

1994 Chevrolet S10 Pickup

2.2L 4-CYL - VIN [4] '1994 GENERAL MOTORS ENGINES 2.2L 4-Cylinder

FRONT TIMING CASE COVER & FRONT SEAL

Removal

1. Disconnect negative battery cable. Remove P/S reservoir from radiator shroud. Remove upper fan shroud. Remove serpentine belt.
2. Remove generator with brackets and lay aside. Using Hub Puller (J-24420-B), remove crankshaft pulley hub. Remove oil pan. See OIL PAN. Remove front timing case cover bolts, and cover.
3. Using large screwdriver, remove crankshaft front seal. DO NOT distort timing gear cover during seal removal.

CAUTION: To prevent oil leakage, coat crankshaft pulley hub keyway with RTV sealant before installation.

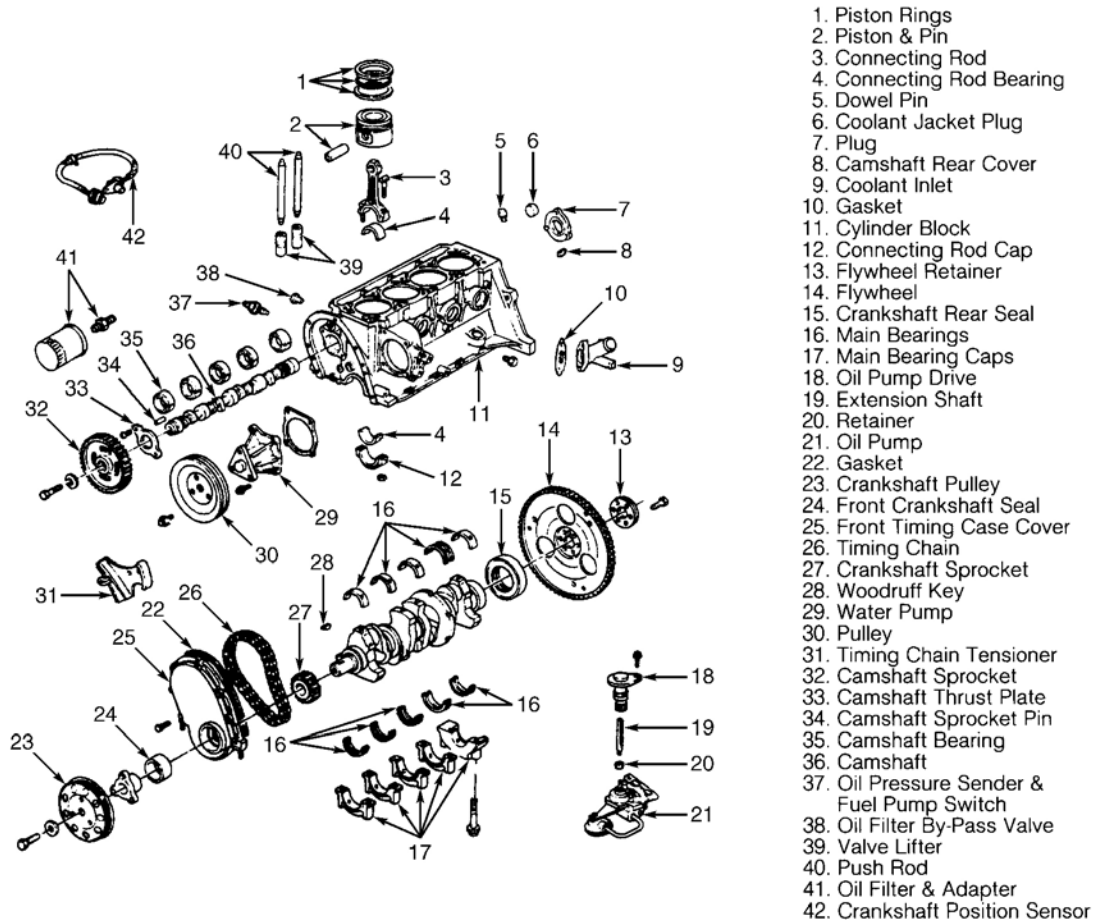
Installation

1. Lubricate seal lips with engine oil. Using Seal Installer (J-35468), install front cover oil seal into front cover and leave installer in position. Apply a 3/8" wide by 5/16 thick bead of RTV sealer to oil pan sealing surface and front cover sealing surface. Apply RTV sealant to crankshaft pulley hub keyway.
2. Install crankcase cover with seal installer in place to front of engine. Install and tighten front cover bolts to specification. See TORQUE SPECIFICATIONS. Position crankshaft pulley hub onto crankshaft.
3. Install crankshaft pulley hub using Hub Installer (J-29113), ensuring at least .24" (6.1 mm) of installer bolt thread is engaged into end of crankshaft.
4. To complete installation, reverse removal procedure. Tighten nuts and bolts to specification. See **Fig. 6**. See TORQUE SPECIFICATIONS.

None		

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Fig. 6: Exploded View Of Cylinder Block & Components
Courtesy of GENERAL MOTORS CORP.

