

Document Title: Description	Function Group: 200	Information Type: Service Information	Date: 2014/6/26
Profile:			

Description

Articulated Hauler A30C is equipped with an engine type TD103KBE (serial No.–2958, US –60026) and TD104KAE (serial No. 2959–, US 60027–).

The engine is a straight, six-cylinder, direct-injection, turbocharged diesel engine with intercooler.

The engine type designation, part and serial numbers are stamped into the left side of the cylinder block. The cylinder heads, one for each cylinder, are mutually interchangeable. The heads have replaceable valve seats and valve guides for both inlet and exhaust valves.

The valve mechanism receives its movement from the camshaft via push rods and rocker arms.

The injection pump is equipped with a smoke limiter in order to limit the engine torque. The injectors are installed in replaceable copper sleeves which are pressed into the cylinder head and in direct contact with the circulating coolant.

For repair work on the engine we refer to a separate Service Manual, see the Foreword.

Document Title: Diagnosis using Service Display Unit	Function Group: 200	Information Type: Service Information	Date: 2014/6/26
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Diagnosis using Service Display Unit

Error codes

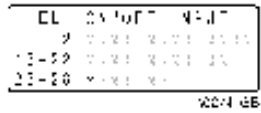
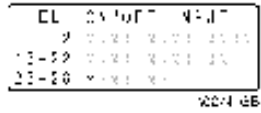
The table below shows a summary of error codes which may appear on the display unit and the most likely cause of the fault/error.

The following trouble-shooting diagram shows, in addition to error codes, also error symptoms, probable error cause and the action required to rectify the fault as well as a reference to the service display unit.

Error messages

Display	Cause	Control malfunction transmission	lamp, in	Central warning
201 Engine pressure ER	Electrical fault sensor circuit (SE16)	–		–
202 Engine pressure low	Too low lubricating oil pressure, engine	–		yes

Trouble-shooting diagram

Error code	Symptom	Probable error cause	Action	Service display unit screen (figure) No.
201 Engine oil pressure, sensor fault (SE16)		Faulty sensor SE16 or faulty cable harness to the same.	Measure resistance in cable harness and check sensor.	 <p>Figure 5.12 Number 23 Normal oil pressure; 0 Low oil pressure; 1</p>
202 Low engine oil pressure (SE16)	Lubricating oil pressure too low.			 <p>Figure 5.12 Number 23 Normal oil pressure; 0 Low oil pressure; 1</p>

- EL . ON / OFF INPUT -

1 - 1 2 : X X X X X X X X X X

1 3 - 2 2 : X X X X X X X X

2 3 - 2 8 : X X X X X X

A02747GB

- EL . ON / OFF INPUT -

1 - 1 2 : X X X X X X X X X X

1 3 - 2 2 : X X X X X X X X

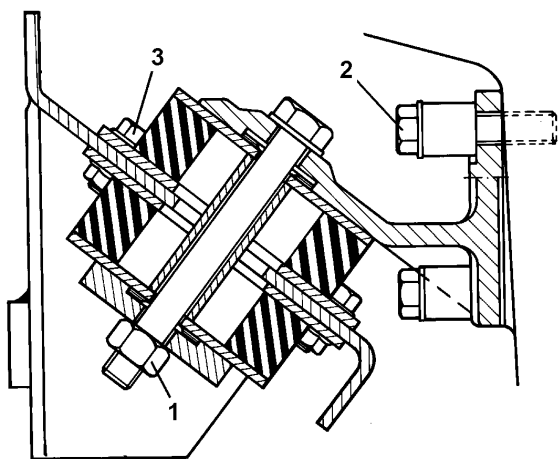
2 3 - 2 8 : X X X X X X

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Document Title: Tightening torques	Function Group: 200	Information Type: Service Information	Date: 2014/6/26
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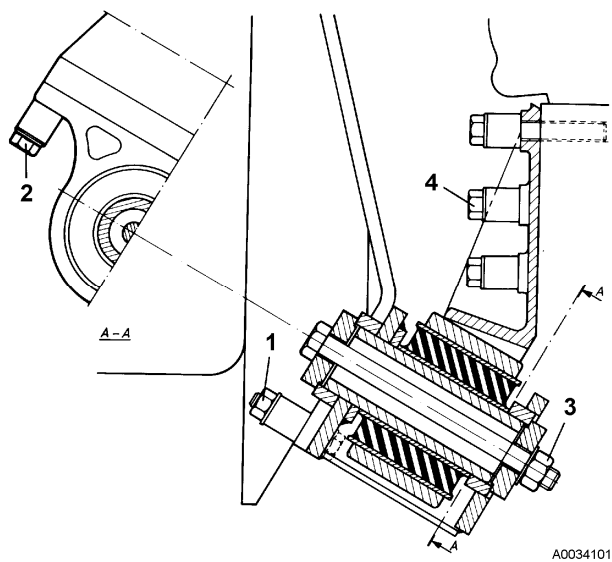
Tightening torques

