Perkins
POWER SERVICE

WORKSHOP MANUAL

Prima	**Four cylinder diesel engines for vehicle applications**
Prima Marine	**Four cylinder diesel engines for marine applications**
500 Series	**Four cylinder diesel engines for agricultural and industrial applications**

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Contents

General information 10

Introduction

This workshop manual has been designed to provide assistance in the service and overhaul of Perkins Prima and 500 Series engines.

Most of the general information which is included in the relevant User's Handbook (sections 1 to 9) has not been repeated in this workshop manual and the two publications should be used together.

Where the information applies only to certain engine types, this is indicated in the text.

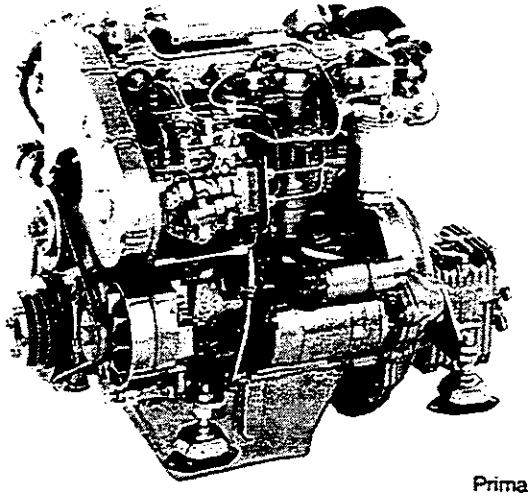
When reference is made to the "left" or "right" side of the engine, this is as seen from the flywheel end of the engine.

Special tools have been made available and a list of these is given in section 25. Reference to relevant special tools is also made at the beginning of each operation.

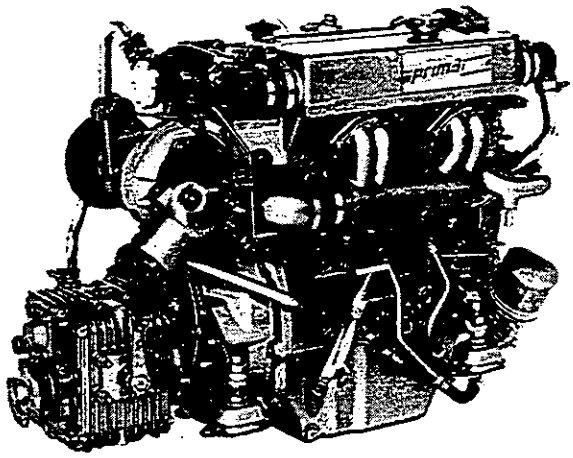
All the joints on these engines can be fitted dry unless instructions are given for the application of sealant. Where fasteners are fitted into threaded holes which are open to the inside of the engine, manifolds, etc., a suitable sealant must be applied to the threads. If necessary, sealant is already applied to new fasteners but, if these are used more than once, the threads should be cleaned and new sealant applied.

Read and remember the "Safety precautions". They are given for your protection and must be used at all times.

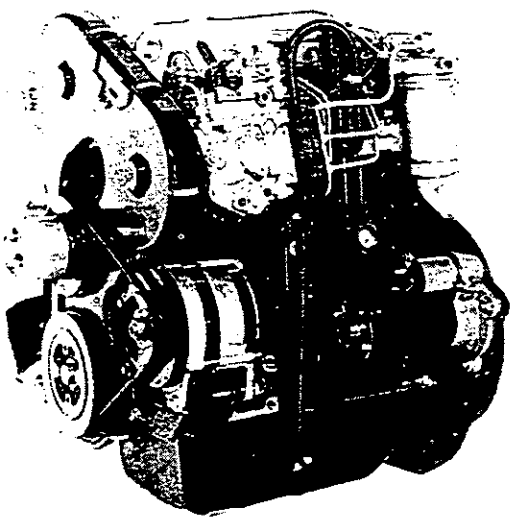
A hazard symbol in the text indicates that there is a danger of personal injury if certain operations are not done correctly.



