

# 3.0L V6 - VINS [H,R] & 3.0L V6 TURBO - VIN [C]

1991 Nissan 300ZX

1991 NISSAN ENGINES  
3.0L V6

Maxima, Pathfinder, Pickup, 300ZX

## \* PLEASE READ THIS FIRST \*

NOTE: For engine repair procedures not covered in this article, see ENGINE OVERHAUL PROCEDURES - GENERAL INFORMATION article in the GENERAL INFORMATION section.

## ENGINE IDENTIFICATION

Engine can be identified by fourth character of Vehicle Identification Number (VIN). See ENGINE IDENTIFICATION CODES TABLE. VIN is located on top of dash panel, at lower left corner of windshield. Engine type and serial numbers are stamped into a machined pad, located at the right rear of cylinder block, below rear cam cover.

### ENGINE IDENTIFICATION CODES TABLE

Application	Engine Code	VIN Code
3.0L V6		
Maxima, Pathfinder & Pickup	VG30E	H
300ZX	VG30E	R
3.0L Turbo V6		
300ZX Turbo	VG30ETT	C

## VALVE CLEARANCE ADJUSTMENT

Hydraulic valve lifters are used; no valve adjustment is required.

## REMOVAL & INSTALLATION

NOTE: For reassembly reference, label all electrical connectors, vacuum hoses and fuel lines before removal. Also place mating marks on engine hood and other major assemblies before removal.

## FUEL PRESSURE RELEASE

Remove fuel pump fuse from fuse block. Start engine. After engine stalls, crank engine 2 or 3 times to ensure fuel pressure is released. Turn ignition switch to OFF position. Erase ECU memory (Code 22) by disconnecting battery negative cable.

## ENGINE

Removal (Maxima)

For removal procedure, see Fig. 1. No other information is available from manufacturer.

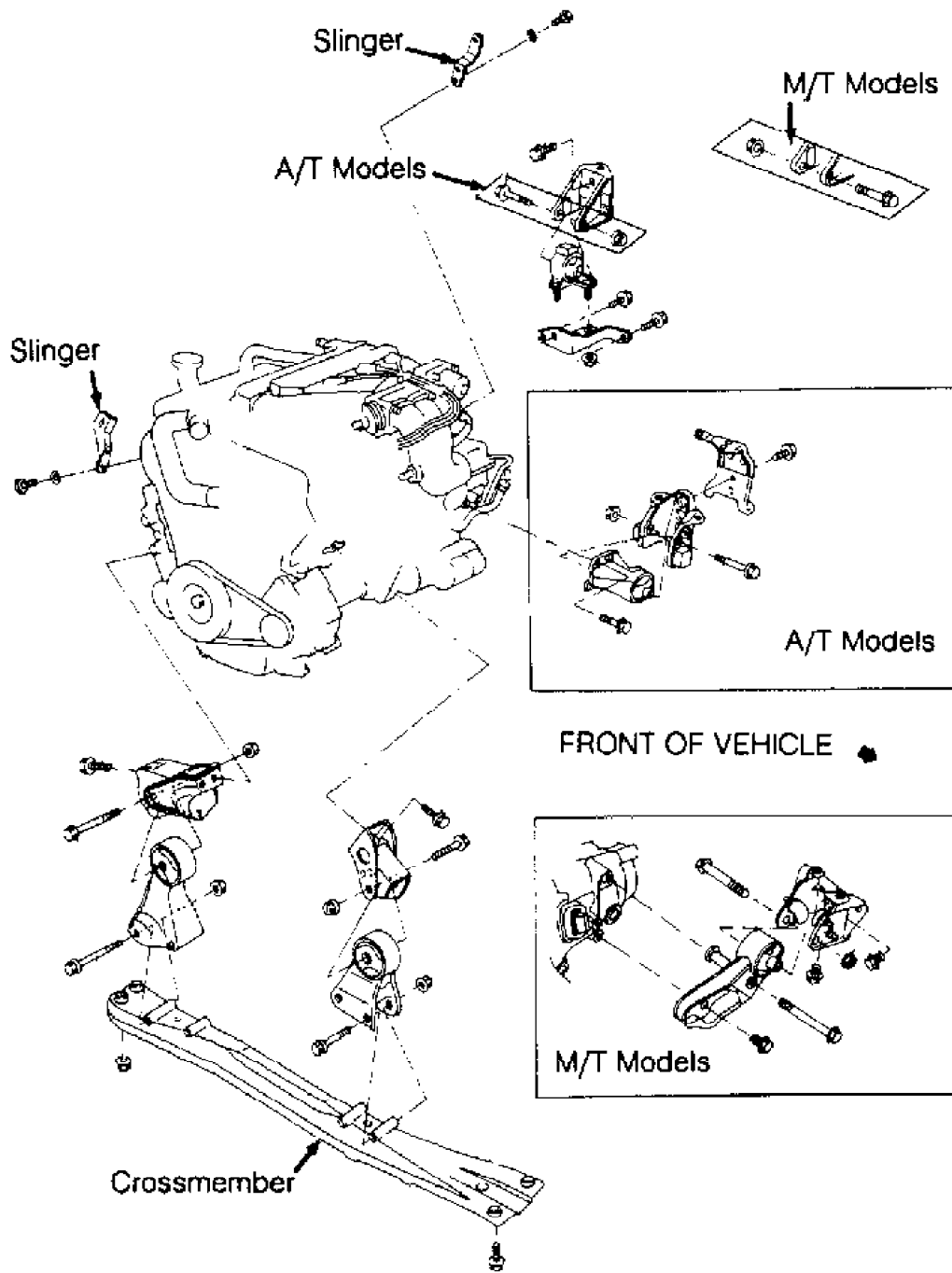


Fig. 1: Removing & Installing Engine Assembly (Maxima)  
 Courtesy of Nissan Motor Co., U.S.A.

Removal (Pathfinder & Pickup)

- 1) Mark hinge locations on hood for installation reference.

Remove hood. Release fuel system pressure. See FUEL PRESSURE RELEASE under REMOVAL & INSTALLATION.

2) Remove battery. Drain cooling system and engine crankcase. Remove radiator, shroud and fan. Remove accessory drive belts. Remove power steering pump and A/C compressor (if equipped) with hoses connected.

NOTE: DO NOT loosen or remove 4 bolts holding cover on fluid-filled front engine mount.

3) Label and disconnect all wiring and hoses affecting engine removal. Disconnect exhaust pipe from exhaust manifold. Remove transmission. Install engine hoist. Raise engine slightly to remove pressure from engine mounts. Disconnect engine mounts. Remove engine.

#### Removal (300ZX)

1) Mark hinge locations on hood for installation reference. Remove hood and air cleaner. Release fuel system pressure. See FUEL PRESSURE RELEASE under REMOVAL & INSTALLATION.

2) Remove battery. Drain cooling system and engine crankcase. Remove radiator. Remove accessory drive belts and fan. Remove power steering pump and A/C compressor (if equipped) with hoses connected. Remove starter motor, clutch slave cylinder, exhaust pipes and drive shaft.

3) On A/T models, remove transmission. Remove lower splash guard (if equipped). Install engine hoist, and raise engine slightly to remove pressure from engine mounts. Disconnect engine mounts. Remove engine.

4) On M/T models, disconnect steering column lower joint. Remove tension rod and transverse link. Install engine hoist. Slightly raise engine to remove pressure from engine mounts. Support crossmember using a jack. Remove crossmember. Disconnect remaining engine/transmission mounts. Remove engine and transmission as assembly.

#### Installation (All Models)

1) To install, reverse removal procedure. Replace rubber engine mounts if deteriorated. Adjust accelerator control system. Refill fluids before starting engine. Adjust drive belt tension.

2) On Maxima, ensure length between buffer rod bolts is 3.50-3.58" (88.9-90.9 mm) for front buffer rod and 3.90-3.98" (99.1-101.1 mm) for rear buffer rod. See Fig. 2. On all models, briefly run engine and check for fluid leaks.

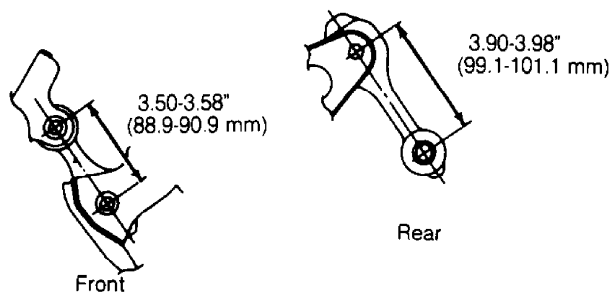


Fig. 2: Adjusting Length of Buffer Rods (Maxima)  
Courtesy of Nissan Motor Co., U.S.A.

## INTAKE MANIFOLD

### Removal

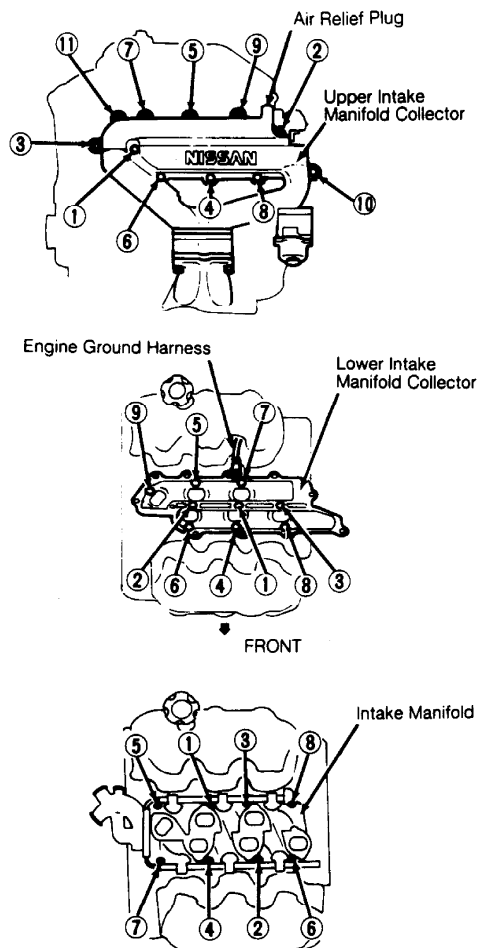
1) Release fuel system pressure. See FUEL PRESSURE RELEASE under REMOVAL & INSTALLATION. Allow engine to cool to room temperature. Disconnect battery. Drain cooling system. Disconnect and label vacuum and coolant lines attached to intake manifold. Remove throttle linkage.

NOTE: Removal sequence for 300ZX intake collector or intake manifold is not available from manufacturer.

2) Remove collector cover, collector and intake manifold using removal sequence. See Fig. 3 or 4. Disconnect fuel line and components affecting removal. Remove intake manifold and fuel injector fuel lines as an assembly.

### Installation

Using new gaskets, install intake manifold assembly. Tighten bolts in reverse order of removal sequence. See Fig. 3 or 4. See TORQUE SPECIFICATIONS TABLE at end of article. To complete installation, reverse removal procedure.



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Fig. 3: Intake Collector & Intake Manifold Removal Sequence (Maxima)  
Courtesy of Nissan Motor Co., U.S.A.

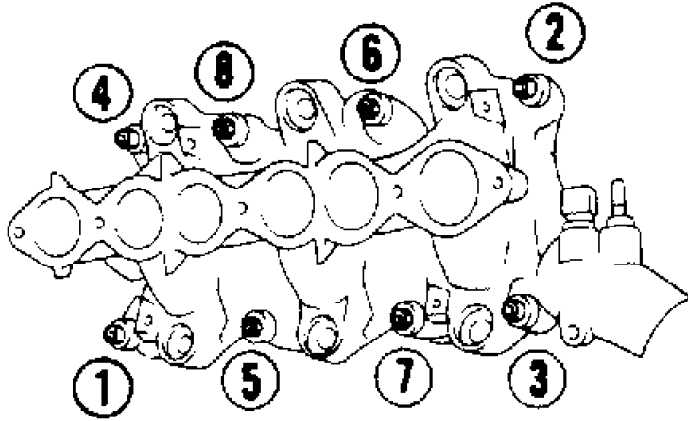


Fig. 4: Intake Manifold Removal Sequence (Pathfinder & Pickup)  
Courtesy of Nissan Motor Co., U.S.A.

