CYLINDER BLOCK AND LINERS

To Renew Bush in No. 1 Camshaft Bore

Current engines have a bush fitted into No. 1 camshaft bore in the cylinder block.

A prefinished bush is available to replace a worn bush. The worn bush may be extracted and replaced by a new one, making sure that the oil holes in the bush and cylinder block correspond.

Cylinder Liners

Three types of service cylinder liners are available for the 4.236 engine, these being flangeless cast iron, flanged cast iron and flanged chrome plated.

Flangeless cast iron cylinder liners (which are an interference fit) can be rebored to +0,76 mm (0.030 in) oversize when the bores are worn to such an extent whereby engine performance is affected.

Alternatively, the worn liners may be replaced by new ones then bored and honed to finished size.

Flanged cast iron cylinder liners (which, in production, are an interference fit) should not be rebored, but replaced by a prefinished service liner (which is a transition fit).

Chrome liners (which are a transition fit) cannot be rebored and should be replaced by new when worn.

Engines fitted with chrome plated liners can be identified by the letters "CL" stamped adjacent to the engine number on the cylinder block or a letter "C" contained in the engine number after the digits.

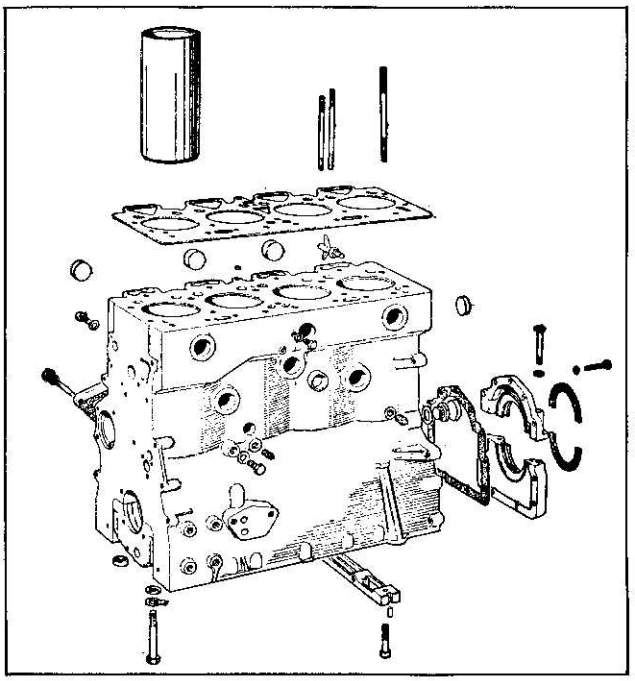

Fig. 1

Flanged liners (which, in production, are an interference fit) should not be rebored, but replaced by a prefinished service liner (which is a transition fit).

Flangeless liners (which are an interference fit) can be rebored +0,76 mm (0.030 in) oversize when the bores are worn to such an extent that engine performance is affected. Alternatively, new liners can be fitted which must be bored and honed to size after fitting.

To Renew Flangeless Cylinder Liners (Cast Iron)

1. Remove all components from the cylinder block.
2. Remove the cylinder head studs.
3. Press out the liners from the bottom.
4. Lubricate the outside diameter of the liners with clean oil and press them in until 0,71/0,89 mm (0.028/0.035 in) of the liner is protruding above the cylinder block face (Fig. 2). Shim washers or a solid stop spacer 0,71/0,89 mm (0.028/0.035 in) thick should be used to give the correct protrusion.

Note: Earlier 4.236 engines incorporate a liner which when fitted is 0,15/0,23 mm (0.006/0.009 in) below the top face of the cylinder block. The later type liner can be identified by its length of 228,7/229,0 mm (9.005/9.015 in), compared with the length of the old type liner which is 227,/227,9 mm (8.963/8.973 in). The old type liner must not be fitted to give a protrusion of 0,76/0,89 mm (0.030/0.035 in) as the bottom piston ring may clear the bottom of the liner when the piston is at bottom dead centre.

5. Bore and finish hone the liners to the dimension given in 'Data'.
   When using a boring bar on the top face of the cylinder block, fit a parallel plate between the boring bar and cylinder block face.

To Fit New Unbored Flanged Cast Iron Cylinder Liners

1. Remove all components from the cylinder block and press out the old liners from the bottom.
2. Lightly lubricate the outside of the new liner and press the liner progressively into the parent bore until the flange locates into the cylinder block flange recess. The limits for liner protrusion are given in 'Data' and may be checked as shown in Fig. 2.
3. Bore and finish hone the liners to the dimension given in 'Data'.
4. Re-assemble the engine components to the cylinder block.

