Group 05 - Safety

Recognize Safety Information



This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

Handle Fluids Safely—Avoid Fires



When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

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Group 05 - Engine

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.

Lifting Bracket

JDG19

Used to remove and install engine.

Lifting Bracket

JTO1748

Used to remove and install engine.

Flywheel Turning Tool

JDE83

Rotates flywheel. (4-Cylinder)

Flywheel Turning Tool

JDG1704

Rotates flywheel. (5-Cylinder)

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Group 05 - Fuel System

Specifications

Item	Measurement	Specification
Fuel Tank Mounting Cap Screw	Torque	20 N•m (15 lb-ft)

Injection Pump, Nozzle and Governor Repair—Use CTM207 or CTM301



For complete repair information the component technical manual (CTM) is also required. Use the component manual in conjunction with this machine manual.

- 5-cylinder, 3.0 L engines, use CTM301
- 4-cylinder, 4.5 L engine mechanical fuel systems, use CTM207

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Group 05 - Battery, Starter and Alternator

Starter Repair—Use CTM77



For complete repair information the component technical manual (CTM) is also required. Use the component technical manual in conjunction with this machine manual.

Prevent Battery Explosions



Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

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Group 05 - Clutch Housing

Essential Tools

→NOTE:

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

Flywheel Turning Tool

JDE83 (4-Cylinder)

Align traction clutch and shaft

Flywheel Turning Tool

JDG1704 (5-Cylinder)

Align traction clutch and shaft

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.

Lifting Brackets

JDG19

Used to remove and install engine.

Lifting Brackets

JT01748

Used to remove and install engine.

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Group 05 - Steering Repair

Other Material

Number	Name	Use
• PM37477 (us) • NA (canadian) • 242 LOCTITE ™ (loctite)	Thread Lock and Sealer (Medium Strength)	Apply to steering cylinder-to-axle cap screws (2WD axle).
• TY6333 (us)	Moly High Temperature EP Grease	Apply to mating surfaces of steering cylinder and differential case (MFWD axle) and to tie rod sleeves (2WD axle).

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Group 05 - Hydraulic Pump and Filter

Service Parts Kit

The following kits are available through your parts catalog.

Hydraulic Pump Seal Kit

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.

Bushing, Bearing, and Seal Driver Set

Used to remove and install hydraulic pump seals.

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Group 05 - Front Axle—2WD

Specifications

Item	Measurement	Specification
Axle	End Play	0.8 mm (0.030 in.)
2WD Axle Pivot Pin Retainer Cap Screw	Torque	135 N˙m (100 lb-ft)
Spindle Nut	Torque	320 N˙m (240 lb-ft)
Tie Rod End Nylock Nut	Torque	80 N˙m (59 lb-ft)
Steering Cylinder Lock Nut	Torque	165 N˙m (122 lb-ft)
Front Wheel Cap Screw	Torque	175 N˙m (129 lb-ft)

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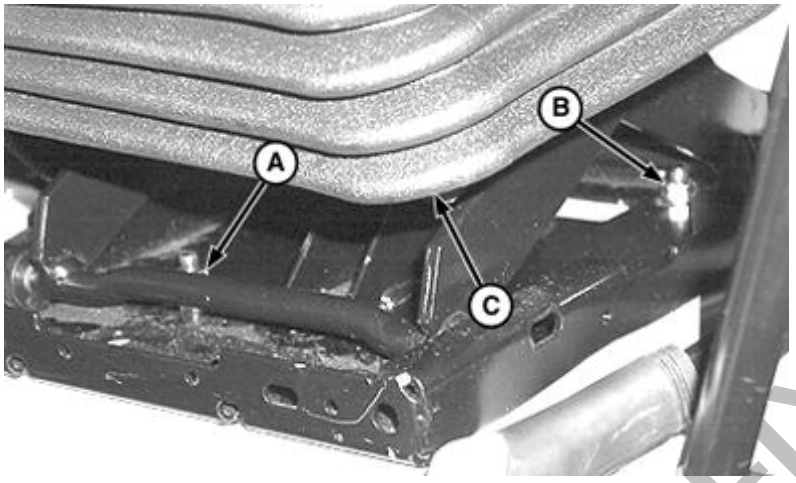
Group 05 - Seat and Support

Remove and Install Seat and Support

[1] -

→NOTE:

Cab tractor shown; straddle mount is similar.





LEGEND:

A	Front Mounting Cap Screw (2 used)
B	Rear Mounting Cap Screw (2 used)
C	Boot
D	Harness Connector

Disconnect boot (C) from lower support.

[2] - Remove front and rear mounting cap screws (A and B).

[3] - Disconnect harness connector (D).

[4] - Remove seat and support from tractor. Repair or replace as necessary.

[5] - Install seat and support.

