SERVICE MANUAL

TRUCKS

L 385

Export Service Department

AKTIEBOLAGET
VOLVO
GÖTEBORG . SWEDEN

4. Fit the other circlip.

5. Check to ensure that the piston is in right angles to the piston pin center. This check is carried out in a control and aligning apparatus for connecting rods. See the instructions on page 1-44 "Alignment of connecting rods". The maximum permissible deviation from a right angle is 0.03 mm (0.0012") measured over 100 mm (4").

6. Fit the piston rings (Fig. 1-33) on the piston. Make sure that the piston ring gaps are correct. Take the oil control rings first and then the lower compression rings. These can be turned as desired. Always use a piston ring tool in order to avoid ring breakages.

   Finally the upper chromed compression ring is fitted and this should be turned so that the inner groove faces upwards.

CYLINDER HEADS

Removing

1. Remove the rocker arm covers, the intake manifold and the exhaust manifold.

2. Remove the thermostat housing and disconnect the water tube (28) between the cylinder heads.

3. Disconnect the delivery tubes and the leak-off line from the injectors. Fit protector caps.

4. Loosen the oil pipes (21) for rocker arm lubrication and the attaching bolt for the rocker arm bearing bracket after which the rocker arm mechanism is lifted out.

5. Lift up the push rods.

6. Remove the cylinder head nuts and lift off the cylinder heads.

7. Remove the cylinder head gaskets.

Disassembly

1. Remove the leak-off line and the cap nut. Place tool SVO 2035 in the position occupied by the cap nut.

   Remove the nuts retaining the injectors and then remove the injectors by using puller SVO 2035. See Fig. 1-51. Place injectors in a protected place.

2. Remove the valves and valve springs. Use a valve spring compressor. See Fig. 1-52. Place the valves in order in the fixture for this purpose.

3. Clean all parts, being particularly careful to ensure that the channels are not overlooked.

Inspection

The first procedure is that of pressure testing to detect any cracks or leaks at the copper sleeves. See "Pressure testing" below.

The water nozzles should be firmly in position in the cylinder head. Loose nozzles should be replaced.

The cylinder head surface should be checked for warping. Variation should not exceed 0.05 mm (0.002") over 100 mm (4") and should not exceed 0.1 mm (0.004") over the complete length and width of the entire surface. Use a special facing plate to check for warping. A warped cylinder head can be ground or levelled by using other methods. Always fit new cylinder head gaskets even if the old ones appear to be in good condition.

Pressure Testing

1. Fit connector washer SVO 1686 and its packing in the water outlet of the cylinder head.
2. Fit expander plugs SVO 1685 in the seven water channels in the cylinder head by inserting the plugs into the channels and then tighten the butterfly nuts until the plugs are firmly in position. Do not tighten so much that the rubber packing is damaged.
3. Connect up the water hose and fill the cylinder head with water. Then fit sealing washer SVO 1687 and its packing. Then admit water under the pressure which should be 3-4 kg/cm^2 (42-56 p.s.i.).
4. Remove the plugs and washers.

Assembly and Fitting

1. Fit the valve springs with the tightly wound section towards the cylinder head, oil in the valve stems and insert the valves in their respective guides. Fit the valve spring washers in position and then compress the springs by using a spring compressor. Secure the valves in position. Fit the protector rings on the valve stems.
2. Carefully dry up the contact surfaces on the cylinder head and the cylinder block. Smear the cylinder head gaskets with a little oil and lay on the gaskets so that the side with the edge fold faces upwards (new gaskets). Fit the cylinder heads.
3. Fit the intake manifold but do not tighten the nuts. Always use new gaskets.
4. Fit the cylinder head nuts and tighten them in the order shown in the tightening scheme in the specifications. Tighten to a torque of 14-15 kgm (100-115 lb.ft.)

5. Tighten the intake manifold nuts finally, fit the exhaust manifold and tighten. Always use new gaskets.

6. Fit the thermostat housing and the water pipe (28).

7. Fit the push rods and rocker arm mechanism. Connect the lubricating oil pipe (21) for rocker arm lubrication.

8. Fit the injectors and tighten the delivery pipes and leak-off line.

9. Adjust the valves in accordance with the instructions on page 1-51 "Adjusting of Valves".

10. Fit the rocker arm covers using new gaskets.

REPLACEMENT OF COPPER SLEEVES AND SEAL RINGS FOR INJECTORS

Removing

1. Insert the puller SVO 2181 in the sleeve until it bottoms and in such a way that the yoke can be fitted over the stud bolts.

2. Turn the spindle of the tool in an anti-clockwise direction so that it engages in the sleeve. Do not tighten too much. It is sufficient to tighten until the spindle engages firmly (Fig. 1-53).

3. Screw down the nut whereby the spindle and the sleeve in which it is engaged will be pulled up. The sleeve can then be lifted out and the tool removed from the sleeve.

4. Remove the seal ring in the upper part of the cylinder head and clean the hole thoroughly especially the lower narrower part. Make sure that the hole is even and free from rust since this can cause an inefficient seal when the new sleeve is fitted.

Fitting

1. Smear the new seal ring with a little suitable grease and then place it in the groove in the cylinder head. Make sure that the ring comes correctly in position and that it is not damaged.

2. Fit the sleeve on tool SVO 2187 and oil in the sleeve externally. Insert the tool with the sleeve in the hole in the cylinder head, twisting the tool while this is being done (Fig. 1-54). As soon as the narrow part of the sleeve has entered the lower hole, drive it home with the tool and the hammer. See Fig. 1-55.

3. Oil in the flanging tool SVO 2186, insert it in the sleeve and screw on both the attaching nuts without tightening them.

4. Screw down the tool until it is guided by the narrower section of the sleeve and then tighten the attaching nuts. See Fig. 1-56.

5. Screw down the tool until it reaches the shoulders in the sleeve, whereby the sleeve will be flanged. See Fig. 1-57.

6. Screw out and remove the tool.

7. Carefully cut down the copper sleeve level with the underside of the cylinder head.

8. Pressure test the cylinder head.

Pressure Testing

1. Screw the connector washer SVO 1686 and its washer into the cylinder head.

2. Fit the sealing plugs SVO 1685 by inserting them in the hole and then tightening the butterfly nut until the plug is firmly in position. Do not tighten too hard since this can cause damage to the rubber packing.

3. Connect the upper rubber hose and fill the cylinder head with water. Then screw in the sealing washer SVO 1687. Admit water under pressure. This pressure should be at least 3 kg/cm^2 (42 p.s.i.) but should not exceed 4 kg/cm^2 (56 p.s.i.).

4. Remove the plugs and washers.

CRANKSHAFT

Inspection

When the crankshaft is removed from the engine it should be carefully examined and measured.

The crankpins and main bearing journals have an unfortunate tendency to become oval due to wear while the engine is running. A crankshaft which is worn to such an extent that the bearing surfaces are uneven and scratched must be ground down.

As far as cracks and indications of breakages are concerned, the crankshaft should be carefully checked preferably by using a Magnaflux apparatus if this is available.

Another method is to use finely divided chalk which is applied with a brush and then heating up the crankshaft to 75-80° C (167-176° F) whereby any cracks there may be can be seen as dark lines in the white chalk surface.

Alignment of the crankshaft

The crankshaft throw must be correct and the crankshaft must be free from any sign of deformation due to twist, bending etc.