ROVER

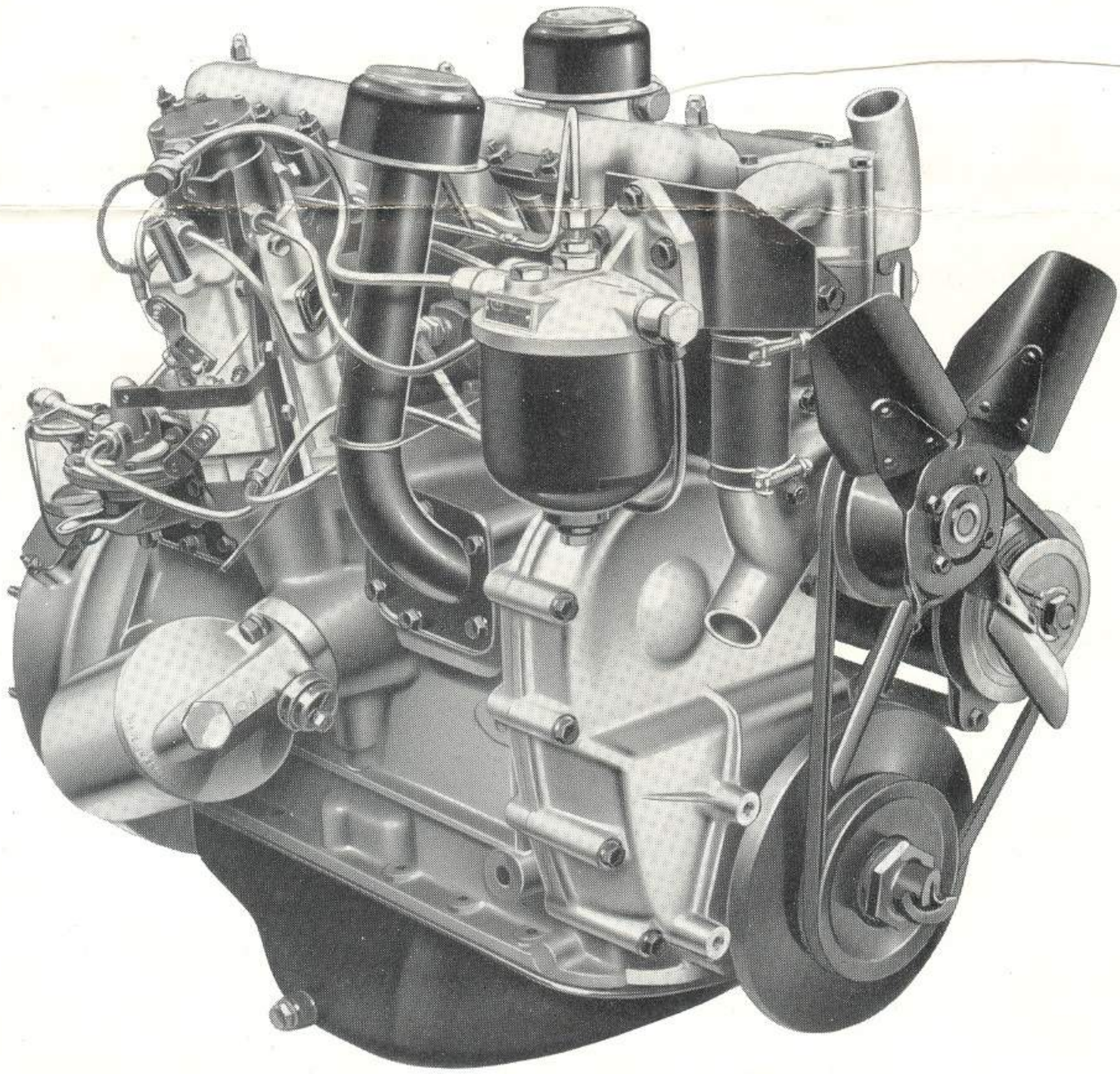
2 litre

DIESEL ENGINE

AS FITTED IN THE

LAND-ROVER

ROVER DIESEL ENGINE . . .



. . . POWERFUL, ROBUST, ECONOMICAL

THE new Rover diesel engine has been designed primarily to provide an alternative means of power for the Land-Rover, increasing its efficiency in conditions which favour diesel operation and giving it even greater universal appeal. It is a Rover product, a fact which in itself is a guarantee of sound design and outstanding workmanship, while two years of research and development by Rover engineers have given it the high standard of reliability and toughness required for service with the "World's Most Versatile Vehicle".

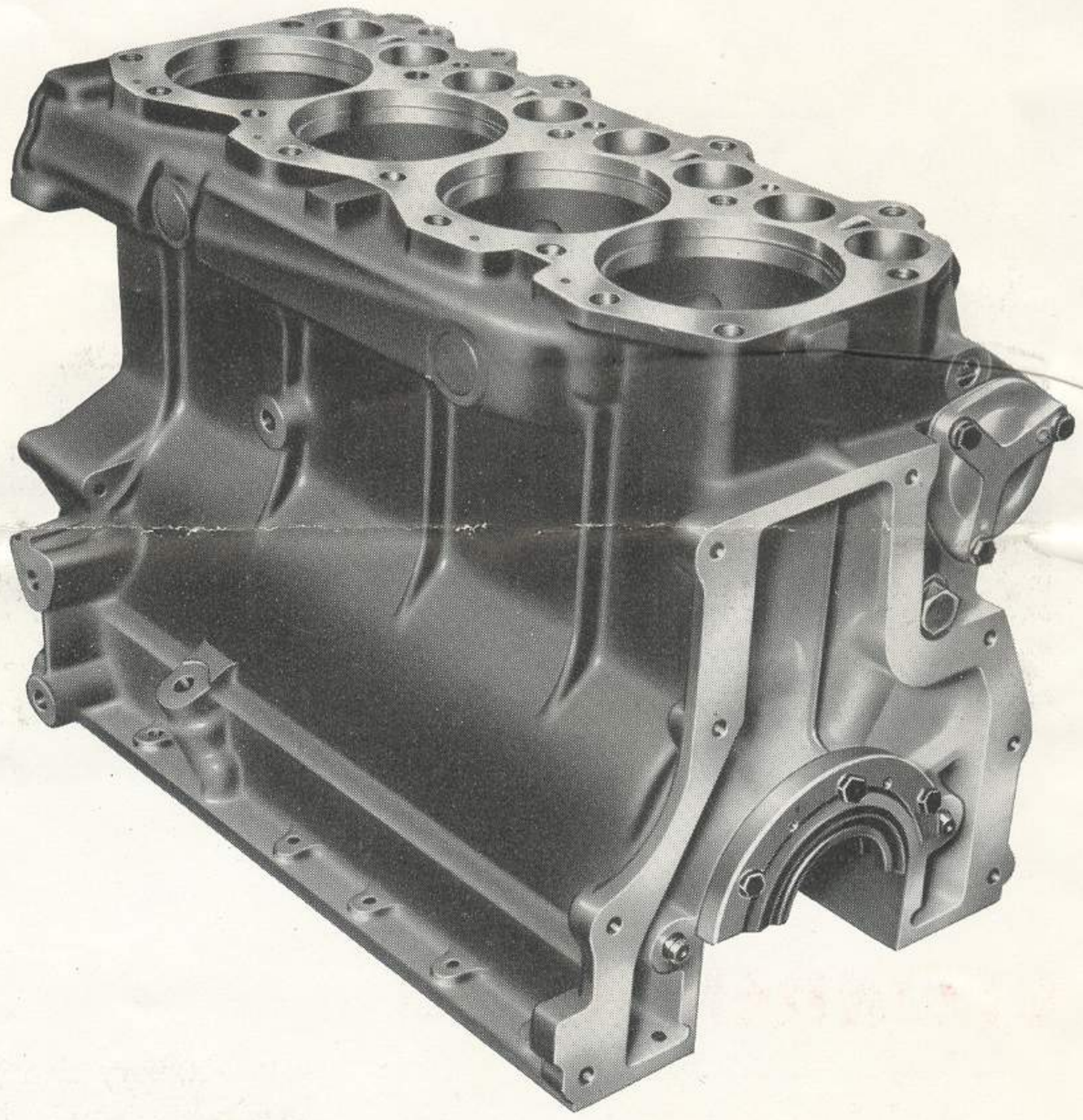
It is a rugged, four-cylinder unit of two litres capacity developing 52 b.h.p. at 3,500 r.p.m. The speed range is, in fact, very close to that of the Land-Rover petrol engine. This is an important characteristic, enabling the same transmission units to be used and permitting the interchange of engines, if desired, on 88 in. and 109 in. wheelbase models.

