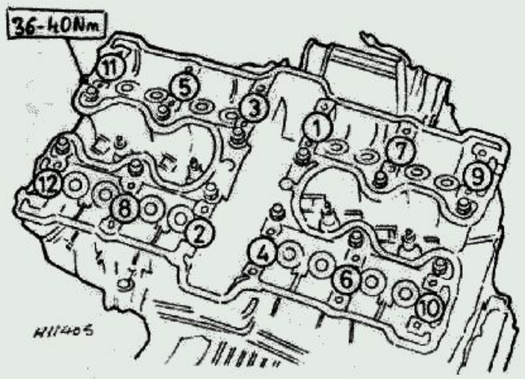
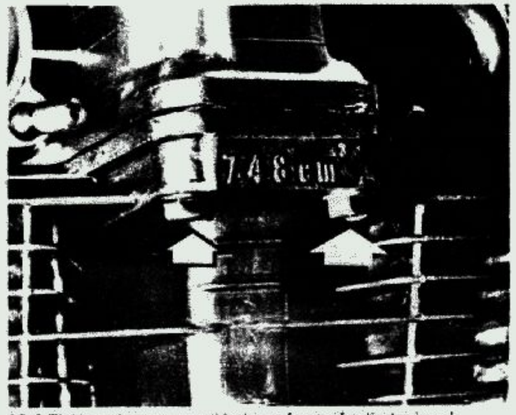


Fig. 1.25 Cylinder head nut tightening sequence



43.4 Tighten the two small bolts at front of cylinder head

44 Engine and gearbox reassembly: refitting the camshafts and setting the valve timing

1 Install the cam followers and adjustment shims in their correct locations, if this has not been done already. The followers and bores should be lubricated with engine oil during installation. Lubricate the camshaft bearing faces with molybdenum disulphide grease.

2 Holding the camshaft chain taut to prevent it from bunching around the crankshaft sprocket, turn the crankshaft by means of the large hexagon on the ATU until the **1,4T** mark appears in the timing window. Line the timing mark up against the index line on the outer cover.

3 Fit the smaller camshaft connecting chain around the smaller section of the exhaust camshaft sprocket ensuring that it is installed to run in its original direction of rotation. The sprocket should now be fitted to the protruding end of the main camshaft chain, taking care not to move the crankshaft. Note that the sprocket has two alignment dots on its left-hand face; these should be arranged horizontally so that they are parallel to the gasket face.

4 Slide the exhaust camshaft (note tachometer drive as means of identification) through the centre of the sprocket, positioning the cam lobes for the No 1 (left-hand) cylinder so that they face horizontally towards the sparking plug. Fit the A and E camshaft bearing caps, securing them by fitting the bolts finger-tight. Note that the arrows on the caps must face forwards. At this stage, one of the camshaft sprocket mounting bolt holes should be accessible and in line with the camshaft's threaded hole. Fit a securing bolt, loosely at this stage.

5 Fit the D and the unmarked tachometer drive bearing caps, again with the bolts finger-tight. Note that the D bearing cap has a groove which locates the camshaft.

6 Turn the crankshaft through 360° (one complete revolution) so that the remaining sprocket mounting hole becomes accessible. Fit the second bolt and tighten it to the specified torque setting. Turn the engine through 360° once more, and tighten the first bolt to the same torque figure.

7 Complete the installation of the camshaft bearing caps, not forgetting the locating dowels fitted to each one. Note that each cap has an identification letter which indicates its position (see Section 8 of this Chapter for details). The bearing cap securing bolts should be tightened progressively in a diagonal sequence to a torque setting of 1.2 – 1.6 kgf m (9 – 12 lbf ft).

8 Set the camshaft chain tensioner by slackening the lower of the two cap nuts at the rear of the cylinder block. This will allow the tensioner to find its own setting, after which the nut can be re-tightened. Check that the **1,4T** mark is still aligned, then re-check that the cam lobes of No 1 cylinder are facing the sparking plug, and that the camshaft sprocket punch marks are parallel to the cylinder head gasket face. If the above checks prove that the exhaust camshaft is correctly timed in relation to the crankshaft, proceed as described below, otherwise re-set the timing until all of the marks align correctly.

9 If the inlet camshaft sprocket was not removed from the camshaft during dismantling or overhaul, loop the connecting cam chain around the sprocket and lower the assembly into position, ensuring that the No 1 cylinder cam lobes face towards the sparking plug and that the punch marks are parallel to the cylinder head gasket face.

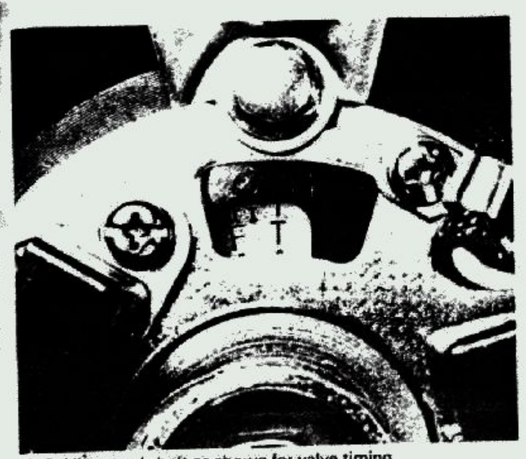
10 In cases where the sprocket was removed, fit the chain around the sprocket so that the punch marks lie parallel to the gasket face and in line with those of the exhaust camshaft sprocket. Fit the accessible sprocket bolt finger-tight.

