3 As each valve is inserted, slip the oil control ring into place just under the bottom of the collet groove. A much larger oil seal is used on the 1275 cc engines. This should be fitted over the top of the valve guide.
4 For the next operation, it may be easier to lay the head with its cylinder block mating face downwards. Move the cylinder head towards the edge of the work bench if it is facing downwards and slide it partially over the edge of the bench so as to fit the bottom half of the valve spring compressor to the valve head.
5 Slip the valve spring(s) and cap over the valve stem.
6 With the base of the valve compressor on the valve head compress the valve spring(s) until the collets can be slipped into place in the valve grooves. Gently release the compressor and fit the circlip in position in the grooves in the collets (where applicable).
7 Repeat this procedure until all eight valves and valve springs are fitted.

61 Rocker gear – reassembly

1 To reassemble the rocker shaft fit the split pin, flat washer and spring washer at the rear end of the shaft and then slide on the rocker arms, rocker shaft pedestals, and spacing springs in the same order in which they were removed (photo).
2 With the front pedestal in position, screw in the rocker shaft locating screws and slip the locating plate into position. Finally, fit to the front of the shaft the spring washer, plain washer, and split pin, in that order.

62 Cylinder head – refitting

1 After checking that both the cylinder block and cylinder head mating faces are perfectly clean, generously lubricate each cylinder with engine oil.
2 Always use a new cylinder head gasket as the old gasket will be compressed and not capable of giving a good seal. It is also easier at this stage to refit the small bypass hose from the water pump to the cylinder head.
3 Never smear grease on the gasket, as when the engine heats up, the grease will melt and may allow compression leaks to develop. It should not be necessary to use gasket cement because a new gasket is used and the head and block faces are true.
4 The cylinder head gasket is marked 'FRONT' and 'TOP' and should be fitted in position according to the markings (photos).
5 With the gasket in position carefully lower the cylinder head onto the cylinder block (photos).
6 With the head in position fit the cylinder head nuts and washers finger tight to the five cylinder head holding-down studs, which remain outside the rocker cover. It is not possible to fit the remaining nuts to the studs inside the rocker cover until the rocker assembly is in position.
7 Fit the pushrods as detailed in the following section.
8 The rocker shaft assembly can now be lowered over its eight locating studs (photo). Take care that the rocker arms are the right way round. Lubricate the ball ends of the tappet adjusting screws and insert them in the pushrod cups. **Note**: *Failure to place the ball ends in the cups can result in them seating on the edge of a pushrod or outside it when the head and rocker assembly is pulled down tight.*
9 Fit the four rocker pedestal nuts and washers, and then the four cylinder head stud nuts and washers, which also serve to hold down the rocker pedestals. Pull the nuts down evenly, but without tightening them right up (photo).
10 When all is in position, the nine cylinder head nuts and the four rocker pedestal nuts can be tightened down in the order shown in Fig. 1.13. Turn the nuts a quarter of a turn at a time and tighten to the specified torque (photo).
Note: *On 1275 cc engines having an additional nut and bolt, these should be tightened last.*

63 Tappets (cam followers) and pushrods – refitting

1 Generously lubricate the tappets (cam followers) internally and externally, and insert them in the bores from which they were removed (photo).
2 With the cylinder head in position, fit the pushrods in the same order in which they were removed. Ensure that they locate properly in the stems of the tappets, and lubricate the pushrod ends before fitting (photos).

64 Rocker arms/valve clearances – adjustment

1 The valve adjustments should be made with the engine cold. The importance of correct rocker arm/valve stem clearances cannot be overstressed as they vitally affect the performance of the engine. If the clearances are set too wide, the efficiency of the engine is reduced as the valves open later and close earlier than was intended. If, on the other hand the clearances are set too close there is danger that the stems will expand upon heating and not allow the valves to close properly, which will cause burning of the valve head and seat, and possible warping. If the engine is in the car, access to the rockers is by removing the two large cap nuts from the rocker cover, and then lifting the rocker cover and gasket away.
2 It is important that the clearance is set when the tappet of the valve being adjusted is on the heel of the cam, (ie opposite the peak). This can be ensured by carrying out the adjustments in the following order (which also avoids turning the crankshaft more than necessary).

