

John Deere

1458

Forwarder

TM1993 (01AUG01)

Workshop Manual

ENG

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Service tools for 1458 Forwarder

Base Machine

Notes

F612884 Middle joint pivot pin nut tool

Boom

F057655 Lifting boom cylinder piston tool

F034814 Lifting boom cylinder cover tool

F617765 Jib boom cylinder piston tool

F046590 Jib boom cylinder cover tool

F061007 Extension boom cylinder tool

F055825 Pivot nut spanner, d=60

F055826 Pivot nut spanner, d=70

F055827 Pivot nut spanner, d=80

Engine

F058073 Engine barring tool

Same in all Cummins engines

F058074 Blowby checking tool

F058079 Injector puller

Same in all Cummins engines

F058080 Turbocharger wastegate pressure set kit

F058081 Torque angle gauge

F058082 Capscrew length gauge

F058083 Piston ring expander

F058086 Fuel pump drive gear puller

Same in all Cummins engines

F058088 Water manometer for blowby checking

Same in all Cummins engines

F058089 Blowby checking tool hose

Same in all Cummins engines

F058090 Front oil seal installation tool

F058094 Tappet removal & installation tool kit

Same in all Cummins engines

Electrical

F057934 Etools, tool kit for TMC/LCS

Computer required

F057938 Etools software program

Included in kit F057934

F057935 PCMCIA card for Etools

Included in kit F057934

F057936 Cable PC card / LCS

Included in kit F057934

F057941 LCS programs

Included in kit F057934

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manual**

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1000 Power Unit

1100 Engine

1200 Drive Coupling

1300 Fuel System

Cummins Workshop Manual for B-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	124kW / 1800 rpm
Torque	694 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

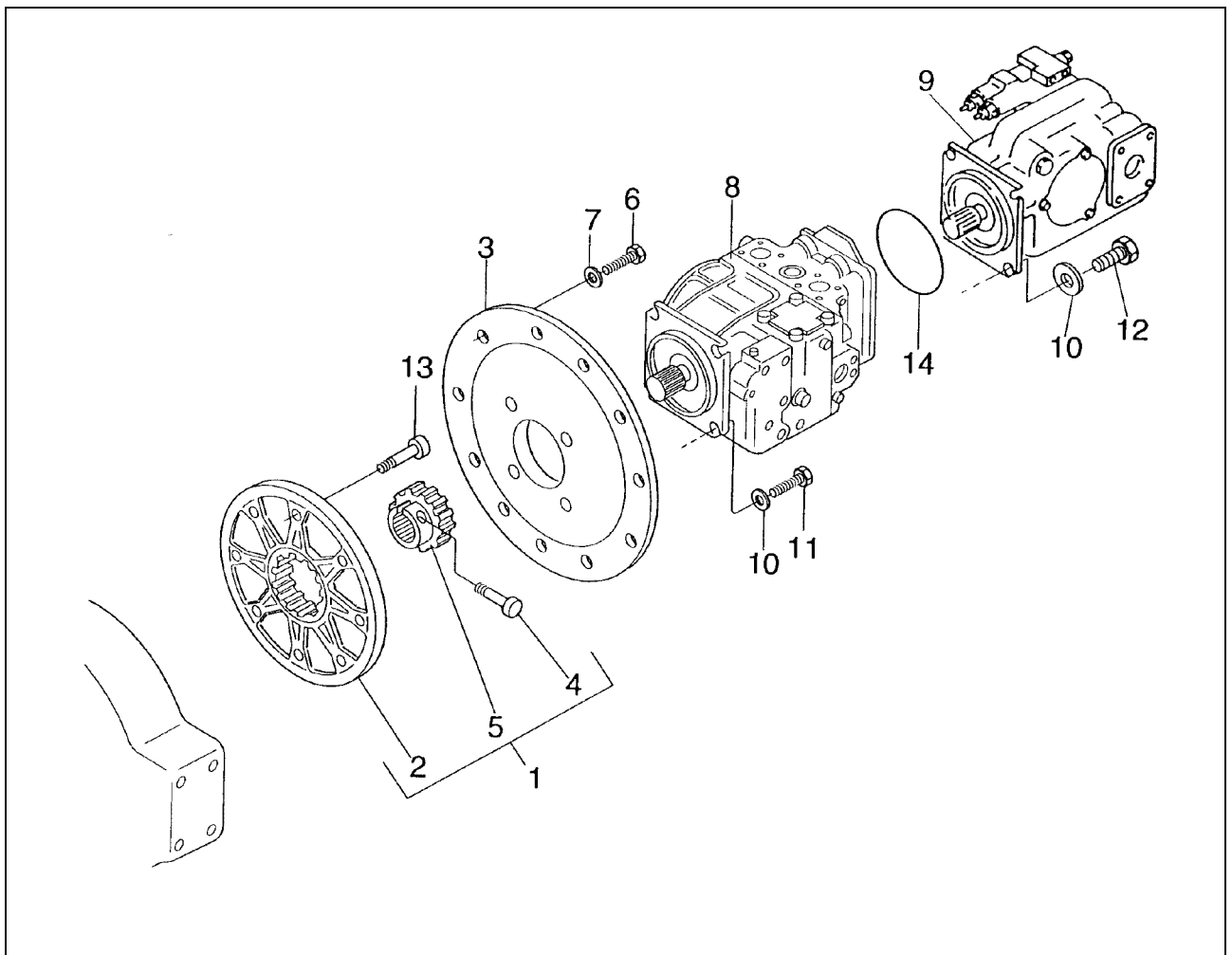
See Cummins manuals, which are specified at page 1000-1.

