

2.6 litre – 6 cylinder Engine

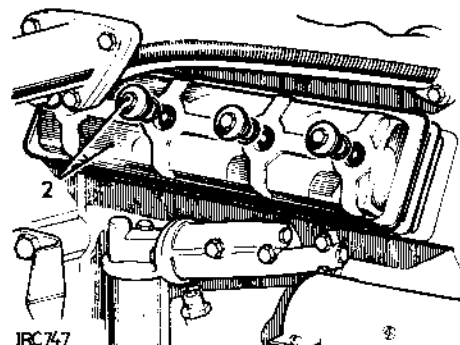
2.6 litre - 6 cylinder Engine

DISTRIBUTOR AND OIL PUMP
DRIVE SHAFT

Remove and refit 12.10.22

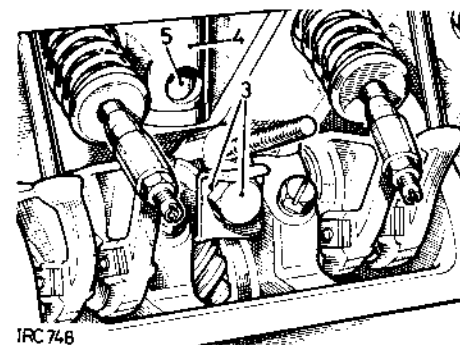
Removing

- 1 Remove the distributor and short drive shaft. 86.35.20.
- 2 Remove the side rocker cover.



IRC 747

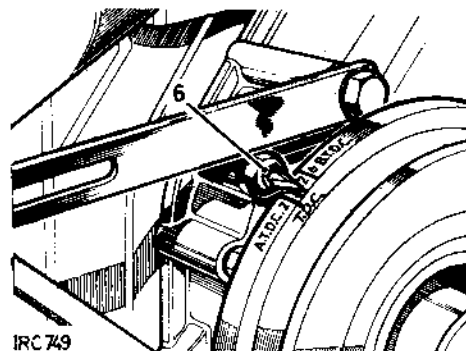
- 3 Remove the oil feed bolt and lock washer locating the distributor housing inside the rocker chamber.
- 4 Lift out the distributor housing.
- 5 Withdraw the drive shaft.



IRC 748

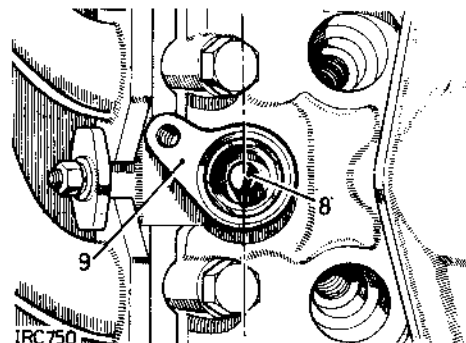
Refitting

- 6 Rotate the engine in direction of rotation until the TDC mark on the crankshaft pulley aligns with the timing pointer, with both valves on No. 1 cylinder fully closed (i.e. No. 1 cylinder commencing firing stroke).



IRC 749

- 7 Fit the oil pump and distributor gear drive shaft to the engine with the lower splines engaged in the oil pump, and the skew gear engaged with the camshaft.
- 8 Turn the drive shaft using a suitable screwdriver, until the offset drive slot in the end of the shaft is positioned as illustrated.
- 9 Fit the distributor housing to the engine and locate and secure with the oil feed bolt and lock washer.
- 10 Reverse 1 and 2.



IRC 750

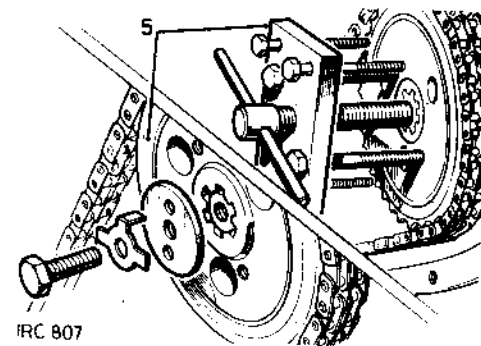
CAMSHAFT

Remove and refit 12.13.01

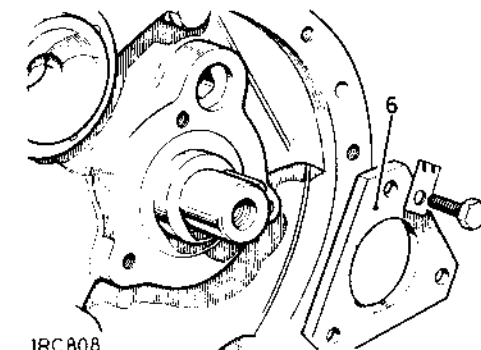
Service tools: 530101 Extractor for camshaft
507231 Extractor for chainwheel

Removing

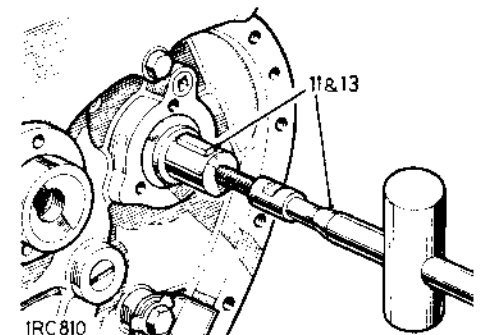
- 1 Remove the radiator and grille panel. 26.40.01.
- 2 Remove the exhaust manifold. 30.15.10.
- 3 Remove the timing gear cover. 12.65.01.
- 4 Remove the timing chain tensioner. 12.65.28.
- 5 Remove the camshaft chainwheel and timing chain. Extractor 507231.
- 6 Remove the camshaft thrust plate.
- 7 Remove the side rockers and shafts. 12.29.36.
- 8 Remove the distributor and short drive shaft. 86.35.20.
- 9 Remove the oil pump and distributor gear drive shaft. 12.10.22.
- 10 Remove the six camshaft bearings locating screws.
- 11 Withdraw the camshaft until the bearings are clear of the housing. Extractor 530101.
- 12 Remove the bearings by separating the bearing halves. Keep the halves in related pairs as indicated by the figures marked on the end faces.
- 13 Withdraw the camshaft clear of the engine.
- 14 Withdraw the remaining bearing from the rear housing, utilising the oil relief holes for extraction purposes if required.



IRC 807



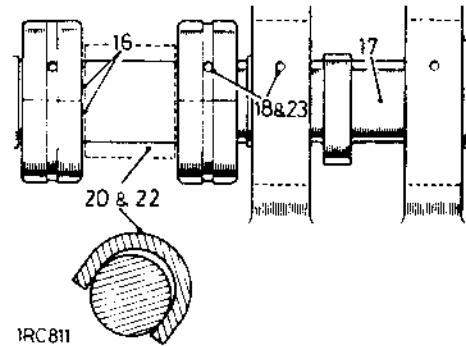
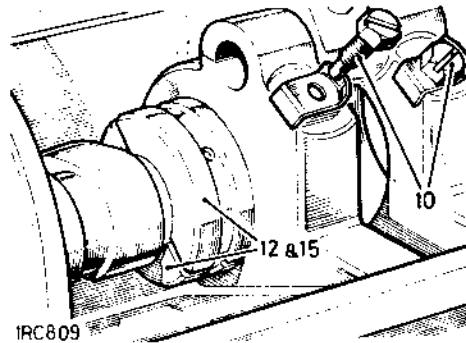
IRC 808



IRC 810

Refitting

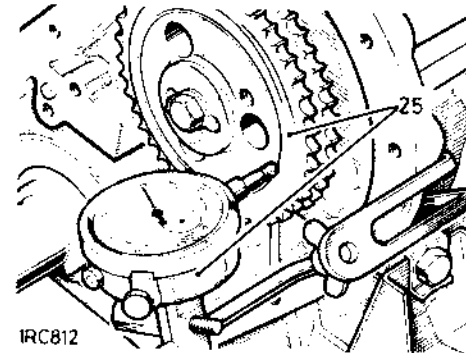
- 15 Before attempting to fit the camshaft bearings to the cylinder block, ensure that the bearing halves fit together correctly on the dowels by checking that no light is visible between the joint faces.
- 16 The bearings must be fitted dry and should be a hand push fit in the cylinder block; they must always be renewed in paired halves and the numbers stamped on one of the end faces of the bearing halves must be adjacent.
- 17 Insert the camshaft partly into the cylinder block, allowing the distributor and oil pump drive gear to pass through the first and second intermediate housing webs.
- 18 Assemble the front and intermediate bearings on to their respective journals on the camshaft. Ensure that the dowelled joint faces are tightly fitted together and the locating holes in the bearings are in line with the holes in the housing webs.
- 19 Fit the rear bearing into the housing.
- 20 Place a suitable distance between the first and second intermediate bearings. The width of the distance piece to be approximately the distance between the bearing housings but allowing sufficient clearance for withdrawal.
- 21 Tap the camshaft rearwards until the bearings are fully home in their respective housings and the locating holes are aligned.
- 22 Remove the distance piece.
- 23 Lubricate the bearings through the locating bolt holes then fit the bearing fixings.
- 24 Fit the camshaft thrust plate.



DATA

Camshaft end float

- 25 Temporarily fit the camshaft chainwheel and check the camshaft end-float which must be 0,11 to 0,16 mm (0.0045 to 0.0065 in.). Replace the thrust plate if the end-float is excessive.



- 26 Temporarily remove the camshaft chainwheel and fit the side rocker shafts. 12.29.36.
- 27 Fit the camshaft chainwheel and timing chain and set the valve timing. 12.65.12.
- 28 Fit the oil pump and distributor gear. 12.10.22.
- 29 Fit the distributor and short drive shaft. 86.35.20.
30. Reverse 1 to 4.

0,11 to 0,16 mm (0.0045 in. to 0.0065 in.).

CONNECTING RODS AND PISTONS

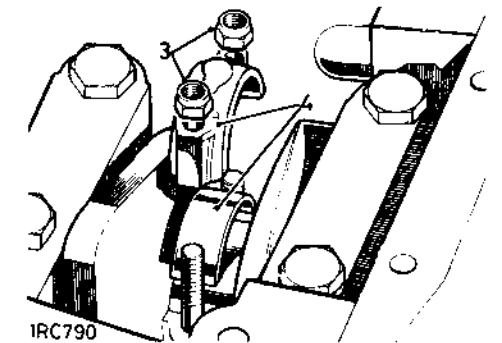
Remove and refit

12.17.01

Removing

NOTE: During the following procedures retain all components in related sets to facilitate re-assembly. If the pistons are not to be replaced, add location marks to ensure re-assembling in the same relative positions.

- 1 Remove the cylinder head. 12.29.10.
- 2 Remove the oil sump. 12.60.44.
- 3 With two pistons at bottom dead centre (BDC) remove the connecting rod cap fixings.



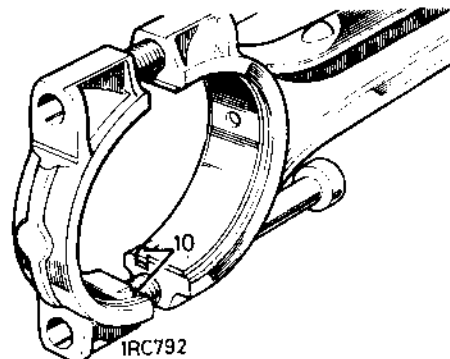
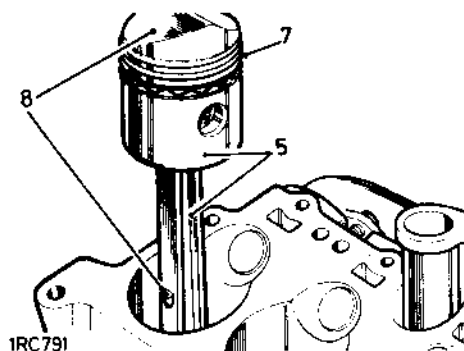
- 4 Remove the caps and withdraw the connecting rod bearing halves. Retain the caps and bearings in related sets.
- 5 Withdraw the pistons and attached connecting rods from the top of the bore.
- 6 Position the remaining pistons at BDC and repeat the removal procedure.

continued

Refitting

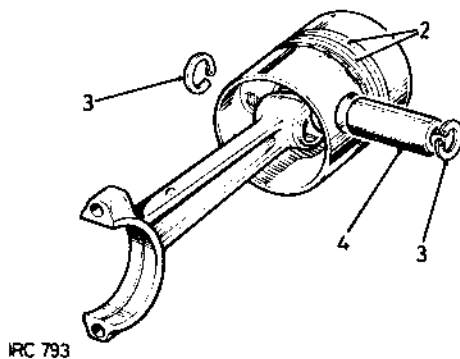
NOTE: If replacement components are to be fitted, the checks detailed in 'overhaul' 12.17.10 must be carried out as necessary.

- 7 Position the piston rings so that the end gaps do not align with each other or with the gudgeon pin bore in the piston.
- 8 Enter the connecting rods into the appropriate cylinders and position the oil hole in the connecting rod and the flat on the piston crown away from the camshaft side of the engine.
- 9 Carefully insert the pistons into the cylinders, taking care not to damage the rings.
- 10 Lubricate the journals and bearing halves and fit the appropriate halves to the connecting rods and caps. The bearing halves are located by tongues, these to be positioned at the same side of the connecting rod in the grooves provided.
- 11 Fit new bearing cap nuts and tighten to 2,8 kgf. m (20 lbf. ft.).
- 12 Reverse 1 and 2.

**CONNECTING RODS AND PISTONS****Overhaul****12.17.10****Dismantling**

NOTE: During the following procedures retain all components in related sets to facilitate subsequent assembly. If the same pistons are to be refitted, add location marks to ensure reassembling in the same relative position.

- 1 Remove the connecting rods and pistons. 12.17.01.
- 2 Remove the piston rings.
- 3 Remove the circlips from the gudgeon pin bosses.
- 4 Withdraw the gudgeon pins from the pistons.

**Overhauling pistons****Original Pistons**

- 5 Remove the carbon and deposits, particularly from the ring grooves.
- 6 Examine the pistons for damage or excessive wear - see under 'New pistons' for clearance dimensions - fit new replacements as necessary.

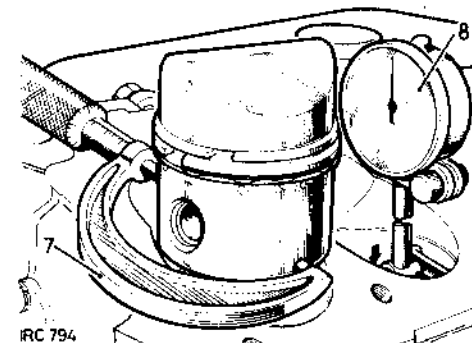
New Pistons

Original pistons fitted to new engines at the factory are specially graded to facilitate assembly. The grading letter on top of the piston crown must be ignored when ordering new pistons. Genuine Land-Rover service standard size pistons are supplied 0,025 mm (0.001 in) oversize to allow for production tolerances on new engines. When fitting a new piston to a standard size cylinder block the bore must be honed to accommodate the piston with the correct clearances.

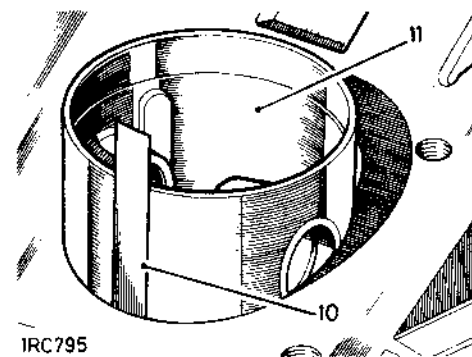
The clearance limits between the pistons and cylinder bores are 0,048 mm to 0,060 mm (0.0019 in. to 0.0024 in.), measured as described subsequently.

The temperature of the piston and cylinder block must be the same to ensure accurate measurements.

- 7 Check the piston diameter at the bottom of the skirt at right angles to the gudgeon pin.
- 8 Check the bore diameter at approximately half way down.



- 9 If gauge equipment is not available, the piston clearance can be assessed using long feeler gauges, 10 to 12.
- 10 Insert a long, suitably sized feeler gauge down the thrust side of the cylinder bore.
- 11 Insert the correct piston, inverted, into the cylinder bore and position it with the gudgeon pin parallel with the axis of the crankshaft.



12 Push the piston down the cylinder until the piston reaches its tightest point in the bore, at this point withdraw the feeler gauge – a steady resistance should be felt.

13 If standard size pistons are being fitted, select pistons from the range available until the clearance is satisfactory.

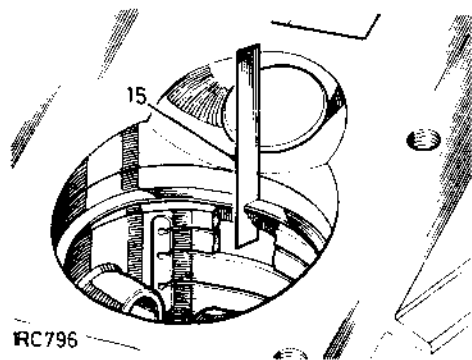
14 If new piston rings are to be fitted without reboring, deglaze the cylinder walls with a hone, without increasing the bore diameter. A deglazed bore must have a cross-hatch finish.

15 Check the compression and oil control rings gaps in the applicable cylinder, held square to the bore with the piston.

Compression rings gap: 0,38 mm to 0,50 mm (0.015 in. to 0.020 in.).

Oil control ring gap: 0,40 mm to 0,80 mm (0.015 in. to 0.033 in.).

Use a fine cut flat file to increase the gap if required. Select a new piston ring if the gap exceeds the limit.



Reboring

16 The cylinder head is inclined at an angle of 22°; standard boring equipment can be used in conjunction with a special jig block 261288.

17 Where the maximum permitted boring tolerance is not sufficient to reclaim the bores, cylinder liners may be fitted.

18 Fitting the cylinder liners conforms to normal practice. Machine the cylinder block bores to 81,28 mm + 0,025 mm (3.200 in. + 0.001 in.) which will provide the liner with 0,07 mm to 0,10 mm (0.003 in. to 0.004 in.) interference fit.

19 Prior to pressing in the liner, allowance must be made for unavoidable rotation of up to 5 mm (0.187 in.), clockwise. To facilitate realignment should the liner not be positioned correctly at the first attempt, scribe lines down the sides of the liner from the two peaks, and make corresponding marks on the cylinder block.

20 Press in the liner, using a special press block 246650, until the top edge is level with the bottom of the exhaust valve pocket. Bland to the shape of the cylinder block.

Bore to the selected diameter to suit pistons. Liners may be bored to a maximum of 1,01 mm (0.040 in.).

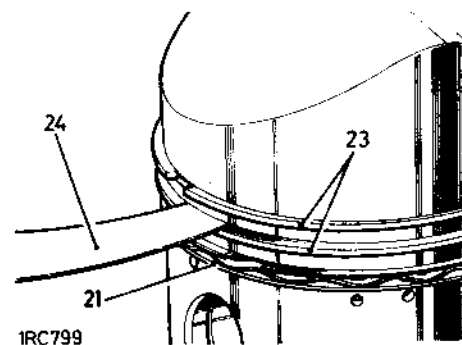
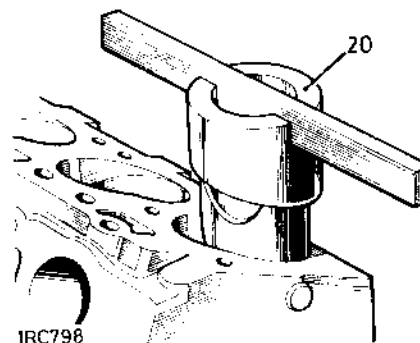
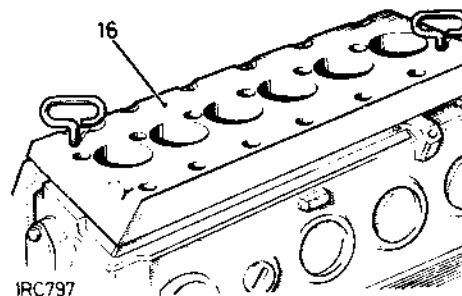
Assembling

21 Fit the oil control ring to the piston.

22 Check the oil control ring clearance in the piston groove. Clearance limits: 0,05 mm to 0,10 mm (0.002 in. to 0.004 in.).

23 Fit the two compression rings to the piston with the sides marked 'T' or 'Top' uppermost.

24 Check the compression ring clearance in the piston grooves. Clearance limits: 0,046 mm to 0,097 mm (0.0018 in. to 0.0038 in.).



Connecting rods

25 Check the alignment of the connecting rod.

26 Check the gudgeon pin clearance in the connecting rod bush. Clearance limits: zero to 0,0241 mm (0.00095 in.).

27 If a new connecting rod small end bush is required, ensure that the oil holes are aligned when pressing in the replacement, then ream the bush to obtain the correct clearance, as above.

28 Check the fit of the gudgeon pin in the piston, the pin must not fall through either boss but be capable of being fitted by hand at normal room temperature 20°C (68°F).

Gudgeon pins of 0,025 mm and 0,076 mm (0.001 in. and 0.003 in.) oversizes are available.

29 Select the correct cap for each connecting rod as denoted by the number stamped near the joint faces. This number also indicates the crankshaft journal to which it must be fitted.

30 Assemble the caps, less bearing halves, to the respective connecting rods. Torque 2,8 kgf. m (20 lbf. ft.).

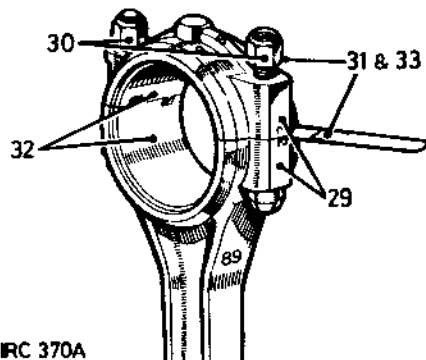
31 Slacken the fixing on one side of the cap only and check that there is no clearance at the joint face. If there is clearance, a new assembly must be fitted.

continued

Connecting rod bearing nip and clearance

NOTE: New bearing halves are supplied with a protective coating and must be degreased, prior to fitting, to remove the coating.

- 32 Fit the bearing halves to the connecting rod and cap, and secure the assembly. Torque 2,8 kgf. m (20 lbf. ft.).
- 33 Slacken the fixing on one side of the cap only and check the clearance between the joint faces. The clearance must be 0,05 mm to 0,10 mm (0.002 in. to 0.004 in.). The bearing nip can be corrected by selective assembly of the bearings shells; these are available in slightly varying thicknesses. Do not file or machine the caps or connecting rods to vary the bearing nip.

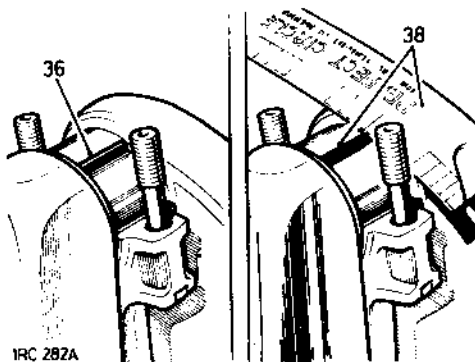


IRC 370A

- 34 Make a final check to prove the bearing clearance, using selected shim papers fitted between the journal and one half of the bearing shell. As the bearing clearance is taken up, the connecting rod will become stiff to rotate about the journal. The correct bearing clearance is 0,0114 mm to 0,043 mm (0.00045 in. to 0.0017 in.).

