

THE TIMING GEAR

The camshafts are driven by Duplex endless roller chains in two stages.

The first stage or bottom timing chain drives the larger wheel of a double intermediate sprocket; the second stage or top timing chain passes round the smaller wheel of the intermediate sprocket, both camshaft sprockets, and is looped below an idler sprocket.

The idler sprocket has an eccentric shaft for top timing chain tension adjustment and the bottom chain is automatically tensioned by an hydraulic tensioner bolted to the cylinder block. Nylon or rubber vibration dampers are located at convenient points around the chains.

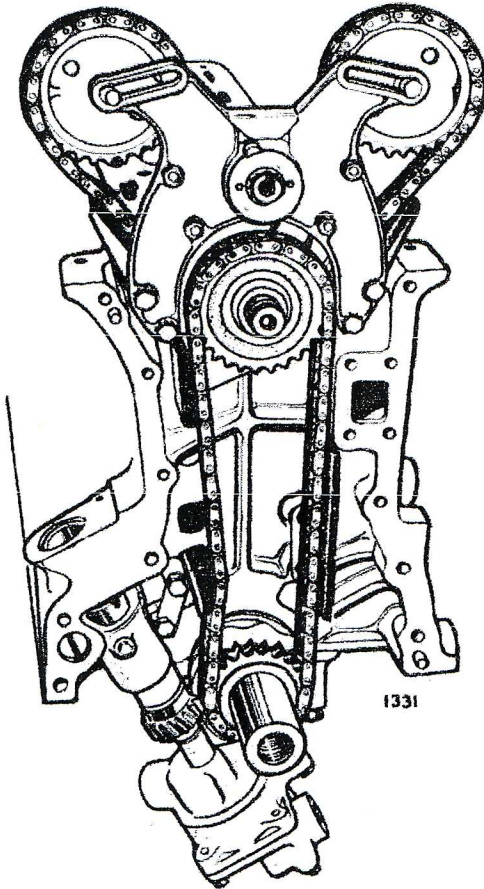


Fig. 52. The timing gear arrangement.

REMOVAL

Remove the cylinder head as described on page B.41.

Remove the radiator, cowl, header tank and cooling fan (as described in Section D "Cooling System").

Remove the damper as described on page B.35.

Withdraw the split cone.

Remove the sump as described on page B.50.

Unscrew the set bolts and nuts, and remove the water pump from the timing cover.

Note the gasket between the pump and the timing cover.

Remove the front cover as described on page B.22.

Remove the bottom timing chain tensioner as described on page B.59.

Unscrew the four setscrews securing the front mounting bracket to the cylinder block.

Remove the two screwdriver slotted setscrews securing the rear mounting bracket; these setscrews secure the intermediate damper bracket.

The timing gear assembly can now be removed.

DISMANTLING

Remove the nut and serrated washer from the front end of the idler shaft, and withdraw the plunger and spring.

Remove the four nuts securing the front mounting bracket to the rear bracket. Withdraw the front bracket from the studs.

Remove the bottom timing chain from the large intermediate sprocket.

To remove the intermediate sprockets, remove the circlip from the end of the shaft in the mounting bracket. Press the shaft out of the bracket, and withdraw the sprockets from the shaft.

