

ENGINE SERVICE MANUAL

PERKINS NEW 700 SERIES



NEW HOLLAND
CONSTRUCTION

6-77740NA

SERVICE MANUAL
PERKINS NEW 700 SERIES
ENGINES

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10-02 GENERAL INFORMATION

Introduction

This workshop manual has been designed to provide assistance in the service and overhaul of Perkins 700 Series engines.

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

The engines that are referred to in this manual are the UA (3.0 litre - direct injection), and the UB (2.6 litre - indirect injection). Both engines conform to Stage 1 off-highway emissions to CI -8 mode cycle ref. ISO 8178 part 4.

Where the information applies only to one engine type, this will be 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 tools is given in section 25. Reference to the relevant special tools is also made at the beginning of each operation.

Loctite recommended consumable products are listed in section 10. Reference to the relevant consumable products is made at the beginning of operation.

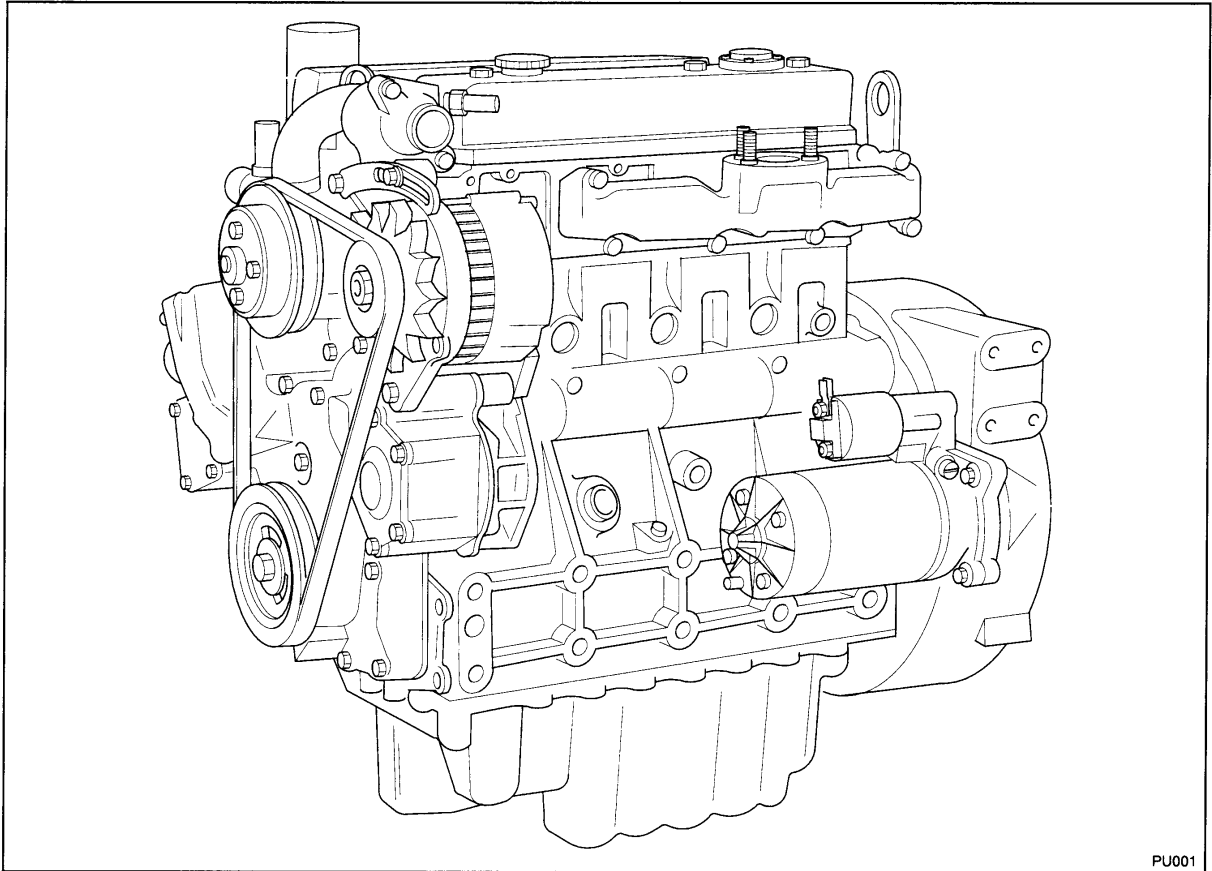
Data and dimensions are included at the end of each section.