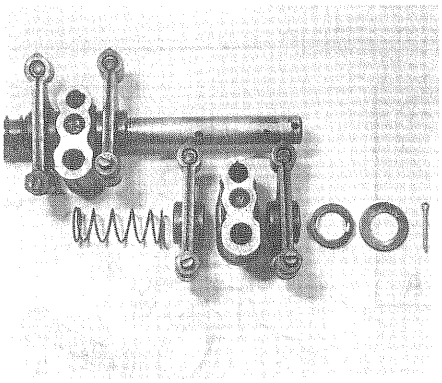
Valve fully open	Check and adjust
Valve No 8	Valve No 1
Valve No 6	Valve No 3
Valve No 4	Valve No 5
Valve No 7	Valve No 2
Valve No 1	Valve No 8
Valve No 3	Valve No 6
Valve No 5	Valve No 4
Valve No 2	Valve No 7

3 The correct valve clearance is obtained by slackening the hexagon locknut with a spanner while holding the adjusting screw against rotation with a screwdriver. Then, still pressing down with the screwdriver, insert a feeler gauge in the gap between the valve stem head and rocker arm, and adjust the screw until the feeler gauge will just move in and out without nipping. Then, still holding the adjusting screw in the correct position, tighten the locknut (photo).

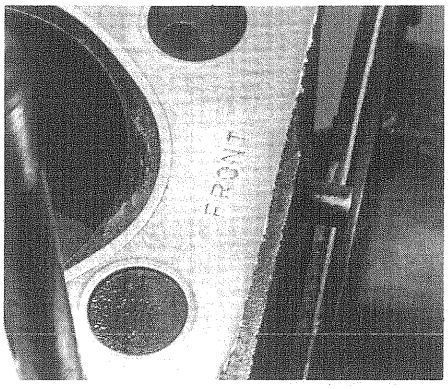
65 Distributor drive – refitting

Note: *It is wise to set the distributor drive correctly, otherwise the ignition timing will be totally incorrect. It is possible to set the distributor drive in apparently the right position, but in fact 180° out, by omitting to select the correct cylinder, which must not only be at TDC but must also be on its firing stroke with both valves closed. The distributor drive should therefore not be fitted until the cylinder head is in position and the valves can be observed.*

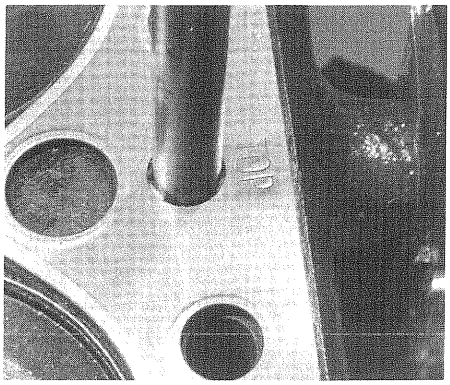
1 Rotate the crankshaft so that No 1 piston is at TDC and on its firing stroke. When No 1 piston is at TDC the inlet valve on No 4 cylinder is just opening and the exhaust valve closing.
2 When the marks 1/4 on the flywheel are at TDC, Nos 1 and 4 pistons are at TDC.
3 Screw a tappet cover bolt into the head of the distributor drive (any $\frac{5}{16}$ in UNF bolt will do if it is not less than 3 in (76 mm) long) (photo).
4 Hold the distributor drive so that the slot is as shown in Fig. 1.31 inset A. Insert the drive into its housing. As the gear on the end of the drive meshes with the skew gear on the camshaft the drive will turn anti-clockwise. When it is fully home, the upper part of the slot should be in the two o'clock position, as shown in the inset B (Fig. 1.31) (photo).
5 Remove the tappet cover bolt from the driveshaft.
6 Refit the distributor housing and a new O-ring and lock it in position with the single bolt and lockwasher (photos).
7 The distributor can now be refitted and the ignition timing reset using the procedure described in Chapter 4.