For service and bleeding instructions see Timberjack Operator manual.

1300 Drive Coupling

Description and Operation

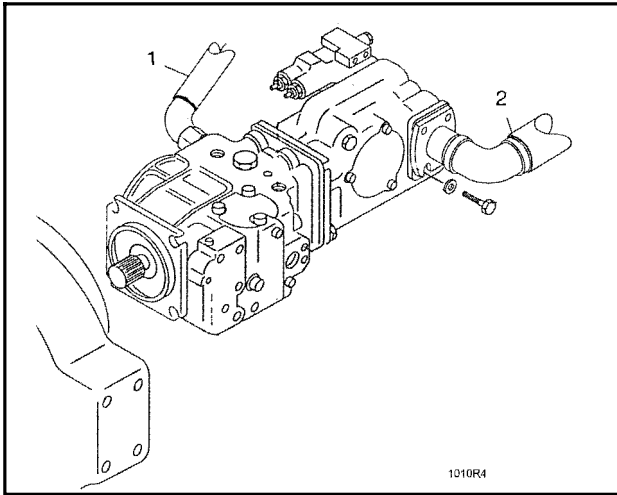
The drive coupling transmits the power from the engine to the drive and working pumps. The coupling consists of a splined adapter attached to the hydrostatic drive pump input shaft and a splined flange mounted to the engine flywheel.



- 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

Coupling Removal



NOTE !

Both hydraulic pumps may be removed as an assembly.

Drain the hydraulic tank.
Disconnect and cap the following hydraulic hoses to enable the pump to be moved away from the engine.:-

Hose - Hydrostatic pump to tank (1)
Hose - Working pump to tank (2)

Disconnect two screws mounting the hydraulic cooler (3) valve to the bracket.

Check and record the amount of crankshaft end play prior to removing the pump



CAUTION !

Observe strict cleanliness when disconnecting and connecting hydraulic components. Contamination introduced into the hydraulic system can result in early equipment failure.

Coupling Removal Cont'd.



CAUTION !

The hydraulic pump assembly is heavy. Use appropriate support, slings and lifting device to prevent personal injury or equipment damage when moving the pump.

Using a lifting device to support the pump assembly, remove the four bolts that secure the pump assembly to the adapter plate.

Slide the pump rearwards 100mm (4") to clear the spline.

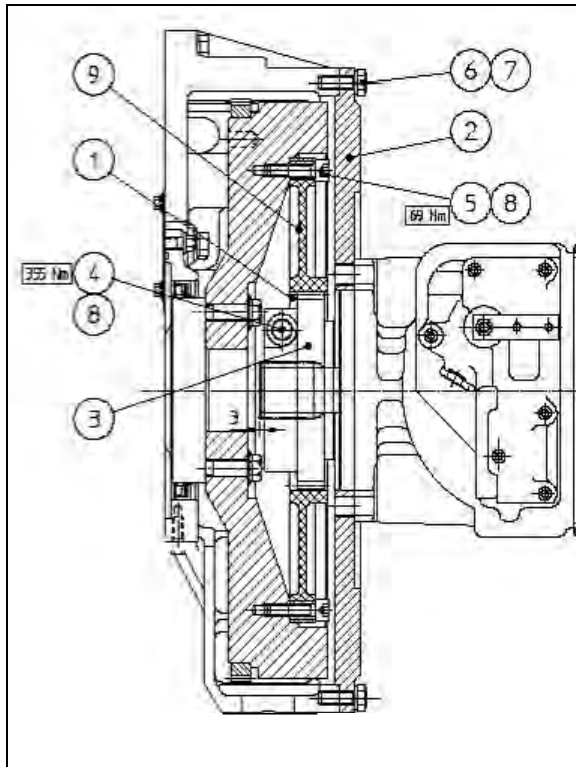
Inspect the splined adapter on the pump shaft and if damaged, remove and replace.

Remove screws and adapter plate.