NOTE: As an alternative, 'Plastigauge' may be used to check the connecting rod bearing clearance. 35 to 41. Do not rotate the connecting rod or crankshaft while the Plastigauge is fitted, or the reading will be impaired.

- 35 Place a piece of 'Plastigauge' across the centre of the lower half of the crankshaft journal. 605238.
- 36 Fit the connecting rod complete with bearings to the applicable journal. Torque 2,8 kgf. m (20 lbf. ft.).
- 37 Remove the connecting rod cap and lower half bearing.
- 38 Using the scale printed on the 'Plastigauge' packet, measure the flattened 'Plastigauge' at its widest point. The graduation that most closely corresponds to the width of the 'Plastigauge' indicates the bearing clearance.

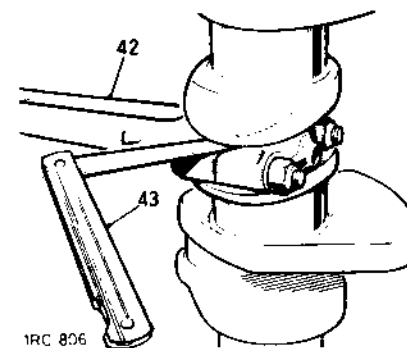


IRC 282A

- 39 The correct clearance with new or overhauled components is 0.0114 mm to 0,043 mm (0.00045 in. to 0.0017 in.).
- 40 If a new bearing is being fitted, use selective assembly to obtain the correct clearance.
- 41 Wipe off the 'Plastigauge' with an oily rag. DO NOT scrape it off.

Connecting rod end-float

- 42 Fit the connecting rods complete with bearings to their applicable journals. Torque 2,8 kgf. m (20 lbf. ft.).
- 43 Check the end float between the end face of the connecting rod and the journal shoulder. End float limits: 0,15 mm to 0,38 mm (0.006 in. to 0.015 in.).
- 44 Remove the connecting rods from the crankshaft and retain all parts in related sets.



IRC 806

Assembling

- 45 Assemble the pistons to their respective connecting rods.
- 46 Fit new circlips to retain the piston gudgeon pins.
- 47 Refit the connecting rods and pistons. 12.17.01.

DATA**Pistons**

Clearance in cylinder bore, measured at bottom of skirt at right angles to gudgeon pin. Standard size and oversize pistons.

0,048 mm to 0,060 mm (0.0019 in. to 0.0024 in.)

Piston rings**Compression (2)**

Type
Gap in bore
Clearance in groove

Cast iron. Marked 'T' or 'TOP' on upper side.
0,38 mm to 0,50 mm (0.015 in. to 0.033 in.)
0,046 mm to 0,097 mm (0.0018 in. to 0.0038 in.)

Oil control

Type
Gap in bore
Clearance in groove

Slotted, square friction edge.
0,38 mm to 0,80 mm (0.015 in. to 0.033 in.)
0,05 mm to 0,10 mm (0.002 in. to 0.004 in.)

Gudgeon Pin

Clearance in connecting rod
Fit in piston

Zero to 0,0241 mm (0.00095 in.)
Push fit by hand

Connecting rods

Clearance, bearing to crankpin
End float on crankpin

0,0114 mm to 0,043 mm (0.00045 in. to 0.0017 in.)
0,15 mm to 0,38 mm (0.006 in. to 0.015 in.)

CRANKSHAFT REAR OIL SEAL

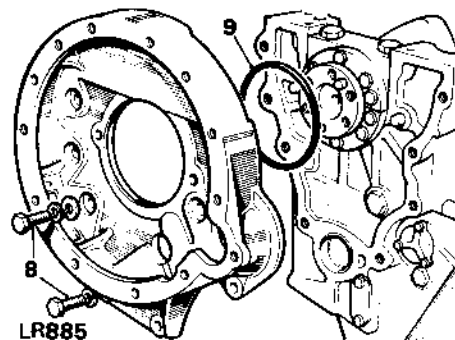
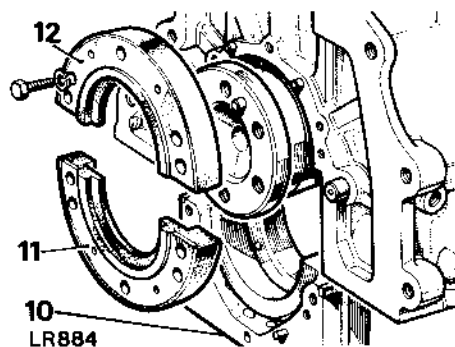
Remove and refit

12.21.20

Service tool: 270304 Guides for oil seal
600963 Engine lifting sling

Removing

- 1 Remove the bonnet. 76.16.01.
- 2 Remove the front floor. 76.10.12.
- 3 Remove the engine assembly. 12.41.01.
- 4 Remove the starter motor. 86.60.01.
- 5 Remove the oil sump. 12.60.44.
- 6 Remove the clutch assembly. 33.10.01.
- 7 Remove the flywheel. 12.53.07.
- 8 Remove the flywheel housing.
- 9 Remove the oil seal ring.
- 10 Remove the rear main bearing cap.
- 11 Remove the dowel located lower half of the oil seal retainer from the rear main bearing cap.
- 12 Remove the dowel located upper half of the oil seal retainer from the cylinder block.



- 13 Remove the oil seal from the crankshaft.

Refitting

- 14 Assemble the garter spring on the crankshaft journal by engaging the hook and eye. Do not stretch the spring.
- 15 Move the assembled spring along the journal until it is against the thrower flange.
- 16 Apply Silicone Grease MS4 to the crankshaft oil seal journal and to both end faces of the split oil seal.
- 17 Open the split seal sufficiently to allow it to be fitted over the crankshaft oil seal journal. The recess in the oil seal must be towards the thrower flange and the garter spring.

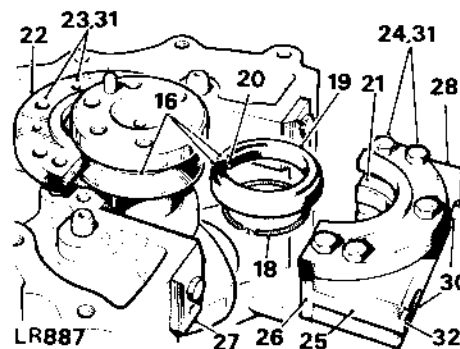
NOTE: The oil seal must not be repeatedly fitted and removed from the crankshaft, as this can damage the sealing lip.

- 18 Position the garter spring so that the hook and eye is located mid-way between the split and hinge of the oil seal.

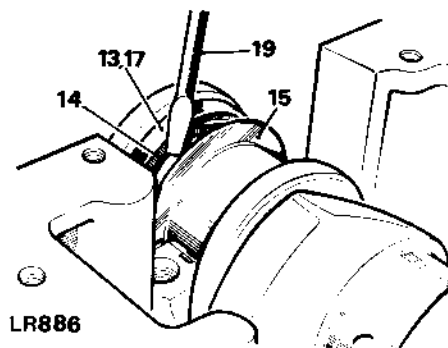
- 19 Using a small screwdriver, ease the spring into the recess in the oil seal.
- 20 Rotate the oil seal until the split is on the vertical axis pointing towards the cylinder head and in its approximate running position on the journal; this position is important.

NOTE: Do not degrease the seal retainer halves with trichlorethylene, but wipe clean with a dry cloth prior to applying Hylomar.

- 21 Apply Hylomar PL 32/M jointing compound, to the seal location diameter of both retainer halves.
- 22 Locate one half of the oil seal retainer onto the cylinder block dowels. The oil seal should be compressed to assist assembly, also ensure that it is correctly located in the retainer recess.



- 23 Secure the upper half of the oil seal retainer with the three inner bolts, leaving the outer bolts at each end finger tight at this stage.



- 24 Secure the lower half of the oil seal retainer to the rear main bearing cap in the same manner as described for the upper half.
- 25 Apply Silicone Grease MS4 to the 'T' seals and fit them to the rear main bearing cap.
- 26 Trim the top edges of the 'T' seals to prevent them from fouling the cylinder block when being fitted.
- 27 Fit the seal guides to the crankcase. 270304.
- 28 Fit the rear main bearing cap complete with the seal retainer, 'T' seals and bearing shell to the crankcase until there is an 0,8 mm (0.030 in.) gap between the cap and the crankcase.
- 29 Check that the seal is correctly located in the retainer recess.
- 30 Tighten the bearing cap bolts ensuring that there is no buckling of the split seal or misalignment of the butt joint; Torque: 10 kgf. m (75 lbf. ft.).
- 31 Fully tighten all the bolts securing the retainer halves. Turn the bolt heads so that the hexagon corners will not foul the flywheel housing seal when fitting.
- 32 Trim the ends of the 'T' seals to leave 0,8 mm (0.030 in.) protruding from the bearing cap.
- 33 Reverse 1 to 19.

CRANKSHAFT**Remove and refit**

12.21.33

Removing

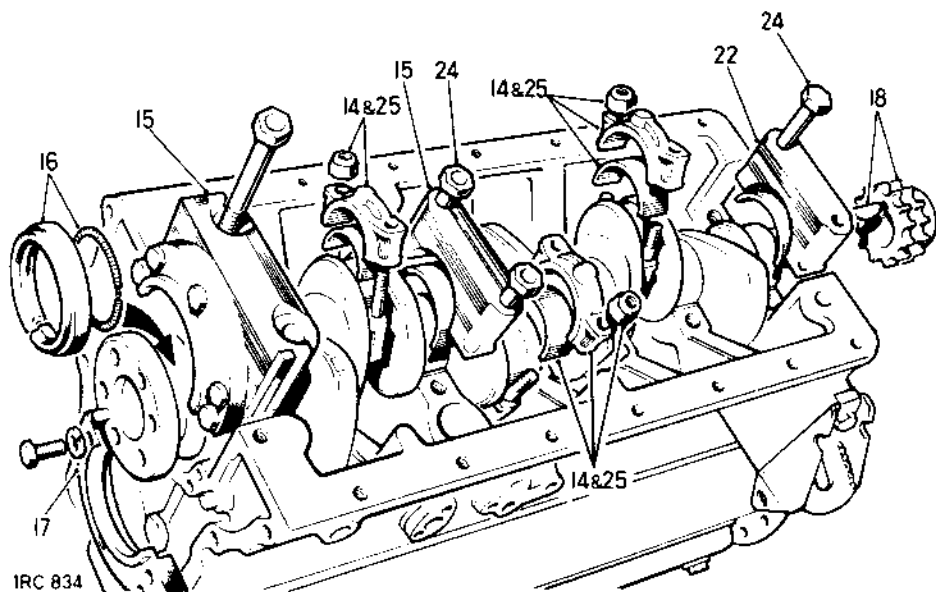
- 1 Remove the bonnet. 76.16.01.
- 2 Remove the air cleaner. 19.10.04.
- 3 Remove the radiator and front panel assembly. 26.40.01.
- 4 Remove the front floor. 76.10.12.
- 5 Remove the engine assembly. 12.41.01.
- 6 Remove the oil sump. 12.60.44.
- 7 Remove the oil pump. 12.60.26.
- 8 Remove the timing gear cover. 12.65.01.
- 9 Remove the timing chain and tensioner. 12.65.28.
- 10 Remove the clutch assembly. 33.10.01.
- 11 Remove the flywheel. 12.53.07.

- 12 Remove the flywheel housing.
- 13 Remove the oil seal.
- 14 Remove the connecting rod caps and bearing lower halves. Retain in related sets.
- 15 Remove the main bearing caps and lift the crankshaft clear. Retain the bearing halves and caps in related sets.
- 16 Remove the oil seal from the crankshaft.
- 17 Remove the upper half of the oil seal retainer from the cylinder block.
- 18 If required, remove the chainwheel and key from the crankshaft.

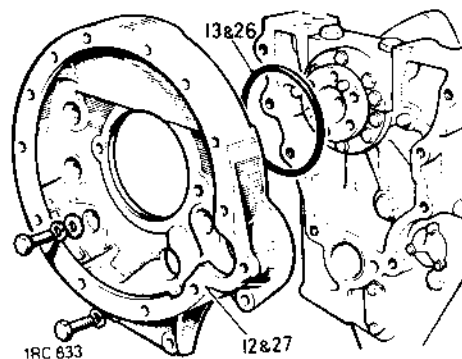
Refitting

NOTE: If replacement components are to be fitted, the checks detailed in 12.21.46 must be carried out.

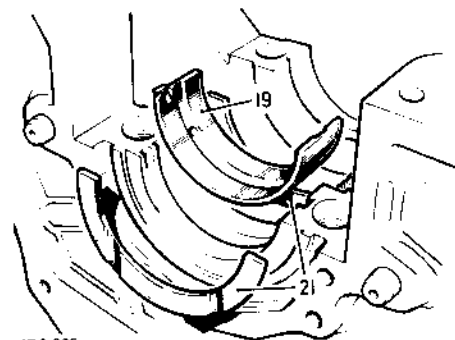
- 19 Locate the upper main bearing halves into the cylinder block.
- 20 Lubricate the bearings and crankshaft journals with clean engine oil, and place the crankshaft in position.



IRC 834



IRC 833



IRC 835

- 21 Insert a thrust washer at each side of the rear upper main bearing shell with the grooved faces towards the crankshaft webs.
- 22 Locate the bearing lower halves into numbers 1 to 6 main bearing caps. Fit the caps but do not fully tighten the fixings at this stage.
- 23 Fit the crankshaft rear oil seal and number 7 rear main bearing shell. 12.21.20.
- 24 Tighten the main bearing cap fixings. Torque: 10,0 kgf. m (75 lbf. ft.).
- 25 Fit the appropriate bearing halves and caps to the connecting rods, using NEW securing nuts. Torque: 2,8 kgf. m (20 lbf. ft.).

- 26 Fit the oil seal ring to the flywheel housing.
- 27 Refit the flywheel housing.
- 28 Refit the flywheel. 12.53.07.
- 29 Refit the clutch assembly. 33.10.01.
- 30 Reset the valve timing. 12.65.22.
- 31 Reverse 1 to 9.

CRANKSHAFT**Overhaul**

12.21.46

Inspecting

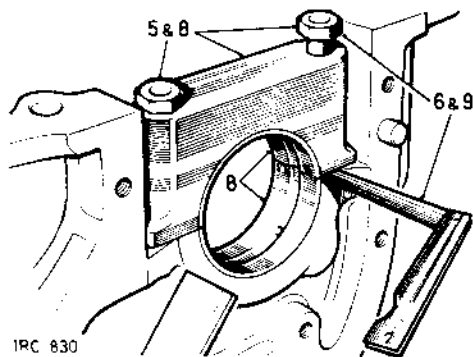
- 1 Remove the crankshaft. 12.21.33.
- 2 Check each crankshaft journal for ovality. If ovality exceeds 0,040 mm (0.0015 in.), a reground or new crankshaft should be fitted.
- 3 Bearings for the crankshaft main journals and the connecting rod journals are available in the following undersizes:
 - 0,25 mm (0.010 in.)
 - 0,50 mm (0.020 in.)
 - 0,76 mm (0.030 in.)
 - 0,01 mm (0.040 in.)
- 4 Thrust washers for the crankshaft rear main journal, to control the crankshaft end float, are available in the following oversizes:
 - 0,06 mm (0.0025 in.)
 - 0,12 mm (0.005 in.)
 - 0,18 mm (0.0075 in.)
 - 0,25 mm (0.010 in.)
 - 0,31 mm (0.0125 in.)
- 5 Fit the front main bearing cap, less bearing halves, to the cylinder block. Torque 10,4 kgf. m (75 lbf. ft.).
- 6 Slacken the fixing on one side of the cap only and check that there is no clearance at the joint face. If there is clearance, a complete new cylinder block must be fitted.

- Repeat 5 and 6 for the remaining main bearing caps.

Main bearing nip and clearance

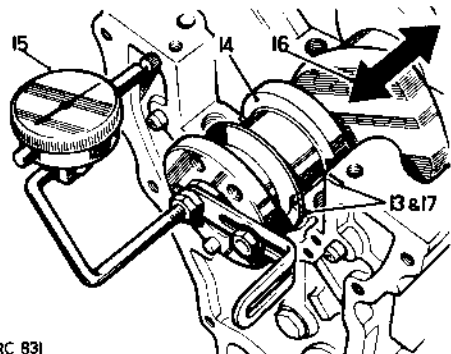
NOTE: New bearing halves are supplied with a protective coating and must be degreased prior to fitting, to remove the coating.

- Locate the bearing halves into the front main bearing cap and the cylinder block, and fit the cap to the block. Torque: 10,4 kgf. m (75 lbf. ft.).
- Slacken the fixing on one side of the cap only and check the clearance between the joint faces. The clearance must be 0,10 mm to 0,15 mm (0.004 in. to 0.006 in.).



- The bearing nip can be corrected by selective assembly of the bearing halves; these are available in slightly varying thicknesses. Do not file or machine the caps or cylinder block to vary the bearing nip.
- Repeat 8 to 10 for the remaining main bearings.
- When the bearing nip has been checked, remove the caps and bearing shell bottom halves.
- Position a standard size thrust washer each side of the rear main bearing shell, top half, with the grooved faces away from the cylinder block. The thrust washer thicknesses must agree within 0,08 mm (0.003 in.).

- Place the crankshaft in position on the cylinder block.
- Mount a dial test indicator to read off the end of the crankshaft.
- Check the crankshaft end float. The correct end float limits are 0,05 mm to 0,15 mm (0.002 in. to 0.006 in.).
- The crankshaft end float can be adjusted by fitting oversize thrust washers. The variation of thrust washer thickness at each side must not exceed 0,08 mm (0.003 in.) to ensure that the crankshaft remains centralised.

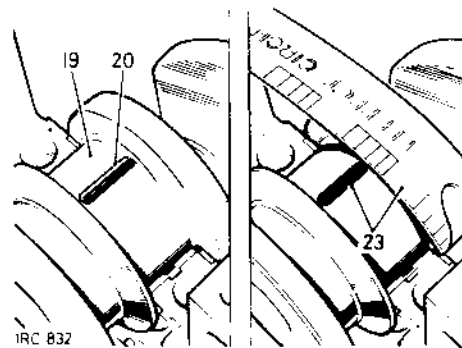


IRC 831

- Make a final check to prove the main bearing clearance, using a 0,063 mm (0.0025 in.) shim paper. Check each bearing in turn by fitting both bearing halves and the bearing cap, with the shim paper between the crankshaft and one half of the bearing. The crankshaft should resist rotation with the shim paper fitted, and move freely by hand with the shim paper removed.

NOTE: As an alternative, Plastigauge may be used to check the main bearing clearance, 19 to 26. Do not rotate the crankshaft while the Plastigauge is fitted, or the reading will be impaired.

- Locate the crankshaft in position on the upper bearing halves in the cylinder block.
- Place a piece of Plastigauge across the centre of the lower half of the crankshaft journal. 605238.



IRC 832

- Fit the bearing cap complete with the lower bearing half. Torque: 10,5 kgf. m (75 lbf. ft.).
- Remove the bearing cap and lower half bearing.
- Using the scale printed on the 'Plastigauge' packet, measure the flattened 'Plastigauge' at its widest point. The graduation that most closely corresponds to the width of the 'Plastigauge' indicates the bearing clearance.
- The correct clearance with new or overhauled components is 0,015 mm to 0,050 mm (0.0006 in. to 0.002 in.).
- If a new bearing is being fitted, use selective assembly to obtain the correct clearance.
- Wipe off the 'Plastigauge' with an oily rag. DO NOT scrape it off.
- Retain all components in related sets.
- Refit the crankshaft. 12.21.33.

DATA

Crankshaft

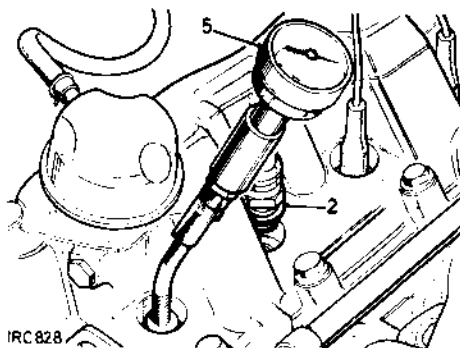
Journal diameter	67,0 mm - 0,0127 mm (2.6245 in. - 0.0005 in.)
Crankpin diameter	47,63 mm + 0,018 mm (1.875 in. + 0.00075 in.)
End float (controlled by thrust washers at rear bearing)	0,05 mm to 0,15 mm (.002 in. to .006 in.)
Regrind permissible by 0,25 mm (0.010 in.) stages to:	Undersize Journal dia. Crankpin dia.
	1,01 mm 65,63 mm 46,6 mm
	(0.040 in.) (2.584 in.) (1.835 in.)
Main bearing running clearance	0,015 mm to 0,050 mm (0.0006 in. to 0.002 in.)
Connecting rod bearing running clearance	0,0114 mm to 0,043 mm (0.00045 in. to 0.0017 in.)

CYLINDER PRESSURES

Check 12.25.01

Checking

- 1 Run the engine until it attains normal operating temperature.
- 2 Remove the sparking plugs.
- 3 Secure the throttle in the fully open position.
- 4 Check each cylinder in turn as follows:
- 5 Insert a suitable pressure gauge into the sparking plug hole.
- 6 Crank the engine with the starter motor for several revolutions and note the highest pressure reading obtainable.
- 7 If the pressure is appreciably less than the correct figure, the piston rings or valves may be faulty.
- 8 Low pressure in adjoining cylinders may be due to a faulty cylinder head gasket.



