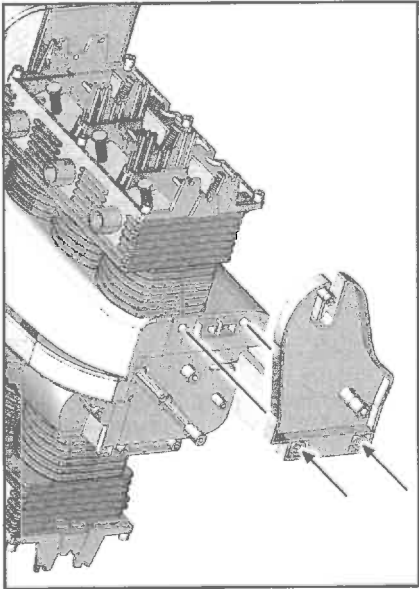


## ASSEMBLING THE ENGINE

### Step 12. Camshaft tunnel – right rear

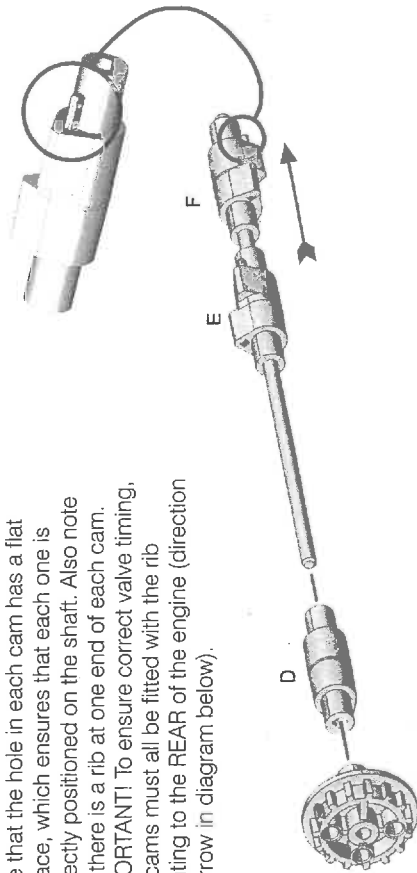
Attach the rear part of the right hand camshaft tunnel (60) to the crankcase and secure with two screws.



### Step 13. Cam and rocker shafts – right side

Assemble the camshaft for the right side of the engine. Slide cams D, E, and F on to a camshaft, IN THIS ORDER.

Note that the hole in each cam has a flat surface, which ensures that each one is correctly positioned on the shaft. Also note that there is a rib at one end of each cam. **IMPORTANT!** To ensure correct valve timing, the cams must all be fitted with the rib pointing to the REAR of the engine (direction of arrow in diagram below).

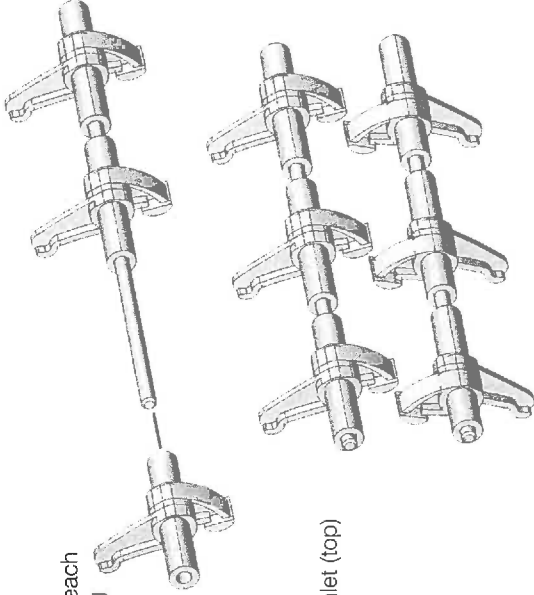


Fit the sprocket to the end of the camshaft – the hole in this also has a flat surface to ensure it is correctly positioned.