## EXHAUST MANIFOLD

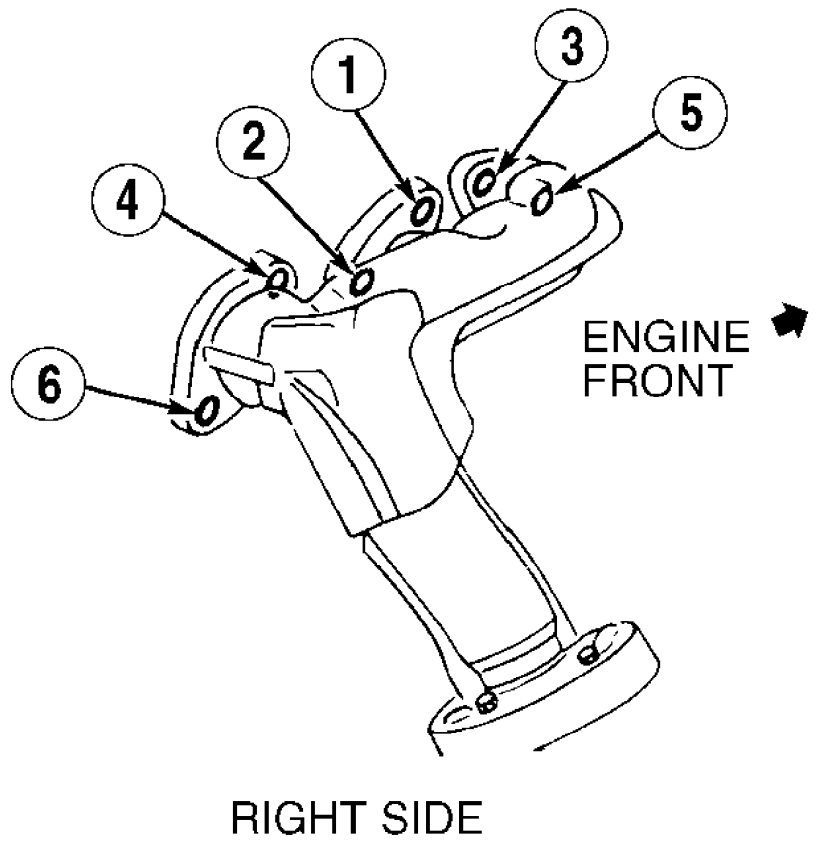
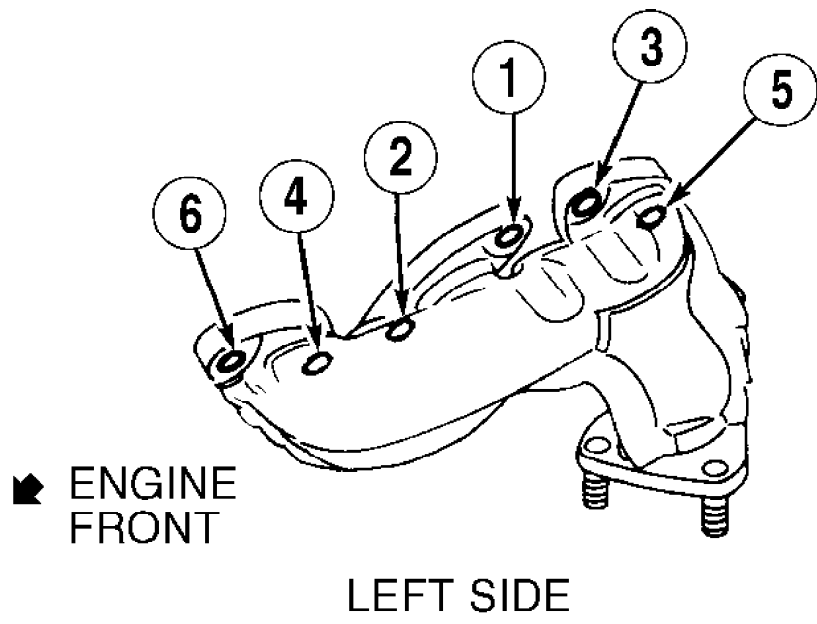
NOTE: Removal sequence for 300ZX exhaust manifold is not available from manufacturer.

### Removal

Allow engine to cool to room temperature. Remove exhaust manifold covers. Disconnect exhaust pipes from manifolds. Disconnect exhaust manifolds from engine using proper sequence. See Fig. 5 or 6.

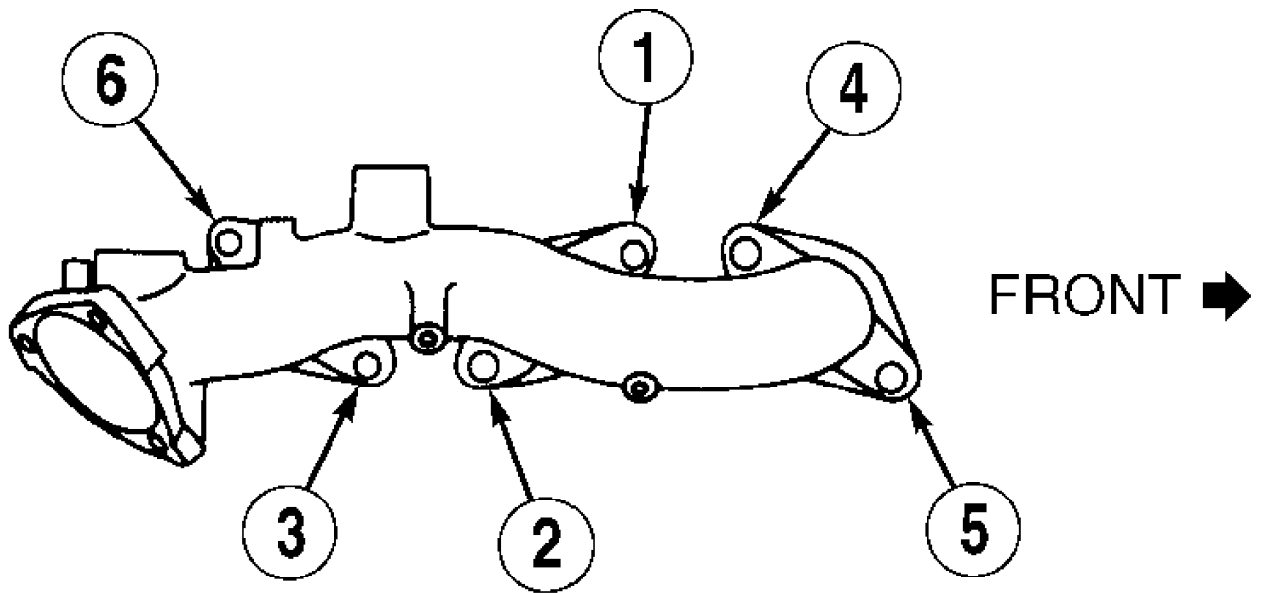
### Installation

To install, reverse removal procedure. Use new gaskets. To tighten reverse exhaust manifold removal sequence. See Fig. 5 or 6. See TORQUE SPECIFICATIONS TABLE at end of article.

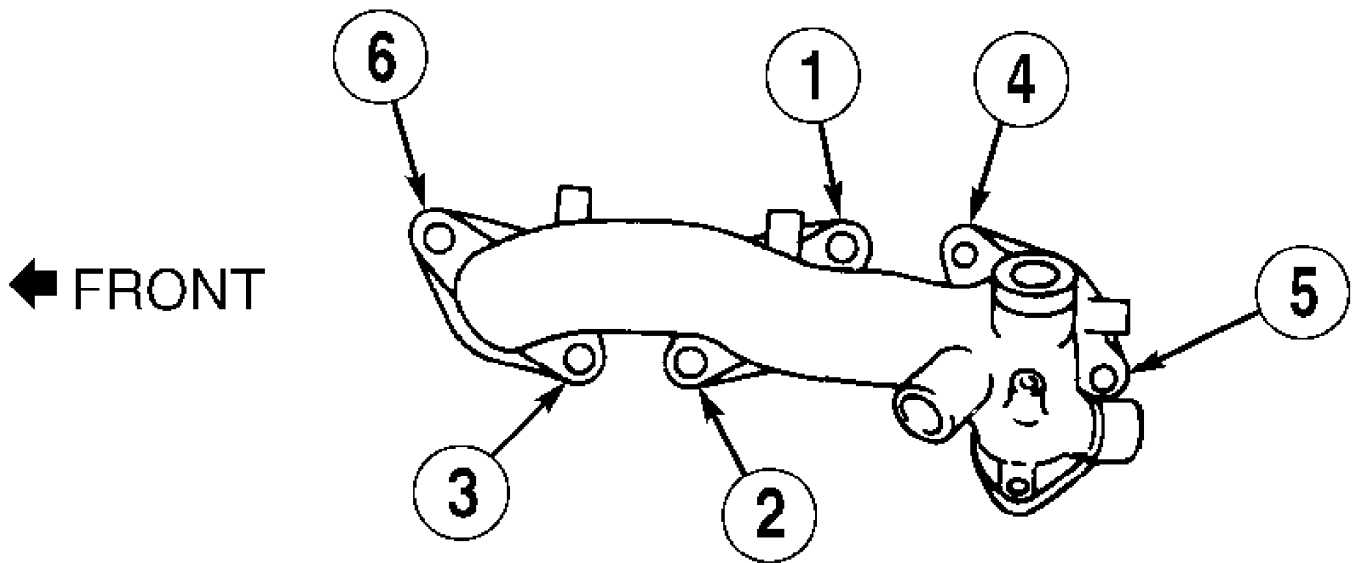


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Fig. 5: Exhaust Manifold Removal Sequence (Maxima)  
 Courtesy of Nissan Motor Co., U.S.A.



RIGHT SIDE



LEFT SIDE

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Fig. 6: Exhaust Manifold Removal Sequence (Pathfinder & Pickup)  
 Courtesy of Nissan Motor Co., U.S.A.

TURBOCHARGERS (300ZX TURBO)

Removal (Left)

1) Remove master cylinder and brake booster. Remove oxygen sensor wire harness connector. Remove air inlet hose and pipe. Remove turbocharger lower pipe. Remove turbocharger water hoses.

2) Disconnect catalyst. Disconnect front exhaust pipe. Disconnect lower steering column joint. Remove oil return and water tube. Remove EGR tube and bracket from wastegate valve. Remove exhaust manifold cover. Remove turbocharger with exhaust manifold.

#### Removal (Right)

1) Remove battery. Remove air inlet hose and pipe. Remove windshield wiper motor and solenoid. Remove turbocharger water hoses, oil return and oil inlet tube.

2) Disconnect catalyst. Remove oxygen sensor and oil pressure switch wire harness connector. Remove oil filter and bracket. Disconnect front exhaust pipe. Remove rod pin from wastegate valve actuator. Remove turbocharger.

#### Inspection (Left & Right)

1) Inspect turbine housing and blades for cracks and damage. Ensure turbine rotates freely and turbine blades do not contact housing. Ensure wastegate valve operates freely. Ensure oil passage in cartridge assembly is clear.

2) Check rotor shaft end play and runout. End play should be .0005-.0038" (.013-.096 mm); runout should be .002-.005" (.056-.127 mm).

3) Leak test wastegate valve actuator diaphragm using a hand-held vacuum pump. DO NOT apply more than 13 psi to diaphragm.

#### Installation

To install, reverse removal procedure. Use new gaskets, manifold nuts and exhaust pipe-to-turbo nuts. Refill all necessary fluids.

## CYLINDER HEAD

#### Removal (Maxima, Pathfinder & Pickup)

1) Release fuel system pressure. See FUEL PRESSURE RELEASE under REMOVAL & INSTALLATION. Position No. 1 piston at TDC of compression stroke. Ensure timing marks are aligned. Remove distributor and wires. DO NOT rotate distributor rotor after removal.

2) Disconnect negative battery cable. Allow engine to cool to room temperature. Drain cooling system. Remove timing belt. See TIMING BELT under REMOVAL & INSTALLATION. Remove brake master cylinder. Label and disconnect all wiring and hoses affecting intake collector removal. Remove intake collector.

3) Remove intake manifold. See INTAKE MANIFOLD under REMOVAL & INSTALLATION. Remove camshaft sprockets and timing belt rear cover. Disconnect exhaust pipe at exhaust manifold.

4) Remove rocker arm covers. Remove alternator, compressor and related brackets. Remove cylinder head mounting bolts in reverse order of tightening sequence. See Fig. 7. Loosen bolts in 2 or 3 steps.

5) Remove cylinder head with exhaust manifold attached. If necessary, remove exhaust manifold from cylinder head. Remove exhaust manifold bolts in sequence. See Fig. 5 or 6. Remove rocker arms. Bolts should be loosened in 2-3 steps. Wire hydraulic lifters so they will not drop from lifter guides.

Inspection Check cylinder head for cracks and damage. Inspect cylinder head and cylinder block mating surfaces for warpage. See CYLINDER HEAD TABLE under ENGINE SPECIFICATIONS at end of article. Replace head and/or block if machined or warped beyond service limit.

NOTE: Cylinder head bolts No. 4, 5, 12 and 13 are longer than



other head bolts. See Fig. 7.

#### Installation

1) Position No. 1 piston at TDC of compression stroke. Crankshaft sprocket timing mark should line up with mark on oil pump housing. Camshaft knockpin should be in 12 o'clock position during installation of cylinder head. Ensure cylinder head and cylinder block mating surfaces are clean. Install cylinder head and gasket.

CAUTION: DO NOT rotate crankshaft and camshafts separately or valves could contact pistons.

2) Oil threads, and install head bolts. Tighten head bolts in 5 steps. See Fig. 7. See TORQUE SPECIFICATIONS TABLE at end of article. Install timing belt. See TIMING BELT under REMOVAL & INSTALLATION. To complete installation, reverse removal procedure.

