REMOVAL & INSTALLATION

FUEL PRESSURE RELEASE

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.

To release fuel pressure, disconnect negative battery cable. Remove fuel cap to release fuel tank pressure. Remove relief valve cap from fuel rail. Connect fuel pressure gauge to relief valve and release fuel pressure into a suitable container.

COOLING SYSTEM BLEEDING

1. Fill cooling system with 50/50 mixture of coolant and water. Pause several minutes for circulation. Fill radiator to filler neck seat. Install radiator cap fully, then back off to first stop.

WARNING: When engine is operating, NEVER remove radiator cap under any conditions. Failure to follow instruction could damage cooling system or engine, or cause personal injury. Always wrap protective material around radiator cap to avoid injury from hot coolant.

2. Place heater controls to maximum heat. Start engine and operate at 2000 RPM for approximately 3-4 minutes. Turn engine off. Using a protective rag, carefully remove radiator cap. Add coolant to filler neck seat.
3. Install radiator cap fully then back off to first stop. Start engine and allow to operate at 2000 RPM until upper radiator hose is warm. Check heater output. Turn engine off. Using a protective rag, carefully remove radiator cap. Add coolant to filler neck seat if necessary.
4. Tightly install radiator cap. Remove small cap (large cap is for windshield washer reservoir) on coolant recovery reservoir. Add 1.1 qt. (1L) of 50/50 mixture of coolant and water to reservoir. Install reservoir cap.

ENGINE

Removal (Aerostar)

1. Disconnect negative battery cable. Drain cooling system. Remove air cleaner and intake duct assembly. Remove radiator hoses and fan shroud. Remove left-handed nut retaining clutch fan to pulley. Remove cooling fan. Disconnect Barometric Manifold Absolute Pressure (BMAP) sensor. Remove throttle linkage shroud.
2. Disconnect throttle linkage at throttle body. Remove accessory drive belts. Disconnect injector harness connector from main Electronic Engine Control (EEC) harness. Disconnect Engine Coolant Temperature (ECT) sensor.
3. Disconnect canister purge solenoid hoses from solenoid. Disconnect power steering pump pressure switch. Remove heater hoses. Remove breather tube from air cleaner and valve cover. Remove transmission oil cooler lines from radiator (if equipped).
4. Remove radiator retaining bolts and radiator. Remove oil fill tube-to-alternator bracket nut. Remove A/C compressor and set aside (if equipped). Remove transmission oil fill tube bolt from top of

manifold (if equipped). Disconnect alternator connectors.

5. Remove brake booster vacuum line from brake booster. Remove bolt retaining steering gear at top of shaft. Remove engine cover. Disconnect radio frequency interference suppressor.
6. Disconnect Thick Film Ignition (TFI) connector at distributor. Disconnect oil pressure sender. Release fuel pressure. See **FUEL PRESSURE RELEASE**. Using Disconnect Tool (D87L-9280-A) for 3/8" line or (D87L-9280-B) for 1/2" line, disconnect fuel supply and return lines. See **Fig. 2**.
7. On M/T models, position shifter in Neutral. Remove shift lever-to-floor retaining bolts. Remove shift lever-to-transmission retaining bolts. Remove shift lever. Raise and support vehicle.
8. Disconnect oil level sensor connector from oil pan. Mark drive shaft-to-flange position and remove drive shaft. Pull speedometer cable from rear of transmission. Remove starter connections and remove starter.
9. On M/T models, remove hydraulic hose-to-slave cylinder lock pin in clutch housing. Remove and plug hose. Disconnect back-up light switch, shift indicator and neutral switch wires. On A/T models, disconnect neutral start switch and 3-4 shift solenoid connectors. Disconnect selector and kickdown cable from transmission lever.
10. Disconnect vacuum modulator hose. Remove converter access cover and adapter plate bolts from lower end of converter housing. Remove flywheel-to-converter retaining nuts. Disconnect oxygen sensor. Disconnect transmission oil cooler lines from transmission (if equipped).
11. Place transmission jack under transmission. Place a safety chain around transmission. Raise transmission slightly. Remove transmission mount-to-crossmember nuts. Remove mount (if necessary). Remove crossmember-to-bracket bolts and nuts. Remove crossmember.
12. Remove bellhousing-to-engine fasteners. Slide transmission rearward. Lower transmission from vehicle. Disconnect exhaust pipes from manifolds. Remove exhaust pipe and converter. Remove front wheels. Remove engine ground straps. Remove stabilizer bar nuts and disconnect stabilizer bar from lower control arms.
13. Disconnect and plug brake lines at bracket on frame behind spindles. Place jack under lower control arm and raise jack until tension is applied to coil spring. Remove upper spindle-to-control arm ball joint bolt and nut. Slowly lower jack to disconnect spindle from ball joint.
14. Position Drive Train Removal Lift (109-00002) under crossmember and engine assembly. Lower vehicle until crossmember rests on lift. Place wood blocks under front crossmember and rear of engine (or transmission if assembled) to keep unit level.
15. Install safety chains around crossmember and lift. With engine and crossmember securely supported on lift, remove 3 engine and crossmember-to-frame retaining bolts from each side of vehicle.
16. Slowly lower engine assembly from vehicle. Ensure A/C compressor and wiring harnesses do not interfere with removal process. Raise body from engine and crossmember assembly. Remove motor mount nuts. Remove engine from crossmember.

