

TIMING CHAIN

CAUTION: If cylinder head is installed and timing chain is disconnected, **DO NOT** rotate camshaft or crankshaft; valves will contact pistons, resulting in bent valves.

NOTE: Procedure includes cylinder head removal; however, it may not be necessary to remove cylinder head.

Removal

1. Release fuel pressure. See **FUEL PRESSURE RELEASE** . Drain coolant from radiator and cylinder block. Drain engine oil. Disconnect all necessary coolant hoses, electrical connectors, vacuum hoses, fuel lines and control cables.
2. Remove front exhaust tube. Remove intake manifold collector supports, and intake manifold. Remove exhaust manifold with catalytic converter. Remove air injection valve pipe. Remove intake air duct. Remove radiator fan and shroud. Remove injectors and fuel rail as an assembly. Remove distributor cap and spark plugs.
3. Set cylinder No. 1 at TDC of compression stroke, ensuring marks on crankshaft pulley and front cover align, and distributor rotor points to spark plug wire No. 1 on cap. Remove cylinder head cover. Remove distributor.

NOTE: It is not necessary to install a stopper to prevent inner or outer timing chains from disengaging sprockets.

4. Prevent camshafts from turning, and remove camshaft sprocket bolts. Remove camshaft sprocket. See **Fig. 13** . Mark and remove camshaft bearing caps in reverse order of installation. See **Fig. 16** . Remove camshafts.
5. Loosen cylinder head bolts in 2 or 3 steps, in reverse order of tightening sequence. See **Fig. 11** . Remove camshaft sprocket cover. Remove outer (upper) chain tensioner and guide. Remove outer timing chain. Remove idler sprocket bolt. Remove cylinder head.
6. Remove oil pan and oil strainer. See OIL PAN. Remove accessory drive belts. Remove A/C compressor idler pulley (if equipped). Remove crankshaft pulley. Remove front cover. Remove chain tensioner, tensioner arm and chain guides. Remove inner (lower) timing chain and idler sprocket. Remove oil pump drive spacer and crankshaft sprocket.

Inspection

1. Inspect chain roller links. Replace chain if roller links are cracked or worn. Inspect cylinder head and cylinder block mating surfaces for warpage. If warpage exceeds specification, machine cylinder head. See **CYLINDER HEAD** under ENGINE SPECIFICATIONS.
2. If machining reduces cylinder head height to less than specification, replace cylinder head. After machining, rotate camshaft by hand. Replace cylinder head if camshaft does not rotate freely.

Installation

1. Install crankshaft sprocket with sprocket teeth toward front of engine, and shoulder toward rear of engine. Install oil pump drive spacer. Ensure cylinder No. 1 is at TDC, with crankshaft sprocket keyway at 12 o'clock position. See **Fig. 14** .
2. Install inner timing chain onto crankshaft sprocket and idler sprocket. Hold idler sprocket in position. Ensure mating marks on sprockets align with Silver chain links. Install chain guide and tensioner.
3. Apply lithium grease to front cover oil seal. Apply a .08-.12" (2-3 mm) diameter bead of sealant to front cover. Install front cover. Install crankshaft pulley. Tighten bolt to specification. See **TORQUE SPECIFICATIONS** .
4. Install oil strainer, oil pan, accessory drive components and belts. Install front engine mount. Install cylinder head and NEW gasket, and temporarily snug cylinder head bolts. Install outer timing chain, chain tensioner and chain guide. Ensure mating marks align. See **Fig. 15** . Hold outer timing chain in position.
5. Apply sealant to camshaft sprocket cover sealing surfaces. Install camshaft sprocket cover. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** . Tighten cylinder head bolts to specification. Install camshafts and bearing caps. Tighten bearing cap bolts in sequence to specification. See **Fig. 16** .
6. Install camshaft sprockets and chain guide. Apply sealant to cylinder head rubber plugs. See **Fig. 10** . Install rubber plugs. Install cylinder head cover. To complete installation, reverse removal procedure.