## ASSEMBLING THE ENGINE

### Step 13. continued

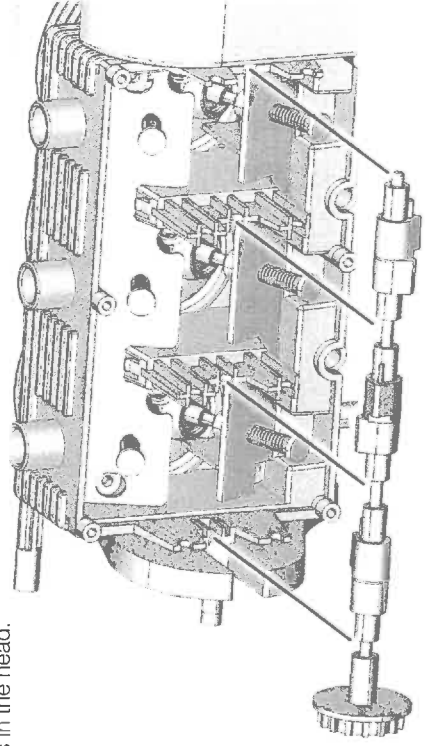
Slide three rocker arms (5) on to each of the two rocker shafts, checking that they move freely.



Note the relative position of the inlet (top) and exhaust rockers (bottom).

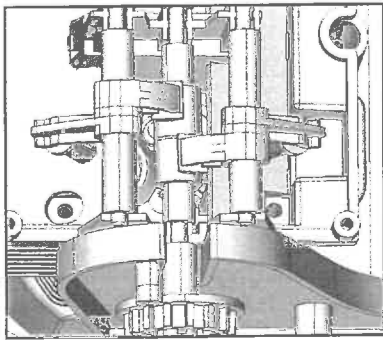
### Step 14. Camshaft assembly – right side

Place the camshaft assembly in position on the cylinder head. This is easiest if the engine is held on its side between your legs, with the cylinder head horizontal. Ensure that the cams are separated so that each sits between the bearing surfaces in the head.



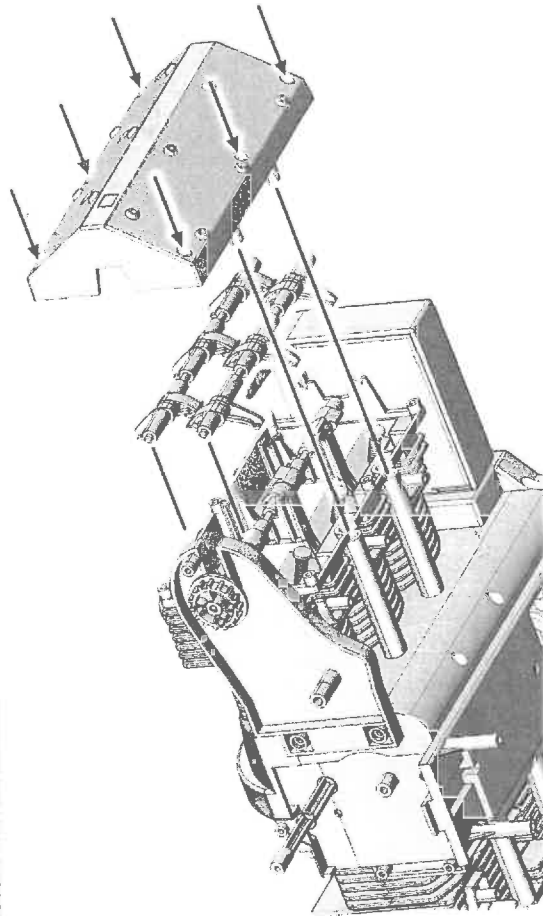
## ASSEMBLING THE ENGINE

### Step 15. Rocker shaft assembly – right side



Place the rocker shaft assemblies for the inlet and exhaust valves on to the cylinder head (refer to the inset picture for guidance). Use your fingers to separate the rockers so that each sits between the bearings that hold the shaft. The ends of each rocker shaft should be level with the end of the cylinder head.

