



FEL-PRO INSTALLATION TIPS

GENERAL INSTRUCTIONS

CLEAN MATING SURFACES. Use a degreaser.

CLEAN THREADS of bolts/studs; for nuts/threaded holes use a bottoming tap.

BOLT PREPARATION: Those **entering** coolant passages require pliable non-hardening sealer on threads and underside of bolt heads. Those **not entering** coolant passages require oil on threads and underside of bolt heads. **Exhaust Assembly:** Apply high temperature anti-seize lubricant to threadings.

CHECK CASTINGS for flatness. Straighten, resurface or replace if needed. **CYLINDER HEAD AND BLOCK:** Refer to OEM manual to determine flatness tolerances and resurfacing limitations.

FINAL ASSEMBLY: Torque all fasteners to OEM specifications unless noted. CYLINDER HEAD torquing is critical; we recommend that you confirm with OEM.

VALVE STEM SEALS



Umbrella Intake



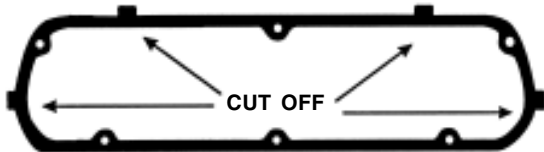
Umbrella Exhaust

Use the valve stem seals included in this set for the applications indicated.

UMBRELLA TYPE SEAL:

Start valve stem seal over valve stem and push seal down on seal body until it touches the top of valve stem guide or "boss". The seal will find its proper position on the stem once the engine starts.

VALVE COVER GASKET



PRIOR TO INSTALLATION of cast aluminum covers check fit of gasket. If necessary, remove gasket tabs. Cut tabs using sharp blade.

ATTACH AND ALIGN GASKET. Apply quick-drying adhesive, sparingly in several places on the mating surface of cover. If gasket has installation tabs, adhesive is **not** required. Mount gasket on cover. **Allow time for adhesive to set.** Test for slippage with light pressure. If gasket moves, allow more time.

HEAD GASKET

SPECIAL TORQUE SPECIFICATIONS

IMPORTANT: For all Ford Passenger and Truck V8, 260, 289 and 302 (5.0L) engines. Two types of cylinder head bolts have been used on these engines, Torque-To-Yield bolts with integrated washers or standard bolts without integrated washers. These bolts cannot be intermixed and each bolt style has specific torque specifications.

IMPORTANT: Consult latest OEM torque specifications as changes may have taken place since this printing.

TORQUE-TO-YIELD BOLTS WITH INTEGRATED WASHER TORQUE SPECIFICATIONS:

Following sequence shown in illustration torque all bolts/studs in the following steps:

Torque all bolts to 25-35 ft. lbs. (34-47 Nm.).

Torque all bolts to 45-55 ft. lbs. (61-75 Nm.).

Finally, tighten all bolts and studs an additional 1/4 turn (85-95°).

Torque all intake manifold bolts to 23-25 ft. lbs. (31-34 Nm.).

STANDARD BOLTS WITHOUT INTEGRATED WASHER TORQUE SPECIFICATIONS:

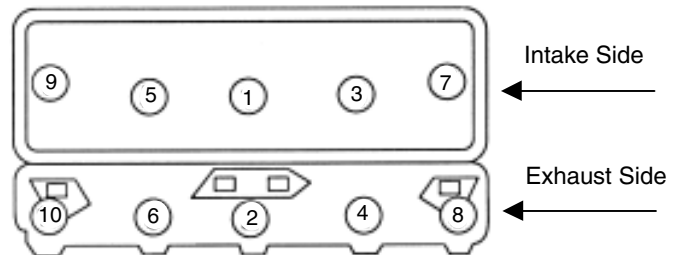
The following torque specifications for the cylinder head and the intake manifold must be followed. Failure to do so can lead to excessive cylinder head "lift", resulting in combustion gas and coolant leakage. Although these specifications may differ from those previously issued by Ford Motor Company, they are the result of extensive research and testing.

