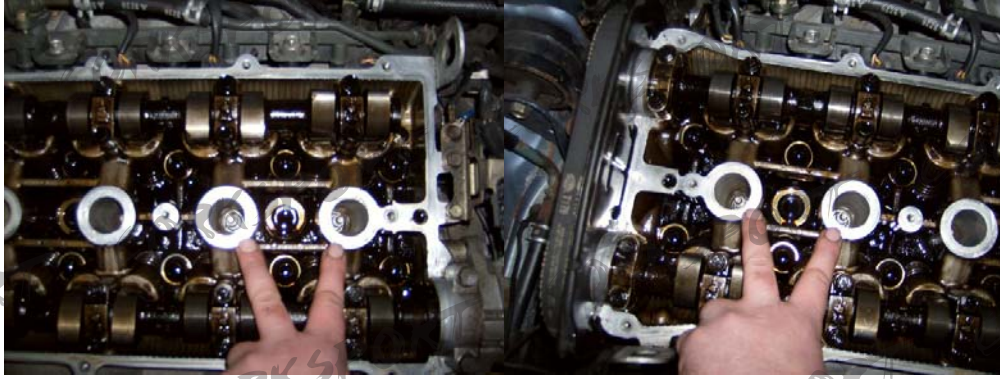


Step 20: Apply small amount of silicone sealant at corners of front cam shaft caps, at corners of distributor and around spark plug holes.



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Step 21: Install new valve cover gasket in valve cover and reinstall valve cover with eleven (11) original 10mm head bolts. Tighten bolts to 61-95in/lbs.

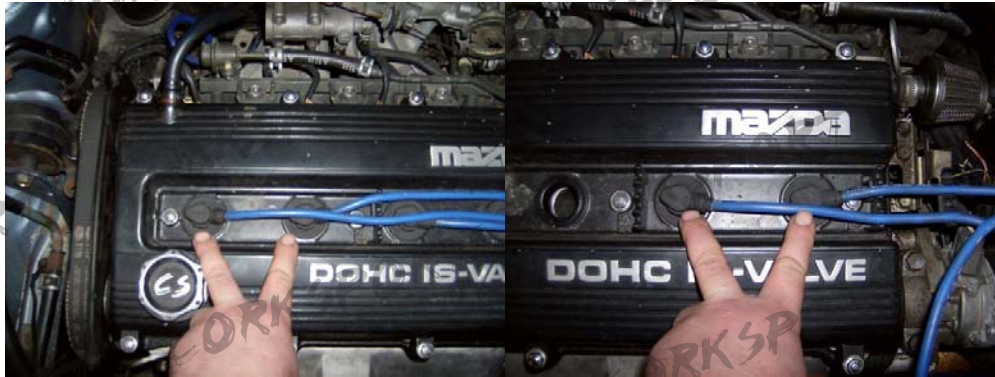


Step 22: Reconnect PCV and crank case vent hose to valve cover.

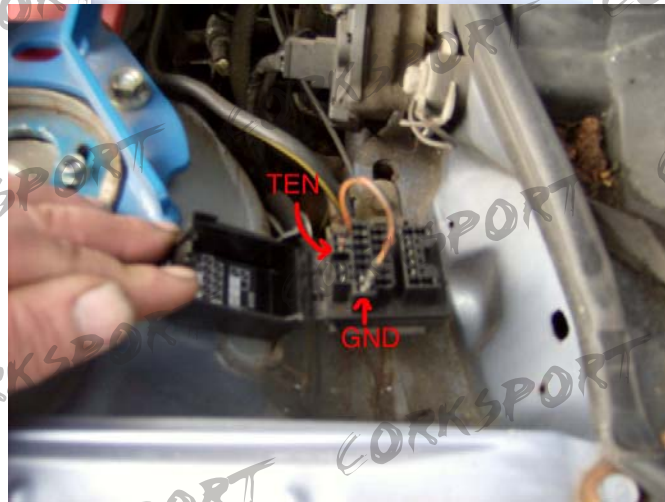


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Step 23: Reinstall spark plug wires.



Step 24: Start up vehicle and let warm up to full operating temperature. Connect a jumper wire between the TEN and GND of the diagnostic test box.



With a timing light, verify that timing is correct at the crank shaft timing marks. Timing is normally 8-10 degrees BTDC. If timing is not correct loosen the two (2) 12mm head distributor lock down bolts and rotate distributor until timing is correct. Once timing is correct remove jumper wire and test drive.

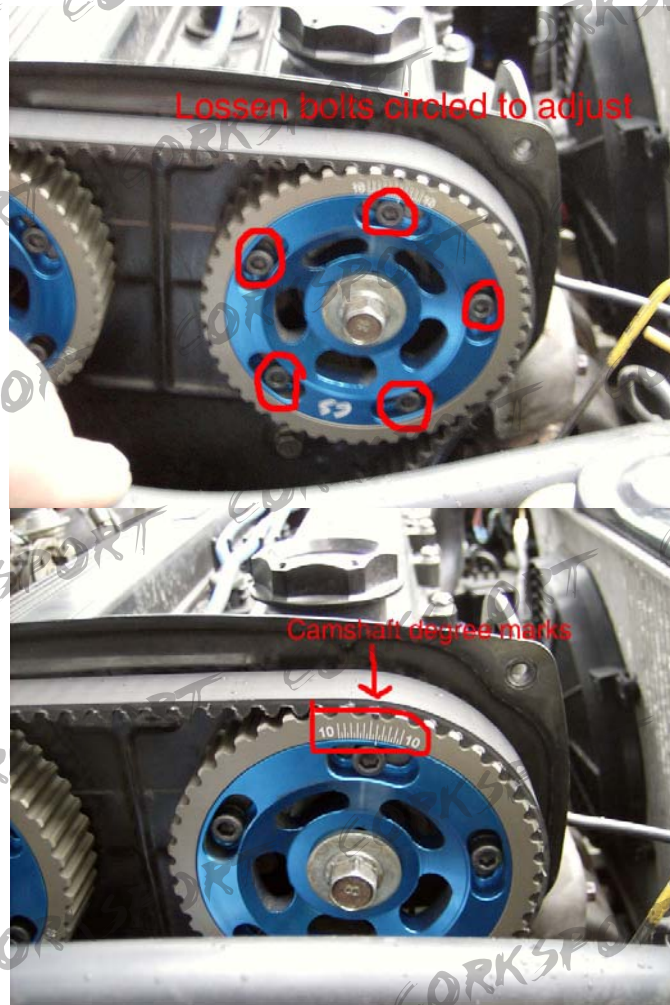
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If at anytime during the test drive your vehicle has pinging (detonation) release throttle and get your vehicle to a safe place to recheck ignition timing. If ignition timing is correct, super unleaded fuel may be required.

Step 25: (Optional) To achieve the maximum benefit from the adjustable cam shaft gears, CorkSport recommends that you take your vehicle to a dyno and make adjustments to your cam shaft timing to gain full power.

For adjustment of cam shaft timing, loosen the five (5) 5mm allen head bolts on cam gear and using the 14mm head center bolt, rotate cam shaft using degree marks on cam gears. Clockwise rotation of cam shaft, advances the cam shaft and counter clockwise rotation retards the cam shaft.

**WARNING:** Take care while rotating cam shafts as valve to piston contact can occur which will cause serious engine damage.



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