

3.0L V6 - VINS [H,J,K]

1994 Mitsubishi 3000GT

1994 CHRYSLER CORP./MITSUBISHI ENGINES
3.0L V6

Dodge: Stealth
Mitsubishi: Diamante, 3000GT

ENGINE IDENTIFICATION

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

Engine may be identified by Vehicle Identification Number (VIN) stamped on a metal pad located near lower left corner of windshield. The eighth character identifies the engine model. Engine code number is stamped on front upper edge of cylinder block, below cylinder head, or on vehicle information plate on firewall. Engine serial number is stamped near the engine code number.

ENGINE IDENTIFICATION CODES TABLE

Application	Engine Code	VIN Code
Diamante		
3.0L V6 SOHC	6G72	H
3.0L V6 DOHC	6G72	J
Stealth		
3.0L V6 SOHC	6G72	H
3.0L V6 DOHC		
Non-Turbo	6G72	J
Turbo	6G72	K
3000GT		
3.0L V6 DOHC		
Non-Turbo	6G72	J
Turbo	6G72	K

ADJUSTMENTS

VALVE CLEARANCE ADJUSTMENT

NOTE: All engines are equipped with hydraulic lash adjusters. Adjustment is not required.

REMOVAL & INSTALLATION

GENERAL PRECAUTIONS

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle.

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

Perform these steps to release fuel system pressure:

- * Disconnect fuel pump harness connector at fuel tank.
- * Start engine. After it stalls, turn ignition switch to OFF position.
- * Disconnect battery (-) terminal. Reconnect fuel pump harness.
- * Wrap shop towels around fuel return and high pressure hoses to prevent fuel splashing on engine. Disconnect fuel return hose and high pressure fuel hose to drain any residual fuel.

ENGINE

Removal (Diamante)

1) Remove hood. Drain cooling system. Remove radiator.

Release fuel system pressure. See FUEL PRESSURE RELEASE. Disconnect negative battery cable. Drain engine oil and transaxle oil. Remove front exhaust pipe. Remove transaxle assembly. See appropriate CLUTCHES or TRANSMISSION SERVICING article.

2) Disconnect accelerator cable, brake booster vacuum hose, fuel supply and return lines, and heater hoses. Disconnect EGR temperature sensor (if equipped). Unplug vacuum hose connector. Remove drive belts. Remove power steering pump and A/C compressor, leaving hoses attached.

3) Unplug all harness connectors. Remove bolt from body ground connection. Disconnect alternator wiring inside relay box. Remove relay box and engine wiring harness connection. On models with ABS, remove radiator overflow tank and bracket.

4) Attach engine hoist. Raise engine enough to take weight from mounts. Remove engine mount bracket. Remove damper. Remove rear roll stopper bracket mount bolt. Remove front roll stopper bracket mount bolt. Carefully lift engine from car.

Installation (Diamante)

To install, reverse removal procedure. Install engine mount bracket so that arrow points away from engine, toward body. Install new "O" rings on fuel lines. Install new exhaust gaskets and nuts. Adjust throttle cable. See TORQUE SPECIFICATIONS. Replenish fluids.

CAUTION: DO NOT allow foreign material into turbocharger air intake hoses or pipes.

Removal (Stealth & 3000GT)

1) Release fuel pressure. See FUEL PRESSURE RELEASE. Remove hood. Remove cruise control vacuum pump and linkage. On turbo models, remove necessary turbo air intake hoses and pipes. On all other models, remove air cleaner hoses.

2) On all models, drain cooling system. Drain engine oil and transaxle oil. Remove heater hoses and radiator hoses. Remove transaxle assembly. See appropriate article in CLUTCHES or TRANSMISSION SERVICING.

3) Remove radiator. Label and disconnect all vacuum hoses. Label and unplug all electrical connections and harnesses from engine. Remove accessory drive belts.

4) Remove and support A/C compressor and power steering pump. DO NOT disconnect hoses from compressor or pump. Cover fuel hose with shop towel, and disconnect high pressure fuel hose and "O" ring. Disconnect fuel return hose.

5) On turbo models, disconnect oil cooler and vacuum hoses. On all models, remove motor mount bolts and brackets. Ensure all hoses and wires are disconnected and set aside. Attach engine hoist to engine. Remove engine.

Installation (Stealth & 3000GT)

To install, reverse the removal procedure. Install new "O" ring on fuel line. Install new exhaust gaskets and nuts. Refer to TORQUE SPECIFICATIONS. Replenish fluids.

INTAKE MANIFOLD

CAUTION: Fuel system is under pressure. Fuel pressure must be released before disconnecting fuel lines. Refer to FUEL PRESSURE RELEASE.

Removal (Diamante SOHC)

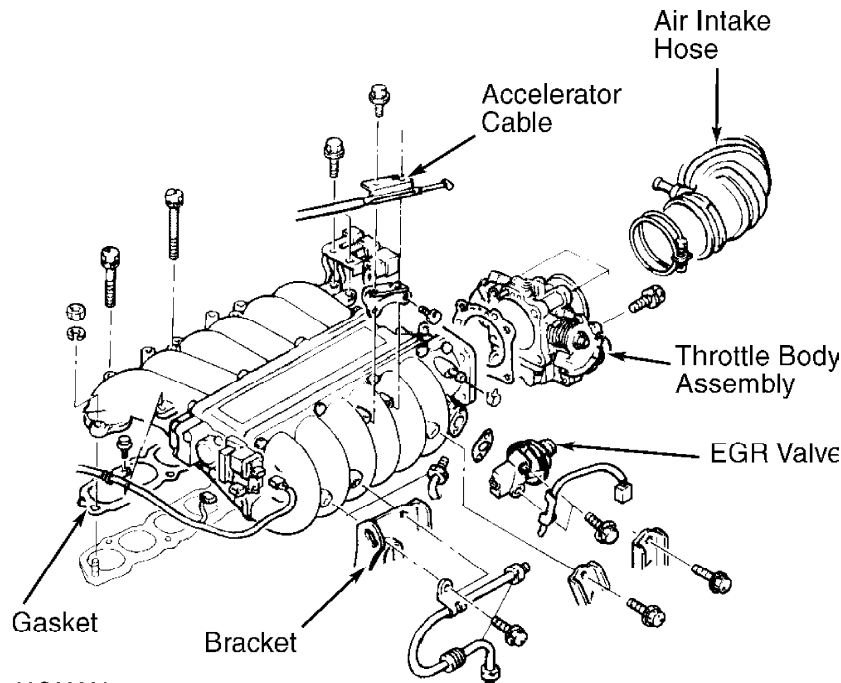
1) Release fuel pressure. Drain cooling system. Remove EGR tube (if equipped). Remove ignition coil and cable. Remove front and rear intake plenum braces. Remove EGR valve and gasket (if equipped). Remove throttle body. Remove power transistor.

2) Remove plenum. Remove distributor and spark plugs. Remove fuel injector wiring harness. Remove fuel pressure regulator, fuel rails, fuel injectors, and grommets. Remove coolant outlet fitting and thermo-stat. Remove retaining nuts and intake manifold.

Removal (Stealth SOHC)

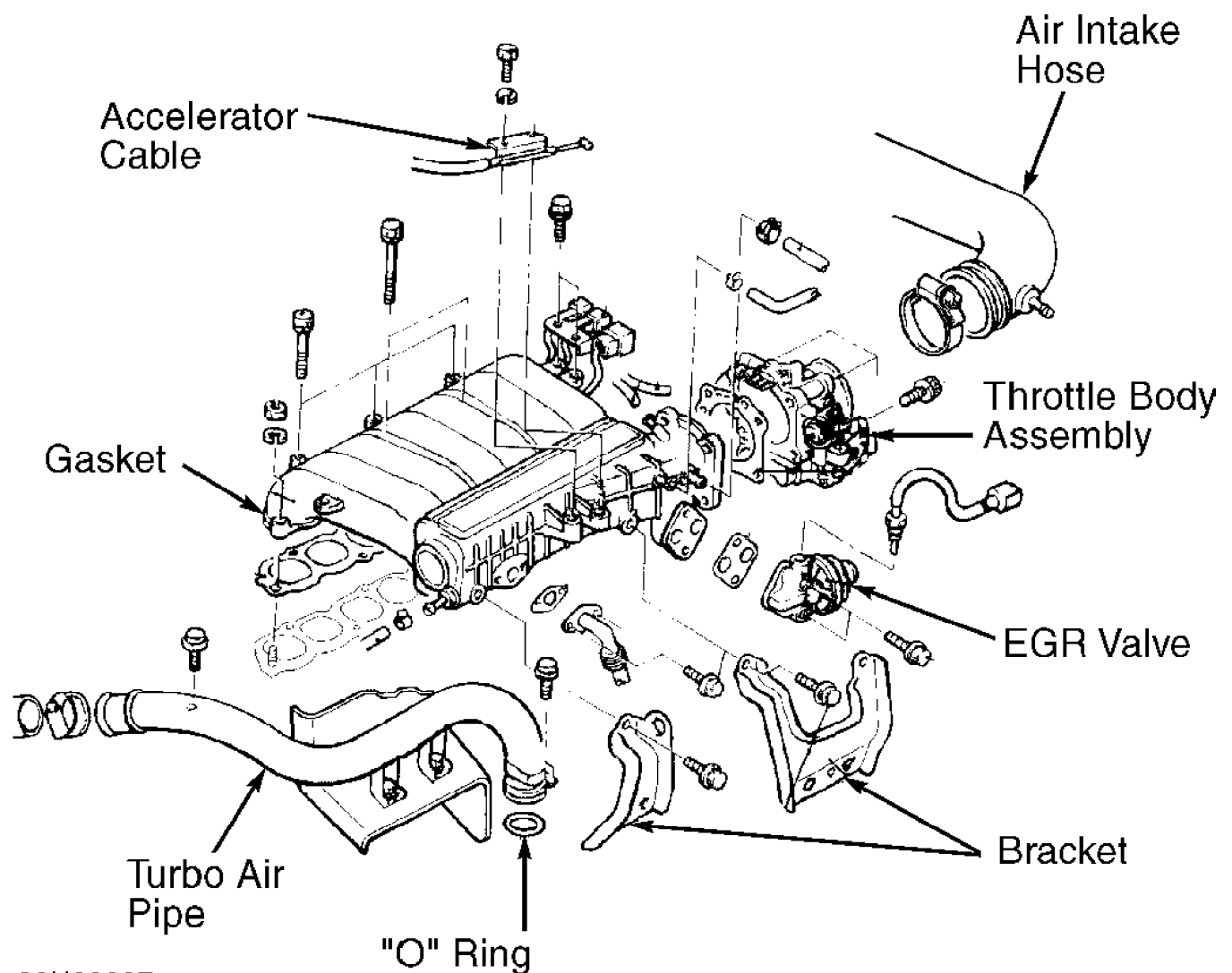
1) Release fuel pressure. Drain cooling system. Remove throttle body. Remove EGR valve and tube (if equipped). Remove front and rear manifold brackets. Remove upper intake manifold. See Fig. 1.

2) Remove spark plug cables, spark plugs, distributor, and coil. Remove fuel pressure regulator, fuel injectors, fuel rails, and grommets. Remove coolant and heater hoses. Remove temperature sensors and thermostats. Remove coolant outlet fitting and thermostat. Remove retaining nuts and intake manifold.



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Fig. 1: Exploded View Of Typical Upper Intake Manifold Components
Courtesy of Mitsubishi Motor Sales of America, Inc.



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Fig. 2: Exploded View Of Typical Upper Intake Manifold Components
Courtesy of Mitsubishi Motor Sales of America, Inc.

Removal (DOHC Non-Turbo)

1) Release fuel pressure. Remove EGR tube (if equipped). Remove front and rear intake plenum braces. Remove EGR valve. Remove throttle body. Remove intake plenum.

2) Remove center cover. Remove spark plug cables, spark plugs, and ignition coil. Remove power transistor. Remove crank angle sensor. Remove fuel injector harness. Remove fuel pressure regulator, fuel injectors, fuel rails, and grommets. Remove retaining nuts and intake manifold. See Fig. 3.

Removal (DOHC Turbo)

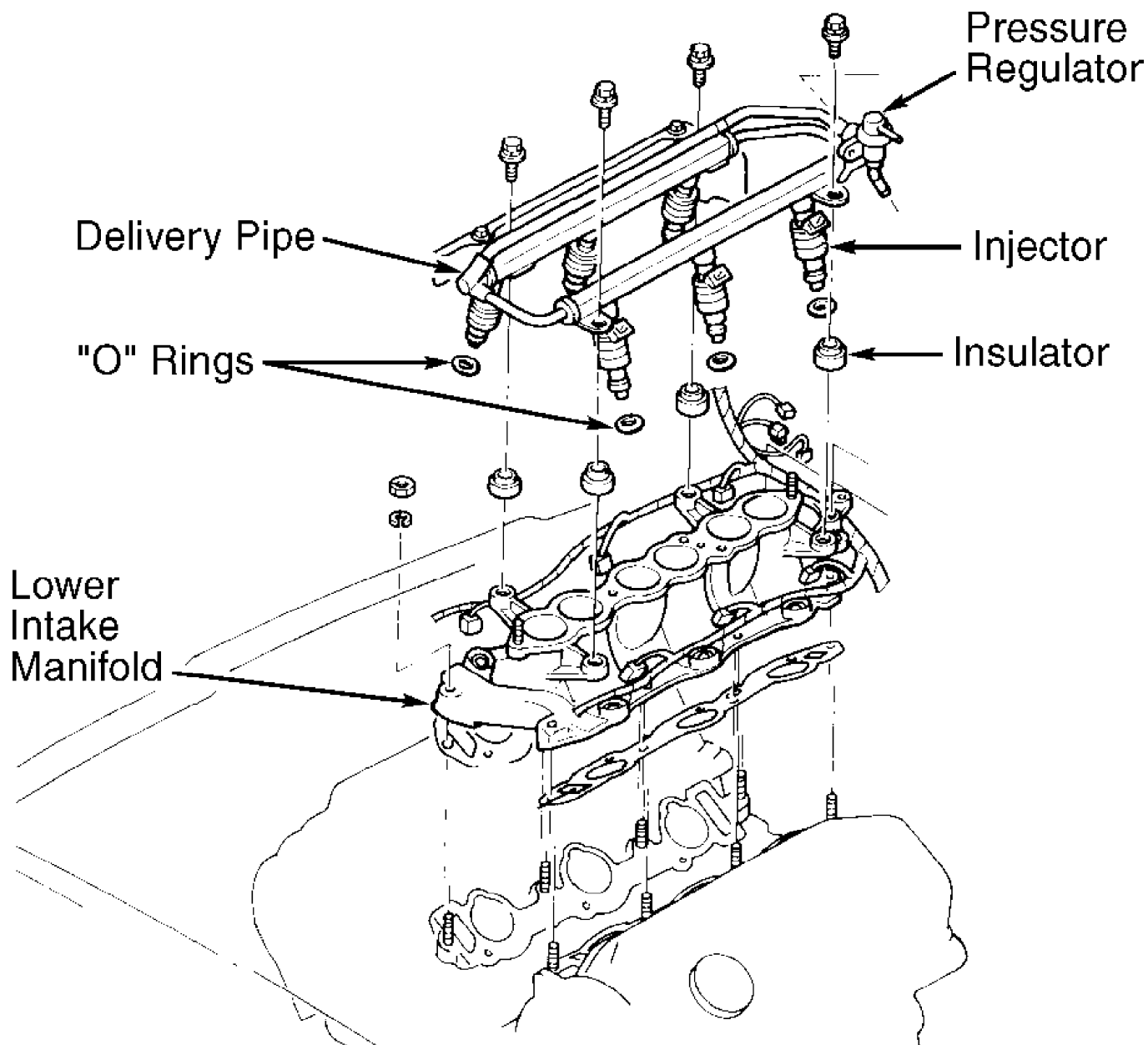
1) Release fuel pressure. Drain cooling system. Remove EGR tube (if equipped). Remove front and rear intake plenum braces. Remove EGR valve. Remove throttle body. Remove intake plenum.

