

workshop manual for **4.154** diesel engines

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This publication is written for world-wide use. In territories where legal requirements govern smoke emission, noise, safety factors etc., then all instructions, data and dimensions given must be applied in such a way that, after servicing, (preventive maintenance) or repairing an engine, it does not contravene the local regulations when in use.

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SAFETY PRECAUTIONS

THESE SAFETY PRECAUTIONS ARE IMPORTANT. You must refer also to the local regulations in the country of use. Some items only apply to specific applications.

- Only use these engines in the type of application for which they have been designed.
- Do not change the specification of the engine.
- Do not smoke when you put fuel in the tank.
- Clean away fuel which has been spilt. Material which has been contaminated by fuel must be moved to a safe place.
- Do not put fuel in the tank while the engine runs (unless it is absolutely necessary).
- Do not clean, add lubricating oil, or adjust the engine while it runs (unless you have had the correct training; even then extreme caution must be used to prevent injury).
- Do not make adjustments that you do not understand.
- Ensure that the engine does not run in a location where it can cause a concentration of toxic emissions.
- Other persons must be kept at a safe distance while the engine, or equipment, is in operation.
- Do not permit loose clothing or long hair near moving parts.
- Keep away from moving parts during engine operation. Attention: Some moving parts cannot be seen clearly while the engine runs.
- Do not operate the engine if a safety guard has been removed.
- Do not remove the filler cap of the cooling system while the engine is hot and while the coolant is under pressure, because dangerous hot coolant can be discharged.
- Do not use salt water or any other coolant which can cause corrosion in the closed coolant circuit.



- Do not allow sparks or fire near the batteries (especially when the batteries are on charge) because the gases from the electrolyte are highly flammable. The battery fluid is dangerous to the skin and especially to the eyes.
- Disconnect the battery terminals before a repair is made to the electrical system.
- Only one person must control the engine.
- Ensure that the engine is operated only from the control panel or from the operator's position.
- If your skin comes into contact with high-pressure fuel, obtain medical assistance immediately.
- Diesel fuel and lubricating oil (especially used lubricating oil) can damage the skin of certain persons. Protect your hands with gloves or a special solution to protect the skin.
- Do not wear clothing which is contaminated by lubricating oil. Do not put material which is contaminated with oil into the pockets.
- Discard used lubricating oil in a safe place to prevent contamination.
- Do not remove mobile equipment if the brakes are not in good condition.
- Ensure that the control lever of the transmission drive is in the "out-of-drive" position before the engine is started.
- Use extreme care if emergency repairs must be made at sea or in adverse conditions.
- The combustible material of some components of the engine (for example certain seals) can become extremely dangerous if it is burned. Never allow this burnt material to come into contact with the skin or with the eyes.
- Read and use the instructions relevant to asbestos joints.
- Fit only genuine Perkins parts.

ASBESTOS JOINTS

Some joints and gaskets contain compressed asbestos fibres in a rubber compound or in a metal outer cover. The "white" asbestos (Chrysotile) which is used is a safer type of asbestos and the risk of damage to health is extremely small.

The risk of asbestos from joints occurs at their edges or if a joint is damaged when a component is removed or if a joint is removed by abrasion.

To ensure that the risk is kept to a minimum, the procedures given below must be applied when an engine which has asbestos joints is dismantled or assembled.

- Work in an area with good ventilation.
- Do not smoke.
- Use a hand scraper to remove the joints—do not use a rotary wire brush.
- Ensure that the joint to be removed is wet with oil or water to contain loose particles.
- Spray all loose asbestos debris with water and put it in a closed container which can be sealed for safe disposal.



POWERPART Consumable Products

Perkins have made available the products indicated below in order to assist in the correct operation, service and maintenance of your engine and your machine.

The instructions for the use of each product are given on the outside of each container.

These products are available from your Perkins distributor.

POWERPART Antifreeze

Protects the cooling system against frost and corrosion. See page A.8.

POWERPART De-Icer

Removes frost.

POWERPART Easy Flush

Cleans the cooling system.

POWERPART Easy Seal

Stops leakages from the cooling system.

POWERPART Foam Action Gasket Remover

Allows easy and rapid removal of old gaskets and joints.

POWERPART Hylomar

Universal jointing compound which seals joints.

POWERPART Hylosil

Silicone rubber sealant which prevents leakage through gaps.

POWERPART Lay-Up 1

A diesel fuel additive for protection against corrosion. See page A.8.

