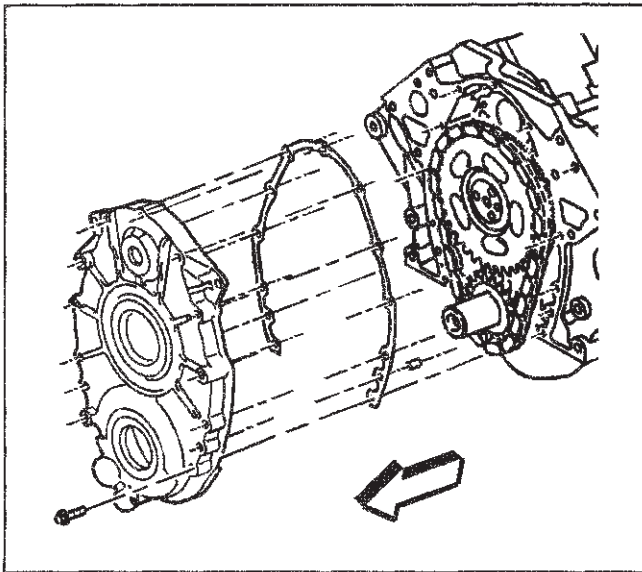


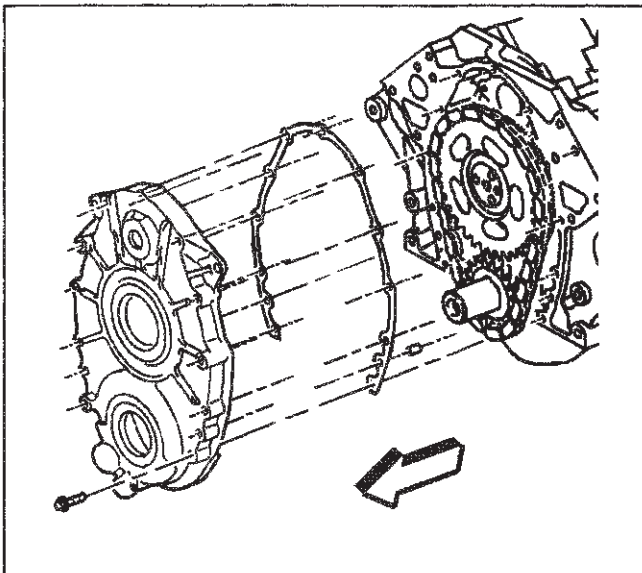
11485

6. Remove the crankshaft position sensor.
7. Remove the oil pan. Refer to *Oil Pan Replacement*.



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8. Remove the engine front cover bolts.
9. Remove the engine front cover.
10. Remove the gasket.
11. Clean the engine front cover and the engine block gasket surfaces.
12. Inspect the engine front cover for damage to the oil seals or the gasket surfaces. Refer to *Engine Front Cover Removal and Engine Front Cover and Oil Seal Installation* in order to replace the front cover oil seals in necessary.



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Installation Procedure

Tools Required

J 30987 Water Pump Driveshaft Engine Front Cover Oil Seal Protector

Notice: Do not damage the oil seal during the installation of the engine front cover over water pump driveshaft assembly.

1. Use the J 30987 on the water pump driveshaft in order to install the gasket and the engine front cover.
2. Install the engine front cover bolts.

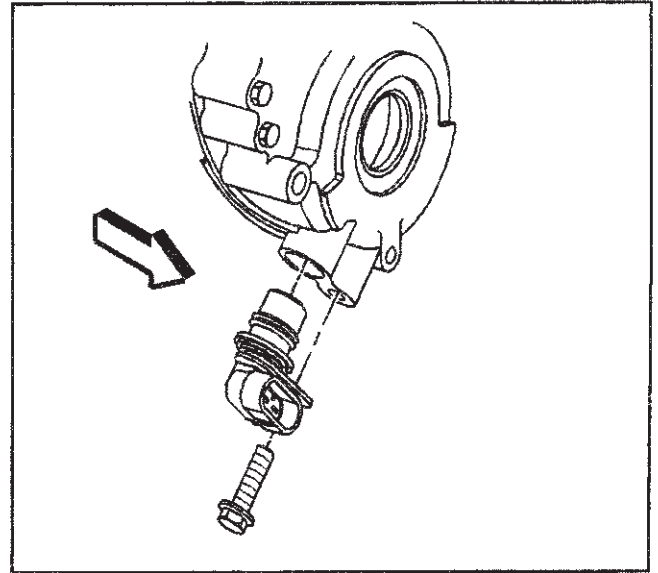
Tighten

Tighten the engine front cover bolts to 12 N·m (106 lb in).