Following sequence shown in illustration torque all bolts in the following steps:

Torque intake side (long, odd numbered bolts) to 80 ft. lbs. (109 Nm.).

Torque exhaust side (short, even numbered bolts) to 70 ft. lbs. (95 Nm.).

Torque all intake manifold bolts to 23-25 ft. lbs. (31-34 Nm.).



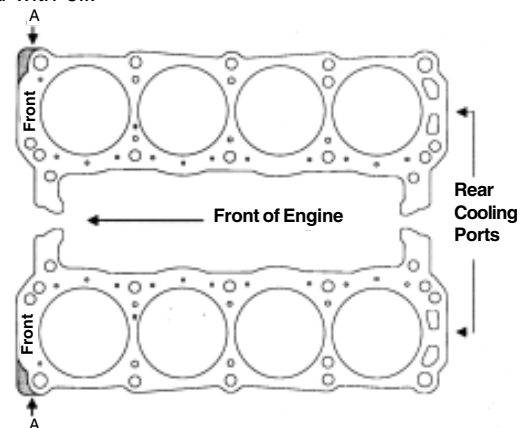
Intake Manifold: Using a torque wrench, torque all bolts to 23-25 ft. lbs. **DO NOT EXCEED** torque specifications.

IMPORTANT: For 351W engines, these torque procedures **DO NOT** apply. Torque securely following OEM specifications.

CLEAN ALL BOLT THREADS by using a wire brush.

IMPORTANT: **DO NOT** use an anti-seize product on any of the bolt threads.

Determine which bolts extend into the coolant passages. Those bolts **entering** the coolant passages require a pliable non-hardening sealer on the threads. Those bolts **not entering** the coolant passages require oil on the threads. Lubricate the underside of **every** bolt head with oil.

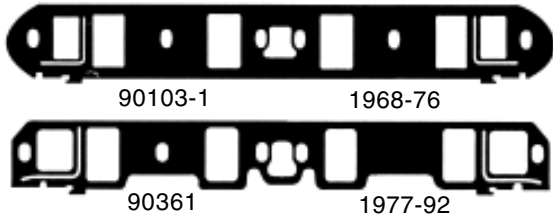


TO INSURE PROPER COOLANT CIRCULATION, the word FRONT is stamped on both sides of the head gasket and must always be installed towards the front of the engine.

After engine assembly, the head gaskets are properly installed when corner "A" of the each head gasket protrudes from under the FRONT of each cylinder head (see shaded area of illustration).

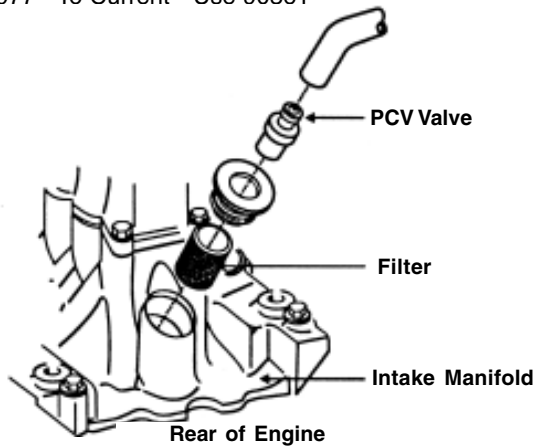
ATTACH AND ALIGN GASKET(S)

INTAKE MANIFOLD GASKET



This set contains 2 pairs of manifold side gaskets. Identify and install as indicated:

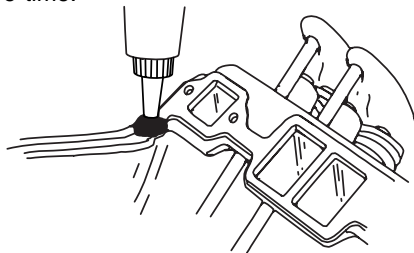
- 1968-76 - Use 90103-1
- 1977 - To Current - Use 90361



IMPORTANT: 1986 and later Ford 5.0L applications, require the replacement of the crankcase breather filter, located under the PCV Valve. If the filter is not replaced the filter can get clogged with carbon and sludge resulting in increased crankcase pressure, intake manifold end seal leakage, timing cover or rear main seal leakage.