Installation

To install, reverse removal procedure. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** table at end of article. Check and fill all fluid levels. Bleed brakes. Fill and bleed air from cooling system. See **COOLING SYSTEM BLEEDING**. Start engine and check for leaks. Check front end alignment and adjust as necessary.

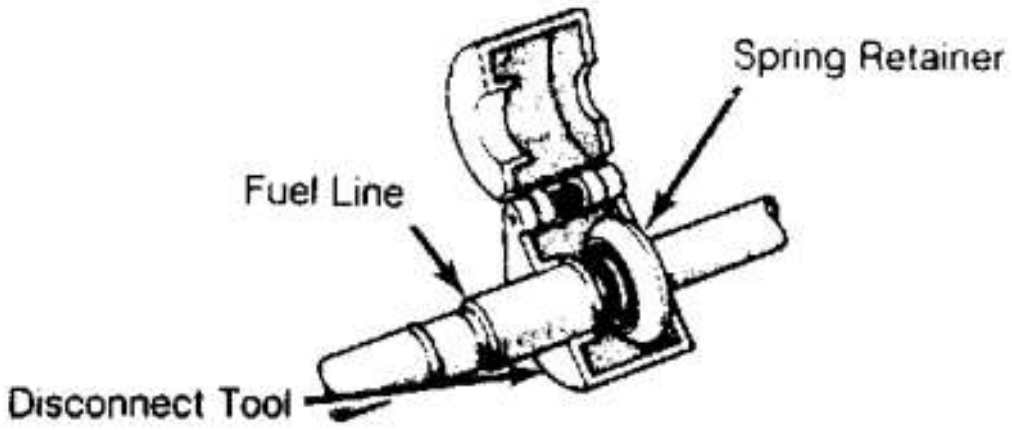

Fig. 2: Disconnecting Fuel Lines
Courtesy of FORD MOTOR CO.

Removal (Ranger)

1. Disconnect negative battery cable and drain cooling system. Remove hood, air cleaner and intake duct assembly. Remove fan shroud and position over fan. Remove radiator with hoses and shroud. Remove alternator and bracket.
2. Remove A/C compressor and power steering pump with hoses attached (if equipped). Disconnect heater hoses from engine. Release fuel pressure. See **FUEL PRESSURE RELEASE**. Using Disconnect Tool (D87L-9280-A) for 3/8" line or (D87L-9280-B) for 1/2" line, disconnect fuel supply and return lines. See **Fig. 2**.
3. Disconnect brake booster vacuum hose. Disconnect throttle cable linkage and shield at throttle body and intake manifold. Disconnect all vacuum hoses from rear vacuum fitting in upper intake manifold.
4. Disconnect wiring from coil, oil pressure sending unit and engine coolant temperature sending units. Disconnect injector harness, air charge temperature sensor and throttle position sensor.
5. Mark distributor rotor and body position for installation reference. Remove distributor. Raise and support vehicle. Remove 2 lower bolts from A/C compressor. Disconnect oil level sensor connector from oil pan. Disconnect oil pressure sender connector.
6. Remove transmission oil cooler line bracket from right side of engine. Disconnect exhaust pipes from manifolds. Remove starter and front engine mount nuts or through bolts. Remove ground wires from engine block. On A/T models, remove converter inspection cover and disconnect flywheel from converter.
7. Remove kickdown rod and bellhousing mounting bolts. Remove adapter plate-to-converter housing bolt. On M/T models, remove bellhousing bolts and hydraulic clutch hose. On all models, remove engine front support-to-crossmember nuts and bolts.
8. Lower vehicle and attach engine hoist to brackets at exhaust manifolds. Remove remaining A/C compressor bolts and set compressor aside. Ensure all wires and hoses are disconnected before raising engine. Support transmission. Raise engine slightly and carefully pull engine forward from transmission without damaging rear cover plate. Remove engine from vehicle.

Installation

To install, reverse removal procedure. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** table at end of article. Fill or top off all engine fluids. Fill and bleed air from cooling system. See **COOLING SYSTEM BLEEDING**. Bleed clutch hydraulic system (if equipped). Adjust ignition timing and idle speed.

INTAKE MANIFOLDS

NOTE: Upper and lower intake manifold service procedures are covered separately

Removal (Upper)

1. Disconnect negative battery cable. Remove air cleaner duct hose. Remove throttle linkage shield and disconnect linkage. Mark and disconnect vacuum hoses from throttle body. Mark and disconnect electrical connectors.
2. Disconnect PCV hose. Remove alternator support brace. Remove 6 upper intake manifold assembly bolts. Remove upper intake manifold assembly and gasket.

Installation

Clean gasket mating surfaces. Install a new gasket. Use guide pins and install upper intake manifold. Tighten bolts in sequence to specification. See **Fig. 3**. See **TORQUE SPECIFICATIONS** table at end of article. To complete installation, reverse removal procedure.