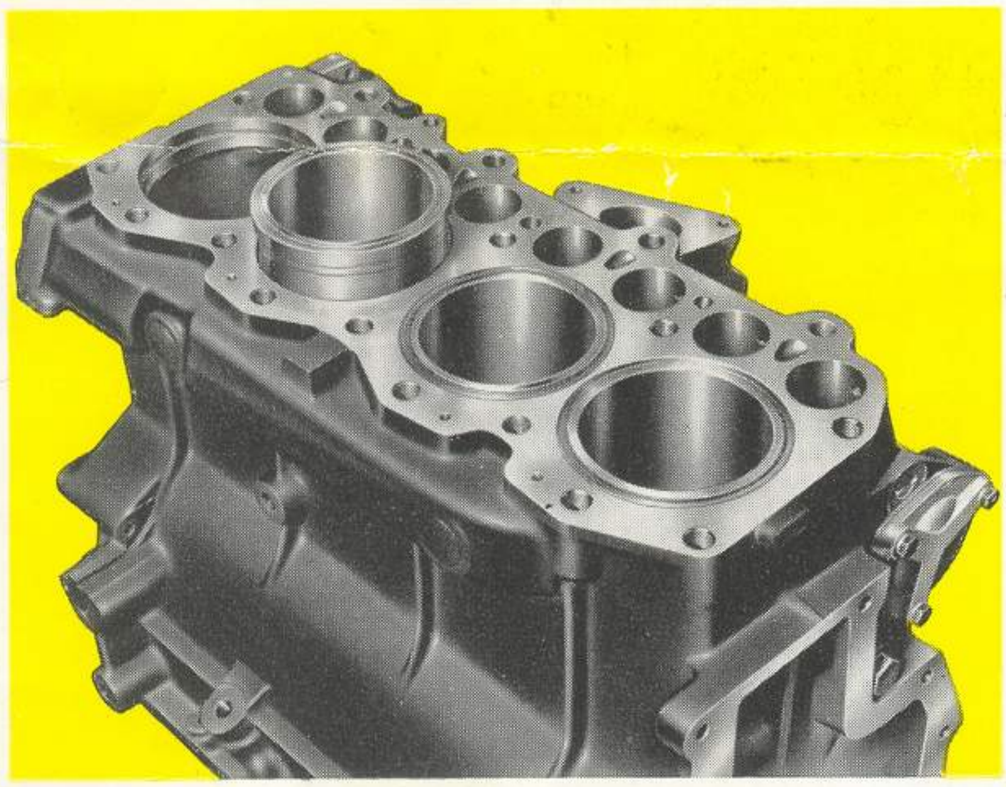
The following pages of this booklet give details of the new Rover diesel engine and show just why it is the finest, most advanced engine of its kind.

RUGGED CYLINDER BLOCK

The cylinder block is an extremely rigid casting with an integral water distribution gallery which feeds the coolant round the cylinders through four jets.

The cylinder block walls extend to below the crankshaft bearing split line to give added rigidity, while particular care has been taken in the arrangement of the cylinder head holding down bolts to ensure an efficient seal between block and head.