Danger is indicated in the text by two methods:

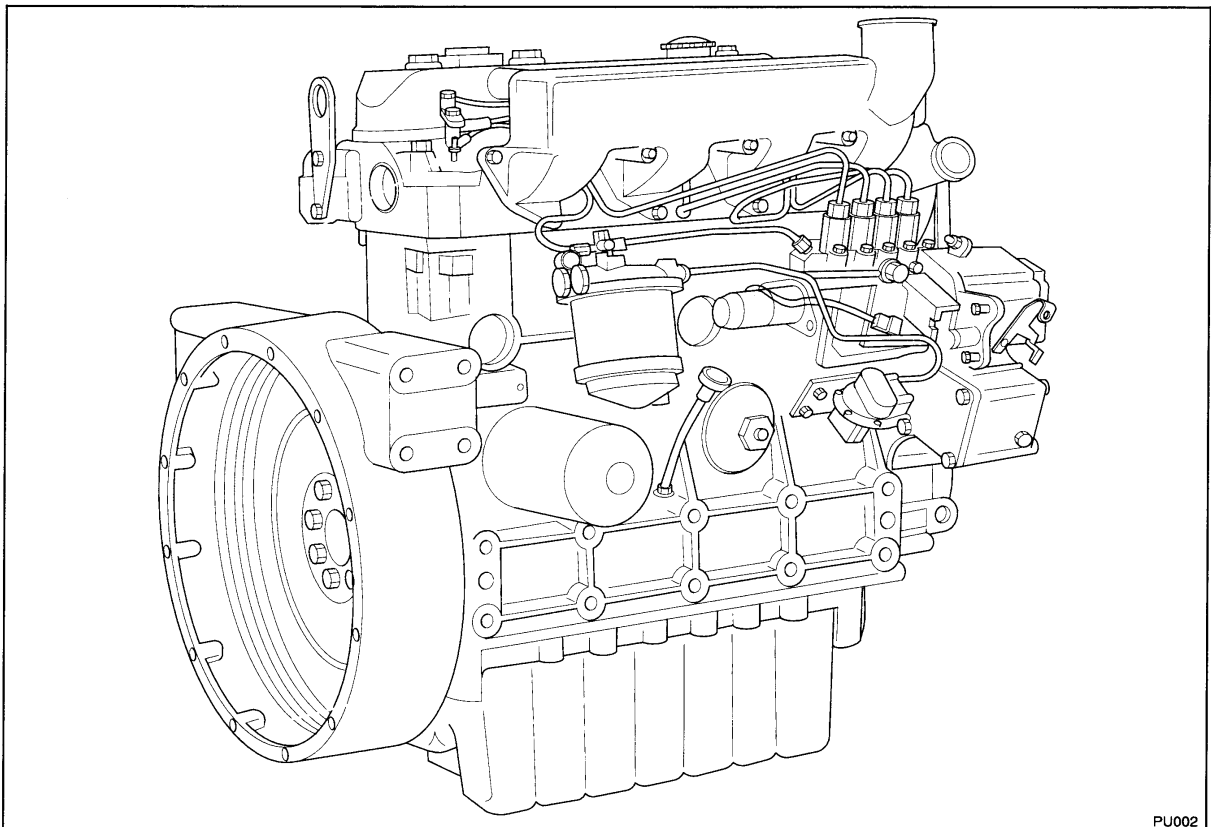
Warning! *This indicates that there is a possible danger to the person.*

Caution: *This indicates that there is a possible danger to the engine.*

Note: *Is used where the information is important, but there is not a danger.*



PU001



PU002

10-04 GENERAL INFORMATION

Engine identification

The 3.0 litre version, is a water cooled, naturally aspirated, four cylinder diesel engine with direct injection. It has been specifically designed for industrial and agricultural applications and is identified with the letters UA.

The 2.6 litre version, is a water cooled, naturally aspirated, four cylinder diesel engine with indirect injection. It has been specifically designed for forklift truck applications and is identified with the letters UB.

The engine number is stamped on a label (A) which is fastened to the right, rear side of the cylinder block.