Remove the splined flange attached to the engine flywheel.

Inspect the bushing and if damaged, remove and replace.

Coupling Installation



Install flange to engine flywheel. Use Loctite 242 Blue and torque screws (5) to 49 Nm.

NOTE !

*The longer hub of the splined flange **MUST** be installed toward the engine flywheel.*

Install adapter plate to flywheel housing using screws with Nord-lock washers.

The cooler valve bracket is installed to the engine using the flywheel housing screws

If the splined adapter has been removed or loosened, it must be re-installed as follows :-

Adapter hub must extend past end of pump input shaft by 4.9mm

Install locking screw (4) using Loctite 242 Blue and torque to 355 Nm.

Slide pump forward and install four screws to secure pump. Torque screws to 100 Nm (74 lb ft)



CAUTION !

Use care when installing pump as the splined flange is Nylon and can be damaged. Rotate the pump shaft to line up the splines before installation.

Coupling Installation Cont'd.

Re-check end play on the engine crankshaft.

If no end play is noticeable, remove pump assembly and check that the splined flange is installed with the long hub towards the engine flywheel.

Reconnect hydraulic hoses and refill hydraulic tank.

NOTE !

Air must be removed from the hydrostatic and working systems before machine operation. See Sections 2010 and 2300.

2000 Hydraulic System

2100 Hydraulic Tank and Filters

2200 Working Hydraulics

2210 Working Pump - Rexroth A10VO Repair Instructions

2300 Hydrostatic Drive System

 Drive Pump – Rexroth A4VG Repair Instructions

 Drive Motor – Rexroth A6VM Repair Instructions

2400 Valves

2410 Crane Control Valve

 VOAC K170LS Directional control valve

2600 Brake Hydraulics

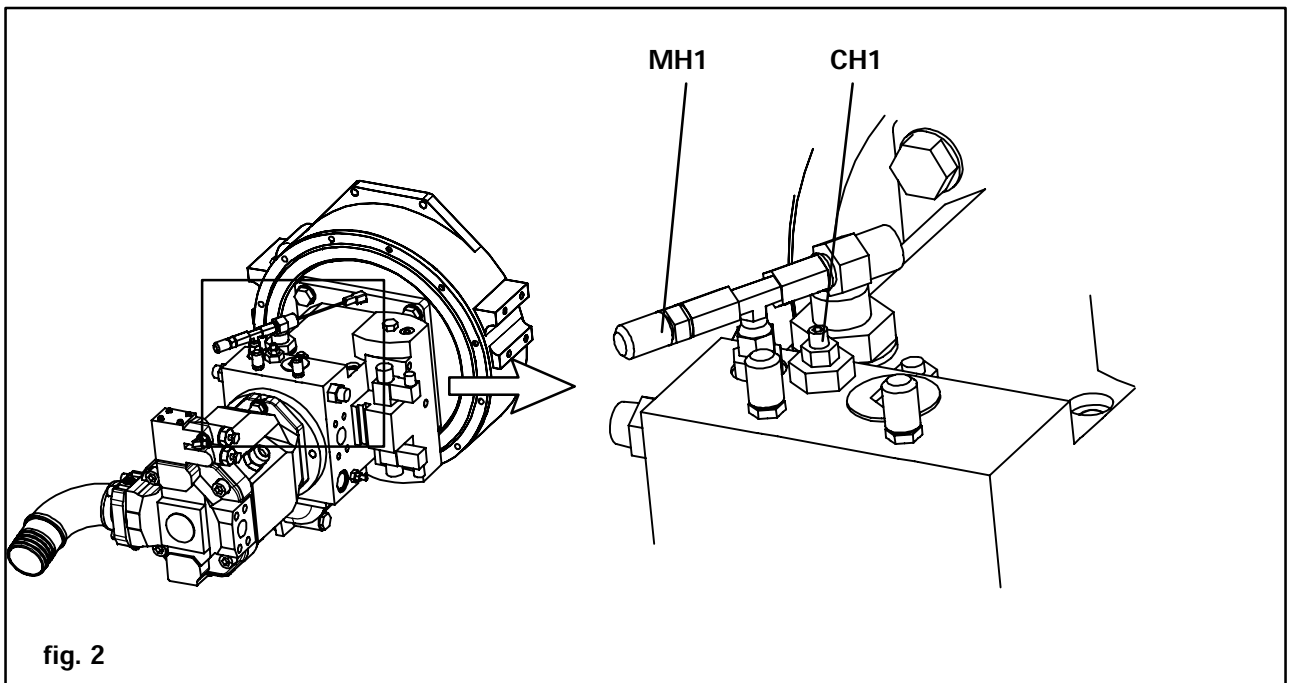
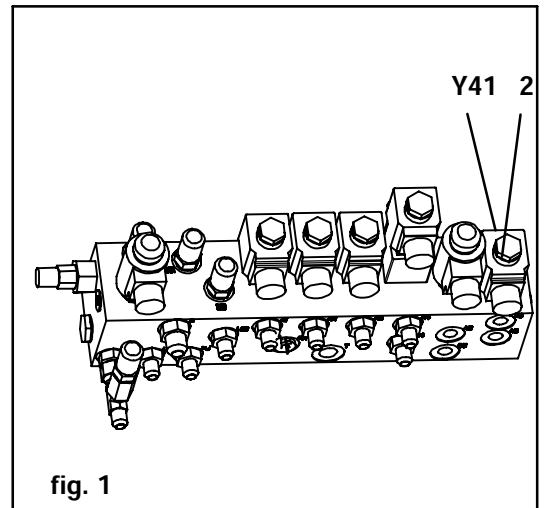
Appendix 1 – Hydraulic Component Symbols