DATA

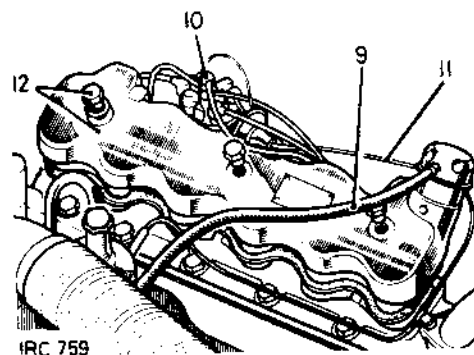
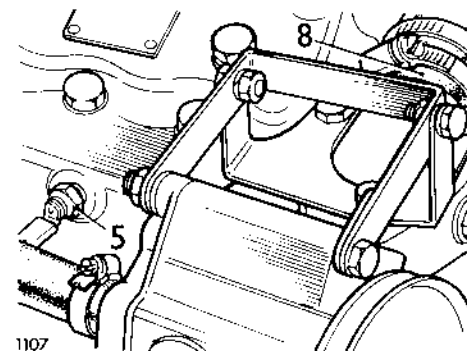
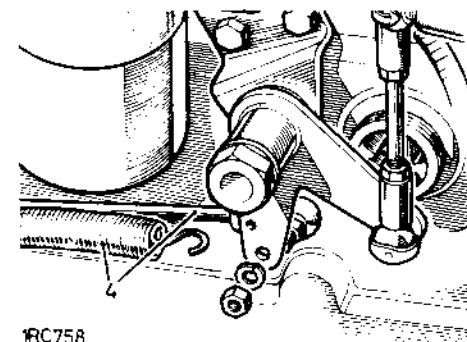
Compression ratio	7.8 : 1	7.0 : 1
Compression pressure.....	11,95 kgf. cm ² (170 lbf. in. ²)	9,84 kgf. cm ² (140 lbf. in. ²)
Cranking speed	300 rev/min	300 rev/min

CYLINDER HEAD

Remove and refit 12.29.10

Removing

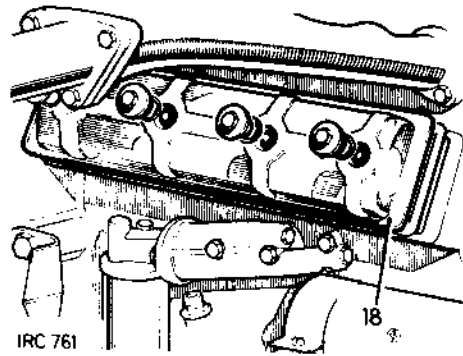
- 1 Drain the coolant at the radiator and engine block.
- 2 Disconnect the brake servo pipe from the inlet manifold.
- 3 Remove the carburetter. 19.15.09.
- 4 Disconnect the accelerator control rod and return spring at the bell crank lever.
- 5 Disconnect the two temperature transmitter leads from the cylinder head.
- 6 Disconnect the rocker oil feed pipe at the rear of the cylinder head.
- 7 Remove the sparking plugs.
- 8 Disconnect the radiator top hose.
- 9 Disconnect the hose from the engine breather cap.
- 10 Remove the distributor. 86.35.20.
- 11 Remove the distributor vacuum pipe and retaining clip from the thermostat outlet pipe fixing.
- 12 Remove the special nuts and sealing washers and lift off the top rocker cover and joint washer.



- 13 Slacken the locknuts and screw back the tappet adjusting screws.
- 14 Slacken the cylinder head fixings evenly and remove them.
- 15 Lift off the cylinder head and discard the cylinder head gasket.
- 16 Remove the 'O' ring seal from the connector by-pass to water pump.
- 17 Withdraw the tappet push rods and retain them in their fitted order.

Refitting

- 18 Remove the side rocker cover and fit the tappet push rods in their original positions.
- 19 Smear a new cylinder head gasket with oil and place on the face of the cylinder block, with the side marked 'this side up' uppermost.

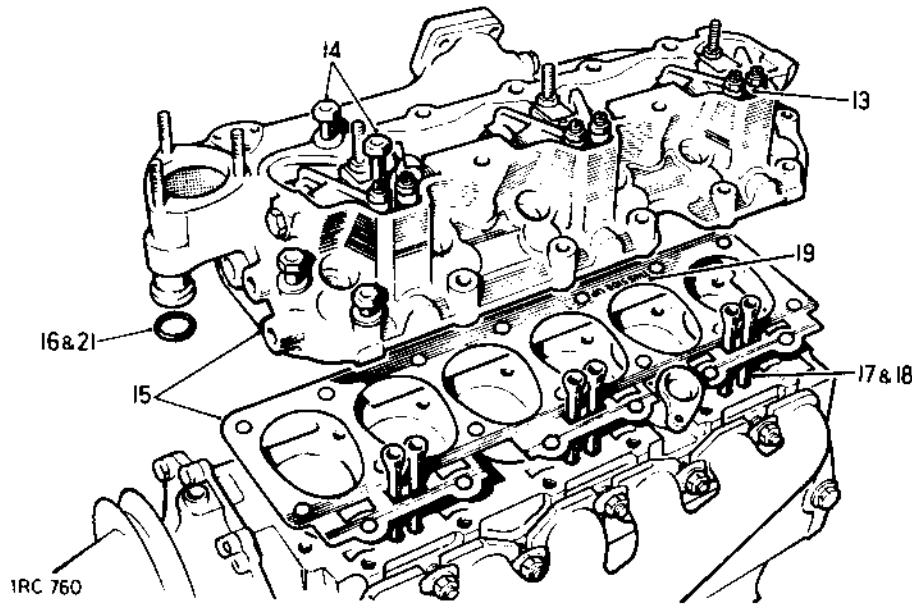


1RC761

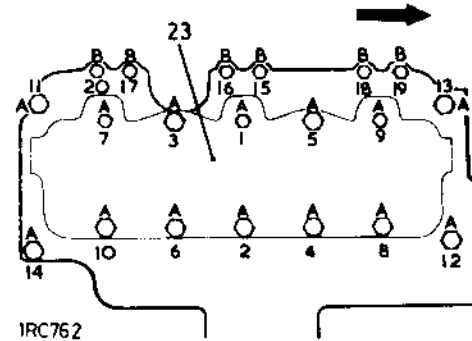
- 20 Use two old cylinder head bolts with their heads sawn off to locate the gasket and head. Cut a screwdriver slot across the diameter of the bolts to facilitate removal when the cylinder head is in position.
- 21 Position the cylinder head onto the block, at the same time position the 'O' ring seal onto the by-pass connector.
- 22 Ensure that the tappet push rods remain correctly seated.
- 23 Tighten the cylinder head bolts in the order shown and to the following torques:

- a. Bolts 'A' 7 kgf. m (50 lbf. ft.)
- b. Bolts 'B' 4 kgf. m (30 lbf. ft.)

- 24 Set the inlet valve tappet clearances to 0,15 mm (0.006 in.) in the following order:
Set No. 1 tappet with No. 6 valve fully open.
Set No. 2 tappet with No. 5 valve fully open.
Set No. 3 tappet with No. 4 valve fully open.
Set No. 4 tappet with No. 3 valve fully open.
Set No. 5 tappet with No. 2 valve fully open.
Set No. 6 tappet with No. 1 valve fully open.
- 25 Refit the side and top covers.
- 26 Fit the distributor. 86.35.20.
- 27 Reverse 1 to 8.
- 28 With the engine at normal running temperature, check the cylinder head fixings tightness, then the inlet valves tappet clearances, and tighten and reset as necessary.



1RC760



1RC762

CYLINDER HEAD

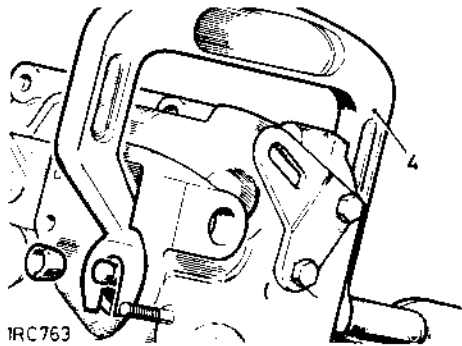
Decarbonise and top overhaul 12.29.21

Service tools: 262749 Rocker shaft extractor
276102 Valve Spring compressor
274401 Exhaust valve guide remover
274400 Inlet valve guide remover
600959 Exhaust valve guide replacer
601508 Inlet valve guide replacer
263050 Protection plate, insert removal
530625 Exhaust valve seat replacer

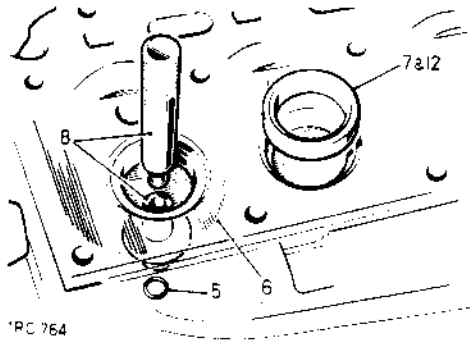
Cylinder head and inlet valves

Dismantling

- 1 Remove the cylinder head. 12.29.10.
- 2 Remove the thermostat housing and thermostat.
- 3 Remove the inlet valve rockers and shafts. 12.29.35.
- 4 Remove the inlet valve assemblies, using spring compressor 276102, and retain the components in sets related to their parent cylinder.



- 5 Withdraw the oil seals from the valve guides.
- 6 Remove combustion deposits from the cylinder head, valve ports and piston crowns, using only soft metal tools.
- 7 If necessary, remove the inlet valve seat inserts by grinding sufficient to weaken the insert, then prising out.
- 8 Drive out the inlet valve guides from the combustion chamber side, using remover 274400.

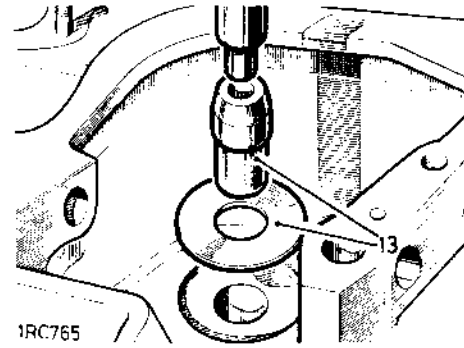


- 9 Inspect the valve spring pairs which must be an interference fit with each other.
- 10 Inspect the valve split cones and spring caps for general condition.
- 11 Inspect the cylinder head for general condition and for damage to threads.

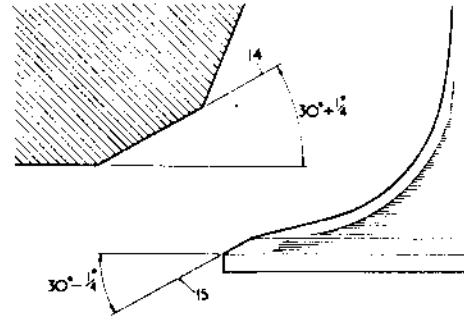
Assembling

- 12 If replacement inlet valve seat inserts are to be fitted, warm the head evenly for a few minutes at 66°C (150°F) approximately (the normal operating temperature of a degreaser), enter the seat squarely into the cylinder head recess and press into position.

- 13 Lubricate and fit the inlet valve guides, together with the valve spring seating washers, using replacer 601508.



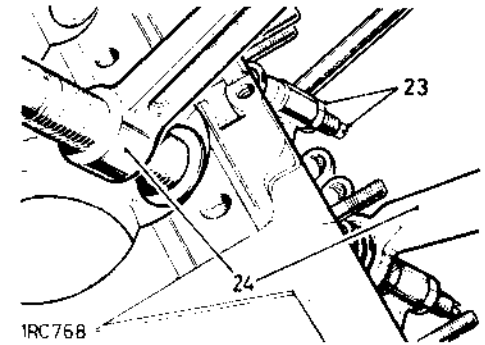
- 14 Face the inlet valve seats, both original and replacements, to $30^\circ + \frac{1}{4}^\circ$, using the valve guides as pilots.
- 15 Check, and if necessary, reface the inlet valve faces to $30^\circ - \frac{1}{4}^\circ$.



- 16 Lap each valve into its respective seat then thoroughly wash the assembly.
- 17 Lubricate the valve stems and reverse 4.
- 18 Reverse 2 and 3.
- 19 Place the cylinder head assembly aside pending refitting.

Dismantling the exhaust valves arrangement

- 20 Remove the exhaust manifold. 30.15.10.
- 21 Remove the side rocker cover and joint washer.
- 22 Mark the exhaust valves for refitting in correct sequence.
- 23 Slacken the tappet adjusting screws right off and set each rocker back on its cam.
- 24 Remove the exhaust valve assemblies, using spring compressor 276102, and retain the components in sets related to their parent cylinder.



- 25 Remove the combustion deposits from the valves and ports.
- 26 Examine the valve seat inserts and valve guides. If replacement is necessary, first remove the exhaust valve rockers and shafts. 12.29.36.

NOTE: In installations where access is restricted, to replace valve guides on No. 5 or No. 6 cylinders may first require engine removal.

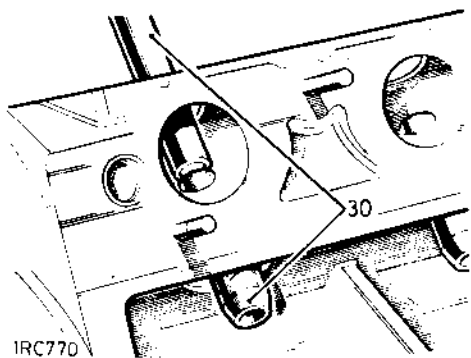
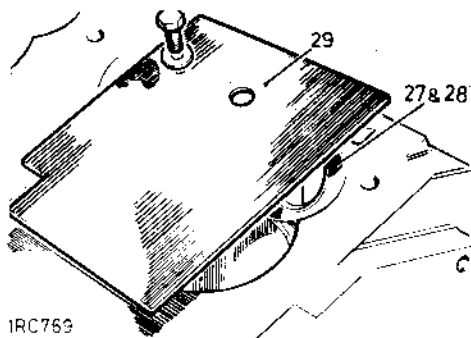
27 If necessary, remove the valve seat inserts, 28 and 29.

WARNING: Due to the extreme hardness of the seat inserts, take great care to avoid possible injury due to fragmentation.

28 Reduce the insert to a minimum thickness by grinding.

29 Secure the protection plate 263050 over the cylinder block face and break the seat insert, using a suitable chisel applied through the hole in the plate.

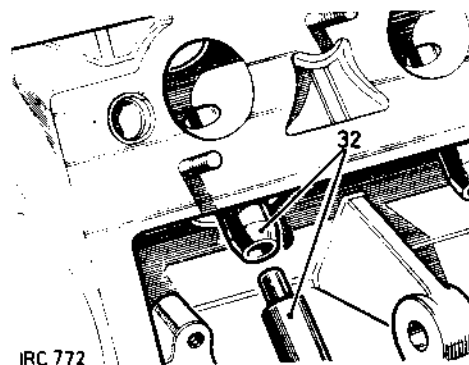
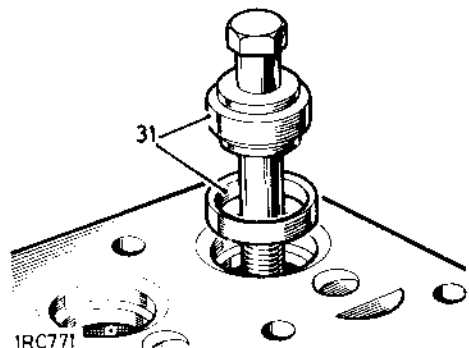
30 If necessary, drift out the exhaust valve guides, using remover 274401.



Exhaust valves, seats and guides, refitting

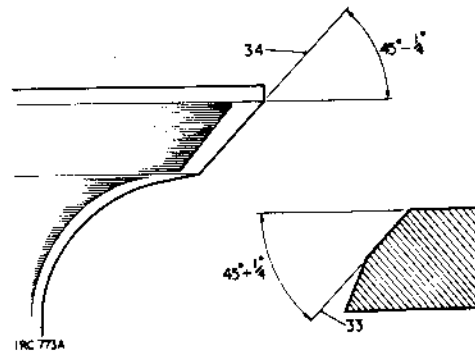
31 If next exhaust seat inserts are to be fitted, clean the seat recess and pull the new insert into position, using special tool 530625. It is not necessary to heat the block or freeze the insert, but light taps on the tool may be required to ensure that the insert enters smoothly. Continue precautions against fragmentation, by fitting the protection plate 263050 and leaving it in position for a few minutes.

32 Lubricate the exhaust valve guides and carefully drift them into position, using replacer 600959.



33 Use the valve guide as a pilot and cut the valve seat to $45^\circ \pm \frac{1}{4}$.

34 Face the exhaust valves to 45° and lap each valve into its respective seat, using suitable equipment.



35 Wash each valve, seat, port and guide in clean paraffin.

36 Lightly oil the valve stems and reverse 24.

37 If removed, reverse item 26, during which the valve timing must be re-set as necessary.

38 Reverse 20 and 21.

39 Refit the cylinder head. 12.29.10.

INLET VALVE ROCKERS AND SHAFTS

Remove and refit

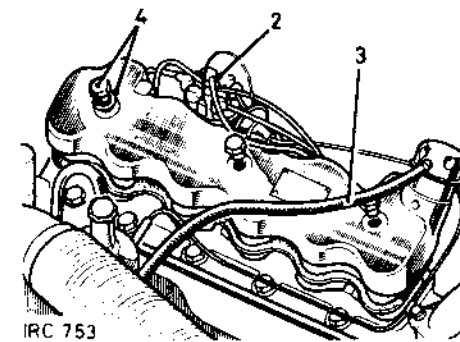
12.29.35

Service tool: 262749 Extractor for rocker shafts

Removing

- 1 Remove the radiator and grille panel. 26.40.01.
- 2 Disconnect the sparking plugs leads and remove the distributor cap.
- 3 Disconnect the hose at the engine breather cap.

4 Remove the special nuts and sealing washers and lift off the top rocker cover and joint washer.



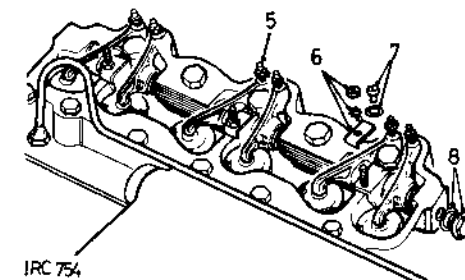
5 Slacken the locknuts and screw back the tappet adjusting screws.

6 Remove the nuts, washers and screw retainer plates from the rocker spacers.

7 Remove the special set screws and washers securing the rocker shafts.

8 Remove the end plug and sealing washer from the front of the cylinder head.

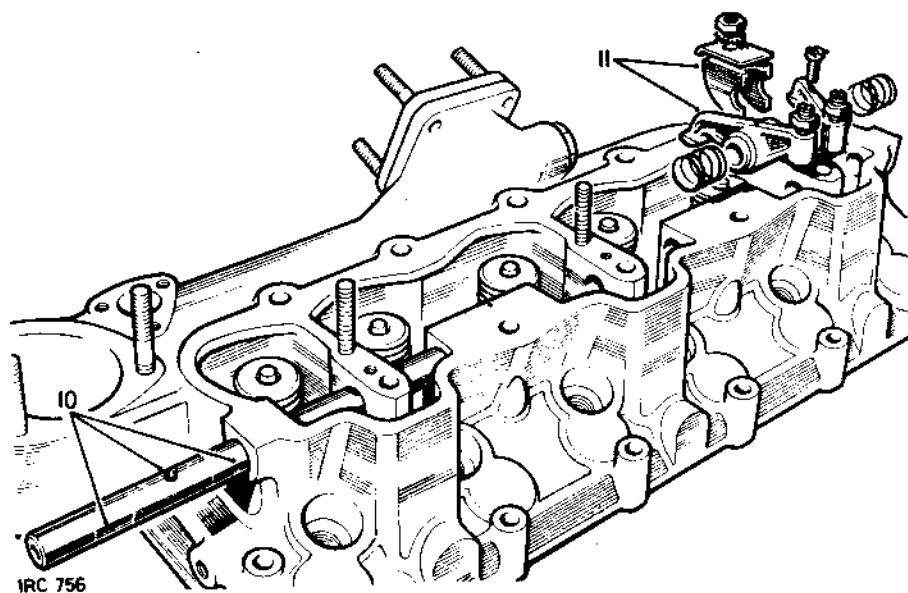
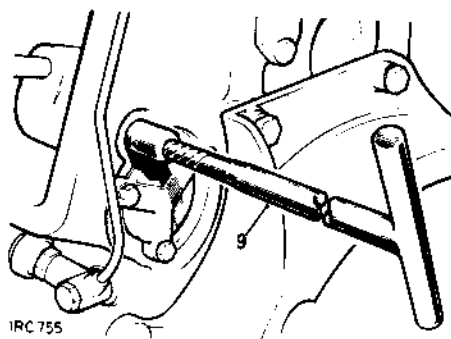
continued



- 9 Extract the front and rear rocker shafts and withdraw the valve rockers, springs and spacers as they are released. Extractor 262749.

Refitting

- 10 Enter the rear (longer) shaft into the head, with the tapped holes aligned with the set screw holes in the housing webs, and with the oil holes facing away from the valves.
- 11 Push the shaft rearwards, fitting a spring, valve rocker, spacer, valve rocker and spring for each cylinder.



DATA

Inlet valve tappet clearance 0,15 mm (0.006 in.) with engine at normal running temperature.

- 12 Reverse 6 and 7 for the rear shaft.
- 13 Repeat 10 and 11 for the front (shorter) shaft.
- 14 Reverse 6 and 7 for the front shaft.
- 15 Set the tappet clearances to 0,15 mm (0.006 in.) in the following order:
Set No. 1 tappet with No. 6 valve fully open.
Set No. 2 tappet with No. 5 valve fully open.
Set No. 3 tappet with No. 4 valve fully open.
Set No. 4 tappet with No. 3 valve fully open.
Set No. 5 tappet with No. 2 valve fully open.
Set No. 6 tappet with No. 1 valve fully open.
- 16 Reverse 1 to 4.
- 17 Check the inlet valve tappet clearances with the engine at normal running temperature. Reset to 0,15 mm (0.006 in.) as necessary.

EXHAUST VALVE ROCKERS AND SHAFTS

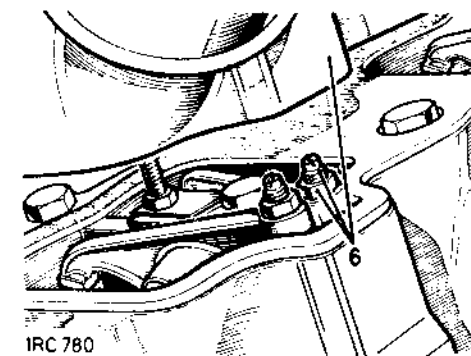
Remove and refit 12.29.36

Service tool: 262749 Extractor for rocker shafts

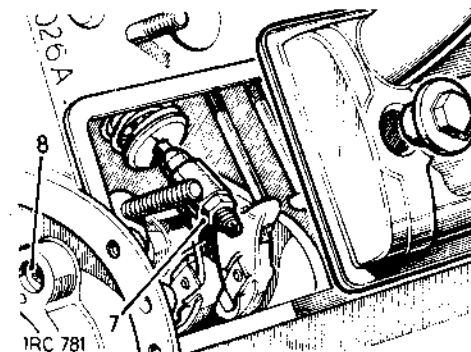
Removing

- 1 Remove the radiator and grille panel. 26.40.01.
- 2 Remove the exhaust manifold. 30.15.10.
- 3 Remove the timing gear cover. 12.65.01.
- 4 Remove the timing chain tensioner. 12.65.28.
- 5 Remove the timing chain and gears. 12.65.12.

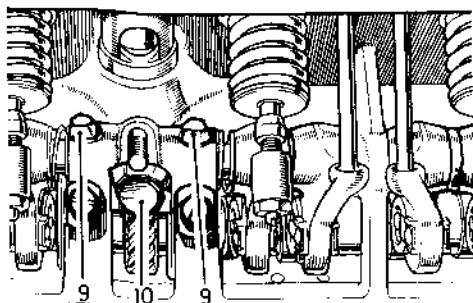
- 6 Remove the top rocker cover and slacken the inlet tappet adjusting screws.



