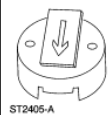



Synchronizer—Camshaft, 3.8L**Special Tool(s)**


 ST2405-A	Synchronizer Alignment Gauge 303-630
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Material

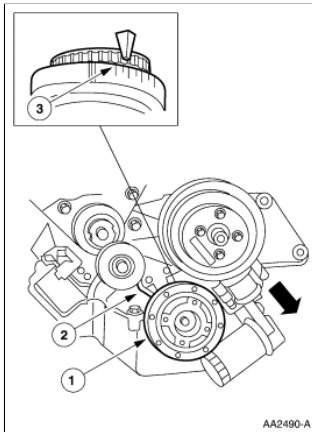
Item	Specification
Super Premium SAE 5W-20 Motor Oil XO-5W20-DSP or equivalent	WSS-M2C914-A

Removal

1. Disconnect the battery ground cable. For additional information, refer to [Section 414-01](#).
2. Remove the EGR valve to exhaust manifold tube. For additional information, refer to [Section 303-08](#).
3.  **CAUTION:** Before proceeding, set cylinder number one to Top Dead Center (TDC) of the compression stroke, note the position of the camshaft position (CMP) sensor electrical connector. The installation procedure requires that the connector be located in the same position.

 **CAUTION:** Do not turn the crankshaft or the camshaft during the removal and installation procedure or the fuel system timing will be out of time with the engine and possibly cause engine damage.

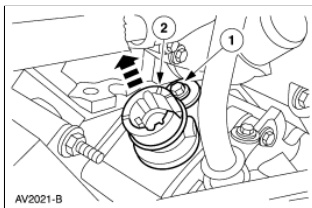
Rotate the (1) crankshaft until the No. 1 cylinder is at TDC of the compression stroke and the (2) TDC mark lines up with the (3) timing mark.




4. Remove the camshaft position (CMP) sensor. For additional information, refer to [Camshaft Position \(CMP\) Sensor—3.8L](#) in this section.
5. **NOTE:** The oil pump intermediate shaft should be removed with the synchronizer assembly. If the shaft does not come out with the assembly, retrieve the shaft before proceeding.

Remove the camshaft synchronizer.

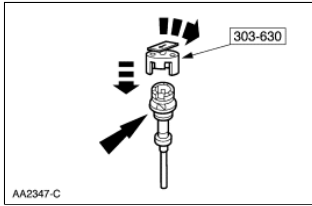
1. Remove the bolt.
2. Remove the camshaft synchronizer.

**Installation**

 **CAUTION:** After installation, do not loosen the synchronizer bolt and rotate the synchronizer assembly. The synchronizer assembly is not adjustable. Do not loosen the synchronizer bolt after the alignment tool has been removed in order to align the CMP electrical connector for any reason. If the electrical connector is not in the correct position, the synchronizer assembly must be removed, the alignment tool and the assembly reinstalled if the engine has not been rotated from top dead center (TDC) of the compression stroke on the No. 1 cylinder.

1.  **CAUTION:** The special tool must be used during the installation of the synchronizer assembly. Failure to follow this procedure will result in the fuel system being out of time with the engine, possibly causing engine damage.

Install the special tool on the camshaft synchronizer by rotating the tool until it engages the notch in the camshaft synchronizer housing and the armature.

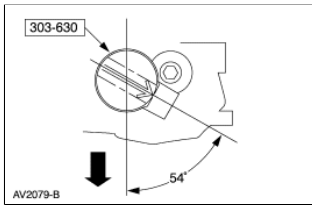


2. **CAUTION:** It is very important to coat the gear on the camshaft synchronizer with clean engine oil prior to installation. Failure to do so could result in gear failure upon engine start-up.

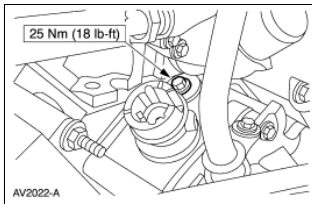
NOTE: If a new camshaft synchronizer is used, transfer the oil pump shaft to the new camshaft synchronizer.

NOTE: During installation, the arrow on the special tool will rotate clockwise until oil pump intermediate shaft and camshaft gear engages.

Install the camshaft synchronizer housing assembly so the arrow on the special tool is 54 degrees from the center line of the engine.



3. Install the bolt.
- Install the bolt.
 - Remove the synchronizer alignment gauge.



4. Install the camshaft position (CMP) sensor. For additional information, refer to [Camshaft Position \(CMP\) Sensor—3.8L](#) in this section.
5. Install the EGR valve to exhaust manifold tube.
6. Connect the battery ground cable.