POWERPART Lay-Up 2

Protects the inside of the engine and of other closed systems. See page A.8.

POWERPART Lay-Up 3

Protects outside metal parts. See page A.8.

POWERPART Moisture Dispersant and Rust Penetrant

Dries damp equipment and gives protection against corrosion. Passes through dirt and corrosion to lubricate and to assist removal of components.

POWERPART Retaining Compound

Retains components which have a transition or an interface fit, for example, pulleys, bushes etc..

POWERPART Studlock

Secures threaded fasteners. Recommended for fasteners which, normally, are not removed.

POWERPART Threadseal

Seals threads and pipe connections. Low pressure systems can be used immediately.

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FOREWORD

This Workshop Manual has been compiled for use in conjunction with normal workshop practice. Mention of certain accepted practices therefore, have been omitted in order to avoid repetition. Where the removal, dismantling, assembly or refitting of a part is straightforward it is omitted from the text. Similarly, references to renewing joints, cleaning joint faces, cleaning before inspection and re-assembly and removal of burrs and scale have largely been omitted, it being understood that these procedures will be carried out where applicable. It follows that any open ports of high precision components, e.g. fuel injection equipment, exposed by dismantling, will be blanked off until re-assembled, to prevent the ingress of foreign matter. The difference between the minimum and maximum dimensions which are given in the Manufacturing Data and Dimensions for the relevant component parts quoted in each of the sections in this manual is known as "the manufacturing tolerance". This tolerance is necessary as an aid to manufacture and its numerical value is an expression of the accuracy of the desired quality of workmanship.

If when carrying out a major overhaul it is found that a bush and corresponding shaft have worn and that the majority of wear has taken place in the bush it may be necessary to renew the bush only; however, good workshop practice will ensure that consideration will be given as to the advisability of returning worn parts to service with an expectation of life that will involve labour costs at an early date.

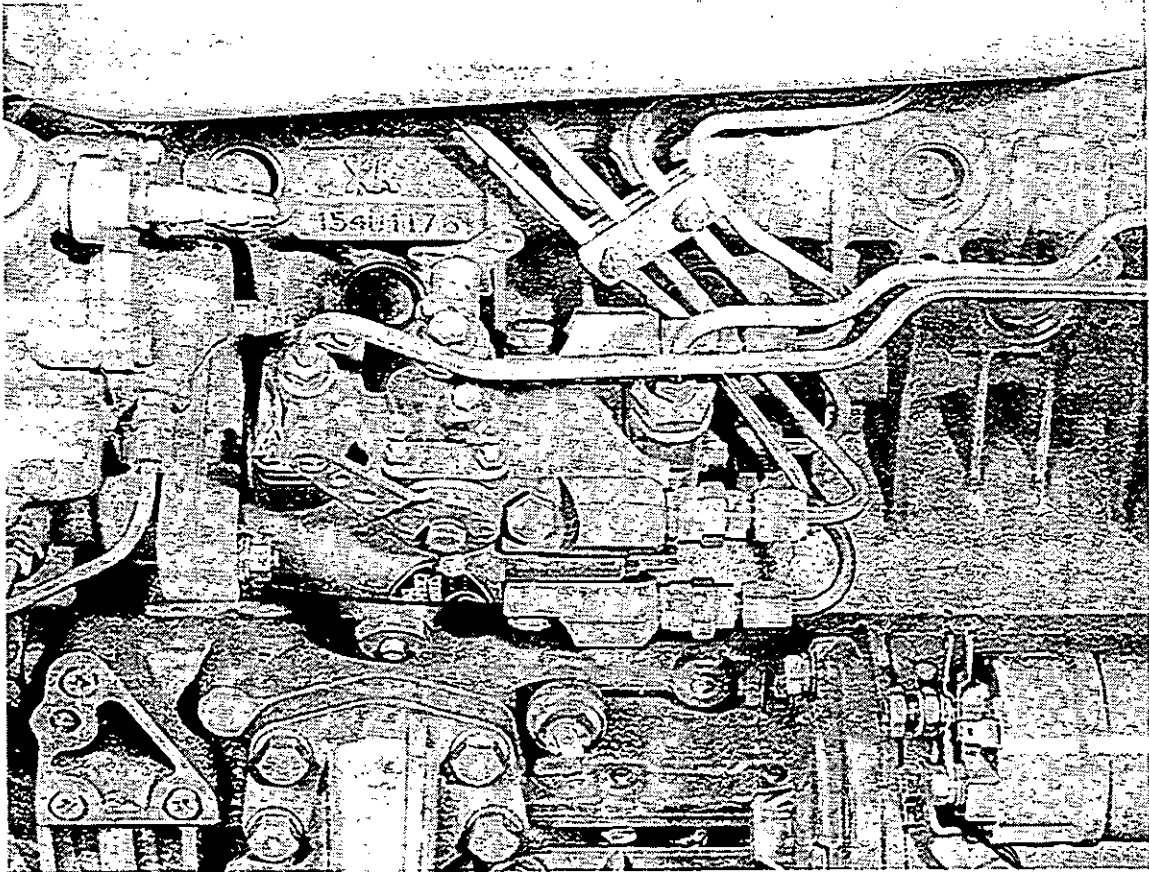
When setscrews or studs are fitted into holes which are tapped through into the inside of the engine, a suitable sealant must be used on the threads.