- 7 Remove the side rocker cover and slacken the exhaust tappet adjusting screws.
- 8 Remove the camshaft retaining plate and remove the end plug from the front end of the rocker shaft.

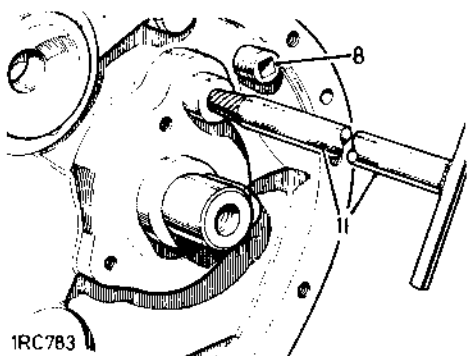


- 9 Remove the two locating screws securing front and rear rocker shafts.
- 10 Remove the oil feed bolt locating the distributor housing.



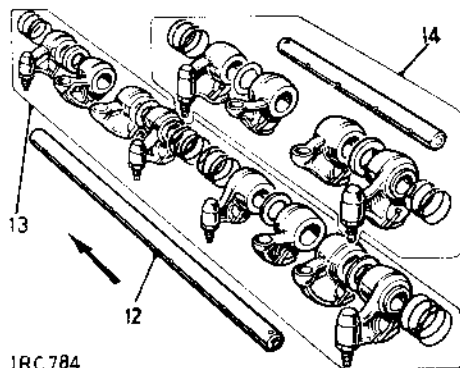
1RC782

- 11 Engage the extractor 262749 into the front rocker shaft.



1RC783

- 12 Withdraw the rocker shaft.
- 13 Lift out the exhaust valve rockers, inlet cam followers, springs and spacers. Note the sequence of assembly.
- 14 Repeat 11 and 12 on the rear rocker shaft arrangement.

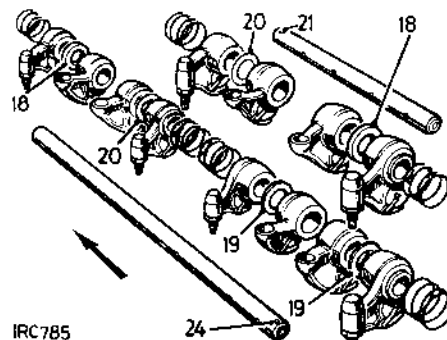


1RC784

Refitting

- 15 Fit a suitable slave bolt and packing washer into the tapped hole at front end of camshaft. This will enable the camshaft to be rotated as required to position the cam lobes away from the rocker assembly being fitted.
- 16 To aid reassembly, lay out the six spacer washers to be fitted between the inlet cam followers and exhaust valve rockers as follows:
Thick, thin, medium, medium, thin, thick.
- 17 Reverse 14 in the order removed, noting the fitted positions of the spacing washers. Items 18 to 20.
- 18 Thick washers.
- 19 Medium washers.
- 20 Thin washers.

- 21 Feed in the rear rocker shaft. Ensure that the locating screw hole in the shaft is to the front; use the extractor tool to align the hole with the hole in the block.
- 22 Secure the shaft with the locating screw and lock washer.
- 23 Reverse 12 and 13 in the order removed.
- 24 Feed in the front rocker shaft. Ensure the locating screw hole in the shaft is to the rear and in line with the hole in the block.



1RC785

- 25 Reverse 8 and 9.
- 26 Reverse 3, 4 and 5 setting the valve timing as described.
- 27 Set the tappet clearances to 0,15 mm (0,006 in.) for inlet valves and 0,25 mm (0,010 in.) for exhaust valves in the following order:
Set No. 1 tappet with No. 6 valve fully open.
Set No. 2 tappet with No. 5 valve fully open.
Set No. 3 tappet with No. 4 valve fully open.
Set No. 4 tappet with No. 3 valve fully open.
Set No. 5 tappet with No. 2 valve fully open.
Set No. 6 tappet with No. 1 valve fully open.
- 28 Reverse 1 and 2 and fit the rocker covers.
- 29 Check, and if necessary, reset the inlet valves tappet clearances with the engine at normal running temperature.

DATA

Tappet clearances:

Inlet	0,15 mm (0,006 in.).
Exhaust	0,25 mm (0,010 in.).

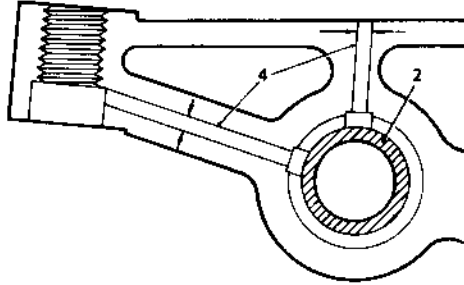
INLET VALVE ROCKERS

Replace Bush

12.29.55

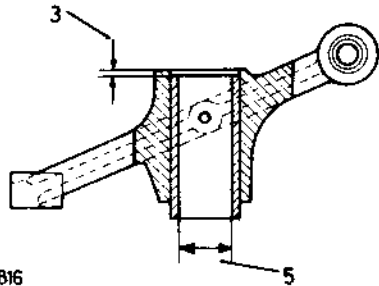
Replacing bush

- 1 Remove the rockers and shafts. 12.29.35.
- 2 Press out the bush from the rocker.



IRC 222B

- 3 Press in the replacement bush to 0,25 mm to 0,50 mm (0.010 in. to 0.020 in.) below the thrust face of the rocker.



IRC 816

- 4 Using the holes in the rocker as guides, drill oil holes 1,58 mm (0.062 in.) and 2,77 mm (0.109 in.) diameter in the bush.
- 5 Ream the bush to 12,5 mm + 0,025 mm (0.500 in. + 0.001 in.).
- 6 Reverse 1.

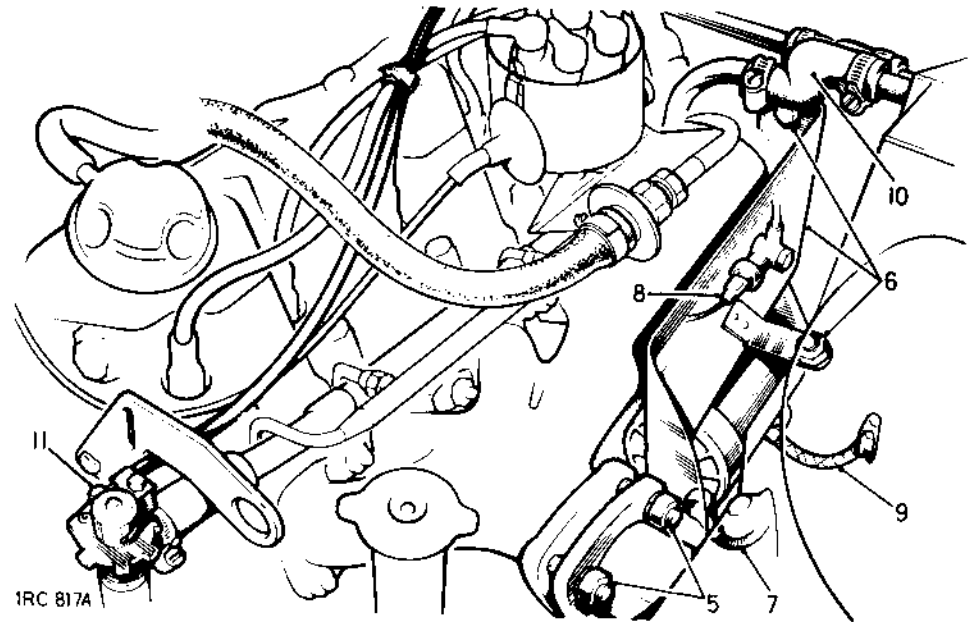
ENGINE ASSEMBLY

Remove and refit

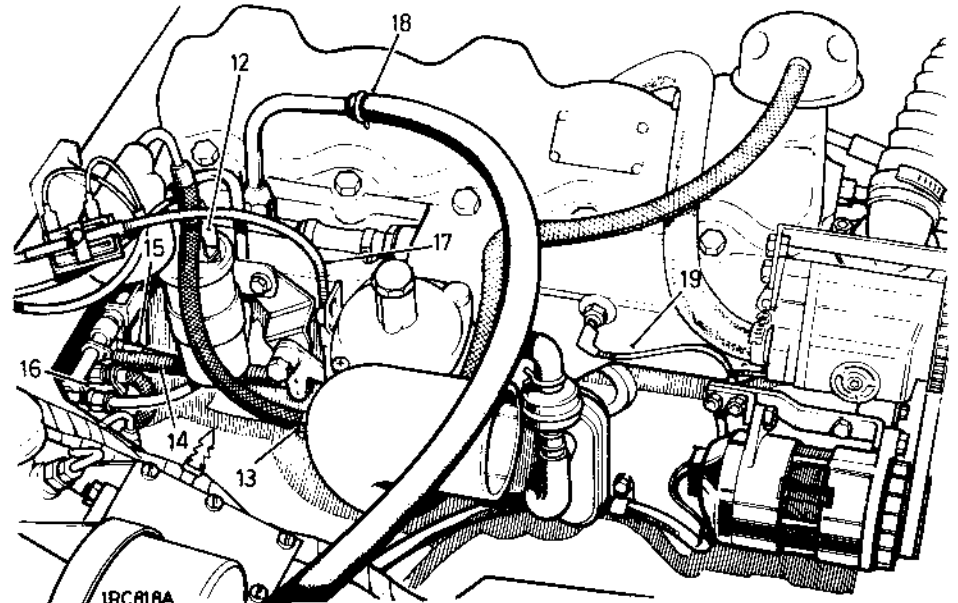
12.41.01

Removing

- 1 Remove the bonnet. 76.16.01.
- 2 Disconnect the battery earth lead.
- 3 Remove the radiator and grille panel. 26.40.01.
- 4 Remove the gearbox tunnel cover. 76.25.07.
- 5 Disconnect the front exhaust pipe from the manifold.
- 6 Remove the exhaust heat shield.
- 7 Disconnect the starter lead at the solenoid.
- 8 Disconnect the oil pressure and water temperature wires from the multi-plug on the main harness by the clutch pedal box, remove from the clip and release the harness clip from the air pipe.
- 9 Disconnect the engine earth cable at the chassis side-member.
- 10 Where fitted, disconnect the heater hoses.
- 11 Where fitted, disconnect the control cable at the heater water valve.
- 12 Disconnect the switch lead and HT lead at the ignition coil.
- 13 Disconnect the fuel feed at the filter.
- 14 Release the accelerator return spring.
- 15 Disconnect the accelerator linkage at the spring loaded bell crank lever.
- 16 Remove the fixings securing the clutch hose and speedometer cable bracket at the flywheel housing.
- 17 Disconnect the cold start control cables at the carburetter.
- 18 Detach the servo hose at the manifold pipe.
- 19 Remove the alternator lead from the solenoid.
- 20 Untape and remove the white wire from the throttle jack.
- 21 Remove the ignition coil from the bulkhead.

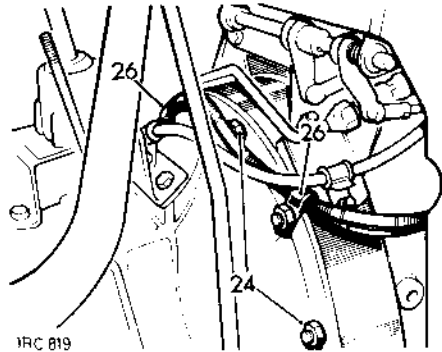


IRC 817A



IRC 818A

- 22 Support the engine weight, using a suitable lifting sling.
- 23 Remove the engine front mountings upper and lower fixings.
- 24 Support the gearbox, using suitable packing blocks or a jack, and remove the bell housing to flywheel housing fixings.
- 25 Pull the engine forward sufficient to disengage the drive from the gearbox.



IRC 819

- 26 Ensure that all cables, pipes etc. are clear then hoist the engine from the vehicle.

Refitting

- 27 Smear the splines of the primary pinion, the clutch centre and the withdrawal unit abutment faces with Molybdenum disulphide grease such as Rocol MTS 1000.
- 28 Engage a gear to prevent gearshaft rotation and offer the engine to the gearbox. If necessary, rotate the engine sufficient to align the gearbox primary pinion with the clutch plate splines.
- 29 When aligned, push the engine fully to the rear and secure the bell housing to the flywheel housing, tightening the fixings evenly.
- 30 Lift the engine sufficient to remove the packing or jack from beneath the gearbox and insert the engine front mounting rubbers.
- 31 Reverse 1 to 23.

FLYWHEEL

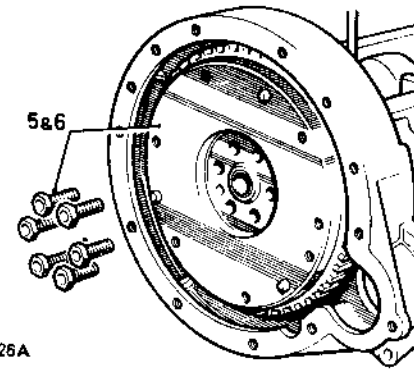
Remove and refit 12.53.07

Removing

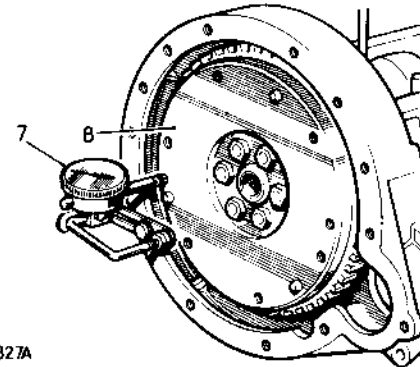
- 1 Remove the front floor. 76.10.12.
- 2 Remove the seat base. 76.70.06.
- 3 Remove the engine assembly. 12.41.01.
- 4 Remove the clutch assembly. 33.10.01.
- 5 Remove the flywheel.

Refitting

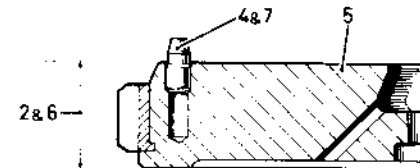
- 6 Fit the flywheel to the crankshaft and tighten the securing bolts. Torque: 8,5 to 9,0 kgf. m (60 to 65 lb. ft.).
- 7 Mount a dial test indicator to read off the flywheel face.
- 8 Check the run-out on the flywheel face, this must not exceed 0,05 mm (0.002 in.).
- 9 If the run-out is excessive, remove the flywheel and investigate the cause.
- 10 Reverse 1 to 4.



IRC 826A



IRC 827A



IRC 829

FLYWHEEL

Overhaul 12.53.10

Procedure

Wear or scoring on the flywheel pressure face may be corrected by machining, providing that the overall thickness of the flywheel is not reduced below 30,5 mm (1.204 in.).

- 1 Remove the flywheel. 12.53.07.
- 2 Check the overall thickness of the flywheel, as it may have been previously machined.
- 3 If the flywheel is above the minimum thickness, the clutch face can be refaced as follows:
 - 4 Remove the dowels.
 - 5 Reface the flywheel over the complete surface.
 - 6 Check the overall thickness of the flywheel to ensure that it is still above the minimum thickness.
 - 7 Fit the dowels.
 - 8 Refit the flywheel. 12.53.07.

STARTER RING GEAR

Remove and refit 12.53.19

Removing

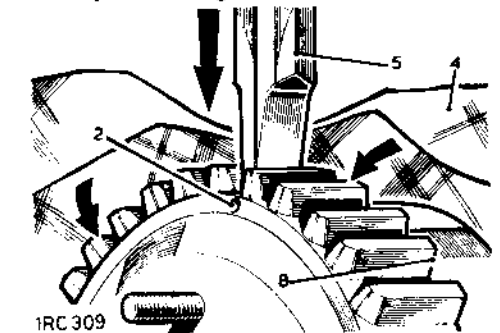
- 1 Remove the flywheel. 12.53.07.
- 2 Drill an 8 mm (0.312 in.) diameter hole axially between the root of any tooth and the inner diameter of the starter ring sufficiently deep to weaken the ring. DO NOT allow the drill to enter the flywheel.
- 3 Secure the flywheel in a vice fitted with soft jaws.
- 4 Place a cloth over the flywheel to protect the operator from fragments.

WARNING: Take adequate precautions against fragments as the starter ring may break asunder when being split.

- 5 Place a chisel immediately above the drilled hole and strike it sharply to split the starter ring.

Refitting

- 6 Heat the starter ring gear uniformly to between 225°C and 250°C (437°F and 482°F) but do not exceed the higher temperature.
- 7 Place the flywheel, flanged side down, on a flat surface.
- 8 Locate the heated starter ring gear in position on the flywheel with the square edge of the teeth against the flywheel flange.



IRC 309

- 9 Press the starter ring gear firmly against the flange until the ring contracts sufficiently to grip the flywheel.
- 10 Allow the flywheel to cool gradually. DO NOT hasten cooling in any way.
- 11 Refit the flywheel. 12.53.07.

SPIGOT BEARING

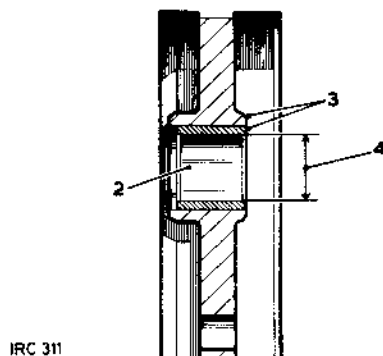
Remove and refit 12.53.20

Removing

- 1 Remove the flywheel. 12.53.07
- 2 Press the spigot bearing from the flywheel.

Refitting

- 3 Press in the new spigot bearing flush with the clutch side of the flywheel.
- 4 Ream the spigot bearing to 22,237 mm to 22,242 mm (0.8755 in. to 0.8757 in.).
- 5 Refit the flywheel. 12.53.07.



OIL FILTER ASSEMBLY, EXTERNAL

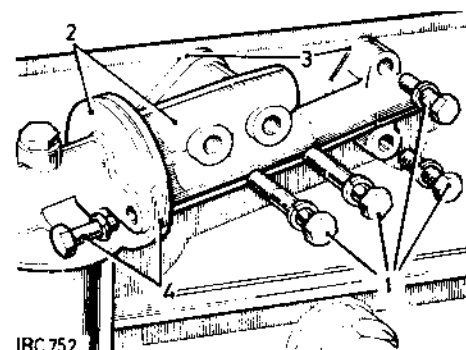
Remove and refit 12.60.01

Removing

- 1 Remove the fixings, oil filter adaptor to cylinder block.
- 2 Withdraw the oil filter assembly complete with adaptor.
- 3 Withdraw the front and rear joint washers.
- 4 If required, remove the fixings and detach the filter body from the adaptor; withdraw the joint washer.

Refitting

- 5 Reverse 4 as necessary. Torque 3,45 kgf m (25 lbf ft).
- 6 Reverse 1 to 3.
- 7 Replenish the lubricating oil as necessary.



OIL STRAINER

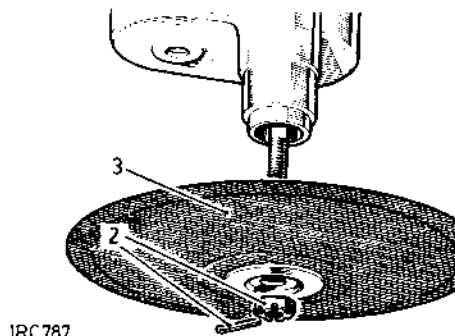
Remove and refit 12.60.20

Removing

- 1 Remove the oil sump. 12.60.44.
- 2 Remove the strainer fixings.
- 3 Withdraw the strainer from the oil pump.

Refitting

- 4 Wash the strainer, using clean fuel.
- 5 Reverse 1 to 3.



OIL PUMP

Remove and refit 12.60.26

Removing

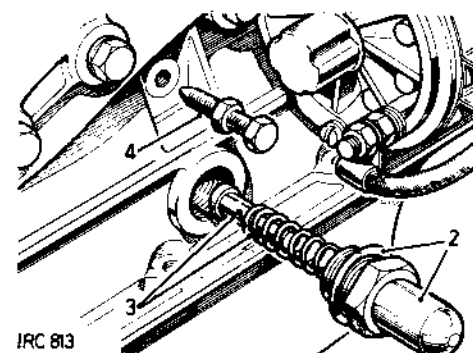
- 1 Remove the oil sump. 12.60.44.
- 2 Remove the relief valve retainer and joint washer.

NOTE: Take care to retain the steel ball which is freed from the oil pump relief outlet.

- 3 Withdraw the spring and plunger.
- 4 Remove the oil pump locating screw.
- 5 Withdraw the oil pump and strainer assembly from the engine.

Refitting

- 6 Offer the oil pump assembly to the engine and align the pressure relief valve housing and the locating screw bore with the respective tappings in the engine block.
- 7 Reverse 1 to 5.



OIL PUMP

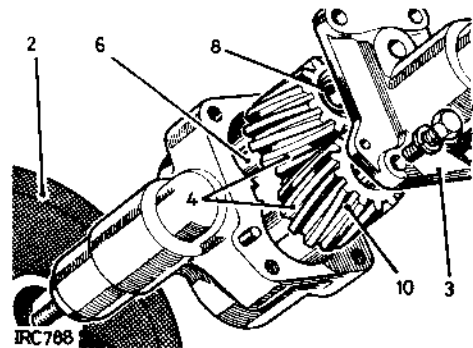
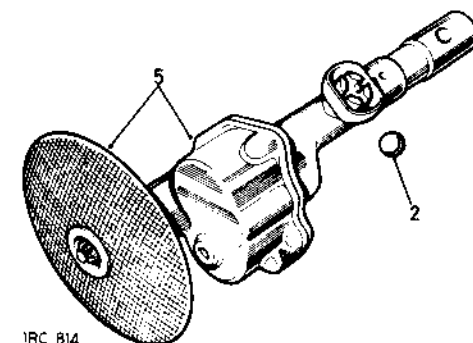
Overhaul 12.60.32

Dismantling

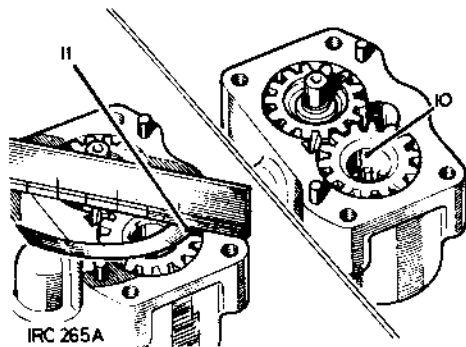
- 1 Remove the oil pump. 12.60.26.
- 2 Remove the oil pump strainer.
- 3 Remove the oil pump body.
- 4 Lift out the pump gears.

Inspecting and replacement

- 5 Clean all parts and examine for wear.
- 6 If required, unscrew and replace the idler gear spindle in the pump cover.
- 7 If required, replace the drive shaft bush at the top of the pump body. Press the replacement bush into the body and ream in position to 14,28 mm + 0,02 mm (0.5625 in. + 0.001 in.). Ensure correct alignment with the bore at the bottom end of the pump body; the bush should be a light drive fit.