2) Remove center cover. Remove spark plug cables and spark plugs. Remove clamp, located in coil area. Remove ignition coil. Remove decking hook. Remove power transistor. Remove crank angle sensor. Remove fuel injector harness. Remove fuel pressure regulator, fuel injectors, fuel rails, and grommets. Remove retaining nuts and

intake manifold.

Installation (All Models)

Clean all gasket mating surfaces. Inspect for damage and cracks on all mounting surfaces. To install, reverse removal procedure using, new gaskets and "O" rings. Tighten bolts and nuts to specification. See TORQUE SPECIFICATIONS.



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Fig. 3: Exploded View Of Typical Lower Intake Manifold
Courtesy of Mitsubishi Motor Sales of America, Inc.

TURBOCHARGER

CAUTION: DO NOT allow foreign material into turbocharger air intakes

or coolant and oil passages.

Removal (Front)

1) Drain coolant. Remove radiator. Remove right transaxle brace. Disconnect exhaust pipe from turbocharger. Remove all air intake ducts. Note match marks and installation depth on air pipes and hoses for reinstallation reference. Remove accessory drive belt. Remove alternator. Remove A/C compressor and bracket, leaving hoses connected, and support aside.

2) Remove O2 sensor. Remove dipstick assembly. Remove turbocharger heat shield. Disconnect turbo coolant feed and return lines. Disconnect turbocharger oil feed and return lines. Remove turbocharger assembly.

Removal (Rear)

1) Drain coolant. Remove battery. Disconnect accelerator cable at bracket and throttle body. Disconnect exhaust pipe from turbo. Remove all air intake pipes and heat shields. Disconnect accelerator cable at pedal.

2) Remove clutch booster vacuum hose. Remove O2 sensor. Remove EGR tube. Remove turbocharger heat shield. Disconnect turbocharger coolant feed and return lines. Disconnect turbocharger oil feed and return lines. Remove turbocharger assembly.

Installation (Front & Rear)

Inject clean engine oil into turbocharger through oil pipe installation hole. To complete installation, reverse removal procedure. Align match marks, and install air ducts and hoses to proper depth.

EXHAUST MANIFOLDS

Removal (Diamante SOHC)

1) Disconnect exhaust pipe from both exhaust manifolds. To remove rear manifold, go to step 2). Remove heat shield. Remove dipstick assembly. Remove retaining nuts and exhaust manifold.

2) Remove roll stopper brace. Remove heat shield. Remove intake plenum brace and bracket. Remove EGR tube (if equipped). Remove retaining nuts and exhaust manifold.

Removal (Diamante DOHC)

1) Disconnect exhaust pipe from both exhaust manifolds. To remove rear manifold, go to step 2). Remove condenser fan assembly. Remove alternator drive belt, alternator bracket, and alternator. Remove A/C compressor, leaving hoses connected. Remove dipstick assembly. Remove heat shield. Remove retaining nuts and exhaust manifold.

2) Remove studs from bottom of exhaust manifold. Remove roll stopper brace. Remove heat shield. Remove EGR tube (if equipped). Remove retaining nuts and exhaust manifold.

Removal (Stealth & 3000GT)

1) Remove turbocharger(s) (if equipped). See TURBOCHARGER. On front manifold, remove drive belt and alternator. Remove oil dipstick. On rear manifold, remove EGR tube (if equipped).

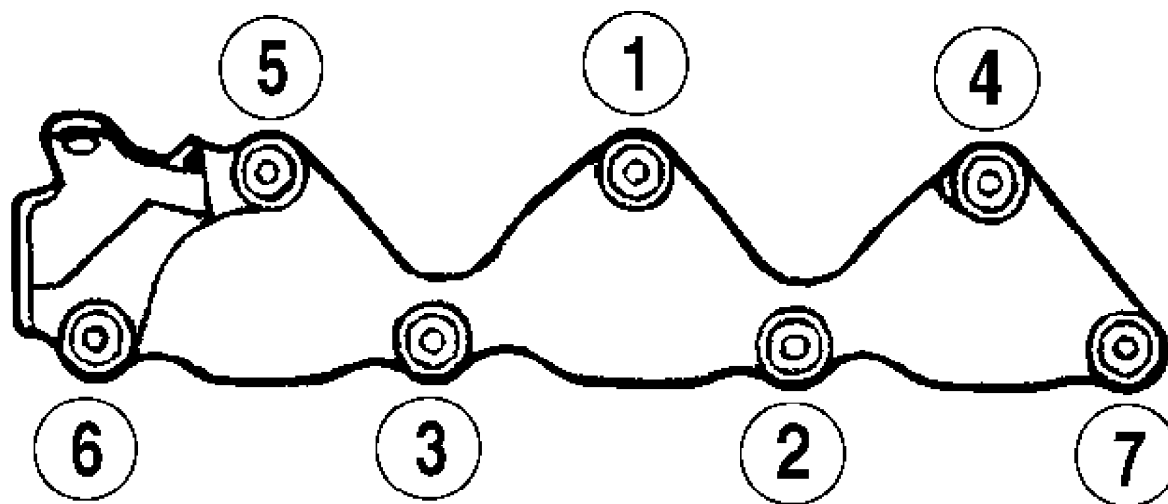
NOTE: Note locations and orientation of exhaust manifold washers for installation reference. DO NOT mix these fasteners.

2) On all manifolds, remove exhaust pipe-to-manifold nuts. Lower exhaust pipe. Remove heat shield. Remove exhaust manifold nuts and washers. Note locations and orientation of all washers for reinstallation reference. DO NOT mix these fasteners. Remove exhaust

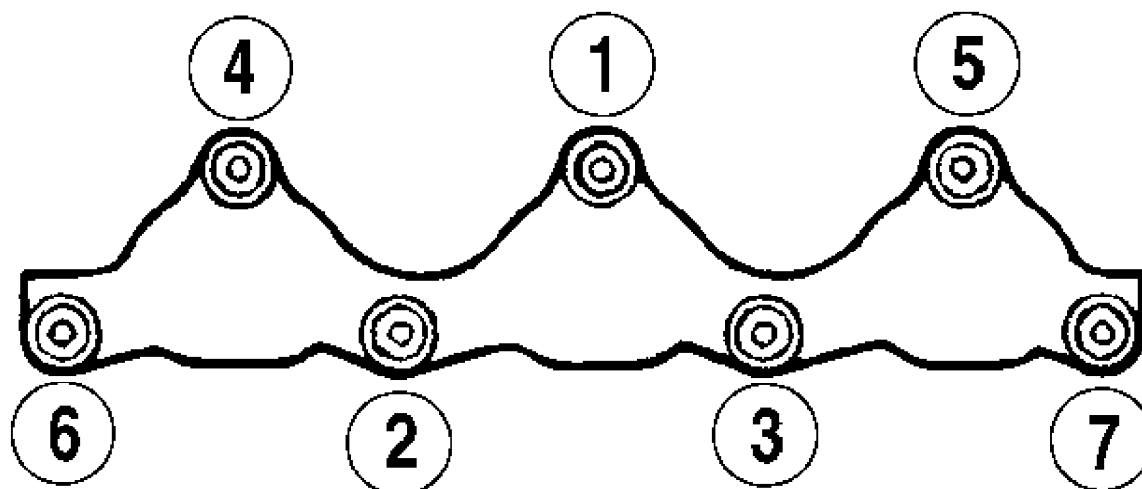
manifold and gasket.

Installation (All Models)

To install, reverse removal procedure. Install new gaskets. Lubricate new dipstick tube "O" ring with engine oil before installation. Install manifold nuts and washers in original locations. On Diamante, Stealth and 3000GT, tighten nuts in sequence. See Fig. 4. On all models, tighten nuts to specification. Refer to, at the end of this article, TORQUE SPECIFICATIONS.



FRONT MANIFOLD



REAR MANIFOLD

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Fig. 4: Exhaust Manifold Tightening Sequence
Courtesy of Mitsubishi Motor Sales of America, Inc.

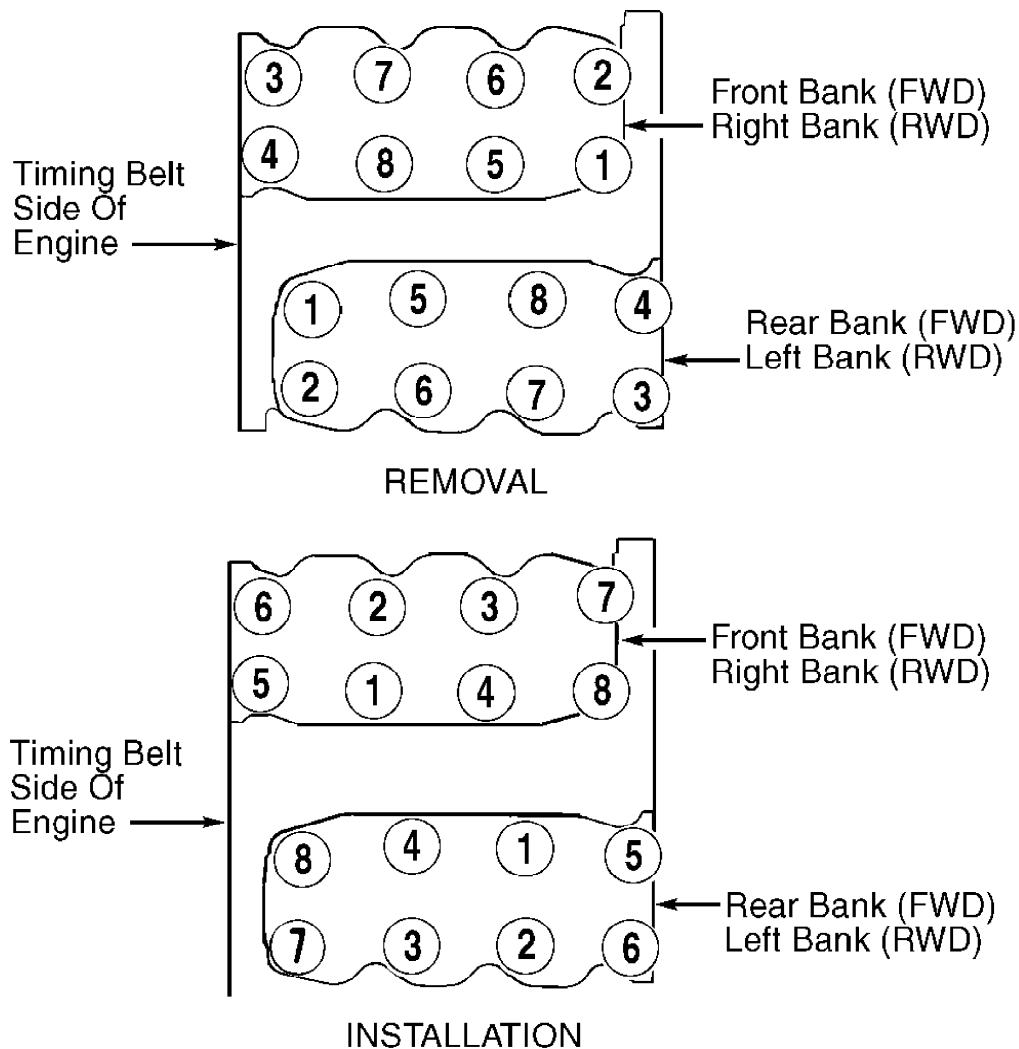
Removal (SOHC)

1) Drain cooling system. Remove intake manifolds and brackets. See INTAKE MANIFOLD. Remove spark plug wires. Remove splash shields. Disconnect O2 sensor. Remove heat shields and exhaust manifolds. See EXHAUST MANIFOLDS.

2) Remove distributor. Remove timing belt outer covers, camshaft sprockets, timing belt, and timing belt inner covers. See TIMING BELT. Remove accessory bracket bolts from front of cylinder head. Remove rocker cover and gasket.

NOTE: To prevent cylinder head warpage and cracking, loosen cylinder head bolts in 2 or 3 stages in proper sequence.

3) Using Socket (MD998051), unscrew cylinder head bolts in 2 or 3 stages in proper sequence. See Fig. 5. Remove cylinder head and camshaft assemblies. Note orientation of washers under cylinder head bolts.



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Fig. 5: Removing & Installing Cylinder Head Bolts
Courtesy of Mitsubishi Motor Sales of America, Inc.

Inspection (SOHC)

Measure cylinder head height. Measure warpage at gasket and

manifold surfaces. Resurface head if warpage exceeds specification. See CYLINDER HEAD (SOHC) table under ENGINE SPECIFICATIONS. Replace cylinder head if it is not within specification after resurfacing.

Installation (SOHC)

1) Ensure mating surfaces are clean and dry. Note identification mark located on front of head gasket. Identification marks are "R" for SOHC, 2DN for DOHC non-turbocharged, and 2DT for DOHC turbocharged engine. Install head gasket with identification mark toward timing belt side of engine, facing upward.

2) Install the cylinder head. Install the washers cylinder head bolts with chamfered side toward bolt head. Using proper sequence, tighten bolts to specification in 2 or 3 stages in proper sequence. Refer to Fig. 5. Refer to, at the end of this article, TORQUE SPECIFICATIONS.

3) Apply sealant to rocker cover sealing surfaces before installation. See Fig. 6. Align rocker cover gasket projections with notches in rocker cover. Lubricate all "O" rings with engine oil before installation. Install new "O" rings onto distributor adapter and oil dipstick tube.

4) Lubricate camshaft area with oil prior to installing distributor adapter. To complete installation, reverse removal procedure. Tighten bolts and nuts to specification. Refer to, at the end of this article, TORQUE SPECIFICATIONS. After engine reaches normal operating temperature, allow engine to cool. Retighten cylinder head bolts to specification.

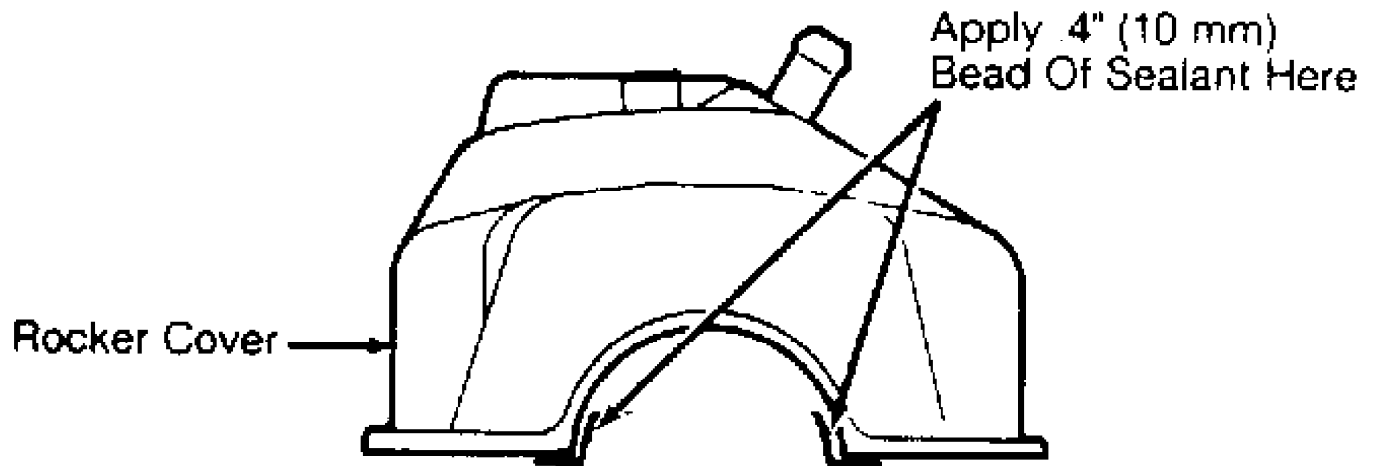


Fig. 6: Applying Sealant To Rocker Cover (SOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

Removal (DOHC)

1) Drain the cooling system. Remove the manifolds and the brackets. Refer to INTAKE MANIFOLD. Remove turbocharger(s) (if equipped). Refer to TURBOCHARGER. Remove exhaust manifolds. Refer to EXHAUST MANIFOLDS.

