

## TIMING CHAIN

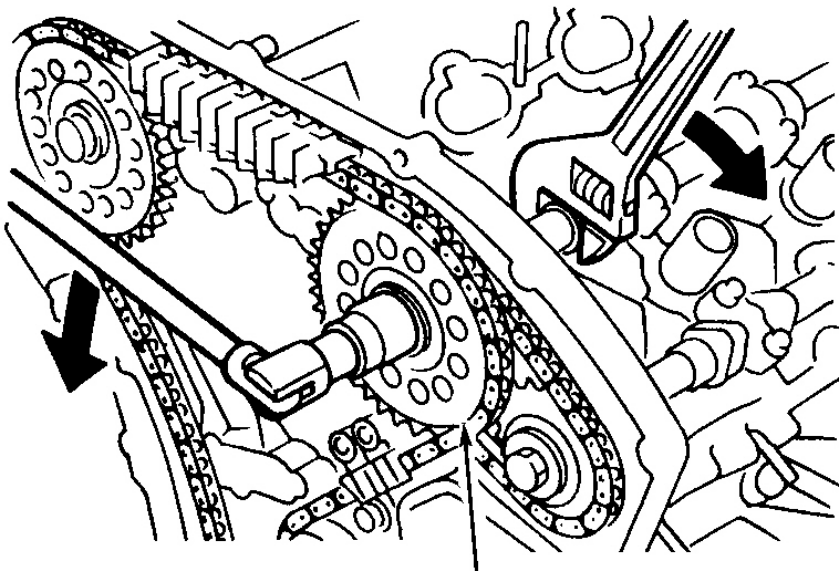
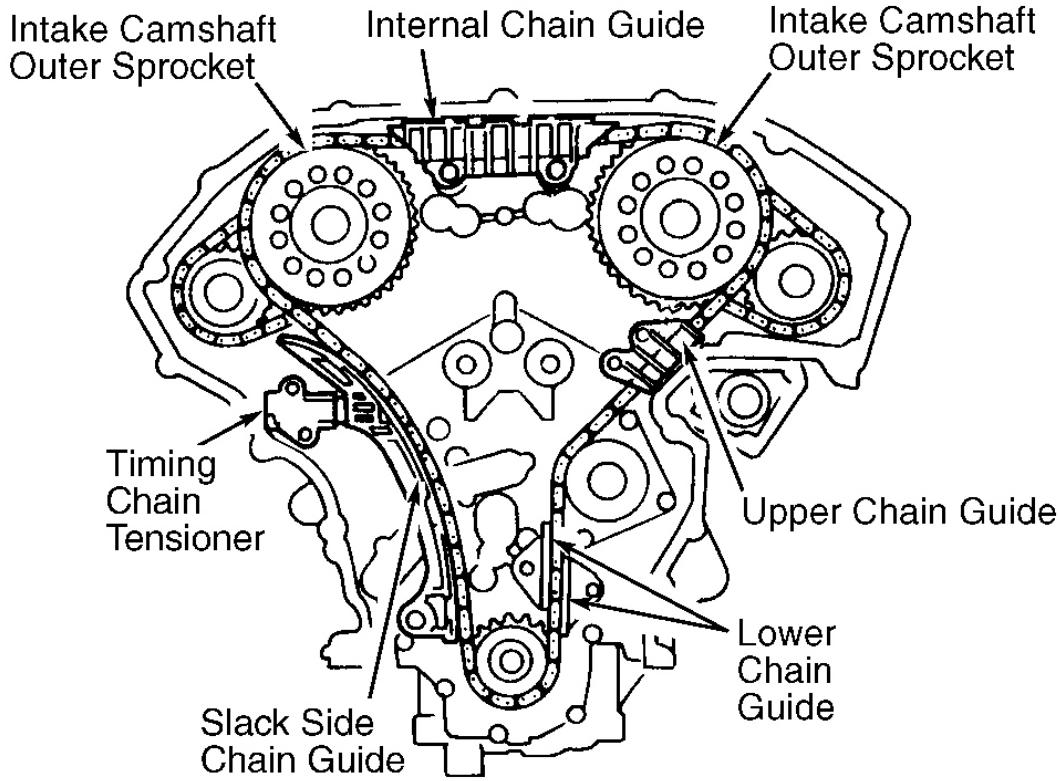
**CAUTION:** If one or both cylinder heads is installed and timing chain is disconnected, **DO NOT** rotate camshaft or crankshaft; valves will contact pistons, resulting in bent valves.