- 8 If required, replace the bush in the idler gear. Drill the oilway 3,0 mm (0.125 in.) diameter then ream the bush, in position, to 12,7 mm + 0,02 mm (0.500 in. + 0.001 in.) in diameter.
- 9 Fit the idler gear to the spindle.
- 10 Fit the driving gear with the plain part of the gear bore uppermost.
- 11 Using a straight edge and feeler gauges, check the gears end-float which should be:
Driving gear: 0,05 to 0,12 mm (0.002 to 0.005 in.).
Idler gear: 0,07 to 0,15 mm (0.003 to 0.006 in.).
- 12 Reverse 1 to 3.

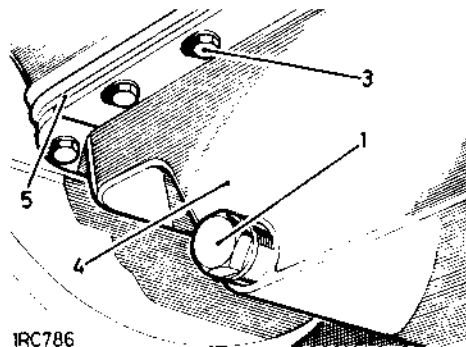


OIL SUMP

Remove and refit 12.60.44

Removing

- 1 Remove the sump plug and drain off the lubricating oil.
- 2 Withdraw the dipstick.
- 3 Remove the fixings at the sump flange.
- 4 Lower the sump to clear the oil strainer and withdraw.
- 5 Withdraw the sump joint washer.



Refitting

- 6 Reverse 4 and 5, using a new sump joint washer.
- 7 Reverse 3, fitting the two 5/16 in. UNC bolts into the timing gear cover tappings.
- 8 Reverse 1 and 2.
- 9 After 1600 km (1000 miles) running, recheck sump bolts for correct torque as follows:
- 10 Slacken each bolt in turn approximately one flat, then retighten to 1,65 kgf m (12 lbf ft).

TIMING GEAR COVER AND OIL SEAL

Remove and refit	
Gear cover 1 to 9	12.65.01
Oil seal	12.65.05

Service tool: 530102 Spanner for starter dog

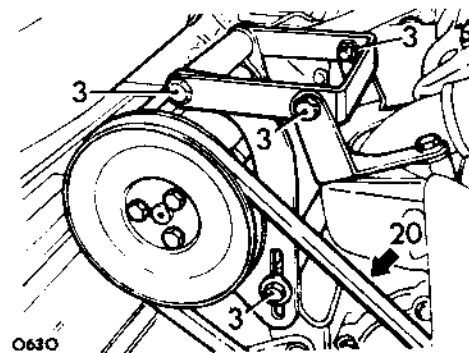
NOTE: On initial assembly of the engine, the mud shield around the oil seal is rivetted in position but after removal in service the rivets are substituted with self tapping drive screws. Where drive screws are fitted, it may be possible to renew the seal without removing the timing gear cover.

AT 7, if the mud shield is fitted with drive screws, the screws may be removed and the oil seal extracted.

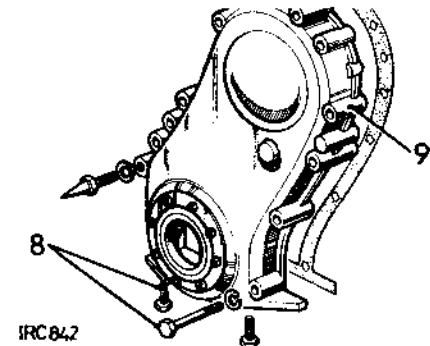
On fitting a new seal, the mud shield should be allowed to finally pull the seal into position to ensure a positive location.

Removing

- 1 Remove the bonnet. 76.16.01.
- 2 Remove the fan blades and radiator front panel assembly. 26.40.01.
- 3 Slacken the air pump fixings and remove the drive belt.
- 4 Slacken the alternator fixings and remove the fan belt.

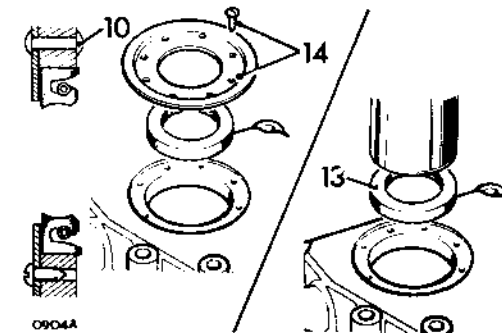


- 5 Remove the alternator adjusting link.
- 6 Remove the starter dog using 530102.
- 7 Withdraw the crankshaft pulley. At this point, see note above and if the mud shield is rivetted:
- 8 Remove the timing cover fixings, including those at the sump front face.
- 9 Taking care not to damage the sump joint, carefully withdraw the timing cover and gasket.



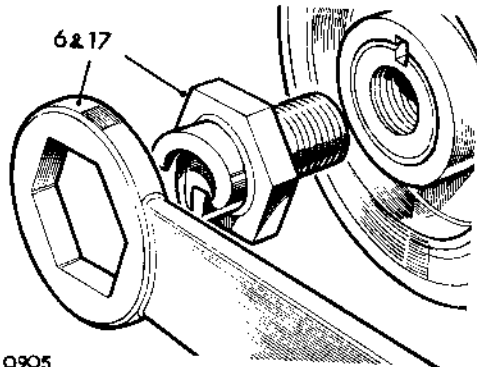
- 10 Drill out the rivets securing the oil seal mud shield.
- 11 Press out the oil seal and clean the mating surfaces.
- 12 Smear the outside diameter of a new oil seal with Hylomar PI 32/M jointing compound.
- 13 Press the oil seal into the timing cover.
- 14 Coat the drive screws with Hylomar and fit and secure the mud shield.

continued



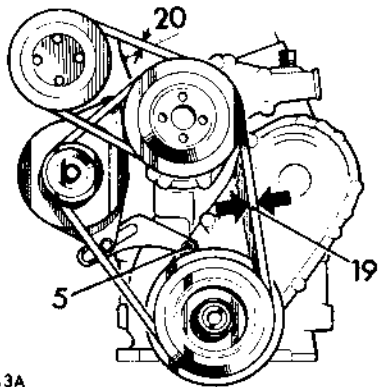
Refitting

- 15 Smear general purpose grease on both sides of the cover joint washer.
- 16 Reposition the cover on the engine and refit the fixings.
- 17 Fit the starter dog. Torque: 27,65 kgf. m (200 lbf. ft.).



O905

- 18 Fit the alternator adjusting link.
- 19 Refit the fan belt and adjust.
- 20 Refit the air pump drive belt and adjust.
- 21 Reverse 1 to 3.



IRC 843A

TIMING CHAIN GEARS

Remove and refit 12.65.12

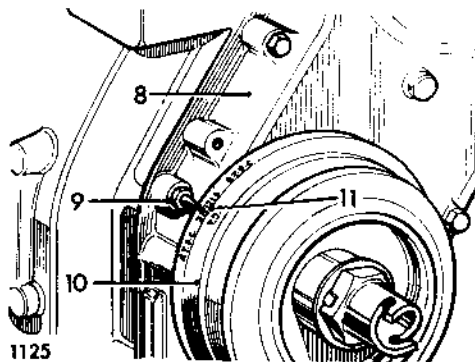
Service tool: 507231 Extractor for chainwheel

Removing

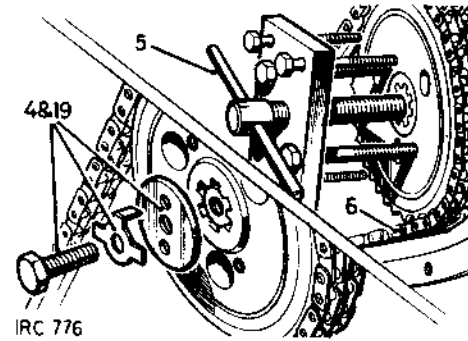
- 1 Remove the radiator and front panel. 26.40.01.
- 2 Remove the timing gear cover. 12.65.01.
- 3 Remove the timing chain tensioner. 12.65.28.
- 4 Remove the camshaft chainwheel fixings.
- 5 Extract the camshaft chainwheel, using 507231, together with the crankshaft chainwheel.
- 6 Withdraw the chain from the chainwheels.
- 7 Replace the chain vibration damper if the rubber facing is worn.

Refitting, including valve timing procedure

- 8 Temporarily fit the timing gear cover, using fixings sufficient to retain it on the dowels.
- 9 Fit the timing pointer to the cover.
- 10 Temporarily fit the pulley to the crankshaft, engaging the keyway and key.
- 11 Rotate the crankshaft to align the TDC mark on the pulley with the timing pointer.

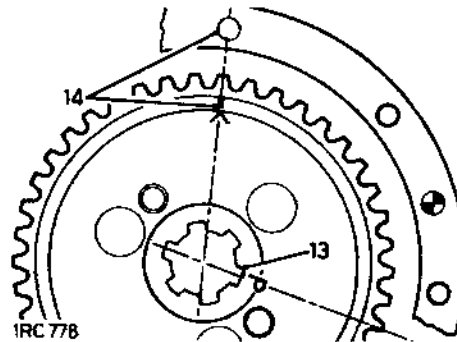


1125



IRC 776

- 12 Remove the crankshaft pulley and timing gear cover without disturbing the crankshaft position.
- 13 Temporarily fit the camshaft chainwheel, engaging the keyway marked 'P'.
- 14 Rotate the camshaft to position the groove marked 'A' in line with the centre line of the top fixing hole for the gear cover. Remove the chainwheel without disturbing the camshaft position.
- 15 Fit the crankshaft chainwheel, chamfered bore first, to just engage the crankshaft inner key.

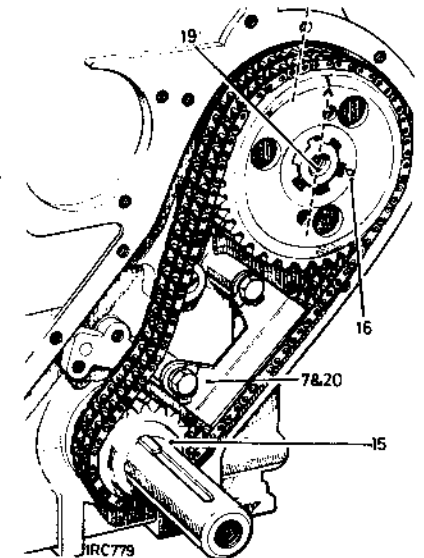


IRC 778

- 16 Position the chain on the chainwheels, aligning the keyway 'P' with the camshaft key and with 'no slack' at the driving side of the chain.
- 17 Fit the camshaft chainwheel and chain.
- 18 Lightly tap home the chainwheels.

NOTE: It is important that the timing chain has no slack at the driving side. Slightly offset keyways are provided in the camshaft chainwheel to enable adjustment to be made, if required, provided that the crankshaft and camshaft relationship is not disturbed.

- 19 Fit and lock the camshaft chainwheel fixings.
- 20 If required, adjust the chain vibration damper position to allow 0,05 mm to 0,25 mm (0.002 in. to 0.010 in.) clearance with the chain.
- 21 Reverse 2 and 3. Torque load for starting dog fixing is 27,5 kgf. m (200 lbf. ft.).
- 22 Reverse 1.



IRC 779

DATA

Clearance, timing chain to chain vibration damper

0,05 mm to 0,25 mm (0.002 in. to 0.010 in.)

TIMING CHAIN TENSIONER

Remove and refit

12.65.28

Removing

- 1 Remove the radiator and front panel. 26.40.01.
- 2 Remove the timing gear cover. 12.65.01.
- 3 Remove the tensioner retaining bolts and spring washers.
- 4 Remove the tensioner and backplate between the tensioner body and cylinder block.

Dismantling

- 5 Press in the slipper and remove it from the tensioner body.
- 6 Remove the ratchet and spring.

Examination

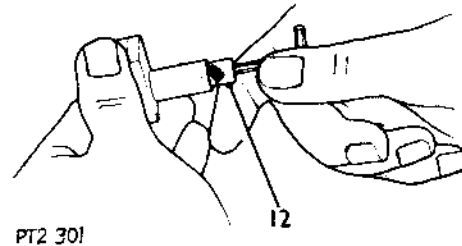
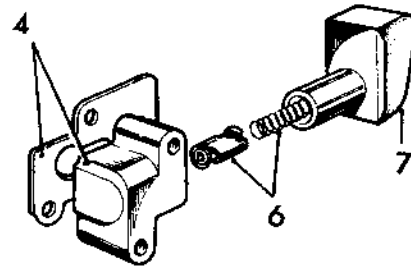
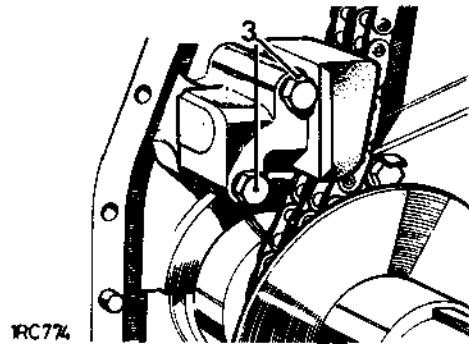
- 7 Check the slipper pad for wear, and renew if necessary.
- 8 Examine the ratchet for wear and renew if suspect.
- 9 Check the spring and renew if broken or suspect.
- 10 Examine the tensioner body and check that the oil inlet hole is clear.

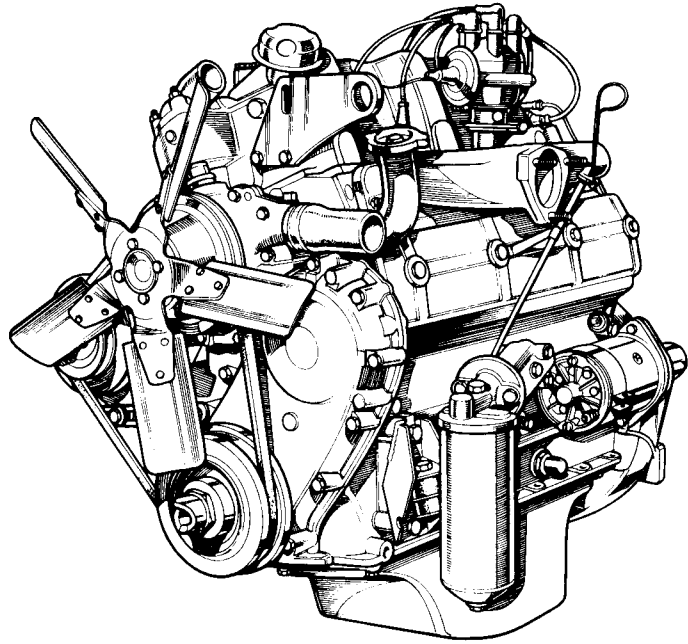
Reassembling

- 11 Insert the spring into the slipper bore.
- 12 Fit the ratchet into the bore and turn clockwise with an Allen Key to lock it in a retracted position.
- 13 Fit the slipper assembly to the tensioner body.

NOTE: To prevent the tensioner releasing while fitting, insert a spacer between the tensioner body and the back of the slipper.

- 14 Fit the tensioner assembly and backplate to the cylinder block taking care not to allow the tensioner to release. Secure with the two bolts and spring washers.
- 15 Ensure correct location of the chain guide.
- 16 Reverse 1 and 2.



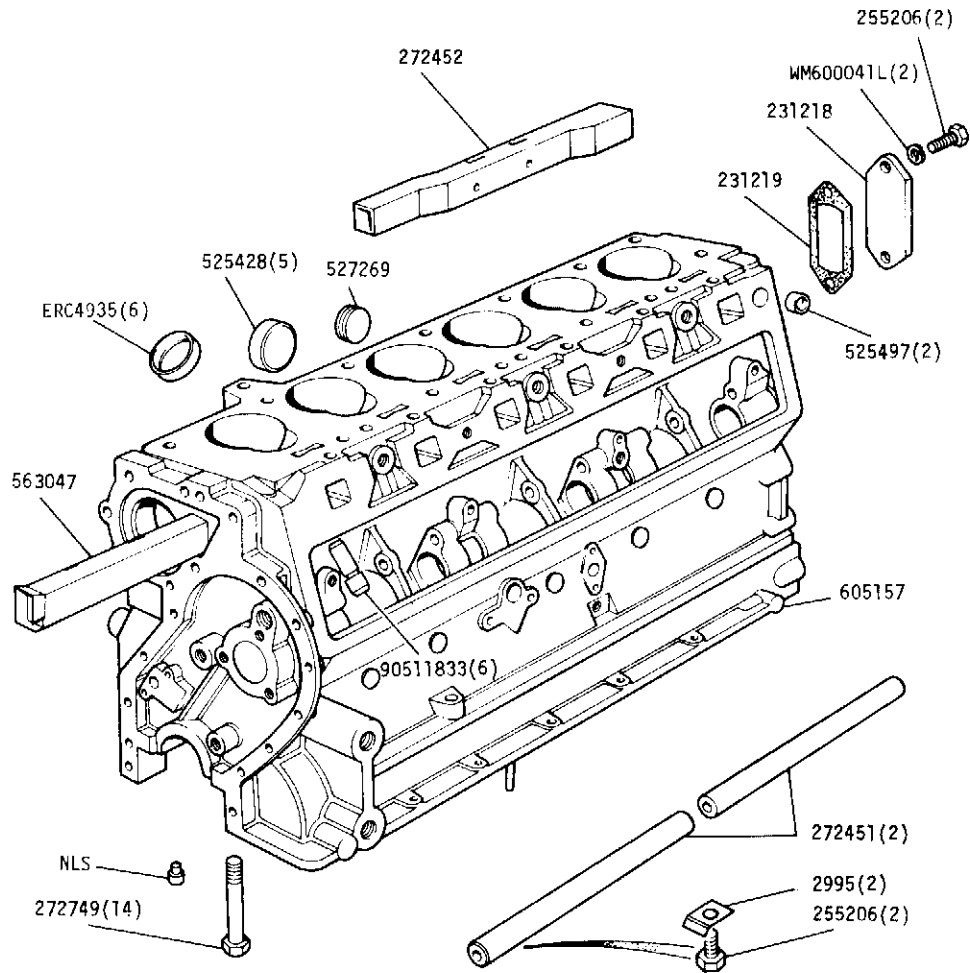


Engine complete assembly 7.0:1 N.L.S

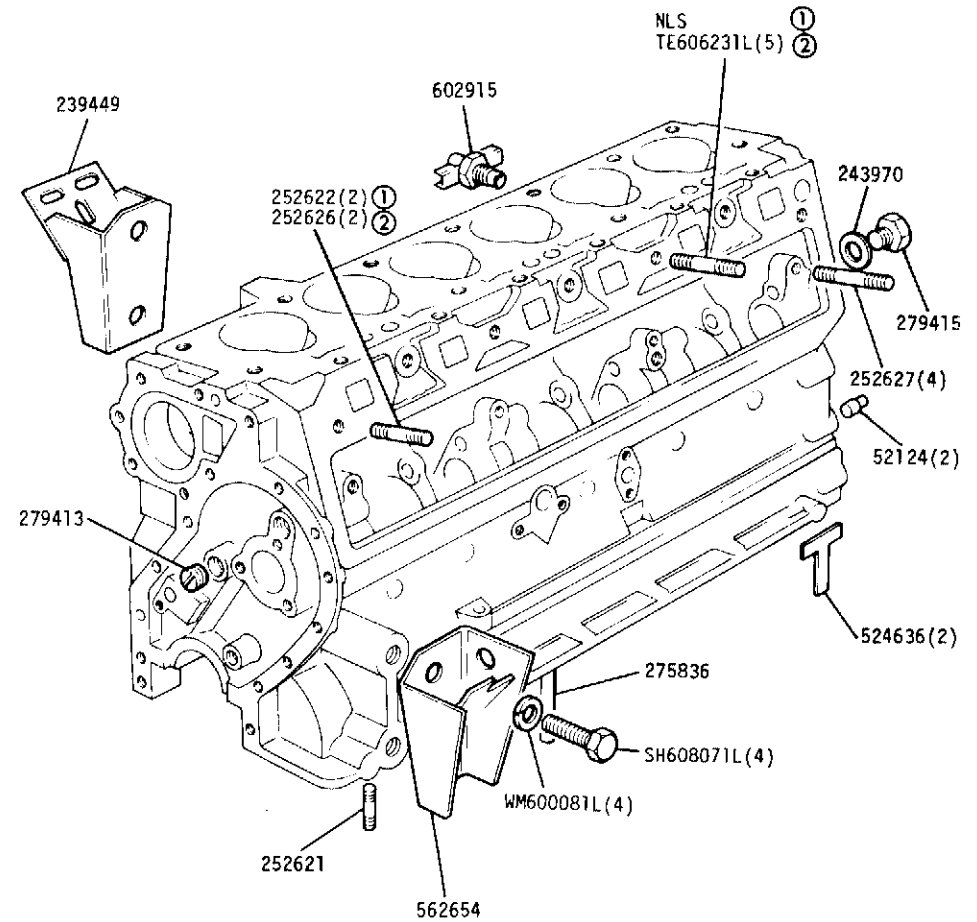
Engine complete assembly 7.8:1 RTC2475N Detoxed

Complete with all ancillaries except flywheel and clutch

GROUP B
ENGINE - Cylinder Block 2.6 Litre Petrol



GROUP B
ENGINE - Cylinder Block Fixings 2.6 Litre Petrol

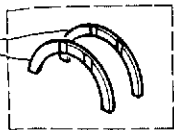


Stripped engine assembly new 7.0:1 RTC2407N
Stripped engine assembly new 7.8:1 NLA
Stripped engine assembly rebuilt 7.8:1 RTC2388R
Short engine 7.0:1 RTC2643
Short engine 7.8:1 RTC2642
Stud and dowel kit for cylinder block 535708
Cylinder liner 516498(6)
Engine overhaul gasket kit 605106
Decarbonising gasket kit RTC3333

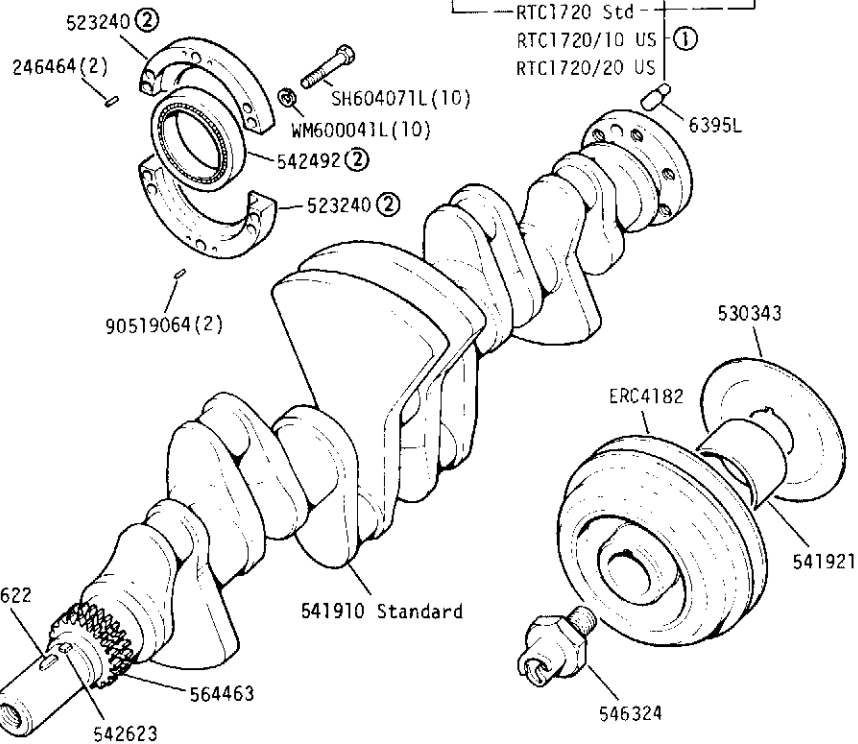
① Up to Engine suffix 'B' inclusive
② From Engine suffix 'C' onwards

GROUP B
ENGINE - Crankshaft 2.6 Litre Petrol.