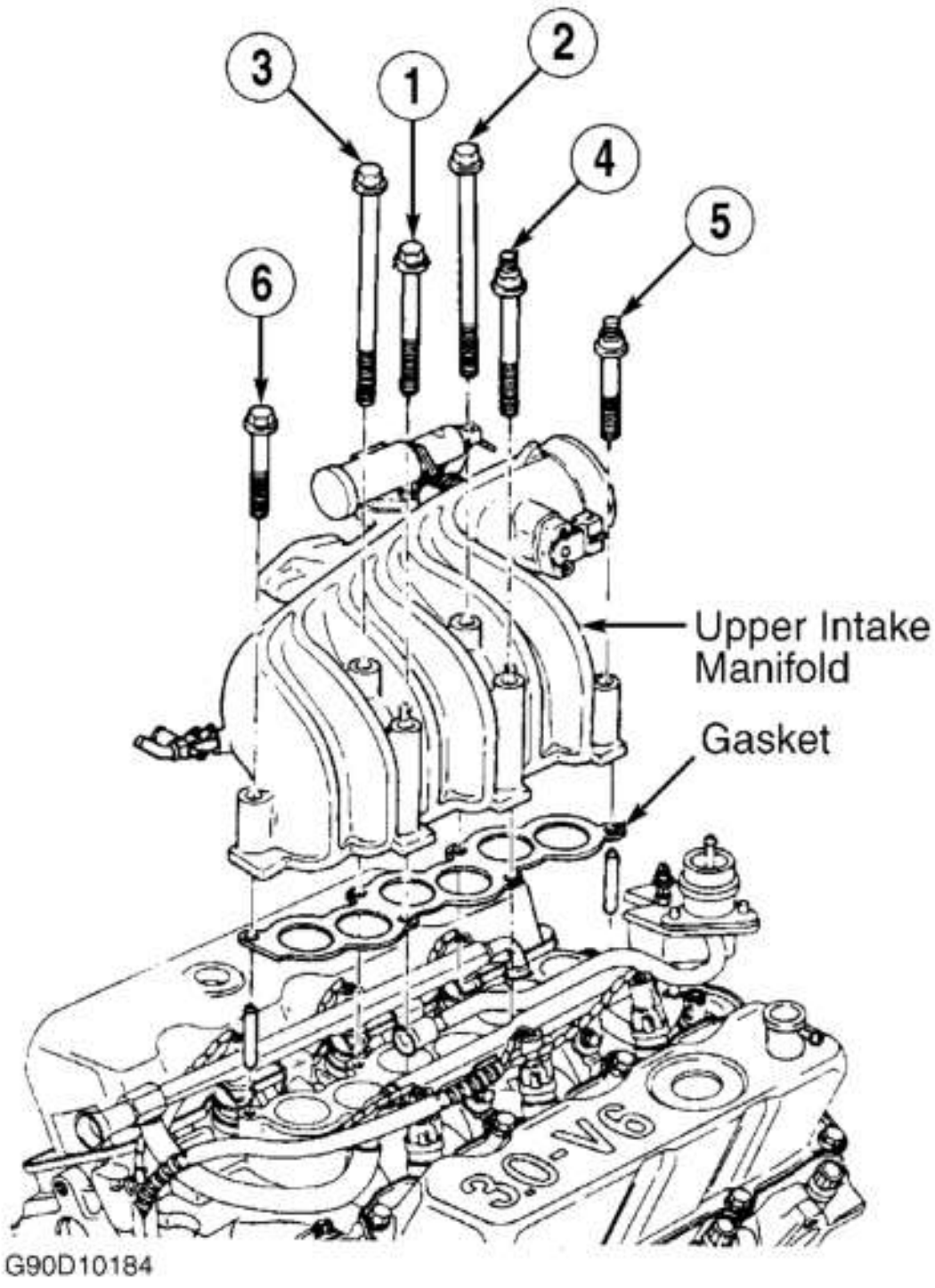

Fig. 3: Upper Intake Manifold Tightening Sequence
Courtesy of FORD MOTOR CO.

Removal (Lower)

1. Remove upper intake manifold as previously described. Drain cooling system. Release fuel pressure.

See, in this article, **FUEL PRESSURE RELEASE**.

2. Using Disconnect Tool (D87L-9280-A) for 3/8" line or (D87L-9280-B) for 1/2" line, disconnect fuel supply and return lines. See **Fig. 2**. Remove fuel injector wiring harness. Remove upper radiator hose and heater hoses.
3. Disconnect wiring harness connectors as necessary. Remove alternator-to-throttle body bracket. Position No. 1 piston on TDC of compression stroke. Mark and remove spark plug wires from spark plugs. Remove distributor cap with plug wires.
4. Mark distributor rotor and body position for installation reference. Remove distributor. On Aerostar, remove ignition coil from left cylinder head. On all models, remove valve covers. See, in this article, **VALVE COVERS**.
5. On No. 3 intake valve, loosen rocker arm bolt. Rotate rocker arm aside and remove push rod. Remove lower intake manifold retaining bolts. Remove lower intake manifold (with fuel rail and injectors) as an assembly. Remove and discard end seals and side gaskets.