11 Fit the inlet camshaft bearing caps (F, G, K and L) tightening the retaining bolts evenly in a diagonal sequence to 1.2 – 1.6 kgf m (9 – 12 lbf ft). Turn the crankshaft through 360° and fit the remaining camshaft sprocket bolt, tightening it to the specified torque setting; then turn the crankshaft another complete turn and secure the first sprocket bolt to the same torque value.

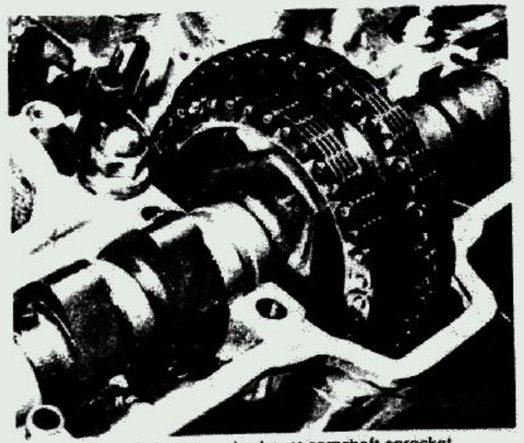
12 Set the connecting camshaft chain tension by slackening the locking bolt to allow the slack to be taken up. (Note that the chain tension should be re-checked after the engine has been started). Set up the crankshaft timing mark once more, and make a final check on the camshaft timing as described above.

13 Fit the black plastic oil deflector cap on each of the two cylinder head nuts nearest to the camshaft chain tunnel on the inlet side of the cylinder head. Fit the chain tensioner support plate, securing it with its right-hand mounting bolt only. Place the oil feed pipe and chain guide in position. These are retained by the inner bearing cap bolts to the right of the camshaft connecting chain, and by a single bolt on the left, the latter doubling as the means of holding the left-hand side of the support plate.

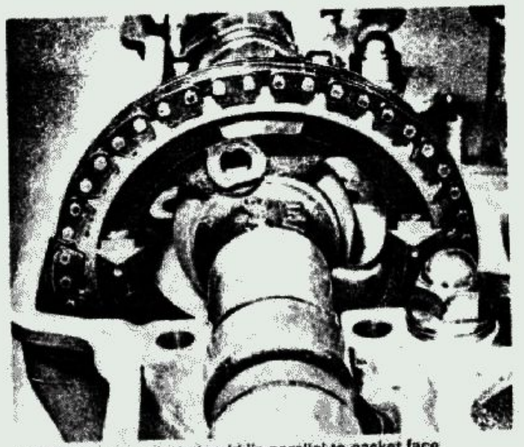
14 Prime the recesses around each valve with engine oil to provide lubrication when the engine is first started. Check the valve clearances as described in Routine Maintenance, and make any necessary adjustments before proceeding further. Check the cylinder head cover gasket for indentations or other damage. If it is in good condition, it can be re-used. Clean the gasket and gasket face, and apply a smear of RTV sealant in the angled areas formed by the semi-circular end plugs. The cover can now be refitted.



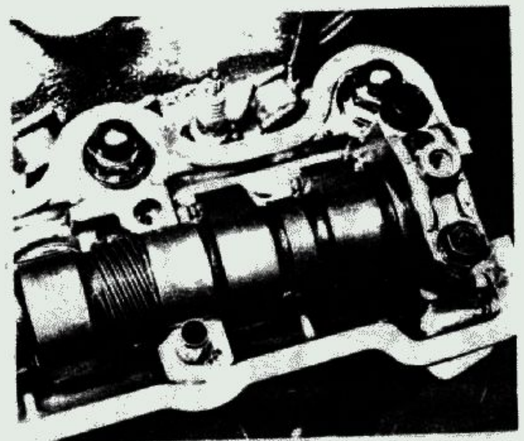
44.2 Align crankshaft as shown for valve timing



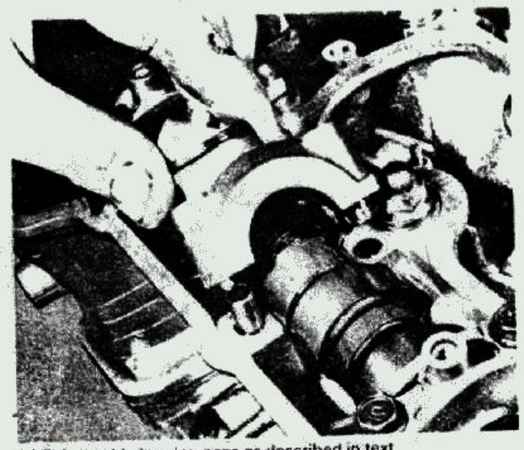
44.3a Fit cam chains around exhaust camshaft sprocket



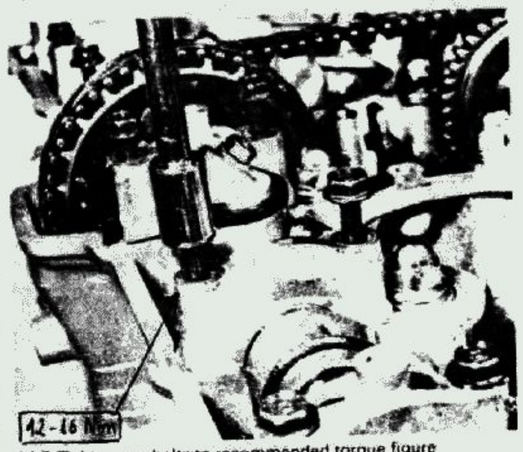
44.3b Alignment dots should lie parallel to gasket face



44.4 Cam lobes must face towards sparking plugs



44.5 Assemble bearing caps as described in text



44.7 Tighten cap bolts to recommended torque figure