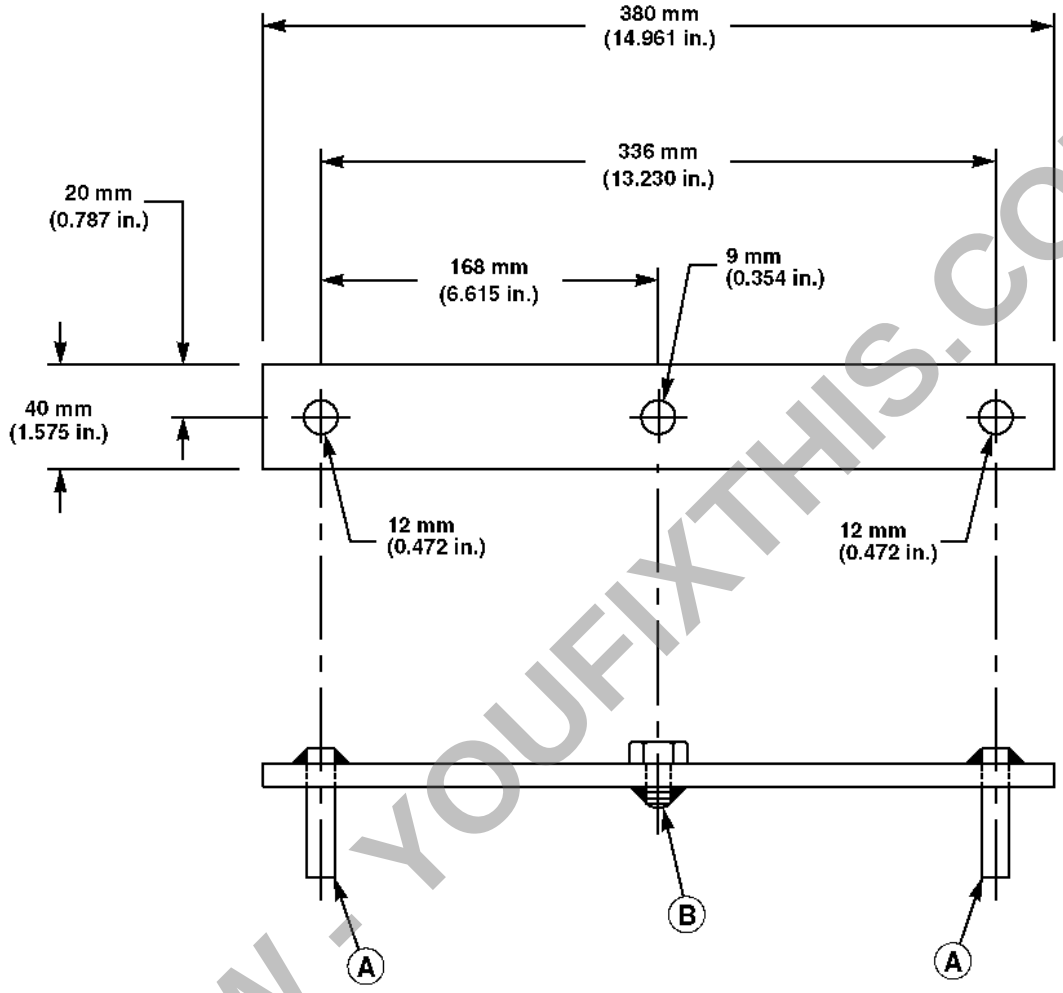
[6] - Connect harness connector (D).

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Group 05 - Dealer Fabricated Tools

DFLV1A—Final Drive Turning Tool



LEGEND:

A	Rod
B	Cap Screw

Use: Tool is used to rotate final drive housing to determine rolling drag torque.

Material Required:

- 40 x 10 x 380 mm (1.575 x 0.394 x 14.961 in.) Flat Steel Stock
- 12 x 50 mm long (0.472 x 1.969 in. long) Round Steel Stock (2 used)
- M8 x 15 mm Cap Screw
- Drill two 12 mm (0.472 in.) and one 9 mm (0.354 in.) holes as shown
- Weld rods (A) and cap screw (B) to flat steel stock as shown

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Water Quality

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate. All water used in the cooling system should meet the following minimum specifications for quality:

Chlorides	<40 mg/L
Sulfates	<100 mg/L
Total dissolved solids	<340 mg/L
Total hardness	<170 mg/L
pH	5.5 to 9.0

Freeze Protection

The relative concentrations of glycol and water in the engine coolant determine its freeze protection limit.