Refer to *Fastener Notice* in General Information.

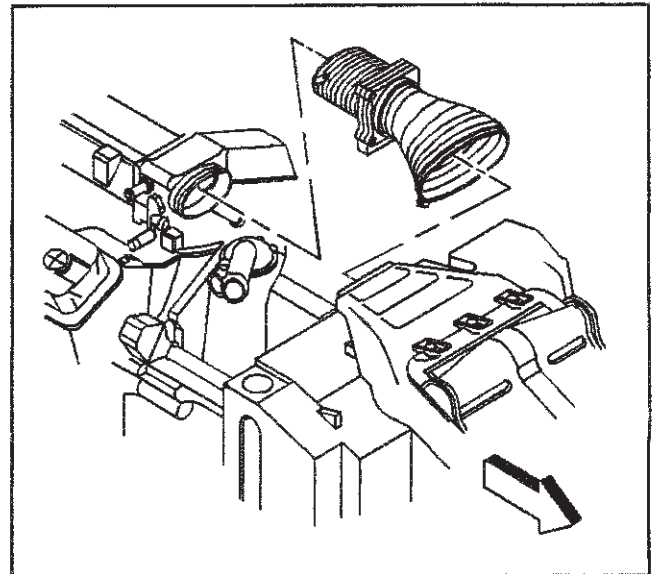
3. Install the oil pan. Refer to *Oil Pan Replacement*.

4. Install the crankshaft position sensor.
5. Install the distributor. Refer to *Distributor Installation*.
6. Install the crankshaft balancer and hub. Refer to *Crankshaft Balancer and Hub Replacement*.
7. Install the water pump. Refer to *Water Pump Installation*.
8. Install the drive belt. Refer to *Accessory Drive Belt Replacement*.



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9. Install the throttle body air duct.



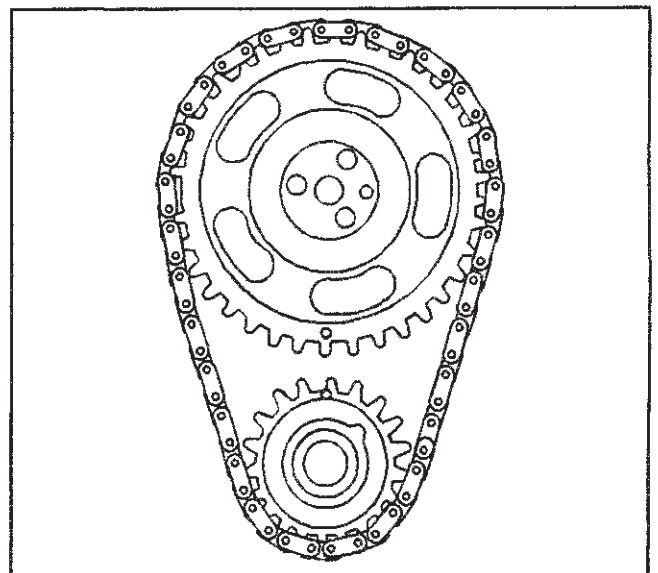
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Timing Chain, Sprockets, and WP Driveshaft Replace