TIMING CHAIN & SPROCKETS

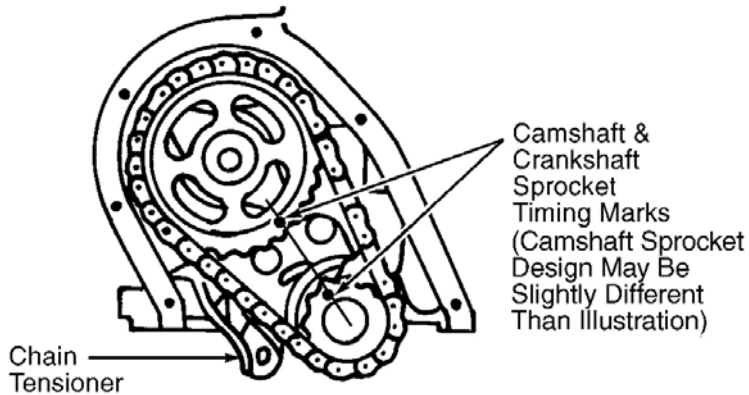
Removal

1. Remove front timing case cover. See FRONT TIMING CASE COVER. Align camshaft sprocket timing marks and crankshaft sprocket timing marks with tabs on chain tensioner. See **Fig. 7**.
2. Loosen timing chain tensioner bolt, but DO NOT remove bolt. Remove camshaft sprocket and timing chain. Using Sprocket Puller (J-22888), remove crankshaft sprocket.

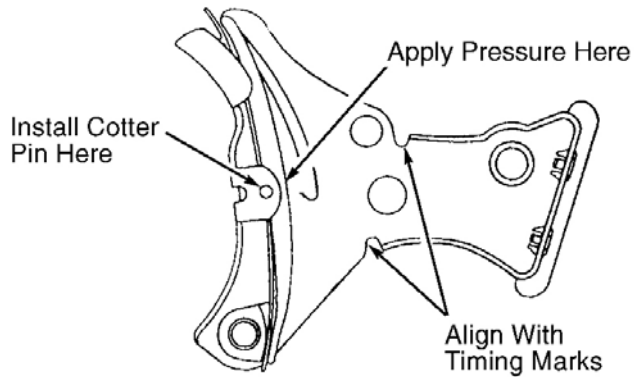
None

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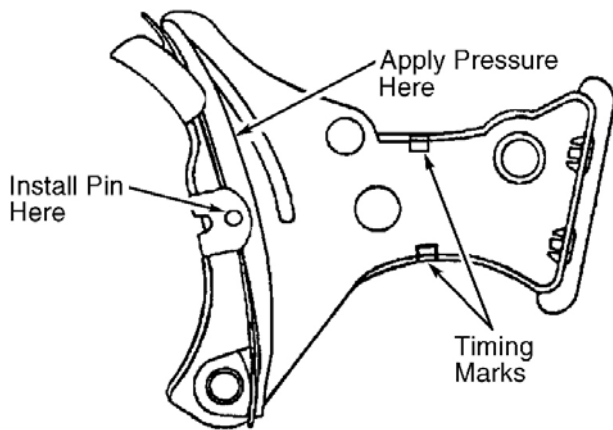
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ALIGNING SPROCKET MARKS



COMPRESSING CHAIN TENSIONER EARLY STYLE



LATE STYLE

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Fig. 7: Aligning Timing Chain Sprockets & Chain Tensioner
Courtesy of GENERAL MOTORS CORP.

Installation

None	
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1. Install crankshaft sprocket using Sprocket Installer (J-5590). Ensure crankshaft sprocket is fully seated against crankshaft. Compress chain tensioner spring and install small cotter pin in hole of chain tensioner. See [Fig. 7](#).
2. Install timing chain and camshaft sprocket, aligning sprocket marks with tabs on chain tensioner. Ensure hole in camshaft sprocket aligns with camshaft dowel pin. Install camshaft sprocket bolt and tighten to specification. See TORQUE SPECIFICATIONS.
3. Lubricate timing chain with oil. Remove cotter pin from chain tensioner. To complete installation, reverse removal procedure.

CAMSHAFT

NOTE: To replace camshaft, engine must be removed from vehicle.

Removal

1. Remove engine assembly, and mount it on engine stand. See ENGINE. Remove valve lifters. See VALVE LIFTERS.
2. Remove timing chain and camshaft sprocket. See TIMING CHAIN & SPROCKETS. Remove oil pump drive from right side of cylinder block. See [Fig. 6](#).
3. Remove camshaft thrust plate. Remove camshaft. If necessary, use Camshaft Bearing Remover/Installer (J-33049) to remove camshaft bearings.

Inspection

Inspect camshaft journal diameter, lobe lift and oil clearance. Replace components if not within specification. See CAMSHAFT table under ENGINE SPECIFICATIONS.

CAUTION: Replace all lifters if new camshaft is installed. Verify use of oversize valve lifters by mark on cylinder block near valve lifter bore. Add GM EP Lubricant (1051396) to engine oil if camshaft is replaced.

Installation

Install camshaft bearings (if removed), ensuring oil holes are aligned. Coat camshaft journals and bearings with Lubricant (1051396). Install camshaft. Install camshaft thrust plate. To complete installation, reverse removal procedure.

CAMSHAFT SPECIFICATIONS

Application	In. (mm)
Journal Diameter	1.867-1.869 (47.44-47.49)
Lobe Lift	
Intake	.259 (6.60)
Exhaust	.250 (6.35)
Oil Clearance	.001-.004 (.03-.10)

None