Ethylene Glycol	**Freeze Protection Limit**
40%	-24°C (-12°F)
50%	-37°C (-34°F)
60%	-52°C (-62°F)
Propylene Glycol	**Freeze Protection Limit**
40%	-21°C (-6°F)
50%	-33°C (-27°F)
60%	-49°C (-56°F)

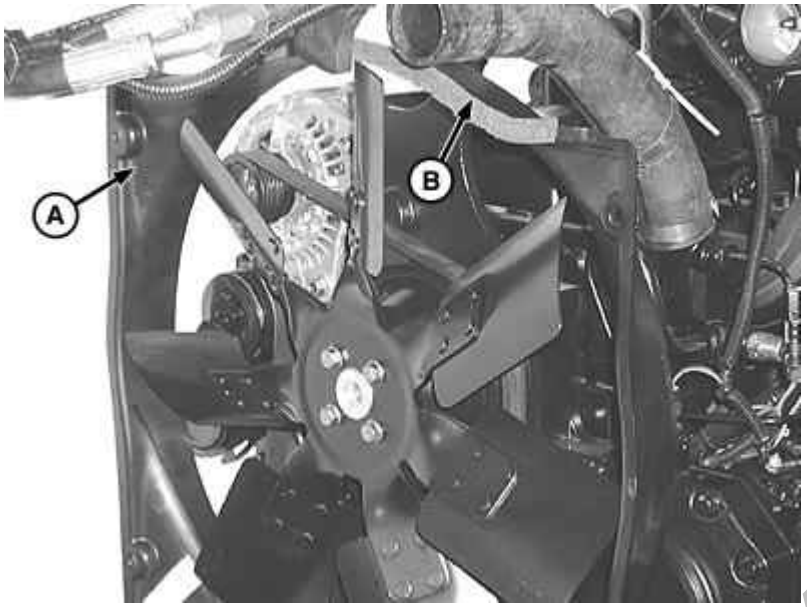
DO NOT use a coolant-water mixture greater than 60% ethylene glycol or 60% propylene glycol.

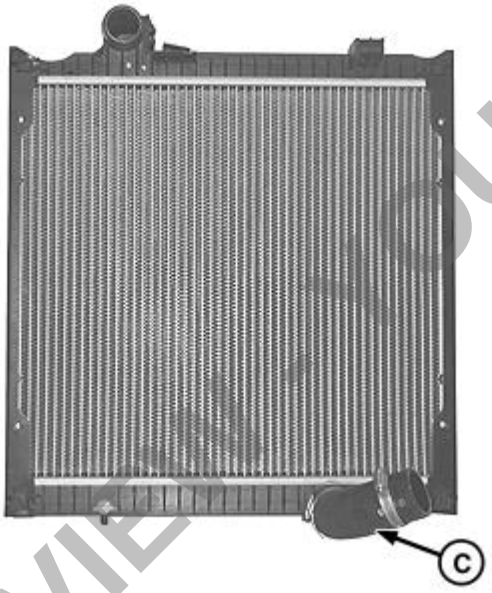
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Install Radiator

[1] -





LEGEND:

A	Fan Shroud
B	Hose Notch
C	Lower Radiator Hose

Place fan shroud (A) over cooling fan, with hose notch (B) at top.

[2] - Install lower radiator hose (C).

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Group 10 - Electrical System Components

Essential Tools

→NOTE:

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

Special Socket

JDG465

Used to remove and install engine oil pressure switch.

Other Material

Number	Name	Use
• PM37477 (us) • 242 LOCTITE ™ (loctite)	Thread Lock and Sealer (Medium Strength)	Apply to threads of engine oil pressure switch.

Specifications

Item	Measurement	Specification
Rear Wheel-to-Axle Cap Screw M20	Torque	600 N˙m (442 lb-ft)

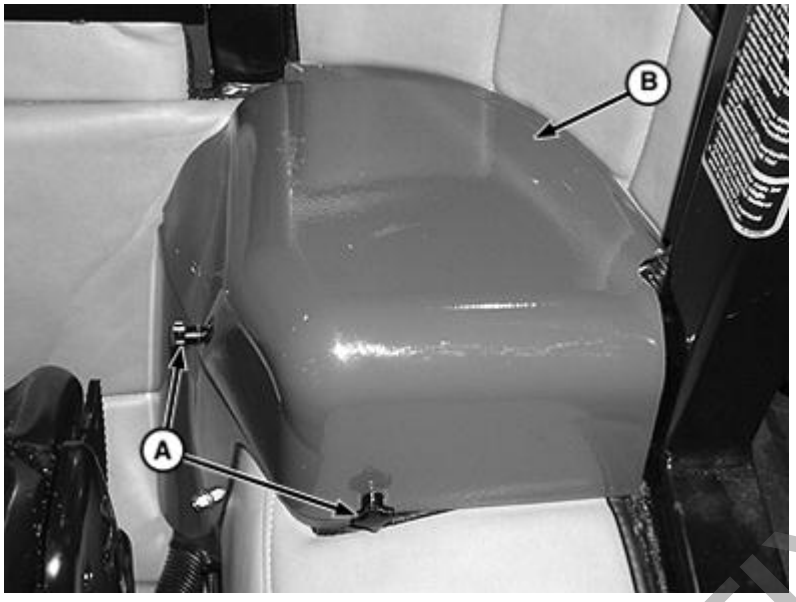
Replace Air Filter Restriction Switch

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Replace Load Center Panel—Cab Tractors

Load center panel is integrated into the cab wire harness. If replacement is necessary see Replace Rear Wiring Harness—Cab Tractors in Section 40, Group 15.