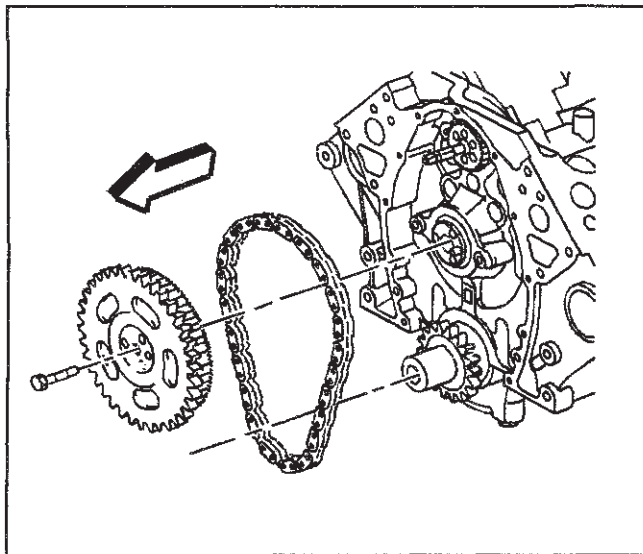
Removal Procedure

Tools Required

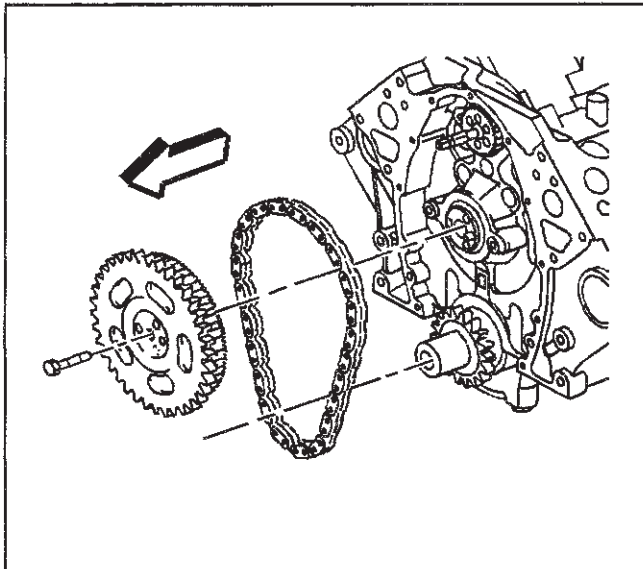
- J 5825-A Crankshaft Sprocket Remover
 - J 39243 Water Pump Driveshaft Remover
1. Remove the engine front cover. Refer to *Engine Front Cover Replacement*.
 2. Rotate the crankshaft until the timing marks on the crankshaft sprocket and the camshaft sprocket are aligned.



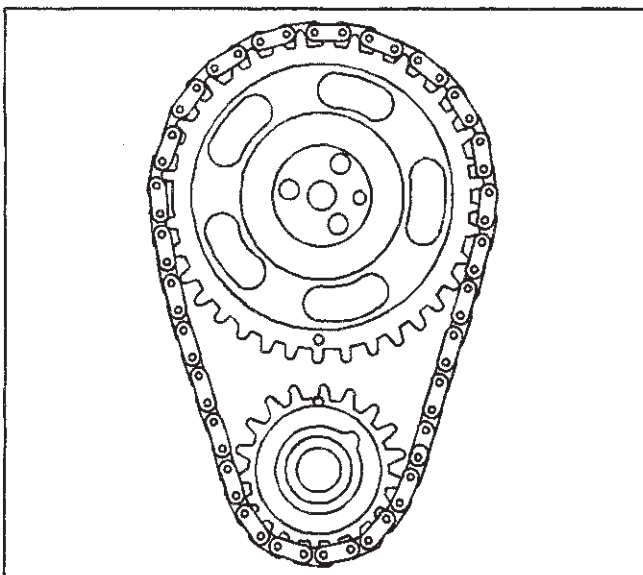
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3. Remove the crankshaft sprocket bolts.
4. Remove the camshaft sprocket.

Notice: Do not turn the crankshaft assembly after the timing chain has been removed in order to prevent damage to the piston assemblies or the valves.

5. Remove the timing chain.
6. Use the *J 39243* in order to remove the water pump bearing retainer bolts and water pump driveshaft.
7. Remove and discard the O-ring from the water pump driveshaft.
8. Use the *J 5825-A* in order to remove the crankshaft sprocket.
9. Remove the key, if necessary.

Installation Procedure

Tools Required

- *J 5590* Crankshaft Sprocket Installer
- *J 41546* Water Pump Driveshaft Installer
- *J 39089* Water Pump Driveshaft O-ring Seal Installer

1. Install the key, if you removed it.
2. Use the *J 5590* in order to install the crankshaft sprocket.
3. Use the *J 41546* in order to install the water pump driveshaft.
4. Install the water pump bearing retainer bolts.

Tighten

Tighten the water pump driveshaft bearing retainer bolts to 12 N·m (106 lb in).

Refer to *Fastener Notice* in General Information.

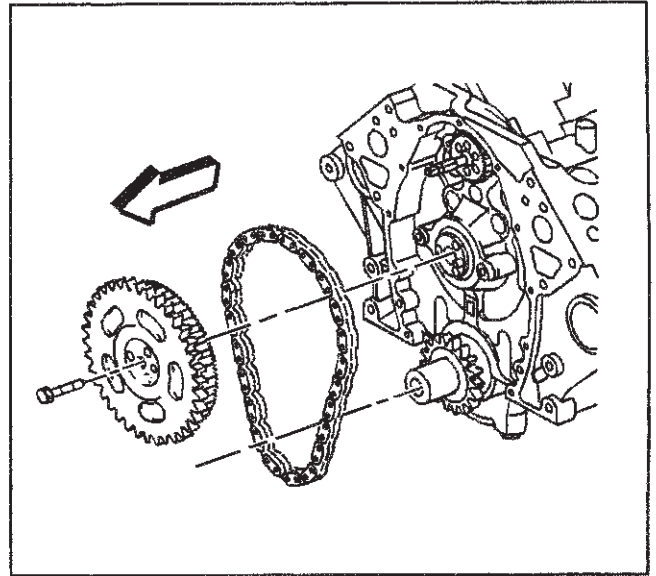
5. Install the camshaft sprocket and the timing chain. Ensure that the camshaft sprocket and the water pump driveshaft gears mesh.
6. Ensure that the camshaft and the crankshaft timing marks align.

