

CAM-02, Camshaft Assembly Installation

Tools Needed

- 8 mm Allen head socket or 8 mm hex key
- 6 mm Allen head socket and 6" socket extension OR Long 6 mm Allen head socket (preferred)
- 10 mm socket
- Flat tip screwdriver
- Flywheel lock 9206 (optional)
- 27 mm thin head open end wrench (cars with eccentric roller tensioners only)
- 19 mm socket (cars with eccentric roller only)
- 12 mm socket (cars with spring tensioners only)

Other Procedures Needed

- [FUEL-02](#), Fuel Injector and Fuel Rail Removal and Installation
- [IGN-01](#), Distributor Cap and Rotor Replacement
- [ENG-13](#), Locating and Setting Engine to Top Dead Center (TDC), Cylinder 1
- [ENG-06](#), Camshaft and Balance Shaft Belt Installation
- [ENG-10](#), Camshaft and Balance Shaft Belt Tension - Checking and Adjusting

Procedure

1. Ensure that all old gasket material is removed from the mating surfaces on the head and the camshaft housing. If a scraper is used to remove the old gasket material, do so carefully to prevent gouging or scratching the mating surfaces. Minor scratches in the mating surface may be removed with emery cloth or fine grit sandpaper.
2. Ensure that the rear distributor housing and cam sprocket are installed.
3. Set the alignment mark on the cam sprocket to the alignment mark on the rear distributor housing (i.e. TDC).
4. If old lifters are to be reused, ensure that all lifters are installed in the same location they were in on removal.
5. If new lifters are being installed, be sure to soak them in oil for several hours prior to installation. After soaking them for a period of time, compressing them between the fingers along with additional period of oil soak will minimize the time for the lifters to properly "self-adjust" after initial startup.

NOTE

A coat of grease on the outside of the outside of the lifters will help hold the lifters in the cam housing during installation.

6. Place a new cam housing gasket onto the cylinder head mating surface. If correctly oriented the letters "OBEN" or "TOP" will be facing up. Correct orientation is important as the oil supply passage to the cam housing (lifters and cam bearings) can otherwise be blocked.
7. Ensure the engine is aligned to TDC ([ENG-13](#)).
8. Place the cam housing onto the cylinder head and ensure that it engages the alignment pins on the head. The cam housing will not sit flush with the cylinder head as some of the cam lobes will be positioned to try and open their respective valves.

NOTE

As the cam housing bolts are tightened, the cam may move slightly from the TDC alignment mark. This is expected.

9. Install the cam housing bolts (M8). A small amount of grease in the head of the Allen bolt or on the tip of the Allen head socket will hold the bolt on the socket while installing inside the cam housing. Remember to install the coolant return pipe when installing the cam housing bolts. There is no specified tightening sequence for the cam housing bolts. However, they should be tightened so that the cam housing is pulled down evenly onto the alignment pins. Once the housing is fully seated on the head, torque the cam housing bolts to 20 Nm (14 ft-lbs).
10. Install and tension the camshaft belt using applicable portions of [ENG-06](#) and [ENG-10](#).
11. Install the front timing covers.
12. Using [FUEL-02](#), install the fuel rail and injectors.
13. Using [IGN-01](#), install the distributor cap and rotor.
14. If equipped, reconnect the cruise control cable to the cruise control servo.
15. Connect the battery leads.

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