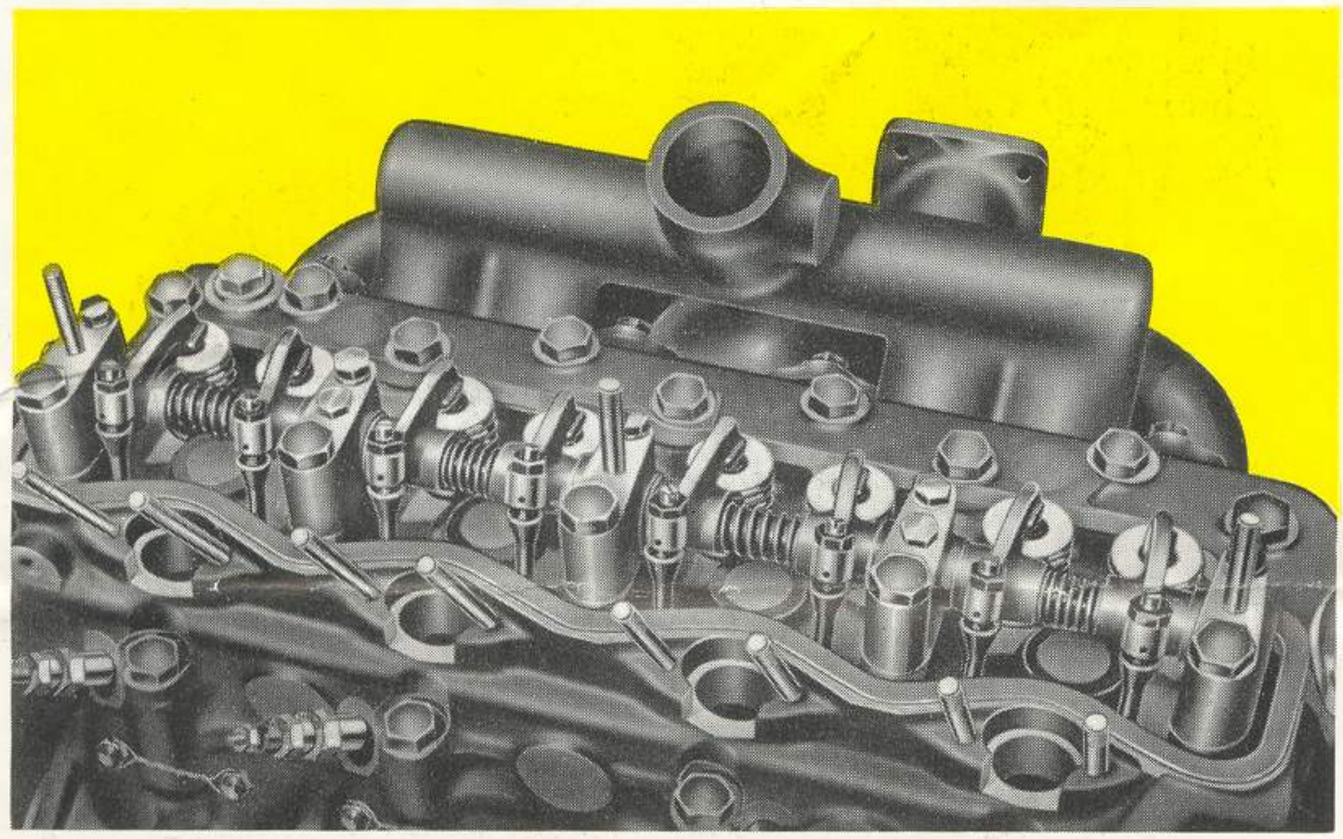




WET CYLINDER LINERS

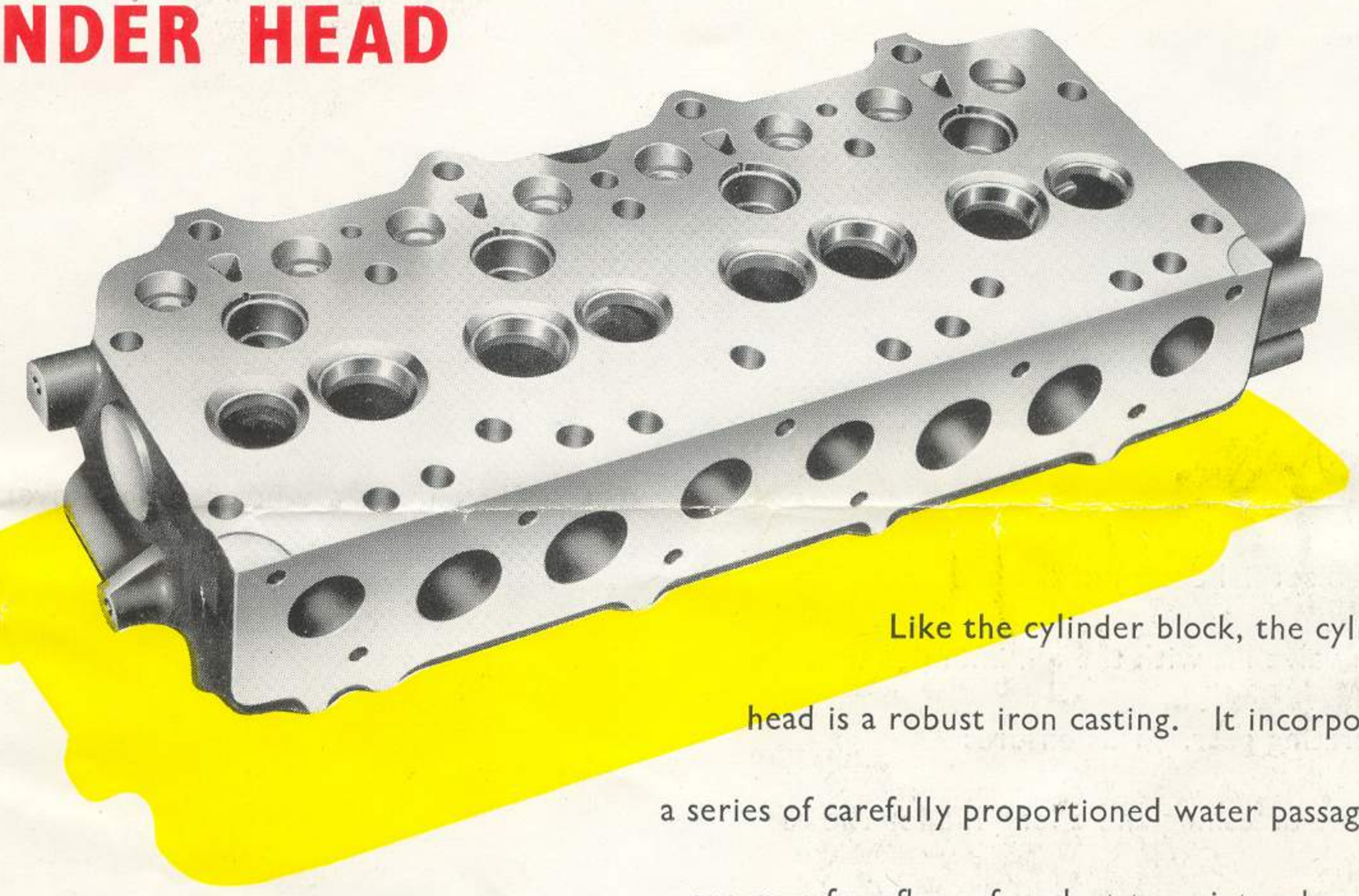
Wet cylinder liners are fitted in the Rover diesel engine. Their uniform and hard-wearing structure ensures very long life and they are accurately positioned in the cylinder block, being easily removed and replaced during overhaul.

OVERHEAD VALVES



The overhead valves are operated by push rods and rockers from a chain-driven camshaft. Valve heads are of large diameter to give the most efficient breathing and they are cooled by ample water passages between the ports. Rubber rings are fitted to all valve guides to maintain good oil sealing.

CYLINDER HEAD

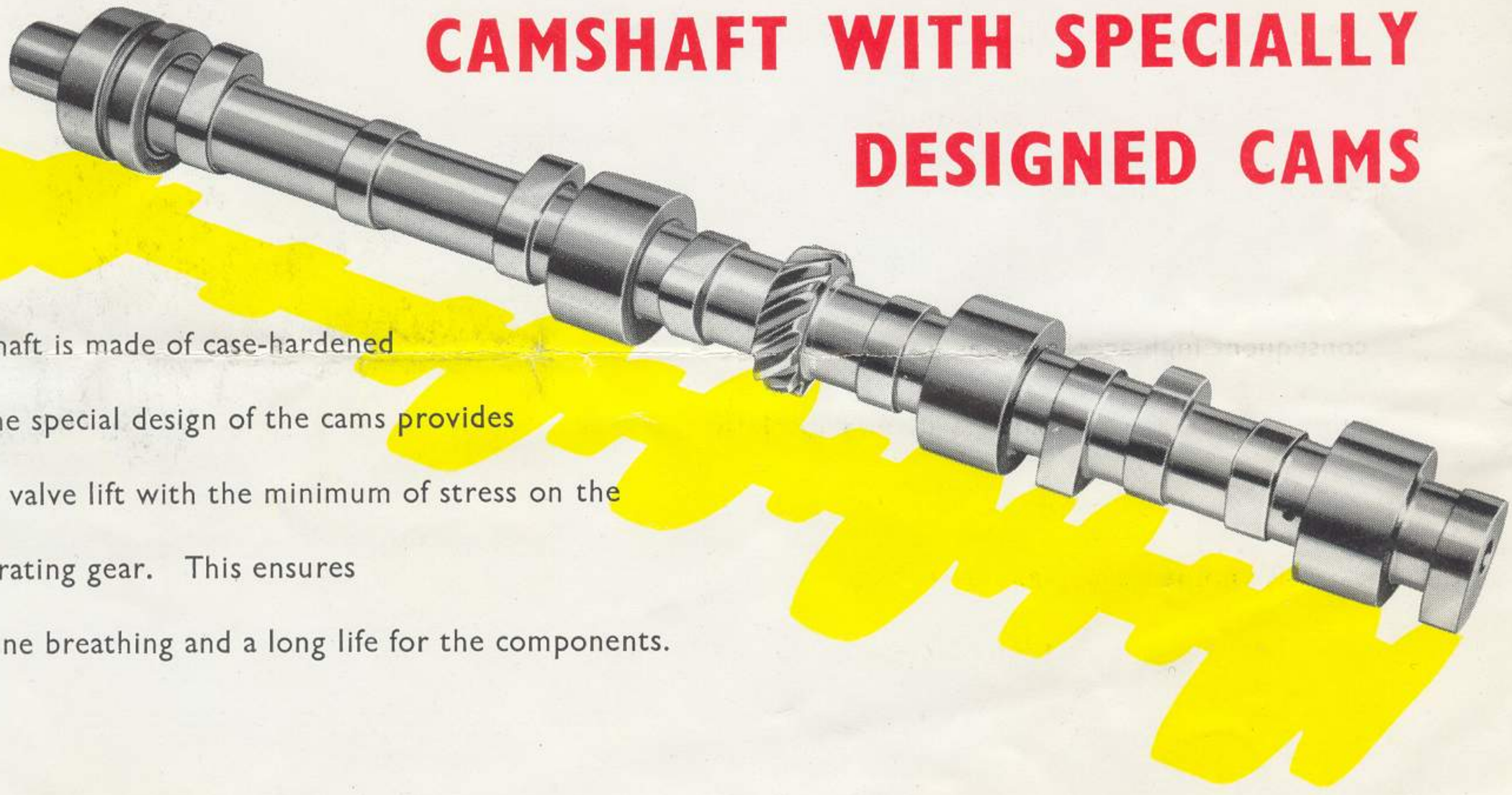


Like the cylinder block, the cylinder head is a robust iron casting. It incorporates a series of carefully proportioned water passages to ensure a free flow of coolant to points where it is most needed, i.e., round the injector pockets and between the valves.

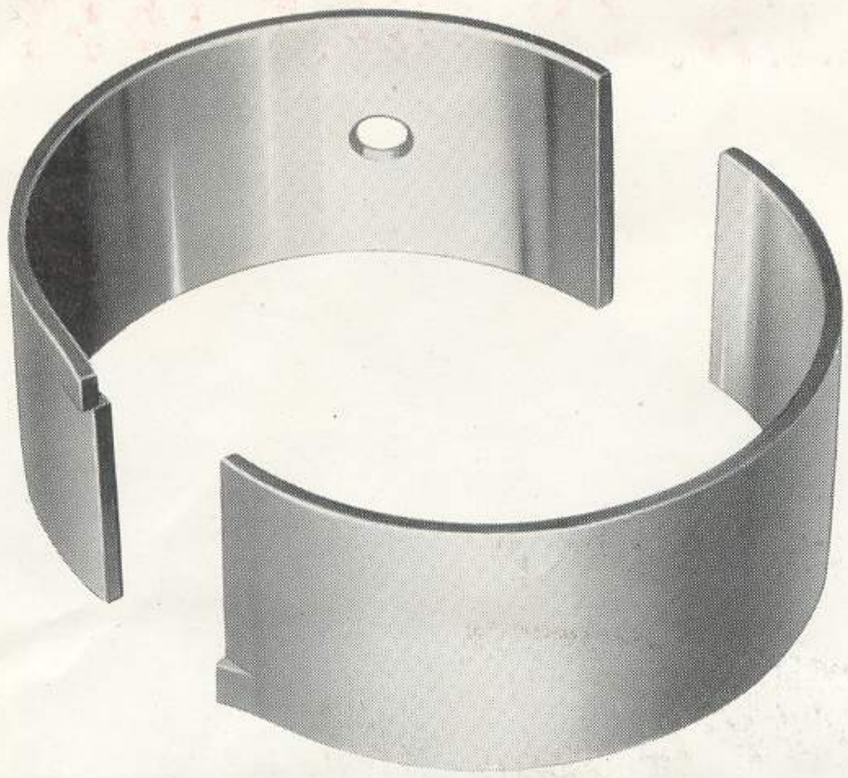
COUNTERBALANCED CRANKSHAFT

A three-bearing counter-balanced crankshaft is forged from steel machined in the hardened state. Journals and crankpins are generously proportioned to suit the high compression of the engine and give long life.