An example of an engine number is:

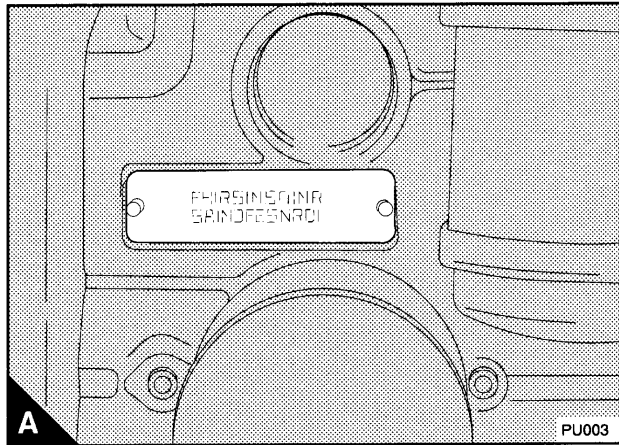
UA80862UI23456A

The components of the engine number are as follows:

UA80862UI23456A

UA	Type code letters
80862	Build list number
U	Built in the UK
123456	Engine serial number
A	Year of manufacture

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



Safety

General safety precautions

These safety precautions are important. You must refer also to the local regulations in the country of use. Some items only refer 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.
- Make sure 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, auxiliary equipment is in operation.
- Do not permit loose clothing or long hair near moving parts.
- Keep away from moving parts during engine operation. **Warning!** *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 or any component 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 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.
- Make sure 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 accordance with local regulations to prevent contamination.
- Make sure that the control lever of the transmission drive is in the "out-of-drive" position before the engine is started.
- 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.
- Always use a safety cage to protect the operator when a component is to be pressure tested in a container of water. Install safety wires to secure the plugs which seal the hose connections of a component which is to be pressure tested.
- Do not allow compressed air to contact your skin. If compressed air enters your skin, obtain medical help immediately.
- Do not clean an engine while it runs. If cold cleaning fluids are applied to a hot engine, certain components on the engine may be damaged.
- Install only genuine New Holland parts.

10-06 GENERAL INFORMATION

Safety

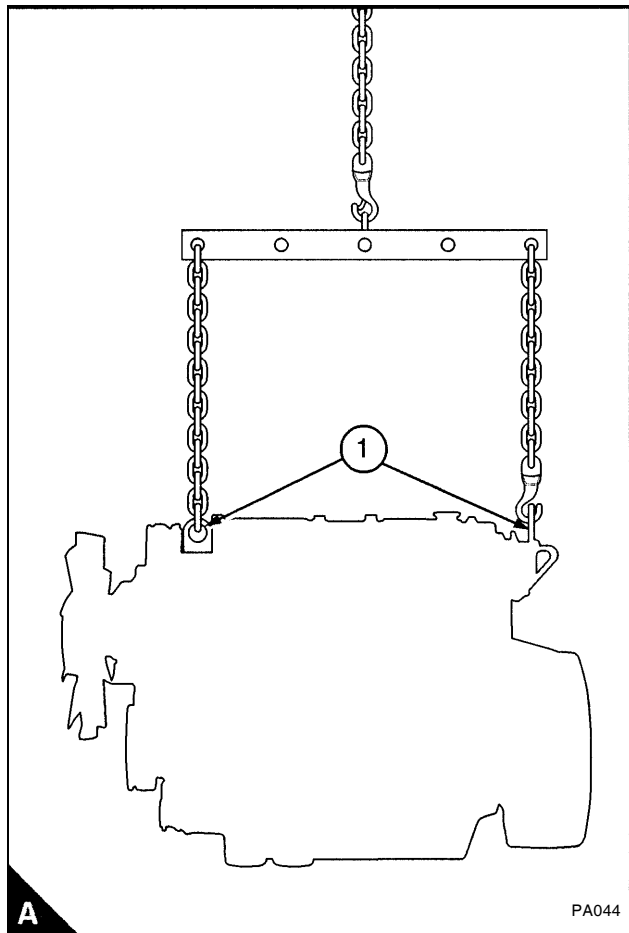
Engine lift equipment

Caution: *If the sump contains engine lubricating oil and the engine is tilted to an extreme angle or turned onto its side or end faces, lubricating oil can enter the closed breather system, pass into the induction manifold and the cylinder bores. If this occurs, it will cause an hydraulic lock in the engine and the engine may be damaged. If it is necessary to move an engine in this way, the lubricating oil must first be drained.*

The maximum weight of the engine without coolant, lubricant or a gearbox installed will vary for different applications. It is recommended that lift equipment of 300 kg (662 lbs) minimum capacity is used.

