

SB013

Fitting Wet Liners

The fitting of wet-type cylinder liners and sealing 'o' rings to an engine should not be difficult. Reasonable care and attention to detail should make assembly easy and avoid subsequent failures. Lack of knowledge of correct procedures and lack of care can however cause 'o' rings to 'twist' and possibly shear, resulting in water leaks and cylinder distortion and, in extreme cases, piston seizure with consequent extensive engine damage. 'Twisted' 'o' rings on a fitted wet liner can easily result in bore distortion in excess of 0.004".

Most engine blocks suffer from some internal corrosion, and debris tends to accumulate in the lowest regions which are normally situated just above the liner 'o' rings. To assist installation, *all* debris, scale and corrosion should be removed from the engine block in the 'o' ring sealing areas, sharp edges should also be removed to avoid cutting or shearing the seals as the liners are pushed into position. If the sealing ring grooves are located in the cylinder block, they must be clean and in good condition - if they are damaged or dirty the 'o' rings will be prevented from sealing correctly.

Check the flange recesses are clean and square. Make sure the sealing areas in the cylinder block are clean, undamaged and that there are no burrs or sharp edges which could damage the 'o' rings. Ensure the 'o' ring grooves are clean and dry - do not lubricate them before fitting the 'o' rings, as this could promote liner failure and bore distortion due to hydraulic action in the groove. Fit each liner to the block *without* 'o' rings to check they will fit and rotate freely. This is the time to check the liner flange protrusions are within specification. Remove the liners and fit the 'o' rings making sure they are not twisted. This can be done by sliding the body of a pen or pencil between the fitted 'o' ring and liner and running it around the liner several times - visually confirm the 'o' rings are not twisted. Finally, generously lubricate over the installed 'o' rings with rubber grease, detergent or soap - *do not* use petroleum based oils or greases. Generously lubricate the lead-in edges to the sealing areas in the block. Carefully install the liners.

Slight resistance will be felt as the 'o' rings are compressed into their grooves and this is normal. Should undue force seem necessary (i.e. the use of a hammer or piece of wood), the liner should be withdrawn and the cause of the resistance investigated and corrected - *do not use undue force*.

If a wet lined engine has to be dismantled to investigate an operating problem shortly after being reconditioned, the inside of each liner should be examined adjacent to the 'o' ring grooves. If a band of wear, polishing or seizure is visible, the liner should be removed and the sealing areas examined for any problem which could place pressure on the liner.