7. Install the camshaft sprocket bolts.

Tighten

Tighten the camshaft sprocket bolts to 25 N.m (18 lb ft).

8. Use the J 39089 in order to install a new O-ring to the water pump driveshaft.
9. Install the engine front cover. Refer to *Engine Front Cover Replacement*.

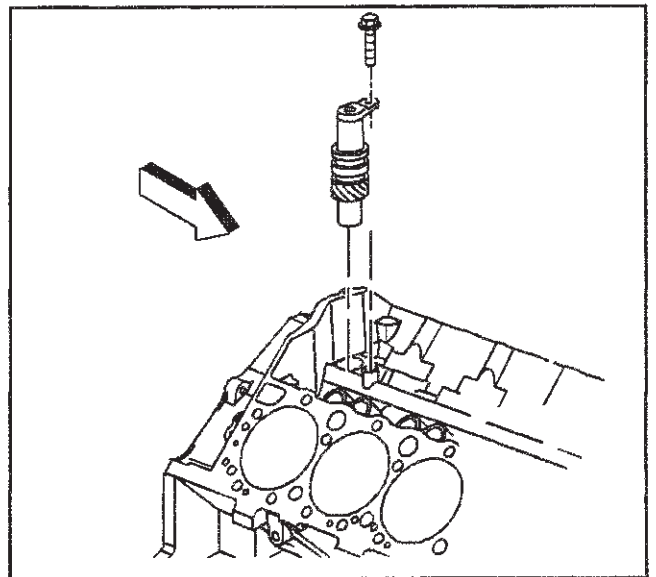


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Camshaft Replacement

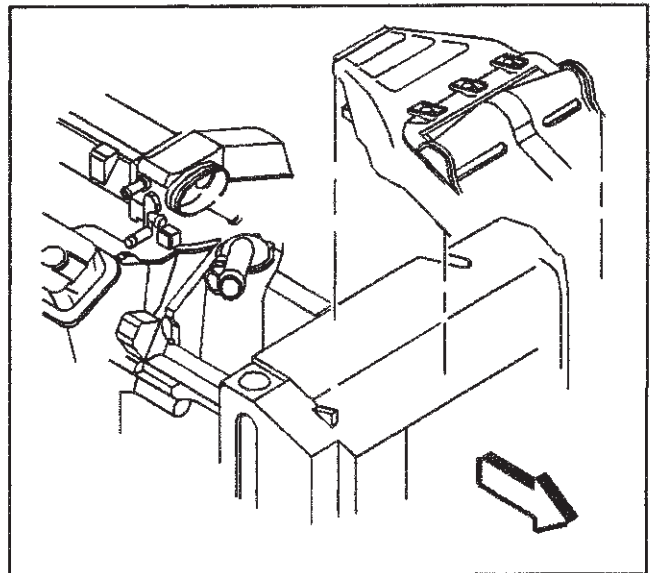
Removal Procedure

1. Remove the engine front cover. Refer to *Engine Front Cover Replacement*.
2. Remove the intake manifold. Refer to *Intake Manifold Replacement*.
3. Remove the oil pump driveshaft bolt.
4. Remove the oil pump driveshaft.
5. Remove the valve rocker arms and pushrods. Refer to *Valve Rocker Arm, Push Rod, and Stud Replacement*.
6. Remove the camshaft sprocket and the timing chain. Refer to *Timing Chain, Sprockets, and WP Driveshaft Replace*.
7. Remove the valve lifters. Refer to *Valve Lifter Replacement*.



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8. Remove the air cleaner.
9. Disconnect the high fill reservoir hose from the radiator.
10. Remove the relay bracket from the left side of the radiator support.
11. Remove the secondary air injection pump intake duct and bolts. Move the pump aside. Refer to *Air Pump in Engine Controls*.
12. Remove the nuts, the screws, and the upper radiator support. Refer to *Radiator Support Replacement in Engine Cooling*.
13. Remove the radiator. Refer to *Radiator Replacement in Engine Cooling*.
14. Raise and support the vehicle. Refer to SECTION 0A.
15. Disconnect the cooling fan electrical connectors.
16. Remove the lower fan shroud bolts. Refer to *Fan Shroud Replacement in Engine Cooling*.



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