LEGEND:

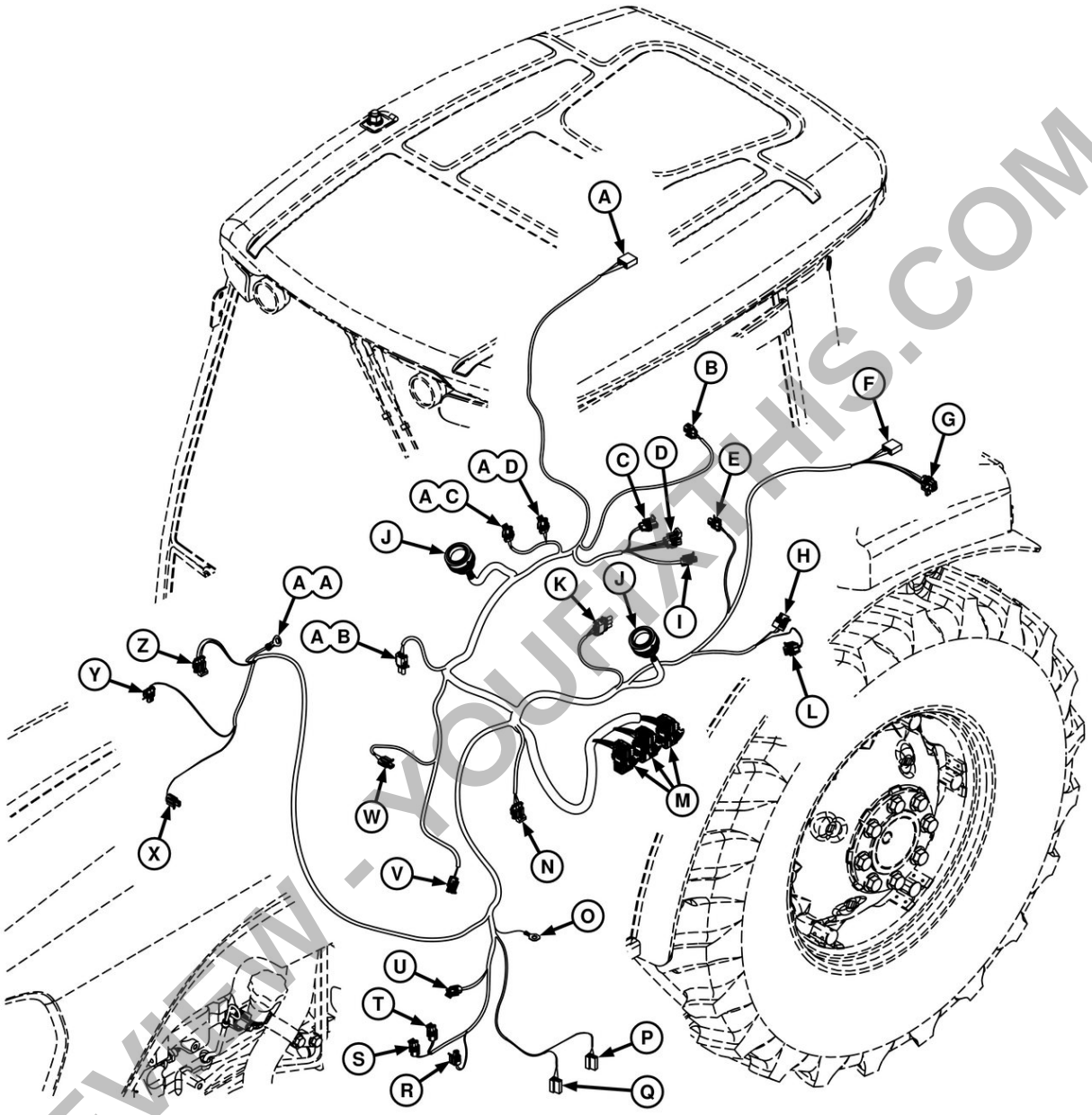
A	Screw (3 used)
B	Cover

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Replace Rear Wiring Harness—Cab Tractors

[1] -



LEGEND:

A	Right Tail/Turn Light Connector
B	Back-Up Alarm Connector
C	7-Pin Trailer Connector
D	7-Pin Trailer Connector
E	Fuel Level Sender Connector
F	Left Tail/Turn Light Connector
G	Left External Hitch Switch Connector
H	Hitch Draft Sensor Connector
I	PTO Speed Sensor Connector
J	Rear Harness-to-Console Harness Connector
K	Hitch Feedback Sensor Connector
L	Electro-Hydraulic PTO Speed Sensor Connector
M	Tractor Control Module Connectors

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D	O-Ring
E	Spring
F	Ball
G	Plug
H	O-Ring
I	Spring
J	Ball
K	Inlet Strainer (2 used)
L	Plug (5 used)
M	Piston
N	Spring
O	O-Ring
P	Plug
Q	Plug
R	Housing

Remove EH Hi/Lo valve. (See Remove and Install EH Hi/Lo Valve in Section 50, Group 11.)