### Removal

1. Drain engine oil. Release fuel system pressure. See [FUEL PRESSURE RELEASE](#). Remove engine lower covers. Remove right front wheel and engine side cover. Drain coolant from radiator and cylinder block. Remove radiator.
2. Remove intake air duct and crankcase ventilation tube. Label and disconnect all electrical connectors, hoses and cables necessary for cylinder head removal. Remove EGR tube. Remove ignition coils. Remove intake manifold collector supports.
3. Remove intake manifold collector bolts. Start with outside bolts and work inward. Remove intake manifold collectors. Remove spark plugs. See [SPARK PLUGS](#). Remove idle air adjust unit. Remove heater pipe. Remove fuel injector rail with injectors.
4. Remove intake manifold. See [INTAKE MANIFOLD](#). Remove cylinder head covers. Remove accessory drive belts. Remove generator and A/C compressor (if equipped), leaving hoses attached. Remove A/C compressor and generator bracket. Remove idler pulley bracket.
5. Remove camshaft position sensor from front of engine under crankshaft pulley. Remove bellhousing front cover. Remove crankshaft position sensor from left rear of engine near flywheel/flexplate. Remove exhaust manifolds. See [EXHAUST MANIFOLD](#).

**NOTE:** Ensure crankshaft does not rotate when removing crankshaft pulley bolt.

6. Set piston No. 1 at TDC of compression stroke. Ensure mark on crankshaft pulley aligns with pointer on front timing chain case. Remove crankshaft pulley bolt. Using puller, remove pulley.
7. Support engine with transmission jack or hoist. Remove engine mounts and center member. Remove upper and lower oil pans. Remove water pump cover. Remove front timing chain case bolts. Separate front and rear timing chain cases by driving Seal Cutter (J-37228) between case halves. Remove front timing chain case.
8. Remove internal timing chain guide. Remove upper chain guide. Remove timing chain tensioner and slack side chain guide. Ensuring camshafts do not rotate, remove intake camshaft outer sprockets. Remove timing chain. See [Fig. 7](#).
9. Install stopper pins in camshaft tensioners. Ensuring camshafts do not rotate, remove intake camshaft sprockets and camshaft chains. Remove lower chain guide.

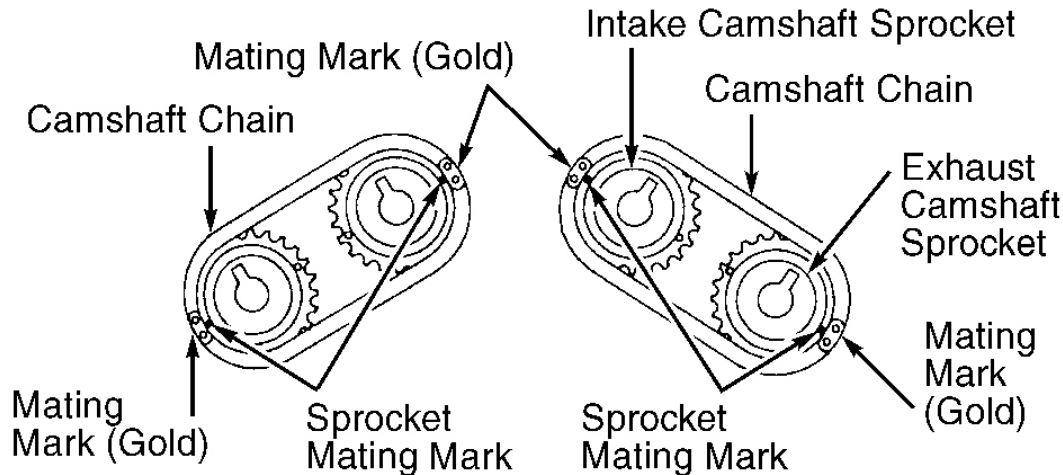


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**Fig. 7: Removing Timing Chain & Intake Camshaft Outer Sprockets**  
Courtesy of NISSAN MOTOR CO., U.S.A.