Installation

1. Lightly oil all retaining bolts and stud threads before installation. Apply silicone sealer to 4 intersecting corners of cylinder block and cylinder head. Install front and rear intake manifold seals. Position lower intake manifold gaskets in place with locking tabs over tabs on cylinder head gaskets.
2. Carefully install lower intake manifold. Install manifold retaining bolts and tighten in sequence to specification. See **Fig. 4**. See **TORQUE SPECIFICATIONS** table at end of article.
3. Install No. 3 cylinder intake valve push rod. Rotate crankshaft until No. 3 intake push rod is at its lowest point on camshaft lobe. Position rocker arm on valve and tighten rocker arm bolt to specification. See **TORQUE SPECIFICATIONS** table at end of article.
4. To complete installation, reverse removal procedure. Fill and bleed cooling system. See **COOLING SYSTEM BLEEDING**.

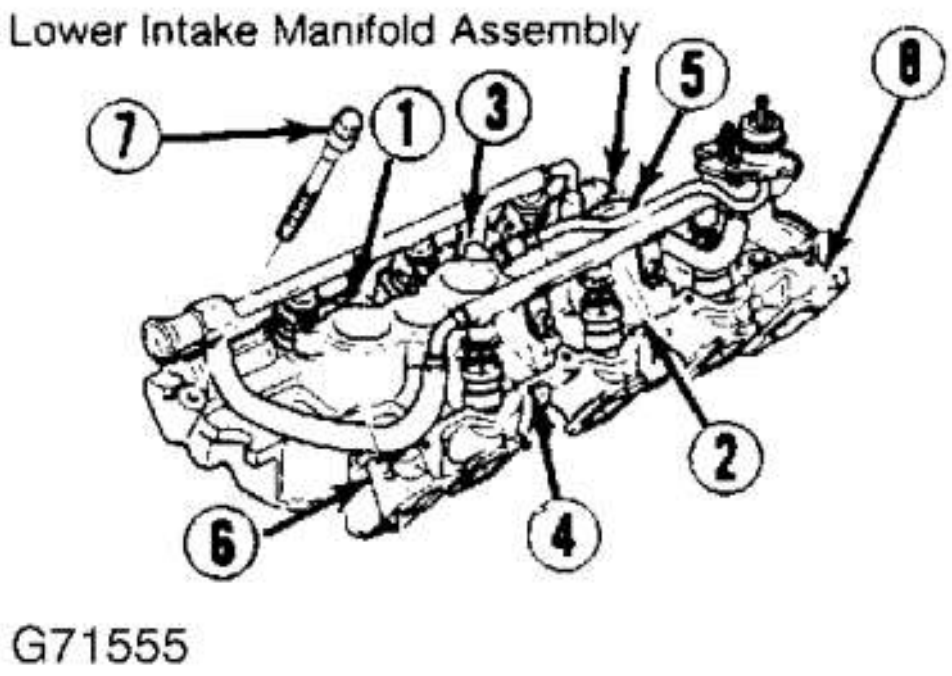

Fig. 4: Lower Intake Manifold Tightening Sequence
Courtesy of FORD MOTOR CO.

EXHAUST MANIFOLDS

Removal

Disconnect negative battery cable. Remove spark plugs. Remove oil dipstick tube retaining nut from left cylinder head, and rotate tube off of stud. Separate inlet pipe from exhaust manifold. Remove exhaust manifold bolts. Remove exhaust manifold.

Installation

Clean carbon from mating surfaces. Lightly oil threads of bolts and stud before installation. Install exhaust manifold(s) and tighten bolts to specification. See **TORQUE SPECIFICATIONS** table at end of article. To complete installation, reverse removal procedure.

VALVE COVERS

NOTE: Valve covers have integral (built-in) gaskets which are made to last the life of the vehicle. If necessary, replacement gaskets are available.

Removal

1. Disconnect negative battery cable. On Aerostar, remove fresh air hose from air cleaner. On all models,

mark and remove spark plug wires from spark plugs. Remove spark plug wire separators from valve cover studs. For left valve cover, remove upper intake manifold. See **INTAKE MANIFOLDS**.

2. Remove PCV valve. Disconnect injector wiring harness bracket from left valve cover studs. For right valve cover on Aerostar, remove oil filler tube. On Ranger, disconnect engine wiring harness connectors from right valve cover.
3. On all models, disconnect injector wiring harness bracket from right valve cover studs. Disconnect breather hose. On all applications, remove valve cover retaining bolts and studs.
4. Carefully slide a thin knife between cylinder head and valve cover. Cut silicone sealer; DO NOT cut integral gasket. Remove valve cover(s).

Installation

1. Replace valve cover gasket if necessary. Ensure gasket lies flat in valve cover channel. Lightly oil threads of bolts and studs. Ensure sealing surfaces are clean.
2. Apply a bead of silicone sealant to intake manifold-to-cylinder head joining area. Install valve cover and tighten bolts to specification. See **TORQUE SPECIFICATIONS** table at end of article. To complete installation, reverse removal procedure.

CYLINDER HEAD

Removal

1. Remove upper and lower intake manifolds. See, in this article, **INTAKE MANIFOLDS**. Remove accessory drive belts and idler. When removing left cylinder head, remove power steering pump bracket retaining bolts. Remove power steering pump and bracket as an assembly (with hoses attached) .
2. On Aerostar, remove ignition coil bracket and coil. On all models, remove dipstick tube retaining nut from exhaust manifold. Rotate or remove dipstick tube. When removing right cylinder head, remove alternator bracket and adjusting arm.
3. Remove spark plugs. Remove exhaust manifolds. See, in this article, **EXHAUST MANIFOLDS**. Remove PCV valve and valve covers. See **VALVE COVERS**.
4. Loosen rocker arm bolts and move rocker arm off push rod. Keep push rods in order for installation reference, and remove push rods. Remove and discard cylinder head retaining bolts. Remove cylinder head and gasket.