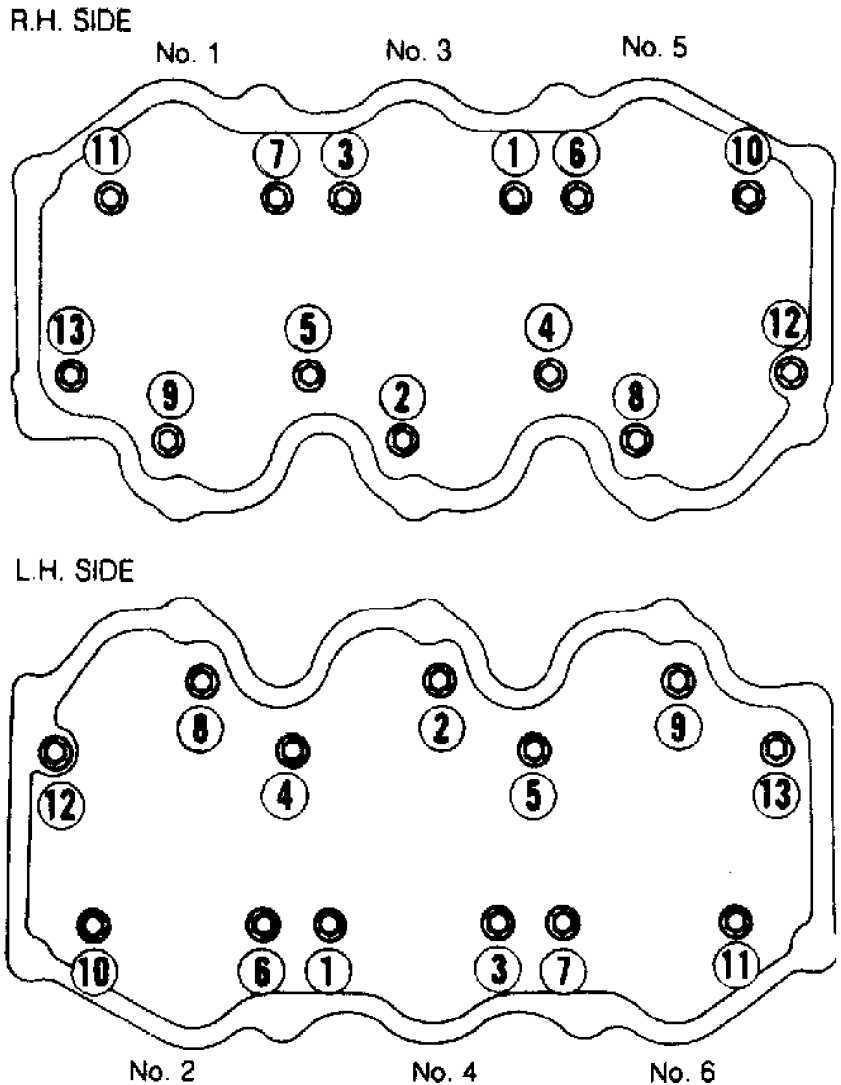


Fig. 7: Cylinder Head Bolt Tightening Sequence  
(Maxima, Pathfinder & Pickup)  
Courtesy of Nissan Motor Co., U.S.A.

Removal (300ZX)

1) Release fuel system pressure. See FUEL PRESSURE RELEASE under REMOVAL & INSTALLATION. Position No. 1 piston at TDC of compression stroke. Ensure timing marks are aligned.

2) Disconnect negative battery cable. Drain cooling system. Label and disconnect all wiring and vacuum hoses affecting intake collector removal. Remove intake manifold collector.

3) Remove rocker arm covers. Remove timing belt. See TIMING BELT under REMOVAL & INSTALLATION. Remove idler pulley and stud. Remove intake manifold. See INTAKE MANIFOLD under REMOVAL & INSTALLATION. Disconnect exhaust pipe from exhaust manifold.

4) Remove cylinder head mounting bolts in reverse order of tightening sequence. See Fig. 8. Loosen bolts in 2 or 3 steps. Remove cylinder head with exhaust manifold attached.

5) If necessary, remove exhaust manifold from cylinder head. Remove camshaft sprockets and timing belt rear cover. Remove camshaft bearing caps. Loosen bolts in 2 or 3 steps.

#### Inspection

Check cylinder head for cracks, flaws and damage. Inspect cylinder head and cylinder block mating surfaces for warpage. See CYLINDER HEAD TABLE under ENGINE SPECIFICATIONS at end of article. If warpage is beyond limit, resurface head. Replace head and/or block if machined or warped beyond service limit.

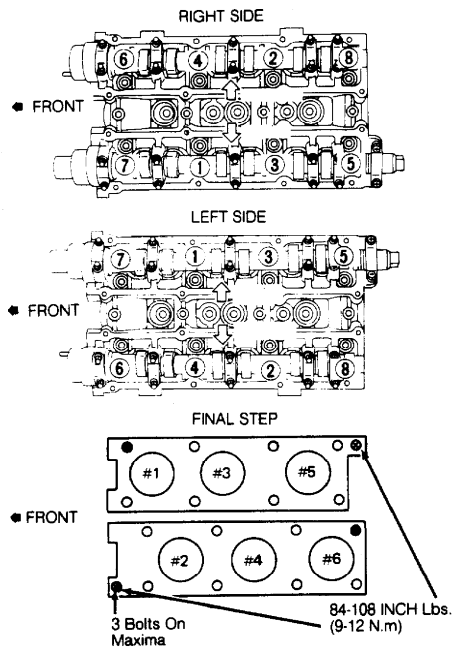
#### Installation

1) Position No. 1 piston at TDC of compression stroke. Crankshaft sprocket timing mark should line up with mark on oil pump housing. Align camshaft sprocket timing marks with marks on timing belt rear cover.

**CAUTION:** DO NOT rotate crankshaft and camshafts separately or valves could contact pistons.

2) Ensure mating surfaces of cylinder head and block are clean. Install cylinder head and gasket. Oil threads, and install head bolts. Both short head bolts are positioned at front of No. 1 cylinder and rear of No. 6 cylinder.

3) Tighten head bolts in 5 steps. See TORQUE SPECIFICATIONS TABLE at end of article. Tighten small bolts indicated in illustration. See Fig. 8. Install timing belt. See TIMING BELT under REMOVAL & INSTALLATION. To complete installation, reverse removal procedure.



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 Fig. 8: Cylinder Head Bolt Tightening Sequence (300ZX)  
 Courtesy of Nissan Motor Co., U.S.A.

## FRONT COVER OIL SEAL

### Removal

Remove timing belt. See TIMING BELT under REMOVAL & INSTALLATION. Remove crankshaft sprocket. On 300ZX models, remove oil pan. See OIL PAN under REMOVAL & INSTALLATION. On all models, remove front cover assembly. Pry or drive out old oil seal.

### Installation

Apply engine oil to new seal, and install seal using driver. To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article.

## TIMING BELT

### Removal (Maxima)

1) Raise and support vehicle. Remove right wheel and engine side cover. Drain cooling system. Remove accessory drive belts. Using puller, remove crankshaft pulley.

2) Remove upper radiator hose and water inlet hose. Remove water pump pulley. Remove A/C compressor idler pulley and bracket. Remove upper and lower timing belt front covers.

3) Set No. 1 cylinder at TDC of compression stroke. Align timing mark on left camshaft sprocket with timing mark on timing belt upper rear cover. Align timing mark on crankshaft sprocket with mark on front cover housing.

4) If necessary, temporarily install crankshaft pulley bolt so crankshaft can be rotated. Loosen timing belt tensioner nut. Release tension on belt. Remove timing belt.

### Removal (Pathfinder & Pickup)

1) Remove engine undercovers. Drain radiator. DO NOT allow coolant to contact drive belts. Remove radiator. Remove cooling fan

and water pump pulley.

2) Remove accessory drive belts. Remove spark plugs. Remove A/C compressor idler pulley and bracket. Remove distributor protector. Remove fresh air tube from rocker arm cover. Remove thermostat housing coolant hose.

3) Using puller, remove crankshaft pulley. Remove upper and lower timing belt front covers. Set No. 1 cylinder at TDC of compression stroke. If necessary, temporarily install crankshaft pulley bolt to rotate crankshaft.

4) Align timing mark on left camshaft sprocket with timing mark on timing belt upper rear cover. Align timing mark on crankshaft sprocket with mark on front cover housing. Loosen timing belt tensioner. Remove timing belt.

#### Installation (Maxima, Pathfinder & Pickup)

1) Ensure No. 1 piston is at TDC of compression stroke. Install tensioner and return spring. If return spring stud has been removed, apply thread lock sealant, and reinstall stud. Turn tensioner clockwise.

2) Temporarily tighten lock nut. Install timing belt. Align white lines on timing belt with punch marks on camshaft sprockets and crankshaft sprocket. See Fig. 9. Arrow on timing belt must be pointing toward timing belt front covers.

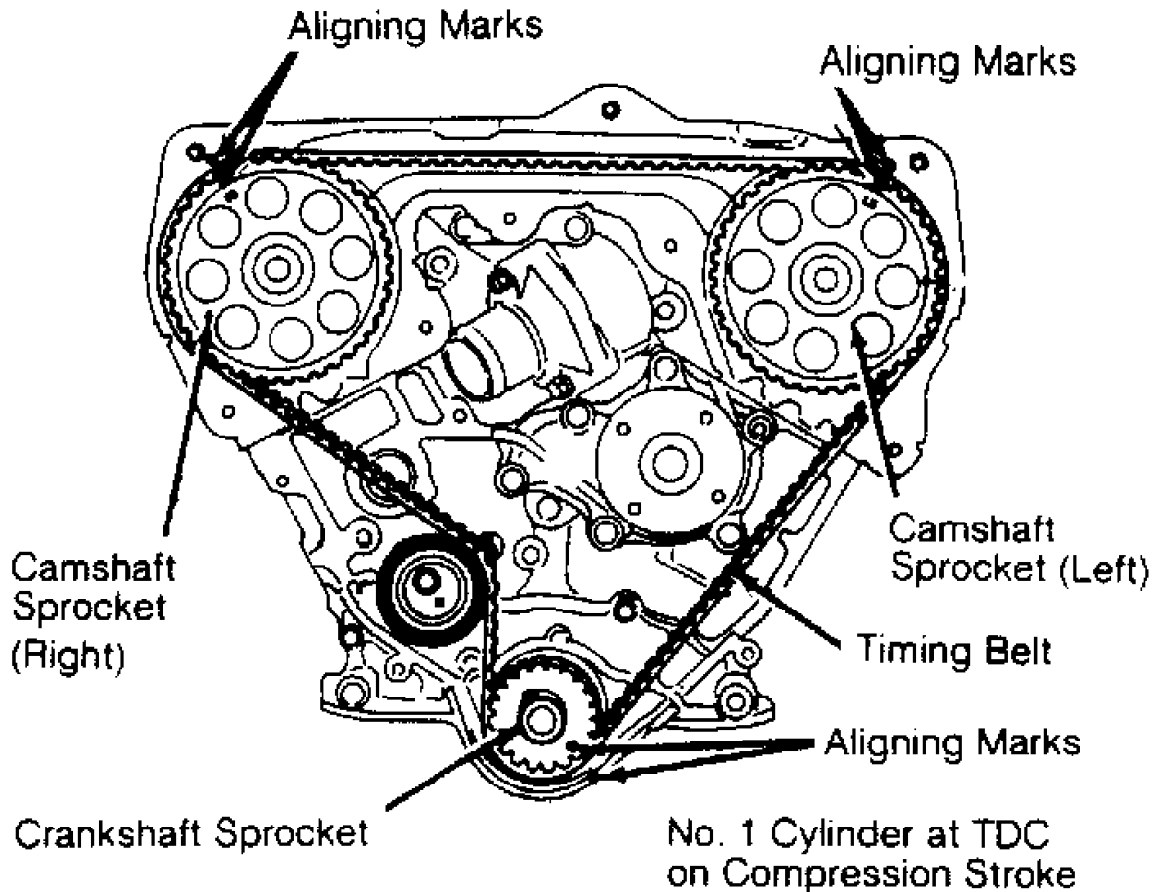


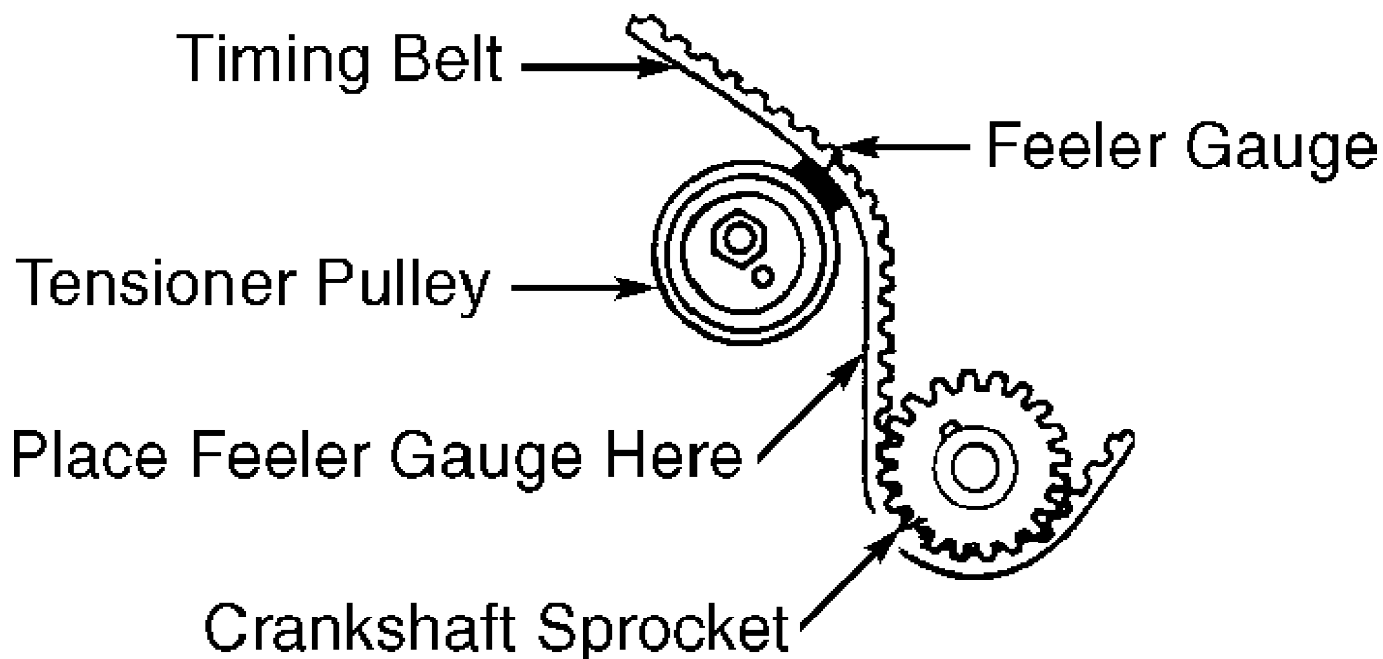
Fig. 9: Installing Timing Belt & Sprocket  
(Maxima, Pathfinder & Pickup)  
Courtesy of Nissan Motor Co., U.S.A.

