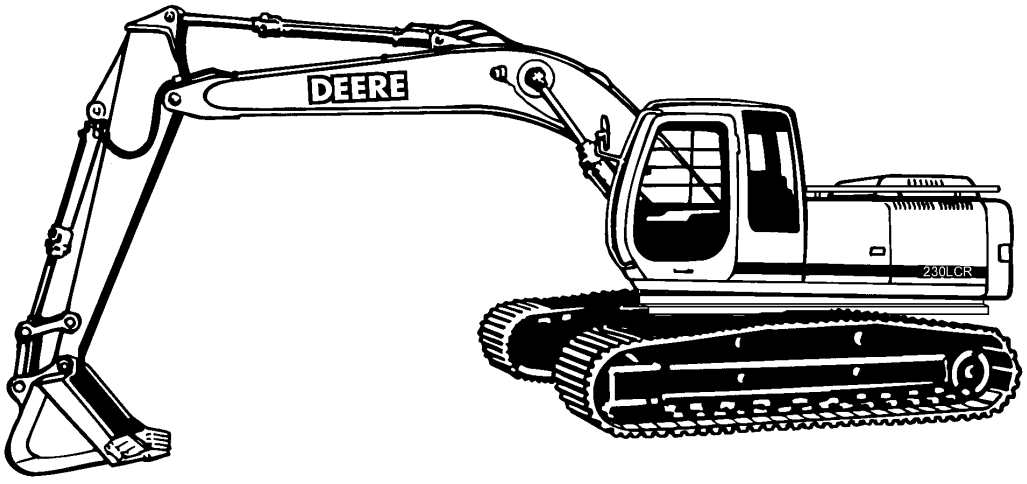
TECHNICAL MANUAL

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

HYDRAULIC EXCAVATOR
JOHN DEERE
MODEL 230LCR
NSN 3805-01-463-0804

AND

MODEL 230LCRD WITH ROCK DRILL
NSN 3805-01-463-0806



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DEPARTMENT OF THE ARMY
Washington, DC, *15 February 2000***

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CHAPTER 13

SECTION 04

ENGINE REPAIR

ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC).

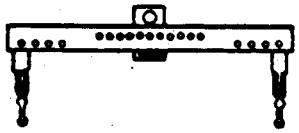
SERVICEGARD is a trademark of Deere & Company.

CED,OUOE003,1159 –19–18SEP98–1/6

T6585NV –UN–18OCT88

Lifting Sling JDG23

To remove engine.



CED,OUOE003,1159 –19–18SEP98–2/6

T6585NO –UN–18OCT88

Flywheel Turning Tool JDG820

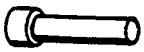
To rotate crankshaft to position number one piston at "TDC" on compression stroke.

CED,OUOE003,1159 –19–18SEP98–3/6

T6585NP –UN–18OCT88

Timing Pin JDE81-4

To lock engine at TDC.

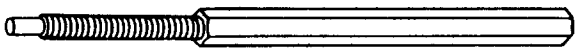


CED,OUOE003,1159 –19–18SEP98–4/6

RG7212 –UN–23NOV97

Injection Pump Timing Pin. JDG886

To lock fuel injection pump timing prior to removal of pump.



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CED,OUOE003,1159 –19–18SEP98–5/6

Removal and Installation

RG5154 –UN–23AUG88

3/4 in. Special Crowsfoot JDF22

To disconnect injection lines.

CED,OUOE003,1159 –19–18SEP98–6/6

SERVICE EQUIPMENT AND TOOLS

NOTE: Order tools according to information given in the U.S. SERVICEGARD™ Catalog or from the European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

04 0400 2

SERVICEGARD is a trademark of Deere & Company

CED,OUOE003,513 –19–15MAY98–1/2

Pump Support . . . . . DFT1119[1]

To support main hydraulic pump when engine is removed.

[1]Fabricated tool, dealer made. (See Section 99 for instructions to make tool.)

CED,OUOE003,513 –19–15MAY98–2/2

OTHER MATERIAL

Number	Name	Use
TY6304 (U.S.) TY9484 (Canadian) 515 (LOCTITE®)	Flexible Sealant	Apply to oil pan rail where flywheel housing, front plate, and timing gear cover contact cylinder block.
TY9375 (U.S.) TY9480 (Canadian) 592 (LOCTITE®)	Pipe Sealant	Apply to elbow drain fittings.
AR54749 (U.S.)	Soap Lubricant	To aid in pump installation and prevent O-ring damage.

LOCTITE is a trademark of Loctite Corp.