Inspection

Clean head gasket mating surfaces. Clean carbon from combustion chambers. DO NOT damage surfaces. Check cylinder head for cracks, burrs, nicks and warpage. DO NOT machine more than .010" (.25 mm) from original cylinder head surface to correct warpage. Replace cylinder head as necessary. See **CYLINDER HEAD** table under ENGINE SPECIFICATIONS at end of article.

Installation

1. Replace locating dowels in cylinder block if damaged. Position new head gasket over locating dowels on cylinder block, with marked side in proper position.

NOTE: "V" notch below TRUCK marking on gasket indicates right-hand head gasket. "V" notch above TRUCK marking on gasket indicates left-hand head gasket. See Fig. 5. Ensure UP mark on gasket faces upward.

2. Install cylinder head and new cylinder head bolts. Tighten cylinder head bolts in sequence to specification. See **Fig. 5**. See **TORQUE SPECIFICATIONS** table at end of article. Dip each push rod end in Oil Conditioner (D9AZ-19579-CA). Install push rods in their original location.
3. For each valve, rotate crankshaft until lifter rests on heel of camshaft lobe. Position rocker arm over push rod and install fulcrum. Tighten rocker arm bolt to 96 INCH lbs. (11 N.m). After all rocker arms have been installed, tighten rocker arm bolts (camshaft may be in any position) to a final torque of 24 ft. lbs. (33 N.m).

CAUTION: Rocker arms must be fully seated in cylinder head and push rods must be seated in rocker arm sockets before final tightening. If all original components removed are reinstalled, valve clearance check is not required. If valves/seats were serviced, check and adjust valve clearance. See VALVE CLEARANCE ADJUSTMENT under ADJUSTMENTS.

4. To complete installation, reverse removal procedure. Tighten all bolts/nuts to specification. See **TORQUE SPECIFICATIONS** table at end of article. Fill and bleed cooling system. See, in this article, **COOLING SYSTEM BLEEDING**.

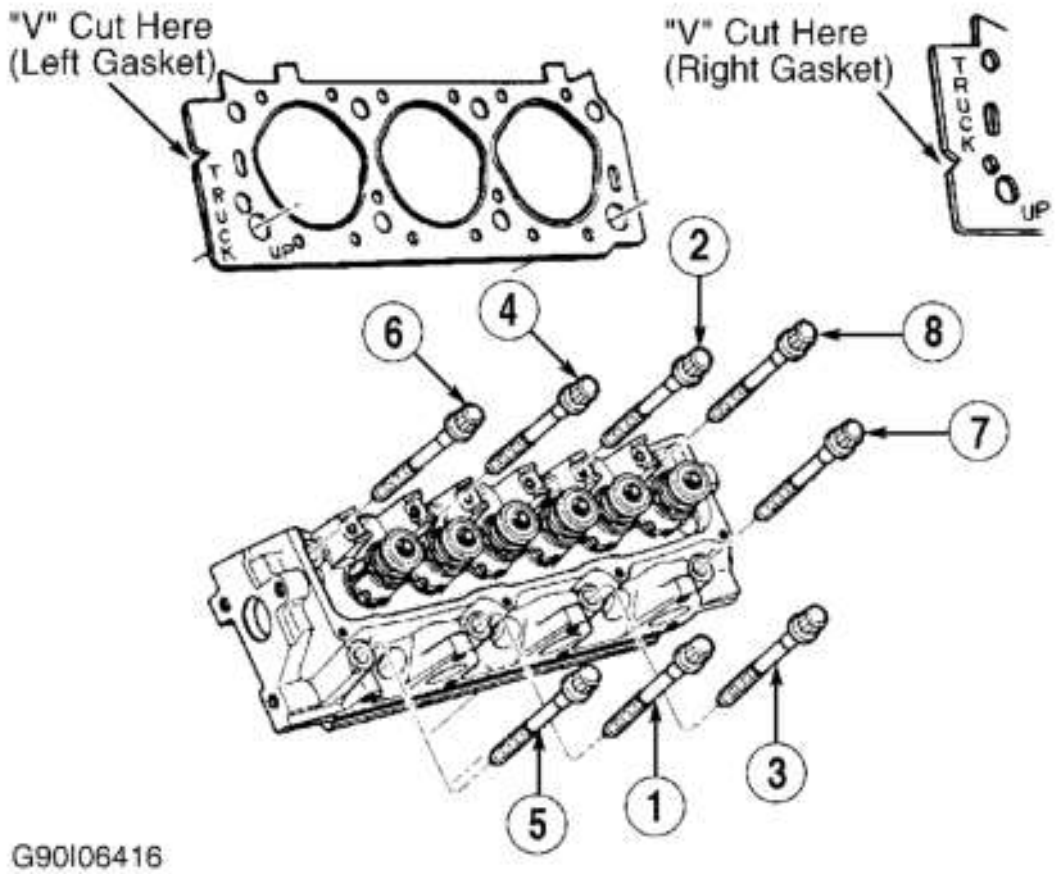

Fig. 5: Cylinder Head Gasket Position & Head Bolt Tightening Sequence
Courtesy of FORD MOTOR CO.