Throughout this manual, whenever the "left" or "right" hand side of the engine is referred to, it is that side as viewed from the rear or fly-wheel end of the engine.

Unified Threads and Engine Number Location

All THREADS used on the 4.154 engine excepting proprietary equipment are Unified Series and American Pipe Series.

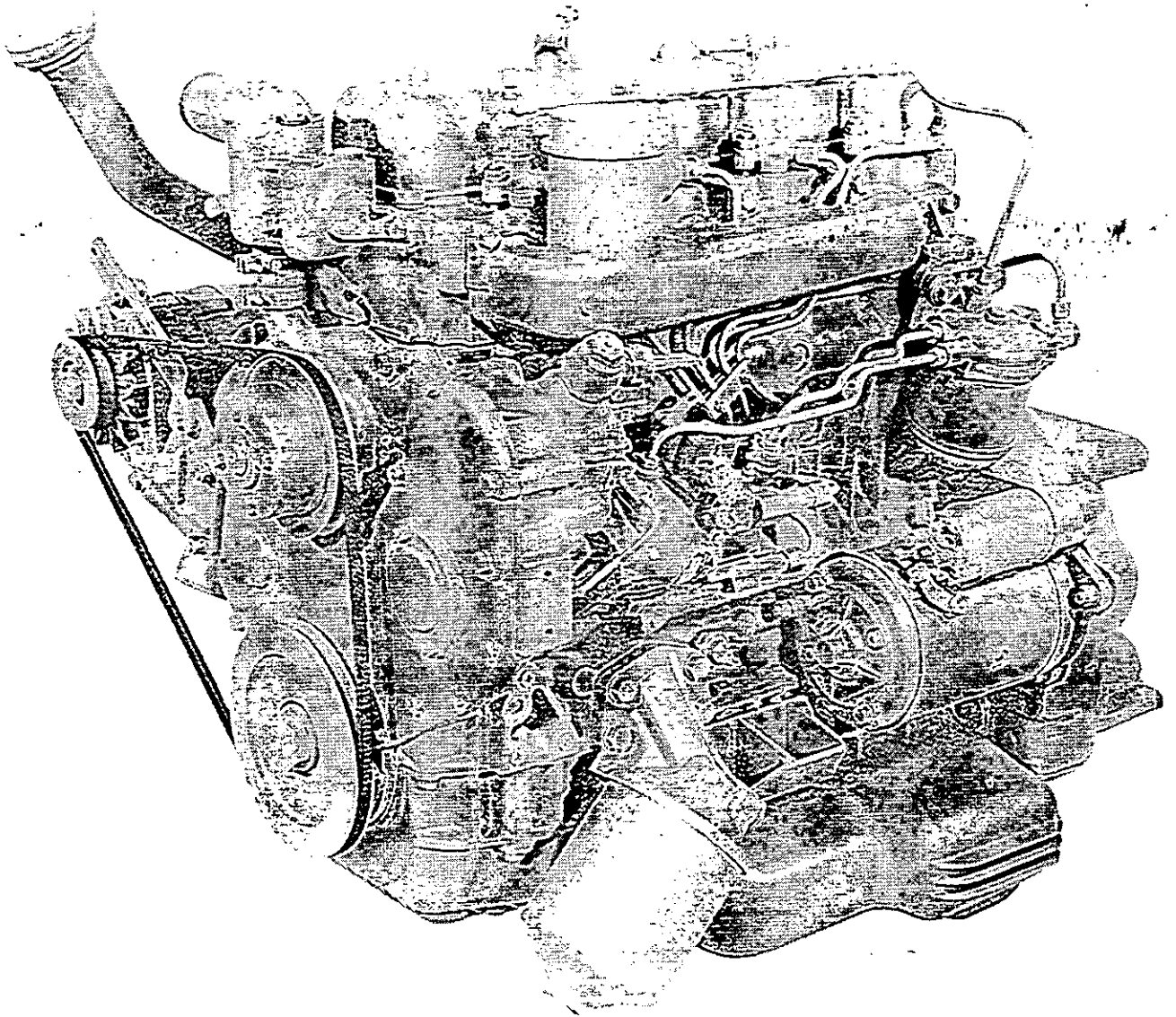
The ENGINE NUMBER is located on the cylinder block immediately behind the fuel pump. This number should be quoted in full when seeking information or ordering parts. The engine number consists of both letters and figures. A typical example for current engines is GA13870U510256D and for earlier engines, 154U251.