CED,OUOE003,1160 –19–18SEP98–1/1

SPECIFICATIONS

Item	Measurement	Specification
Engine:		
Hydraulic Pump and Gearbox	Weight	167 kg (370 lb) approximate
Engine	Weight	954 kg (2100 lb) approximate
Bracket and Mount-to-Frame Cap Screw	Torque	350 N•m (260 lb-ft)
Oil Pan:		
Oil Pan and Gasket-to-Engine Block Cap Screw	Torque	35 N•m (26 lb-ft)
Oil Pan Drain Plug	Torque	47 N•m (35 lb-ft)
Fuel Injection Pump:		
Mounting Stud Nut	Torque	70 N•m (52 lb-ft)
Drive Gear-to-Pump Hub Cap Screw	Torque	47 N•m (35 lb-ft)
Injection Pump Drive Gear-to-Hub Cap Screw	Torque	27 N•m (20 lb-ft)
Fuel Delivery Line Nut	Torque	27 N•m (20 lb-ft)
Engine Valve:		
Exhaust Valve (E)	Clearance	0.46 mm (0.018 in.)
Intake Valve (I)	Clearance	0.36 mm (0.014 in.)
Intake and Exhaust Valve Jam Nut	Torque	27 N•m (20 lb-ft)
Rocker Arm Cover Cap Screw	Torque	10.8 N•m (96 lb-in.)
Starter:		
Starter	Weight	23 kg (50 lb) approximate

04
0400
3

Continued on next page

CED,OUOE003,1161 –19–18SEP98–1/2

Removal and Installation

Item	Measurement	Specification
Starter Mounting Flange-to-Flywheel Housing Cap Screw	Torque	47 N•m (35 lb-ft)

CED,OUOE003,1161 –19–18SEP98–2/2

REMOVE ENGINE

TS281 –UN–23AUG88

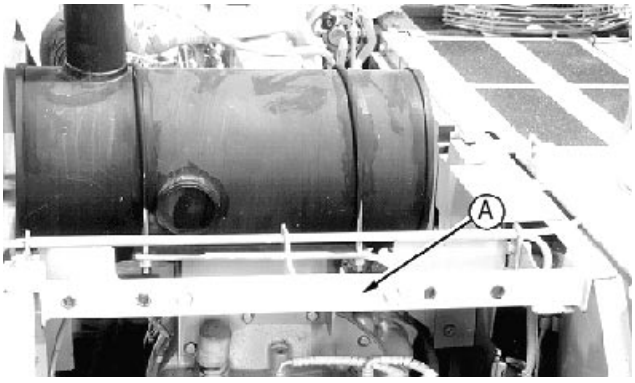
CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

1. Disconnect negative (-) battery cable.
2. Drain coolant. Cooling capacity is approximately 28.4 L (30 qt).

TX,04,UU3872 –19–18SEP98–1/5

3. Remove hood and hood support (A).



T104488 –UN–17OCT96

A—Hood Support

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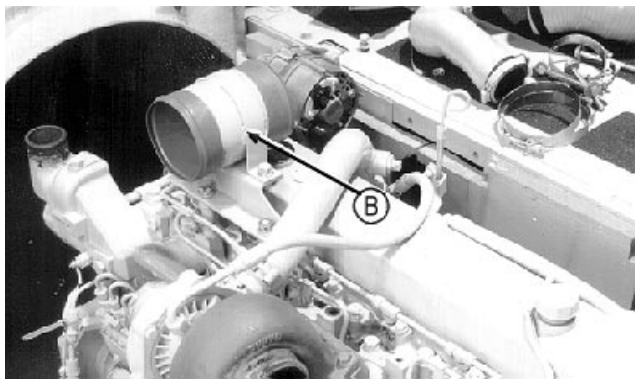
TX,04,UU3872 –19–18SEP98–2/5

4. Remove air intake hoses and coupling (B) above the rocker arm cover.
5. Remove fan guard.
6. Remove upper and lower radiator hoses.
7. Remove fan and fan spacer.
8. Remove muffler and muffler bracket.
9. Disconnect wiring harnesses.
10. Disconnect fuel lines. Plug openings.
11. Disconnect heater hoses. Plug openings.
12. Remove air conditioner compressor and bracket from engine. It is not necessary to discharge the air conditioning system.
13. Secure compressor so it does not interfere when removing the engine.