2) Remove spark plug wires and ignition coils. Remove rocker cover and gasket. Remove timing belt and timing belt inner covers. See TIMING BELT. Remove intake camshaft sprockets.

3) Remove coolant manifold and coolant inlet pipe. Using Socket (MD998051), unscrew cylinder head bolts evenly in several stages. Remove cylinder head. For installation reference, note orientation of washers under cylinder head bolts.

Inspection (DOHC)

Measure cylinder head height. Measure warpage at gasket and

manifold surfaces. Resurface head if warpage exceeds specification. See CYLINDER HEAD (DOHC) table under ENGINE SPECIFICATIONS. After resurfacing, remeasure cylinder head height. Replace cylinder head if it is not within specification.

Installation (DOHC)

1) Ensure mating surfaces are clean and dry. Note identification mark located on front of head gasket. Identification marks are "R" for SOHC, 2DN for DOHC non-turbocharged, and 2DT for DOHC turbocharged engine. Install head gasket with identification mark toward timing belt side of engine, facing upward. Align all holes in head gasket.

2) Install cylinder head. Install cylinder head bolt washers with chamfered side toward bolt head. Using proper sequence, tighten bolts to specification in 2 or 3 stages in sequence. See Fig. 5. See TORQUE SPECIFICATIONS.

3) To reinstall camshaft sprocket, hold hexagonal area of camshaft with wrench while tightening sprocket bolt. Tighten rocker cover bolts in a crisscross pattern. Start at 4 corners of rocker cover and work toward center.

NOTE: Rocker cover bolts are color-coded. Front cylinder bank bolts are black; rear cylinder bank bolts are green.

4) To complete installation, reverse removal procedure. Tighten bolts and nuts to specification. See TORQUE SPECIFICATIONS.

FRONT CRANKSHAFT OIL SEAL

Removal & Installation

Remove timing belt and crankshaft sprocket. See TIMING BELT. Pry oil seal from oil pump. Before installation, coat seal lip with grease. Using Seal Driver (MD998717), install seal in oil pump. Install remaining components. See TORQUE SPECIFICATIONS.

TIMING BELT

Removal (Diamante SOHC)

1) Remove left front and left side splash shields. Using engine hoist, lift engine just enough to remove weight from engine mounts. Remove drive belts. Remove A/C tensioner pulley and bracket. Remove engine mount bracket bolts in sequence. Lubricate reamer bolt with penetrating oil before and during removal. See Fig. 7. Remove power steering pump, leaving hoses attached.

2) Remove engine support bracket. Remove crankshaft pulley. Remove timing belt covers. Remove flange from crankshaft. See Fig. 8. Rotate crankshaft to align all timing marks. See Fig. 9. Loosen belt tensioner bolt, and rotate belt tensioner counterclockwise to release belt tension.

3) If reusing timing belt, mark belt to indicate direction of belt rotation. Loosen tensioner bolt. Pry tensioner counterclockwise to relieve belt tension. While holding tensioner, tighten tensioner bolt. Remove timing belt.

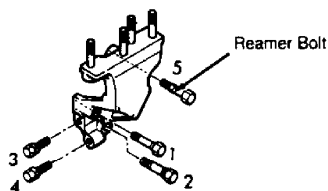
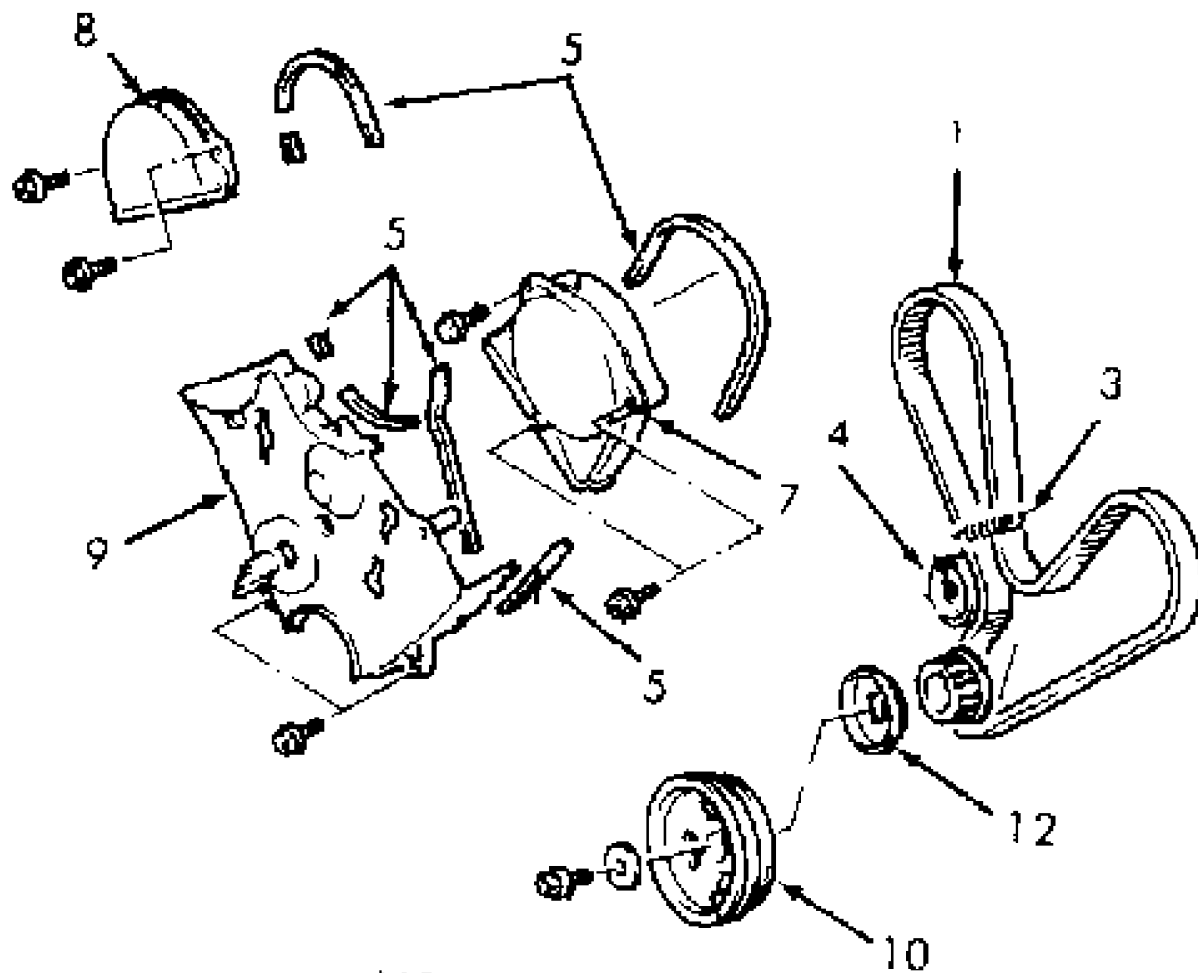


Fig. 7: Removing Engine Support Bracket
Courtesy of Mitsubishi Motor Sales of America, Inc.



MONTERO & RAIDER

- | | |
|----------------------------|----------------------------|
| 1. Timing Belt | 8. No. 1 Upper Outer Cover |
| 2. Engine Support Bracket | 9. Lower Outer Cover |
| 3. Tensioner Spring | 10. Crankshaft Pulley |
| 4. Belt Tensioner Bolt | 11. Cover Cap |
| 5. Gasket | 12. Flange |
| 6. Belt Tensioner | 13. Cover |
| 7. No. 2 Upper Outer Cover | |

Fig. 8: Exploded View Of Timing Belt Components (SOHC Similar)
 Courtesy of Mitsubishi Motor Sales of America, Inc.

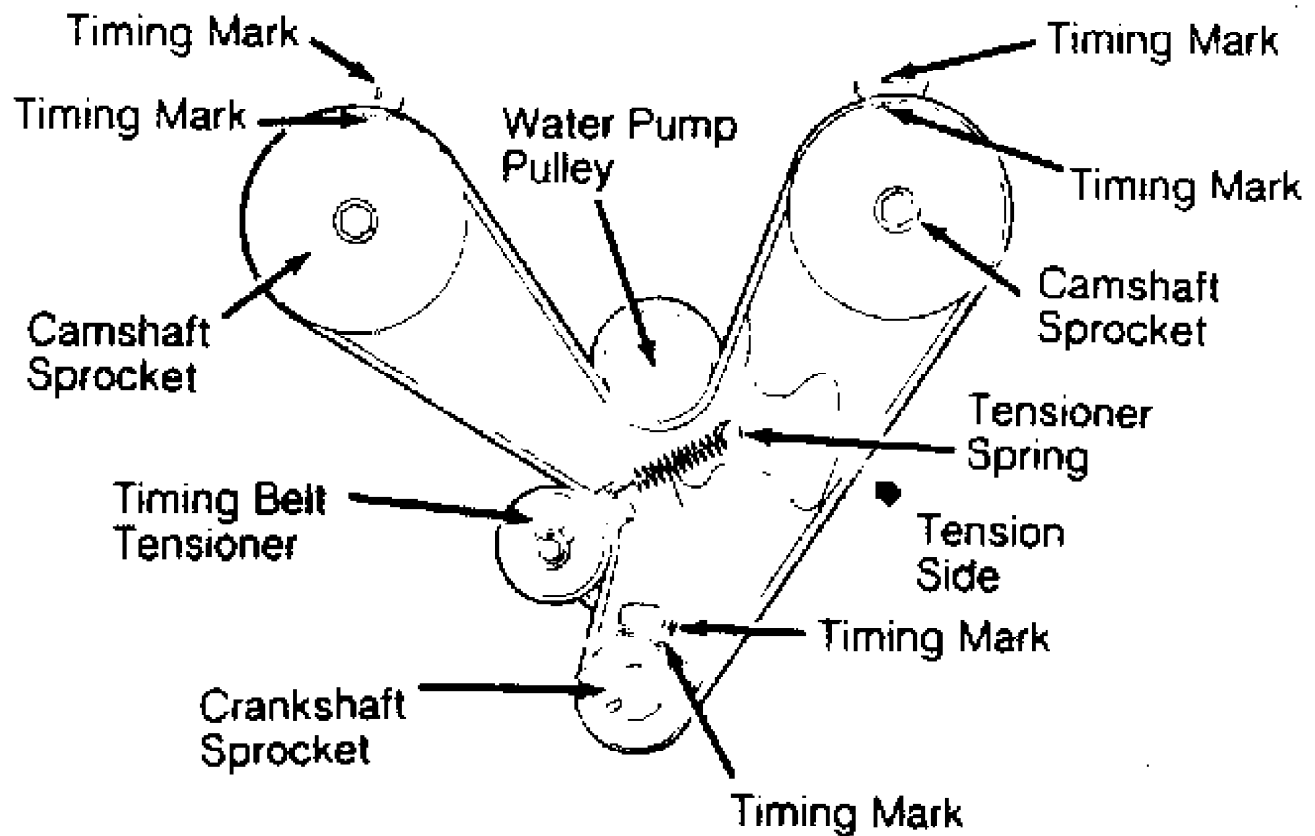


Fig. 9: Aligning Timing Marks (SOHC)
 Courtesy of Mitsubishi Motor Sales of America, Inc.

Installation (Diamante SOHC)

1) If original belt is to be reinstalled, install in original running direction. Install timing belt onto crankshaft sprocket, then around left camshaft sprocket, with all slack removed from tension side of belt. Route timing belt onto water pump pulley, right camshaft sprocket, and tensioner. Apply torque to rear camshaft pulley to tighten belt. Ensure all timing marks are aligned.

2) Install flange onto crankshaft. Loosen belt tensioner bolts slightly, and allow tensioner to apply belt tension. Using Crankshaft Socket (MD998716-01), rotate crankshaft 2 revolutions clockwise. DO NOT rotate counterclockwise. Realign all timing marks. Tighten belt tensioner bolts to specification. Using belt tension gauge, measure belt tension halfway between crankshaft sprocket and camshaft sprocket on side opposite belt tensioner.

3) Belt tension should be 44-66 lbs. (20-30 kg). To install remaining components, reverse removal procedure. Install proper length bolts in timing belt covers. See Fig. 9. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

Removal (Stealth SOHC)

1) Remove lower splash shields. Remove cruise control actuator (if equipped). Remove all drive belts. Unplug electrical connector at power steering pump. Remove A/C tensioner pulley and mounting bracket.

2) Remove power steering pump, leaving hoses connected, and wire aside. Support engine. Remove front engine mount through-bolt and front engine mount. Remove timing belt No. 1 upper cover and gaskets. See Fig. 8.

NOTE: Engine support bracket reamer bolt may be seized. Apply penetrating lubricant to bolt during removal.

3) Remove engine support bracket bolts in proper sequence. See Fig. 7. Remove engine support bracket. Remove timing cover cap, timing belt cover, and gaskets. Using Holder (MB990767) and Adapter Bolts (MD998719), remove crankshaft pulley.

4) Remove lower timing belt cover, gaskets, and flange. See Fig. 8. Rotate crankshaft to align all timing marks. See Fig. 9. Loosen belt tensioner bolt. Rotate belt tensioner counterclockwise to relieve belt tension.

5) If reusing timing belt, place arrow on belt to indicate belt running direction. Remove timing belt and belt tensioner.

6) If camshaft sprocket requires removal, install Holder (MB990767) with Adapter Bolts (MD998719) onto camshaft sprocket. Remove camshaft sprocket bolt and camshaft sprocket. Remove rear timing belt cover if necessary.

Installation (Stealth SOHC)

1) Install rear timing belt cover. Tighten bolts to specification. See TORQUE SPECIFICATIONS. Install camshaft sprockets (if removed). Using holder, hold camshaft and tighten camshaft sprocket bolt to specification.

2) Install belt tensioner and spring. Ensure spring is secured on pin of water pump and engaged in hole of belt tensioner, with hook of spring pointing away from cylinder block.

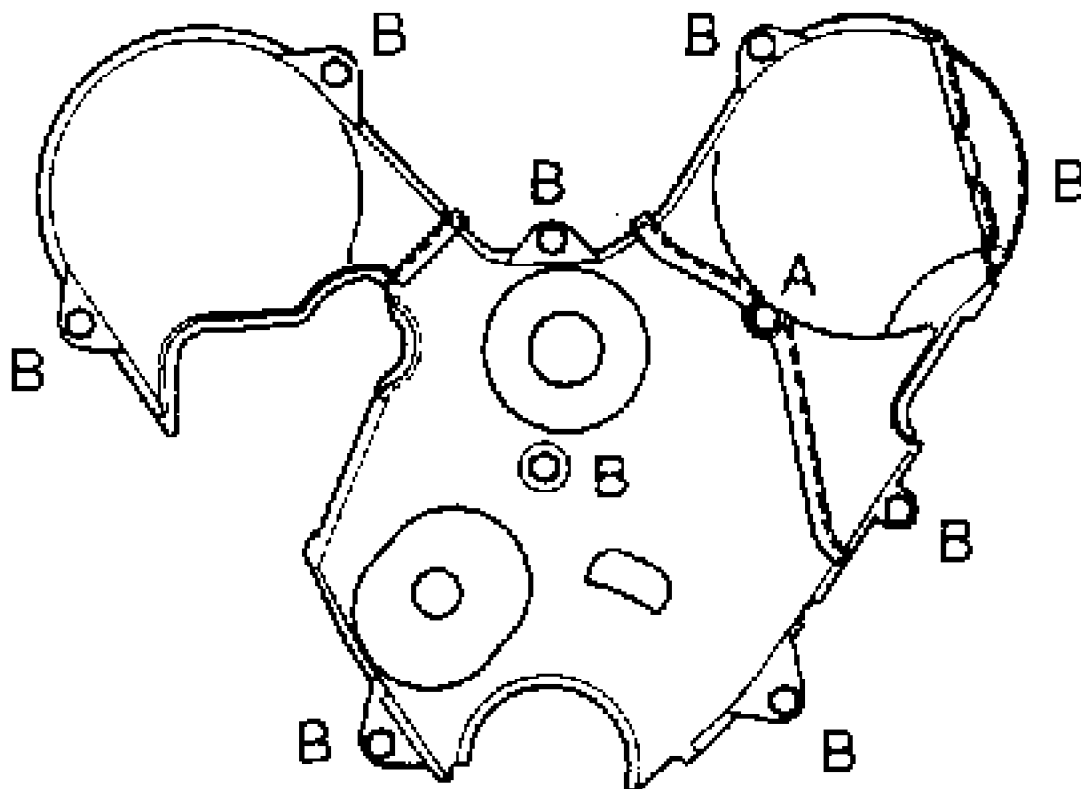
3) Rotate belt tensioner counterclockwise as far as possible. Temporarily tighten bolt. Align all timing marks with No. 1 cylinder at TDC of compression stroke. See Fig. 9.