Before the engine is lifted:

- Always use engine lift equipment of the approved type and of the correct capacity to lift the engine. It is recommended that lift equipment of the type shown in (A) is used to provide a vertical lift, directly above the engine lift brackets (A1). Never use a single lift bracket to raise an engine.
- Check the engine lift brackets for damage and that they are secure before the engine is lifted. The torque for the setscrews for the engine lift brackets is 22 N m (16 lbf ft) 2.2 kgf m.
- To prevent damage to the rocker cover, make sure that there is clearance between the hooks and the rocker cover.
- Use lift equipment or obtain assistance to lift heavy engine components such as the cylinder block, the cylinder head, the flywheel housing, the crankshaft and the flywheel.



Viton seals

Some seals used in engines and in components installed to engines are made of Viton.

Viton is used by many manufacturers and is a safe material under normal conditions of operation.

If Viton is burned, a product of this burnt material is an acid which is extremely dangerous. Never allow this burnt material to come into contact with the skin or with the eyes.

If it is necessary to come into contact with components which have been burnt, make sure that the precautions which follow are used:

- Make sure that the components have cooled.
- Use Neoprene gloves and discard the gloves safely after use.
- Wash the area with calcium hydroxide solution and then with clean water.
- Disposal of components and gloves which are contaminated must be in accordance with local regulations.

If there is contamination of the skin or eyes, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 15-60 minutes. Obtain immediate medical attention.

10-08 GENERAL INFORMATION

Specifications

11

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Recommended torque tensions.....	11B
Compression test data	11C

Basic engine data

11A

Basic engine data11A.02

11A-02 BASIC ENGINE DATA

Basic engine data

Cycle.....Four stroke

Number of cylinders..... 4

Cylinder arrangement..... In line

Firing order 1,3,4,2

Direction of rotation Clockwise from the front

Induction system..... Naturally aspirated

Cubic capacity:

UA engines..... 2.956 litres (183 in³)

UB engines..... 2.602 litres (159 in³)

Compression ratio:

UA engines..... 17.5:1

UB engines..... 22.0:1

Combustion system:

UA engines..... Direct injection

UB engines..... Indirect injection

Nominal bore:

UA engines.....97.0 mm (3.82 in)

UB engines.....91.0 mm (3.58 in)

Stroke..... 100.0 mm (3.94 in)

Valve tip clearances (cold):

- Inlet and exhaust.....0,35 mm (0.014 in)

Lubricating oil pressure (at normal engine temperature):

- Minimum pressure at maximum engine speed.....280 kPa (41 lbf/ in²) 2.86 kgf/cm²

Typical dry installed engine weight (1)200 kg (440 lb.)

(1) Engine weight may alter with final specification

Recommended torques tensions

11B

General information

Thread sealant 11B.02

Recommended torques tensions

Standard torque tensions 11B.03

Special torque tensions 11B.03

Cylinder head assembly 11B.03

Pistons and connecting rod assembly 11B.03

Crankshaft assembly 11B.04

Timing case and drive assembly 11B.04

Aspiration system 11B.04

Fuel system 11B.04

Lubrication system 11B.04

Cooling system 11B.05

Flywheel and housing 11B.05

Auxiliary equipment 11B.05

11B-02 RECOMMENDED TORQUES

General information

Thread sealant

When setscrews or studs are installed into holes which are tapped into the inside of the engine, a suitable sealant should be used.

M.E.A.S. (Micro encapsulated anerobic sealant) fasteners are installed into the holes that are open to the inside of the engine. A thin layer of sealant is applied to the threads of the fasteners when they are manufactured. The colour of the sealant can be red, yellow or blue.

With M.E.A.S. sealed studs, the sealed end must be installed into the cylinder head / cylinder block etc. Make sure that the threaded holes have a 1.59 mm (0.0625 in) 45° chamfer, such that when the new fasteners are installed the M.E.A.S. sealant is not removed. If the fasteners have to be removed and installed again, the threads must be cleaned and a suitable sealant applied.

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

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