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1758

Forwarder

TM1995 (01AUG01)

Workshop Manual

ENG

Contents

Issue

Page

03/01

0-1

1000	Power Unit
1100	Engine Mounting
1200	Fuel System
1300	Drive Coupling
2000	Hydraulic System
2100	Hydraulic Tank and Filters
2200	Working Hydraulics
2300	Hydrostatic Drive System
2600	Brake Hydraulics
3000	Electrical System
3100	Main Electrics
4000	Drive Line
4100	Transfer Case
4500	Axles and Bogies
6000	Frames / Covers
6320	Frame Brake

1000 Power Unit

1100 Engine

1200 Drive Coupling

1300 Fuel System

Cummins Workshop Manual for C-Series Engines

1100 Engine Mounting

General description

Engine is 6 cylinder, inline, direct injection diesel engine. Engine has water-cooling, wet liners, one-piece cylinder head, 2 valves/cylinder, wastegated turbocharger and Bosch PES6MW inline fuel injection pump with RSV governor.

Manufacturer	Cummins
Model	6CT 8.3-215
Power	163 kW / 2100 rpm
Torque	872 Nm / 1500 rpm
Displacement	8,3 litre
Bore	114 mm
Stroke	135 mm

Removal

1. Clean engine compartment well
2. Disconnect battery cable.
3. Remove hood and cover plates.
4. Drain coolant from engine. Draining plug is located at the bottom of radiator.
5. Remove air filter. Protect inlet port of turbocharger.
6. Remove exhaust muffler. Protect exhaust port of turbocharger.
7. Disconnect all water hoses. Mark if necessary.
8. Mark if necessary and disconnect wires from

- oil pressure switch
- engine rpm sensor
- start motor
- alternator
- coolant temperature sensor
- stop solenoid
- engine rpm regulator unit
- water valve

9. Remove A/C compressor from engine. Don't open hoses, leave compressor at engine compartment.
10. Remove protection shields, which are around fan blade and alternator and remove fan blade.
11. Disconnect fuel lines. Suction hose from low pressure pump and return hose from injection pump. Protect all connections against dirt.
12. Remove drive clutch mounting bolts.
13. Pull hydraulic pumps backwards a little and support them to that place.
14. Connect load chains between engine lifting lugs and engine crane. Lift up a little and make sure that chains are well connected. NOTE ! Engine wet weight is 620 kg. Check that load chains can carry that weight.
15. Remove engine mounting bolts, 2 pcs front and 2 pcs rear.
16. Lift engine up about 10 mm and pull engine forward so much that drive clutch looses. Beware radiator while lifting engine up.

Installation

1. Check the condition of engine mounting rubber pads. Replace if necessary.
2. Lower engine down to engine compartment carefully. Beware radiator.
3. While lowering and positioning engine to its place install drive clutch.
4. Lower engine properly in its place.
5. Install engine mounting bolts. See tightening torque from operators' manual chapter 6.2.2.
6. Install hydraulic pumps.
7. Install A/C compressor.
8. Install protection shields and fan blade.

9. Connect all wires to

- oil pressure switch
- engine rpm sensor
- start motor
- alternator
- coolant temperature sensor
- stop solenoid
- engine rpm regulator unit
- water valve

10. Install all water hoses.

11. Fill up the coolant. See specifications and instructions from operators' manual, chapters 6.4.1, 6.4.4 and 6.6.8.

12. Fill up the engine oil. See specifications from operators' manual chapter 6.4.3.

13. Connect fuel lines and bleed fuel system. See bleeding instructions from operators' manual chapter 6.8.1.

14. Install exhaust muffler.

15. Install air filter.

16. Connect battery cables.

17. Start engine and check for leaks. Look after engine temperature, coolant level and oil pressure. If everything seems to be properly in condition drive a short test drive.

18. Install hood and cover plates.

19. Check coolant and oil level after the engine has cooled down.

RPM sensor setting

1. Clean threads of sensor and flywheel case well.
2. Rotate crankshaft so that one cog of flywheel ring is visible in the center of sensor mounting hole.
3. Turn sensor carefully by hands clockwise until it contacts to cog. Then turn sensor $\frac{1}{2}$ turn anti-clockwise and tight locking nut. Torque is 25 Nm.
4. Install connector.

Engine troubleshooting and repair instructions

See Cummins manuals, which are specified in page 1000-1.

1200 Fuel System

General description

Fuel tank is located at the right side of rear frame. From fuel tank fuel is sucked through suction pipe to water separator. In suction line is a solenoid valve, which closes fuel line when engine is not running.

From water separator fuel is transferred to suction/low pressure pump which is located at left side of engine and to engine pre-heater (if installed.) Low pressure pump pumps fuel from water separator to fuel filters. At first fuel filter is another water separator.

From filters fuel goes to injection pump which delivers fuel to injection nozzles.

From injection pump comes fuel return line, which goes straight to the fuel tank. The bleeding fuel line of injection nozzles is connected to fuel filters. Low-pressure pump has hand lever, which is needed when bleeding fuel system.