FRONT COVER OIL SEAL

Removal

Disconnect negative battery cable. Remove accessory drive belts. Remove crankshaft belt pulley. Remove crankshaft damper using Crankshaft Damper Remover and Adapter (T58P-6316-D and T82L-6316-B). Pry seal out carefully to avoid damaging sealing surface.

Installation

Lubricate lip of seal with clean engine oil. Using a proper size seal installer, install seal. Lubricate damper seal surface with engine oil. Apply RTV sealer to damper keyway. To complete installation, reverse removal procedure. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** table at end of article.

FRONT COVER

Removal

1. Remove negative battery cable. Drain cooling system. Remove accessory drive belts. Remove left-handed nut retaining clutch fan to pulley. Remove cooling fan and water pump pulley. Remove A/C bracket, brace and compressor as an assembly (if equipped). Remove alternator adjusting arm and brace, and position alternator aside.
2. On Ranger, remove upper motor mount nuts. Position No. 1 piston on TDC of compression stroke. Remove distributor cap with plug wires. Mark distributor rotor and body position for installation reference. Remove distributor.
3. On all models, remove crankshaft belt pulley. Using Crankshaft Damper Remover and Adapter (T58P-6316-D and T82L-6316-B), remove crankshaft damper. Remove hoses from water pump.
4. Remove oil pan. See **OIL PAN**. Remove 10 bolts retaining front cover and water pump assembly to engine. See **Fig. 6**. Remove front cover and water pump as an assembly.

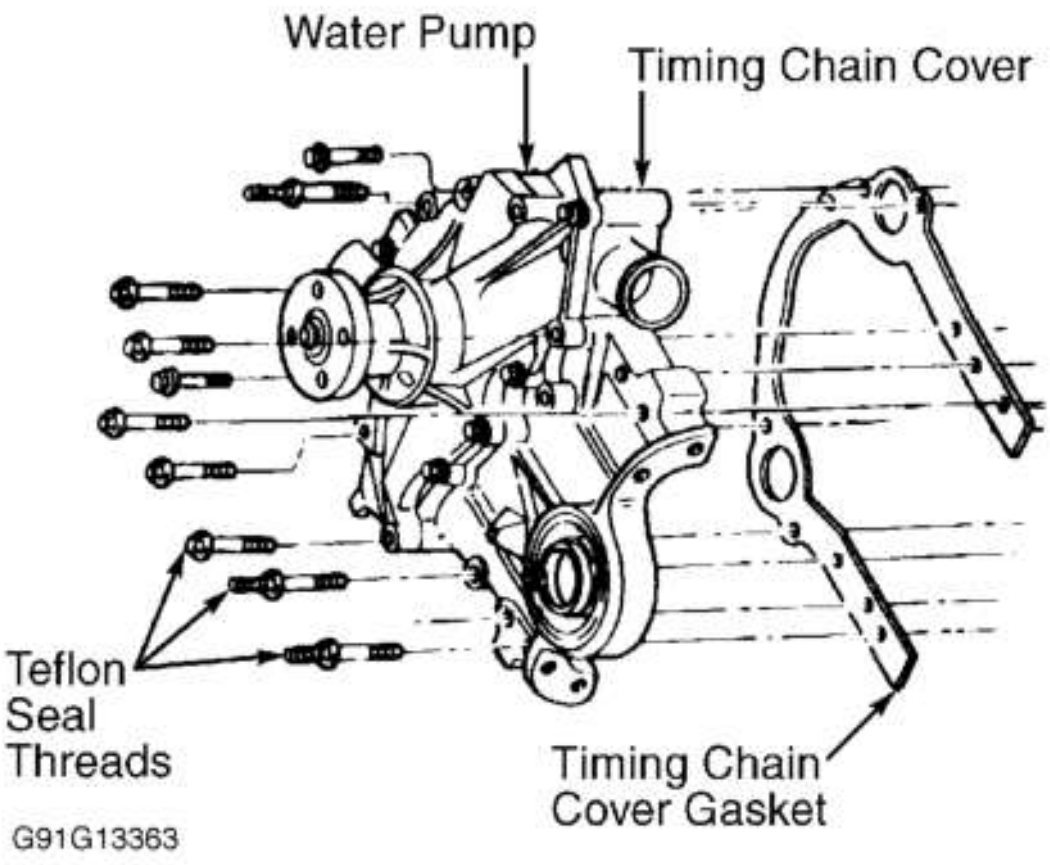

Fig. 6: Removing & Installing Water Pump & Front Cover Assembly
Courtesy of FORD MOTOR CO.

Installation

1. Clean all gasket mating surfaces. Coat both surfaces of new front cover gasket with sealing compound. Install front cover gasket. Install front cover. Lightly oil threads of bolt and stud, except those with Teflon sealant, before installation. See **Fig. 6**.
2. Tighten bolts to specifications. See **TORQUE SPECIFICATIONS** table at end of article. To complete installation, reverse removal procedure. Fill and bleed cooling system. See **COOLING SYSTEM BLEEDING**.