CAMSHAFT WITH SPECIALLY DESIGNED CAMS



The camshaft is made of case-hardened steel. The special design of the cams provides for a high valve lift with the minimum of stress on the valve operating gear. This ensures good engine breathing and a long life for the components.

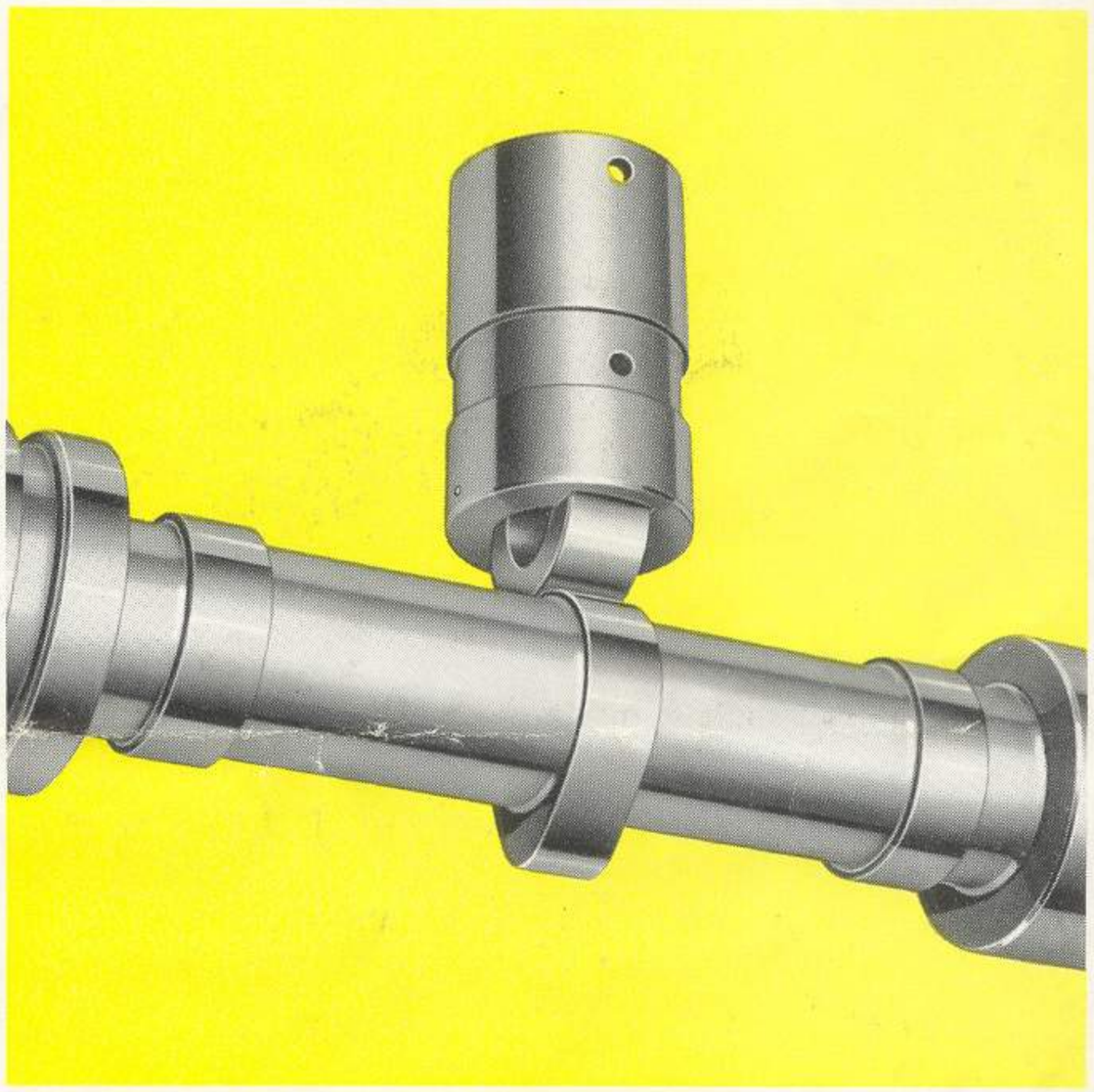


COPPER-LEAD BEARINGS

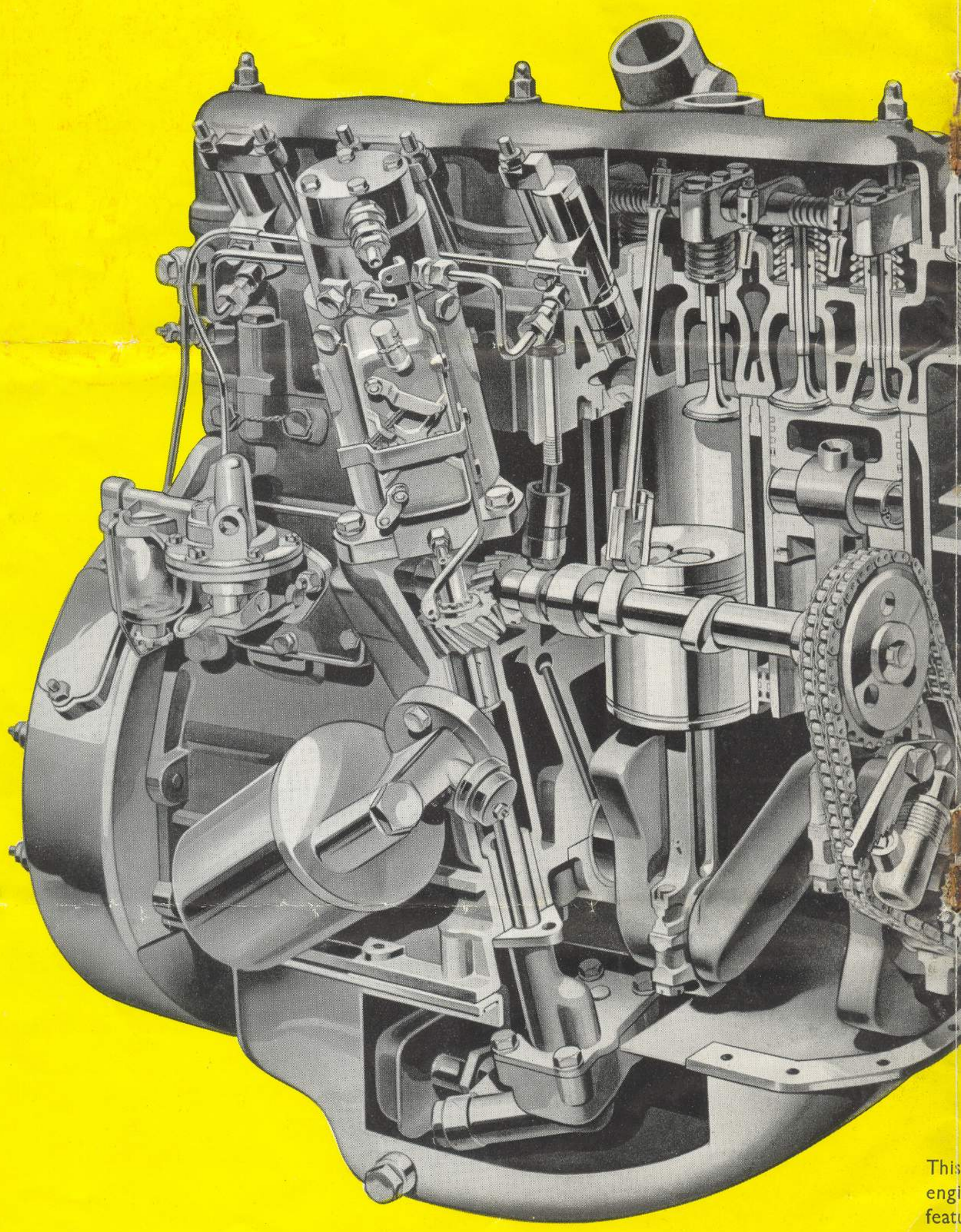
Main and big-end bearing shells are of copper-lead with tin overlay. Bearings of this type are well-known for their great lasting qualities and are, in fact, used in all Rover engines.