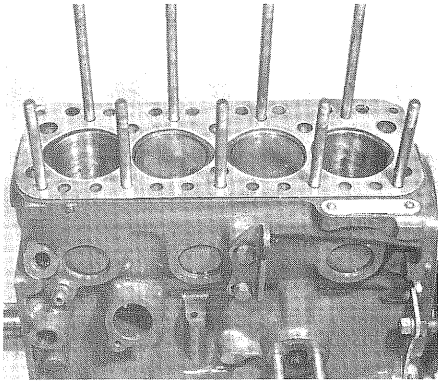
61.1 Rocker shaft components laid out for assembly



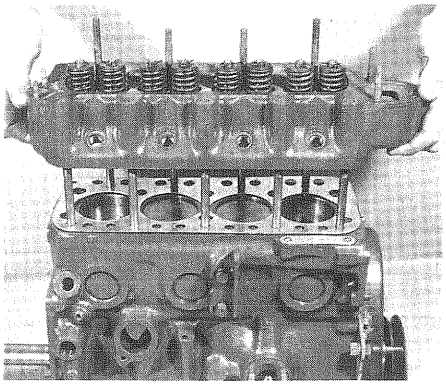
62.4a The cylinder head gasket is marked FRONT...



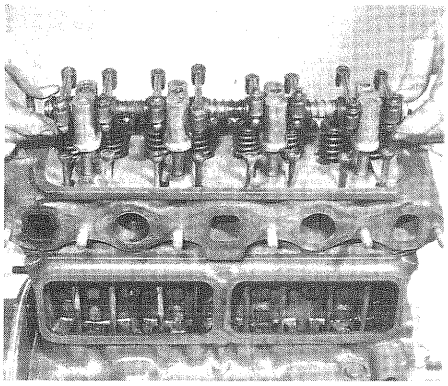
62.4b ...and TOP to avoid confusion



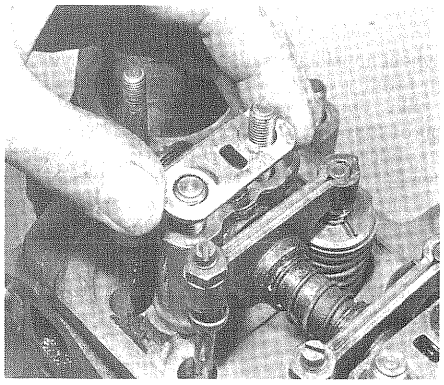
62.5a With the gasket in position...



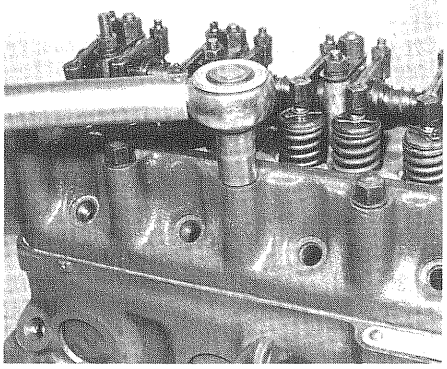
62.5b ...lower the cylinder head onto the block



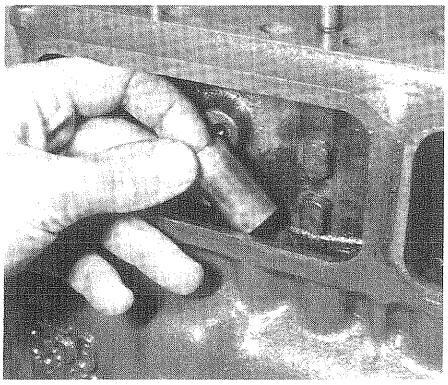
62.8 Refitting the rocker shaft assembly



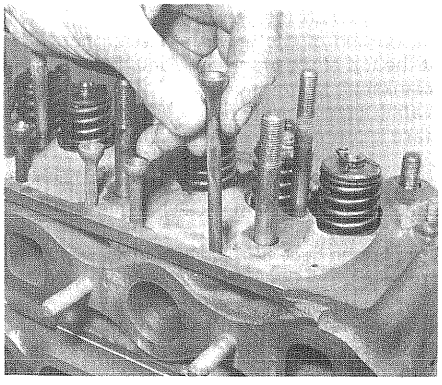
62.9 Fit the plate to the rocker pedestal, and then the retaining nuts