4) Install timing belt onto crankshaft sprocket, rear cylinder bank camshaft sprocket, water pump pulley, front cylinder bank camshaft sprocket, and timing belt tensioner. Ensure belt is installed in original direction of rotation, and all timing marks are aligned. Install flange onto crankshaft. Loosen belt tensioner bolts slightly, and allow tensioner to apply belt tension.

5) Using Crankshaft Socket (MD998716), rotate crankshaft 2 revolutions clockwise. DO NOT rotate counterclockwise. Realign all timing marks. Tighten belt tensioner bolts to specification. See TORQUE SPECIFICATIONS. Using belt tension gauge, measure belt tension halfway between crankshaft sprocket and camshaft sprocket on side opposite belt tensioner.

NOTE: Engine support bracket reamer bolt must be tightened slowly. Apply lubricant onto bolt during installation.

6) Belt tension should be 44-66 lbs. (20-30 kg). To install remaining components, reverse removal procedure. Install bolts into proper holes. Install covers and engine support bracket. See Figs. 6 and 10. Tighten bolts to specification. See TORQUE SPECIFICATIONS.



Note: Bolt measurements indicated in millimeters.

Thread Diameter & Length

A - 6x55mm

B - 6x20mm

Fig. 10: Identifying Timing Belt Cover Bolts (Stealth SOHC)
 Courtesy of Mitsubishi Motor Sales of America, Inc.

Removal (Diamante DOHC)

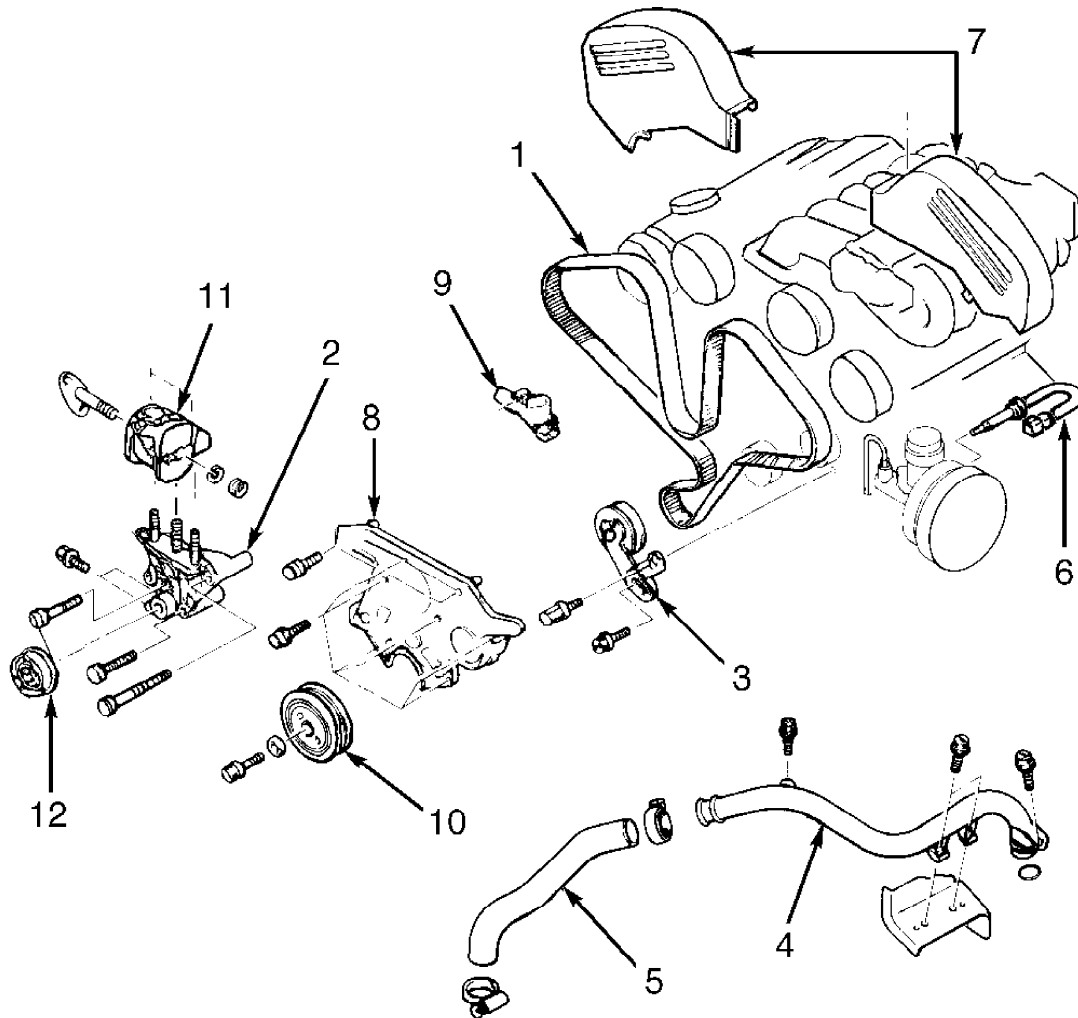
1) Disconnect negative battery cable. Remove left front and left side splash shields. Using engine hoist, lift engine to remove weight from engine mounts. Remove alternator and drive belt tensioner assembly. Remove crankshaft pulley. On vehicles with ABS, remove overflow tank and bracket.

2) Remove engine mount bracket bolts in sequence. Lubricate reamer bolt with penetrating oil before and during removal. Refer to Fig. 6. Remove timing belt covers. Turn crankshaft clockwise to align all timing marks. Loosen center bolt on tensioner pulley to relieve belt tension. Remove belt. Mark running direction if belt is to be reused.

Removal (Stealth & 3000GT DOHC)

1) Remove lower splash shields. Remove cruise control actuator (if equipped). Remove drive belts. Remove alternator. Remove drive belt tensioner assembly.

2) Using Holder (MB990767) and Adapter Bolts (MD998754), remove crankshaft pulley. See Fig. 11. Disconnect brake fluid level sensor. Remove upper timing belt covers. Support engine. Remove front engine mount through bolt and front engine mount.



1. Timing Belt
2. Engine Support Bracket
3. Belt Tensioner
4. Turbo Air Hose
5. Turbo Air Pipe
6. Brake Fluid Level Sensor

7. Upper Timing Belt Covers
8. Lower Timing Belt Cover
9. Automatic Tensioner
10. Crankshaft Pulley
11. Engine Mount Bracket
12. Drive Belt Idler Pulley

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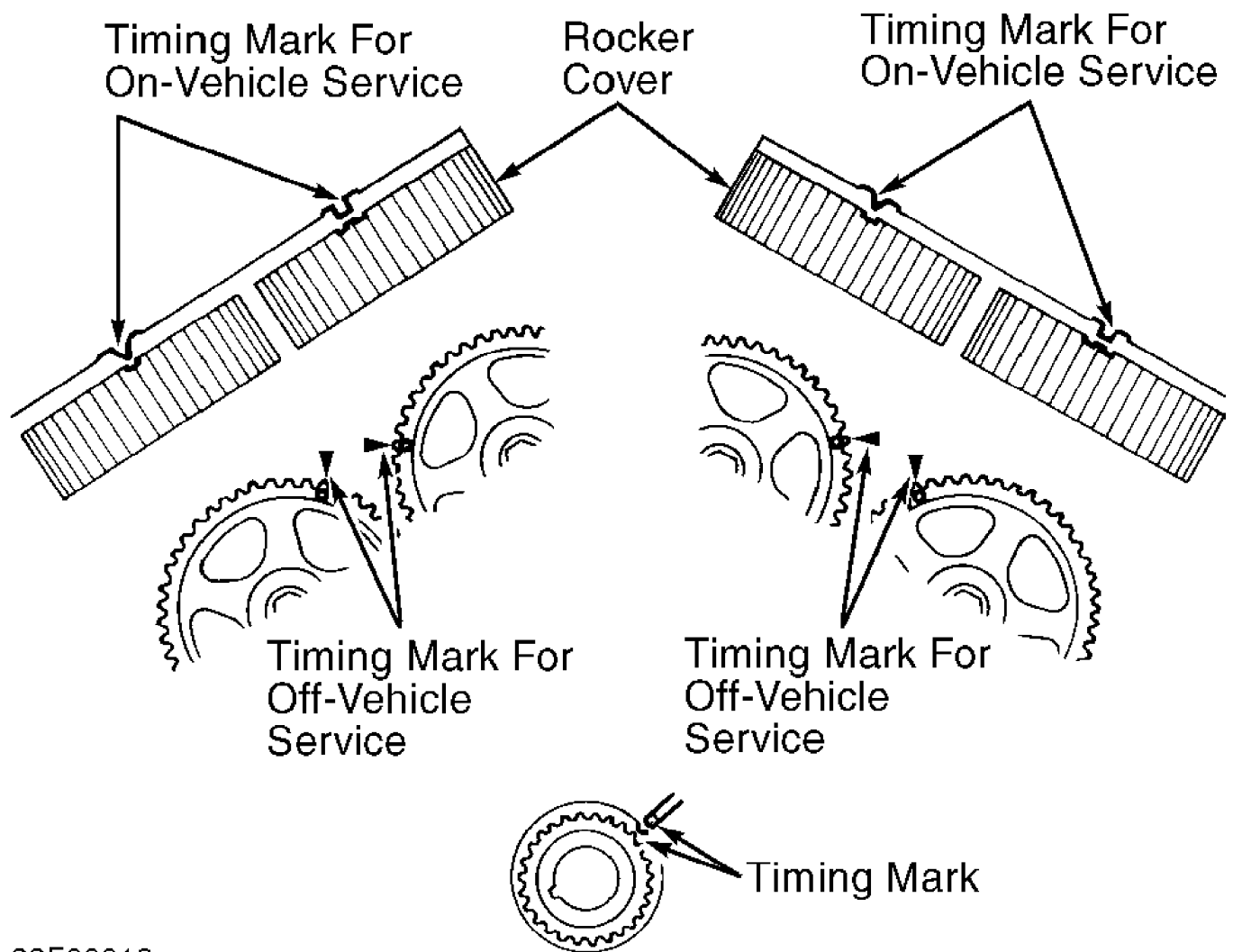
Fig. 11: Exploded View Of Timing Belt Components (DOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

NOTE: Engine support bracket reamer bolt may be seized. Apply penetrating lubricant to bolt during removal.

3) Remove drive belt idler pulley. Remove engine support bracket bolts in sequence. See Fig. 7. Remove engine support bracket. Remove timing belt upper and lower covers, noting length and location of cover bolts.

4) If reusing timing belt, place arrow on belt to indicate running direction. Remove timing belt and belt tensioner. Rotate crankshaft to align all timing marks. See Fig. 12. Loosen tensioner center bolt. Remove timing belt.

5) If camshaft sprocket requires removal, hold camshaft with wrench on hexagonal portion of camshaft. Remove camshaft sprocket bolt and camshaft sprocket.



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Fig. 12: Aligning Timing Marks - Initial Alignment (DOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

Installation (Diamante, Stealth & 3000GT DOHC)

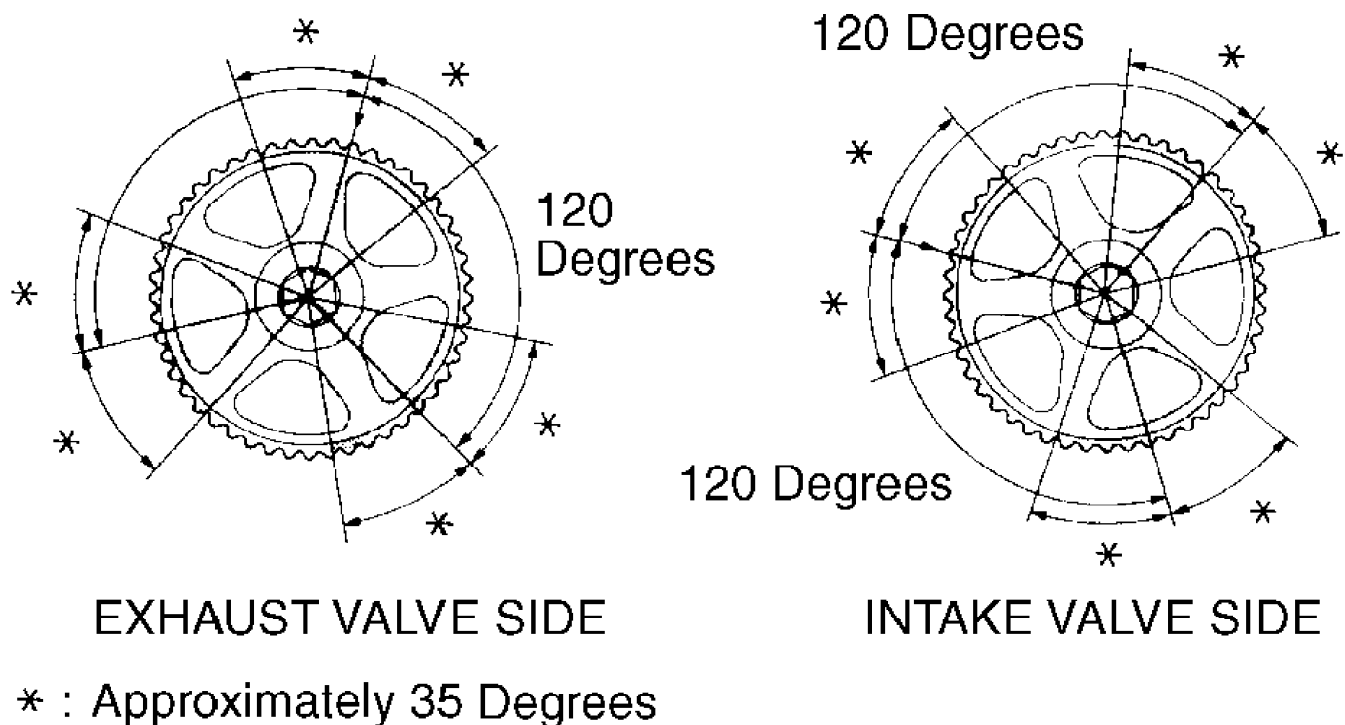
1) Install the camshaft sprockets (if removed). Refer to TORQUE SPECIFICATIONS.

2) Place automatic tensioner assembly in a soft-jawed vise. Slowly close vise to press rod back into tensioner until both rod and housing holes are aligned. Install a .055" (1.40 mm) diameter wire through both holes.

3) Remove tensioner from vise, and install assembly with wire in place. Install crankshaft sprocket (if removed). Align timing marks on crankshaft and camshaft sprockets. See Fig. 12.

CAUTION: Turning camshaft sprockets while No. 1 cylinder is at TDC may damage valve and piston. Use care when aligning timing marks.

4) To lower No. 1 piston from TDC and prevent valve and piston contact, turn crankshaft back 3 sprocket teeth (measured at timing mark). Starting with front bank of cylinders, verify intake and exhaust camshaft timing marks are not within shaded area of figure. See Fig. 13.