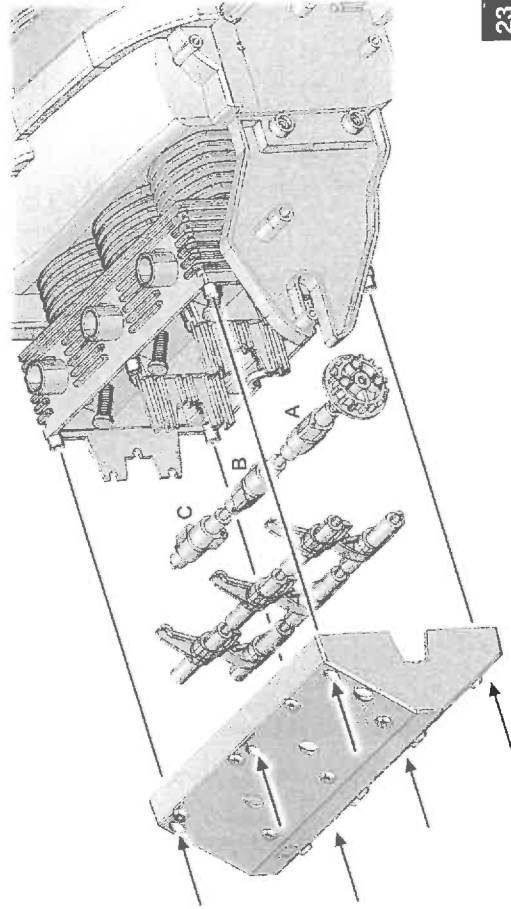
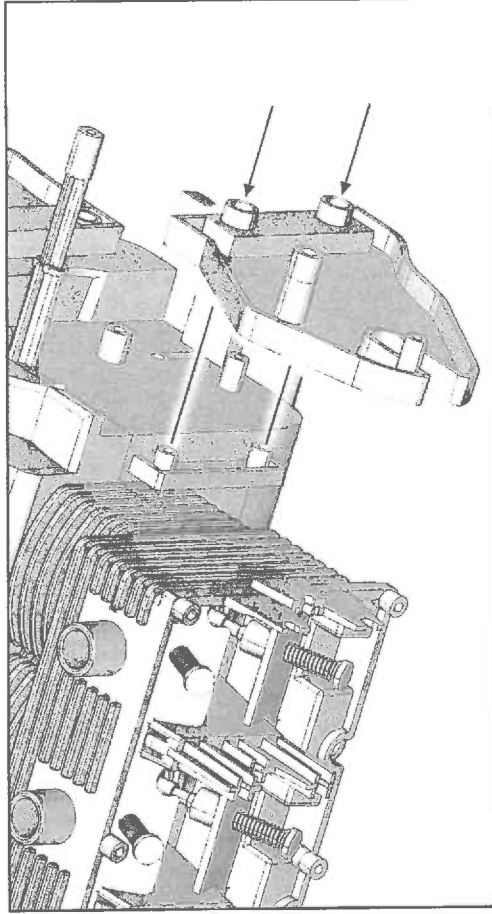
Place the cylinder head cover (53) in position. Note the correct orientation - the two tubes moulded into the bottom edge should be inserted into the ends of the oil return pipes. Secure with six screws.



## ASSEMBLING THE ENGINE

### Step 16. Cylinder head – left side

Repeat steps 11 to 14 for the left hand side of the engine. Note the position of cams A, B and C, making sure the ribs on each point towards the rear of the engine.

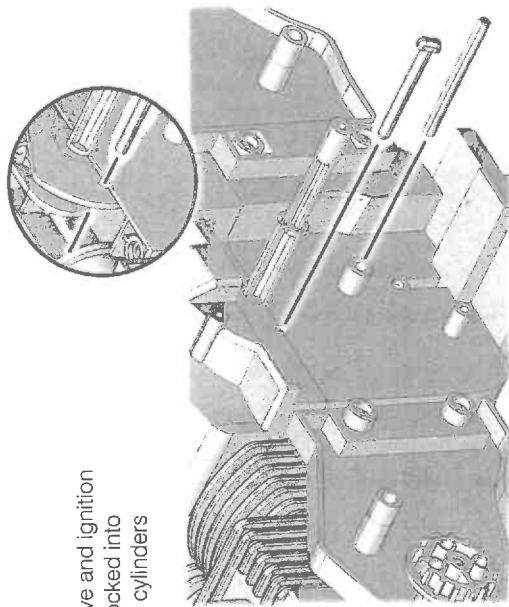


## ASSEMBLING THE ENGINE

### Step 17. Timing pin

In order to accurately set the valve and ignition timing, the crankshaft must be locked into position. Note that the pistons in cylinders 1 and 4 must be at Top Dead Centre (TDC). Insert a timing alignment pin (77) through the holes in the crankcase and crankshaft counterweight.

