

# Flying Spares

Dear Sir/ Madam,  
Thank you for ordering one of our loan tools.

Many of these tools are limited in their availability and difficult to replace or repair.

In order to keep their condition to the highest quality we inspect all our tools when they are returned to us.

Upon receipt please check that the tool is suitable for the task required, there may be a slight variance from the picture on our website. Should you have any concerns about the condition of the tool please contact me on 01455 299 781 or email me at [martin@flyingspares.co.uk](mailto:martin@flyingspares.co.uk).

Once you have used the tool please be mindful that there may be another request for it, and there is a possibility that I call or email you as a reminder to return the tool.

Thereafter, upon return it is very important that the tool is returned in the original packaging to ensure safe transit.

If you send the tool back with your own courier please ensure you take out suitable insurance cover, particularly where electrical tools are concerned as additional packing may also be required.

Finally, should the tool be returned in a substandard condition we reserve the right to withhold some or all of the surcharge.

To arrange collection please contact us on 01455 292969 and the cost of this will be deducted from your surcharge credit.

Thank you again for your business and helping us to keep these tools in the best condition, your cooperation is very much appreciated.

Yours Faithfully,

Martin Scott  
(Reconditioning)



## **FITTING INFORMATION**

### **USING THE CYLINDER LINER PULLER (RH7095EXTLOAN)**

*This information can be found in Section E3 on TSD2476*

#### **Introduction**

The cylinder bore dimensions should be checked only when all the liners from any one bank are in position, any deviation from this rule could result in false readings.

If the readings taken show that the bore is worn in excess of 0,1016 mm. (0.004 in.) or ovality exceeds 0,076 mm. (0.003) (see Section E11 in TSD2476 for Dimensional Data) the liner should be withdrawn and a new liner, sealing rings and piston fitted.

Cylinder liner seal leakage can be detected by 'tell-tale' holes in the side of the crankcase. Coolant or oil will issue from these holes depending upon which of the two bottom scaling rings is leaking. The upper of the two bottom rings leaks coolant and the lower one leaks oil, in either case the appropriate liner should be removed, and new seals fitted to the crankcase (see Fig. E20).

**When renewing liners, it is important that as one liner is removed it is replaced by a new liner, before any other liners are removed.**

If this procedure is not adopted and a liner is extracted from a bore adjacent to bores without liners, it is possible for the crankcase bridge piece to sustain damage. This is caused by a hard crust of corrosion which forms on the liner immediately below the upper of the two lower sealing rings (see Fig.E20). As the liner is withdrawn, the deposit has to pass under the sealing ring thus exerting an abnormally high bursting pressure which, if the crust of corrosion is thick enough will cause the rubber ring to twist and the bridge piece to fracture.

#### **Cylinder liner - To remove**

1. Using extraction tool (RH 7095) as shown in Figure E21, remove the liner from the crankcase; note that the liners can be removed from the top face only.

#### **Cylinder liner - To fit**

1. Ensure that the coolant drain hole in the crankcase wall is clean and unobstructed.
2. Ensure that the seal leakage 'tell-tale' holes in the crankcase wall are clean and unobstructed.
3. Remove any burrs then clean the crankcase cylinder liner, crankcase liner location bore and seating face in the crankcase counterbore with 'Genklene' or a similar alternative.

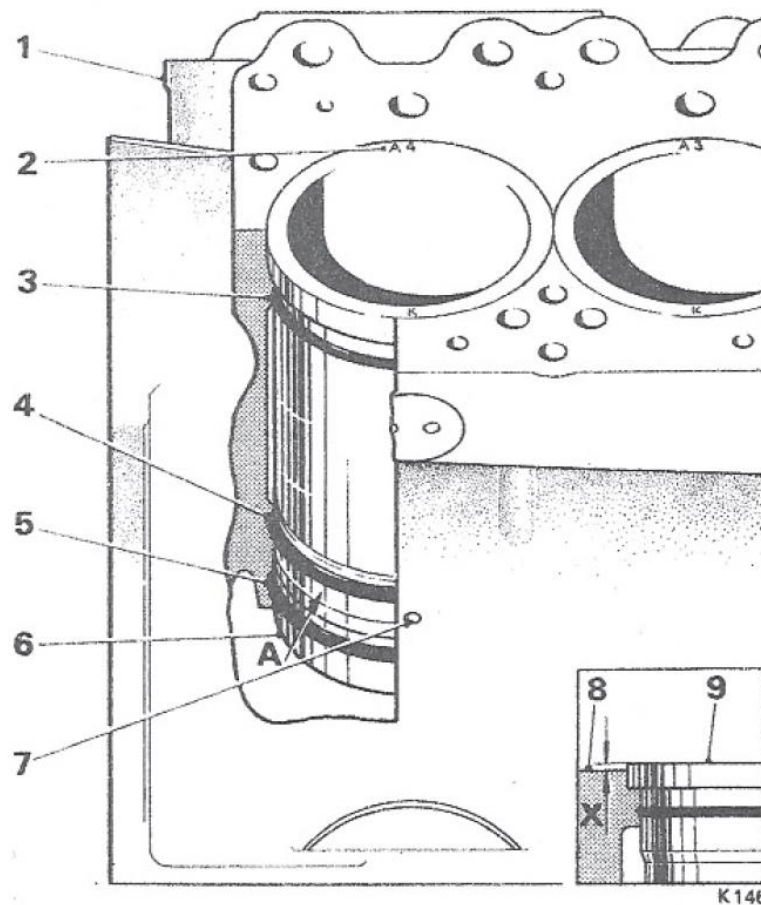
**Note:** Meticulous care should be exercised when carrying out these operations as any dirt or burrs allowed to remain will have an adverse affect on the fit of the liner in the crankcase and may in fact distort the liner bore.