FRONT CYLINDER BANK

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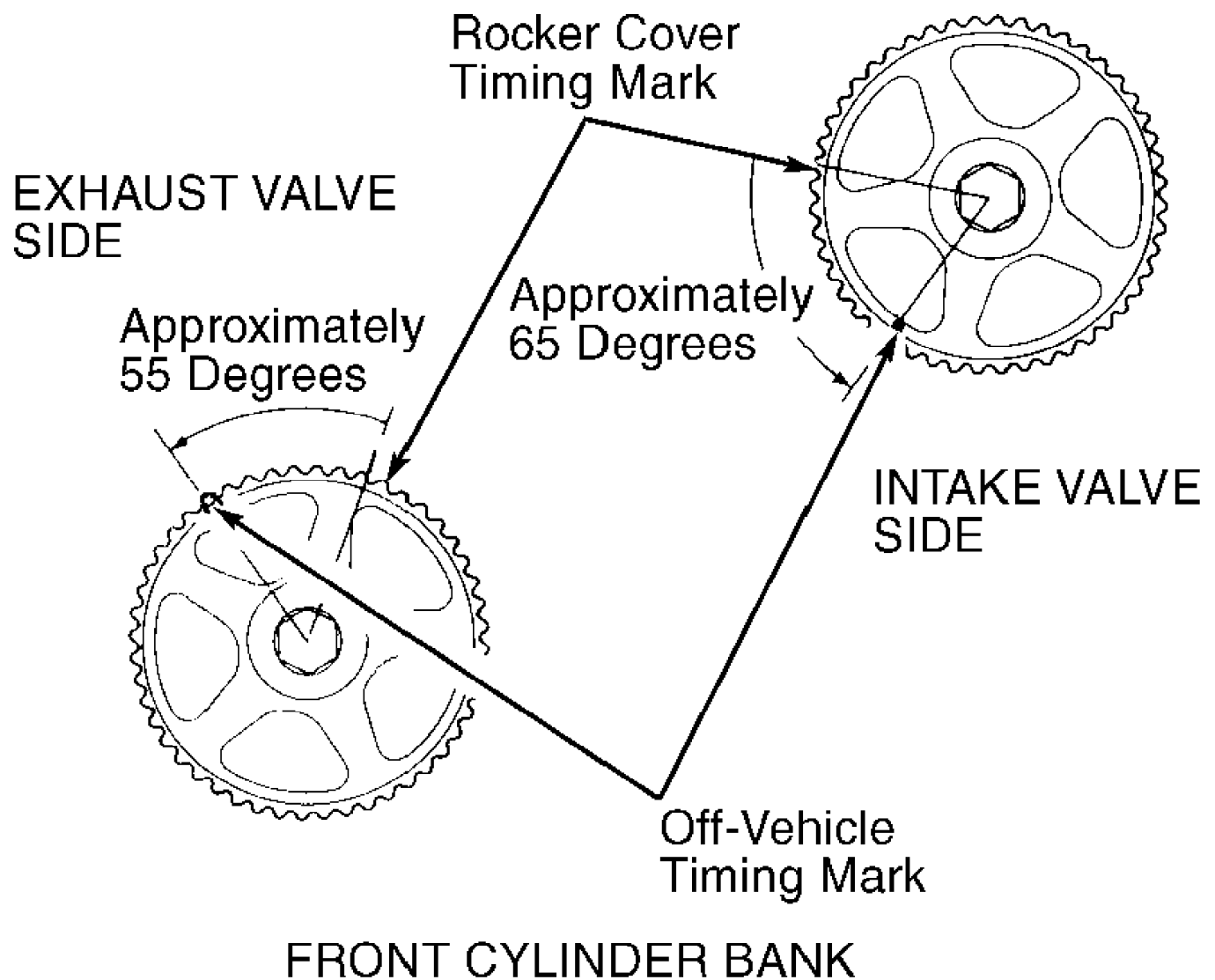
Fig. 13: Aligning Timing Marks (DOHC) To Prevent Valve & Piston Damage

Courtesy of Mitsubishi Motor Sales of America, Inc.

WARNING: Use care when aligning timing marks. When camshaft sprocket timing marks are in indicated area, camshaft is under valve spring pressure and may rotate suddenly, pinching hand between sprockets.

5) If camshaft sprocket timing mark is within indicated area, carefully rotate camshaft sprocket until timing mark is located in nearest safe area. See Fig. 13.

6) Rotate either camshaft sprocket clockwise to align timing marks as shown in illustration. See Fig. 14. If camshaft sprocket is rotated past timing mark, rotate it counterclockwise to realign it. Repeat procedure for other front bank camshaft sprocket.

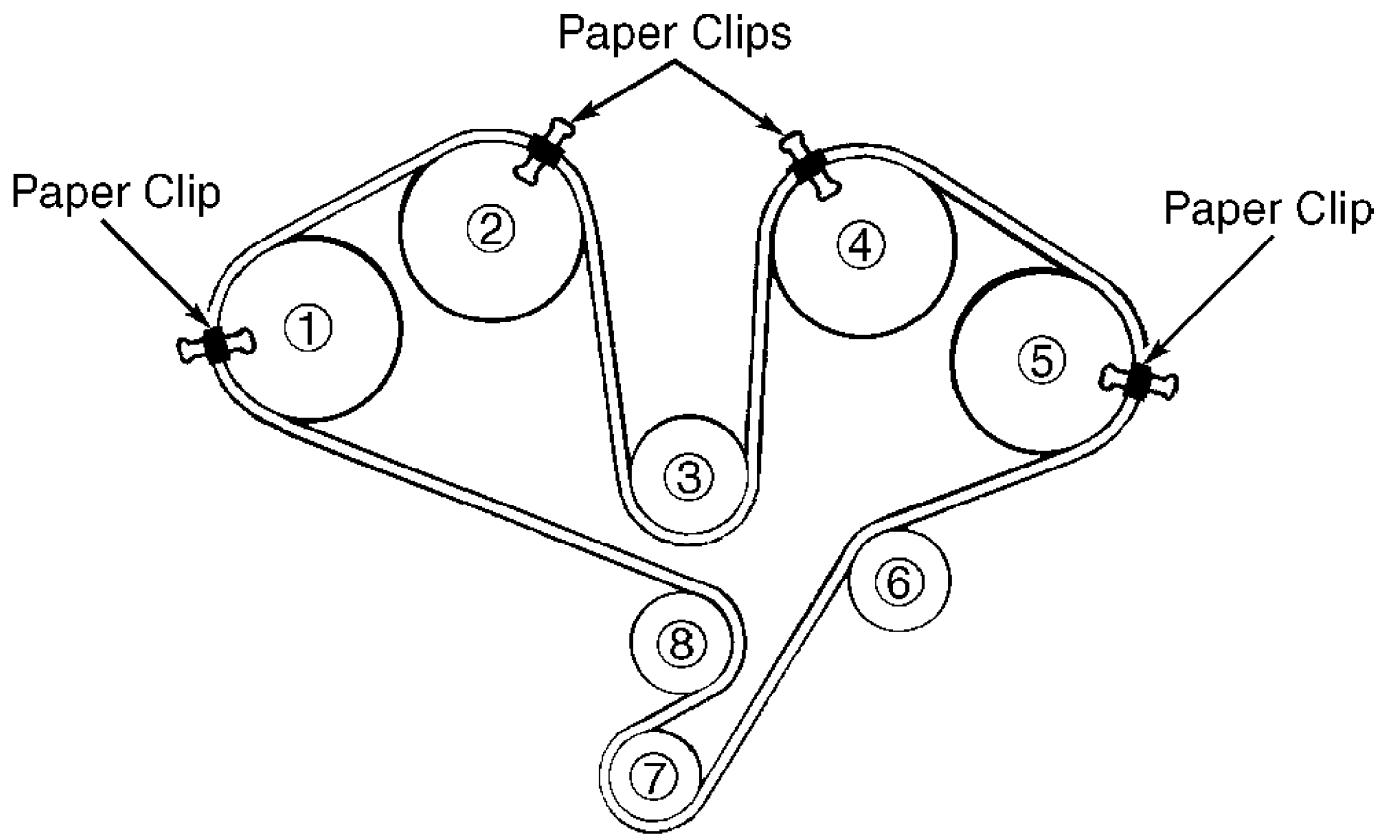


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Fig. 14: Aligning Timing Marks - Final Alignment (DOHC)
 Courtesy of Mitsubishi Motor Sales of America, Inc.

NOTE: If necessary, crankshaft sprocket may be turned one tooth counterclockwise to aid belt installation.

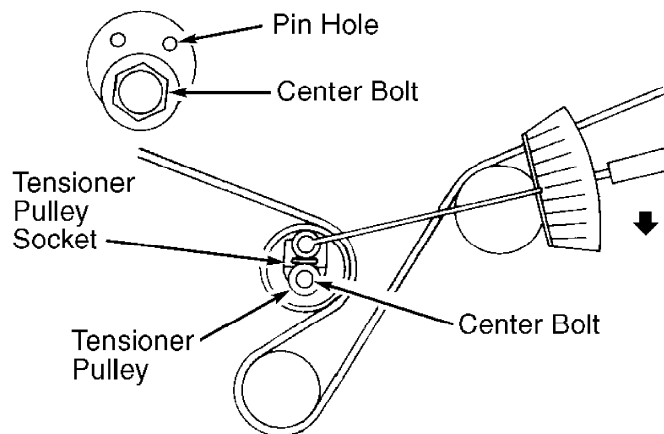
7) Repeat steps 4) through 6) for rear cylinder bank camshafts. Align crankshaft timing mark. Install timing belt onto sprockets in sequence. See Fig. 15. Use spring-type paper clips to secure belt on sprockets. Use wrenches on camshaft sprocket bolts to prevent camshafts from turning during belt installation.



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Fig. 15: Installing Timing Belt (DOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

8) Rotate timing belt tensioner pulley until pin holes are located above center bolt. See Fig. 16. Push tensioner pulley against belt, and temporarily tighten center bolt. Ensure all timing marks are aligned, and remove clips.



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Fig. 16: Adjusting Timing Belt Tensioner (DOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

9) Rotate crankshaft 1/4 revolution counterclockwise. Rotate crankshaft clockwise until timing marks are realigned. Loosen

tensioner center bolt. Using Tensioner Pulley Socket (MD998767), apply approximately 90 INCH lbs. (10 N.m) torque to tensioner pulley to prevent it from turning. See Fig. 16. Retighten center bolt to specification. See TORQUE SPECIFICATIONS. Ensure tensioner pulley does not rotate while tightening center bolt.

10) Rotate crankshaft 2 revolutions clockwise. Wait 5 minutes. Verify wire can still be moved easily, or automatic tensioner rod projects from tensioner body .15-.18" (3.8-4.5 mm). If wire does not move easily, or rod projection is not to specification, repeat steps 6) and 10). Remove wire.

NOTE: Lubricate engine support bracket reamer bolt while it is tightened slowly.

11) To complete installation, reverse removal procedure. Install bolts into correct timing belt cover holes. Install bolts into engine support bracket in reverse order of removal sequence. See Fig. 7. Tighten bolts to specification. Refer to, at the end of this article, TORQUE SPECIFICATIONS.

CAMSHAFT & ROCKER ARMS

Removal (SOHC)

1) Remove PCV valve and breather hoses. Remove timing belt, camshaft sprocket, and rear timing belt cover. See TIMING BELT. Remove rocker covers and gaskets. Remove circular packing from rear of camshafts.

2) Remove camshaft oil seal from front of cylinder head or distributor adapter. Remove distributor adapter and "O" ring. Install Valve Lash Adjuster Holder (MD998443) onto rocker arm. See Fig. 17. Note arrow marks on bearing caps and cylinder head. See Fig. 18.

3) Bearing cap location number is stamped on front side of bearing cap. Remove bearing cap bolts. Keep components in order for reassembly reference. Remove rocker arm assembly. Remove camshaft from cylinder head.

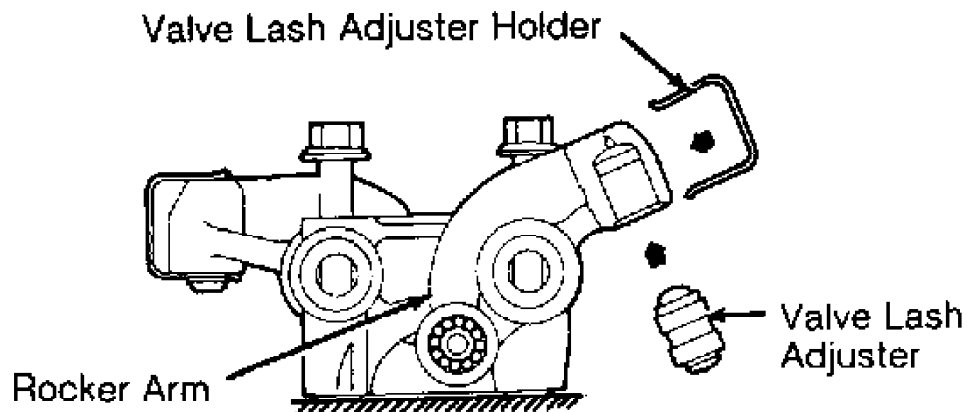


Fig. 17: Installing Valve Lash Adjuster Holder (SOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

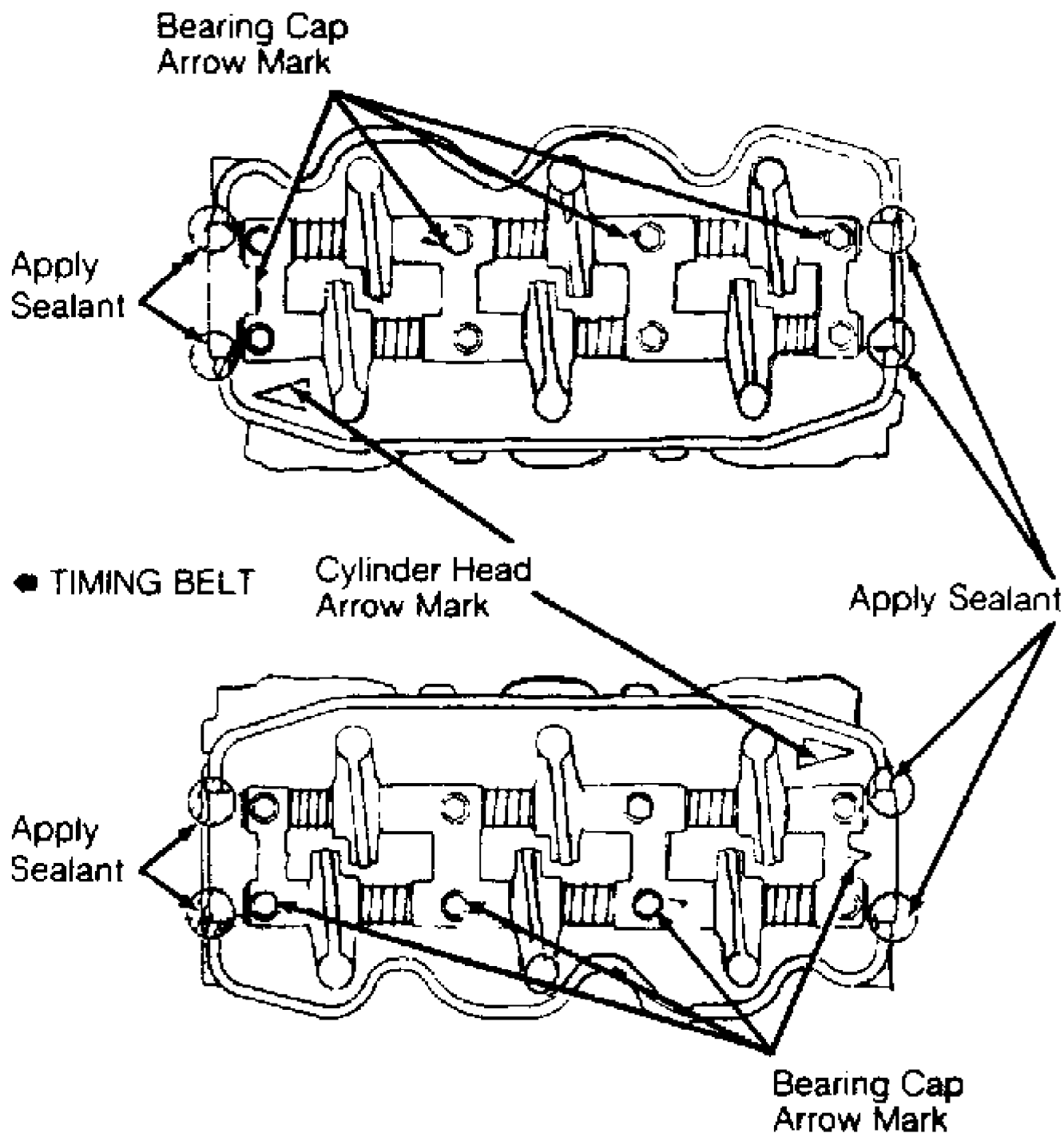


Fig. 18: Identifying Bearing Cap & Sealant Locations (SOHC)
 Courtesy of Mitsubishi Motor Sales of America, Inc.