Appendix 2 – Hydraulic Schematics

1. Check and Adjust the Hydrostatic System; Drive Pump

1.1 Checking and Adjusting the Charge Pressure

- Disconnect the parking brake solenoid Y41 (1) from the valve block. After this, the parking brake will stay engaged (fig. 1).
- Connect a 6,0 MPa (870 psi) pressure gauge to pressure measuring point MH1 (fig. 2). When the engine RPM is 1600, the pressure should be 2.8 ... 3.2 MPa (406 ... 464 psi).
- If necessary, adjust the pressure with adjusting screw CH1 (fig. 1).
- Fit the solenoid into the valve and tighten the lockscrew (2) hand tight.



1.2 Checking and Adjusting the Pressure Cut-Off Valve Setting of the Drive Pump

- Disconnect the parking brake solenoid Y41 from the valve block (1). After this, the parking brake will stay engaged.
- Connect 60 MPa (8700 psi) pressure gauges to measuring points MH2 (forward) and MH3 (reverse) (fig. 1).
- Engage high gear.
- Drive the machine both forward and backward even though the brake is on. Do not do this longer than for five seconds at a time.
- The pressure should rise to **45.0 + 0.5 MPa (6527 + 72 psi)** both directions.
- If necessary, adjust the pressure with adjusting screw CH2 (forward/reverse).
- After making the adjustment, check the pressures once again.
- Fit the solenoid into the valve and tighten the lockscrew (2) hand tight.

<p>MH2 = Driving forward MH3 = Driving reverse CH2 = Pressure cut -off adjustment screw</p>
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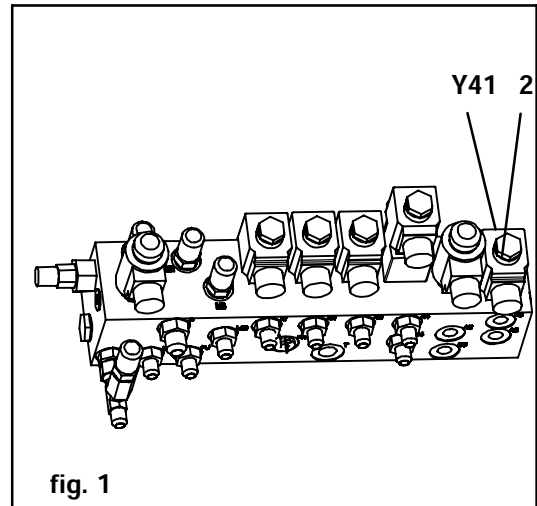


fig. 1

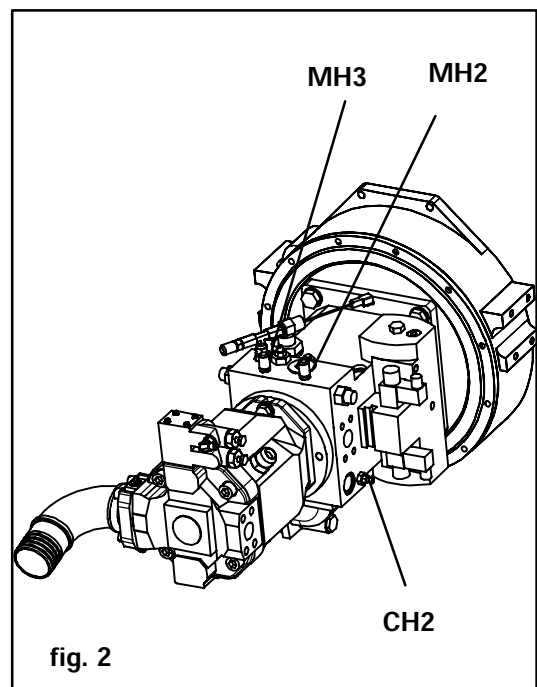


fig. 2