## Installation

1. If crankshaft sprocket was removed, install with shoulder facing engine. Ensure piston No. 1 at TDC on compression stroke. Install lower chain guide on dowel pin with front mark on guide facing upward.
2. Align camshaft sprockets as indicated. See **Fig. 8**. Install camshaft chains and sprockets. Remove chain tensioner stopper pins.

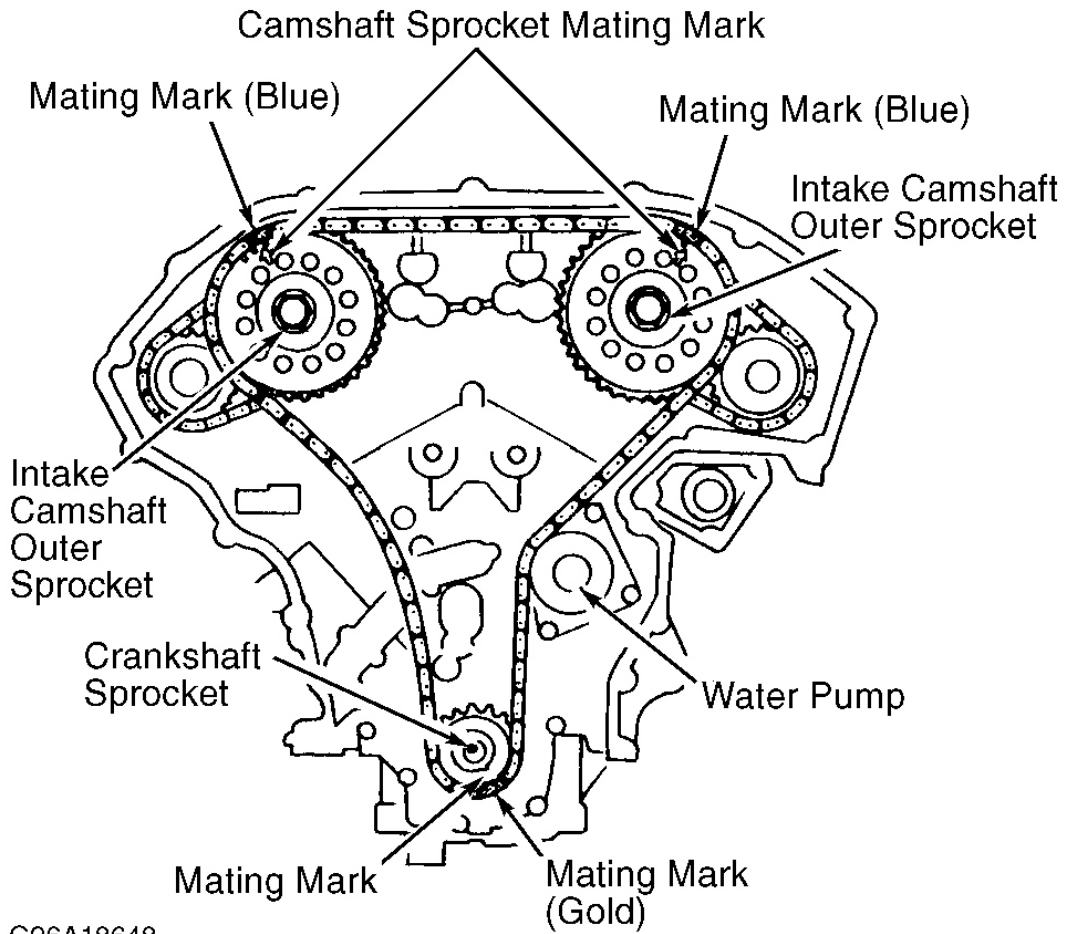


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**Fig. 8: Aligning Camshaft Sprocket Mating Marks**

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

3. Align mating mark on crankshaft sprocket with Gold match mark on timing chain. Install chain on water pump sprocket. Align Blue match mark on intake camshaft outer sprocket mating marks. See **Fig. 9**. Install chain and sprockets. Install chain guides and chain tensioner. Tighten all bolts to specification. See **TORQUE SPECIFICATIONS**.
4. Ensure front timing chain case is clean. Apply liquid gasket to mating surfaces. Install front timing chain case. Tighten bolts to specification evenly in a crisscross pattern. To complete installation, reverse removal procedure.



**Fig. 9: Aligning Timing Marks**

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