[2] - Remove socket head cap screws (A) and remove solenoid valve (B).

[3] - Remove parts (C—F).

[4] -

→NOTE:

All EH Hi/Lo valves contain a MFWD check valve, even if tractor is not equipped with MFWD.

Remove parts (G—J) to remove MFWD check valve.

[5] - Remove parts (M—P) to remove lubrication relief valve.

[6] -

→NOTE:

Inlet strainers (K) will be damaged and must be replaced if removed.

Clean and check inlet strainers (K). Remove and replace only if necessary.

[7] - Remove plugs (L and Q).

[8] - Clean and inspect valve housing (R). Replace if necessary.

[9] -

IMPORTANT:

Replace all O-rings and seals. Used or damaged O-rings and seals will leak.

→NOTE:

Lubricate all internal parts with clean transmission/hydraulic oil during assembly.

Install new inlet strainers (K), if removed.

[10] - Install plugs (L and Q).

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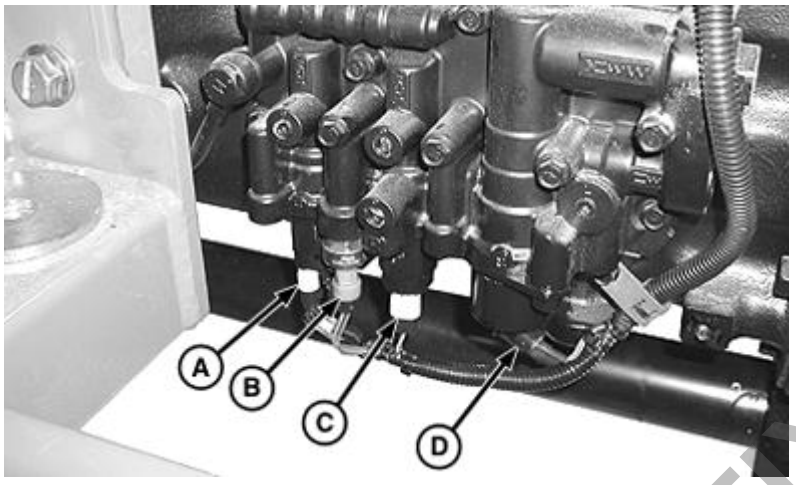
[12] - Remove banjo fitting (E) to disconnect PTO clutch engagement line.

[13] - Loosen clamp (F) and disconnect fuel line.

[14] - Disconnect brake valve return line at fitting (G).

[15] - Remove MFWD drive shaft , if equipped. (See Remove, Inspect, and Install MFWD Drive Shaft in Section 50, Group 35.)

[16] -

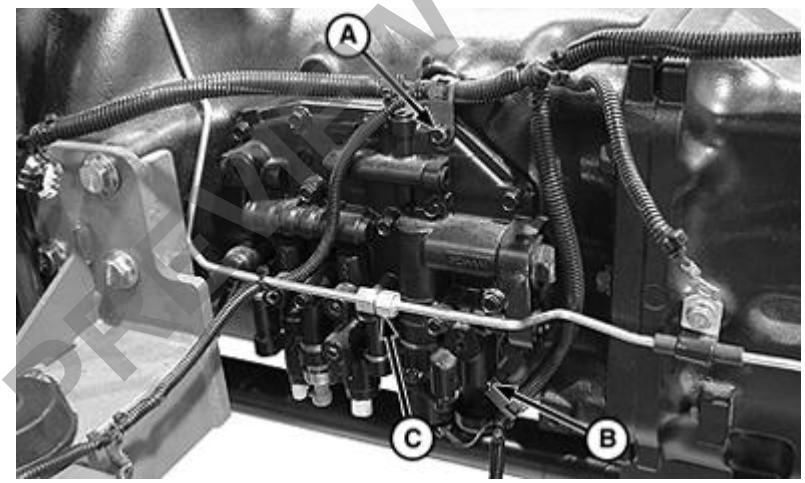


LEGEND:

A	Forward Solenoid Connector
B	Pressure Transducer Connector
C	Reverse Solenoid Connector
D	Clutch Enable Valve Connector

Disconnect valve connectors (A—D).

