

# **Engine**

## **Service Manual**

**Case G 4.0 and G 4.0T**

### **4 Cylinder Diesel Engines**



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## 10-02 GENERAL INFORMATION

### Introduction

This Service manual has been designed to provide assistance in the service and overhaul of these engines. For Service and overhaul procedures the assumption is made that the engine is removed from the machine, refer to Engine Removal in your Machine Service Manual.

Some of the illustrations used throughout this manual, may not exactly reflect your engine, they are to be used as a guide only.

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

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 and Shop Equipment tools have been made available and a list of these tools are given in section 23. Reference to the relevant Special and Shop Equipment tools are also made at the beginning of each operation.

Original setscrews or studs used in holes, which are open to the inside of the engine, have a sealant which is applied by the manufacturer. If the setscrew or stud is to be used again, the threads must be cleaned and a suitable sealant should be used on the threads.

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.*

## Engine Identification

The engine number is stamped on a label (A2) which is fastened to the left side of the cylinder block.

### Code letters Engine type

AK	Four cylinder, turbocharged
AP	Four cylinder, naturally aspirated
AQ	Four cylinder, turbocharged
AS	Four cylinder, naturally aspirated (103 mm cylinder bore)

An example of an engine number is:

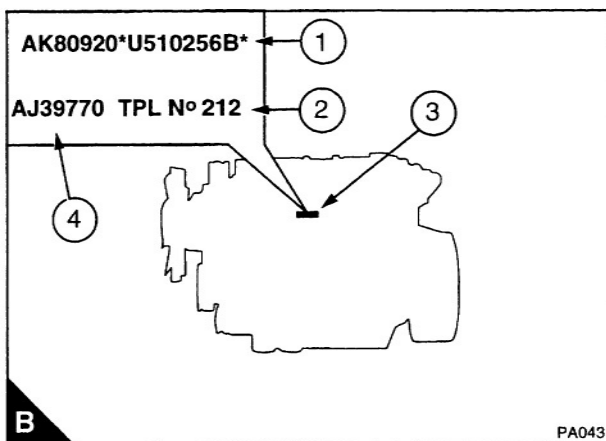
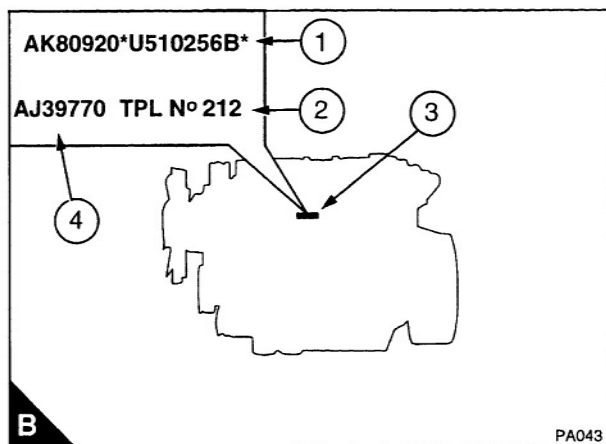
**AQ12345U123456A**

**Note:** *If you need parts, service or information for your engine, you must give the complete engine number to your Case Dealer. If there is a number in the area of the label marked TPL No, then this number must also be given to your Case Dealer.*

Other Identification labels installed to the Engine include:

An emissions legislation label (A3) on the side of the cylinder block.

A label (A1) with the fuel injection pump part number is located on the fuel injection pump.



If a short engine is installed two engine serial numbers and a TPL number on the engine serial number plate (B3), examples are shown above.

If parts are required for the short engine in service use serial number (B4). If parts which were moved from the original engine to the short engine are needed use the serial number (B1) and TPL number (B2).

## 10-04 GENERAL INFORMATION

### 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.

- Do not fill the engine with lubricating oil above the mark on the dipstick or damage could occur to the engine.
- If the lubrication system has been drained, the rocker gear and the camshaft reservoir must be lubricated before the engine is started or damage could occur to the engine.
- 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 care 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 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 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 operators 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 of clothing.
- Discard used lubricating oil in a safe place to prevent contamination.
- Make sure that the control lever of the transmission drive is in the "neutral" position before the engine is started.
- Use extreme care if emergency repairs must be made 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, see page 10.06.
- Read and use the instructions relevant to lift equipment which are given on page 10.05.
- 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.
- Turbochargers operate at high speeds and at high temperatures. Keep fingers, tools and items away from the inlet and outlet ports of the turbocharger and prevent contact with hot surfaces.
- 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 Case parts, supplied by Case Dealers.

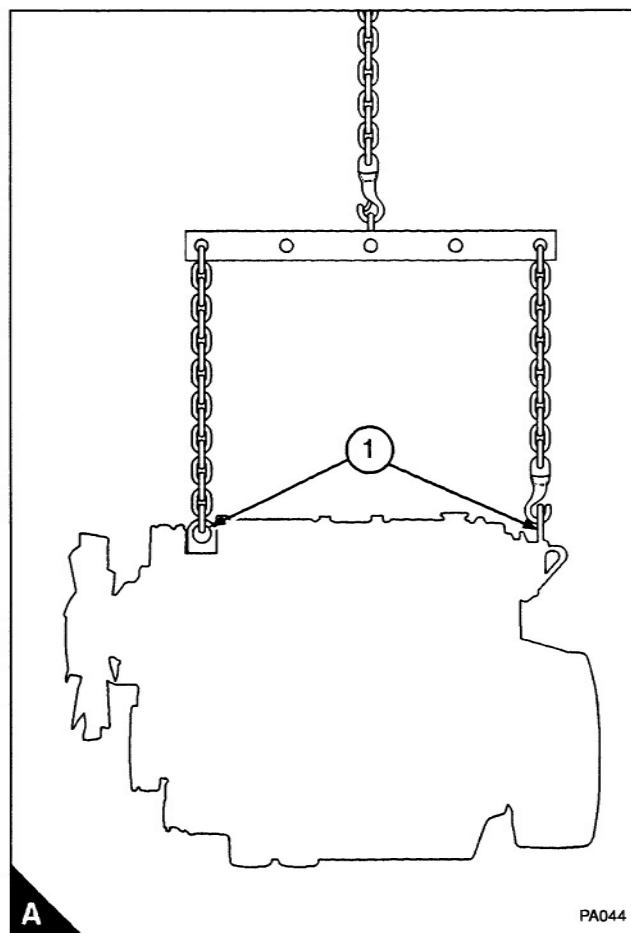


## Engine lifting equipment

The maximum dry weight of the engine is 500 kg (1100 lb).

Before the engine is lifted:

- Always use engine lifting equipment of the approved type and of the correct capacity to lift the engine. It is recommended that lifting 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 44 Nm (33 lbf ft) 4,5 kgf m.
- To prevent damage to the rocker cover, make sure that there is clearance between the hooks and the rocker cover.
- Use lifting equipment or obtain assistance to lift heavy engine components such as the cylinder block, cylinder head, flywheel housing, crankshaft and flywheel.



## **10-06 GENERAL INFORMATION**

### **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.

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