ATTACH AND ALIGN GASKET(S) TO CYLINDER HEAD(S). Apply quick-drying adhesive sparingly in several places on the cylinder heads. Mount gasket(s) on cylinder head(s). **Allow time for adhesive to set.** Test for slippage with light pressure. If gasket moves, allow more time.

ATTACH AND ALIGN END SEALS. Apply quick-drying adhesive sparingly to cylinder block. Mount end seals. **Allow time for adhesive to set.** Test for slippage with light pressure. If seals move, allow more time.



PRIOR TO INSTALLING INTAKE MANIFOLD apply a small dab of silicone sealer where all gaskets and seals meet.

Never apply RTV completely across gaskets or seals.

REINSTALL INTAKE MANIFOLD TO ENGINE. Using a torque wrench, torque all bolts to 23-25 ft. lbs. **DO NOT EXCEED** torque specifications.

IMPORTANT: For 351W engines, these torque procedures **DO NOT** apply. Torque securely following OEM specifications.

EXHAUST MANIFOLD GASKET

ATTACH AND ALIGN GASKET(S). If gasket has only one steel faced side, install steel side towards manifold.

MISCELLANEOUS FLUID SEALING GASKET(S)/SEAL(S)

ATTACH AND ALIGN GASKET(S)/SEAL(S): If supplementary sealer is desired, apply a thin coat of gasket sealer to both sides of gasket(s). However, molded rubber gasket(s) or those with colored sealing beads, install **DRY**.

TIMING COVER SEALS

This set contains 2 timing cover seals. Identify and install as indicated.

- 1979 and later engines - use seal with flange.
- 1978 and earlier engines - use seal without flange.

SEAL WITH FLANGE is properly installed from the outside of the timing cover with metal flange bottomed against the face of the timing cover.

SEAL WITHOUT FLANGE is properly installed from the inside of the timing cover with rubber face bottomed into the counterbored hole of the timing cover.

FLYWHEEL BOLTS

REINSTALL FLYWHEEL to crankshaft. Note: On some engines that use a one-piece rear main bearing seal, a condition may exist where the bolt holes in the crankshaft rear flange have been drilled too deep by the manufacturer. This can result in oil seepage which may be misdiagnosed as coming from the oil pan or rear main bearing seal. To prevent seepage, coat bolt threads with thread locking sealer. Torque securely to OEM specifications.

ROTATING SHAFT SEALS

RUBBER SEAL(S): Install seal with its **largest raised sealing lip toward the engine.** Two-piece rubber seals may be installed using a "shoehorn" installation aid placed underneath seals to protect them from sharp edges.

ROPE SEALS: Install seals into grooves of cap and block by firmly pressing packing into grooves with a "packing tool." Ensure that ends of seals protrude above face of cap and block.

IMPORTANT: Final interference of rope packing seals against crankshaft is critical. To achieve proper interference, it is best to install packings using correct **Packing Tool** for your engine. With "packing tool" in position, cut protruded ends of seals flush with cap and block.

LUBRICATE SEALING LIPS AND CRANKSHAFT with motor oil or grease. If engine will not be started within several days, grease is recommended.

IMPORTANT: Never install any seal without break-in lubricant protection.

REAR MAIN BEARING CAP: Prior to installation, apply anaerobic sealant to mating surfaces of cap or block. **AVOID** sealant on ends of seals.

OIL PAN GASKET

ATTACH AND ALIGN GASKET(S). Apply quick-drying adhesive sparingly. Mount gasket and/or seals. **PRIOR TO INSTALLING OIL PAN** apply a dab of silicone sealer where all gaskets and seals meet.