3) Loosen tensioner lock nut using Allen wrench. Turn

tensioner clockwise 70-80 degrees. Temporarily tighten lock nut. Turn crankshaft clockwise 2-3 revolutions.

4) Return to TDC of compression stroke. Using Push/Pull Gauge (J-38387), apply 22 lbs. (10.0 kg) pressure to timing belt between right camshaft sprocket and tensioner. Use wrench to hold tensioner in position while loosening tensioner lock nut.

5) Place feeler gauge at tensioner pulley and timing belt and rotate crankshaft until feeler gauger is centered between tensioner pulley and timing belt. See Fig. 10. Tighten tensioner lock nut. See TORQUE SPECIFICATIONS TABLE at end of article. To complete installation, reverse removal procedure.



## 92A01561

Fig. 10: Adjusting Timing Belt (Maxima, Pathfinder & Pickup)  
Courtesy of Nissan Motor Co., U.S.A.

### Removal (300ZX)

1) Remove engine undercover. Drain coolant, and remove radiator. Remove accessory drive belts. Remove cooling fan and coupling. Position No. 1 piston at TDC of compression stroke.

2) Remove starter. Lock flywheel/flexplate to prevent crankshaft from rotating. Using puller, remove crankshaft pulley. Remove water inlet and outlet hoses. Remove timing belt front covers.

3) Install a stopper bolt into timing belt tensioner arm to maintain tensioner position. Ensure No. 1 cylinder is at TDC of compression stroke. Remove timing belt tensioner and timing belt.

### Inspection

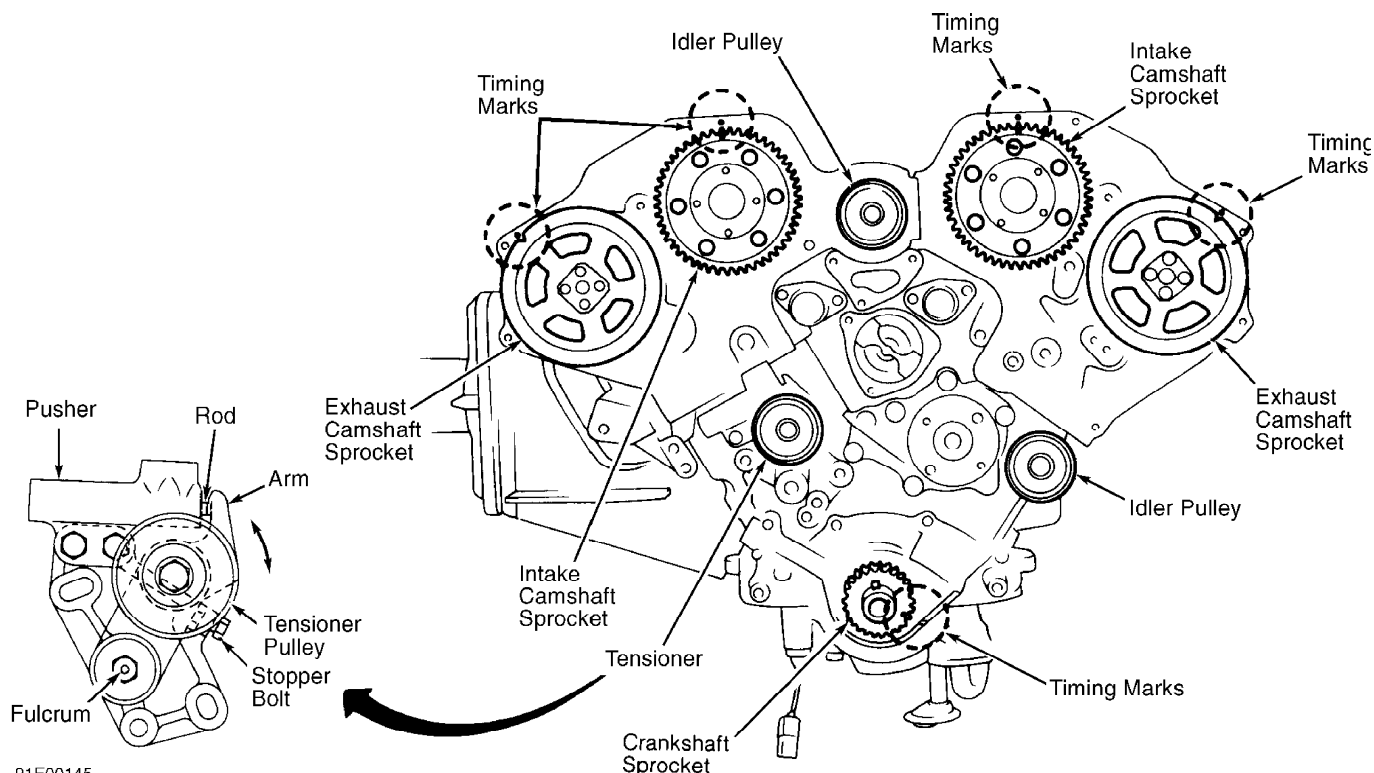
Inspect timing belt for cracks, wear and oil/coolant saturation. Inspect tensioner for oil leaks, and replace if necessary.

### Installation

1) Remove spark plugs. Ensure No. 1 piston is at TDC of compression stroke. Align timing marks on camshaft sprockets with timing marks of timing belt rear cover.

2) Align crankshaft sprocket timing mark with mark on front

cover housing. See Fig. 11. Check clearance between tensioner arm and pusher rod. Initial clearance should be set at .016" (.4 mm). Place tensioner in vise to adjust (if necessary). Install stopper bolt in tensioner when adjustment is correct.



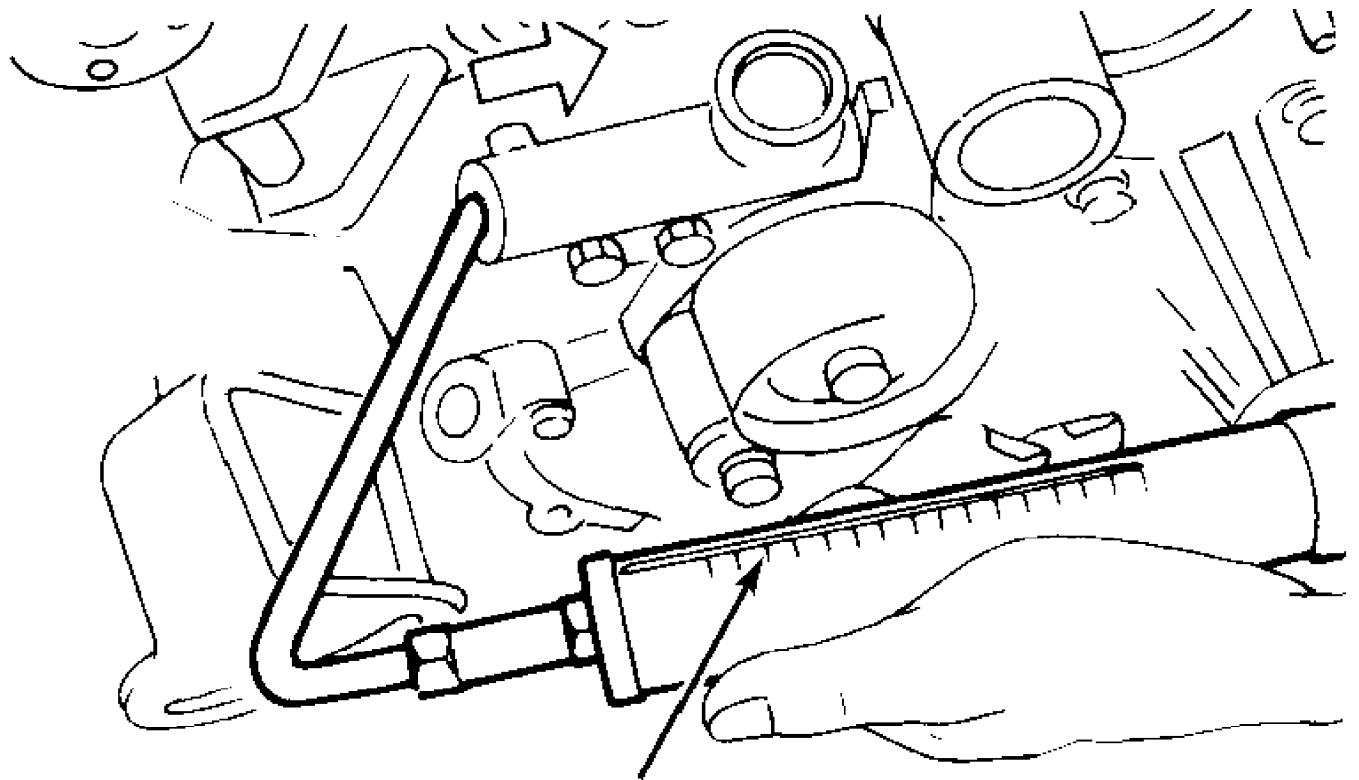
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 Fig. 11: Installing Timing Belt & Tensioner (300ZX)  
 Courtesy of Nissan Motor Co., U.S.A.

3) Install tensioner on engine, and hand-tighten nut and bolts. Install timing belt. Push tensioner gently toward timing belt to prevent belt from slipping (excessive pressure will overtighten belt). Maintain light pressure on tensioner.

4) Turn crankshaft clockwise 10 degrees, and tighten tensioner bolts and nut. See TORQUE SPECIFICATIONS TABLE at end of article. Turn crankshaft 120 degrees counterclockwise, and then turn clockwise to TDC of No. 1 cylinder compression stroke.

5) Loosen tensioner nut and bolts 1/2 turn and position tensioner as far back as possible. Using Push/Pull Gauge (J-38387), apply 13.2 lbs. (6.0 kg) pressure to end of pusher. See Fig. 12. Retighten tensioner nut and bolts. See TORQUE SPECIFICATIONS TABLE.

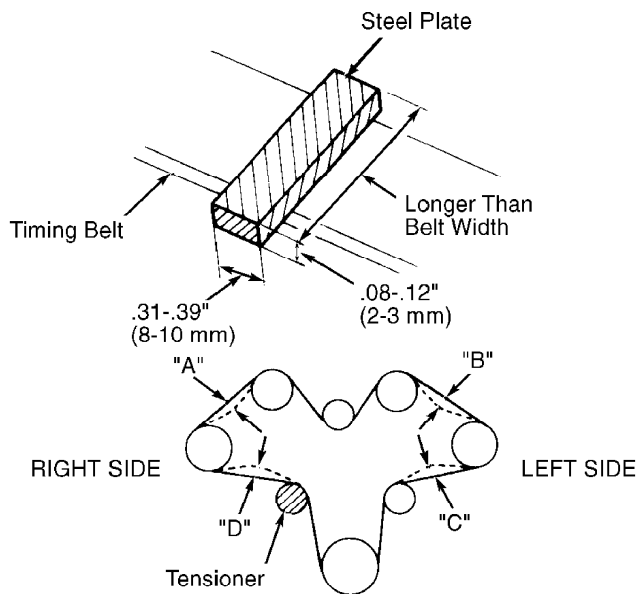
6) Turn crankshaft 120 degrees clockwise, and then turn crankshaft 120 degrees counterclockwise, returning to TDC of No. 1 cylinder compression stroke. Fabricate a small steel plate. See Fig. 13. Set plate at each position shown ("A", "B", "C" and "D").



## Push/Pull Gauge

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Fig. 12: Adjusting Timing Belt Tensioner (300ZX)  
 Courtesy of Nissan Motor Co., U.S.A.



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 Fig. 13: Checking Timing Belt Deflection (300ZX)  
 Courtesy of Nissan Motor Co., U.S.A.

7) Using push/pull gauge, apply 11 lbs. (5 kg) of pressure.  
 Measure and record timing belt deflection in each position. Divide sum

of 4 measurements ("A" + "B" + "C" + "D") by 4 to obtain average.

8) Average timing belt deflection should be .24-.28" (6-7 mm). If deflection is not as specified, repeat steps 4)-7). If timing belt deflection is excessive, amount of pushing force applied in step 5) may be increased.

9) Remove tensioner stopper bolt. After 5 minutes, ensure clearance between pusher rod and tensioner arm is .138-.205" (3.5-5.2 mm). Check for slippage or misplacement of timing belt at each sprocket. Install timing belt covers. To complete installation, reverse removal procedure.

## ROCKER ARMS

### Removal

Remove components as necessary to access rocker arm covers. Remove rocker arm covers. Loosen rocker arm bolts in 2-3 steps. Remove rocker arms and rocker arm shafts, and mark for reassembly position and direction of installation.

NOTE: If servicing hydraulic lifters, secure lifters in lifter guide using wire, and remove as an assembly. Keep hydraulic lifters upright. DO NOT allow lifters to lie on side as air may enter lifter.

### Inspection

1) Check rocker arms and rocker arm shafts for scratches, seizure and wear. Measure outer diameter of rocker arm shaft and inner diameter of rocker arms. See VALVE TRAIN OVERHAUL.

2) Check hydraulic lifters and lifter guide bore for scratches, seizure and wear. Measure outer diameter of hydraulic lifter and inner diameter of lifter guide. See VALVE LIFTERS TABLE under ENGINE SPECIFICATIONS at end of article. If not within specification, replace as necessary.

### Installation

1) Install hydraulic lifters in original positions in lifter guide (if removed), and secure using wire. Install hydraulic lifters and guide assembly. Place rocker arms on rocker arm shaft in original position.

2) Install rocker arm shaft assembly in original position and direction. Hand-tighten bolts. Position No. 1 piston at TDC of compression stroke. Tighten rocker arm shaft bolts for cylinders No. 2, 4 and 6 to specification. See TORQUE SPECIFICATIONS TABLE at end of article.