Inspection (SOHC)

1) Remove bearing caps, rocker arms, and springs from shafts. Mark component location for reassembly reference. Inspect rocker arm and shaft for damaged roller and flaking. Measure rocker arm I.D. and rocker arm shaft O.D. Determine oil clearance. Measure spring free length. Replace components if not within specification. Refer to **ROCKER ARM & SHAFT SPECIFICATIONS (SOHC)** table.

2) Inspect camshaft and distributor gear for damage. Measure camshaft end play, journal diameter, and lobe height. Replace camshaft if it is not within specification. See CAMSHAFT (SOHC) table under ENGINE SPECIFICATIONS.

3) Lubricate components with engine oil. Reassemble rocker arms, springs, and bearing caps. Install bearing caps with identification number toward camshaft sprocket. Ensure oil holes and notch of shafts are properly positioned. See Fig. 19.

ROCKER ARM & SHAFT SPECIFICATIONS (SOHC) TABLE

Application	In. (mm)
Oil Clearance (1) .0004-.0016 (.010-.041)	
Rocker Arm I.D. .... .7444 (18.91)	
Rocker Arm Shaft O.D. .... .7440 (18.90)	
Spring Free Length 2.173 (55.19)	

(1) - Maximum clearance is .004" (.10 mm).

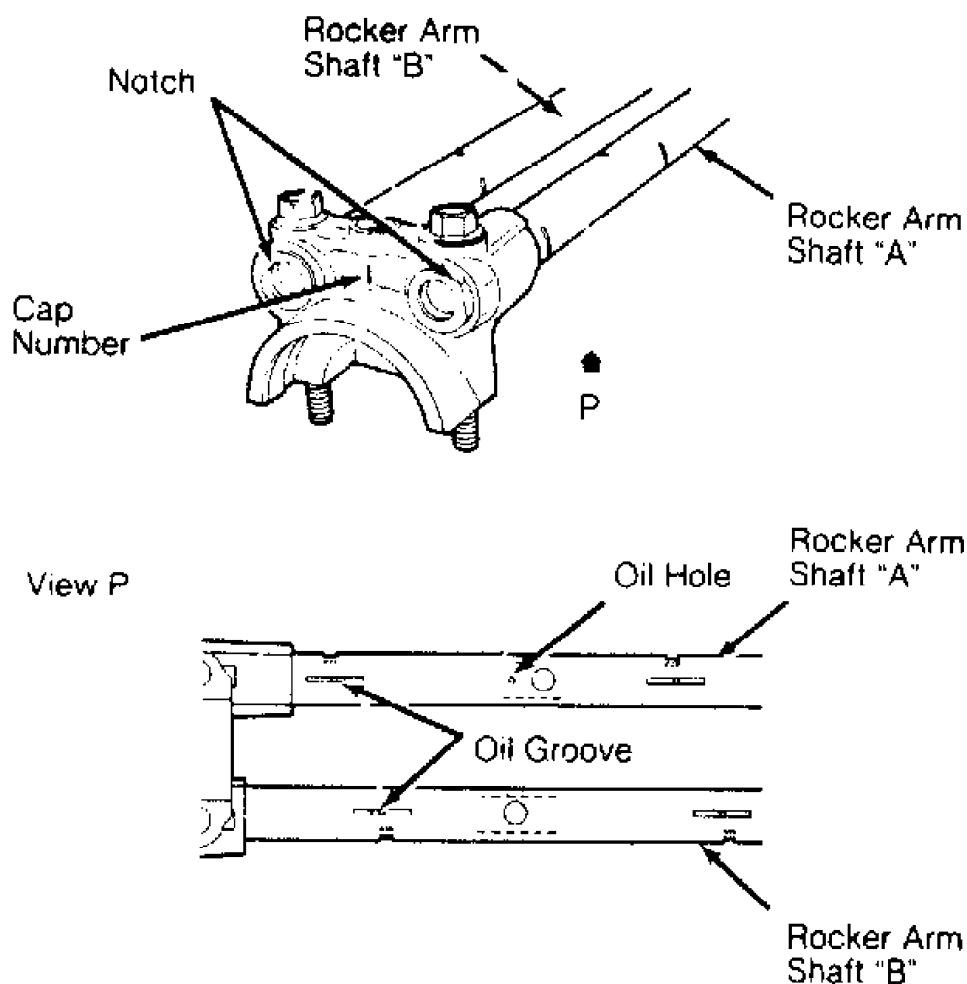


Fig. 19: Installing Rocker Arm Shafts (SOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

Installation (SOHC)

1) Lubricate camshaft with engine oil, and install into

cylinder head. Install valve lash adjusters and valve lash adjuster holders (if removed). See Fig. 17.

2) Apply 3M Sealant (4171) to designated areas of cylinder head. See Fig. 18. Use care so sealant does not get onto camshaft or camshaft bearings. Install rocker arm assembly. Ensure arrow on bearing cap faces same direction as arrow on cylinder head. See Fig. 18. Tighten the bearing cap bolts to specification. Refer to TORQUE SPECIFICATIONS. Remove valve lash adjuster holders.

3) Lubricate camshaft oil seal area with engine oil. Using Seal Driver (MD998713), install camshaft oil seal. Using Circular Packing Installer (MD998306), install circular packing to press-in depth of .02" (.5 mm).

4) Apply Three Bond (1212D) sealant to rocker cover sealing surfaces before installation. See Fig. 6. Lubricate new "O" ring with oil, and install onto distributor adapter (if removed).

5) Lubricate camshaft area with oil before installing distributor adapter. To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

Removal (DOHC)

1) Remove intake manifold if necessary. See INTAKE MANIFOLD. Remove timing belt, camshaft sprockets, and rear timing belt covers. See TIMING BELT.

2) Remove center cover and spark plug wires. Remove PCV and breather hoses. Remove rocker covers and gaskets. Remove crankshaft angle sensor adapter. Remove front and rear camshaft bearing caps together with seals and packings.

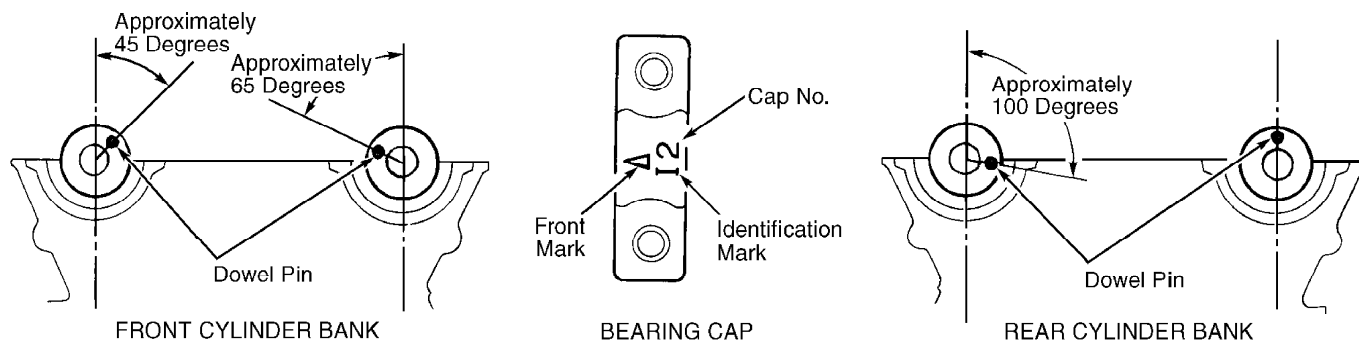
3) Remove remaining camshaft bearing caps in sequence: No. 2, No. 4, and No. 3. Remove camshaft, rocker arms, and lash adjusters. Mark component location for reassembly reference.

Inspection (DOHC)

Inspect rocker arms for damage. Inspect camshaft for damage. Measure camshaft end play, journal diameter, and lobe height. Replace camshaft if it is not within specification. See CAMSHAFT (DOHC) table under ENGINE SPECIFICATIONS.

Installation (DOHC)

1) Lubricate components with engine oil. Install lash adjusters and rocker arms. Bring No. 1 cylinder to TDC. Install intake and exhaust camshafts into correct locations. Intake camshaft is marked with a "V", and exhaust camshaft is marked with a "C" on hexagon section. Position camshaft dowels as shown. See Fig. 20.



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Fig. 20: Installing Camshafts & Bearing Caps (DOHC)
Courtesy of Mitsubishi Motor Sales of America, Inc.

NOTE: If cylinder head is off vehicle, support cylinder head at least .4" (10 mm) above work surface to prevent valve damage while installing camshaft bearing caps.

2) Install camshaft bearing caps in sequence: No. 3, No. 4, and No. 2. Install bearing caps with front mark arrow facing the same direction as similar mark on cylinder head beside bearing journal. Note bearing cap number and identification mark ("I" for intake camshaft and "E" for exhaust). See Fig. 20.

3) Install front and rear bearing caps. Tighten bearing cap bolts to specification. See TORQUE SPECIFICATIONS. Lubricate camshaft oil seal area with engine oil. Using Seal Driver (MD998761), install camshaft oil seal. Using Circular Packing Installer (MD998761), install packing.

4) Install crankshaft angle sensor adapter. To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

REAR CRANKSHAFT OIL SEAL

Removal

Remove transaxle/transmission. See appropriate article in TRANSMISSION SERVICING or CLUTCHES. Remove flywheel or drive plate. Remove rear oil seal housing. Pry seal from seal housing.

Installation

Lubricate seal lip with engine oil. Using Seal Driver (MD998718), install seal into seal housing. Apply sealant to sealing surface of seal case. Install seal case. Install flywheel or drive plate. Tighten bolts to specification. See TORQUE SPECIFICATIONS. To complete installation, reverse removal procedure.

WATER PUMP

Removal

Drain cooling system. Remove timing belt and crankshaft sprocket. See TIMING BELT. Remove coolant ducts to water pump if necessary. Remove water pump bolts, noting length and location for reassembly reference. Remove water pump.

Installation

To install, reverse removal procedure, using new gasket and "O" rings. Coat all "O" rings with water before installation. Install water pump and gasket. Tighten the bolts to specification. Refer to TORQUE SPECIFICATIONS.

OIL PAN

Removal (Diamante)

Raise and support vehicle. Drain engine oil. Remove splash shield. Remove exhaust pipe. If equipped with 4-wheel steering, remove right crossmember. On all models, remove left crossmember. Remove starter. Remove roll stopper brace. Remove front and rear transaxle braces. Remove bellhousing cover. Remove retaining bolts and oil pan.

Removal (Stealth & 3000GT)

1) Raise and support vehicle. Remove engine undercovers. Drain engine oil. Unplug O2 sensor connector. Disconnect front exhaust pipe from manifolds. On All-Wheel Drive (AWD) models, drain transfer case. Remove front air dam. Remove AWD drive shaft and transfer case.

2) On turbocharged models, remove oil return lines from oil pan. On all models, remove starter. Remove crossmember and transaxle braces. Remove bellhousing cover. Remove oil pan bolts. Using Seal Cutter (MD998727), separate oil pan from cylinder block. Remove oil pan.

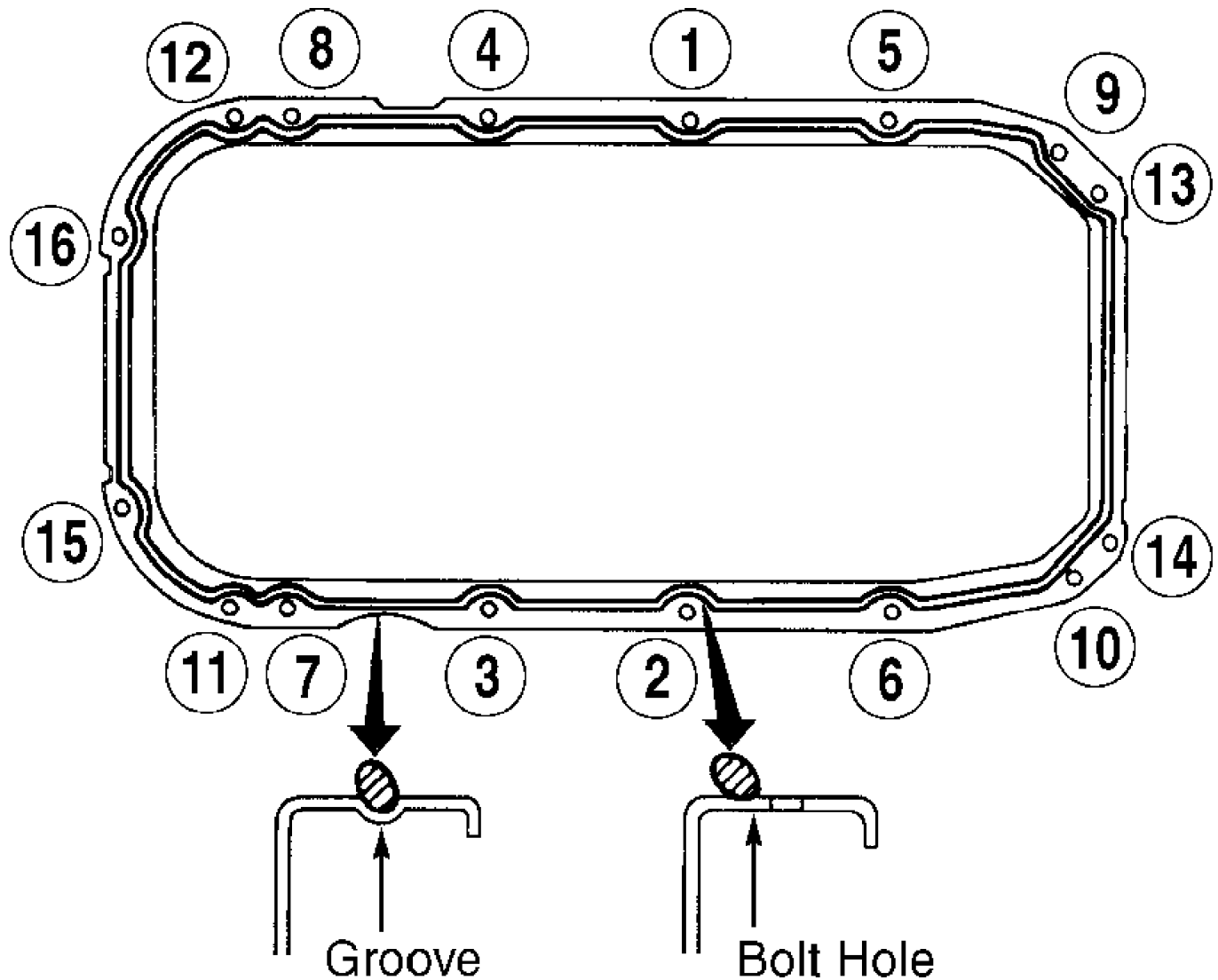
Inspection (All Models)

Clean sealant from mating surfaces on engine block and oil pan. Inspect oil pan for cracks and damage. Inspect sealing surface for damage and deformation. Inspect oil pick-up screen for damage.

Installation (All Models)

1) To install, reverse removal procedure. Apply sealant to oil pan flange in a continuous .16" (4 mm) diameter bead. See Fig. 21. Install oil pan within 15 minutes of applying sealant.

2) Tighten bolts to specification in proper sequence. See TORQUE SPECIFICATIONS. Wait at least 30 minutes before adding oil and starting engine. On AWD models, refill transfer assembly with GL-4 hypoid gear oil. On all models, complete installation by reversing removal procedure.