TIMING CHAIN & SPROCKETS

NOTE: Check timing chain deflection (stretch) before removal to determine component wear.

Inspection

1. Remove left-side valve cover. See **VALVE COVERS**. Loosen No. 5 exhaust rocker arm and rotate to one side. Install a dial indicator on end of push rod. Turn crankshaft clockwise until No. 1 piston is at TDC to take up slack on right side of chain. The damper timing mark should point to TDC.

2. Zero dial indicator. Slowly turn crankshaft counterclockwise until slightest movement is seen on dial indicator. Note the number of degrees of travel from TDC. If reading exceeds 6 degrees, replace timing chain and sprockets.

Removal

Position No. 1 piston on TDC of compression stroke. Remove front cover. See **FRONT COVER**. Check alignment of camshaft and crankshaft sprocket timing marks. Check timing chain deflection. See INSPECTION under TIMING CHAIN & SPROCKETS (previous paragraphs). Remove camshaft sprocket retaining bolt and washer. Slide sprockets and timing chain forward and remove as an assembly.

CAUTION: DO NOT replace camshaft sprocket retaining bolt with standard bolt. Original camshaft bolt has a drilled oil passage.

Installation

1. Ensure No. 1 piston is still at TDC of compression stroke. Assemble timing chain and sprockets so sprocket timing marks are aligned. See **Fig. 7**. Install chain and sprockets as an assembly. Lubricate timing chain and sprockets with engine oil.
2. Apply RTV sealer to damper keyway. To complete installation, reverse removal procedure. Tighten bolts and nuts to specifications. See **TORQUE SPECIFICATIONS** table at end of article.

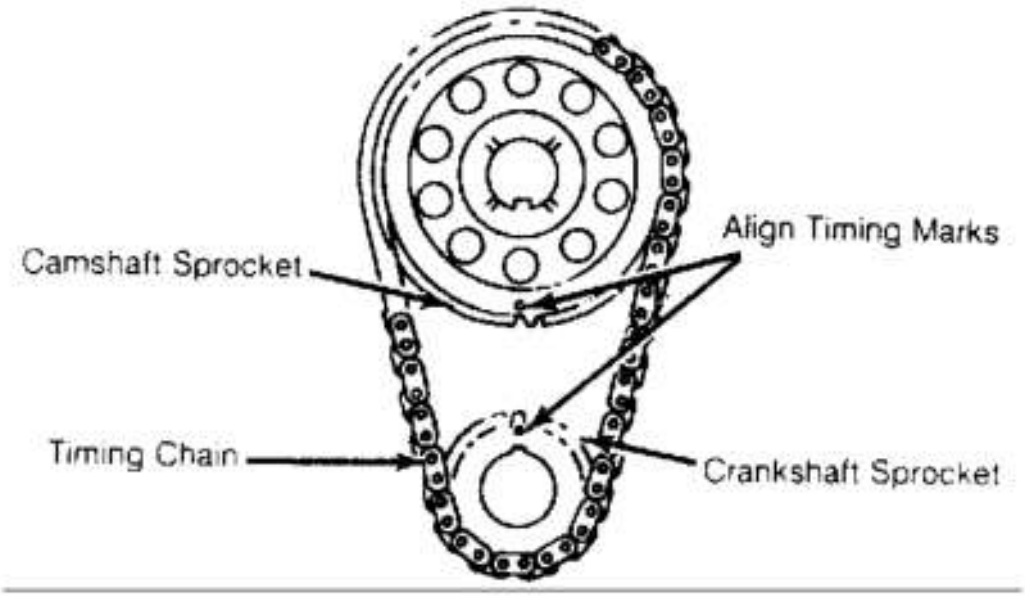

Fig. 7: Aligning Sprocket Timing Marks
Courtesy of FORD MOTOR CO.

CAMSHAFT

Removal

1. Remove negative battery cable. Drain cooling system. Remove air cleaner hoses. Remove upper and lower radiator hose. Remove radiator, shroud and A/C condenser (if equipped). Remove left-handed nut retaining clutch fan to pulley and remove cooling fan.
2. Release fuel pressure. See **FUEL PRESSURE RELEASE**. Using Disconnect Tool (D87L-9280-A) for 3/8" line or (D87L-9280-B) for 1/2" line, disconnect fuel supply and return lines. See **Fig. 2**.
3. Mark and disconnect vacuum hoses and electrical connectors. Remove accessory drive belts. Remove water pump pulley. Remove lower intake manifold. See **INTAKE MANIFOLDS**.
4. Position No. 1 piston on TDC of compression stroke. Mark distributor rotor and body location for installation reference. Remove distributor. Remove valve covers. See **VALVE COVERS** under REMOVAL & INSTALLATION. Loosen rocker arms and rotate off push rods. Keeping in order of removal, remove push rods and valve lifters.
5. Check camshaft end play. If end play is not within specification, replace thrust plate. See **CAMSHAFT** table under ENGINE SPECIFICATIONS at end of article. Check timing chain deflection and remove timing chain and camshaft sprocket. See, in this article, **TIMING CHAIN & SPROCKETS**. Remove camshaft thrust plate. Remove camshaft.

