GENERAL INSTRUCTIONS FOR
WET SLEEVE INSTALLATION
Federal-Mogul Document #1208

CAUTION: If "special instruction sheets" are supplied with the sleeves, the specific information shown on them must be followed.

Note: In the handling and installation of new parts, use extreme care to keep them clean.

SECTION - I
PREPARATION OF BLOCK

1. Removal of the old sleeves can be done, in some cases by hand, after first tapping the bottom end of the sleeve to loosen seal. In larger engines however, it is necessary to use a good commercial sleeve puller. After sleeves are removed, scrape out all deposits of rust, scale, and carbon from the counterbore and lower deck area that comes in contact with the sleeve. If sealing ring grooves are in block, all old rubber must be cleaned out.

2. Corrosion at the sealing ring area is quite prevalent today and must be corrected. If this condition is severe enough, the diameters will become enlarged to a point where the sleeve will be excessively loose. The area can then be bored out and bushed to restore it to its original clearance. Failure to do so can mean improper sealing of the coolant and abnormal sleeve movement resulting in flange breakage.

3. Erosion (eating away) of the water jacket area is also quite common and preventive measures should be used. Some operators add 3 ½% soluble oil to the water with good results. Water filters such as the Perry filter type are increasing in popularity especially in the West Coast area. In some severe cases a magnesium rod has been used to dampen the galvanic action created in the cooling system. It is good insurance to use at least one of these precautionary methods in any engine using wet sleeves.

4. After cleaning and polishing sealing ring area or reconditioning the lower deck, extreme care must be given the upper inside bevel or chamfer. If this edge is left jagged and sharp, the soft rubber seals will cut and turn during installation.

5. The new sleeve can now be inserted in the block (without seals) to make certain it fits properly. You should be able to turn the sleeve by hand.
SECTION - II
INSTALLATION OF SLEEVES

1. Place sealing rings on sleeve or in block in position specified by engine manufacturer. Take care not to over stretch when putting over sleeve. When in place, the rings must not be twisted; if so, they should be lifted out of the groove and turned until a thin flash line can be observed around the entire circumference of the seal.

2. For easy entry of the sleeve into the block, the seals and deck bore must be properly lubricated. By far the best product for this purpose is a silicone lubricant in either a pressurized spray or grease form. If a silicone lubricant is not available, one of the following substitutes may be used:
   (a) Hydraulic brake fluid.
   (b) Engine oil.

NOTE: Sealing rings expand and swell after prolonged contact with petroleum products. Therefore any lubricant applied to the rubber should be just prior to installation into the cylinder block.

NOTE: Sealing rings made of silicone compounds are less sensitive to temperature and will retain original resiliency for a longer period of time in the engine. These compounds however, will cut or shear more readily and must be treated with extreme care at installation. These rings are color-coded. The most commonly used color is red.

3. If the sealing ring bore is polished and smooth, no tapping will be necessary to work the sleeve into place. Final positioning can be done by bumping the sleeve with both hands or pushing down with the thumbs.

4. After sleeves are in place, it is a good policy to press the sleeve down with a plate across two head bolts to make sure it is properly bottomed and has the correct protrusion above the block.

5. Check the inside diameter of all sleeves especially in the packing ring area. Use inside mikes or a plug gage made of an old piston, to detect any closing in of the sleeve. Twisted or cramped sealing rings will cause distortion and scoring.
SECTION – III
ASSEMBLY OF PARTS AND BREAK-IN

1. NEW SLEEVE ASSEMBLIES are not always the only requirement to restore an engine to top performance. Worn valve seats, guides, bearings and weak valve springs all contribute to wasted power and loss of lubricating oil. All these factors should be considered at the time of the overhaul.

2. Careful attention must be given each pin type, as follows:
   (a) When the rod eye is clamped on the piston pin by means of a bolt, use extreme care in tightening, to prevent pin distortion. If distorted, the piston will be restricted in its "breathing" under thermal changes and scoring will often result.
   (b) Lock rings will loosen up in operation if "over stressed" in assembly. Compress only enough to enter the pin hole and install with opening towards bottom of piston.

3. Use “wrap around” or "funnel type" ring compressor when installing piston rings making sure they are fully compressed to prevent ring and land breakage. Be sure expander ends are butted on stainless steel oil rings.

4. When rod is assembled to piston, immerse piston in oil bath for instant lubrication when engine is started.

5. Proper tightening of cylinder heads will reduce cylinder wall and valve seat distortion as well as water leakage. Engine manufacturers strongly recommend use of torque indicating wrenches. Specified bolt torque and order of tightening should always be followed.

6. Pressurizing the system is a good recommended practice for all engines especially the larger types. Pre-filling of hollow crankshafts, drill passages, galley lines, etc., is good insurance against early engine damage.

7. For break-in procedure follow recommendation as outlined by the respective engine manufacturer.