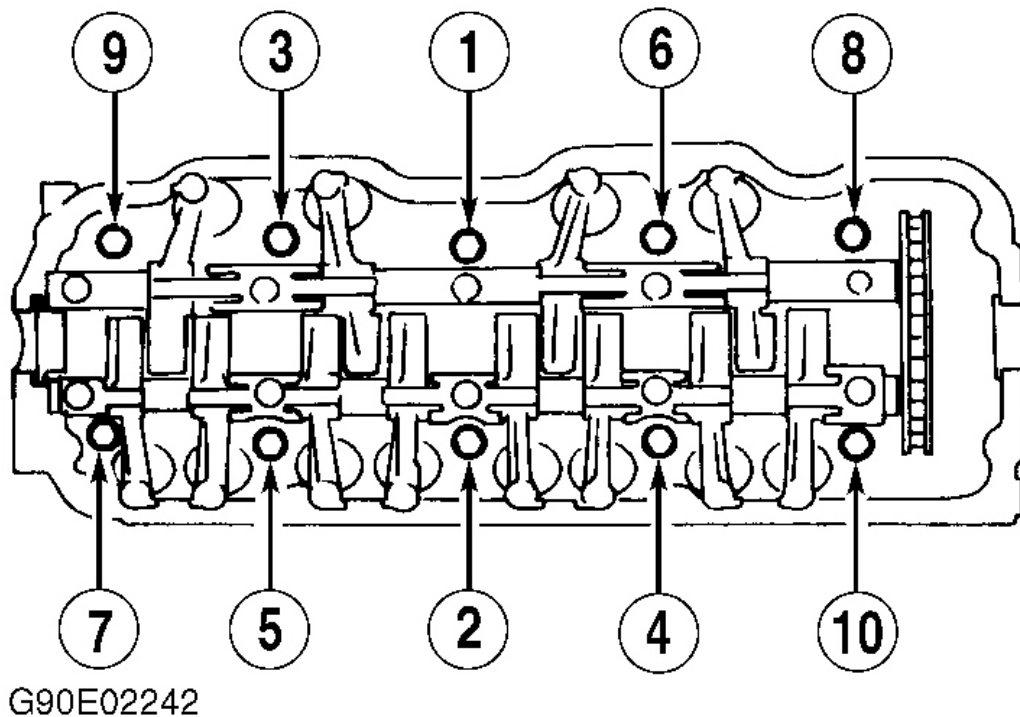


Fig. 12: Cylinder Head Bolt Tightening Sequence
 Courtesy of NISSAN MOTOR CO., U.S.A.