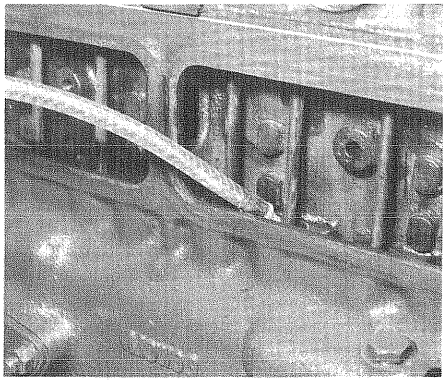
62.10 Tightening the cylinder head nuts with a torque wrench



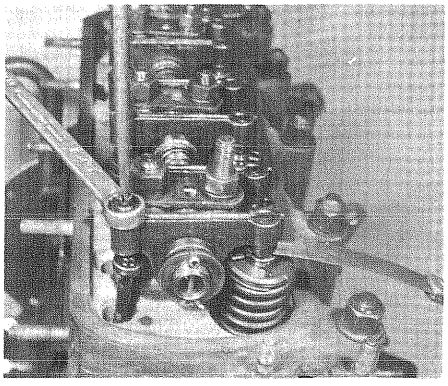
63.1 Refit the cam followers...



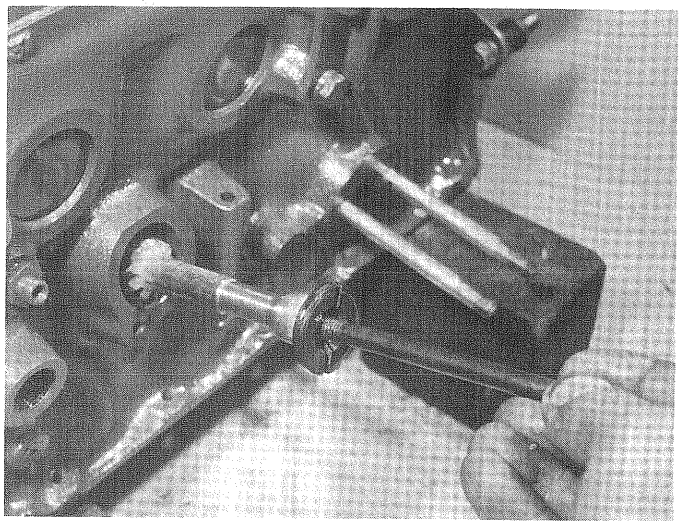
63.2a ...and then the pushrods before fitting the rocker shaft assembly



63.2b Thoroughly lubricate the pushrods and tappets



64.3 Adjusting the rocker arm/valve clearances



65.3 Using a $\frac{5}{16}$ in bolt to refit the distributor drive

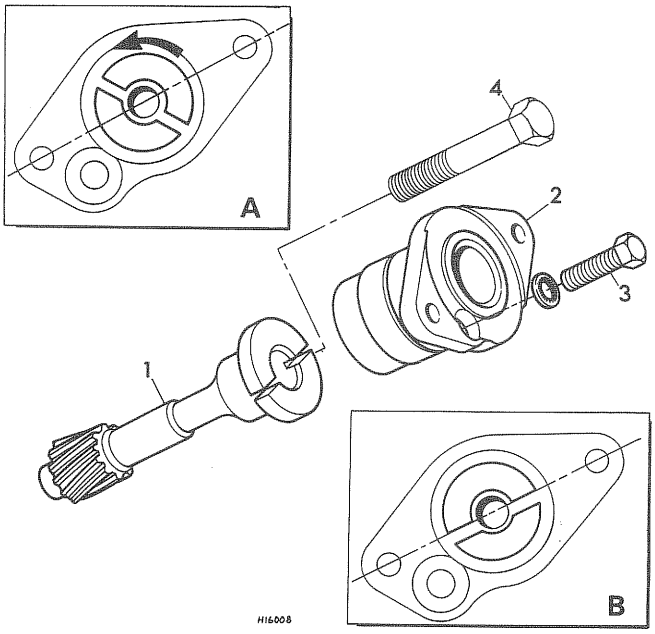


Fig. 1.31 Distributor driveshaft components (Sec 65)