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Fig. 21: Applying Sealant & Tightening Oil Pan Bolts
Courtesy of Mitsubishi Motor Sales of America, Inc.

CYLINDER HEAD OVERHAUL

Cylinder Head

Measure cylinder head height. Measure warpage at gasket and manifold surfaces. Resurface head if warpage exceeds specification. See appropriate table below:

- * CYLINDER HEAD (SOHC).
- * CYLINDER HEAD (DOHC).

Replace cylinder head if it is not within specification after resurfacing.

NOTE: Install valve springs with enamel-coated side toward valve spring retainer.

Valve Springs

Measure free length of valve springs. Measure spring pressure at specified height. Replace springs if not within specification. See appropriate table below:

- * VALVES & VALVE SPRINGS (SOHC).
- * VALVES & VALVE SPRINGS (DOHC).

Inspect valve spring for squareness. Replace spring if out-of-square exceeds 4 degrees.

Valve Stem Oil Seals

With valves removed, remove oil seals from cylinder head. Lubricate new seals with engine oil. Using Valve Stem Oil Seal Installer (MD998729 for Stealth SOHC, or MD998763 for DOHC), install valve stem oil seal.

Valve Guides

1) Measure valve stem oil clearance. Replace valve guide if not within specification. See appropriate table below:

- * VALVES & VALVE SPRINGS (SOHC).
- * VALVES & VALVE SPRINGS (DOHC).

2) Using rod of Valve Guide Remover/Installer (MD998115) for SOHC, drive out valve guide toward combustion chamber side of cylinder head. Note length of valve guides. On DOHC, use press and appropriate driver to press valve guide out toward combustion chamber side of head.

3) On all models, cylinder head must be bored to install oversized valve guide once guide is removed. DO NOT install valve guide of same O.D. as old guide. Bore cylinder head to specification for oversize valve guide. See appropriate table below:

- * OVERSIZE VALVE GUIDE SPECIFICATIONS (SOHC).
- * OVERSIZE VALVE GUIDE SPECIFICATIONS (DOHC).

4) On SOHC, install proper length valve guide. Intake guide is 1.73" (43.9 mm) long; exhaust guide is 1.89" (48.0 mm) long. On all models, position cylinder head with combustion chamber downward.

5) Using valve guide remover/installer, install valve guide. Remover/installer sets valve guide height on SOHC. On DOHC, install valve guide to .689" (17.5 mm), measured from cylinder head spring seating area to top of valve guide. On all models, ensure valve slides smoothly in valve guide. Recondition valve seat.

OVERSIZE VALVE GUIDE SPECIFICATIONS (SOHC) TABLE

Oversize - In. (mm)	Size Mark	Bore Size - In. (mm)
.002 (.05)	5 ....	.5138-.5147 (13.050-13.073)
.010 (.25)	25 ....	.5217-.5224 (13.251-13.269)
.020 (.51)	50 ....	.5315-.5323 (13.500-13.520)

OVERSIZE VALVE GUIDE SPECIFICATIONS (DOHC) TABLE

Oversize - In. (mm)	Size Mark	Bore Size - In. (mm)
.002 (.05)	5 ....	.4744-.4752 (12.050-12.070)
.010 (.25)	25 ....	.4823-.4830 (12.251-12.269)
.020 (.51)	50 ....	.4921-.4929 (12.500-12.519)

Valve Seat (SOHC)

1) Measure valve spring installed height after valve and valve seat have been reconditioned and lightly lapped. With valve assembly installed, measure installed height of valve spring between spring seat and retainer. Valve seat must be replaced if measurement exceeds 1.63" (41.4 mm).

2) To replace seat, grind wall until seat can be removed. Machine cylinder head to accommodate an oversize valve seat. See OVERSIZE VALVE SEAT SPECIFICATIONS (SOHC) table. Heat cylinder head to approximately 480°F (250°C), and install valve seat. Grind valve seat using 45-degree stone. Use 30-degree and 60-degree stones to set seat height.

OVERSIZE VALVE SEAT SPECIFICATIONS (SOHC) TABLE

Application	In. (mm)
Intake	
Bore Depth	
.012" (.3 mm) Oversize .....	.311-.319 (7.9-8.1)
.024" (.6 mm) Oversize .....	.323-.331 (8.2-8.4)
Bore Diameter	
.012" (.3 mm) Oversize	1.7441-1.7453 (44.300-44.330)
.024" (.6 mm) Oversize	1.7559-1.7571 (44.600-44.630)
Exhaust	
Bore Depth	
.012" (.3 mm) Oversize .....	.311-.319 (7.9-8.1)
.024" (.6 mm) Oversize .....	.323-.331 (8.2-8.4)
Bore Diameter	
.012" (.3 mm) Oversize	1.5079-1.5091 (38.300-38.331)
.024" (.6 mm) Oversize	1.5197-1.5209 (38.600-38.630)

Valve Seat (DOHC)

Grind the seat wall thickness until seat can be removed. Machine cylinder head to accommodate an oversize valve seat. Refer to OVERSIZE VALVE SEAT SPECIFICATIONS (DOHC) table. Heat cylinder head to approximately 480°F (250°C), or chill valve seat with liquid nitrogen, and install valve seat. Grind valve seat using 45-degree stone. Use 30-degree and 60-degree stones to adjust seat height.

OVERSIZE VALVE SEAT SPECIFICATIONS (DOHC) TABLE

Application	In. (mm)
Intake	

Bore Depth			
.012" (.3 mm)	Oversize	.....	.295-.303 (7.5-7.7)
.024" (.6 mm)	Oversize	.....	.307-.315 (7.8-8.0)
Bore Diameter			
.012" (.3 mm)	Oversize	.....	1.4291-1.4303 (36.300-36.329)
.024" (.6 mm)	Oversize	.....	1.4409-1.4421 (36.600-36.629)
Exhaust			
Bore Depth			
.012" (.3 mm)	Oversize	.....	.311-.319 (7.9-8.1)
.024" (.6 mm)	Oversize	.....	.323-.331 (8.2-8.4)
Bore Diameter			
.012" (.3 mm)	Oversize	.....	1.3110-1.3122 (33.300-33.330)
.024" (.6 mm)	Oversize	.....	1.3228-1.3240 (33.600-33.630)

Valves

Disassemble cylinder head. Measure valve stem diameter, valve margin, and overall length. See appropriate table below:

- * VALVES & VALVE SPRINGS (SOHC) .
- * VALVES & VALVE SPRINGS (DOHC) .

Inspect valve for worn stem tip. Measure valve margin after grinding valves. Replace valves if not within specification.

Lash Adjusters

Before installation, submerge lash adjuster in diesel fuel. Using a small wire, hold down internal check valve. Pump plunger up and down 4 or 5 times to bleed air from lash adjuster.

CYLINDER BLOCK ASSEMBLY

Cylinder Block

1) Inspect cylinder block for cracks, warpage, cylinder bore taper, and out-of-round. Replace or repair cylinder block if it is not within specification. See CYLINDER BLOCK table under ENGINE SPECIFICATIONS.

2) Measure cylinder bore and piston skirt diameter. Piston skirt diameter should be measured at 90-degree angle to piston pin. Clearance between piston and cylinder bore must be within specification. See appropriate table below:

- * PISTONS, PINS & RINGS (SOHC) .
- * PISTONS, PINS & RINGS (DOHC) .

Piston & Rod Assembly

1) Remove cylinder heads and oil pan. See CYLINDER HEAD R & I and OIL PAN under REMOVAL & INSTALLATION. Remove cylinder ridge. Mark connecting rod and cap for cylinder identification.

2) Note front mark on piston and connecting rod. See Fig. 22. Mark is positioned toward timing belt side of engine. Remove rod cap and piston assembly.

3) Piston ring end gap and side clearance must be within specification. See appropriate table below:

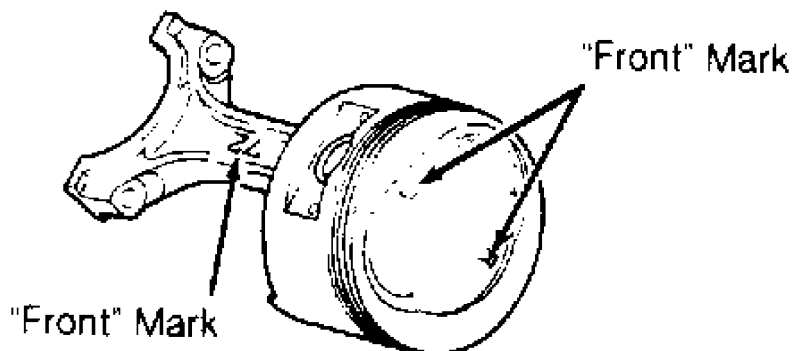
- * PISTONS, PINS & RINGS (SOHC) .
- * PISTONS, PINS & RINGS (DOHC) .

Install rings onto piston with ring code identification marks toward top of piston. On DOHC, top ring is marked "T", and No. 2 ring is marked T2. On SOHC, top ring is marked T1, and No. 2 ring is marked 2R. Lubricate piston, rings, and cylinder bore with engine oil.

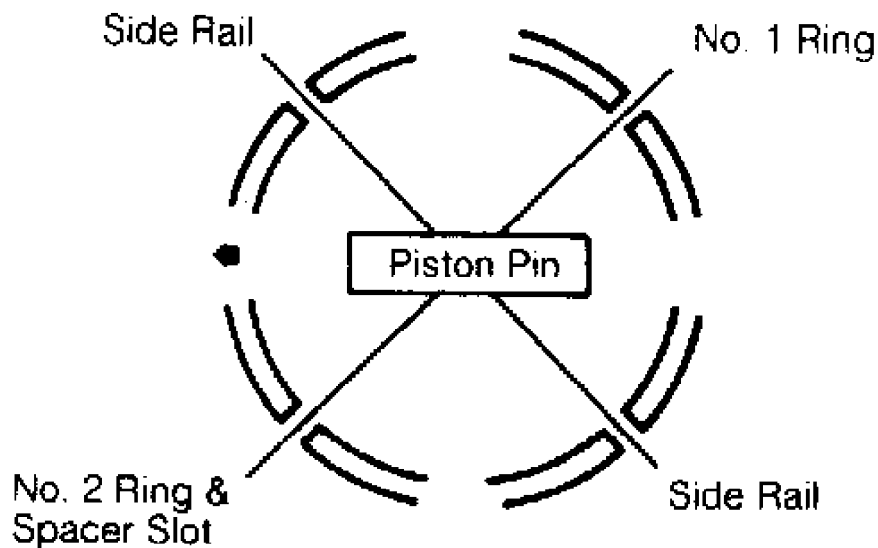
NOTE: Front mark "R" on piston indicates installation in cylinders No. 1, 3, or 5; front mark "L" indicates installation in cylinders No. 2, 4, or 6. Ensure front mark on piston and connecting rod are toward timing belt side of engine. See Fig. 22.

4) Distribute ring end gaps properly around piston. Refer to Fig. 22. Install piston and rod into cylinder bore, with front mark toward timing belt side of engine.

5) Measure bearing clearance using Plastigage. Tighten rod cap nuts to specification. See TORQUE SPECIFICATIONS. Connecting rod must move freely on crankshaft. Measure connecting rod side play. Repair or replace connecting rod if not within specification. See CONNECTING RODS table under ENGINE SPECIFICATIONS.



PISTON ALIGNMENT MARKS



PISTON RING ALIGNMENT

Fig. 22: Aligning Piston & Rings
Courtesy of Mitsubishi Motor Sales of America, Inc.

Fitting Pistons

Measure cylinder bore and piston skirt diameter. Piston skirt

diameter should be measured at 90-degree angle to piston pin. Clearance between piston and cylinder bore must be within specification. See appropriate table below:

- * PISTONS, PINS & RINGS (SOHC) .
- * PISTONS, PINS & RINGS (DOHC) .

Piston Pin Replacement

1) Note reference mark on top of piston and connecting rod. See Fig. 22. Using press and Piston Pin Remover/Installer (MD998184 for SOHC, or MD998765 for DOHC), remove pin.

2) Inspect piston for cracks and damage. Measure ring side clearance. Replace piston if not within specification. See appropriate table below:

- * PISTONS, PINS & RINGS (SOHC) .
- * PISTONS, PINS & RINGS (DOHC) .

3) Measure connecting rod for bend and twist. Replace connecting rod if twist exceeds .004" (.10 mm) or bend exceeds .002" (.05 mm).

NOTE: Install piston with reference mark aligned with connecting rod reference mark. See Fig. 22.

4) Position piston onto connecting rod. Align reference marks on top of piston and connecting rod. See Fig. 22. Lubricate all components with oil. Press piston pin into piston and connecting rod. To install, reverse removal procedure. Ensure piston pin is centered in piston.

Crankshaft & Main Bearings

1) Remove flywheel or drive plate. Remove transaxle/transmission mounting plate and rear seal case. Remove oil pump, oil pan, and oil pick-up tube. Mark connecting rod and main bearing caps for location.

2) Remove connecting rod caps and bearings. Note direction of arrow on main bearing cap. Remove main bearing cap. See Fig. 23. Remove crankshaft. Remove main bearings from cylinder block. Mark bearings for location.

3) Inspect crankshaft for cracks and damaged gear or threads. Measure crankshaft for taper and out-of-round. Replace or repair crankshaft if it is not within specification. See CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS table under ENGINE SPECIFICATIONS.

4) Install upper main bearings into cylinder block. Ensure oil holes are aligned, and bearings are properly seated. Lubricate bearings with engine oil. Install thrust bearing with oil grooves toward crankshaft thrust surface.

5) Install crankshaft into block. Install thrust bearing with oil grooves toward crankshaft thrust surface. Install main bearing caps with arrow toward front of engine.

6) Measure the oil clearance using Plastigage. Tighten the bolts to specification in proper sequence. See Fig. 23. Refer to TORQUE SPECIFICATIONS. Clearance must be within specification. See CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS table. If oil clearance is not within specification, replace bearings or crankshaft.

7) Ensure crankshaft rotates freely with main bearing cap installed. Measure crankshaft end play. See CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS table.

8) Install connecting rod caps and bearings. Install components in original locations. Tighten rod nuts to specification. See TORQUE SPECIFICATIONS. To complete installation, reverse removal procedure. Tighten bolts to specification.

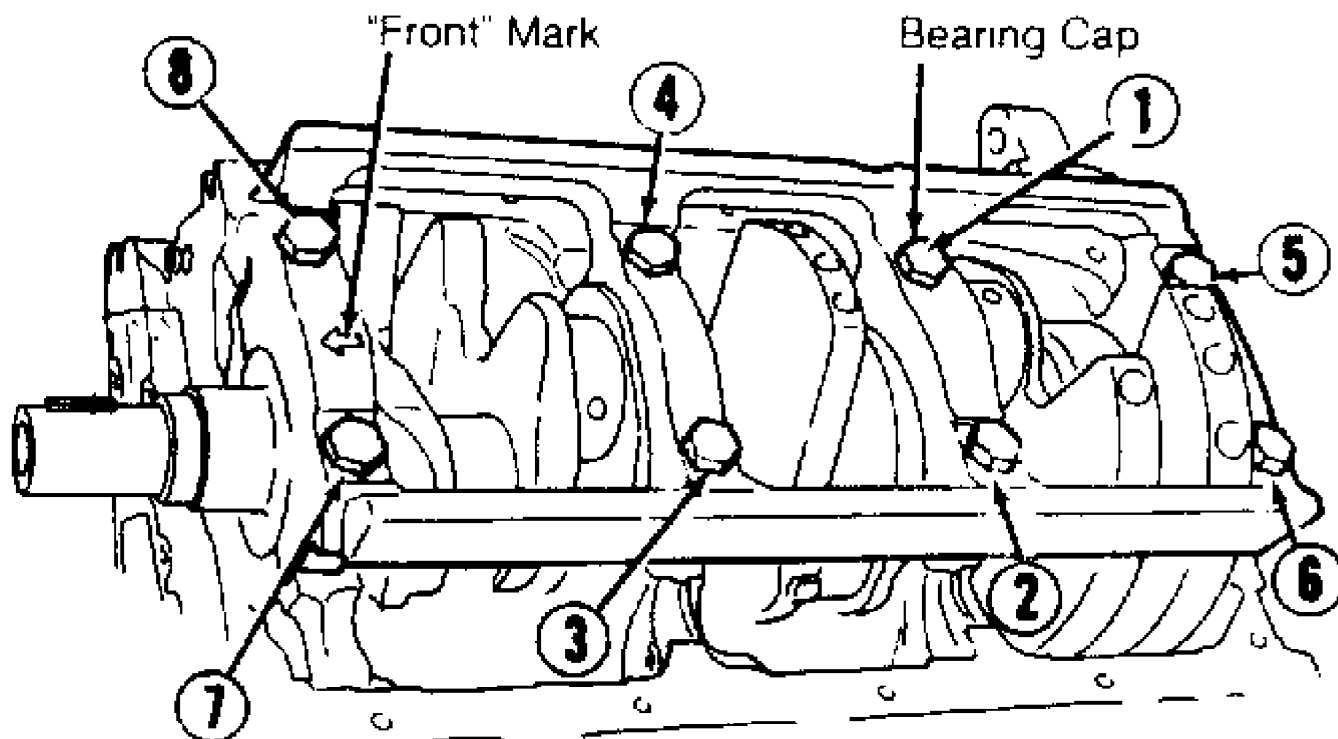


Fig. 23: Tightening Sequence For Main Bearing Cap Bolts
 Courtesy of Mitsubishi Motor Sales of America, Inc.

