



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 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.

CYLINDER HEAD BOLTS: Install **NEW** cylinder head bolts every time the cylinder head is removed and/or replaced.

IMPORTANT: The use of OEM steel washers under each bolt head is required for the installation of the head bolts. **NOTE:** Washers not included in this set. Existing washers can be reused.

LUBRICATE the threads and the underside of every bolt head with oil. **DO NOT DIP BOLTS INTO OIL.**

ATTACH AND ALIGN GASKET FOLLOWING ANY DIRECTIONAL MARKINGS SHOWN ON THE GASKET.

If no marking exist, simply install the gasket by matching the gasket to engine deck surface.

HEAD GASKET

REINSTALL CYLINDER HEAD(S) TO ENGINE: Torque securely to OEM specifications.

TO INSURE PROPER ENGINE OPERATION WE RECOMMEND THE FOLLOWING:

- Bleed cooling system, prior to engine start up. It may be necessary to raise the front of the vehicle to completely bleed the air from the cooling system.
- Use OEM recommended spark plugs, with the correct heat range.
- Vacuum leaks cause lean air/fuel ratios and hot engine operation. Check vacuum hoses.
- Check for proper operation of the EGR valve.
- Check O2 Sensor, coolant entering the combustion chamber from a cracked cylinder block/heads or a leaking head gasket can cause the O2 sensor to become inoperative, replace if necessary.

ANY CYLINDER HEAD GASKET INSTALLATION SHOULD INCLUDE THE FOLLOWING CHECKS:

- Radiator flow and corrosion condition
- All coolant hoses for deterioration
- Thermostat operation
- Thermostat operation
- Fan belt tension
- Water pump flow
- Radiator thermostatic fan switch operation
- Antifreeze mixture
- Radiator cap that maintains rated pressure
- Coolant reservoir fill level
- Ignition timing setting
- Emission controls
- Vacuum leaks
- Restriction in exhaust system.

Peak efficiency of the cooling system is essential to ensure a successful repair of this engine.

- Thoroughly inspect the radiator and heater core for corrosion.
- Test the radiator and heater core for coolant flow rate.
- Check for bent or damaged fins.

Radiator performance is deteriorated by reduced flow caused by corrosion and contaminates. Radiator performance is also deteriorated by reduced heat transfer that occur with minor corrosion and slight loss of flow. To ensure proper engine performance, replacement of the radiator and heater core is recommended using OEM equivalent components only.

Failure to repair all potential leaks on the inlet side of the water pump will result in air being drawn into the cooling system. Aerated coolant will not transfer heat from the heads and block properly. OEM thermostat

IMPORTANT: Due to some recent engineering changes, the cylinder head gasket(s) in this set may appear different from those previously provided for this applications

The engine this cylinder head gasket will be installed on is a lean burn-high fuel efficient design. It can experience localized "hot spots" between cylinders. Consequently, premature cylinder head gasket failure may occur. The formation of localized hot spots can be minimized by following the preparation and installation procedure outlined below:

CLEAN MATING SURFACES of all foreign materials. You may wish to use a degreaser. Improper use of power scrapers and abrasive pads can cause deep scratches, waviness and rounded edges.

CHECK HEAD AND BLOCK: Excessively pitted or corroded surfaces should be resurfaced or replaced. Check for flatness, recommended maximum combined head and block out-of-flat is .004" when measured diagonally and lengthwise; .002" maximum width-wise. If resurfacing is equipped, remove only the minimal amount of material to provide a flat casting. Surface finish is critical. A surface roughness of 65 RMS (60 RA) is recommended.

CAM CARRIER HOUSING

CLEAN MATING SURFACES.

PREPARE MATING SURFACES, for application of anaerobic sealant, by applying a Cleaner/Primer to mating surface.

Allow 1 to 2 minutes to dry.

SEAL CAM CARRIER MATING SURFACE. Apply a thin continuous bead of anaerobic sealant, to the cam carrier surface of the cylinder head.

Wipe off any excess sealant.

THIS WARNING MESSAGE IS SPECIFIC FOR 221L PRO LOCK FLANGE SEALANT

WARNING! EYE AND SKIN IRRITANT.

This product contains bisphenol-A fumarate resin and cumene hydroperoxide. Avoid contact with eyes and skin. In case of skin contact wash thoroughly with soap and water. For contact with eyes flush with water for 15 minutes and call a physician.

KEEP AWAY FROM CHILDREN.

WARNING: This product contains a chemical known to the State of California to cause cancer.

CLEAN ALL BOLT THREADS by using a wire brush. Now lubricate the bolts threads using a pliable non-hardening sealer.

REINSTALL CAM CARRIER.
Torque securely to OEM specifications

VALVE STEM SEALS

POSITIVE GUIDE SEAL:

Use plastic installation sleeve(s), to prevent damage to lip of seal. Trim plastic sleeve so it extends 1/16" below keeper groove. Place sleeve on stem. Carefully start valve stem seal over sleeve. Remove and reuse plastic sleeve. **FOR RUBBER GASKET SEALS:** Push seal over valve guide until it bottoms. **FOR SOLID/METAL JACKET SEALS:** Use of OEM service tool is recommended. If tool is unavailable, use deep socket or rigid tube of appropriate diameter. Center tool over shoulder of seal and tap seal down over guide until it bottoms.

UMBRELLA TYPE SEAL:

Start valve stem seal over valve stem; push seal down on seal body until it touches top of valve stem guide. Seal will find its proper position on stem once 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 MANIFOLD GASKET

V-TYPE ENGINES - FIBER SIDE GASKET(S) ALONG WITH FRONT AND REAR END SEAL(S): Attach and align gasket(s) and end seal(s) using a quick-drying adhesive sparingly. **PRIOR TO INSTALL INTAKE MANIFOLD** apply a dab of RTV Black silicone sealer where all gaskets and seal meet.

INLINE ENGINES: Attach and align gaskets to cylinder heads.

IMPORTANT: WHEN INSTALLING STEEL SHIM GASKET(S): Apply sealer around intake ports on both sides. If gasket(s) have water ports, apply a 1/8" continuous bead of RTV Black silicone sealer around each water port on both sides. While RTV is wet, install intake manifold.

EXHAUST MANIFOLD GASKET

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

WATER OUTLET GASKET

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