- 600177 Standard
- 600174 0.0025in OS
- 600175 0.005 in OS
- 600176 0.0075in OS
- 600178 0.010 in OS
- 600179 0.0125in OS

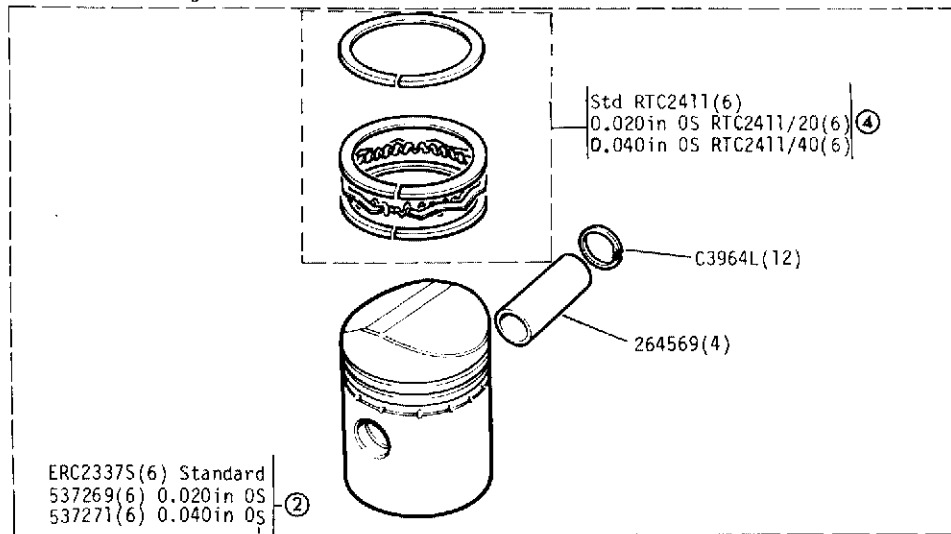


- RTC1720 Std
- RTC1720/10 US
- RTC1720/20 US

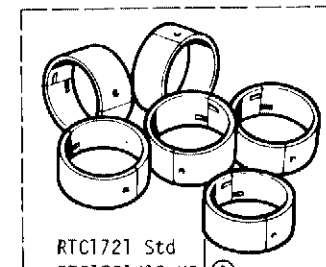
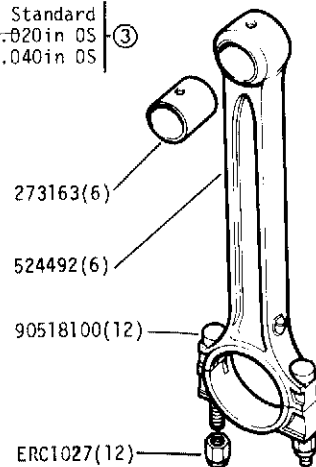


- ① Engine Set
- ② Crankshaft oil seal and retainer assembly 542494 includes silicone grease 270656

GROUP B
ENGINE - Connecting Rod and Piston - 2.6 Litre Petrol



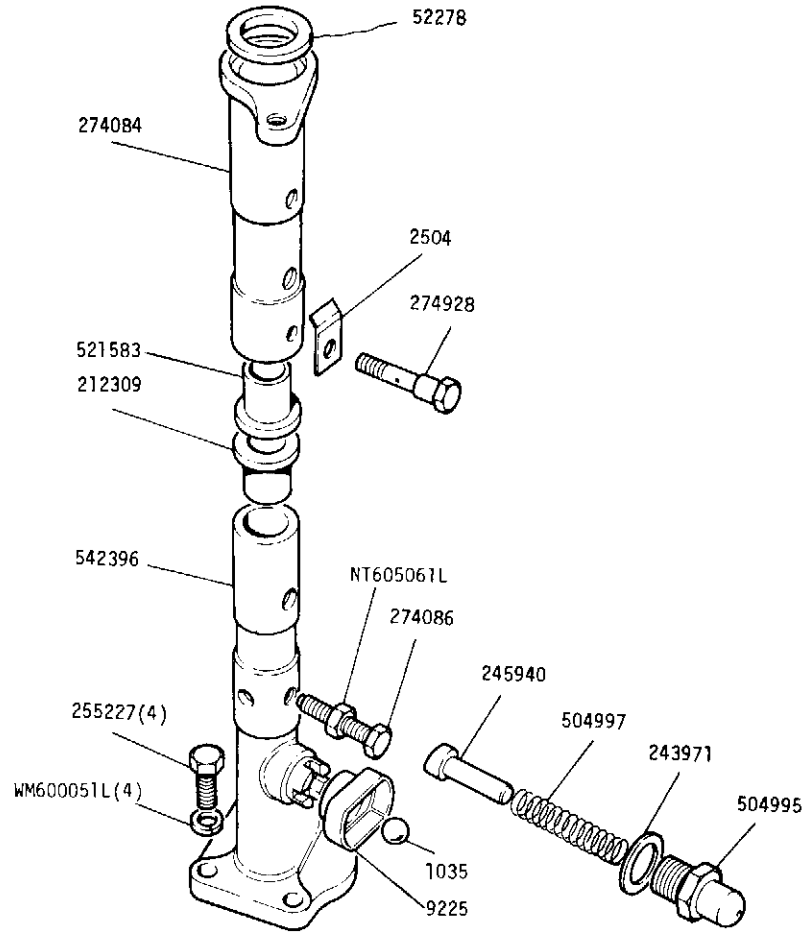
- ERC23395(6) Standard
- 536273(6) 0.020in OS
- 536275(6) 0.040in OS



- RTC1721 Std
- RTC1721/10 US
- RTC1721/20 US

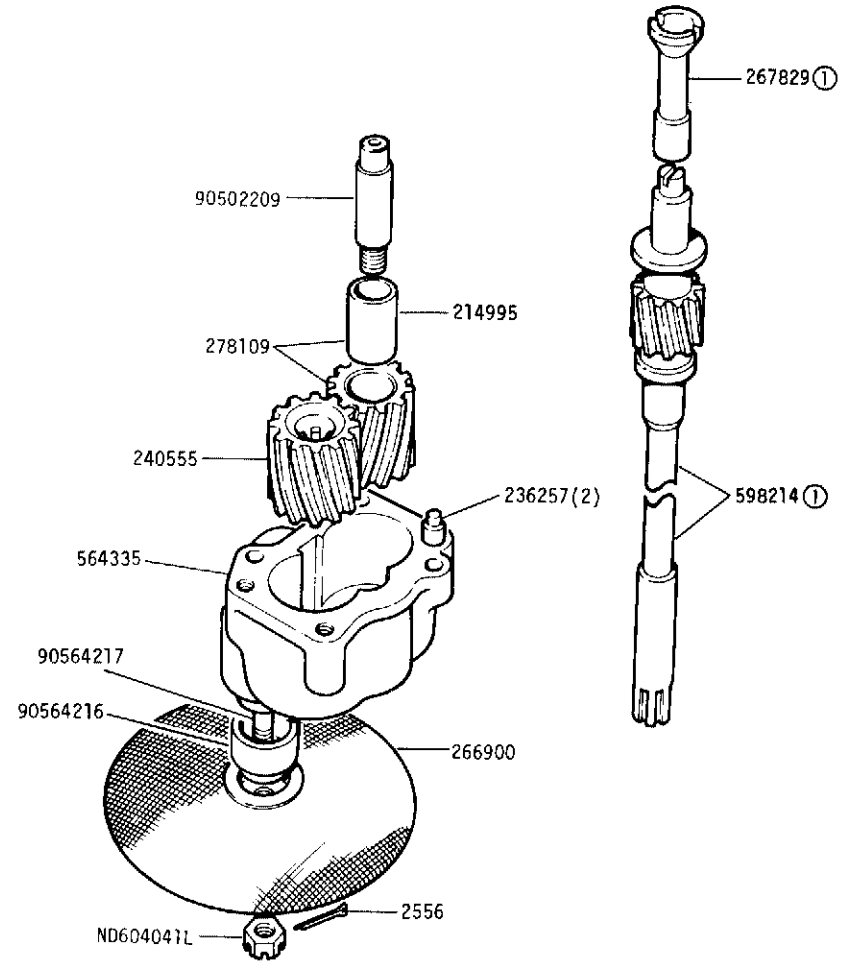
- ① Engine Set
- ② Engines with 7.8:1 compression ratio
- ③ Engines with 7.0:1 compression ratio
- ④ Piston ring set

GROUP B
ENGINE - Oil Pump Body and Release Valve 2.6 Litre Petrol



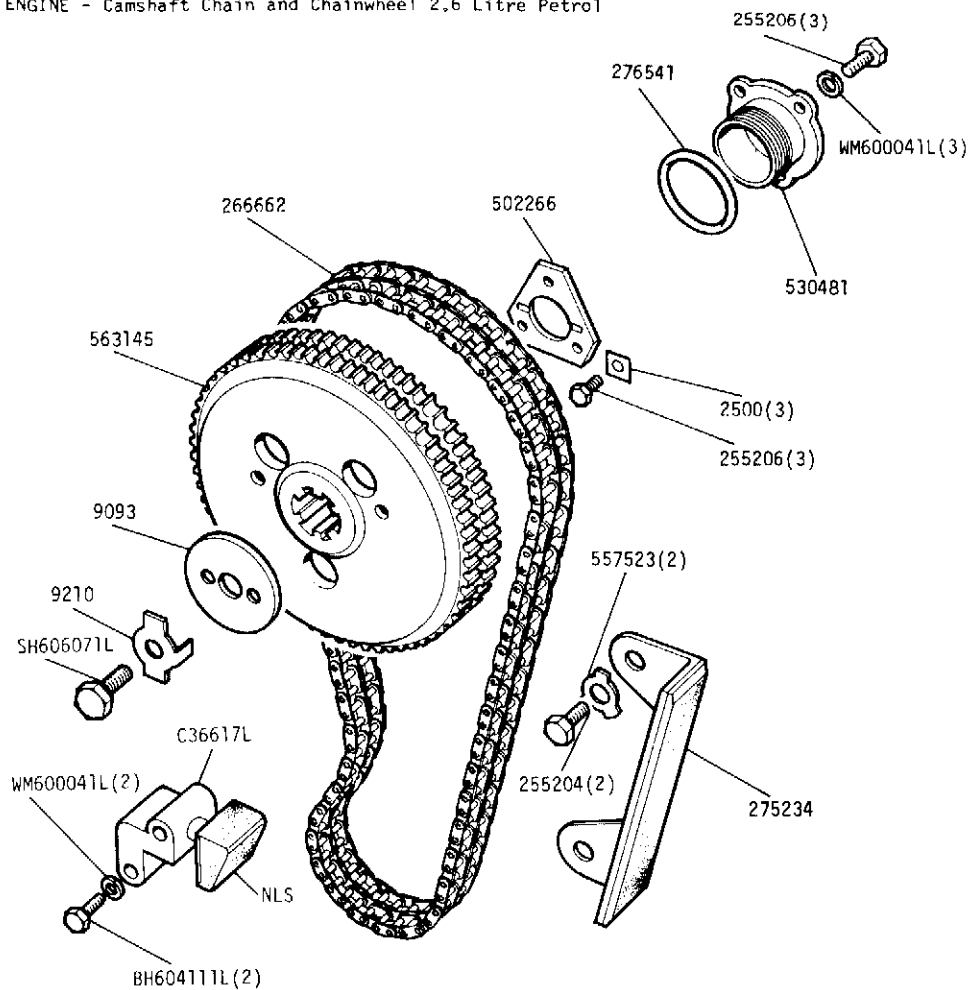
Oil pump assembly 90564334
Assembly does not include drive shafts on adjacent frame

GROUP B
ENGINE - Oil Pump Gears, Drive Shaft and Body, 2.6 Litre Petrol

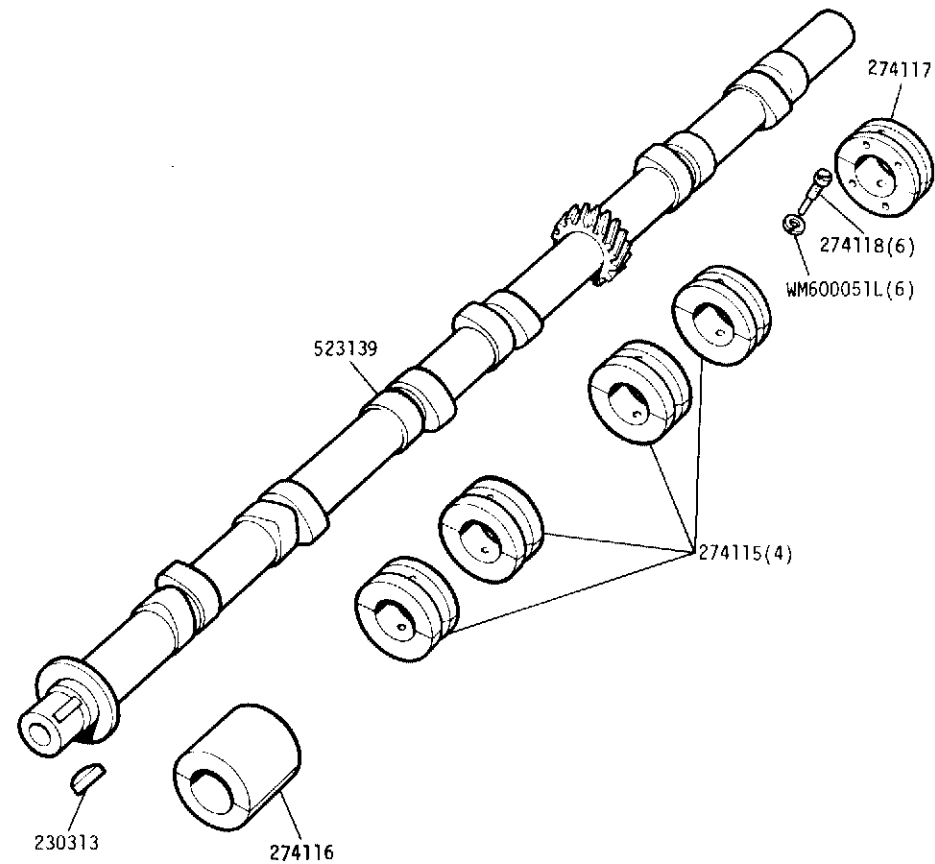


Oil pump assembly 90564334
① Assembly does not include drive shafts

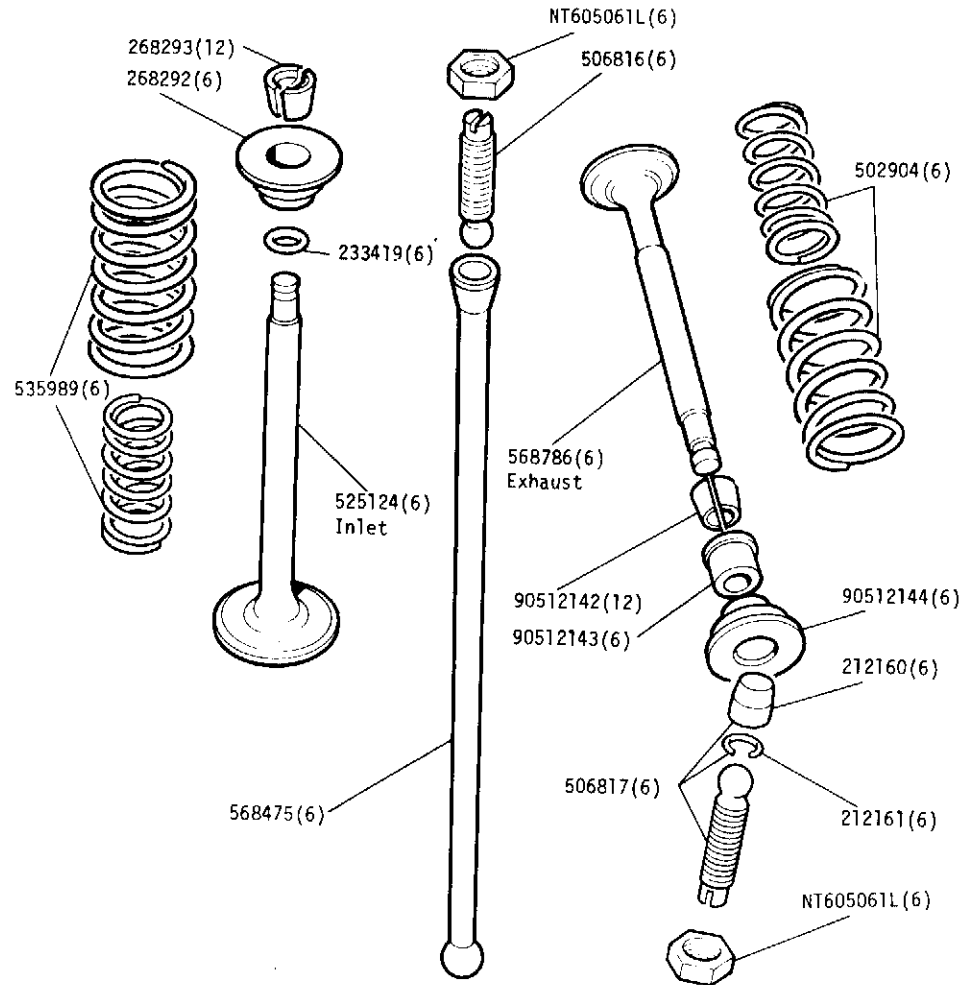
GROUP B
ENGINE - Camshaft Chain and Chainwheel 2.6 Litre Petrol



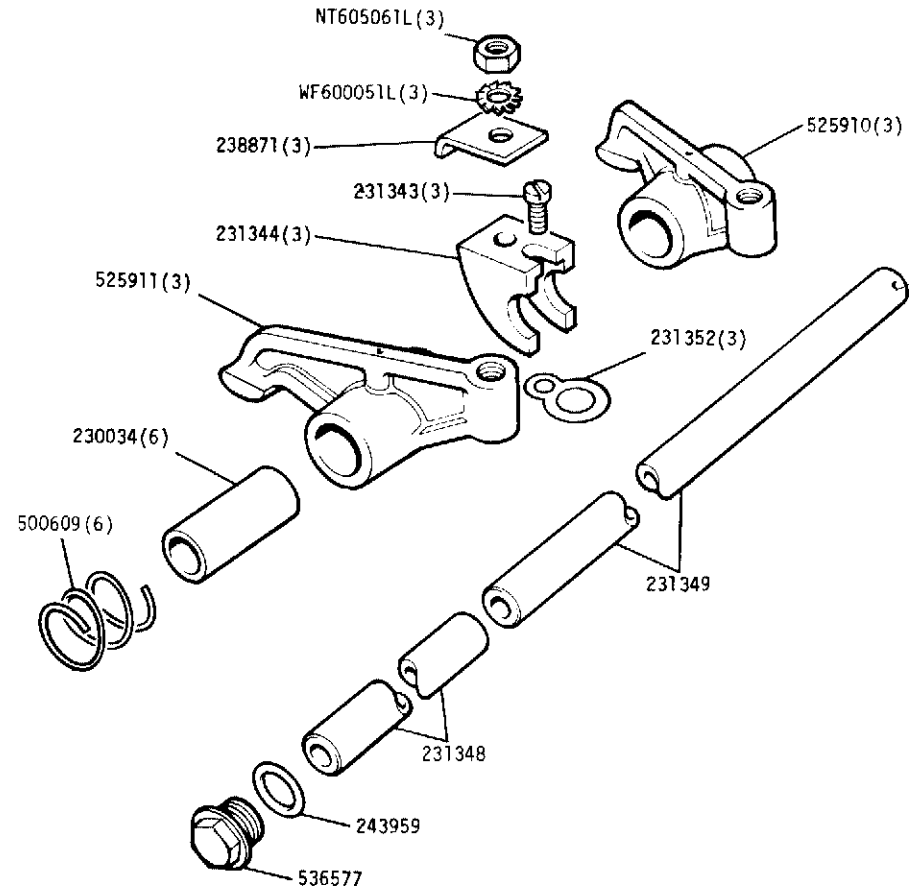
GROUP B
ENGINE - Camshaft 2.6 Litre Petrol