ROLLER-TYPE TAPPETS

One of the many interesting features of the Rover diesel engine is the novel design of the roller-type tappets. The roller which follows the cam runs in a lead tin-plated bronze shoe which in turn slides in a steel tappet guide. In this way the high valve lifts and consequent high accelerations needed for good engine breathing are obtained with the absolute minimum of wear on the cams. Here is another important contribution to the efficiency and long life of the engine.



THE ROVER 2-LITRE DIESEL



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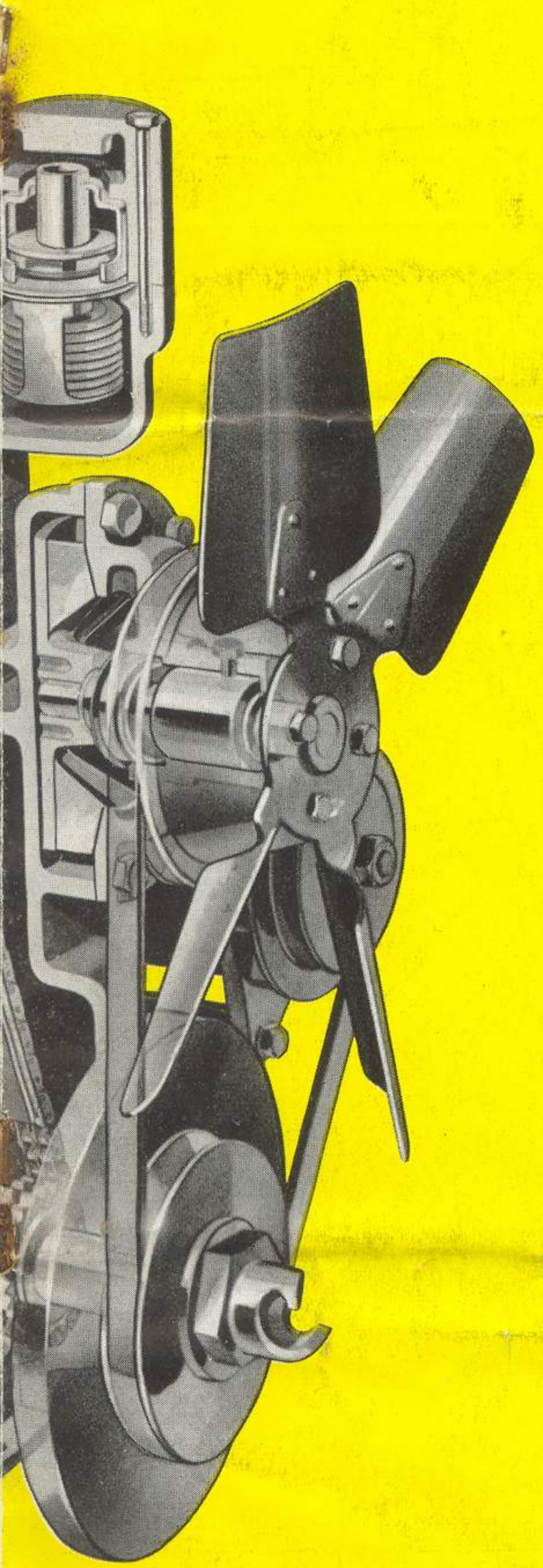
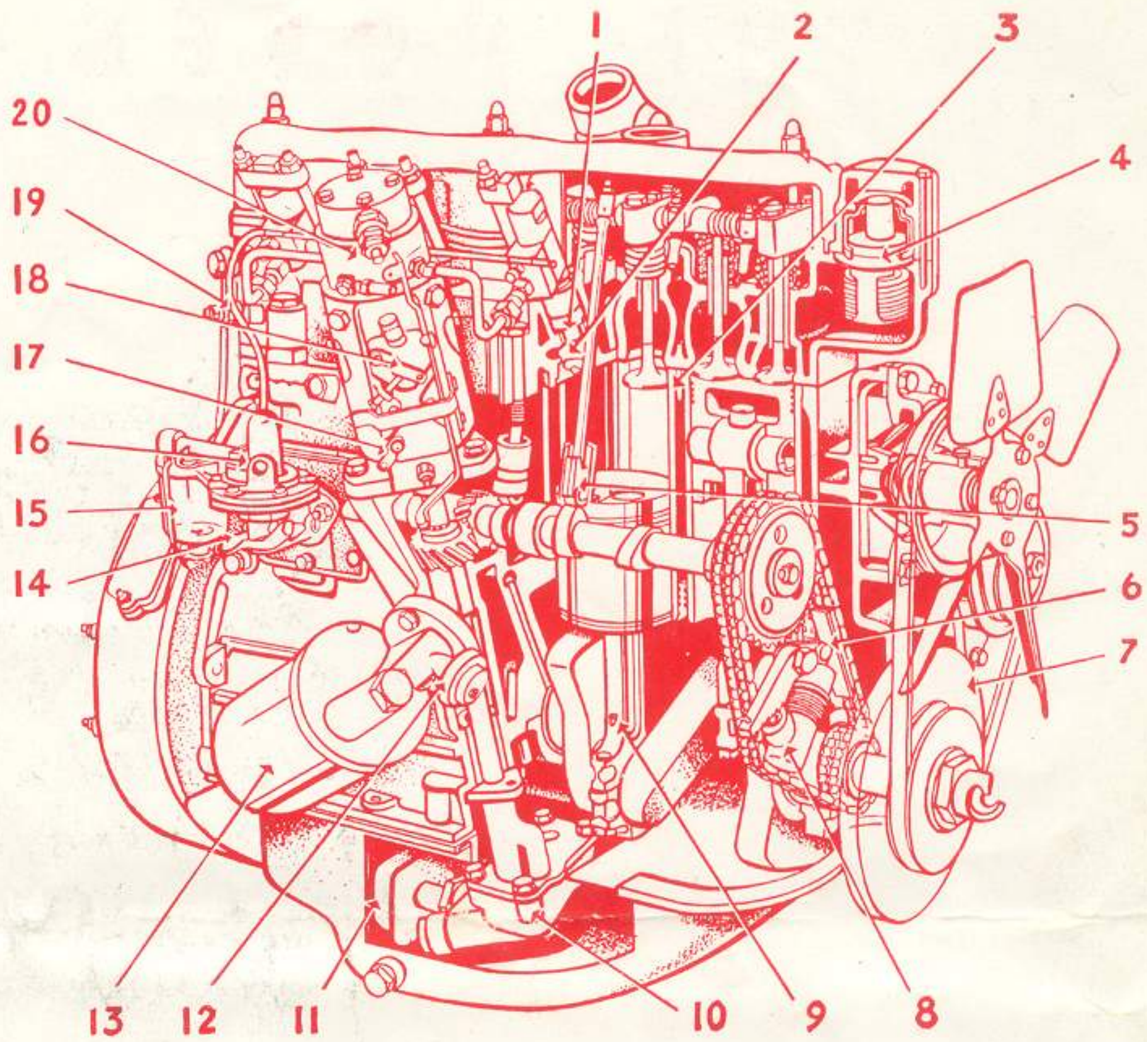