Location of Engine Number

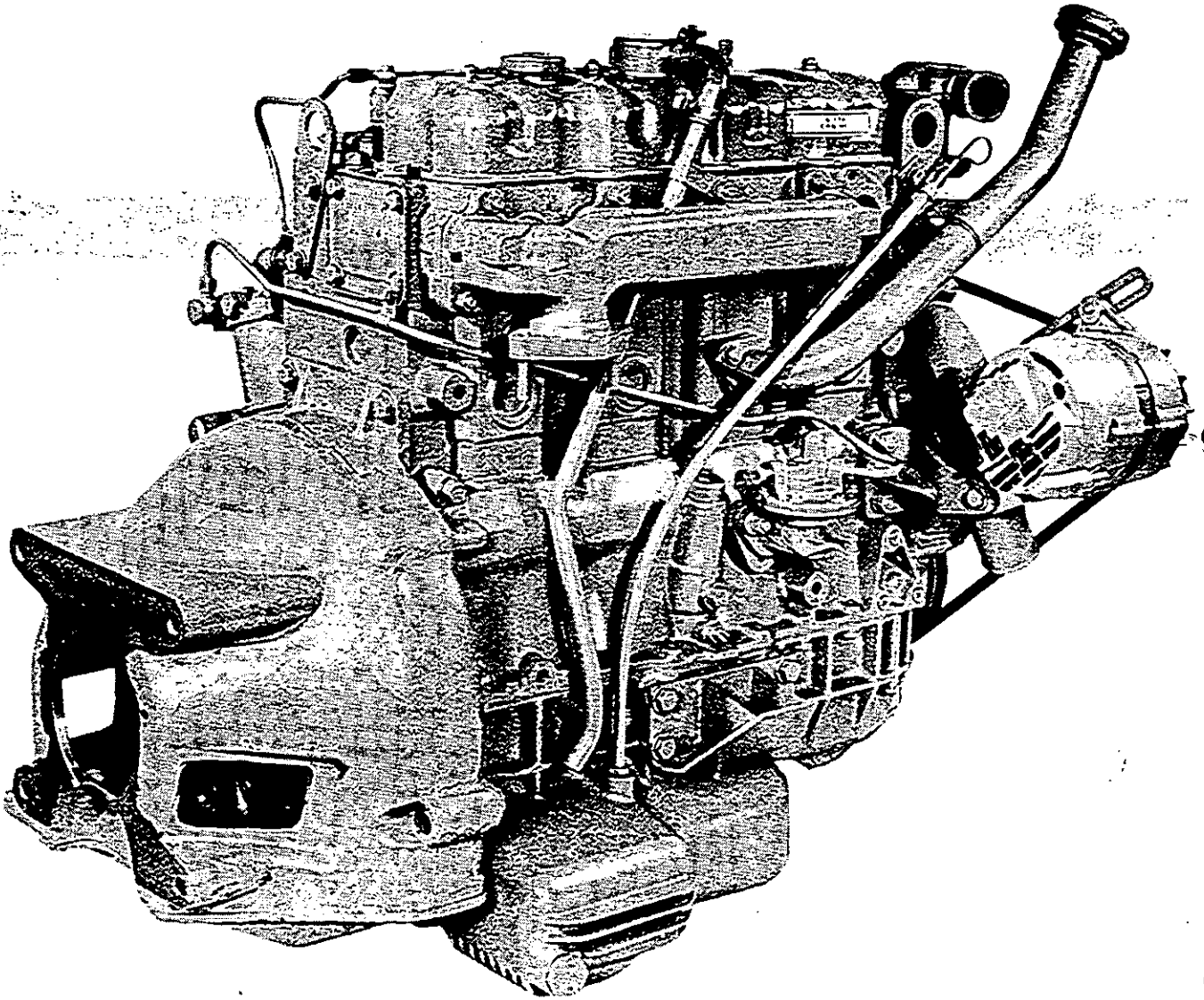
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ENGINE VIEWS