B—Coupling

04
0400
5

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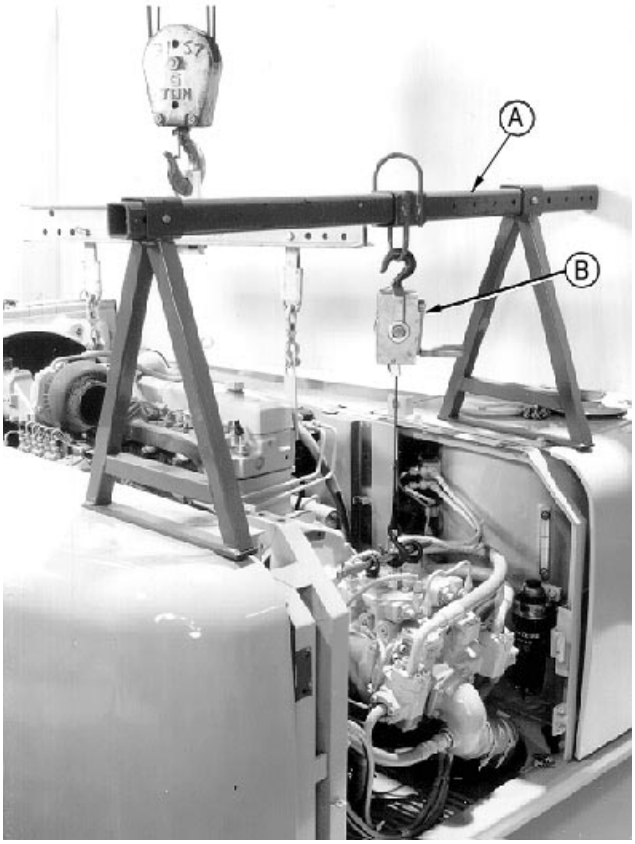
TX,04,UU3872 –19–18SEP98–3/5

CAUTION: The approximate weight of hydraulic pump and gearbox is 167 kg (370 lb).

Hydraulic Pump and Gearbox—Specification

Weight..... 167 kg (370 lb) approximate

14. Support main hydraulic pump and gearbox using DFT1119 Pump Support (A) and a small winch hoist (B). (See Section 99 for instructions to make tool.)



T104491 –UN–17OCT96

A—DFT1119 Pump Support
B—Winch Hoist

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TX,04,UU3872 –19–18SEP98–4/5

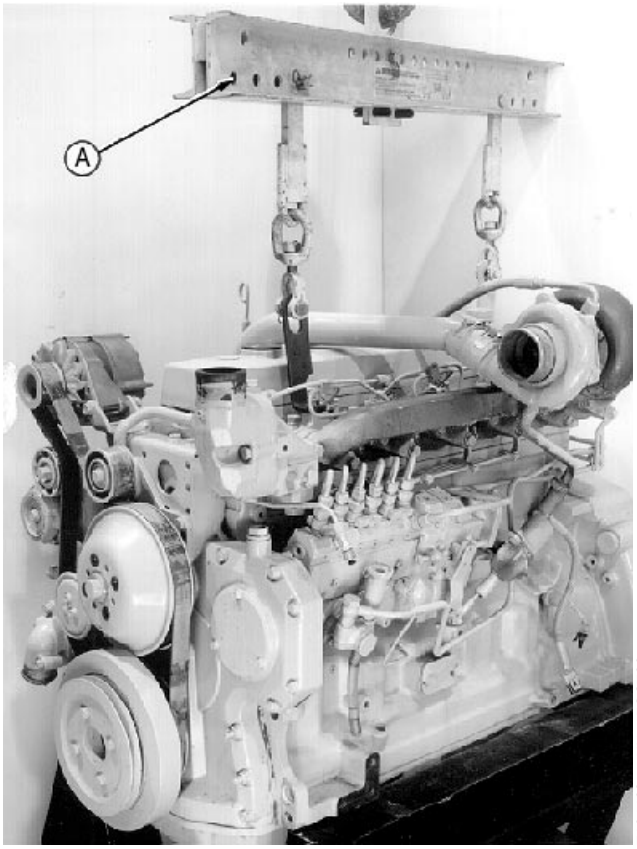
CAUTION: The approximate weight of engine is 954 kg (2100 lb).

The recommended method for lifting the engine is using the JDG23 Lifting Sling. The lifting force must be at 90° at the lifting points.

Engine—Specification

Weight..... 954 kg (2100 lb) approximate

15. Attach JDG23 lifting sling (A) to engine as shown.
16. Remove pump gearbox-to-flywheel housing cap screws.
17. Remove engine mount cap screws.
18. Raise engine slightly and push engine away from hydraulic pump. Lift engine when engine is disengaged from pump drive coupling.