Inset A shows the position of the slot ready for fitting
Inset B shows the shaft correctly installed

1 *Driveshaft*
2 *Housing*
3 *Retaining screw*
4 $\frac{5}{16}$ *in UNF bolt (for removal and refitting of driveshaft)*

66 Engine – final assembly

1 The rocker cover can now be fitted, using a new gasket (photo); also refit the tappet block side covers (where applicable). The remainder of the ancillary components should also now be refitted using the reverse of the removal sequence described in Section 16. With these components all in position, the engine can be installed on the transmission as described in the following Section.

67 Engine – refitting to manual transmission

Note: *Before refitting the engine to the transmission, refer to Chapter 6 and adjust the endfloat of the transfer gears (primary gear and idler gear). Then proceed as described below.*

1 Carefully scrape away any remaining traces of old gasket from the engine/transmission mating faces and flywheel housing joint.
2 Lightly smear the upper sides of the engine/transmission joint gaskets with jointing compound and place them in position on the engine mating face.
3 Now place the front oil seal in position between the front main bearing cap and engine front plate (photo).
4 Locate the oil supply O-ring into its groove in the transmission casing face, and if necessary retain it in place with a trace of grease (photo).
5 Using suitable lifting gear and with the help of an assistant, carefully lower the engine onto the transmission casing. Have your assistant guide the engine, and lower it very slowly, as it is easy to dislodge the gaskets.
6 With the engine in position, refit and fully tighten the retaining nuts, bolts and spring washers, and refit the radiator lower mounting bolts.

68 Flywheel housing – refitting (manual transmission models)

1 Refit the primary gear thrust washer to the end of the crankshaft with its chamfered side toward the crankshaft flange (photo).
2 Slide on the primary gear (photo) and then turn the crankshaft until No 1 and 4 pistons are at TDC.
3 Refit the primary gear retaining ring and then secure the assembly in position with the C-shaped washer (photos).
4 Refit the idler gear to its bearings in the transmission casing, turning it slightly to mesh with the other two gears as it is installed. Ensure that both the thrust washers are in position, one each side of the idler gear; if the later type gear is being fitted, the longer boss goes toward the transmission casing.
5 Place a new joint gasket over the studs on the transmission casing.
6 Before fitting the flywheel housing, make sure that a new flywheel housing oil seal has been fitted, and cover the splines of the primary gear with the special thin sleeve of BL special tool 18G570. Alternatively, wrap tin foil or masking tape tightly over the splines to avoid damaging the seal. Lubricate the lip of the oil seal prior to fitting.
7 Carefully refit the flywheel housing, taking care that the rollers on the first motion shaft bearing enter their outer race squarely. On no account force the housing. If it does not easily push fully home, turn the bearing slightly and try again. Two or three attempts may be needed (photo).
8 Refit new locking tabs, followed by the housing retaining nuts and bolts to their correct locations. Tighten the fixings to the specified torque and bend over the locktabs (photo).

69 Flywheel – refitting

1 Turn the crankshaft so that cylinders 1 and 4 are at TDC and the grooves in the sides of the crankshaft are vertical.
2 Check that the curved portion of the C-washer which holds the primary gear in place is at the top of the crankshaft, and that the sides of the washer fit in the crankshaft grooves.
3 Carefully clean the mating tapers in the flywheel and on the end of the crankshaft, and make quite certain there are no traces of oil, grease, or dirt present.
4 Refit the flywheel on the end of the crankshaft with the 1/4 TDC markings at the top and then refit the driving washer which positively locates the flywheel.
5 Fit a new lockwasher under the head of the flywheel securing bolt. Insert the bolt in the centre of the flywheel and tighten it to the specified torque.
6 Tap down the side of the lockwasher against the driving plate, and tap up the other side of the washer against the retaining bolt head.
7 Refit the thrust plate and secure it in position with the circular retaining spring.
8 Now refit the flywheel housing cover and fully tighten the retaining bolts.