Inspection

Inspect journal diameter, lobe lift, oil clearance and runout. Replace camshaft if these are not within specification. See **CAMSHAFT** table under ENGINE SPECIFICATIONS at end of article.

Installation

1. Lubricate camshaft lobes and journals with heavy SAE 50W engine oil. Carefully slide camshaft through bearings in cylinder block. Install thrust plate and recheck camshaft end play. Install timing chain and sprocket as an assembly.

CAUTION: DO NOT replace camshaft sprocket retaining bolt with standard bolt. Original camshaft bolt has a drilled oil passage.

2. Ensure crankshaft and camshaft sprockets are aligned. See **Fig. 7**. Install camshaft sprocket washer and retaining bolt, and tighten to specification. See **TORQUE SPECIFICATIONS** table at end of article. Lubricate hydraulic valve lifters and bores with heavy SAE 50W engine oil.
3. Install lifters in their original bores. Lubricate push rods with heavy SAE 50W engine oil. Install push rods in their original location. For each valve, rotate crankshaft until lifter rests on heel of camshaft lobe. Position rocker arm over push rod and install fulcrum.
4. Tighten rocker arm bolt to 96 INCH lbs. (11 N.m). After all rocker arms have been installed, tighten rocker arm bolts (camshaft may be in any position) to a final torque of 24 ft. lbs. (33 N.m). To complete installation, reverse removal procedure.
5. Tighten bolts/nuts to specification. See, at end of article, **TORQUE SPECIFICATIONS** table. Fill or top off all fluids. Fill and bleed cooling system. See **COOLING SYSTEM BLEEDING** under REMOVAL & INSTALLATION. Start engine and check for leaks. Check and adjust ignition timing as necessary.

CAMSHAFT BEARINGS

Removal

1. Remove camshaft. See **CAMSHAFT**. Check camshaft bearing clearance. If clearance is not within

specification, replace camshaft bearings. See **CAMSHAFT** table under ENGINE SPECIFICATIONS at end of article.

2. Standard and .015" (.38 mm) undersize camshaft bearings are available. To replace camshaft bearings, remove rear camshaft bearing bore plug. Remove camshaft bearings with Camshaft Bearing Set (T65L-6250-A).

NOTE: When installing new camshaft bearings, ensure bearing oil hole is aligned with oil hole in bearing bore.

Installation

1. Align oil hole in bearing with oil hole in bearing bore. Using camshaft bearing set, install new camshaft bearings. Ensure front bearing is installed .020-.035" (.51-.89 mm) below front face of cylinder block.
2. Coat sealing edge of new rear camshaft bearing bore plug with oil resistant sealer and install bore plug. To complete installation, reverse removal procedure.

REAR CRANKSHAFT OIL SEAL

Remove transmission. Remove clutch assembly (if equipped). Remove flywheel/flexplate. Using a slide hammer, remove rear oil seal. Use care not to damage crankshaft sealing surface. Coat seal surfaces with heavy SF engine oil. Use proper size seal installer. Install seal until firmly seated. To complete installation, reverse removal procedure.

WATER PUMP

Removal

1. Disconnect negative battery cable. Drain cooling system. Remove left-handed nut retaining clutch fan to pulley. Remove cooling fan. Remove accessory drive belts. Remove water pump pulley.
2. Remove alternator adjusting arm and brace from throttle body. Remove lower radiator and heater hose from water pump. Rotate belt adjuster aside. Remove 11 water pump bolts. Remove water pump. See **Fig. 6**.

Installation

Clean all gasket surfaces. Lightly oil threads of bolt and stud, except those with Teflon sealant, before installation. Refer to **Fig. 6**. Use sealant on bolts going into water jacket. Apply contact adhesive to new gasket and position on water pump. Install water pump. To complete installation, reverse removal procedure. Fill and bleed system. See **COOLING SYSTEM BLEEDING**.

OIL PAN

Removal (Aerostar)

Disconnect negative battery cable. Remove dipstick. Raise and support vehicle. Remove retainer clip and electrical connector at oil low level sensor (if equipped). Drain engine oil. Remove starter motor. Remove transmission inspection cover. Remove oil pan bolts, oil pan and gasket.

Installation

To install, reverse removal procedure. Apply silicone sealant at front and rear corners of oil pan surface and cylinder block, and where front cover meets cylinder block. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** table at end of article. Start engine and check for oil leaks.

Removal (Ranger)

1. Disconnect negative battery cable. Remove dipstick. Disconnect fan shroud and position over fan. Remove motor mount nuts from frame. Position No. 1 piston at TDC of compression stroke.
2. Mark distributor rotor and body location for installation reference. Remove distributor. Raise and support vehicle. Remove retainer clip and electrical connector at oil low level sensor. Drain engine oil.
3. Remove starter motor. Remove transmission inspection cover. On 2WD models, remove right front axle assembly. See FRONT AXLE in appropriate SUSPENSION article.
4. Remove oil pan bolts. Using a suitable lifting device, raise engine approximately 2 inches. Be careful not to damage oil pump pick-up tube and carefully remove oil pan. Remove oil pan gasket.

Installation

Clean gasket mating surfaces. To install, reverse removal procedure. Apply silicone sealant at front and rear corners of oil pan surface and cylinder block, and where front cover meets cylinder block. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** table at end of article. Start engine and check for leaks.