3) Set No. 4 cylinder at TDC on compression stroke. Tighten rocker arm shaft bolts for cylinders No. 1, 3 and 5 to specification. See TORQUE SPECIFICATIONS TABLE. To complete installation, reverse removal procedure.

## CAMSHAFT

### Removal (Maxima, Pathfinder & Pickup)

1) Release fuel system pressure. See FUEL PRESSURE RELEASE under REMOVAL & INSTALLATION. Remove cylinder head. See CYLINDER HEAD under REMOVAL & INSTALLATION. Remove rocker arm shafts with rocker arms. See ROCKER ARMS under REMOVAL & INSTALLATION.

2) Secure hydraulic valve lifters using wire to prevent lifters from dropping from lifter guide. If lifters are removed from lifter guide, install in original bore. Remove lifter guide. Remove camshaft from front of each head.

### Inspection

Inspect camshaft journals for damage and wear. See Fig. 14.



Replace camshaft if not within specifications. See CAMSHAFT TABLE under ENGINE SPECIFICATIONS at end of article. Check camshaft end play. If not within specification, replace locating plate.

#### Installation

Carefully install camshafts in heads. Install camshaft locating plate with oblong groove of plate facing front of head. Install lifters and rocker arm assemblies. To complete installation, reverse removal procedure.

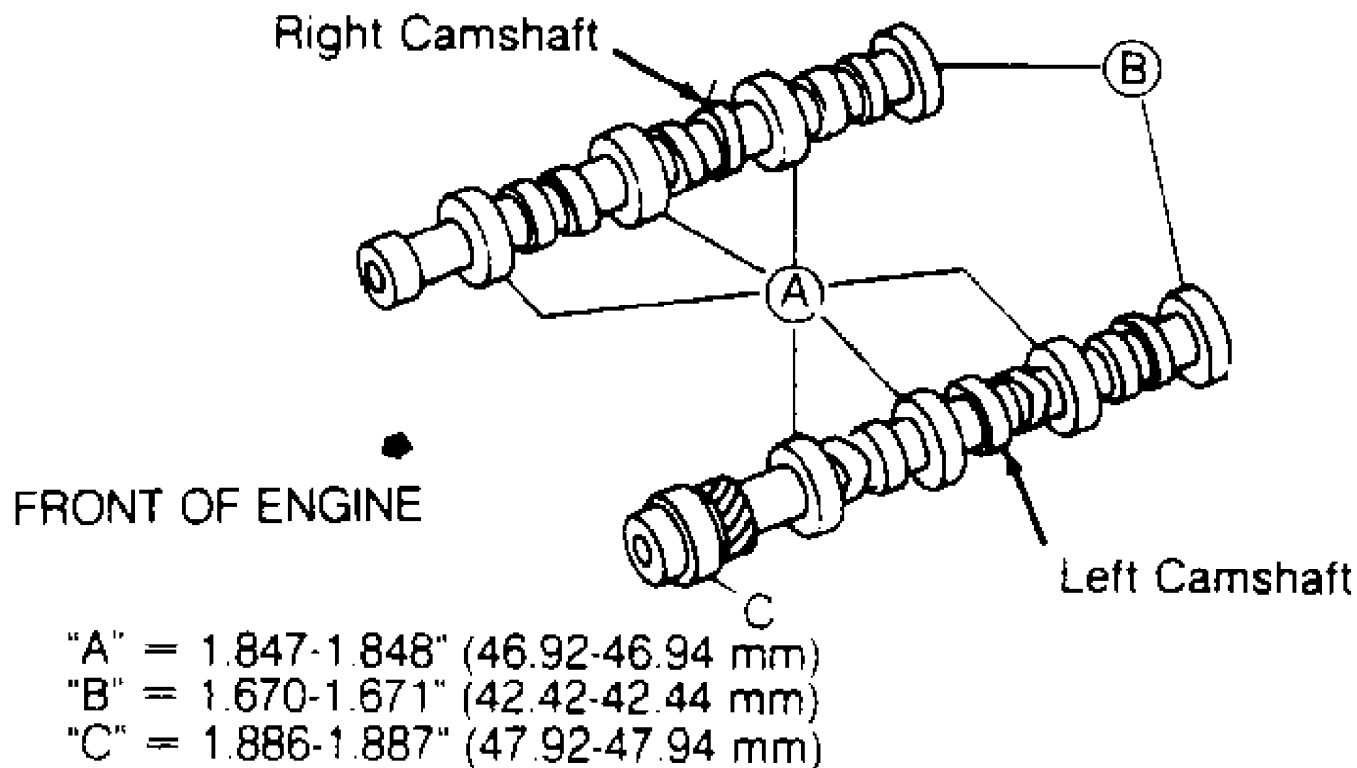


Fig. 14: Measuring Camshaft Bearing Journals Maxima, Pathfinder & P/U  
Courtesy of Nissan Motor Co., U.S.A.

#### Removal (300ZX)

1) Release fuel system pressure. See FUEL PRESSURE RELEASE under REMOVAL & INSTALLATION. Remove cylinder head. See CYLINDER HEAD under REMOVAL & INSTALLATION. Remove exhaust manifold from cylinder head. Remove camshaft sprockets.

2) Remove timing belt rear cover. Remove cam bearing caps. Loosen bolts in 2-3 steps. Remove camshaft, seals and hydraulic lifters. Tag hydraulic lifters for installation reference.

#### Inspection

Check camshaft journal runout, lobe height and journal clearance. See CAMSHAFT TABLE under ENGINE SPECIFICATIONS at end of article. Replace camshaft and/or cylinder head if not within specifications.

#### Installation

1) Install hydraulic lifters. Left exhaust camshaft has splines for crank angle sensor. Carefully install camshafts in heads with knockpins at top of camshaft, centered between camshaft bearing cap bolt holes.

2) Using liquid gasket, coat cylinder head groove for valve timing control solenoid. Install valve timing control solenoid. Install camshaft bearing caps.

3) Apply liquid gasket to front mating edge of front bearing caps. DO NOT allow liquid gasket to contact camshaft bearing surfaces. Tighten bearing caps in 2-3 steps to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Apply oil to new oil seal lip, and install in head. To complete installation, reverse removal procedure.

### REAR CRANKSHAFT OIL SEAL

#### Removal

Remove transaxle/transmission and flywheel/flexplate. Remove retainer if necessary. Remove seal from rear oil seal retainer.

#### Installation

Lubricate new oil seal. Install seal into retainer using seal driver. To complete installation, reverse removal procedure.

### WATER PUMP

#### Removal

1) Drain cooling system. Remove radiator shroud and fan. Remove fan belts and water pump pulley. Remove water inlet (if necessary).

2) Remove crankshaft pulley. Remove timing belt cover. Remove mounting bolts and water pump.

#### Installation

To install, reverse removal procedure. Pressure check system for leaks after installation.

NOTE: For additional information on cooling systems, see ELECT FANS & SYSTEM SPECS article in the ENGINE COOLING Section.

### OIL PAN

#### Removal (Maxima)

Raise vehicle. Drain engine oil. Support engine at crank pulley. Disconnect engine mounts. Disconnect exhaust pipe from exhaust manifolds. Remove crossmember. Remove oil pan.

#### Removal (Pathfinder & Pickup - 2WD)

Raise vehicle. Remove engine undercover. Drain engine oil. Disconnect front stabilizer bar from suspension crossmember. Remove suspension crossmember. Disconnect idler arm from frame. Remove starter motor. Remove brackets and supports as necessary for clearance. Remove oil pan.

#### Removal (Pathfinder & Pickup - 4WD)

1) Raise vehicle. Remove engine undercover. Drain engine oil. Disconnect front drive shaft from differential. Remove front drive shaft retaining bolts.

2) Support front differential, and remove differential support crossmember. Remove front differential. Remove front

differential right front mounting bracket.

3) Disconnect idler arm from frame. Remove starter motor. Disconnect transmission-to-crossmember mount. Disconnect engine mounts. Raise engine. Remove oil pan.

#### Removal (300ZX)

1) Raise vehicle. Drain engine oil. Remove engine undercover. Remove oil filter and bracket. Remove right and left rear engine brackets.

2) Disconnect A/C hose clamps at front crossmember. Position A/C hose aside. Disconnect front stabilizer bar from front suspension crossmember. Disconnect steering shaft from steering gear housing. Disconnect tension rods from lower control arms.

3) Support front suspension crossmember. Remove engine mount bolts. Remove bolts, and slowly lower suspension crossmember. Raise engine. Remove oil pan.

#### Installation (All Models)

Apply liquid gasket sealer to pan surface, rear oil seal retainer gasket and oil pump gasket. To install, reverse removal procedure. Tighten oil pan bolts in sequence. See Fig. 15. See TORQUE SPECIFICATIONS TABLE at end of article.

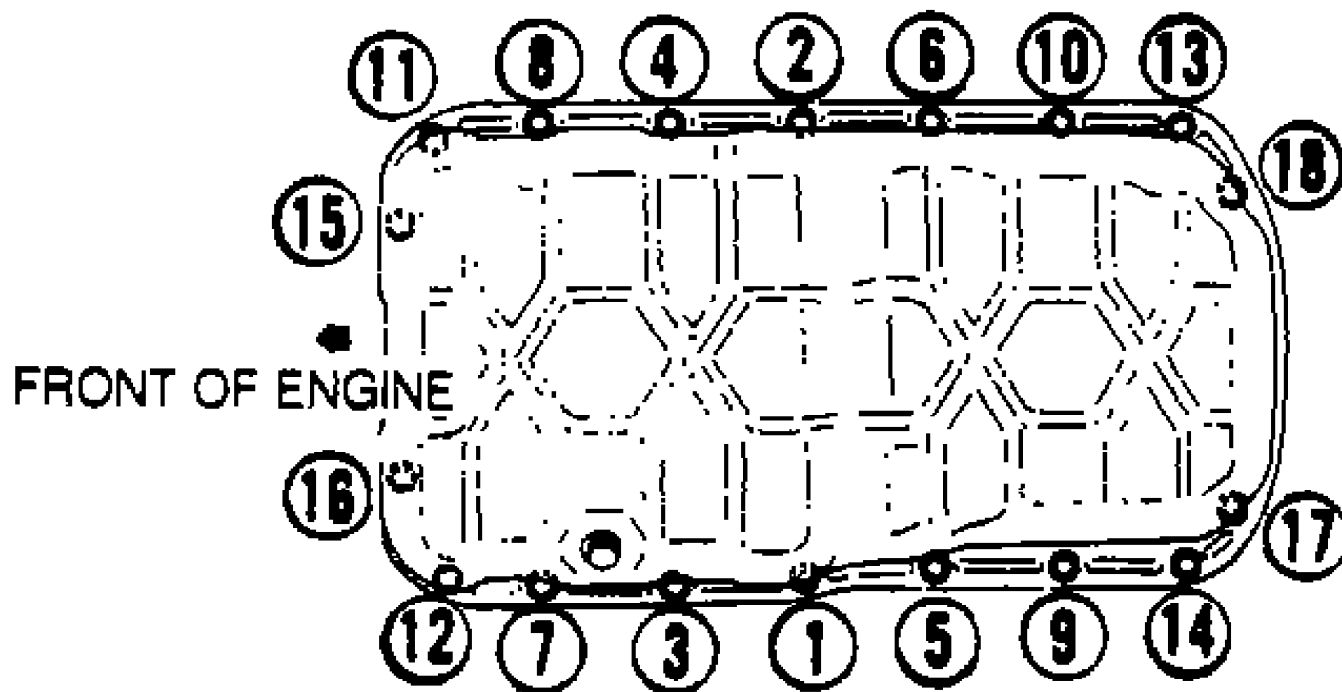


Fig. 15: Tightening Oil Pan Bolts in Sequence  
Courtesy of Nissan Motor Co., U.S.A.

## CYLINDER HEAD OVERHAUL

### CYLINDER HEAD

1) Remove cylinder head. See CYLINDER HEAD under REMOVAL & INSTALLATION. Remove valves using Valve Spring Compressor (J-33986).

Keep disassembled parts in order for reassembly. Mark parts for reassembly reference.

2) Clean cylinder head gasket mating surfaces. Using straightedge and feeler gauge, check cylinder head for warpage. If not within specification, resurface or replace as necessary. See CYLINDER HEAD TABLE under ENGINE SPECIFICATIONS at end of article.

3) Resurface limit of cylinder head is determined by total for both cylinder block and cylinder head. Maximum resurface limit of cylinder head and/or cylinder block combined is .008" (.20 mm).

## VALVE SPRINGS

Check valve springs for squareness. Measure free length and height of valve springs at specified pressure. See VALVES & VALVE SPRINGS TABLE under ENGINE SPECIFICATIONS at end of article. If measurements are not within specifications, replace springs.

NOTE: Outer valve spring has an uneven pitch design. Install spring with its narrow pitch side toward cylinder head.

## VALVE STEM OIL SEALS

Install spring seat. Using Valve Stem Oil Seal Installer (KV101107501), seat new oil seal onto valve guides. Install lubricated valve, springs, retainer and keepers.

## VALVE GUIDES

1) Heat cylinder head to 302-320°F (150-160°C). Using press or hammer and drift, force guide out of cylinder head from combustion chamber side.

2) With head at room temperature, ream valve guide bore to specification. See CYLINDER HEAD TABLE under ENGINE SPECIFICATIONS at end of article. Reheat head. Press service guide into cylinder head.

3) Guide should protrude from spring side of cylinder head .594-.602" (15.1-15.3 mm) on 300ZX and .520-.528" (13.2-13.4 mm) on Maxima, Pathfinder and Pickup. Measurement is taken from outer valve spring seat surface of cylinder head. See Fig. 16.

