

**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 over valve guide until it bottoms.

**FOR SOLID/METAL JACKET SEALS:** The use of an OEM service tool is recommended. If tool is unavailable, use 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 enough to install keepers. **IMPORTANT:** Excessive compression can result in spring retainer damaging valve stem seal. Release spring carefully.

## PUSH ROD COVER GASKET

### ATTACH AND ALIGN GASKET(S):

---

**IMPORTANT:** This molded rubber silicone gasket must be installed DRY without any chemical adhesive

---

## INTAKE AND EXHAUST MANIFOLD GASKETS

Upon disassembly, it is likely to find the absence of an exhaust manifold gasket since none was offered as original equipment. However, this set includes an exhaust manifold gasket to accommodate slight casting distortion or corrosion that may have occurred over the engine's service life. Therefore, we recommend that the included exhaust manifold gasket be installed by the following directions.

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

If gasket is steel faced on one side and fiber on the other, install steel faced side toward the manifold.

**REINSTALL INTAKE AND EXHAUST MANIFOLDS** to the cylinder heads. Torque securely to OEM specifications. Over-torquing can fracture the manifold or cause the bolts and studs to break.

## EXHAUST PIPE FLANGE AND E.G.R. VALVE BOLTS

**CLEAN ALL THREADS** by using a wire brush for bolts and/or studs. Apply a high temperature anti-seize lubricant to the bolt and/or stud threads.

## MISCELLANEOUS FLUID SEALING GASKETS

**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**.

# FIT

## 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.**

## VALVE STEM SEALS



Positive Intake



Positive Exhaust

Use the valve stem seals included in this set for the applications indicated. Identify "Intake" seals by the wide lower retainer ring; "Exhaust" seals by two retainer rings.

**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 over valve guide until it bottoms.

**FOR SOLID/METAL JACKET SEALS:** The use of an OEM service tool is recommended. If tool is unavailable, use 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 enough to install keepers. **IMPORTANT:** Excessive compression can result in spring retainer damaging valve stem seal. Release spring carefully.

## PUSH ROD COVER GASKET

### ATTACH AND ALIGN GASKET(S):

---

**IMPORTANT:** This molded rubber silicone gasket must be installed DRY without any chemical adhesive

---

## INTAKE AND EXHAUST MANIFOLD GASKETS

Upon disassembly, it is likely to find the absence of an exhaust manifold gasket since none was offered as original equipment. However, this set includes an exhaust manifold gasket to accommodate slight casting distortion or corrosion that may have occurred over the engine's service life. Therefore, we recommend that the included exhaust manifold gasket be installed by the following directions.

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

**REINSTALL INTAKE AND EXHAUST MANIFOLDS** to the cylinder heads. Torque securely to OEM specifications. Over-torquing can fracture the manifold or cause the bolts and studs to break.

## EXHAUST PIPE FLANGE AND E.G.R. VALVE BOLTS

**CLEAN ALL THREADS** by using a wire brush for bolts and/or studs. Apply a high temperature anti-seize lubricant to the bolt and/or stud threads.

## MISCELLANEOUS FLUID SEALING GASKETS

**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**.

# FIT

## 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.**

## VALVE STEM SEALS



Positive Intake



Positive Exhaust

Use the valve stem seals included in this set for the applications indicated. Identify "Intake" seals by the wide lower retainer ring; "Exhaust" seals by two retainer rings.

**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.**