GROUP B
ENGINE - Valves and Push Rods 2.6 Litre Petrol

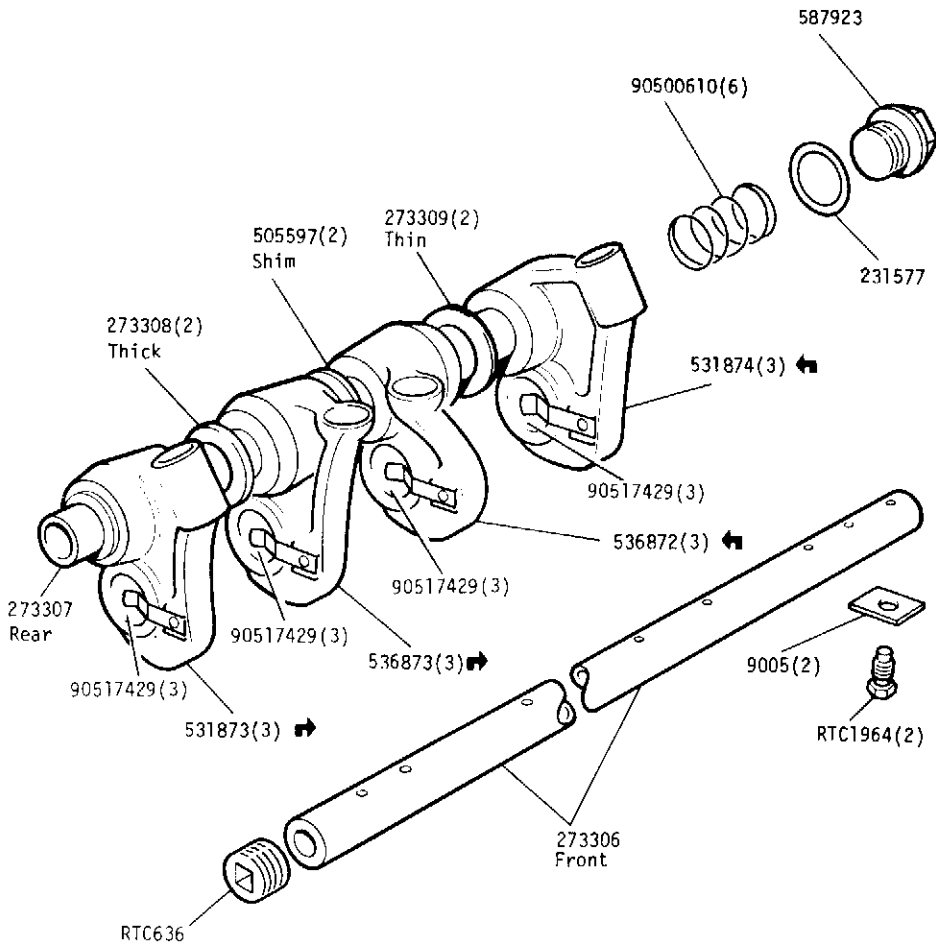


GROUP B
ENGINE - Inlet Valve Rockers 2.6 Litre Petrol



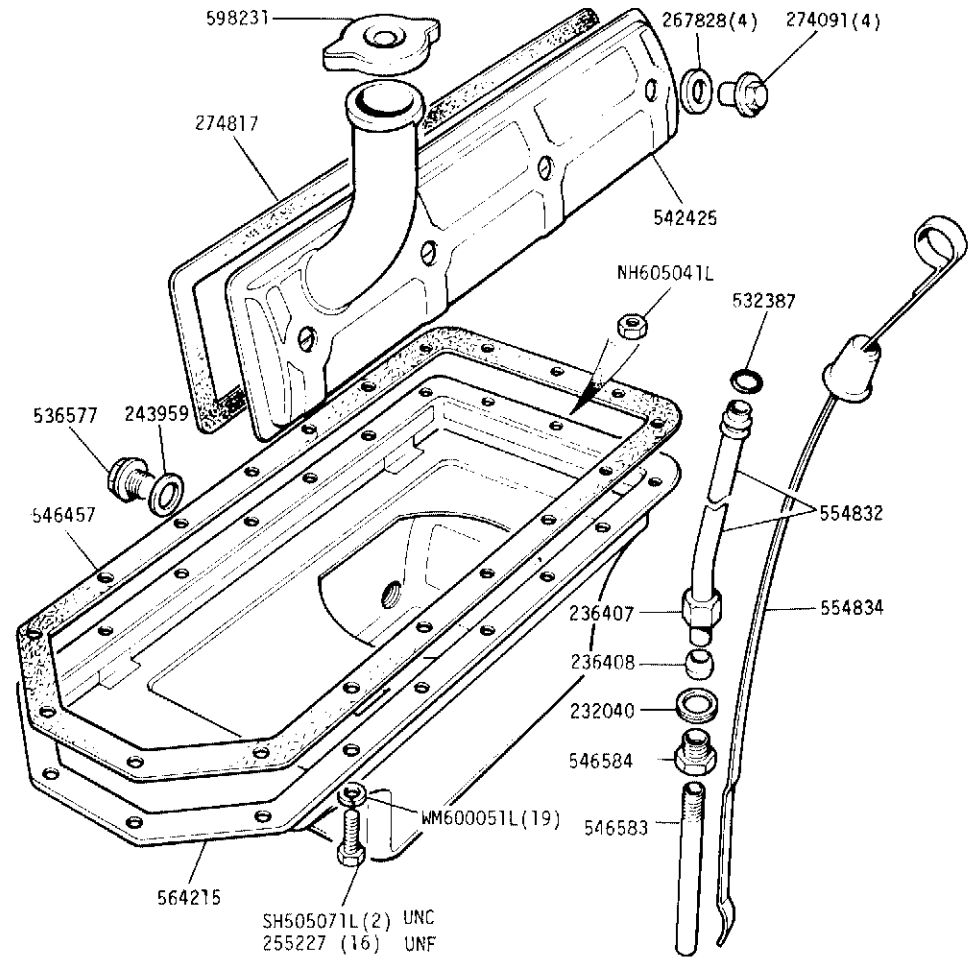
GROUP B

ENGINE - Exhaust Valve Rockers and Inlet Cam Followers 2.6 Litre Petrol

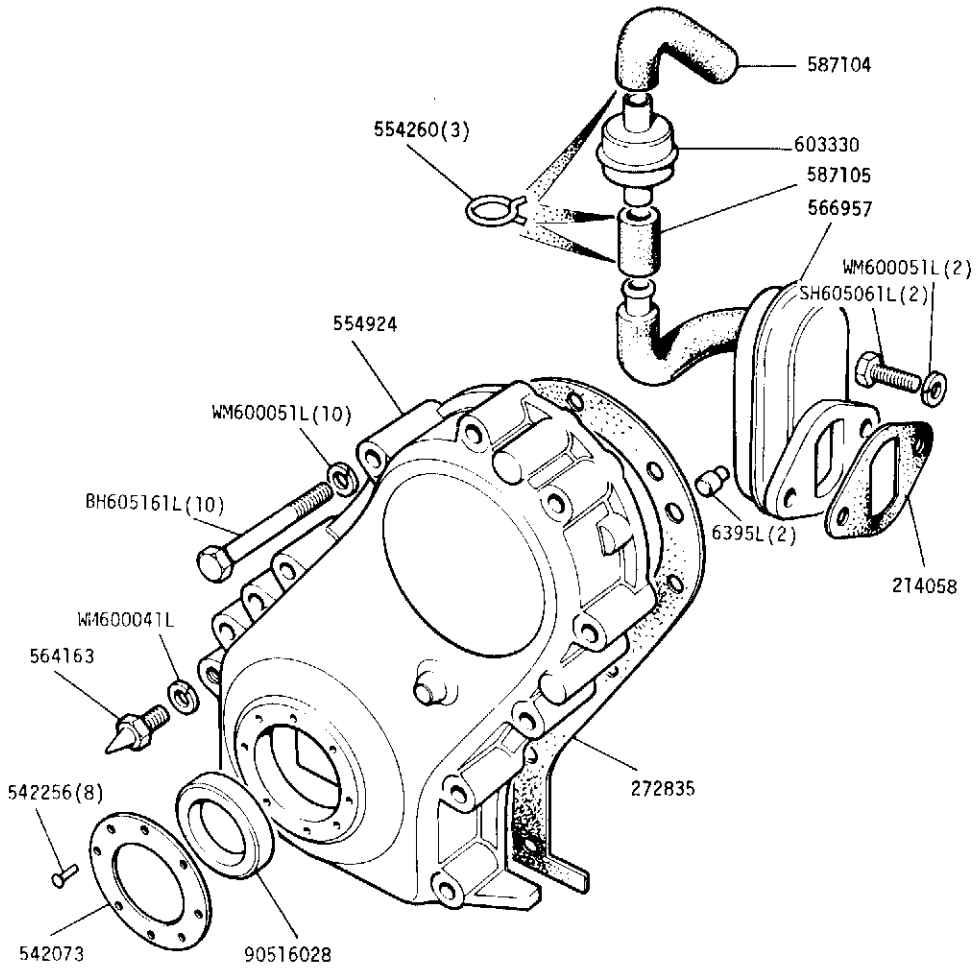


GROUP B

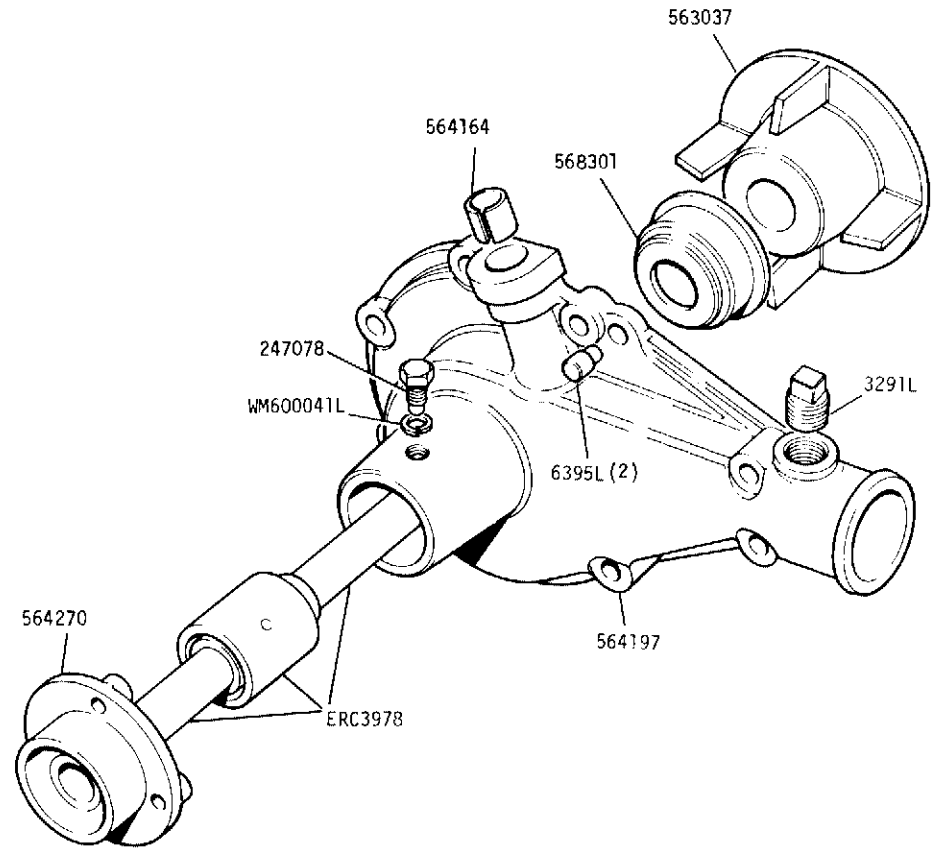
ENGINE - Side Cover and Sump 2.6 Litre Petrol



GROUP B
ENGINE - Front Cover and Engine Breather 2.6 Litre Petrol



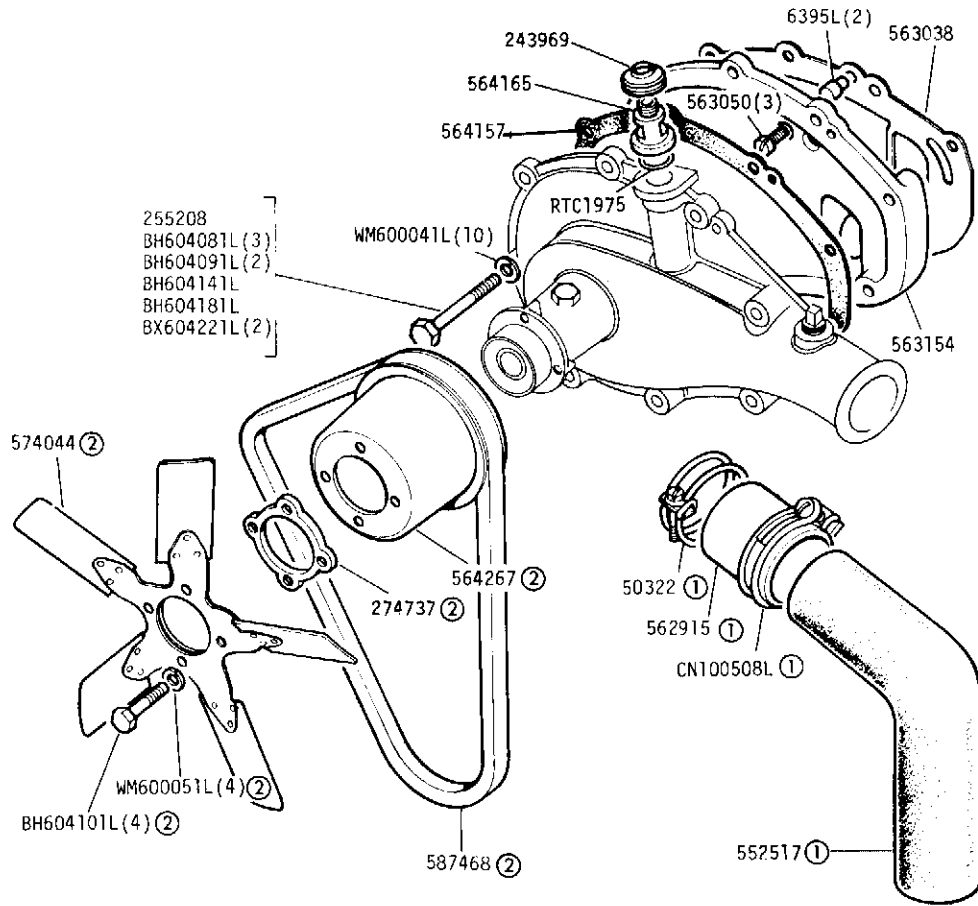
GROUP B
ENGINE - Water Pump 2.6 Litre Petrol Up to Engine Suffix 'B' inclusive



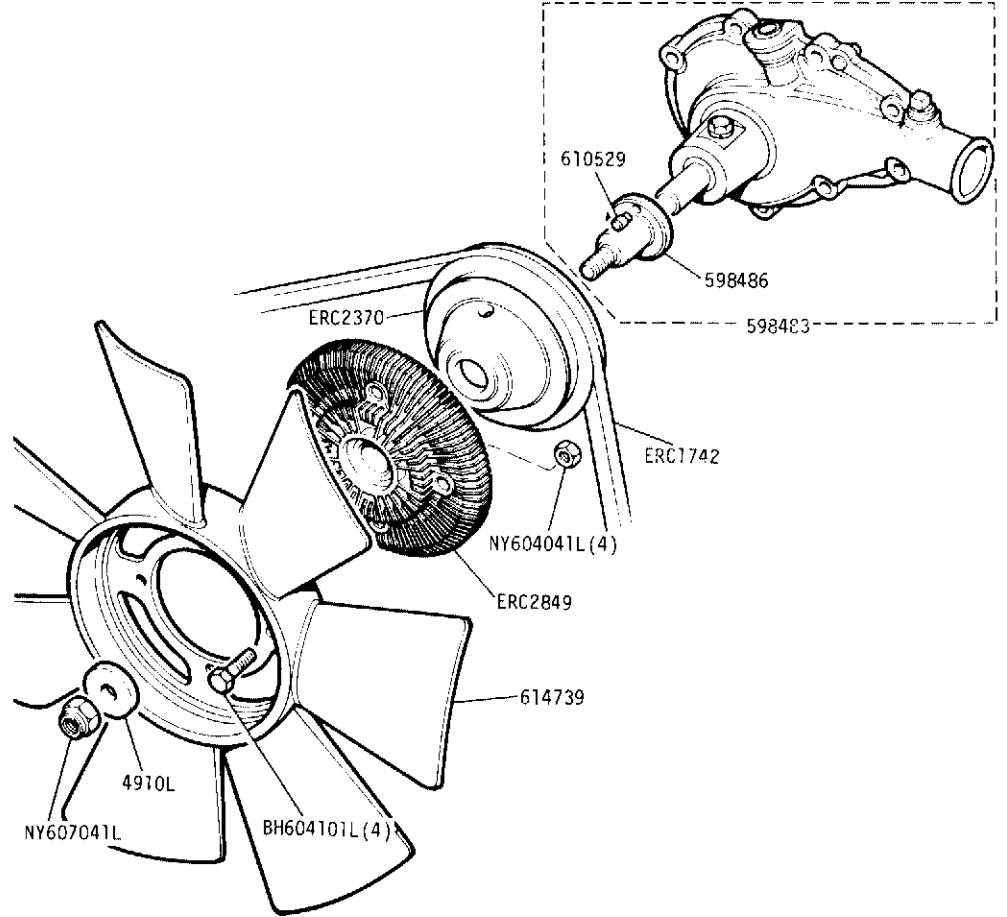
Water Pump overhaul kit 605716



GROUP B
ENGINE - Water Pump Adaptor and Fan 2.6 Litre Petrol



GROUP B
DETOXED ENGINE - Water Pump and Viscous Fan 2.6 Litre Petrol From Engine Suffix 'C' onwards

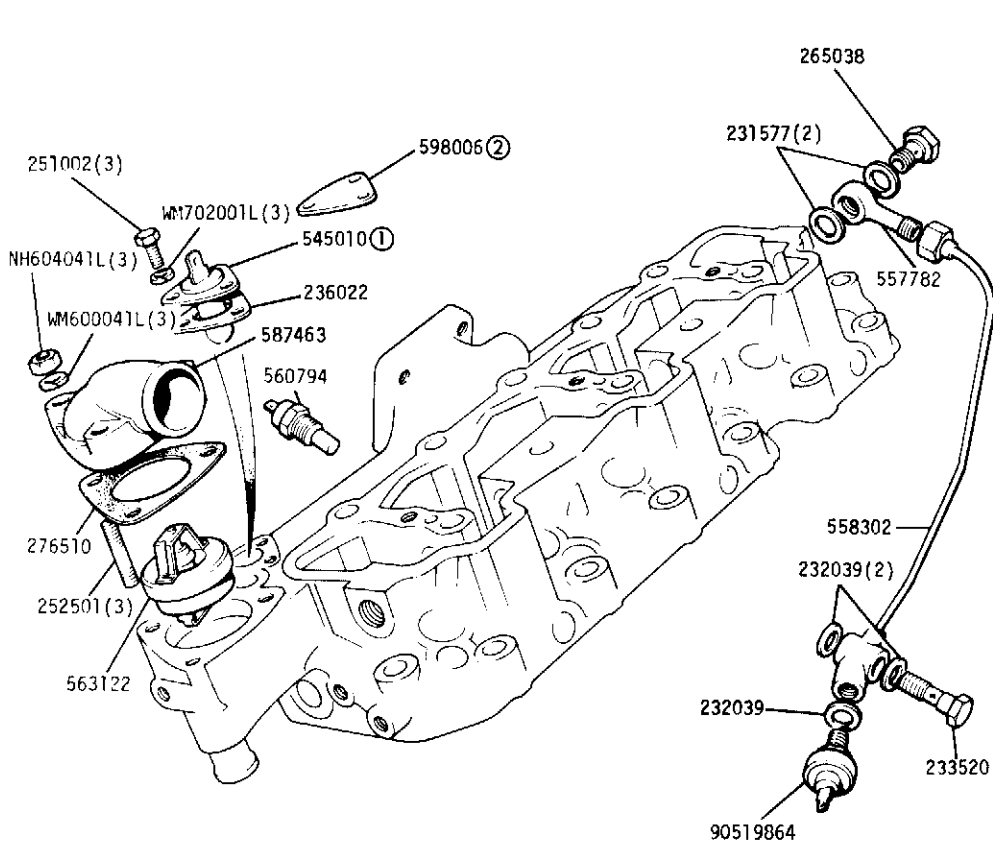


① Not required after August 1974 when one piece moulded bottom hose is fitted

② Up to Engine Suffix 'B' inclusive

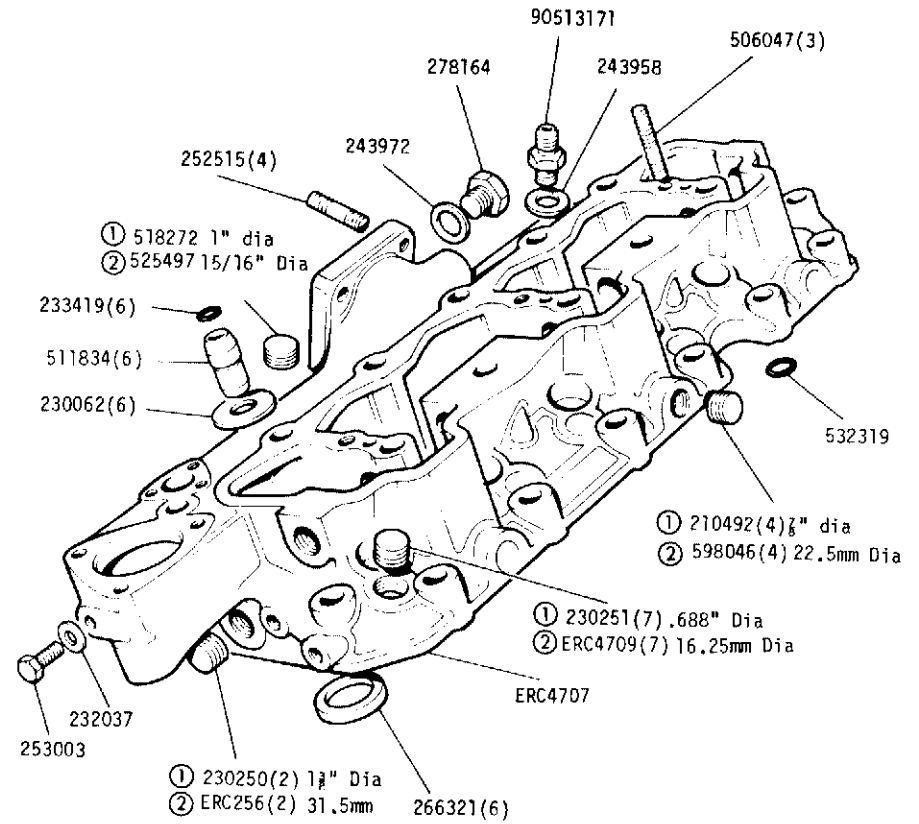
From Engine Suffix 'C' → frame 1D 10 RH

GROUP B
ENGINE - Thermostat and Oil Pipe 2.6 Litre Petrol



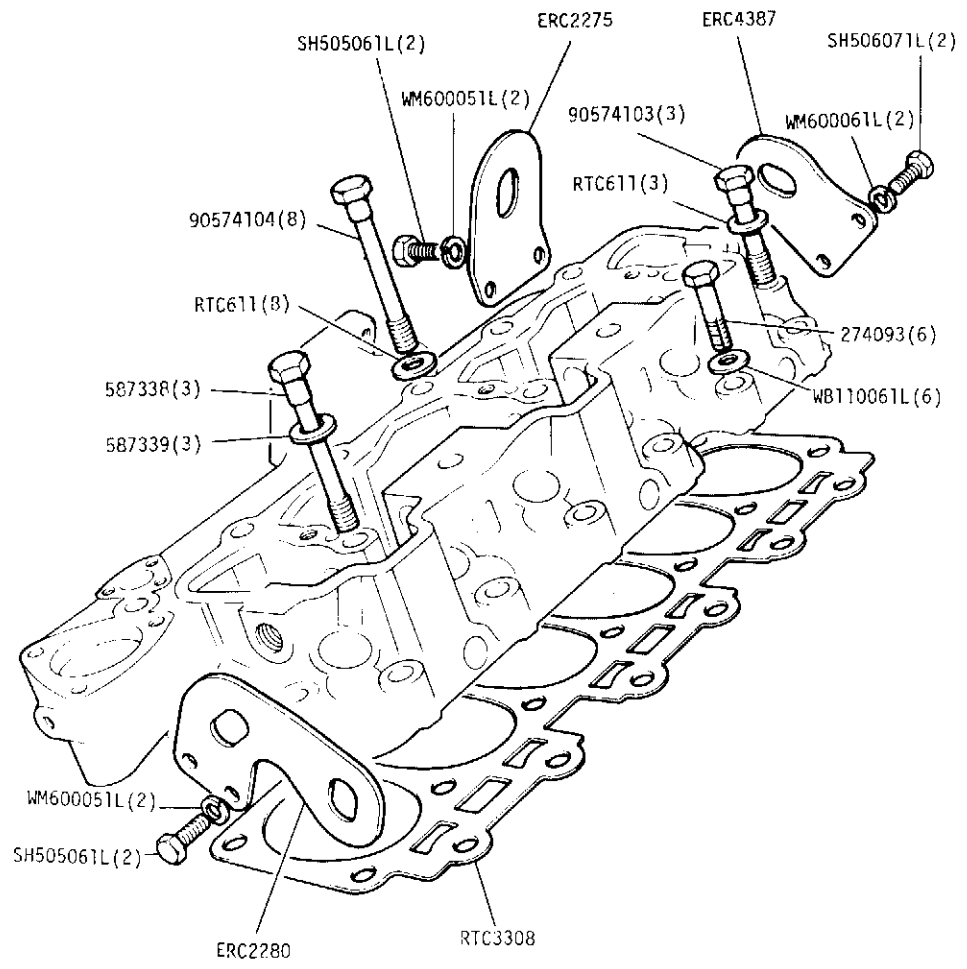
- ① Up to October 1972
- ② From November 1972 onwards