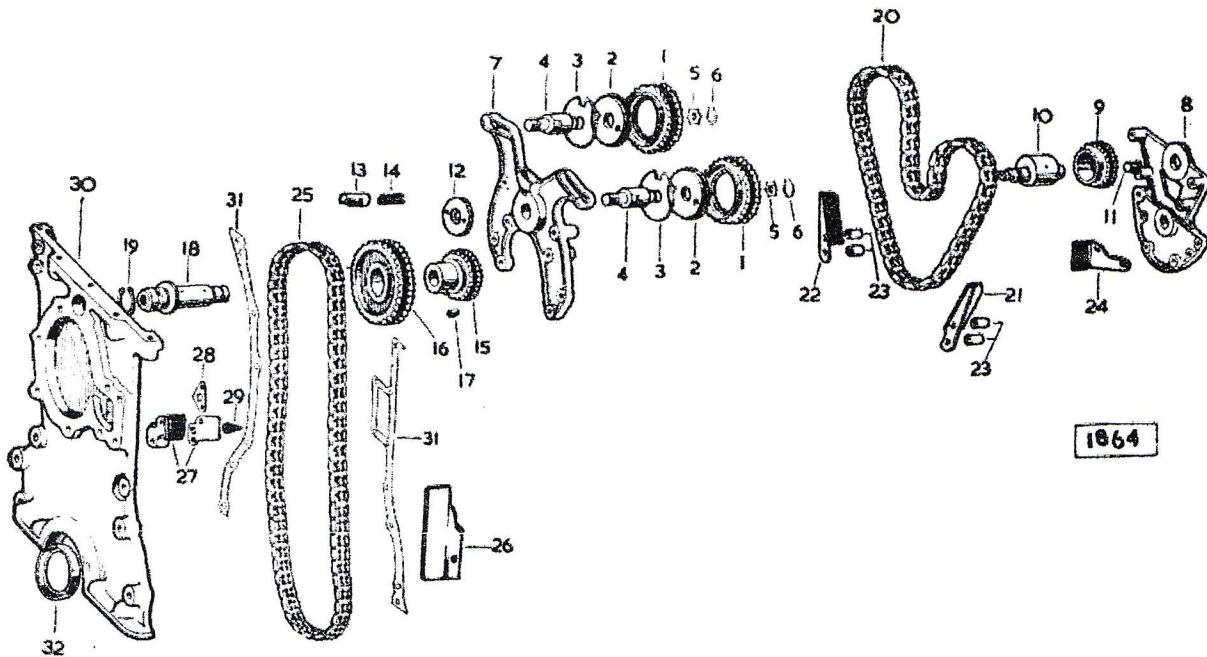
To separate the two intermediate sprockets, press the boss of the small sprocket from the bore of the large sprocket, noting that they are keyed together. (On later models the intermediate sprocket is in one piece).

OVERHAUL

If the chain shows signs of stretching or wear new ones should be fitted. Replace any sprockets and dampers that show signs of wear.

ASSEMBLING

Fit the eccentric shaft to the hole in front mounting bracket. Insert the spring and locking plunger for the serrated plate to the hole in the front mounting bracket.



- | | |
|---|--|
| 1. Camshaft sprocket | 17. Key |
| 2. Adjusting plate | 18. Shaft |
| 3. Circlip | 19. Circlip |
| 4. Guide pin | 20. Top timing chain |
| 5. Star washer | 21. Damper for top timing chain (left hand) |
| 6. Circlip | 22. Damper for top timing chain (right hand) |
| 7. Timing gear front mounting bracket | 23. Distance piece |
| 8. Timing gear rear mounting bracket | 24. Intermediate damper |
| 9. Idler sprocket | 25. Bottom timing chain |
| 10. Eccentric shaft | 26. Vibration damper |
| 11. Plug | 27. Hydraulic chain tensioner |
| 12. Adjustment plate | 28. Shim |
| 13. Plunger pin | 29. Filter gauze |
| 14. Spring | 30. Front timing cover |
| 15. Intermediate sprocket of top timing chain | 31. Gasket |
| 16. Intermediate sprocket of lower timing chain | 32. Oil seal |

Fig. 53. Exploded view of the timing gear.

Fit the serrated plate and secure with the shakeproof washer and nut. Fit the idler sprocket (21 teeth) to the eccentric shaft.

Fit the two intermediate sprockets (20 and 28 teeth) to their shaft with the larger sprocket forward and press the shaft through lower central hole in rear mounting bracket. Secure with the circlip at the rear of bracket.

Fit the top timing chain (longer chain) to the small intermediate sprocket and the bottom timing chain (shorter chain) to the large intermediate sprocket.

Loop the upper timing chain under the idler sprocket and offer up the front mounting bracket to the rear mounting bracket with the two chain dampers interposed between the brackets.

Fit the intermediate damper to the bottom of the rear mounting bracket with two screwdriver slotted setscrews and shakeproof washer.

Pass the four securing bolts through the holes in the brackets, chain dampers and spacers noting that shakeproof washers are fitted under the bolt heads. Secure the two mounting brackets together with four stud nuts and shakeproof washers.