Engine	
Engine – Flywheel housing	140 N m, 14 kgf m (103 lbf ft)
Front engine mounting, see [Invalid linktarget]	
Item 1	220 N m, 22 kgf m (162 lbf ft)
Item 2	140 N m, 14 kgf m (103 lbf ft)
Item 3	50 N m, 5 kgf m (37 lbf ft)
Rear engine mounting, see [Invalid linktarget]	
Item 1	85 N m, 8.5 kgf m (63 lbf ft)
Item 2	134 N m, 13.4 kgf m (100 lbf ft)
Item 3	220 N m, 22 kgf m (162 lbf ft)
Item 4	220 N m, 22 kgf m (162 lbf ft)



A0034001

Figure 1



A0034101

Figure 2

Document Title: Trouble-shooting	Function Group: 200	Information Type: Service Information	Date: 2014/6/26
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Trouble-shooting

Methods and aids

When a fault is suspected or found, it is important immediately to determine the cause of the fault and identify the faulty component.

Certain faults are indicated by the red central warning lamp on the instrument panel lighting up at the same time as the buzzer is sounding or in that the LED (Light Emitting Diode) on the ECU is flashing.

In case of a warning, the engine should be stopped immediately and a service engineer should be called.

In order to facilitate and make the trouble-shooting more efficient, there are a number of aids available.

- Contronic Display Unit
- Contronic Service Display Unit 999 3721
- Multimeter 11 666 140
- Multi-pin breaker box 11 668 002

With the aid of the Service Display Unit it is possible to determine sensor faults, engine oil pressure and low engine oil pressure.

In case of a fault/error the Service Display Unit will show an error code (ER indication) and a reading (value) deviating from the normal. Error codes, possible causes of malfunction and suitable action are described under "Diagnosis using Service Display Unit".

When an error code or a deviating value is shown, measuring resistance is used to establish whether the fault is in a component e.g. sensor) or if the cable harness to the same is faulty.

Document Title: Compression test, warm engine	Function Group: 210	Information Type: Service Information	Date: 2014/6/26
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Compression test, warm engine

Op nbr 21002

[999 6643 Puller](#)

[999 8009 Adapter](#)

[998 8539 Compression gauge](#)

Prerequisite condition: The valves are correctly adjusted, see [Invalid linktarget] .

1. Place the machine on level ground and apply the parking brake.
2. Carefully clean around the injectors and at the connections for the fuel delivery pipes and the leak-off fuel pipes.

WARNING

The fuel delivery pipes are pressure prestressed and must under no circumstances be bent or reshaped.

If a pressure prestressed fuel delivery pipe is bent or deformed, there is a great risk that the pipe will break.

A damaged delivery pipe must always be replaced with a new pipe!

Removing

3. Remove the fuel delivery pipes.

CAUTION

Place protective caps on all injectors and on the injection pump connections.

4. Remove the leak-off fuel pipe.

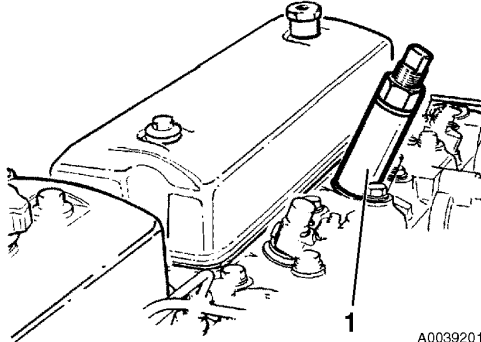


Figure 1

1. 999 6643 Extractor

5. Remove the injector for the number 1 cylinder. When necessary use extractor 999 6643 for taking out the injector.

See [Invalid linktarget] . Make sure that the copper washer which is positioned between the injector and the copper sleeve comes out together with the injector, [Invalid linktarget] . If it does not come out, use a hook made from a piece of wire to get it out.