Connecting Rod Bearings

1) Mark bearing cap and connecting rod for location. Remove connecting rod cap and bearing. Install replacement bearing.

2) Align reference marks on rod cap and connecting rod. Measure bearing clearance with Plastigage. Connecting rods must move freely on crankshaft. Measure connecting rod side play. Refer to CONNECTING RODS table.

Crankshaft End Play

If end play is not within specification, inspect thrust bearings and crankshaft. Replace thrust bearing or crankshaft to obtain correct end play. See CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS table under ENGINE SPECIFICATIONS.

ENGINE OILING

ENGINE LUBRICATION SYSTEM

Oil pressure is provided by a rotor-type pump driven by crankshaft. Pressure relief valve is located in oil pump body.

Crankcase Capacity

On Diamante, crankcase capacity is 4.3L (4.7 qts.) including filter. Stealth and 3000GT oil capacity is 4.2 qts. (4.0L). Add .5 qt. (.4L) with filter replacement. Add .5 qt. (.4L) with oil cooler.

Oil Pressure

Oil pressure should be at least 11 psi (.8 kg/cm²) at idle and engine oil temperature of 167-194°F (75-90°C).

OIL PUMP

Removal

Remove timing belt and crankshaft sprocket. See TIMING BELT under REMOVAL & INSTALLATION. Remove oil pan. See OIL PAN under REMOVAL & INSTALLATION. Remove oil filter and mounting bracket. Remove oil pump and gasket from cylinder block. Note bolt length and location for installation reference.

Disassembly & Inspection

1) Disassemble pump. Inspect for scoring and cracks. Install rotors into pump body. Measure clearance between driven rotor and pump body. See OIL PUMP SPECIFICATIONS table.

2) Measure rotor side clearance. Replace rotor set or pump assembly if not within specification. Ensure relief valve slides freely in pump body bore. Inspect relief valve spring for damage.

OIL PUMP SPECIFICATIONS TABLE

Application	In. (mm)
Driven Rotor-To-Pump Body .....	.0039-.0071 (.099-.180)
Rotor Side Clearance .....	.0016-.0037 (.041-.094)

Reassembly & Installation

1) Reassemble pump. Tighten pump rear cover bolts to specification. See TORQUE SPECIFICATIONS. Install oil pump and gasket. Align splined teeth of oil pump with crankshaft. Install bolts, and tighten to specification.

2) If oil seal was removed, coat new seal with grease. Using Seal Driver (MD998717), install seal in oil pump until flush with case. Install remaining components.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Air Intake Plenum Brace Bolts	13 (18)
Automatic Tensioner Bolt	17 (23)
Camshaft Bearing Cap Bolt	
Front & Rear	15 (20)
No. 2, 3 & 4	(1)
Camshaft Sprocket Bolt	66 (90)
Connecting Rod Nut	38 (52)
Crankshaft Pulley Bolt	136 (185)
Cylinder Head Bolt (2)	
DOHC Turbo	92 (125)
Except DOHC Turbo	59 (80)
Distributor Adapter Bolt	11 (15)
Drive Plate Bolt	55 (75)
Engine Support Bracket Bolt	
Except 10 x 40-mm	76-83 (103-113)
10 x 40-mm	47-54 (63-73)
Exhaust Manifold Nut	13 (18)
Flywheel Bolt	55 (75)
Intake Manifold Bolt	13 (18)
Main Bearing Cap Bolt	
Head Mark "9"	59 (80)
Head Mark "10"	70 (95)

Oil Filter Bracket Bolt	11 (15)
Oil Pick-Up Tube Bolt	14 (19)
Oil Pump Mounting Bolt	11 (15)
Rear Engine Support Bracket-To-Engine Bolt	13-18 (18-25)
Relief Valve Plug	33 (45)
Rocker Shaft	15 (20)
Roll Stopper Bracket Through Bolts	36-43 (49-58)
Turbocharger-To-Exhaust Fitting	40-47 (54-64)
Timing Belt Tensioner Arm Bolt	31 (42)
Timing Belt Tensioner Pulley Nut	36 (49)
Water Pump Bolt	17 (23)

INCH Lbs. (N.m)

Delivery Pipe Bolt	108 (12)
Oil Pan Bolt	48-60 (5-7)
Oil Pump Cover Bolt	96 (11)
Rear Seal Case Bolt	96 (11)
Rocker Cover Bolt	
DOHC	26 (3)
SOHC	72-84 (8-9)
Throttle Body Bolt	84-108 (9-12)
Timing Belt Cover Bolt	84-108 (9-12)
Transmission Mounting Plate Bolt	84-108 (9-12)

- (1) - Tighten to 97 INCH lbs. (8 N.m)
(2) - Tighten in 2 stages in sequence. See Fig. 5.

ENGINE SPECIFICATIONS

GENERAL ENGINE SPECIFICATIONS

GENERAL SPECIFICATIONS TABLE

Application	Specification
3.0L V6 DOHC Non-Turbo	
Displacement	181.4 Cu. In. (3.0L)
Bore	3.587" (91.1 mm)
Stroke	2.992" (76.0 mm)
Compression Ratio	10.0:1
Fuel System	PFI
Horsepower @ RPM	222 @ 6000
Torque Ft. Lbs. @ RPM	201 @ 4500
3.0L V6 DOHC Turbo	
Displacement	181.4 Cu. In. (3.0L)
Bore	3.587" (91.1 mm)
Stroke	2.992" (76.0 mm)
Compression Ratio	8.0:1
Fuel System	PFI
Horsepower @ RPM	300 @ 6000
Torque Ft. Lbs. @ RPM	307 @ 2500
3.0L V6 SOHC	
Displacement	181.4 Cu. In. (3.0L)
Bore	3.587" (91.1 mm)
Stroke	2.992" (76.0 mm)
Compression Ratio	8.9:1
Fuel System	PFI
Horsepower @ RPM	143 @ 5000
Torque Ft. Lbs. @ RPM	168 @ 2500

CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS SPECIFICATIONS

CRANKSHAFT, MAIN & CONNECTING ROD BEARINGS TABLE

Application	In. (mm)
Crankshaft	
End Play	
Standard	.0020-.0098 (.050-.250)
Limit	.012 (.30)
Main Bearings	
Journal Diameter	2.36 (59.9)
Journal Out-Of-Round	
SOHC	.0002 (.005)
DOHC	.00012 (.003)
Journal Taper	
SOHC	.0002 (.005)
DOHC	.00012 (.003)
Oil Clearance	
Standard	
SOHC	.0008-.0020 (.020-.051)
DOHC	.0007-.0017 (.018-.043)
Limit	.004 (.10)
Connecting Rod Bearings	
Journal Diameter	1.965 (49.91)
Journal Out-Of-Round	
SOHC	.0002 (.005)
DOHC	.00012 (.003)
Journal Taper	.0002 (.005)
Oil Clearance	
Standard	.0008-.0020 (.020-.051)
Limit	.004 (.10)

CONNECTING RODS SPECIFICATIONS

CONNECTING RODS TABLE

Application	In. (mm)
Maximum Bend	.002 (.05)
Maximum Twist (Total Rod Length)	.004 (.10)
Side Play	
Standard	.0039-.0099 (.099-.251)
Limit	.016 (.41)

PISTONS, PINS & RINGS SPECIFICATIONS (SOHC)

PISTONS, PINS & RINGS (SOHC) TABLE

Application	In. (mm)
Pistons	
Clearance	.0008-.0016 (.020-.040)
Diameter	3.587 (91.11)
Pins	
Piston Fit	(1)
Rod Fit	(2)
Rings	
No. 1	

End Gap	
Standard	.0118-.0177 (.300-.450)
Limit	.031 (.79)
Side Clearance	
Standard	.0020-.0035 (.051-.089)
Limit	.004 (.10)
No. 2	
End Gap	
Standard	.0098-.0157 (.249-.399)
Limit	.031 (.79)
Side Clearance	
Standard	.0008-.0024 (.020-.060)
Limit	.004 (.10)
No. 3 (Oil)	
End Gap	
Standard	
Except Stealth	.008-.024 (.20-.60)
Stealth	.012-.035 (.30-.89)
Limit	.039 (.99)

(1) - Slip.

(2) - At press load of 1653-3858 lbs. (750-1750 kg).

PISTONS, PINS & RINGS SPECIFICATIONS (DOHC)

PISTONS, PINS & RINGS (DOHC) TABLE

Application	In. (mm)
Pistons	
Clearance	.0012-.0020 (.030-.051)
Diameter	3.587 (91.11)
Pins	
Piston Fit	(1)
Rod Fit	(2)
Rings	
No. 1	
End Gap	.0118-.0177 (.300-.450)
Side Clearance	
Standard	.0012-.0028 (.030-.071)
Limit	.004 (.10)
No. 2	
End Gap	.0177-.0236 (.450-.599)
Side Clearance	
Standard	.0008-.0024 (.020-.060)
Limit	.004 (.10)
No. 3 (Oil)	
End Gap	
Standard	.008-.024 (.20-.60)
Limit	.039 (.99)

(1) - Slip.

(2) - At press load of 1686-3934 lbs. (759-1770 kg).

CYLINDER BLOCK SPECIFICATIONS

CYLINDER BLOCK TABLE

Application	In. (mm)
Cylinder Bore	

Standard Diameter	3.590 (91.19)
Maximum Taper & Out-Of-Round .....	.0008 (.020)
Maximum Deck Warpage	
Standard .....	.002 (.05)
Limit .....	.0040 (.102)

VALVES & VALVE SPRINGS SPECIFICATIONS (SOHC)

VALVES & VALVE SPRINGS (SOHC) TABLE

Application	Specification
Intake Valves	
Face Angle	45-45.5 °
Minimum Margin .....	.028" (.71 mm)
Standard Length	4.055" (103.00 mm)
Stem Diameter .....	.3134-.3140" (7.960-7.976 mm)
Exhaust Valves	
Face Angle	45-45.5 °
Minimum Margin .....	.059" (1.50 mm)
Standard Length	4.043" (102.70 mm)
Stem Diameter .....	.3122-.3130" (7.930-7.950 mm)
Valve Springs	
Free Length	
Standard	1.960" (49.78 mm)
Limit	1.920" (48.77 mm)
Installed Height	1.591" (40.41 mm)
Out-Of-Square	
Standard	2 °
Limit	4 °
Pressure (Valve Closed) ..	(1) 74 @ 1.591 (33.6 @ 40.41)

(1) - Lbs. @ In. (kg @ mm).

VALVES & VALVE SPRINGS SPECIFICATIONS (DOHC)

VALVES & VALVE SPRINGS (DOHC) TABLE

Application	Specification
Intake Valves	
Face Angle	45-45.5 °
Minimum Margin .....	.019" (.48 mm)
Standard Length	4.185" (106.30 mm)
Stem Diameter .....	.260" (6.60 mm)
Exhaust Valves	
Face Angle	45-45.5 °
Minimum Margin .....	.039" (.99 mm)
Standard Length	4.150" (105.41 mm)
Stem Diameter .....	.260" (6.60 mm)
Valve Springs	
Free Length	
Standard	1.830" (46.48 mm)
Limit	1.790" (45.47 mm)
Installed Height	1.492" (37.90 mm)
Out-Of-Square	
Standard	2 °
Limit	4 °
Pressure (Valve Closed) ..	(1) 62 @ 1.492 (28.1 @ 37.90)

(1) - Lbs. @ In. (kg @ mm).

CYLINDER HEAD SPECIFICATIONS (SOHC)

CYLINDER HEAD (SOHC) TABLE

Application	Specification
Cylinder Head Height	3.310" (84.07 mm)
Maximum Warpage .....	.008" (.20 mm)
Valve Seats (Intake & Exhaust)	
Seat Angle	45°-45.5
Seat Width .....	.035-.051" (.90-1.30 mm)
Seat Bore Diameter	1.732-1.742" (44.00-44.25 mm)
Valve Guides	
Intake Valve	
Valve Guide Cyl.	
Head Bore I.D. ....	.5118-.5189" (13.00-13.18 mm)
Valve Guide Length	1.732" (44 mm)
Stem-To-Guide Clearance	
Standard .....	.0012-.0024" (.030-.060 mm)
Limit .....	.004" (.10 mm)
Exhaust Valve	
Valve Guide Cyl.	
Head Bore I.D. ....	.5118-.5189" (13.00-13.18 mm)
Valve Guide Length	1.890" (48 mm)
Stem-To-Guide Clearance	
Standard .....	.0020-.0035" (.050-.090 mm)
Limit .....	.006" (.15 mm)

CYLINDER HEAD SPECIFICATIONS (DOHC)

CYLINDER HEAD (DOHC) TABLE

Application	Specification
Cylinder Head Height	5.20" (132.1 mm)
Maximum Warpage .....	.008" (.20 mm)
Valve Seats (Intake & Exhaust)	
Seat Angle	45°-45.5
Seat Width .....	.035-.051" (.90-1.30 mm)
Seat Bore Diameter	1.417-1.427" (35.99-36.25 mm)
Valve Guides	
Intake Valve	
Valve Guide Cyl.	
Head Bore I.D. ....	.5118-.5189" (13.00-13.18 mm)
Valve Guide Installed Height .....	.689" (17.50 mm)
Stem-To-Guide Clearance	
Standard .....	.0008-.0020" (.020-.051 mm)
Limit .....	.0040" (.102 mm)
Exhaust Valve	
Valve Guide Cyl.	
Head Bore I.D. ....	.5118-.5189" (13.00-13.18 mm)
Valve Guide Installed Height .....	.689" (17.50 mm)
Valve Stem-To-Guide Clearance	
Standard .....	.0020-.0035" (.051-.089 mm)
Limit .....	.0060" (.152 mm)

CAMSHAFT SPECIFICATIONS (SOHC)

CAMSHAFT (SOHC) TABLE

Application	In. (mm)
End Play	
Standard .....	.004-.008 (0.1-0.2)
Limit .....	.015 (0.4)
Journal Diameter	1.34 (34.0)
Lobe Height	
Standard	1.620 (41.15)
Limit	1.600 (40.64)
Oil Clearance .....	.0020-.0035 (.050-.090)

CAMSHAFT SPECIFICATIONS (DOHC)

CAMSHAFT (DOHC) TABLE

Application	In. (mm)
End Play	
Standard .....	.004-.008 (0.1-0.2)
Limit .....	.015 (0.4)
Journal Diameter	1.020 (25.91)
Lobe Height	
Intake	
Standard	1.370 (34.80)
Limit	1.350 (34.29)
Exhaust	
Standard	1.370 (34.80)
Limit	1.350 (34.29)
Oil Clearance .....	.0020-.0040 (.050-.102)