[17] -



LEGEND:

A	Cap Screw
B	Cap Screw
C	Fitting

Remove harness clamp cap screws (A and B) and route harness towards rear of tractor.

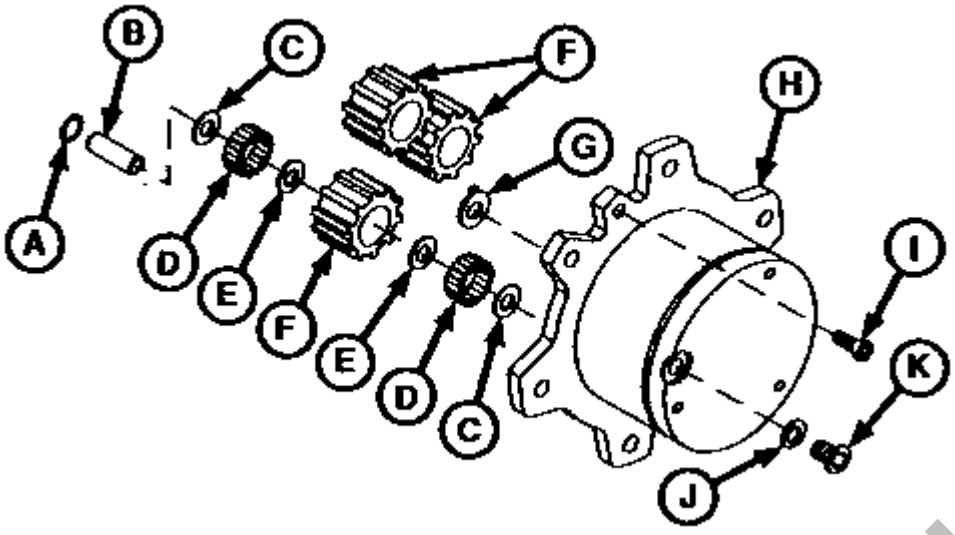
[18] - Disconnect left hand brake line at fitting (C).

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B	Cap Screw (2 used)
C	Plate
D	Spring
E	Snap Ring
F	Washer
G	Snubber Brake
H	Shaft
I	Cap Screw (4 used)
J	Plug (2 used)
K	Holder
L	O-Ring
M	O-Ring
N	Piston
O	O-Ring
P	Spring
Q	Snap Ring
R	Washer
S	Ring
T	Spring Pin (2 used)
U	Fork
V	Shaft
W	Fork
X	Seal
Y	Bearing
Z	Snap Ring
AA	Washer
AB	Spring
AC	Cam
AD	Pin (2 used)
AE	Cap Screw
AF	Shifter
AG	Spring
AH	Snap Ring
AI	Solenoid Valve
AJ	Washer
AK	Gear
AL	Bushing
AM	Plug (2 used)
AN	Shifter
AO	Shift Collar
AP	Frame (2 used)
AQ	Window (2 used)
AR	Gasket
AS	Valve
AT	Cap Screws (6 used)
AU	Shaft
AV	Snap Ring
AW	Seal
AX	Shaft
AY	Ball
AZ	Key

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LEGEND:

A	Snap Ring (3 used)
B	Pinion Shaft
C	Washer (2 per gear)
D	Needle Bearings (40 per gear)
E	Washer (2 per gear)
F	Planet Gear (3 used)
G	Thrust Pad
H	Planet Pinion Carrier
I	Socket Head Screw
J	O-Ring
K	Filler/Drain Plug

Remove parts (A—G) from planet pinion carrier (H).

[8] -

→NOTE:

Pad (G) is held with adhesive to carrier (H). Remove only if replacement is necessary.

Inspect all parts for wear or damage. Replace as necessary.

[9] -

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[6] - Install parts (A—E). Tighten ball joint (D), tie rod jam nut (C), and lock nut (A) to specification.

Item	Measurement	Specification
Ball Joint to Piston Rod—MFWD Axle	Torque	300 N˙m (221 lb-ft)

Item	Measurement	Specification
Tie Rod Jam Nut—MFWD	Torque	120 N˙m (88 lb-ft)

Item	Measurement	Specification
Tie Rod End Lock Nut—MFWD	Torque	165 N˙m (122 lb-ft)

[7] - Install front wheels. Tighten wheel nuts to specification.

Item	Measurement	Specification
Front Wheel Nut	Torque	300 N˙m (221 lb-ft)

[8] - Remove supports and lower tractor to ground.

[9] - Adjust front axle toe-in. (See Reference 260-15-006, Checking Toe-In—MFWD Axle and Reference 260-15-007, Adjusting Toe-In—MFWD Tractor TM2198 Section 260, Group 15.)