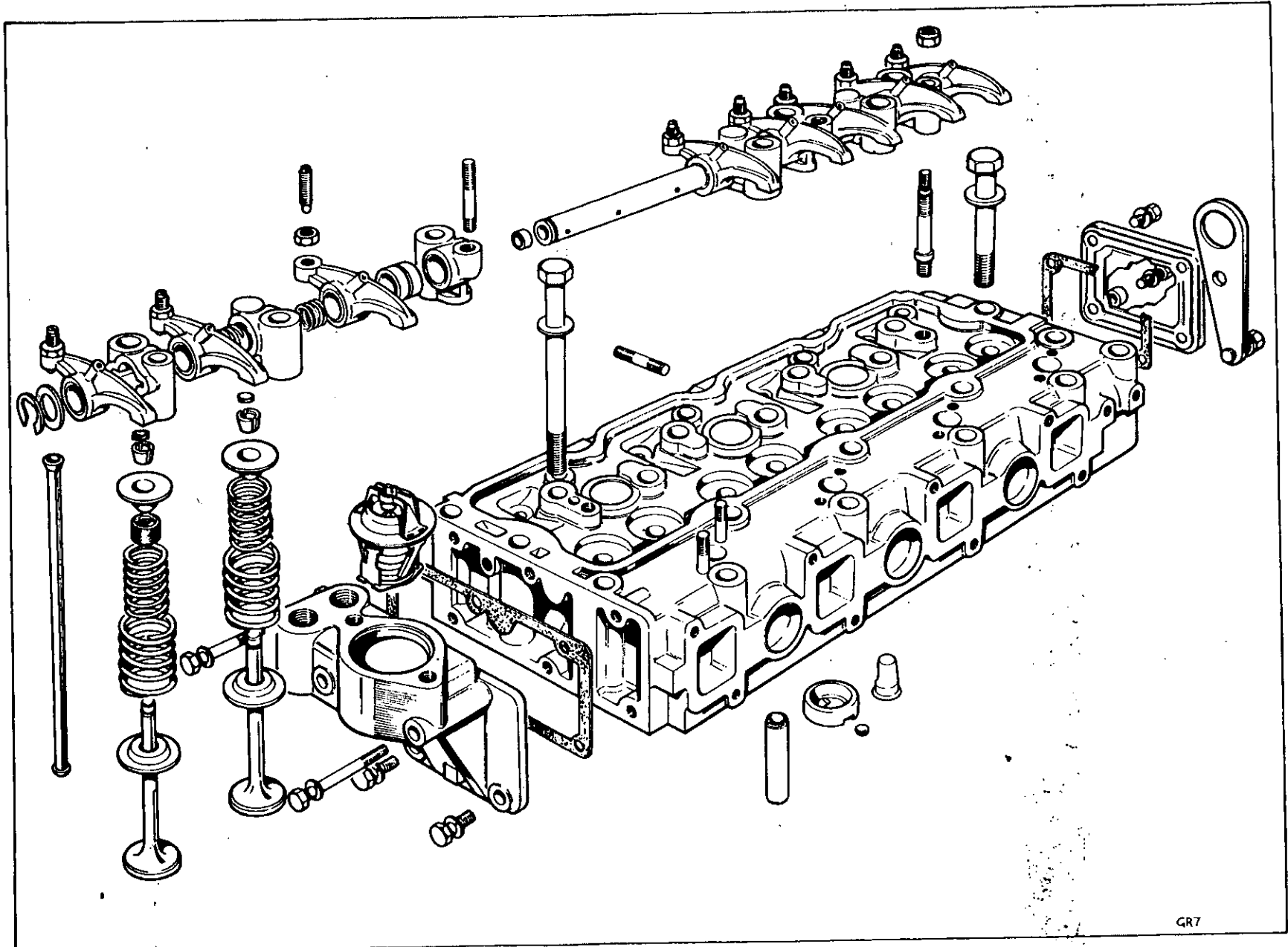


View of Front Left Hand Side of 4.154 Engine

Perkins engines are built to individual requirements to suit the applications for which they are intended and the engine views do not necessarily typify any particular specification.



View of Rear Right Hand Side of 4.154 Engine



GR7

Exploded View of Cylinder Head Assembly