4) On 300ZX, ream valve guides to .2362-.2369" (6.000-6.018 mm). On Maxima, Pathfinder and Pickup, ream valve guide to .2756-.2763" (7.000-7.018 mm) for intake and .3150-.3157" (8.000-8.018 mm) for exhaust.

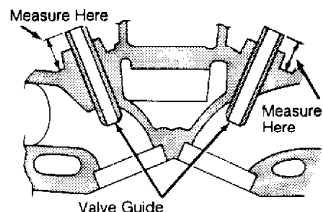


Fig. 16: Measuring Installed Valve Guide Protrusion  
Courtesy of Nissan Motor Co., U.S.A.

## VALVE SEAT

1) Repair valve guides before valve seat servicing or replacing. Bore valve seat until it collapses. Remove seat. Ream valve seat bore for .02" (.5 mm) oversize. See VALVE SEAT REPLACEMENT BORE TABLE.

2) Heat cylinder head to 302-320°F (150-160°C). Press seat in until fully seated. Grind or cut valve seat. See CYLINDER HEAD TABLE under ENGINE SPECIFICATIONS at end of article. After machining, lap valve seat with lapping compound.

#### VALVE SEAT REPLACEMENT BORE TABLE

Application	In. (mm)
Intake .....	1.7520-1.7526 (44.500-44.516)
Exhaust .....	1.4764-1.4770 (37.500-37.516)

## VALVES

Inspect valves for wear, heat damage and deformation. Valve stem end surface grinding limit is .02" (.5 mm). Inspect valve stem keeper grooves for excessive wear. Replace valves as necessary.

## VALVE TRAIN OVERHAUL

NOTE: DO NOT invert hydraulic valve lifters or air will enter lifter cavity. DO NOT disassemble lifters or change installation positions.

## ROCKER ARM SHAFT ASSEMBLY (MAXIMA, PATHFINDER & PICKUP)

1) Remove rocker arms and rocker arm shafts. See ROCKER ARMS under REMOVAL & INSTALLATION. Mark rocker arms and rocker arm shafts for reassembly position and direction of installation.

2) Rocker arm shaft diameter should be .7082-.7087" (17.988-18.000). Rocker arm inner diameter should be .7089-.7098" (18.007-18.028). If rocker arm is not within specifications, replace as necessary.

## CYLINDER BLOCK ASSEMBLY OVERHAUL

### PISTON & ROD ASSEMBLY

1) Remove rod cap with bearing half. Push piston and rod assembly out through top of block. Keep rod caps with matching connecting rods. To remove piston from connecting rod, remove snap ring from piston.

2) Heat piston in oil to 140-158°F (60-70°C). Press piston pin out of connecting rod. Ensure piston pin bore, piston pin diameter and clearance are correct. Piston, connecting rod and/or pin should be replaced if not within specification. See PISTONS, PINS & RINGS TABLE under ENGINE SPECIFICATIONS at end of article.

3) To reassemble, install new snap ring in piston. Heat piston in oil to 140-158°F (60-70°C). Assemble piston, piston pin, connecting rod and remaining snap ring. When installed, pin and rod should be centered in piston. Ensure connecting rod swings smoothly after installation.

4) Always install new snap rings inside piston pin bore. Install piston with front mark on piston toward front of engine. Oil hole in rod should be on opposite side of cylinder identification number. See Fig. 17. With piston/rod assembly installed, ensure rod is

seated on crankshaft journal.

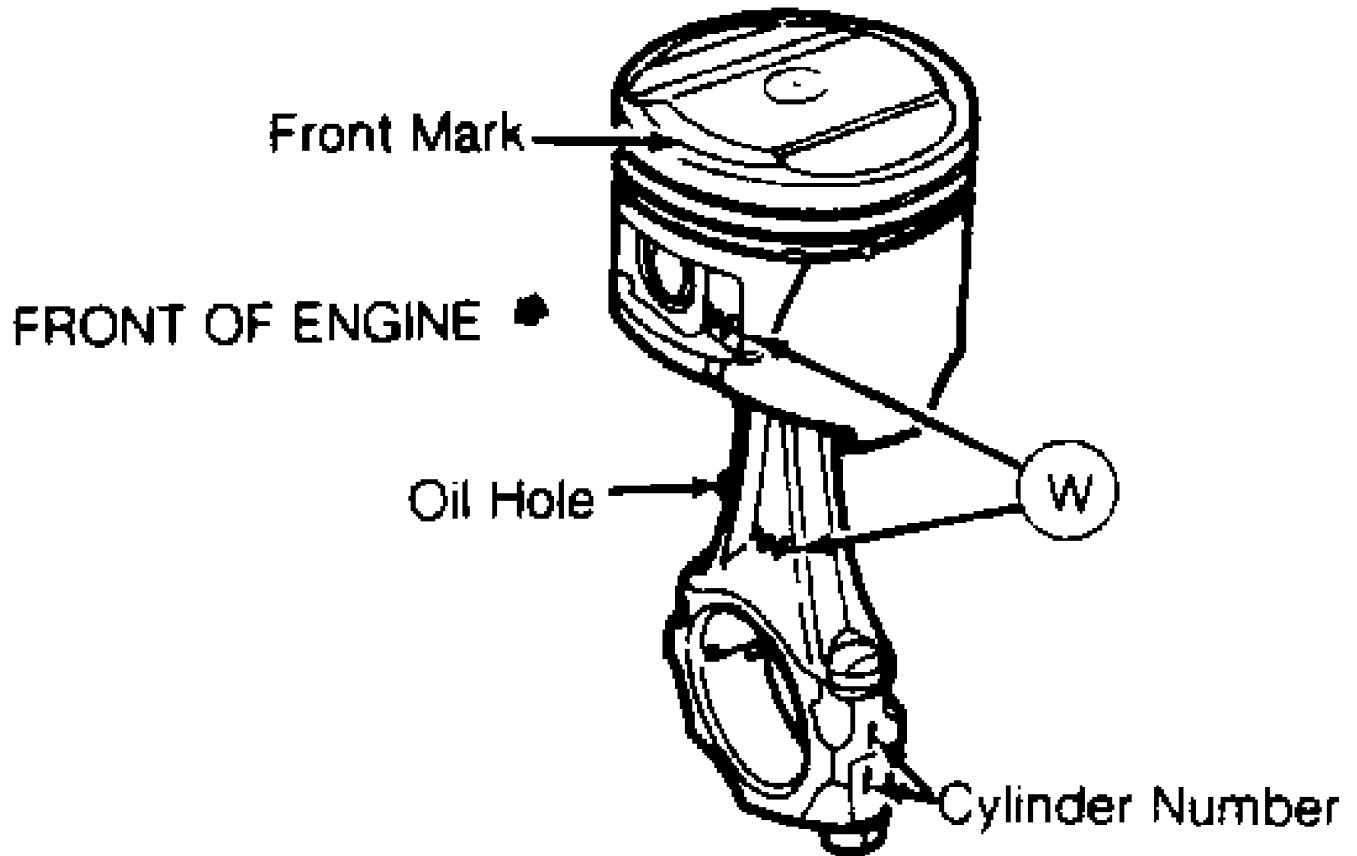


Fig. 17: Positioning Piston Assembly for Installation  
Courtesy of Nissan Motor Co., U.S.A.

### PISTON PIN BUSHING REPLACEMENT

Use proper driver to remove piston pin bushing. When installing new bushing, ensure oil holes align. After installing bushing, ream bushing for proper piston pin-to-bushing clearance. See PISTONS, PINS & RINGS TABLE under ENGINE SPECIFICATIONS at end of article.

### FITTING PISTONS

Measure cylinder bore for excessive wear, out-of-round and taper. See CYLINDER BLOCK TABLE under ENGINE SPECIFICATIONS at end of article. If a cylinder is not within specifications, bore all cylinders. Allow .0008" (.020 mm) for honing.

### PISTON RINGS

Install rings on piston. Apply oil to rings, piston and cylinder bore. Ensure ring gaps are spaced properly. See Fig. 18. Install piston and rod assembly in block.

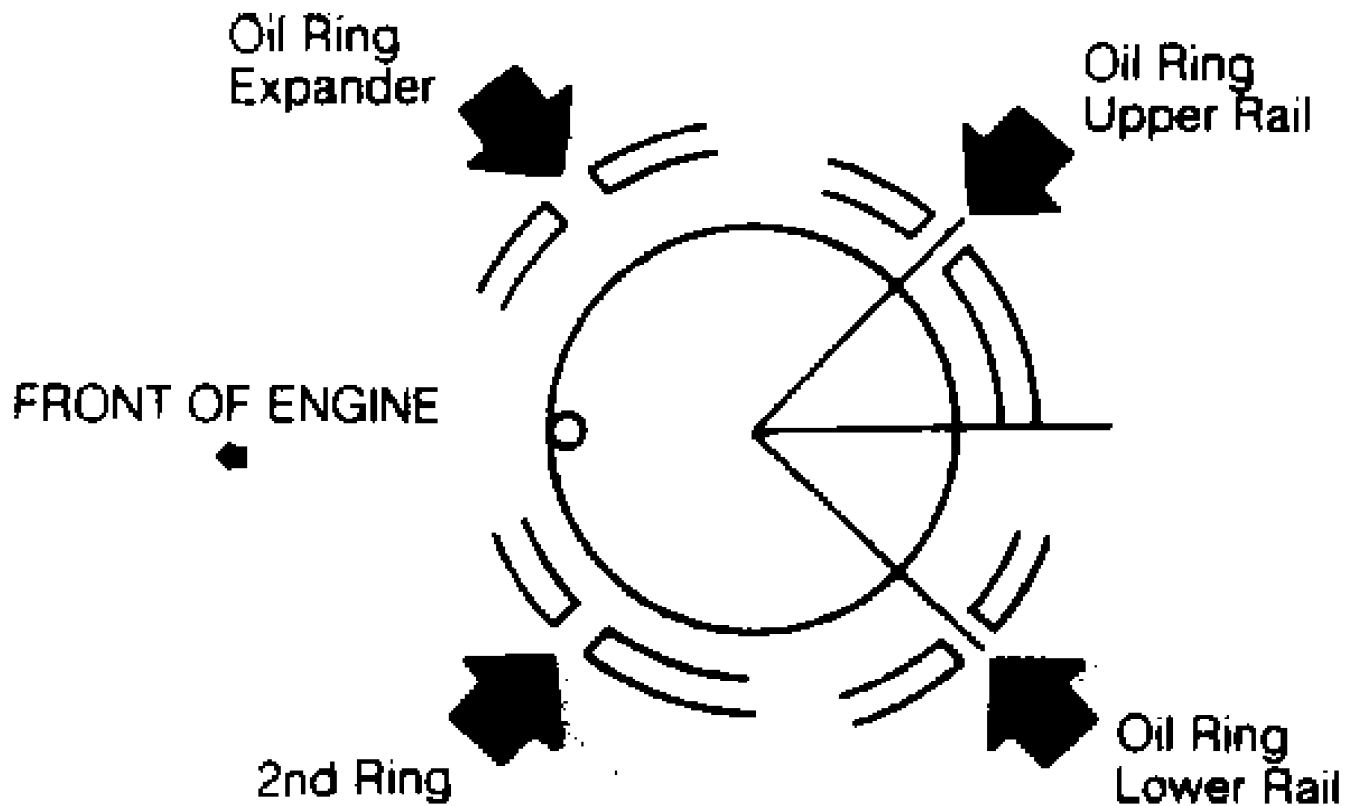


Fig. 18: Spacing Ring Gaps  
 Courtesy of Nissan Motor Co., U.S.A.

### ROD BEARINGS

1) Remove connecting rod cap with bearing half. Use Plastigage method to check clearance. If clearance is not within specification, replace bearings. See CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS TABLE under ENGINE SPECIFICATIONS at end of article.

2) If replacing bearings, determine bearing grade number. See Fig. 19. Tighten rod bearing caps evenly in 2-3 steps in sequence to specification. See TORQUE SPECIFICATIONS TABLE at end of article.

3) Check connecting rods for bend and twist using rod aligner. See CONNECTING RODS TABLE under ENGINE SPECIFICATIONS at end of article. Install piston and connecting rod with bearings on crank journal, and tighten in 2 steps. See TORQUE SPECIFICATIONS TABLE.

4) Measure rod side play. Standard side play at connecting rod big end is .008-.014" (.20-.35 mm); maximum is .016" (.41 mm). Replace or recondition rod if specifications are exceeded.