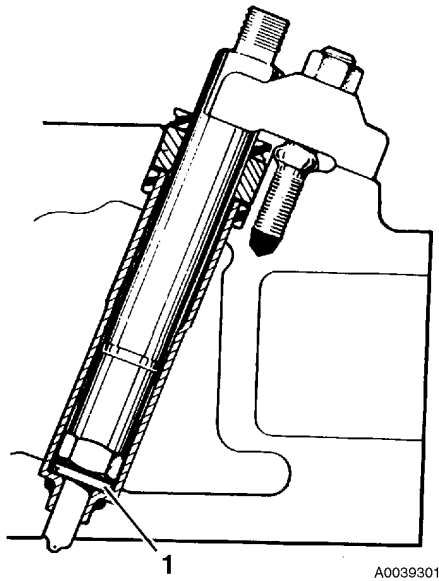


Figure 2

1. Copper washer

6. Install the adapter 999 8009 and secure it using the injector retaining yoke and nut. See [Invalid linktarget] . Tightening torque: **50 N m** (5.0 kgf m) (37 lbf ft).

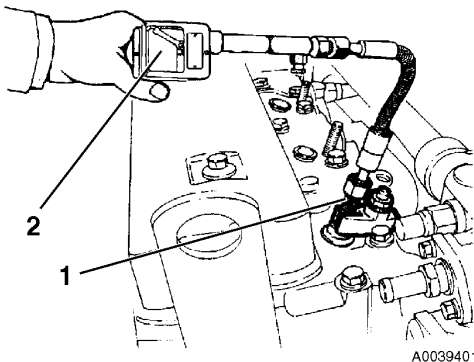


Figure 3

1. 999 8009, Adapter
2. 999 8539, Compression gauge

7. Connect compression gauge 998 8539. See [Invalid linktarget] .
8. Pull out the stop button and secure the injection pump stop lever in the stop position. This is to prevent fuel from running out of the delivery valves when the engine is cranked with the starter motor.
9. Check that the gear selector is in neutral.
10. Crank the engine with the starter motor for 5 seconds.
11. Remove the testing equipment and re-install the injector together with a new copper washer. Tightening torque: **50 N m** (5.0 kgf m) (37 lbf ft).
12. Carry out a compression test of cylinders 2, 3, 4, 5 and 6 in the same way as for cylinder number 1. Remove the pipe between the turbocharger and intercooler when testing cylinder number 6.

Normal compression pressure is 2.6 MPa (26 bar) (377 psi) at 220 rpm.



Differences of 10 % in the compression pressure between the cylinders is fully acceptable and does not constitute a reason for further action as for example valve reconditioning.

Installing

13. Install the leak-off fuel pipe together with new copper washers.
14. Re-install the pipe between the turbocharger and the intercooler.



The fuel delivery pipes are pressure prestressed and must under no circumstances be bent or reshaped. If a pressure prestressed fuel delivery pipe is bent or deformed, there is a great risk that the pipe will break. A damaged delivery pipe must always be replaced!

15. Install the fuel delivery pipes. Observe the greatest possible cleanliness and make sure that the pipes are not bent or deformed. Tighten the pipe nuts.
Tightening torque: **15–25 N m** (1.5–2.5 kgf m) (18 lbf ft).
16. Restore the stop function. Start the engine and check that there are no leaks.

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Engine and transmission, installing

Op nbr 21074

[999 2754 Lifting tool](#)

[999 2755 Lifting tool](#)

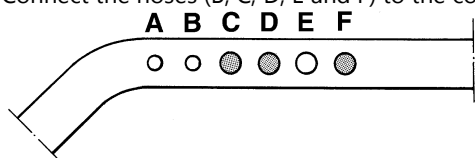
[999 2756 Lifting tool](#)

[999 6052 Lifting tool](#)

Torque wrench 0–400 N m (0–40 kgf m)

(0–295 lbf ft)

1. Connect the lifting device to the engine. Incline the engine and transmission to the correct angle.
2. Lower the unit and install the engine mountings (the front ones first).
Tightening torque, front: **220 N m** (22 kgf m) (162 lbf ft).
Tightening torque, rear: **140 N m** (14 kgf m) (103 lbf ft).
3. Install the propeller shaft.
Tightening torque: **180 N m** (18 kgf m) (133 lbf ft).
4. Install the components on the transmission:
 - two new oil filters
 - connector EH
 - oil filler pipe and oil dipstick
 - hose for breather filter
 - connector for retarder valve and connector for sensor S13.
5. Connect the hoses to the extra oil cooler for the transmission.
6. Connect the hose to the power take-off lubricating oil pump.
7. Connect the suction lines to pumps 1, 2 and 4.
8. Connect the return oil hoses for the hydraulic pumps.
9. Connect the hoses (B, C, D, E and F) to the collecting pipe. See [Invalid linktarget]