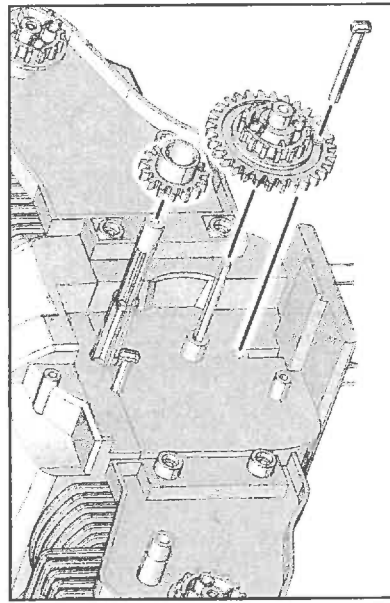
Insert the metal shaft for the cam chain sprocket into the crankcase.



### Step 18. Crankshaft sprocket

Slide the crankshaft gear B (75) on to the end of the crankshaft. Note that there is a slot in the inside surface of the sprocket that engages with a rib on the crankshaft.

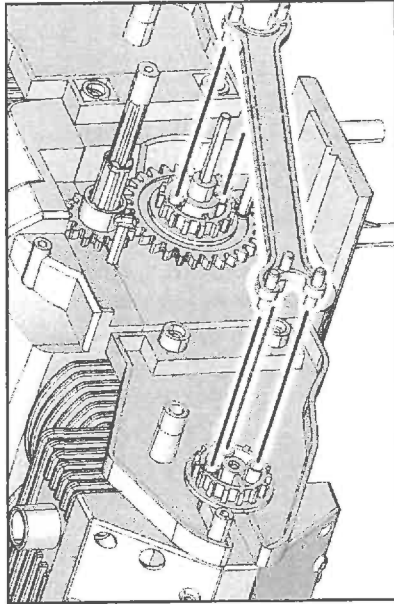
Fit the crankshaft sprocket A (10) to the metal shaft. Note that the shaft has a flat surface on one side that matches a flat surface on the inside of the sprocket. **IMPORTANT!** There is a hole on one side of the sprocket through which the second timing alignment pin (77) must be inserted to fit into a hole in the crankcase. This ensures that the sprocket is correctly aligned. You may need to reposition the sprocket to allow the pin to be inserted.



## ASSEMBLING THE ENGINE

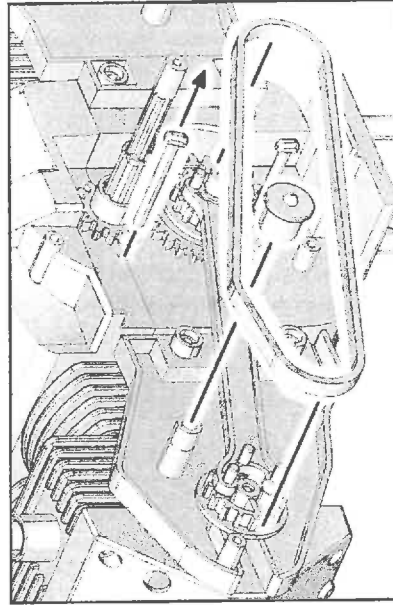
### Step 19. Valve timing tool

Fit the valve timing tool (6) to the left hand side of the engine. There are two pins at one end that fit into the holes in the sprocket beneath the crankshaft, and three at the other end that fit into holes in the camshaft sprocket.



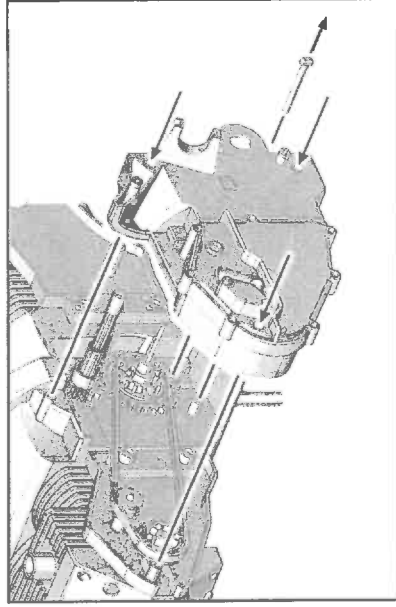
### Step 20. Cam belt – left side

Remove the timing alignment pin as shown (but do not remove the one in the lower sprocket). Place one of the cam timing belts in position over the cam and drive sprockets. Install the idler pulley (37), making sure the cam belt goes up and over this.