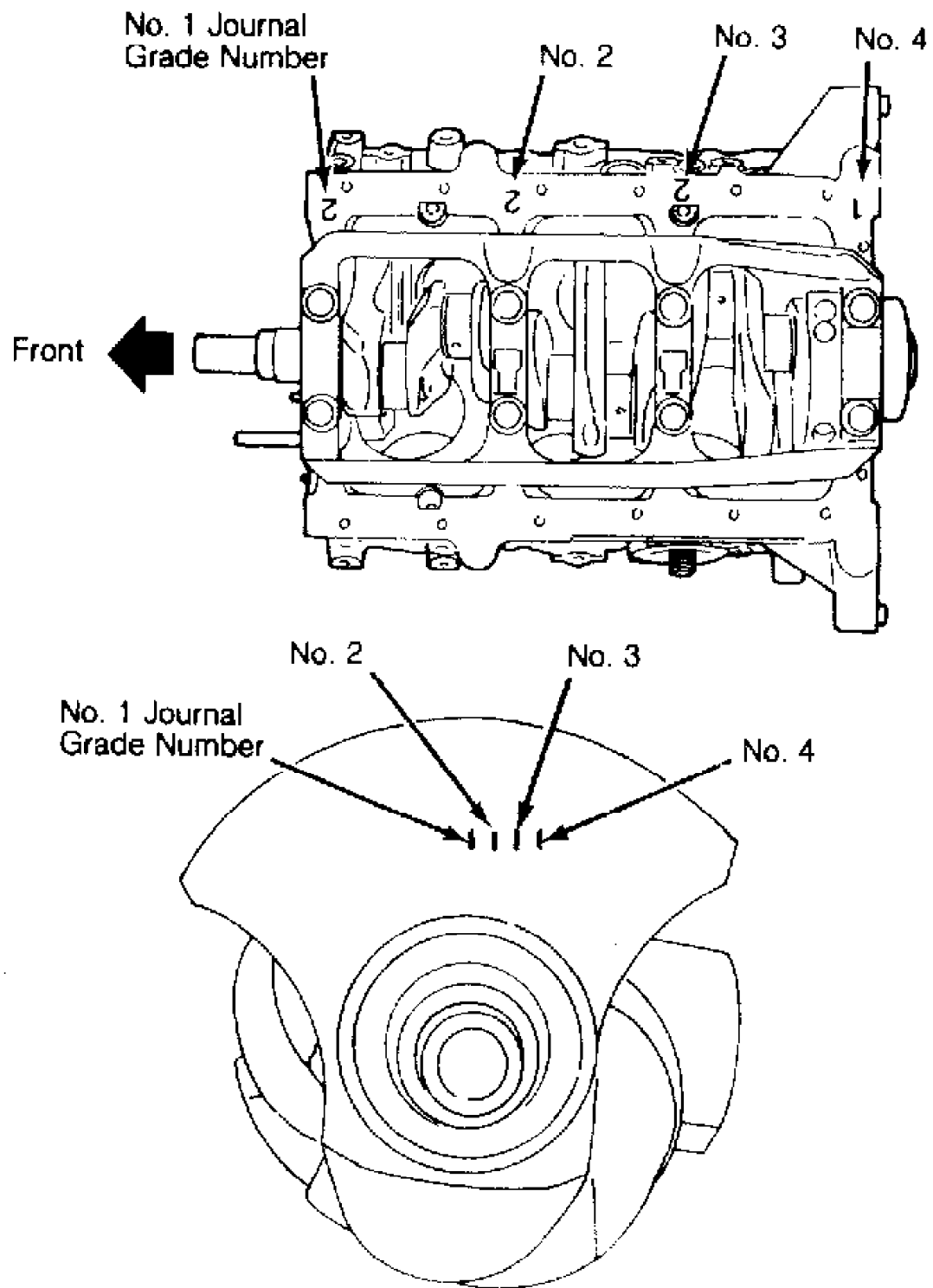


Fig. 19: Identifying Cylinder Block & Crankshaft Code Numbers  
Courtesy of Nissan Motor Co., U.S.A.

### CRANKSHAFT & MAIN BEARINGS



1) Check crankshaft main journals and connecting rod journals for damage. Check crankshaft runout and journal taper. See CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS TABLE under ENGINE SPECIFICATIONS at end of article. Repair or replace crankshaft as necessary.

2) Check bearings for scoring and wear. Replace if damaged. If replacing a standard size bearing with a standard oil clearance, use new bearing with matching number.

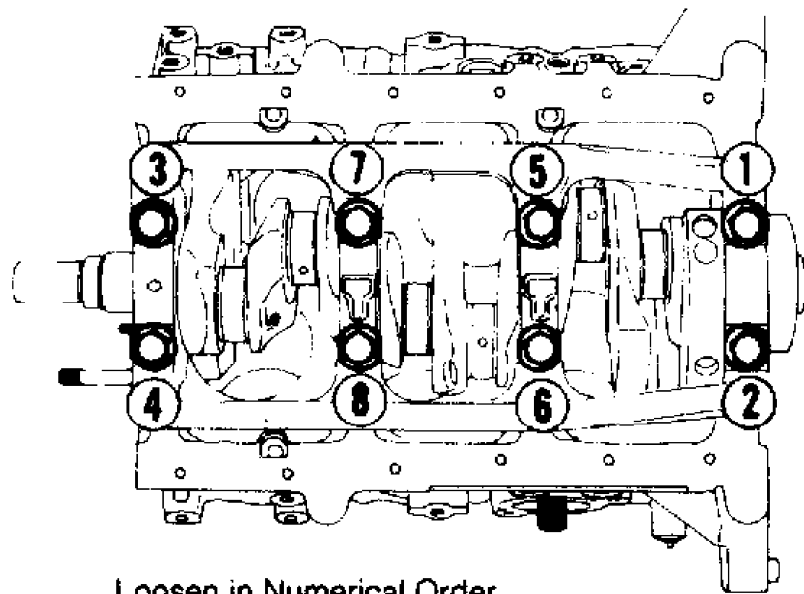
3) If number cannot be obtained, select bearing by adding numbers on crankshaft and cylinder block to arrive at number bearing needed. For example, if cylinder block main bearing bore code number is "1" and crankshaft journal code number is "2", main bearing code number will be "3". See Fig. 19 and CRANKSHAFT MAIN BEARING SPECIFICATIONS TABLE.

4) Install main bearing halves into engine block. Ensure bearings are on correct journal and all oil feed holes are clear. Journal No. 4 requires thrust bearing. Upper bearing halves are not interchangeable with lower bearing halves. Apply oil to main bearing surface.

5) Install crankshaft. Tighten main bearing caps in 2-3 steps, using reverse of removal sequence. See TORQUE SPECIFICATIONS TABLE at end of article. See Fig. 20. Ensure crankshaft rotates smoothly. To complete installation, reverse removal procedure.

CRANKSHAFT MAIN BEARING SPECIFICATIONS TABLE

Code No.	Thickness In. (mm)	ID Color
0	.0715-.0717 (1.817-1.821)	Black
1	.0717-.0719 (1.821-1.825)	Brown
2	.0719-.0720 (1.825-1.829)	Green
3	.0720-.0722 (1.829-1.833)	Yellow
4	.0722-.0723 (1.833-1.837)	Blue



Loosen in Numerical Order.

Fig. 20: Removing Main Bearing Caps in Sequence  
 Courtesy of Nissan Motor Co., U.S.A.

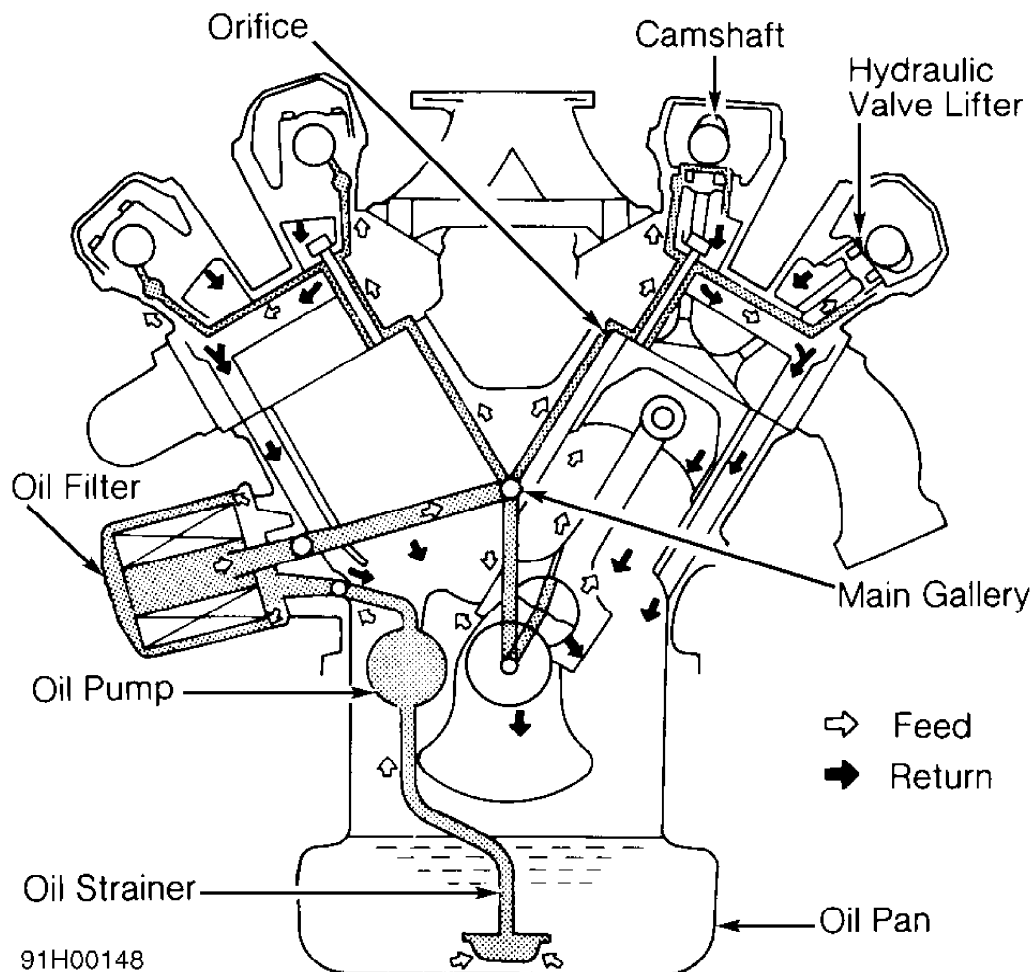
CYLINDER BLOCK

Measure cylinders for out-of-round and taper. If specification is exceeded, cylinders must be bored. See FITTING PISTONS. Maximum surface grinding limit of cylinder head plus block is .008" (.20 mm). Replace head and/or block if machined or warped beyond specification.

## ENGINE OILING LUBRICATION SYSTEM

Oil drawn from oil pan passes through a screen to oil pump. See Fig. 21. Oil is delivered to full-flow filter and main oil gallery. Main oil gallery supplies oil to crankshaft main bearings and drilled passages in crankshaft. Passages from main gallery to lifter guides supply oil to camshaft, lifters and rocker arms.

300ZX is equipped with an ECU-activated Valve Timing Control Solenoid, located on rear of intake camshafts. When signaled by ECU, valve timing control solenoid uses oil pressure to activate camshaft timing advance mechanism, located on front side of intake camshafts. Oil is supplied from main oil gallery, through cylinder head, into camshaft and through camshaft into valve timing control solenoid and advance mechanism.



91H00148

Fig. 21: Engine Oil Circuit (300ZX Shown; Others Are Similar)  
 Courtesy of Nissan Motor Co., U.S.A.

## CRANKCASE CAPACITY

See CRANKCASE CAPACITY (WITH OIL FILTER) TABLE.

CRANKCASE CAPACITY (WITH OIL FILTER) TABLE

Application	Qts. (L)
Maxima .....	4.5 (4.3)
Pathfinder & Pickup	
2WD .....	4.3 (4.0)
4WD .....	3.6 (3.4)
300ZX .....	4.4 (4.1)

## OIL PRESSURE

Oil pressure should be at least 9 psi (.6 kg/cm<sup>2</sup>) at idle and should be 53-65 psi (3.7-4.6 kg/cm<sup>2</sup>) at 3200 RPM.

## OIL PUMP

### REMOVAL & INSTALLATION

1) Drain engine oil. Remove oil pan. See OIL PAN under REMOVAL & INSTALLATION. Remove oil pump assembly. To disassemble pump, remove pump cover and gasket.

2) Remove pump gears from pump body. Remove regulator cap, valve and spring. Clean components with solvent. Inspect for wear and damage. Ensure clearances are within specifications. See appropriate OIL PUMP SPECIFICATIONS TABLE.

3) If clearances are not within specifications, replace gear set or oil pump assembly. Replace gasket, "O" ring and seal. Assemble pump in reverse order of disassembly. Fill pump housing with oil before installing in front cover.

OIL PUMP SPECIFICATIONS (MAXIMA & 300ZX) TABLE

Application	Clearance In. (mm)
Body-To-Outer Gear .....	.0043-.0079 (.11-.20)
Inner Gear-To-Crescent	
Maxima .....	.0047-.0091 (.12-.23)
300ZX .....	.0088-.0131 (.22-.33)
Outer Gear-To-Crescent .....	.0083-.0126 (.21-.32)
Housing-To-Inner Gear .....	.0020-.0035 (.05-.09)
Housing-To-Outer Gear .....	.0020-.0043 (.05-.11)

### OIL PUMP SPECIFICATIONS SPECIFICATION

OIL PUMP SPECIFICATIONS (PATHFINDER & PICKUP) TABLE

Application	Clearance In. (mm)
Inner Rotor Tip-To-Outer	
Rotor .....	Less Than .0047 (.12)
Outer Rotor-To-Body .....	.0059-.0083 (.15-.21)
Side Clearance With Gasket .....	.0016-.0031 (.04-.08)

## TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Camshaft Locating Plate	58-65 (79-88)
Camshaft Sprocket Bolt	
Maxima, Pathfinder & Pickup	58-65 (79-88)
300ZX	
Exhaust	10-14 (14-19)
Intake	90-98 (122-133)
Connecting Rod Nut	
Step 1	10-12 (14-16)
Step 2	28-33 (38-45)
Crankshaft Pulley Bolt	
Maxima, Pathfinder & Pickup	90-98 (122-133)
300ZX	134-141 (182-191)
Cylinder Head Bolt	
Maxima, Pathfinder & Pickup	
Step 1	22 (30)
Step 2	43 (58)
Step 3	Loosen All Bolts
Step 4	22 (30)
Step 5	40-47 (54-64)
300ZX(1)	
Step 1	29 (39)
Step 2	90 (122)
Step 3	Loosen All Bolts
Step 4	30 (41)
Step 5	90 (122)
Final Step	(2)
Exhaust Manifold Bolt/Nut	
Maxima, Pathfinder & Pickup	13-16 (18-22)
300ZX	17-20 (23-27)
Flywheel/Flexplate Bolt	
Maxima & 300ZX	61-69 (83-94)
Pathfinder & Pickup	72-80 (98-108)
Intake Manifold Bolt	12-14 (16-19)
Intake Manifold Nut	17-20 (23-27)
Main Bearing Cap Bolt	67-74 (91-100)
Oil Pump-To-Engine Bolt (Long)	
Maxima, Pathfinder & Pickup	9-12 (12-16)
300ZX	16-22 (22-30)
Rocker Arm Bolt	13-16 (18-22)
Timing Belt Tensioner Nut/Bolt	
Maxima, Pathfinder & Pickup	32-43 (43-58)
300ZX	12-15 (16-20)
Water Pump Bolt	
Maxima, Pathfinder & Pickup	12-15 (16-20)
300ZX	12-14 (16-19)

INCH Lbs. (N.m)

Cylinder Head Bolt (Small)	84-108 (9-12)
Cylinder Head Cover	27 (3)
Oil Pan Bolt	64-70 (7-8)
Oil Pump Cover Bolt	35-43 (4-5)
Oil Pump-To-Engine Bolt (Short)	
Maxima, Pathfinder & Pickup	56 (6)
300ZX	64 (7)
Rear Oil Seal Retainer Bolt	56 (6)
Timing Belt Cover	27-43 (3-5)

(1) - DO NOT tighten small cylinder head bolts until

- final step.  
 (2) - Tighten small cylinder head bolts to 84-108 INCH  
 Lbs. (9-12 N.m). See Fig. 8.