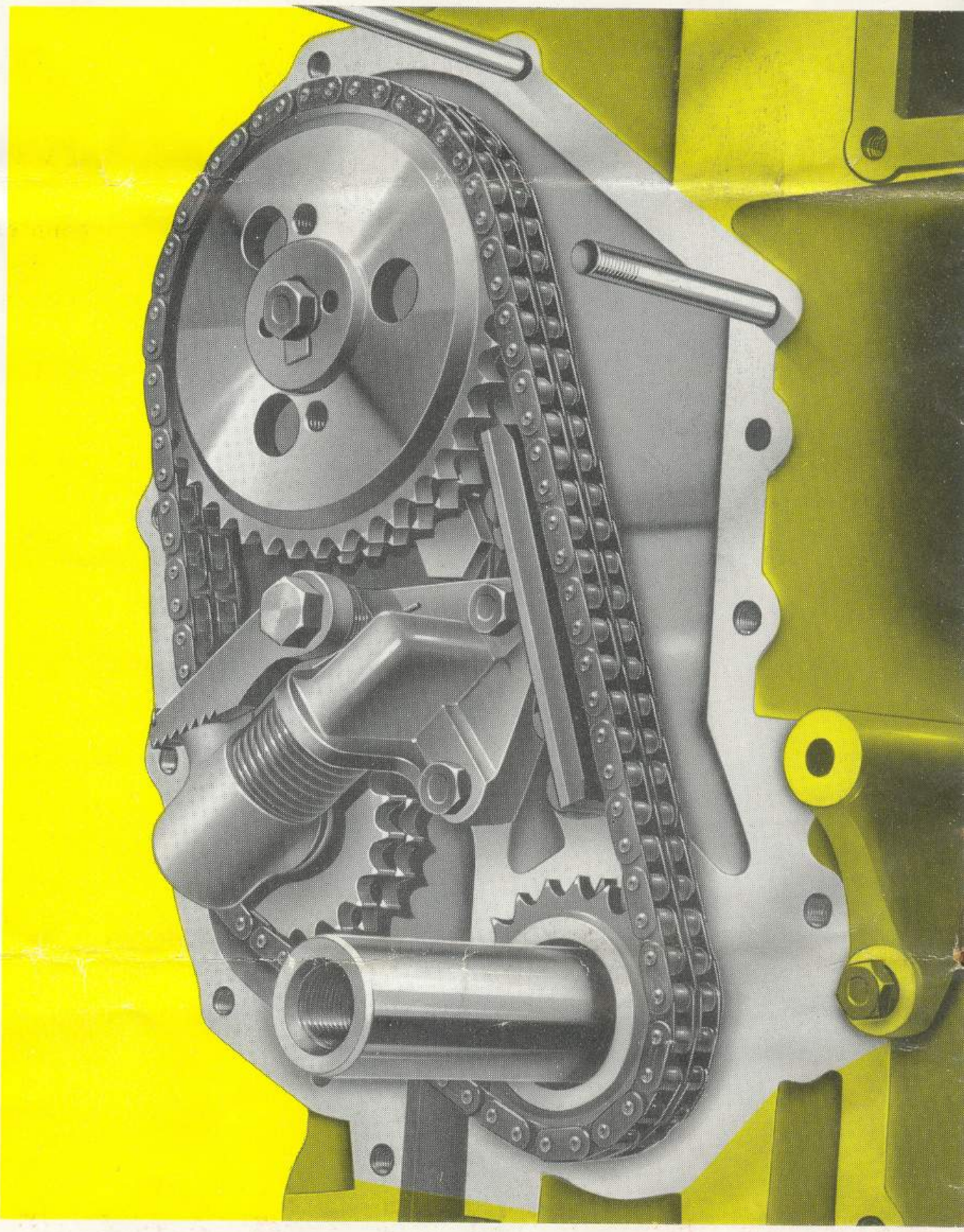
s sectional view of the Rover 2-litre diesel ine clearly shows its sturdiness and the chief ures of its construction. It is an engine of eptional refinement and advanced design, ring throughout the hallmark of Rover quality.



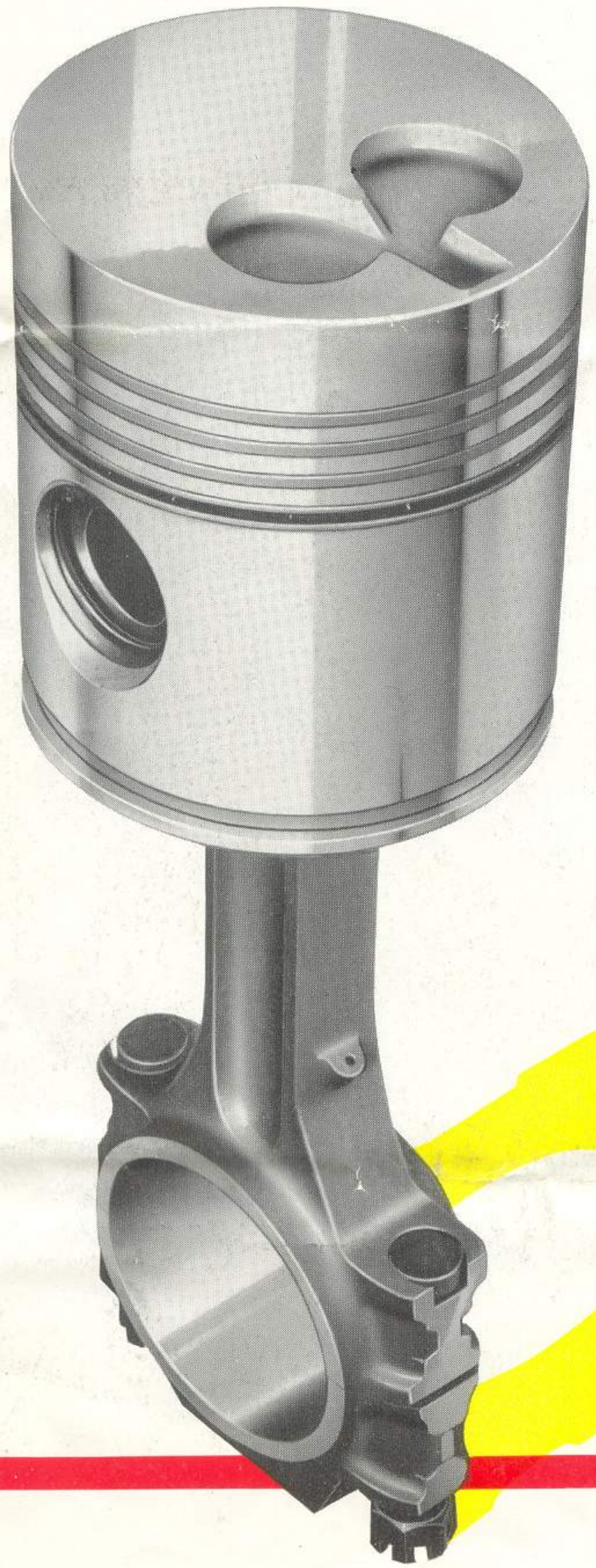
1. Pintaux Injection Nozzle.
2. Ricardo Comet V Combustion Chamber.
3. Wet Cylinder Liners.
4. By-pass Thermostat.
5. Roller Tappets.
6. Rubber Damper Pad.
7. Crankshaft Vibration Damper.
8. Hydraulic Timing Chain Tensioner.
9. Oil Jet to Cylinder Walls.
10. Oil Pump.
11. Gauze Strainer.
12. Oil Pressure Warning Light Switch.
13. Large Capacity Full-Flow Oil Filter.
14. Hand Priming Lever.
15. Sediment Bowl.
16. Fuel Lift Pump.
17. Stop Lever.
18. Accelerator Lever.
19. Glow Plugs.
20. CAV.DPA. Injection Pump with Mechanical Governor.

HYDRAULIC TIMING CHAIN TENSIONER

The camshaft is driven from the crankshaft by a Duplex roller chain on which tension is maintained by a hydraulic tensioner which is fed with oil from the engine lubricating system. It exerts pressure on the chain by means of a jockey sprocket, and ensures smooth and silent operation throughout the life of the engine. At engine idling speeds when oil pressure is low a special ratchet device keeps the tensioner in position and prevents the chain from slackening. A rubber damper pad is also fitted on the taut side of the chain to prevent whip.