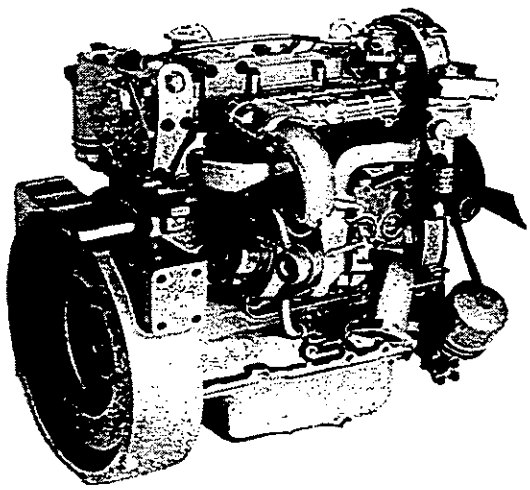
Prima M60



Prima M80T



504-2



504-2T

Engine identification

The Perkins Prima and 500 Series engines have been designed for specific applications, as shown below.

Prima for vehicle applications

Prima Marine for marine applications

500 Series for agricultural and industrial applications

Each series consists of a range of four cylinder engines which are either naturally aspirated or turbocharged.

There are different models in each series.

Prima engines are named according to their approximate power output, for example:

Prima 65 - naturally aspirated vehicle engine rated at 62 bhp

Prima M50 - naturally aspirated marine engine rated at 49 bhp

Prima M80T - turbocharged marine engine rated at 78 bhp

500 Series engines are identified by a system of numbers and letters, for example:

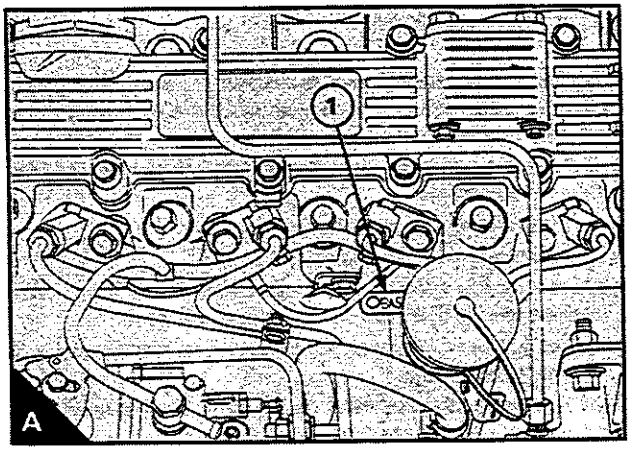
504-2T - four cylinder turbocharged engine of two litres capacity

Further information about the engine number system can be found in the relevant user's handbook.

The information in this workshop manual is relevant to all engine models, unless specifically indicated.

The engine number is stamped on a label which is fastened to the left side of the cylinder block (A1). An example of an engine number is BA50240U523456S.

If you need parts, service or information for your engine, you must give the complete engine number to your Perkins distributor.

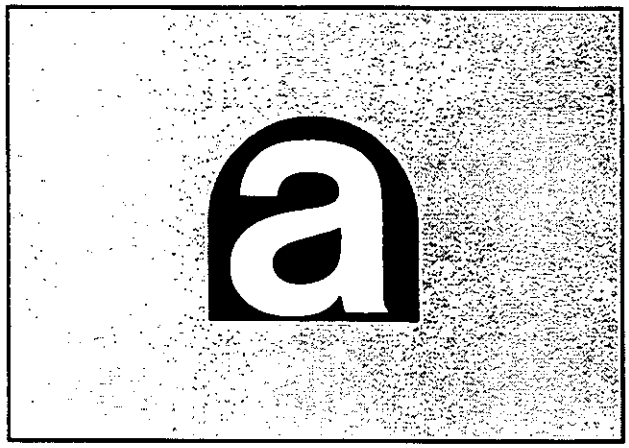


Safety precautions

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 move 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



These engines do not contain asbestos joints and gaskets. These instructions may apply to certain joints and gaskets in components which have been fitted to the engine after it has left the factory.

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 asbestos debris with water and put it in a closed container which can be sealed for safe disposal

Specifications 11

Basic engine data 11A