## ASSEMBLING THE ENGINE

### Step 21. Cam belt cover – left side



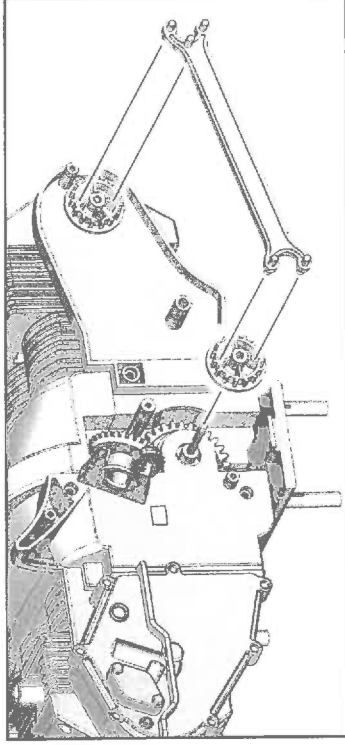
Remove the valve timing tool, and the timing alignment pin from the lower sprocket.

Fit the cam belt tunnel cover (61) and secure with three screws.

## ASSEMBLING THE ENGINE

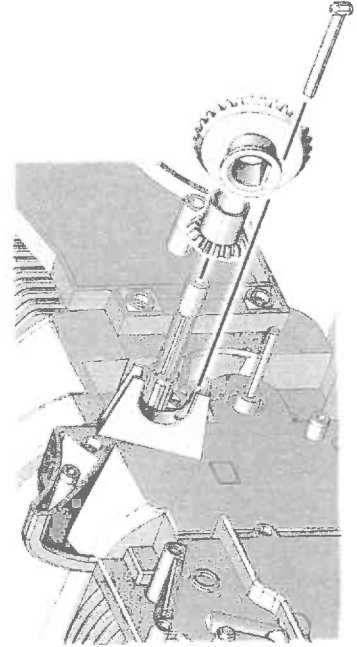
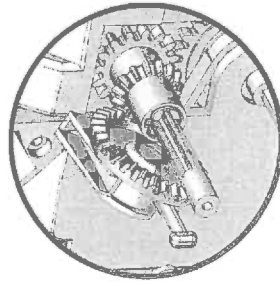
### Step 23. Cam drive sprocket – right side

Fit the crankshaft sprocket B (11) to the metal pin, followed by the valve timing tool.



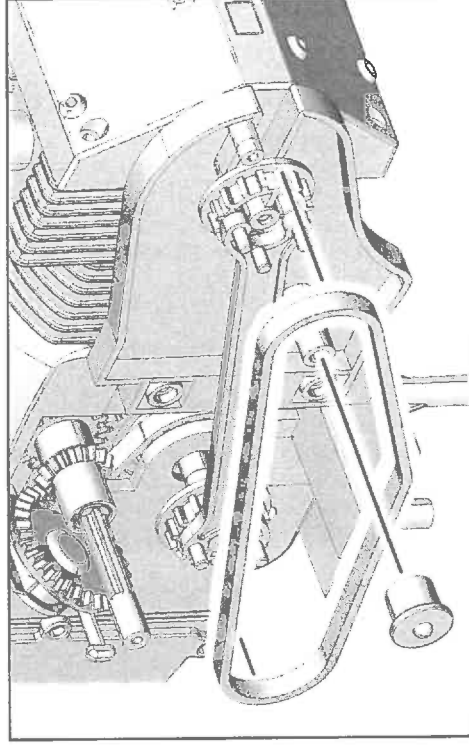
### Step 22. Distributor drive gears

Install the distributor drive bevel gears. Fit the smaller crankshaft gear C (76) first - it has a slot that engages with the rib on the crankshaft. When fitting the larger gear (69), note the round groove in one side. To achieve correct ignition timing, this gear MUST be installed with the flat section facing downwards as shown. Slide a timing pin under the gear and into the bracket in the front of the crankcase to ensure the gear is correctly positioned.