PISTONS AND CONNECTING RODS

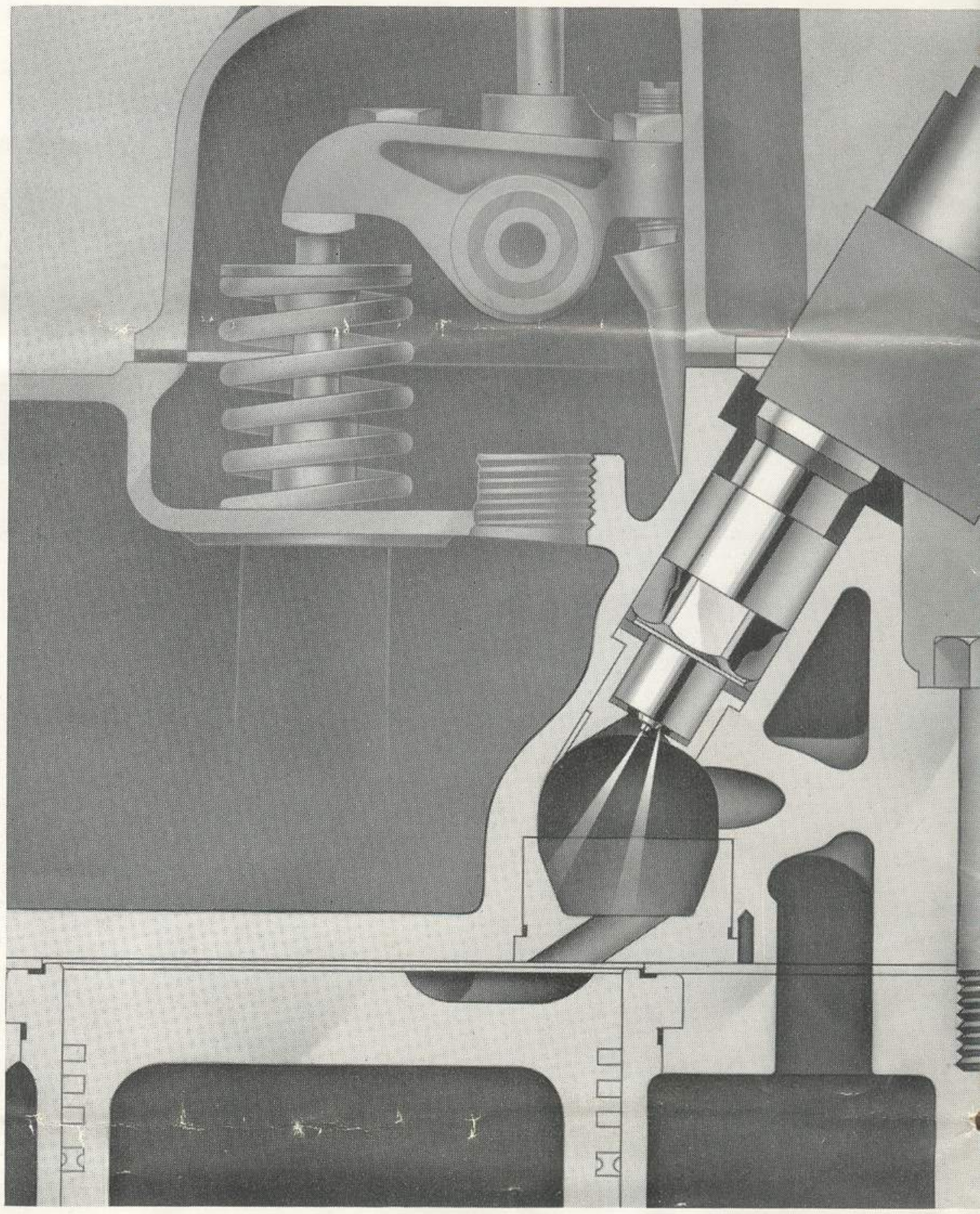


Pistons are made of low expansion aluminium alloy and have provision for three compression rings and two oil control rings. The lower oil control ring is not initially required but can be fitted at a later stage in the life of the engine to counteract any increase in oil consumption after arduous and prolonged service. The familiar recess used in conjunction with the latest Ricardo Comet combustion chamber is cast into the piston crown. Connecting rods are of forged steel and incorporate a jet hole through which oil from the big-end bearings is squirted on to the thrust side of the cylinder walls. The upper part of the big-ends is so made that pistons and connecting rods may be withdrawn upward through the cylinder bores to facilitate servicing.

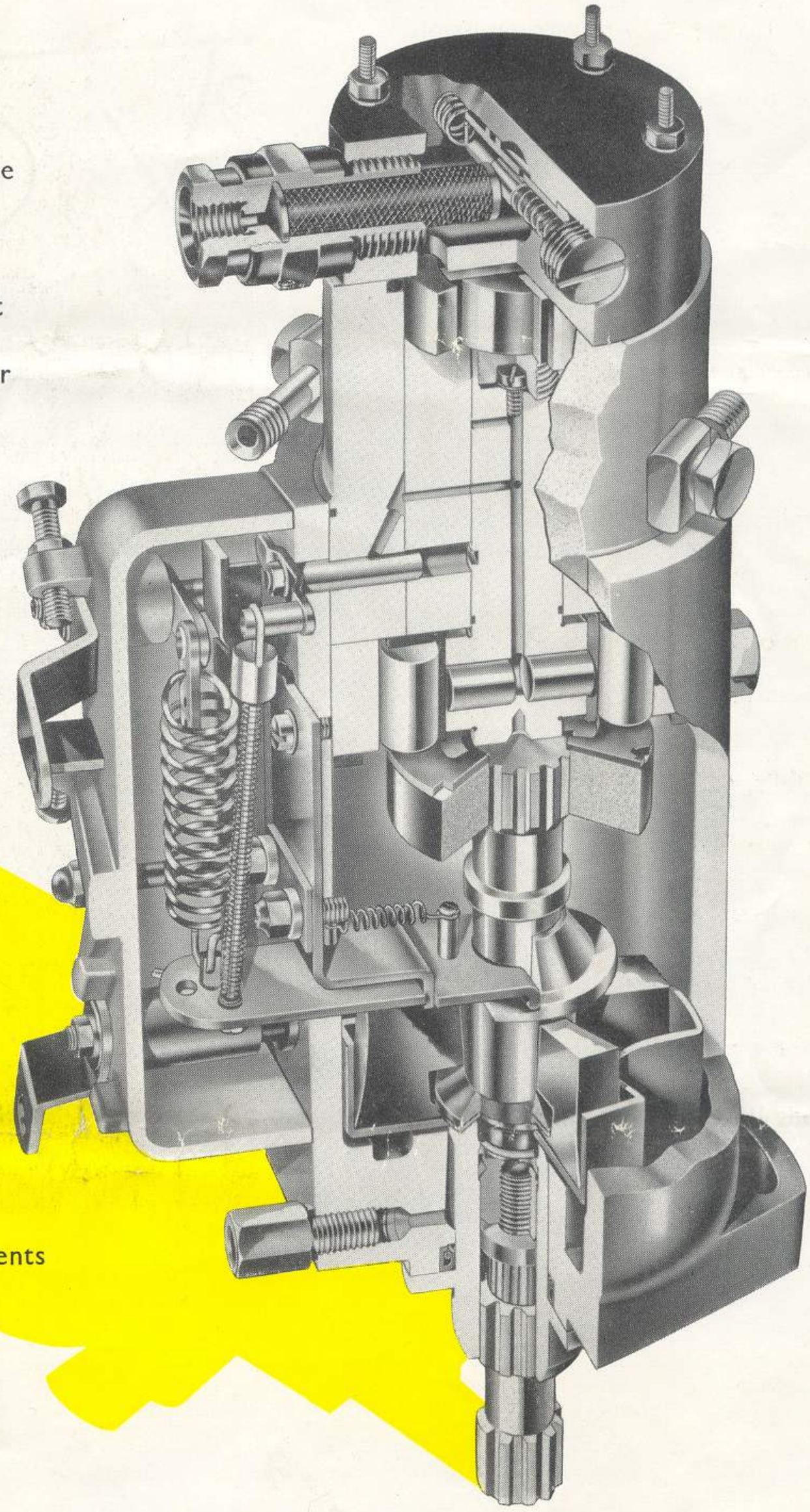
RICARDO COMET V COMBUSTION CHAMBER

The Ricardo Comet V combustion chamber is of an exceptionally efficient design which ensures the highest possible degree of air utilisation. Fuel is sprayed into the hottest zone of the compressed air in the chamber when the engine is started from cold and is directed tangentially in the direction of air swirl for normal running. This is an important feature providing for the complete combustion of the fuel/air mixture and the most economical operation of the engine.

A heat-resistant steel thimble is fitted into the injection nozzle cavity to give extra long life to the nozzle by preventing the hot gases from circulating round it.