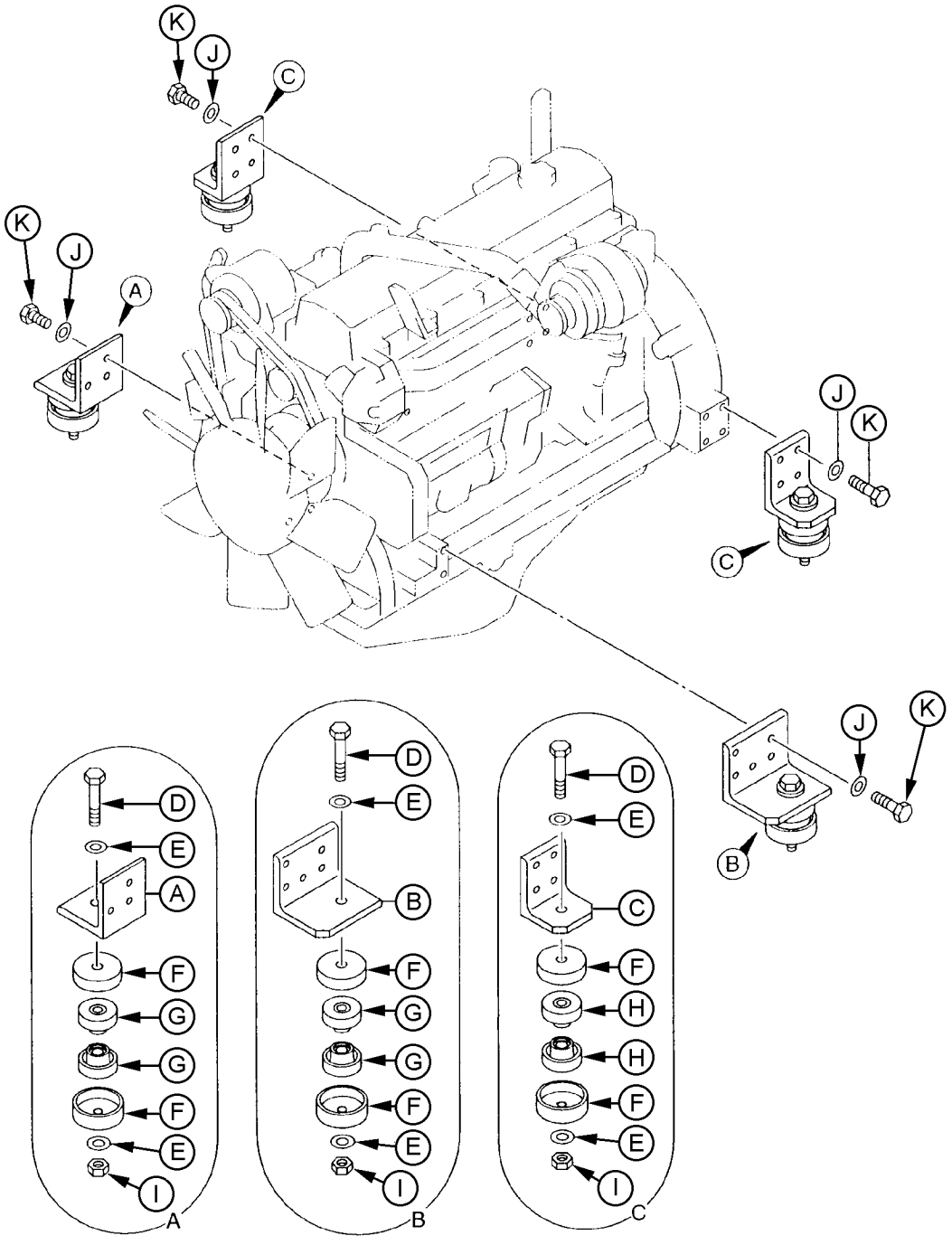


A—JDG23 Lifting Sling

TX,04,UU3872 –19–18SEP98–5/5

04
0400
7

INSTALL ENGINE



A—Bracket, Right Front
B—Bracket, Left Front
C—Bracket, Rear (2 used)
D—Cap Screw (4 used)
E—Washer (8 used)
F—Stop (8 used)
G—Rubber Mount (4 used)
H—Rubber Mount (4 used)
I—Nut (4 used)
J—Washer (14 used)
K—Cap Screw (14 used)

1. Lower engine into excavator.

Continued on next page

TX,04,UU3873 –19–18SEP98–1/4