To Renew Cylinder Liners (Prefinished Flanged Cast Iron or Chrome Plated)

To Remove Liners

1. Remove all components from the cylinder block.
2. Remove the cylinder head studs.
3. Press out the liners from the bottom.

Preparation for Fitting New Liners

Great care must be taken in handling, transit and storage of new prefinished cast iron or chrome plated liners, as the slightest burr or damage is sufficient to cause local distortion of the bore when fitted.

To Fit New Liners

1. Lubricate the outside diameter of the liners with clean oil.
2. Press in the new liners so that the flanges at the top of the liners do not foul the counterbore at the top of the parent bore.

   With the liner fully home, check the relationship between the top of liner flange and the top face of the cylinder block to the limits given in 'Data'.

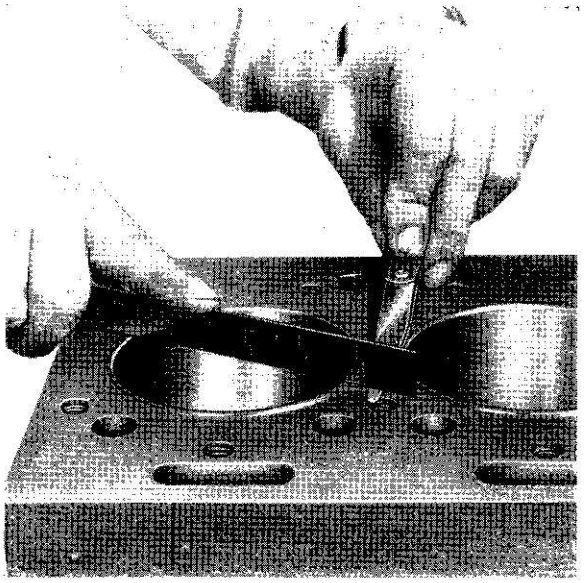

Fig. 2

From engine No. 4702131A the liner flange recess depth in the cylinder block for thin wall chrome liners has been increased, and a 45° chamfer added to this recess and the flange thickness of the thin wall chrome liner has also been increased.

The later thin wall type liner may be used on earlier engines providing the top face of the liner comes within the earlier limits.

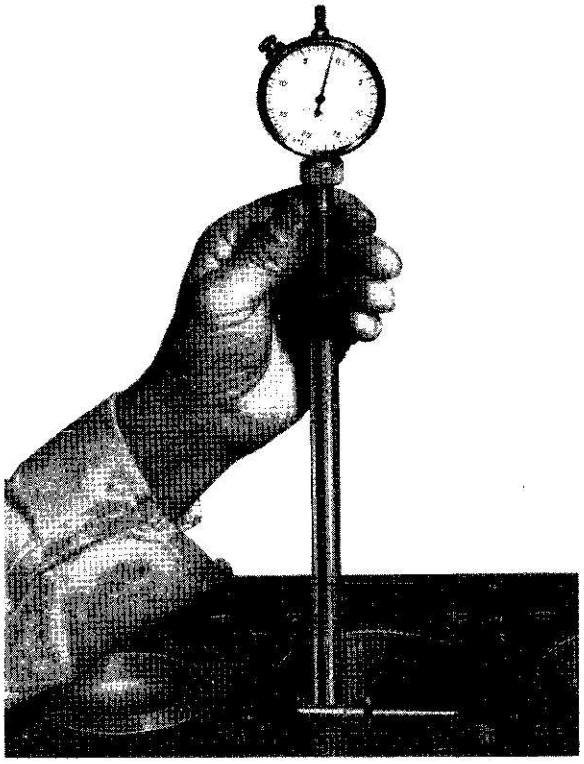

Fig. 3

The latest cast iron flanged liner has a radius under the flange instead of an undercut. The chamfer on the flange recess in the cylinder block, between the recess and the liner parent bore, has been changed from 0,25/0,38mm (0.010/0.015 in) at 45° to 0,51/0,76 mm (0.020/0.030 in) wide x 0,64/0,89 mm (0.025/0.035 in) deep to accommodate this radius. This latest liner also has a thicker flange and the relationship between the top of the liner flange and the top face of the cylinder block has been changed.

3. It is advisable to allow a settling period to elapse before checking the fitted internal bore diameter of the liner. The acceptable limits are given in 'Data'.

Each new liner should be checked in three positions – top, centre and bottom; the readings being taken transversely and parallel to the centre line of the cylinder block (Fig. 3).