1996 Nissan Altima GLE

2.4L 4-CYL '1995-96 ENGINES Nissan - 2.4L 4-Cylinder

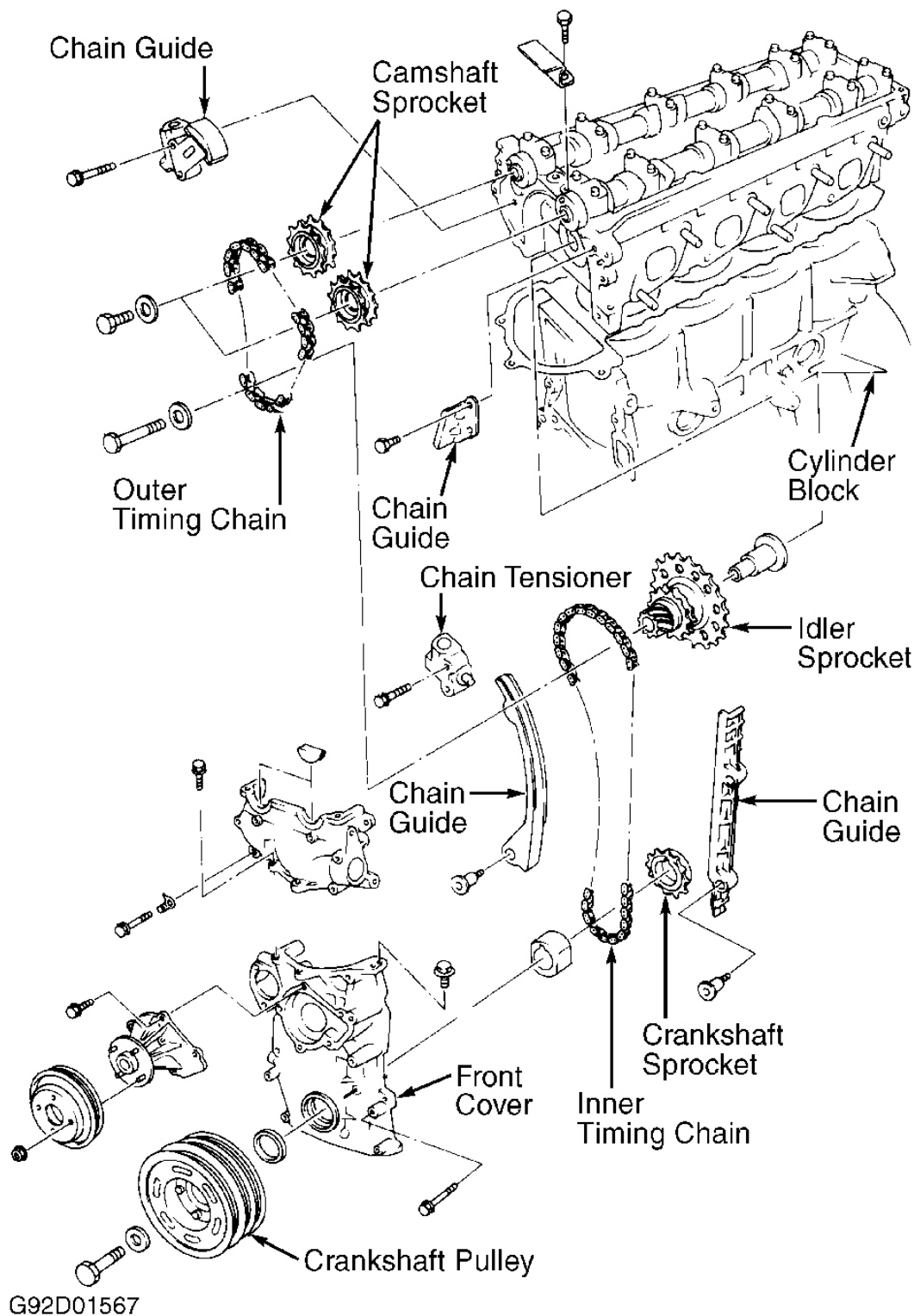
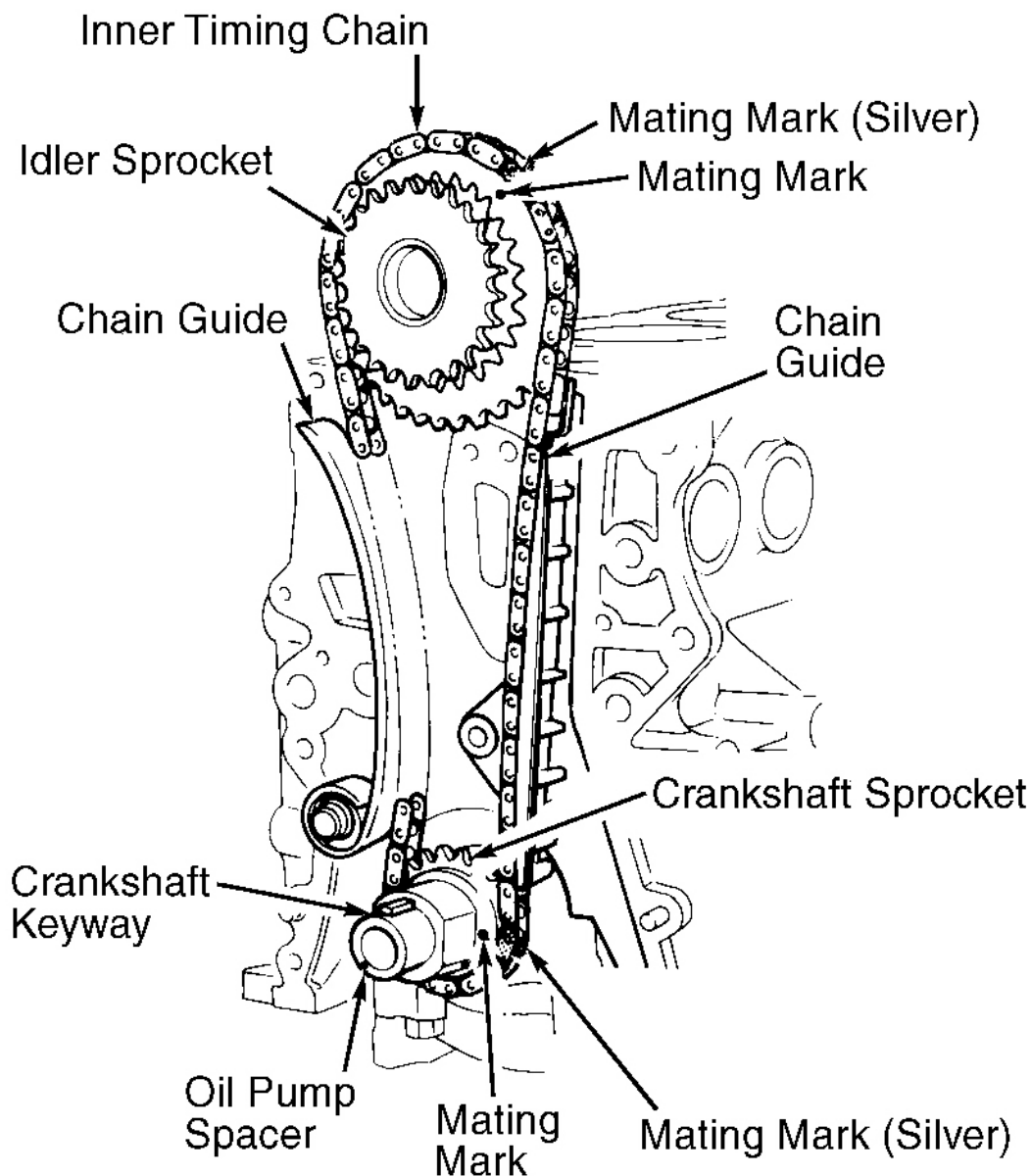