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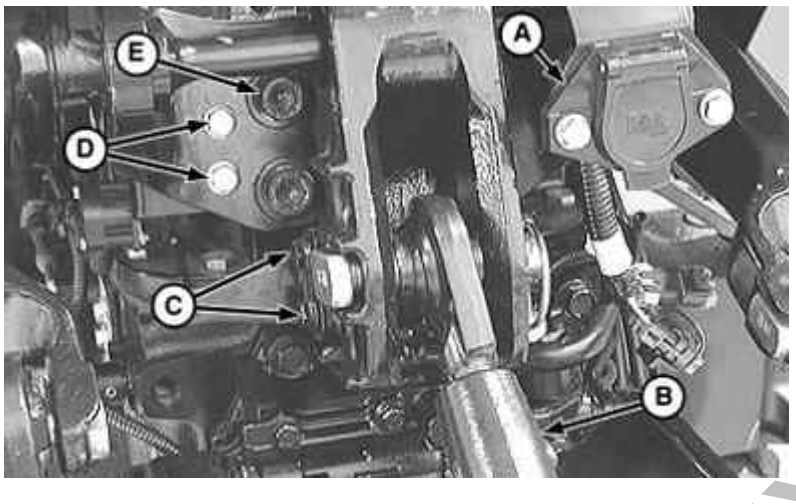
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Inspect and Repair Draft Sensing Support Assembly

[1] -

→NOTE:

Cab tractor shown. Straddle mount tractors are similar.



LEGEND:

A	7-Pin Connector Bracket
B	Center Link
C	Cap Screw (2 used)
D	Cap Screw (2 used)
E	Socket Head Cap Screw (4 used)

Lower rockshaft arms completely.

[2] - Remove center link (B).

[3] - Remove 7-pin connector bracket (A).

[4] - Remove two cap screws (C), two cap screws (D), and lay draft sensor and rod bracket aside.

[5] - Remove four socket head cap screws (E) and support assembly.

[6] - Inspect support assembly for wear or damage. Replace if necessary.

[7] - Install support assembly and four socket head cap screws (E). Tighten socket head cap screws to specification.

Item	Measurement	Specification
Draft Sensing Support Mounting Socket Head Cap Screw	Torque	375 N˙m (277 lb-ft)

[8] - Install draft-sensing rod bracket using two cap screws (C).

[9] - Install draft sensor using two cap screws (D).

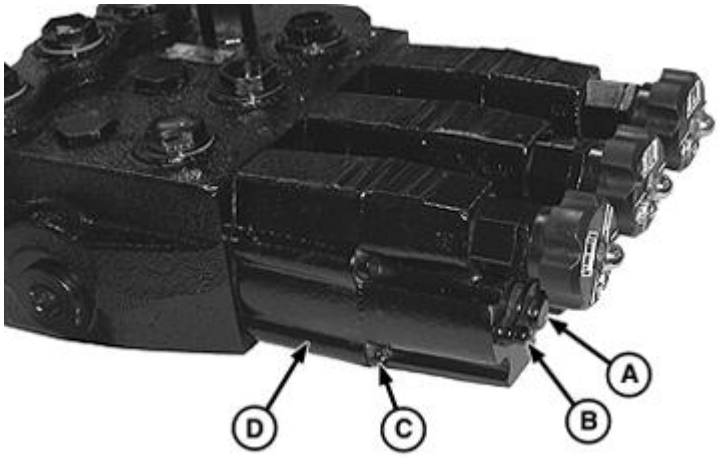
[10] - Install 7-pin connector bracket (A).

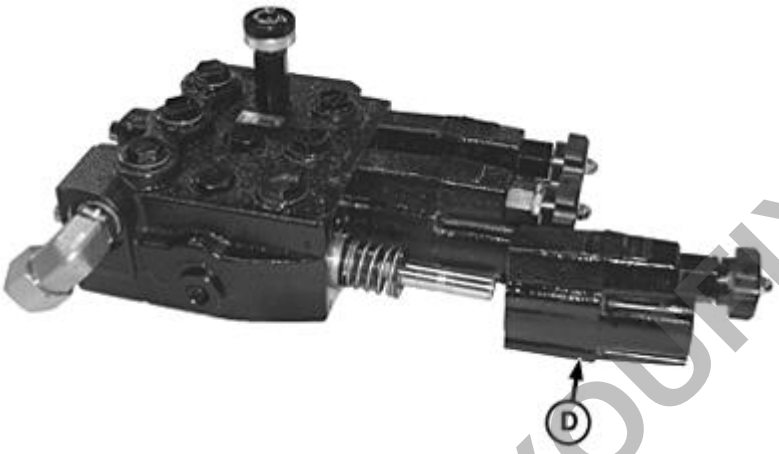
[11] - Install center link (B).

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[41] -





LEGEND:

A	Screw (2 used)
B	Cap
C	Socket Head Cap Screw (4 used)
D	Valve Housing End Cap

Install spool assembly back into valve as shown.