CAV. DPA. INJECTION PUMP WITH MECHANICAL GOVERNOR

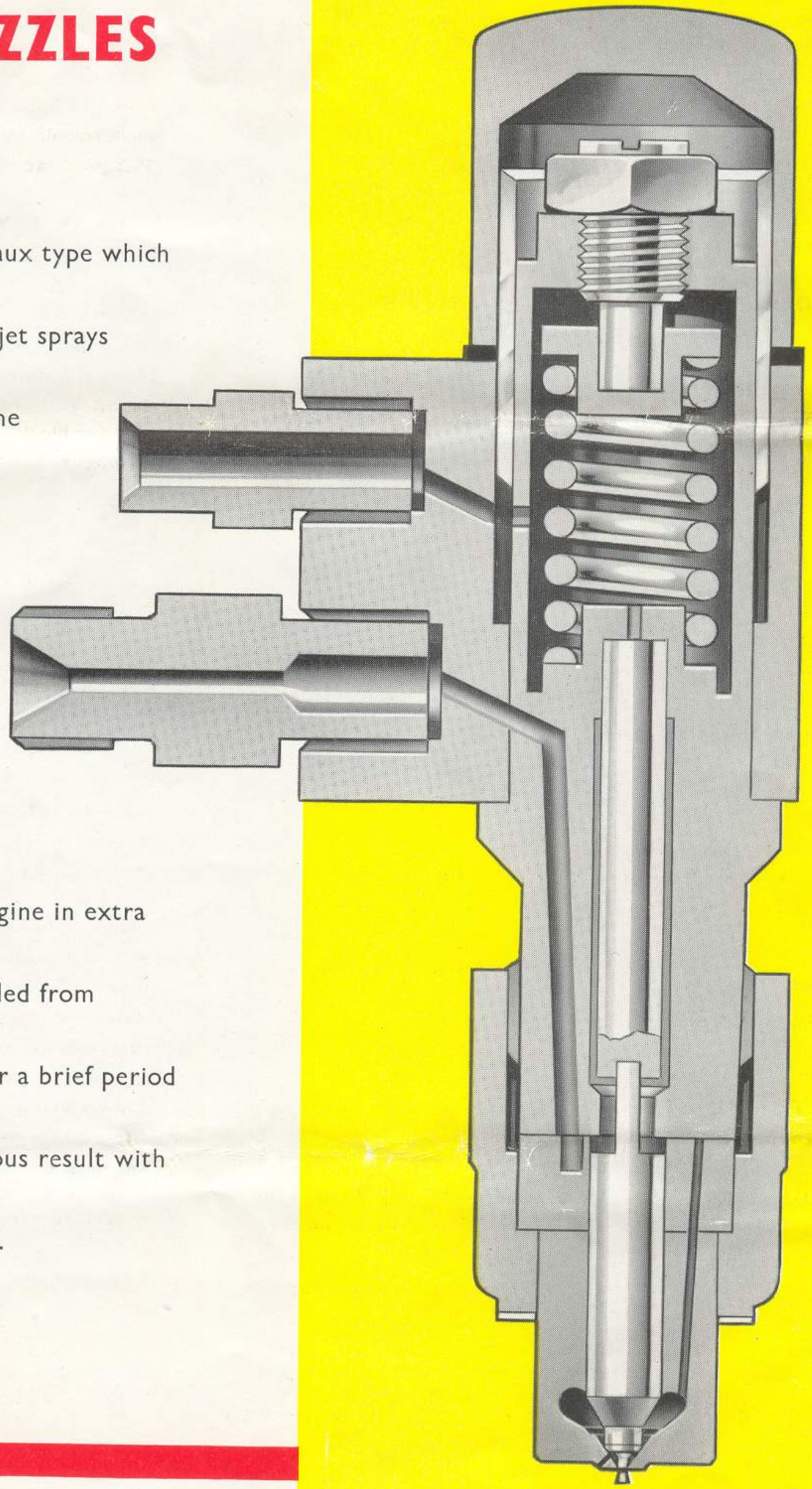


The CAV. DPA. injection pump may briefly be described as a single-cylinder, opposed plunger, inlet metering distributor pump. It incorporates an all-speed mechanical governor which operates during normal running, and in stationary work when the power take-off drives are in use.

This type of injection pump has many advantages, being compact in construction, relatively simple in design and containing no ball or roller bearings, gears or highly stressed springs. The complete pump is an air-tight unit in which pressure is maintained thus preventing the entry of dust, water or other foreign matter during operation. No special lubrication arrangements are necessary since the pump lubricates itself with the filtered fuel that it handles.

PINTAUX-TYPE INJECTION NOZZLES

Fuel injection nozzles are of the Pintaux type which incorporate two jets. The auxiliary jet sprays the fuel into the hottest portion of the combustion chamber and enables the engine to be started easily from cold. The main jet comes into operation at normal running speeds. Glow plugs are also fitted as an additional aid to starting the engine in extra low temperatures. They are controlled from the instrument panel and their use for a brief period before starting ensures an instantaneous result with the minimum of current consumption.



SPECIFICATION

GENERAL

Four cylinders, overhead inlet and exhaust valves, Bore and Stroke $3\frac{3}{8}'' \times 3\frac{1}{2}''$ (85·7mm. × 88·9mm.).
Cubic capacity 2052 c.c.
B.H.P. (max.) 52 at 3,500 r.p.m.
Torque (max.) 87 lb./ft. at 2,000 r.p.m.
Compression Ratio 19·5 : 1.

CYLINDERS. Wet cast iron liners.

CYLINDER HEAD. Detachable, cast iron carrying all valve gear. Ricardo Comet V combustion chambers.

VALVE OPERATION. By rockers, solid push rods and roller cam followers.

CRANKSHAFT. Forged steel. Fully balanced and with counterweights.

MAIN BEARINGS. Three, thin shell, steel backed, copper-lead. Thrust taken at centre bearing.

CAMSHAFT. Forged steel. Four bearings of wrap round white metal on steel backing. Drive by duplex roller chain. Chain tension maintained by self-adjusting jockey sprocket controlled by coil compression spring and oil pressure.

TAPPETS. Hardened steel rollers running in lead tin plated bronze shoes.

PISTONS. Low expansion aluminium alloy, tin plated with Ricardo Comet recesses cast in the crown. One parallel faced chrome compression ring. Two taper faced iron compression rings. One slotted scraper ring. Fully floating gudgeon pins.

VALVES. Exhaust. XB Steel bright ray faced.
Inlet. Silchrome No. 1 Steel.

CONNECTING RODS. Forged steel with thin shell steel backed copper-lead big-end bearings.

LUBRICATION. By submerged gear type pump driven from camshaft. Oil delivered to main, big-end and camshaft bearings and to tappet gallery under a running pressure of 50–60 lb./sq. in. Rocker shaft and rockers lubricated by external pipe from the camshaft bearing oil gallery. Gauze pump intake filter in the sump ; removable full flow external oil filter.
Oil Filler. Tube from front camshaft housing side cover plate incorporating oil wetted breather. Similar breather fitted to valve rocker cover.
Sump capacity. 11 pints. Level determined by dipstick.

COOLING SYSTEM. Pump operated and by-pass thermostat controlled. Water gallery cast on the side of the cylinder block directs water between the liners, it is then routed up to the head where it passes round injector and combustion chamber bosses. From here the water is directed through tube inserts which squirt the water between the portings.
Pump. Centrifugal type, belt driven, mounted on front end of cylinder block.
Radiator. Film block type.
Fan. Four bladed (fabricated). Mounted on water pump spindle and both driven by common belt. Belt tensioned by pivot mounted dynamo method.
Thermostat. A.C. bellows type by-pass.
Capacity of system. $15\frac{1}{2}$ pints.

INDUCTION SYSTEM. Separate induction manifold.

AIR CLEANER and SILENCER. A.C. large capacity oil bath type.

EXHAUST SYSTEM

Silencer. Flexibly mounted transversely behind rear axle.
Tail pipe. Integral with silencer.

FUEL SYSTEM

Fuel lift pump. A.C. mechanical, driven off eccentric on camshaft.
Fuel filter. CAV F4/1 paper element type with air bleed.
Injection pump. CAV DPA type with mechanical governor.
Injector nozzles. Pintaux type.
Combustion chambers. Ricardo Comet V.
Glow plugs for cold starting. K.L.G. 14mm., 17V., 38A., 2-P. operated by press button on starting lever.

ENGINE UNIT MOUNTING. Flexibly mounted on bonded rubber at four points, two at front of crankcase and two on transfer box.

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ROVER

DIESEL