FEL-PRO INSTALLATION TIPS

GENERAL INSTRUCTIONS

CLEAN MATING SURFACES of all foreign material**.** Use a degreaser.

CLEAN THREADS of bolts/studs using a wire brush; all nuts/ threaded holes use a bottoming tap.

Determine Which Bolts extend into the coolant passages. Those **entering** the coolant passages require a pliable non-hardening sealer on the bolt threads and the underside of bolt head. Those **not entering** the coolant passages require oil on the bolt threads and underside of the bolt head.

Exhaust Assembly: Apply a high temperature anti-seize lubricant to the threadings.

CHECK ALL CASTINGS for flatness; straighten, resurface or replace if out of flat conditions exists.

CYLINDER HEAD AND BLOCK: refer to OEM manual to determine flatness tolerances and resurfacing limitations.

Attach and align gasket(s) following any directional markings shown on the gasket. If no markings exist, simply install the gasket by matching the gasket to engine deck surface.

Fiber Faced Gasket(s) are to be installed dry. **Metal Faced Gasket(s)** require a thin even coat of sealer, to be applied to the metal side(s) of the gasket.

FINAL ASSEMBLY always requires torquing of fasteners according to OEM specifications. For certain assemblies we have provided specific torquing specifications.

NOTE: CYLINDER HEAD torquing procedures are critical and therefore we recommend to double-check with OEM.

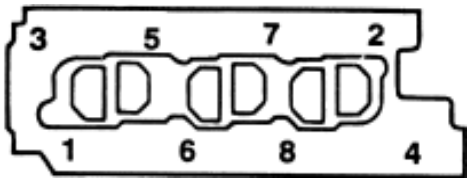
Some procedures may be repeated with additional specific information for your application.

SPECIAL TORQUE SPECIFICATIONS

IMPORTANT: The cylinder heads and lower intake manifold must be installed as a set, torque them alternately and in sequence. Also, cylinder head bolts should not be reused.

CYLINDER HEAD BOLT TIGHTENING SEQUENCE

LOWER INTAKE MANIFOLD BOLT TIGHTENING SEQUENCE



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

TORQUE SPECIFICATIONS: Follow sequence shown in illustration, torque **all cylinder head and lower intake manifold bolts** in the following steps**:**

Torque all head bolts to 44 ft. lbs.

Torque all lower intake manifold bolts to 3-6 ft. lbs.

Torque all head bolts to 59 ft. lbs.

Torque all lower intake manifold bolts to 6-11 ft. lbs.

Turn all head bolts 80°- 85° (less than 1/4 turn).

Torque all lower intake manifold bolts to 11-15 ft. lbs.

Finally, torque all lower intake manifold bolts to 15-18 ft. lbs.

VALVE STEM SEALS

REMOVE SPRING ASSEMBLIES, KEEPERS and the old valve stem seals.

REMOVE BURRS (IF ANY) FROM VALVE STEMS. Use a fine stone or crocus cloth. Clean stems thoroughly to remove all abrasives or dust particles. Lubricate lightly.

INSTALL NEW SEALS.

POSITIVE GUIDE SEAL: Use the plastic installation sleeve(s), included in this set, to prevent damage to the lip of the seal. Trim the plastic sleeve so it extends 1/16" below the keeper groove. Place the sleeve on the stem.

Carefully start valve stem seal over sleeve.

Remove plastic installation sleeve and reuse for installing remaining seals.

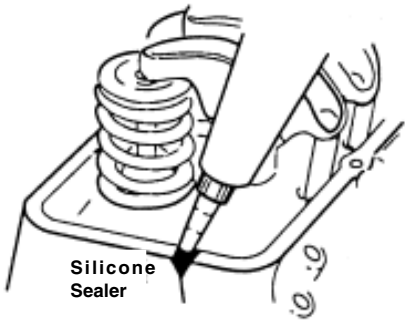
FOR RUBBER JACKET SEALS: Push seal down over valve guide until it bottoms.

FOR SOLID OR METAL JACKET SEALS: The use of an OEM service tool is recommended. If tool is unavailable, use a deep socket or rigid tube of appropriate diameter. Center tool (or socket) over the shoulder of the seal and tap the seal down over the guide until it bottoms.

REPLACE VALVE SPRING ASSEMBLIES. Compress springs just enought to install keepers. **IMPORTANT**: Excessive compression can result in spring retainer damaging valve stem seal. Release spring carefully.

VALVE COVER GASKET

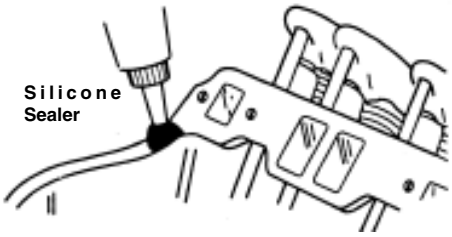
ATTACH AND ALIGN GASKET. Apply quick-drying adhesive, sparingly in several places on the mating surface of cover. If gasket has installation tabs, adhesive is **not** required.Mount gasket on cover. **Allow time for adhesive to set.** Test for slippage with light pressure. If gasket moves, allow more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



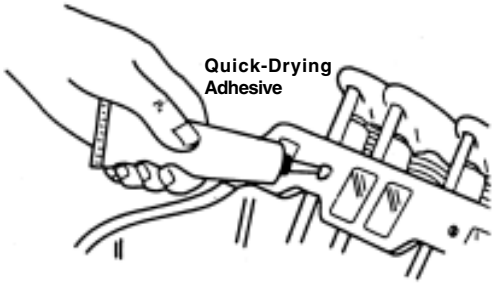
PRIOR TO REINSTALLING VALVE COVER, apply a small dab of silicone sealer to the corner intersections of the intake manifold and cylinder head. **IMMEDIATELY PROCEED** to the next step, as RTV normally sets up in 10-15 minutes.

-Continued-

INTAKE MANIFOLD GASKET



PRIOR TO INSTALLING INTAKE MANIFOLD GASKET apply a small dab of silicone sealer to the 4 lower corners where the ends of the block meet with the cylinder heads. **IMMEDIATELY PROCEED** to the next step, as RTV normally sets up in 10-15 minutes.



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.

PRIOR TO REINSTALLING INTAKE MANIFOLD apply a small dab of silicone sealer to the 4 upper corners of the manifold gaskets. **IMMEDIATELY PROCEED** to the next step, as RTV normally sets up in 10-15 minutes.

EXHAUST MANIFOLD GASKET

ATTACH AND ALIGN GASKET TO CYLINDER HEAD. If gasket is steel faced on one side and fiber on the other, install steel faced side toward the manifold.

EXHAUST PIPE FLANGE

ATTACH AND ALIGN GASKET.

ATTACH AND ALIGN GASKET.

WATER OUTLET GASKET

TO ASSIST IN ALIGNMENT AND SEALING DURING ASSEMBLY, apply a thin coat of gasket sealer to both sides of gasket(s).

TEST RUN ENGINE. Check all mating areas thoroughly to determine that all seals hold during operation.

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