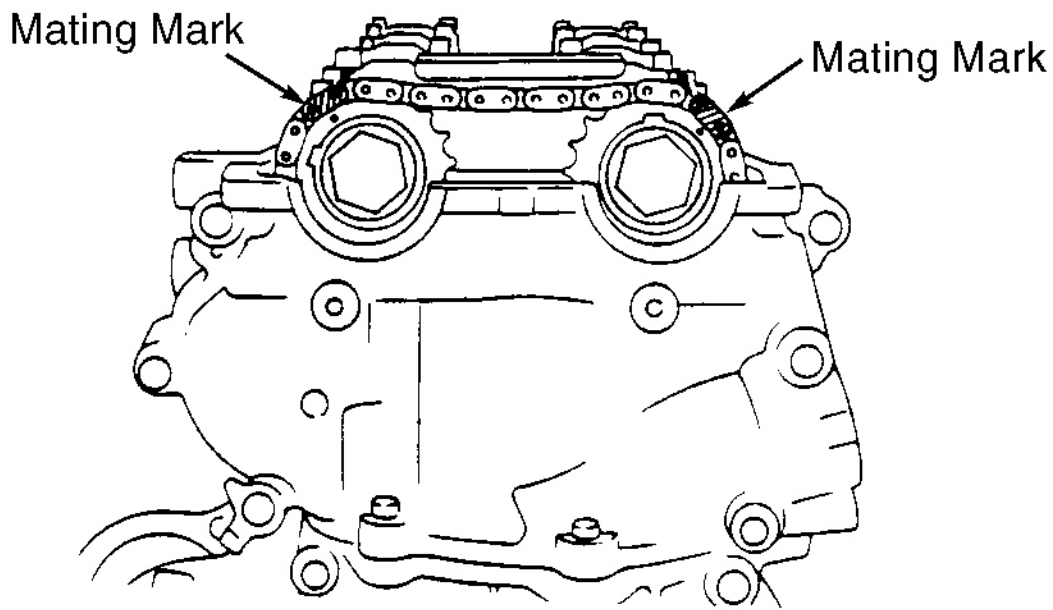
Fig. 13: Exploded View Of Timing Chain Components (Typical)

Courtesy of NISSAN MOTOR CO., U.S.A.



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Fig. 14: Aligning Inner Timing Chain Marks
Courtesy of NISSAN MOTOR CO., U.S.A.



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Fig. 15: Aligning Outer Timing Chain Marks
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