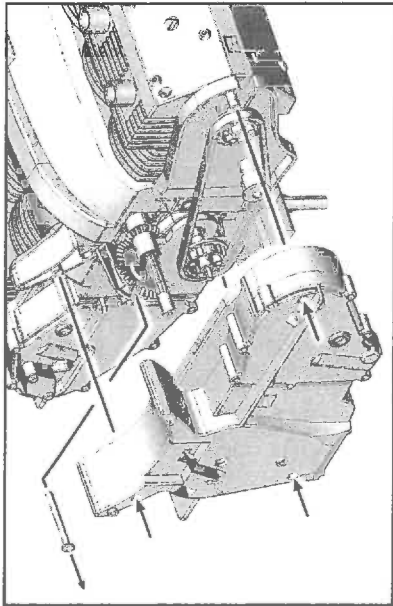
### Step 24. Cam belt – right side

Install the second cam belt and idler pulley.



## ASSEMBLING THE ENGINE

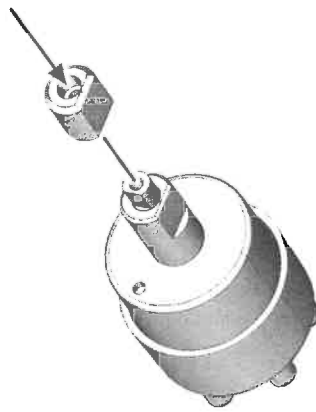
### Step 25. Cam belt cover – right side



Remove the valve timing tool and the bevel gear locking pin.

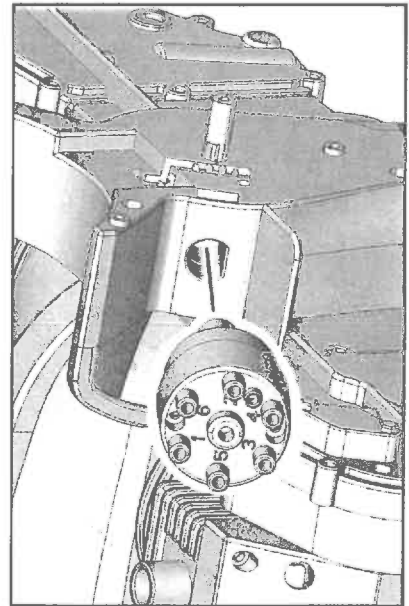
Place the right hand cam belt cover in position and secure with three screws.

### Step 26. Distributor



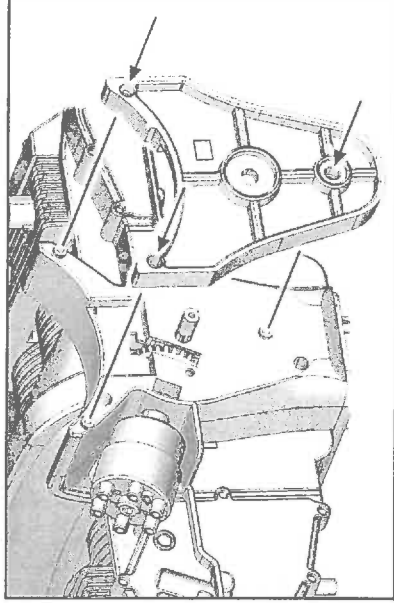
Fit the distributor bush (74) to the end of the shaft and secure with a screw. One end of the bush has a recess for the screw; this must face outwards, as shown.

Fit the distributor – it is a friction fit in the crankcase. The flat surface on the distributor shaft and bush match the flat surfaces of the crankcase and bevel gear. The bevel drive gear for the distributor **MUST** be in the correct position in order for the distributor shaft to be fully inserted.



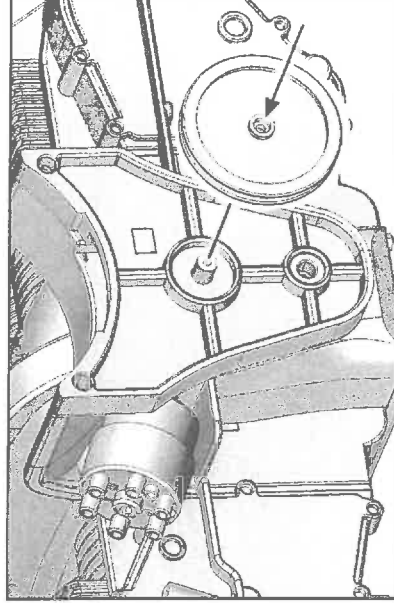
## ASSEMBLING THE ENGINE

### Step 27. Engine front



Attach the engine cover plate and secure with three screws.

### Step 28 Crankshaft pulley wheel



Fit the pulley to the end of the crankshaft and secure with a screw.