GROUP B
ENGINE - Cylinder Head 2.6 Litre Petrol

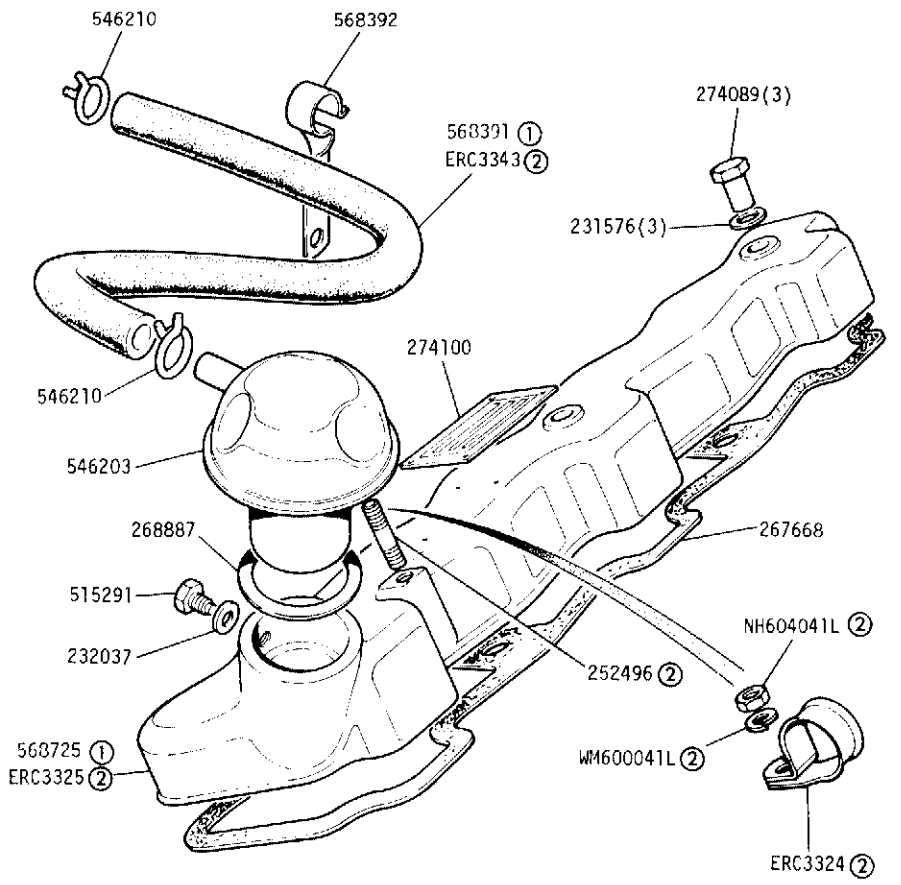


- ① CORE PLUGS
 - ② CUP PLUGS
- CHECK BEFORE ORDERING

GROUP B
ENGINE - Cylinder Head Fixings 2.6 Litre Petrol



GROUP B
ENGINE - Rocker Cover 2.6 Litre Petrol

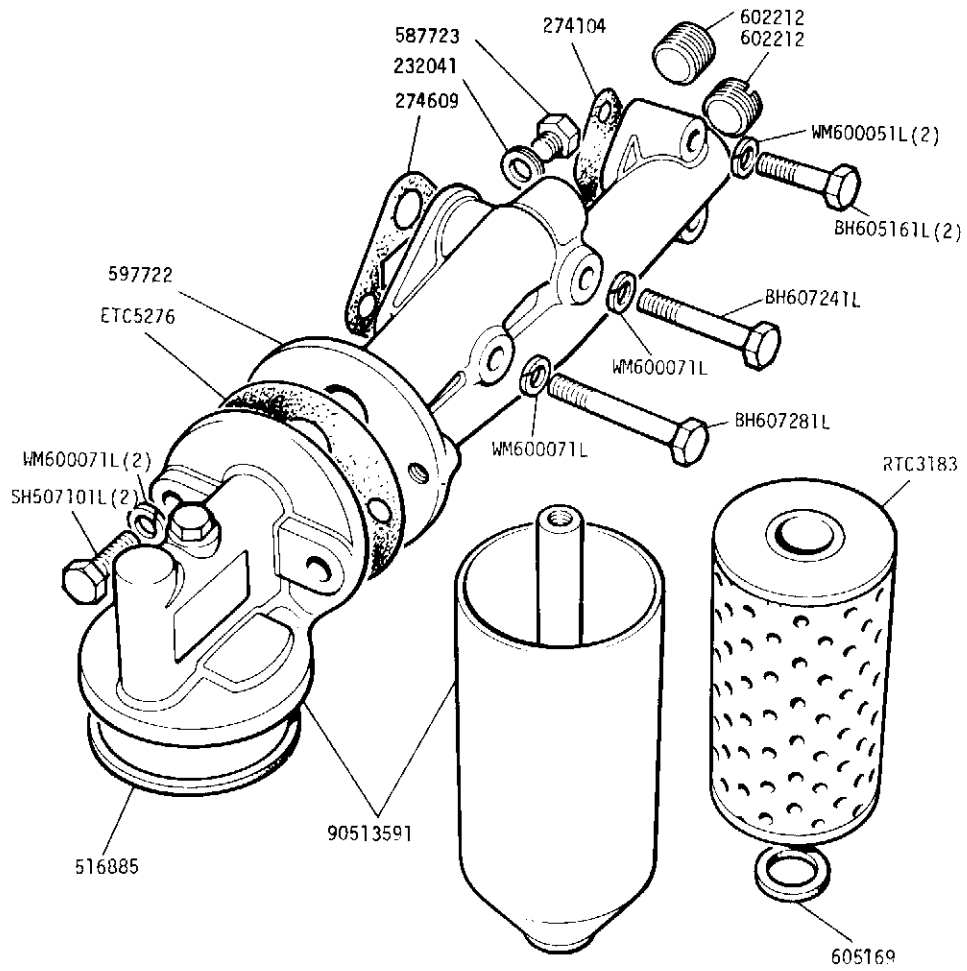


LAND ROVER 2RE 65

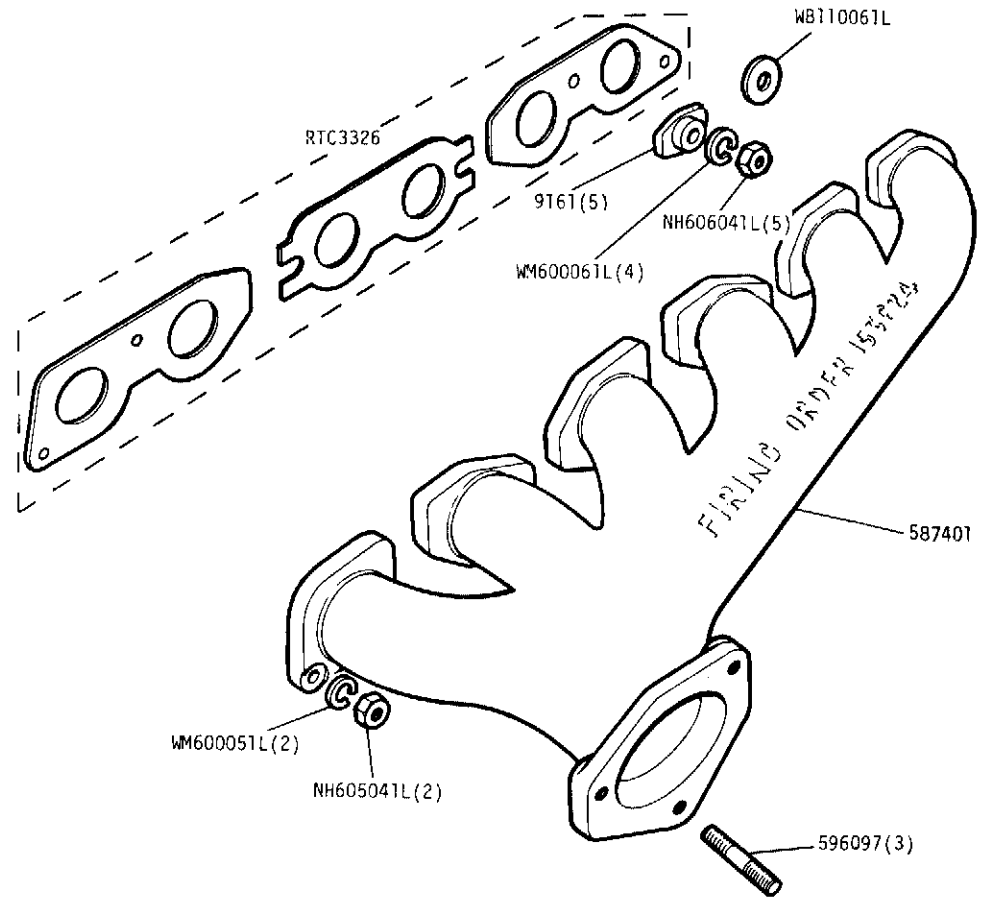
① Up to Engine suffix 'B' inclusive
② From Engine suffix 'C' onwards

LAND ROVER 2RE42/A

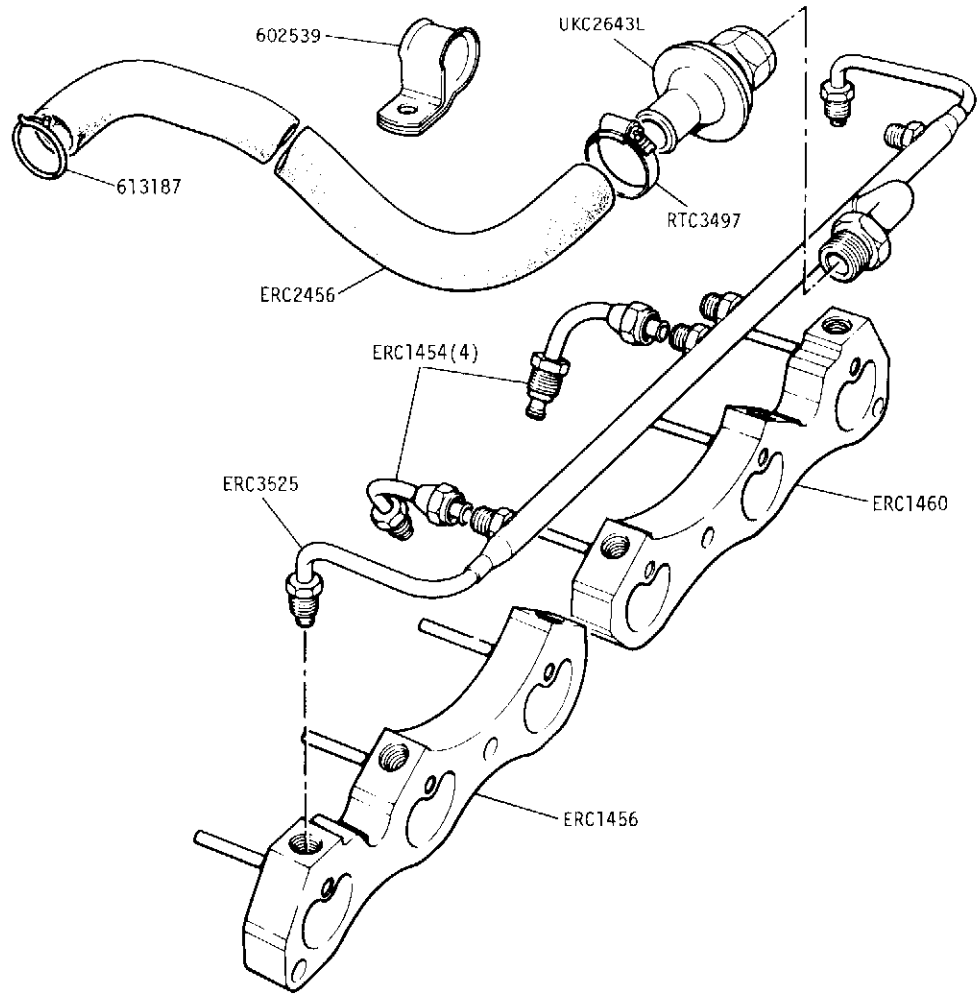
GROUP B
ENGINE - Oil Filter and Adaptor 2.6 Litre Petrol



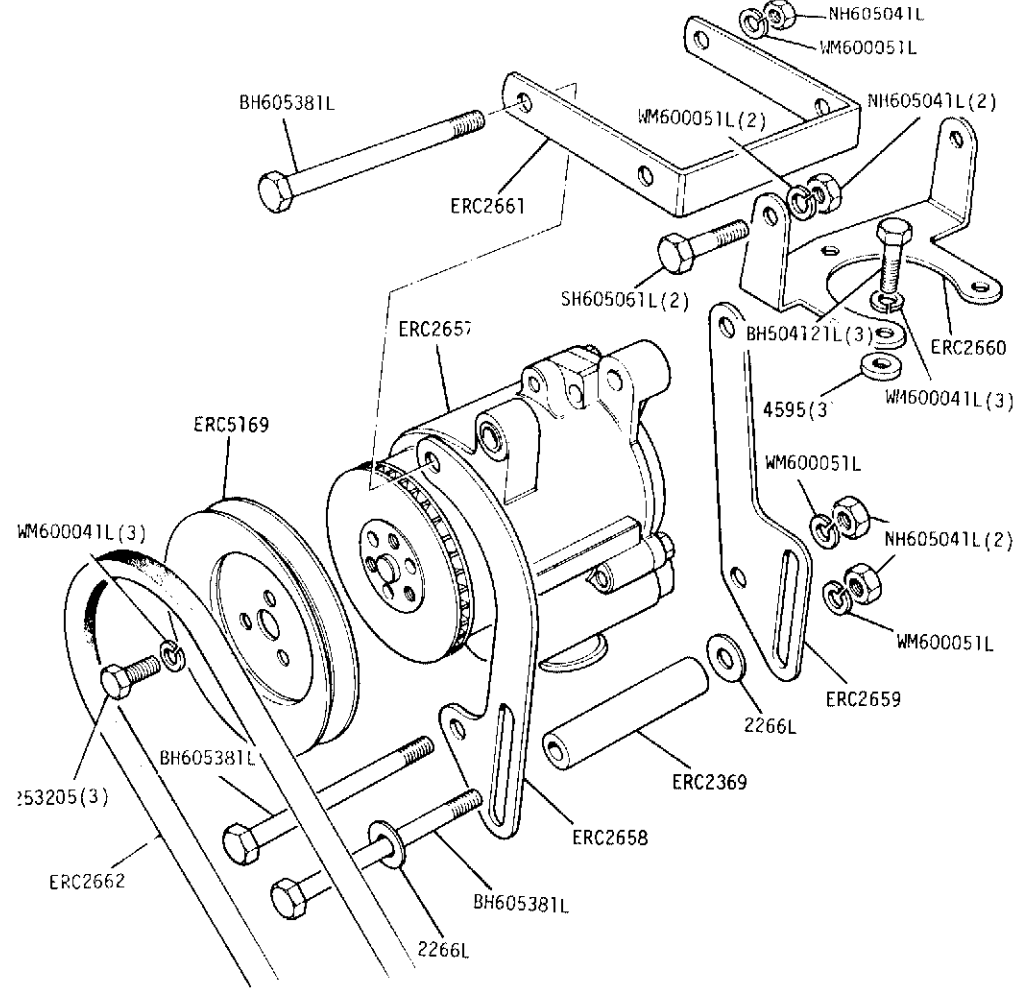
GROUP B
ENGINE - Exhaust Manifold 2.6 Litre Petrol



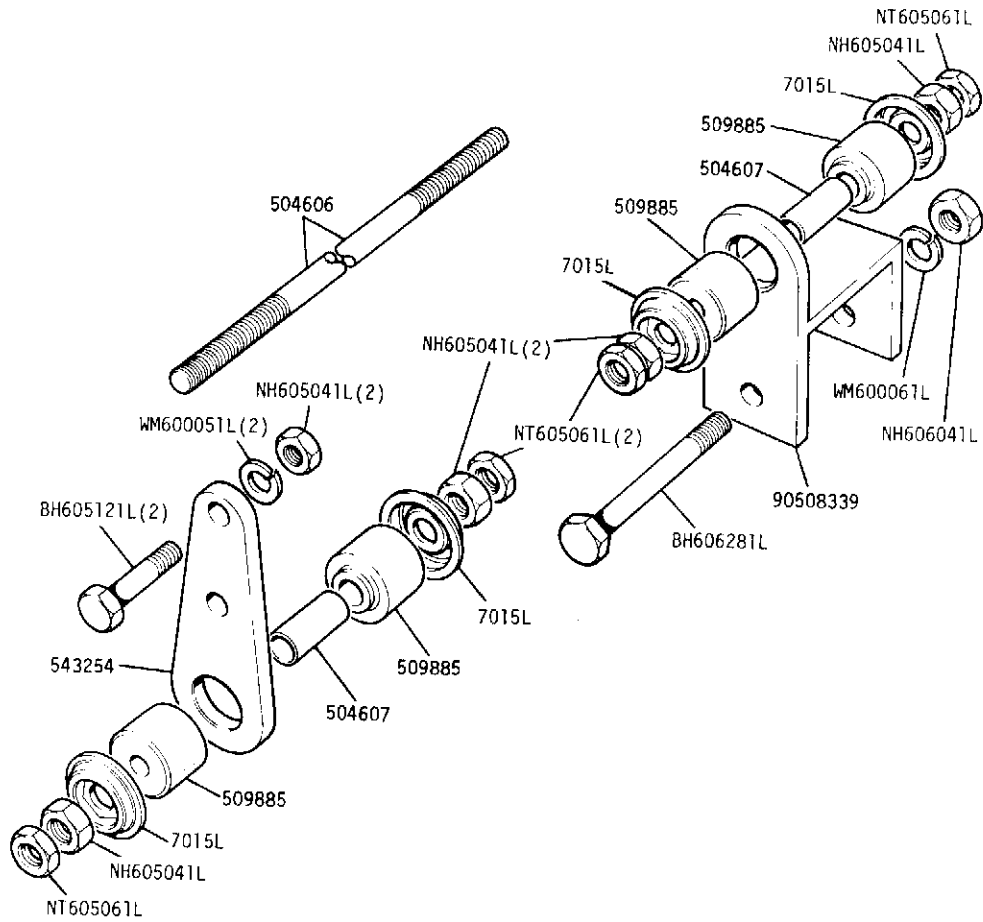
GROUP B
 DETOXED ENGINE - Exhaust Manifold Adaptor 2.6 Litre Petrol From Engine Suffix 'C' onwards



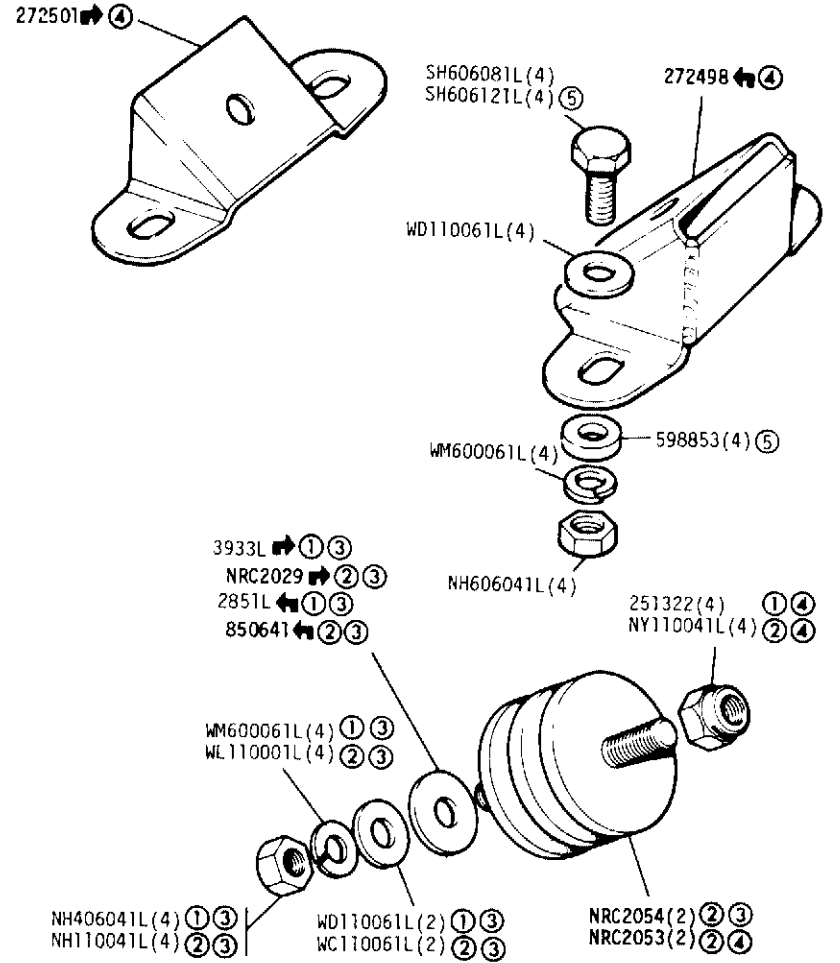
GROUP B
 DETOXED ENGINE - Air Injection Pump 2.6 Litre Petrol From Engine Suffix 'C' onwards



GROUP B
ENGINE - Tie Rod 2,6 Litre Petrol



GROUP B
ENGINE - Mountings and Rubbers 2.6 Litre Petrol



LAND ROVER

1D 15

2RE 38

① BSF Fixings
② Metric Fixings
③ Front Mounting
④ Rear Mounting
⑤ 1 Ton

LAND ROVER

1D 15