## ENGINE SPECIFICATIONS

### GENERAL ENGINE SPECIFICATIONS

GENERAL SPECIFICATIONS TABLE

Application	Specification
Displacement	180.6 Cu. In. (3.0L)
Bore	3.43" (87 mm)
Stroke	3.27" (83 mm)
Compression Pressure	
Maxima, Pathfinder & Pickup	128-173 psi (9.0-12.2 kg/cm <sup>2</sup> )
300ZX	
Non-Turbo	142-186 psi (10.0-13.1 kg/cm <sup>2</sup> )
Turbo	128-171 psi (9.0-12.0 kg/cm <sup>2</sup> )
Compression Ratio	
Maxima, Pathfinder & Pickup	9.0:1
300ZX	
Non-Turbo	10.5:1
Turbo	8.5:1
Fuel System	PFI
HP@RPM	
Maxima	160@5200
Pathfinder & Pickup	153@4800
300ZX	
Non-Turbo	222@5200
Turbo	300@5500
Torque Ft. Lbs.@RPM	
Maxima	181@2800
Pathfinder & Pickup	180@4000
300ZX	(1)

(1) - Information is not available from manufacturer.

### CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS SPECIFICATION

CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS TABLE

Application	In. (mm)
Crankshaft	
End Play	.002-.007 (.05-.18)
Runout	.004 (.10)
Main Bearings	
Journal Diameter	
Grade 0	2.4790-2.4793 (62.967-62.975)
Grade 1	2.4787-2.4790 (62.959-62.967)
Grade 2	2.4784-2.4787 (62.951-62.959)
Journal Out-Of-Round	.0002 (.005)
Journal Taper	.0002 (.005)
Oil Clearance	.0011-.0022 (.028-.056)
Connecting Rod Bearings	
Journal Diameter	
Maxima, Pathfinder	

& Pickup	.....	1.9667-1.9675	(49.955-49.974)
300ZX			
Grade 0	.....	1.9672-1.9675	(49.968-49.974)
Grade 1	.....	1.9670-1.9672	(49.962-49.968)
Grade 2	.....	1.9667-1.9670	(49.955-49.962)
Journal Out-Of-Round	.....	.0008	(.020)
Journal Taper	.....	.0008	(.020)
Oil Clearance			
Maxima, Pathfinder			
& Pickup	.....	.0006-.0021	(.015-.053)
300ZX	.....	.0011-.0035	(.028-.090)

## CONNECTING RODS SPECIFICATION

### CONNECTING RODS TABLE

Application	In. (mm)
Bore Diameter	
Pin Bore	
Maxima, Pathfinder	
& Pickup	..... .8261-.8265 (20.982-20.993)
300ZX	..... .8661-.8666 (22.000-22.012)
Crankpin Bore	..... 2.0866-2.0871 (53.000-53.012)
Center-To-Center Length	..... 6.067-6.071 (154.10-154.20)
Maximum Bend(1)	
Pathfinder, Pickup & 300ZX	..... .006 (.15)
Maxima	..... .004 (.10)
Maximum Twist(1)	
Pathfinder, Pickup & 300ZX	..... .012 (.30)
Maxima	..... .004 (.10)
Side Play	..... .008-.014 (.20-.35)

(1) - Per 3.94" (100 mm) length.

## PISTONS, PINS & RINGS SPECIFICATION

### PISTONS, PINS & RINGS TABLE

Application	In. (mm)
Pistons	
Clearance	
Maxima & 300ZX	
Non-Turbo	..... .0006-.0014 (.015-.036)
Pathfinder, Pickup &	
300ZX Turbo	..... .0010-.0018 (.025-.046)
Diameter (1)	
Maxima, Pathfinder & Pickup	
Grade No. 1	..... 3.4238-3.4242 (86.965-86.975)
Grade No. 2	..... 3.4242-3.4246 (86.975-86.985)
Grade No. 3	..... 3.4246-3.4250 (86.985-86.995)
.0098 (.25)	
Oversize	..... 3.4337-3.4356 (87.215-87.265)
.0197 (.50)	
Oversize	..... 3.4435-3.4455 (87.465-87.515)
300ZX	
Grade No. 1	..... 3.4242-3.4246 (86.975-86.985)
Grade No. 2	..... 3.4246-3.4250 (86.985-86.995)
Grade No. 3	..... 3.4250-3.4254 (86.995-87.005)
.0098 (.25)	
Oversize	..... 3.4340-3.4360 (87.225-87.275)

.0197 (.50)		
Oversize .....	3.4439-3.4459	(87.475-87.525)
Pins		
Diameter		
Maxima, Pathfinder		
& Pickup .....	.8256-.8261	(20.970-20.983)
300ZX .....	.8656-.8661	(21.987-21.999)
Piston Fit (2)		
Maxima, Pathfinder		
& Pickup .....	.0002-.0003	(.005-.008)
300ZX .....	0-.0002	(0-.005)
Rod Fit .....	.0002-0007	(.005-.017)
Rings		
No. 1		
End Gap		
Maxima, Pathfinder		
& Pickup .....	.008-.021	(.20-.53)
300ZX .....	.008-.015	(.20-.38)
Side Clearance .....	.0016-.0069	(.041-.174)
No. 2		
End Gap		
Maxima, Pathfinder		
& Pickup .....	.007-.021	(.18-.53)
300ZX .....	.020-.030	(.51-.76)
Side Clearance .....	.0012-.0065	(.030-.164)
No. 3 (Oil)		
End Gap .....	.008-.069	(.20-1.76 )

- (1) - Pistons are available in .010" (.25 mm) and .020" (.50 mm) oversize.  
(2) - Interference fit or negative clearance.

## CYLINDER BLOCK SPECIFICATION

CYLINDER BLOCK TABLE

Application	In. (mm)
Cylinder Bore	
Standard Diameter	
Grade 1 .....	3.4252-3.4256 (87.000-87.010)
Grade 2 .....	3.4256-3.4260 (87.010-87.020)
Grade 3 .....	3.4260-3.4264 (87.020-87.030)
Maximum Taper .....	.0006 (.015)
Maximum Out-Of-Round .....	.0006 (.015)
Maximum Deck Warpage (1) .....	.004 (.10)

- (1) - Maximum resurfacing limit of cylinder block and cylinder head combined is .008" (.20).

## VALVES & VALVE SPRINGS SPECIFICATION

VALVES & VALVE SPRINGS TABLE

Application	Specification
Intake Valves	
Face Angle .....	45°15'-45°45'
Head Diameter	
Maxima, Pathfinder & Pickup .....	1.654" (42.00 mm)
300ZX .....	1.339" (34.00 mm)

Minimum Margin .....	.020"	(.51 mm)
Minimum Refinish Length		
Maxima, Pathfinder & Pickup .....	4.933"	(125.30 mm)
300ZX .....	4.059"	(103.10 mm)
Stem Diameter		
Maxima, Pathfinder & Pickup .....	.2742"	(6.965 mm)
300ZX .....	.2348"	(5.964 mm)
Valve Tip Maximum Refinish .....	.008"	(.20 mm)
Exhaust Valves		
Face Angle .....	45°15'–45°45'	
Head Diameter		
Maxima, Pathfinder & Pickup .....	1.378"	(35.00 mm)
300ZX .....	1.161"	(29.50 mm)
Minimum Margin .....	.020"	(.51 mm)
Minimum Refinish Length		
Maxima, Pathfinder & Pickup .....	4.89"	(124.2 mm)
300ZX .....	4.08"	(103.6 mm)
Stem Diameter		
Maxima, Pathfinder & Pickup .....	.3136"	(7.965 mm)
300ZX .....	.2341"	(5.945 mm)
Valve Tip Maximum Refinish .....	.008"	(.20 mm)
Valve Springs		
Free Length		
Maxima, Pathfinder & Pickup		
Inner .....	1.736"	(44.10 mm)
Outer .....	2.016"	(51.20 mm)
300ZX .....	1.697"	(43.10 mm)
Out-Of-Square		
Maxima, Pathfinder & Pickup		
Inner .....	.075"	(1.90 mm)
Outer .....	.087"	(2.20 mm)
300ZX .....	.071"	(1.80 mm)
		Lbs.@In. (kg@mm)
Pressure		
Maxima, Pathfinder & Pickup		
Inner .....	57@.984	(26@25)
Outer .....	117@1.181	(53@30)
300ZX .....	102@1.043	(46@26.5)

## CYLINDER HEAD SPECIFICATION

### CYLINDER HEAD TABLE

Application	Specification
Cylinder Head Height	
Maxima, Pathfinder & Pickup .....	4.205–4.220" (106.80–107.20 mm)
300ZX .....	5.429–5.437" (1.28–1.48 mm)
Maximum Warpage (1) .....	.004" (.10 mm)
Valve Seats	
Seat Angle .....	45°
Seat Width	
Exhaust .....	.067" (1.70 mm)
Intake .....	.069" (1.75 mm)
Seat Bore (Oversize)	
Exhaust .....	1.4764–1.4770 (37.500–37.516 mm)
Intake .....	1.7520–1.7526 (44.500–44.516 mm)
Valve Guides (Intake)	
Valve Guide Cylinder Head Bore I.D.	
Maxima, Pathfinder & Pickup	



Exhaust .....	.4793-.4802"	(12.175-12.196 mm)
Intake .....	.4400-.4408"	(11.175-11.196 mm)
300ZX .....	.3927-.3935"	(9.975-9.996 mm)
Valve Guide I.D.		
Maxima, Pathfinder & Pickup		
Exhaust .....	.3150-.3157"	(8.000-8.018 mm)
Intake .....	.2756-.2763"	(7.000-7.018 mm)
300ZX .....	.2362-.2369"	(6.000-6.018 mm)
Valve Guide Installed Height		
Maxima, Pathfinder & Pickup		
Exhaust .....	.520-.528"	(13.20-13.40 mm)
300ZX .....	.594-.602"	(15.10-15.30 mm)
Valve Stem-To-Guide Oil Clearance		
Exhaust		
Maxima & 300ZX .....	.0020-.0070"	(.050-.173 mm)
Pathfinder & Pickup .....	.0012-.0021"	(.030-.053 mm)
Intake .....	.0010-.0060"	(.030-.152 mm)

(1) - Maximum resurfacing limit of cylinder block and cylinder head combined is .008" (.20).

## CAMSHAFT SPECIFICATION

### CAMSHAFT TABLE

Application	In. (mm)
Bore Diameter	
Maxima, Pathfinder & Pickup (1)	
For Journals "A" .....	1.850-1.851 (47.00-47.03)
For Journals "B" .....	1.673-1.674 (42.50-42.53)
For Journal "C" .....	1.889-1.891 (48.00-48.03)
300ZX .....	1.102-1.103 (28.00-28.02)
End Play .....	.001-.003 (.03-.08)
Journal Diameter	
Maxima, Pathfinder & Pickup (1)	
Journals "A" .....	1.847-1.848 (46.92-46.94)
Journals "B" .....	1.670-1.671 (42.42-42.44)
Journal "C" .....	1.886-1.887 (47.92-47.94)
300ZX .....	1.099-1.101 (27.94-27.96)
Journal Runout .....	.004 (.10)
Sprocket Runout .....	.004 (.10)
Lobe Height	
Maxima, Pathfinder & Pickup .....	1.551-1.564 (39.39-39.73)
300ZX .....	1.590-1.598 (40.39-40.59)
Oil Clearance	
Maxima, Pathfinder & Pickup .....	.0059 (.149)
300ZX .....	.0018-.0034 (.045-.086)

(1) - See Fig. 14.

## VALVE LIFTERS SPECIFICATION

### VALVE LIFTERS TABLE

Application	In. (mm)
Bore Diameter	
Maxima, Pathfinder	

& Pickup .....	.6299-.6304	(16.000-16.013)
300ZX .....	1.2205-1.2213	(31.000-31.020)
Lifter Diameter		
Maxima, Pathfinder		
& Pickup .....	.6278-.6282	(15.947-15.957)
300ZX .....	1.2187-1.2191	(30.955-30.965)
Oil Clearance		
Maxima, Pathfinder		
& Pickup .....	.0017-.0026	(.043-.066)
300ZX .....	.0014-.0026	(.036-.066)

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