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 a 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 a 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 top of valve stem guide or "boss." The seal will find its proper position on the stem once the engine starts.

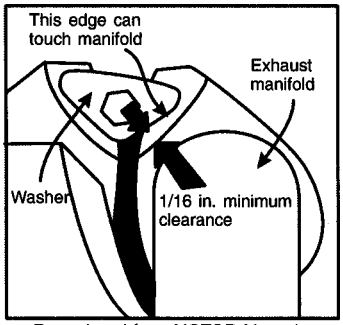
VALVE COVER/PUSH ROD COVER

ATTACH AND ALIGN GASKET(S): Use a quick-drying adhesive, applied sparingly. If gasket has installation tabs, adhesive is not required. **IMPORTANT:** If gasket is rubber, install dry.

INTAKE & EXHAUST MANIFOLD GASKETS

REMOVE MANIFOLDS from cylinder heads. **IMPORTANT:** You must disassemble the intake manifold from the exhaust manifold to allow for corrected realignment of the manifolds to the cylinder head during the reassembly.

REASSEMBLE MANIFOLDS. Install the intake-to-exhaust gasket between the intake and exhaust manifolds. Only finger tighten the manifolds together.



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ATTACH AND ALIGN GASKET(S) TO CYLINDER HEAD(S).

REINSTALL INTAKE AND EXHAUST MANIFOLD ASSEMBLY to cylinder heads.

WASHER INSTALLATION FOR EXHAUST MANIFOLDS: for 170, 198 and 225 engines washers must be installed to permit expansion and contraction of the manifolds. The washers spanning the intake and exhaust flanges should apply more pressure to the intake manifold as opposed to the exhaust manifold. To accomplish this; the intake casting flanges are slightly thicker than the exhaust flanges, this difference should be maintained. **IMPORTANT:** Keep a minimum gap of 1/16" around all the bridging washers.

TORQUE INTAKE AND EXHAUST MANIFOLD ASSEMBLY as follows:

Slightly torque all manifold-to-cylinder head and intake-to-exhaust studs, bolts and/or nuts to 10 in. lbs.

Torque all inboard intake to exhaust manifold studs, bolts and/or nuts to 30 ft. lbs.

Torque all outboard intake to exhaust manifold studs, bolts and/or nuts to 20 ft. lbs.

Repeat the inboard and outboard torquing to assure that full specified torque has been achieved.

Torque all intake and exhaust manifold to cylinder head stud nuts starting with the center moving out in both directions to 10 ft. lbs.

TORQUE INTAKE MANIFOLD EXHAUST CONNECTION to 20 ft. lbs. Over torquing can fracture the manifold and/or cause the bolts and studs to break.

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 Printoseal® sealing beads, install **DRY.**

REAR MAIN BEARING SEAL

To properly install the rear main bearing seals it is necessary to install both seal halves as a pair.

CLEAN MATING SURFACES (cap, block and grooves of cap and block). You may wish to use a degreaser.

Check cap and block for steel pins. If steel pins exist in the casting grooves remove pins before installing molded rubber seals (presence of pins indicate prior installation of rope type seals).

REMOVE NICKS AND SCRATCHES (IF ANY) FROM THE CRANKSHAFT SEALING SURFACE using a crocus cloth.

MOLDED RUBBER SEALS: Install the seals into the grooves. Make certain that the ends of the seals are flush with the face of the cap and block.

IMPORTANT: Install seals using the "shoehorn" installation aid, included in this set. Place shoehorn underneath the seals to protect them from the sharp casting edges.

The seal is properly installed when its largest raised sealing is toward the front of the engine.

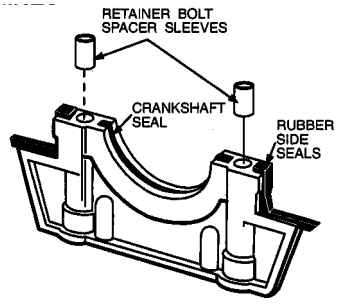
PRIOR TO INSTALLING THE REAR MAIN BEARING CAP apply an anaerobic sealant to either the rear main bearing cap or cylinder block mating surfaces. **Never** apply sealant on the ends of the seals.

LUBRICATE SURFACE of seal lip and crankshaft by applying a thin coat of 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.

REINSTALL CAP TO CYLINDER BLOCK. Torque to OEM specifications.

FOR 6 CYLINDER ENGINES



INSTALL RUBBER SIDE SEALS into the side cavity of the seal retainer.

PRIOR TO INSTALLING THE SEAL RETAINER install the two retainer bolt spacer sleeves into the bolt holes of the cap.

REINSTALL SEAL RETAINER TO CYLINDER BLOCK. Torque to OEM specifications.

OIL PAN GASKET

ATTACH AND ALIGN GASKET(S). Apply a 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.

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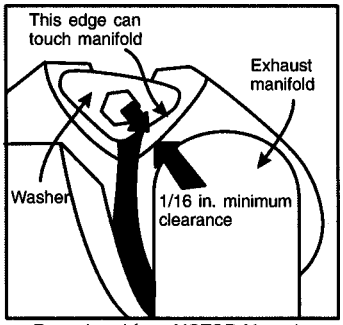

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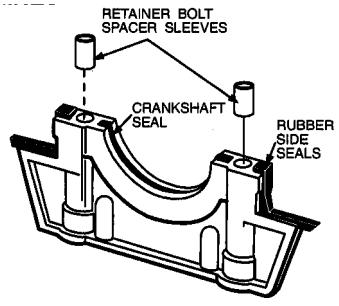

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