Engine shut down is controlled by solenoid, which turns stop lever in fuel pump governor to zero position. Engine rpm is controlled by VDO throttle motor, which is controlled by TMC.

Specification

Fuel tank capacity	190 L
Fuel transfer pump	Carter, located at the left side of engine, driven by engine camshaft
Fuel injection pump	Bosch - Type PES6MW, inline, gear driven by engine camshaft
Injection pump governor	Bosch - Type RSV, constant speed governor with boost pressure controlled air fuel control
Injection nozzles	Bosch

Repair instructions / troubleshooting / service instructions

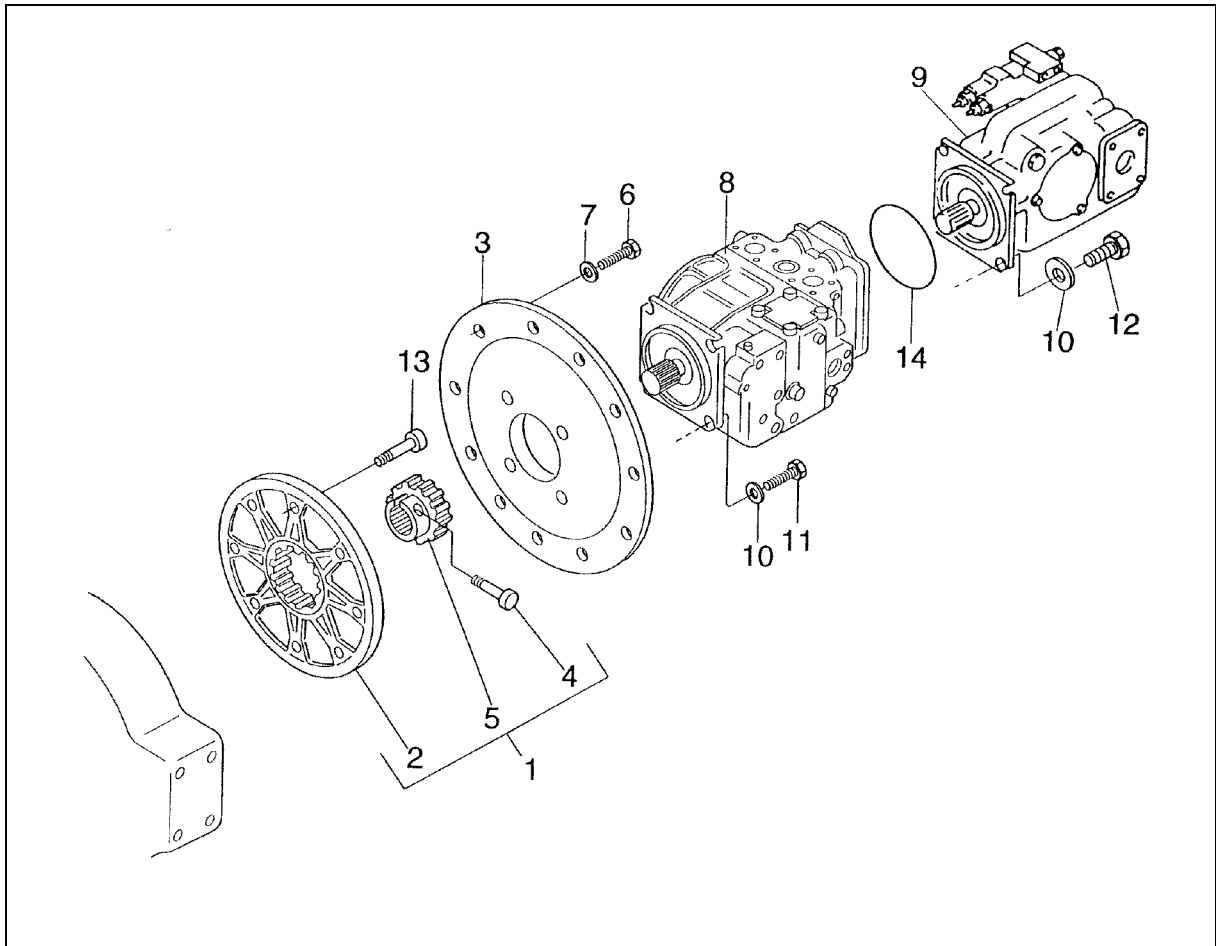
See Cummins manuals, which are specified at page 1000-1.

For service and bleeding instructions see Timberjack Operator manual.

1300 Drive Coupling

Description and Operation

The drive coupling transmits the power from the engine to the drive and working pumps. The coupling consists of a splined adapter attached to the hydrostatic drive pump input shaft and a splined flange mounted to the engine flywheel.



- 1 - Coupling Assembly
- 2 - Splined Flange
- 3 - Adapter Plate
- 4 - Screw
- 5 - Hub Screw
- 6 - Screw
- 7 - Washer

- 8 - Driving Pump
- 9 - Working Pump
- 10 - Washer
- 11 - Screw
- 12 - Screw
- 13 - Screw
- 14 - O-ring