REFITTING

Refitting the remainder of the assembly is the reverse of the removal procedure.

When refitting the timing chain tensioner refer to page B.59.

Data" or by comparison with a new valve spring.

To test against a new valve spring, insert both valve springs to end between the jaws of a vice or under a press with a flat metal plate interposed between the two springs. Apply a load to compress the springs partly and measure their comparative lengths.

When fitting valve springs to the cylinder head compress the springs using Churchill tool No. J.6118.

VALVE CLEARANCE ADJUSTMENT

When checking the valve clearances, the camshafts must be fitted one at a time as if one camshaft is rotated when the other camshaft is in position, fouling is likely to take place between the inlet and exhaust valves. Obtain and record all valve clearances by using a feeler gauge between the back of each cam and the appropriate valve tappet.

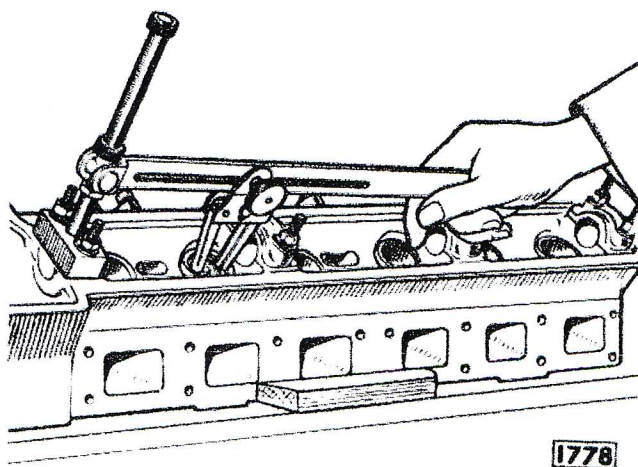


Fig. 56. Fitting the valve springs utilizing the valve spring compressing tool Churchill tool No. J.6118.

Correct valve clearances are:—

Normal Touring Use

Inlet	..	..	.004" (.10 mm.)
Exhaust	..	..	.006" (.15 mm.)

Racing

Inlet	..	..	.006" (.15 mm.)
Exhaust	..	..	.010" (.25 mm.)

Adjusting pads are available rising in .001" (.03 mm.) sizes from .085" to .110" (2.16 to 2.79 mm.) and are etched on the surface with the letter 'A' to 'Z', each letter indicating an increase in size of .001" (.03 mm.). Should any valve clearance require correction, remove the camshaft, tappet and adjusting pad. Observe the letter etched on the adjusting pad

XJ6- INLET .012-.014
EXH .012-.014

if visible. If the letter is not visible measure the pad with a micrometer and should the recorded clearance for this valve have shown say .002" (.05 mm.) excessive clearance select a new adjusting pad bearing a letter two lower than the original pad.

As an example, assume that No. 1 inlet valve clearance is tested and recorded as .007" (.18 mm.). On removal of the adjusting pad, if this is etched with the letter 'D' then substitution with a pad bearing the letter 'G' will correct the clearance for No. 1 inlet valve.

Valve Adjusting Pads

	ins.	mm.
A	.085	2.16
B	.086	2.18
C	.087	2.21
D	.088	2.23
E	.089	2.26
F	.090	2.29
G	.091	2.31
H	.092	2.34
I	.093	2.36
J	.094	2.39
K	.095	2.41
L	.096	2.44
M	.097	2.46
N	.098	2.49
O	.099	2.51
P	.100	2.54
Q	.101	2.56
R	.102	2.59
S	.103	2.62
T	.104	2.64
U	.105	2.67
V	.106	2.69
W	.107	2.72
X	.108	2.74
Y	.109	2.77
Z	.110	2.79

When fitting the camshafts prior to fitting the cylinder head to the engine it is most important that the keyway in the front bearing flange of each camshaft is perpendicular (at 90°) to the adjacent camshaft cover face before tightening down the camshaft bearing cap nuts. Tighten the camshaft bearing cap nuts to a torque of 15 lb.ft. (2.0 kgm.).

REFITTING

Before attempting to refit the cylinder head refer to the instructions given on page B.42.