A0097600

Figure 1
Collecting pipe for leak-off oil

- A. Return oil line from fan motor (9/16 UNF)

- B. Leak-off oil line from thermostat valve (9/16 UNF)
 - C. Leak-off oil line from pump 1 (steering and tipping system) (7/8 UNF)
 - D. Leak-off oil line from pump 4 (steering and tipping system) (7/8 UNF)
 - E. Leak-off oil line from pump 2 (steering and tipping system) (7/8 UNF)
 - F. Leak-off oil line from pump 3 (fan drive) (7/8 UNF)
10. Install governor control arm and stop control cables. Connect the hoses to the brake pump. Install alternator, exhaust pipe and oil filters. Install the air cleaner.
 11. Connect coolant hoses, oil coolers, the fuel lines to injection pump.
 12. Install engine hood and the left side plate.
 13. Clamp hoses and electrical leads where clamping has been removed.
 14. Open the hydraulic oil tank shut-off valve.
 15. Fill with coolant, see [Invalid linktarget] . Fill hydraulic oil. See the Operator's Manual, "Hydraulic oil, changing". Fill engine oil. See the Operator's Manual, "Engine, changing oil". Check that there is a sufficient amount of oil in the transmission, before starting the engine.
 16. Bleed the fuel system, see [Invalid linktarget] .
 17. Swing in the radiator and tighten down.
 18. Switch on the current with the battery disconnect switch, see [Invalid linktarget] .

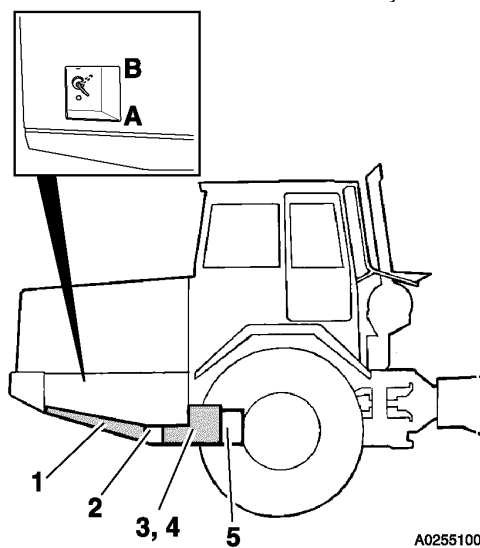


Figure 2

- A. On
 - B. Off
1. Front guard plate
 2. Front, transverse member
 3. Rear guard plate, left
 4. Rear guard plate, right
 5. Rear, transverse member
19. Start the engine and test the function. Check that there are no leaks. Run until warm and check the coolant level and the transmission oil level.
 20. Install the front (2) and the rear (5) transverse members. Install guard plates (1), (3) and (4), see [Invalid linktarget] .

21. Close the engine hood and test-run the machine.

Document Title: Engine and transmission, removing	Function Group: 210	Information Type: Service Information	Date: 2014/6/26
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Engine and transmission, removing

Op nbr 21073

[999 2754 Lifting tool](#)

[999 2755 Lifting tool](#)

[999 2756 Lifting tool](#)

[999 6052 Lifting tool](#)

Torque wrench 0–400 N m (0–40 kgf m)

(0–295 lbf ft)



WARNING

There is a danger of scalding when removing the expansion tank cap (radiator cap), as the cooling system is pressurised when hot.

Hot oil may cause burns.



CAUTION

Plug all pipes, hoses and connections after disconnection.

Removing

1. Place the machine in the service position.

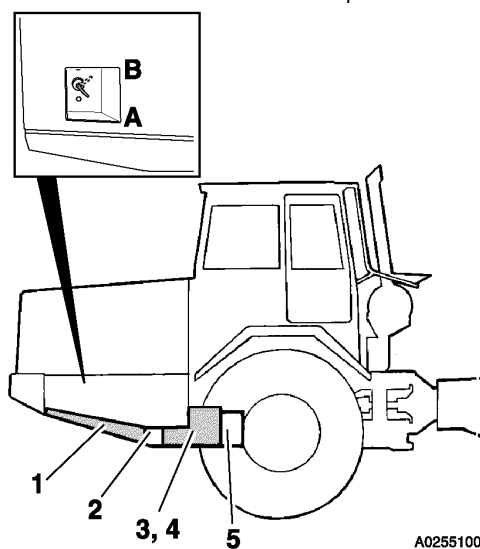


Figure 1

A. On



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