4. A liner when fitted into the crankcase should stand between 0.051 mm. and 0.076 mm. (0.002 in. and 0.003 in.) proud of the crankcase top face, this is to provide a 'nip' when the cylinder head and gasket are fitted. To obtain the correct amount of 'nip' proceed as described in operations 5 and 6 (see Fig.E20).
5. Measure the width of the liner collar and the depth of the counterbore in the crankcase. Subtract the measurement taken for the depth of the counterbore from the width of the collar. Compare this figure with the 'nip' required (see Operation 4).
6. If the amount of 'nip' does not correspond with the amount required, either another liner should be tried or if the figure allows more than 0,076 mm. (0.003 in.) 'nip', the excess should be ground off the top face of the liner; after grinding, again thoroughly clean the liner.
7. A liner is identified with the corresponding bore reference etched onto its top face. Any new liner which is being fitted should also have the appropriate bore reference etched onto its top face before being fitted (e.g. No. 1 bore 'A' bank to be etched A1. Certain cars fitted with service reconditioned engines have oversize liners (outside diameter). These engines are identified by an SR number suffixed by the letters O/L stamped on a small boss situated at the front of the crankcase. The liner is identified by the marking of the letter O/L on the top face of the liner adjacent to the piston grade information.  
A liner is also graded and if not already done so, the grade should be etched onto the top face of the liner so that the grade can be seen when the liner is fitted into crankcase.
8. Fit three new rubber sealing rings to the crankcase, then thinly smear the rings and location diameters with Palmolive grease or its equivalent.
9. To enable a liner to be fitted which can be up to 0,032 mm. (0.00125 in.) interference fit in the crankcase bore, the crankcase should be placed in an oven which has controlled heat of approximately 150°C (302°F). The crankcase should be allowed to remain in the oven until it has to be reached oven temperature.

**Important:** Do not attempt to fit a liner into a cold crankcase.

10. Remove the crankcase from the oven then quickly push the liner into the crankcase bore until it is felt to seat on the seating face of the counterbore. Bear in mind that the bore reference etched onto the top face of the liner should be positioned at its nearest point to the camshaft location i.e. innermost part of the engine.
11. Allow the crankcase 10 return to its cold condition.
12. Using a depth micrometer, measure the amount that the liner stands proud above the crankcase face. As stated previously this figure should be between 0.051 mm. and 0,076 mm. (0.002 in. and 0.003in.).
13. If the liner stands more than 0,076 mm. (0.003 in.) proud, an even tap with a plastic-headed mallet about the top face of the liner is permissible. If this does not move the liner below the 0,076 mm. (0.003 in.) limit or if the liner is below the 0,051 mm. (0.002 in.) limit, the liner should be withdrawn and the cause of the trouble investigated.

**FIG .E20 CYLINDER LINER IN CRANKCASE**



**A** Position of corrosion build up on cylinder liner and crankcase  
**X** 0,051mm. to 0,076mm. (0.002 in. to 0.003in.)

- 1** Crankcase
- 2** Bore reference number
- 3** Rubber 'O' ring
- 4** Upper sealing ring
- 5** Lower sealing ring
- 6** Cylinder liner
- 7** Tell tale hole (8 off)
- 8** Crankcase
- 9** Cylinder Head

**FIG .E21 METHOD OF REMOVING CYLINDER LINERS**