[42] - Apply MT1247 Locking Liquid, supplied with repair kit, to threads of socket head cap screws (C).

Number	Name	Use
• MT1247 (us)	Locking Liquid	Used on threads of triple SCV cap screws.

[43] - Install valve housing end cap (D) and socket head cap screws (C). Tighten to specification.

Item	Measurement	Specification
Valve Housing End Cap Socket Head Cap Screws	Torque	12—15 N˙m (106—133 lb-in.)

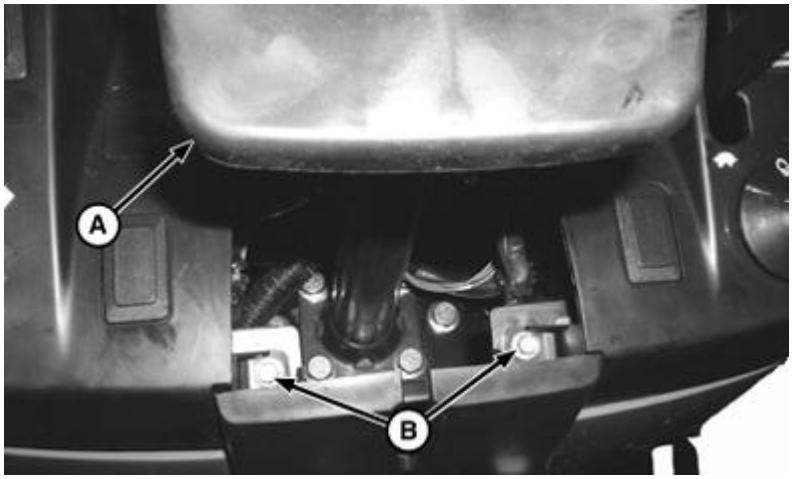
[44] - Install cap (B) and screws (A).

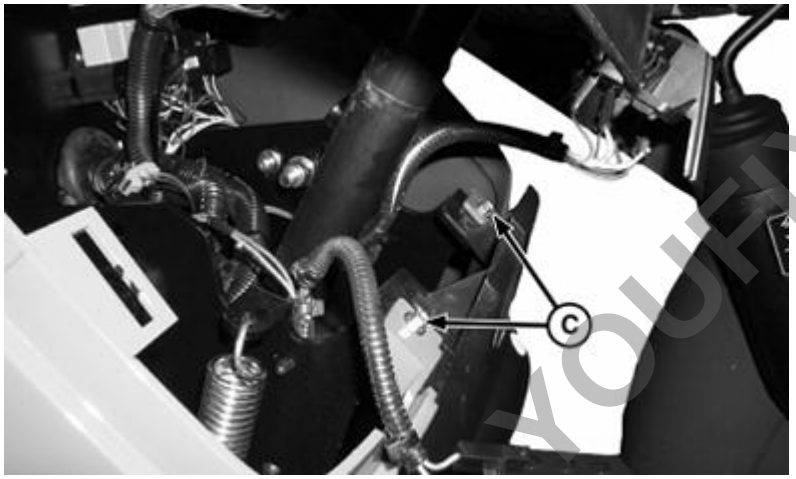
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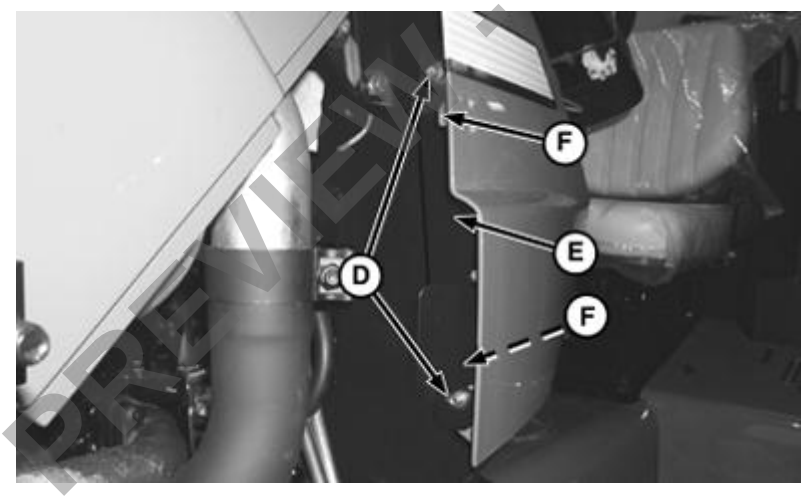
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Remove and Install Cowl Cover

[1] -







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IMPORTANT:

If installing a new receiver-dryer after replacement of the air conditioning compressor was performed, you must flush the air conditioning system before installing the new receiver-dryer. See Flush Air Conditioning System in this group.

Install receiver/dryer with area marked “TOP” in up position. Install cap screw and nut (B).

[5] - Connect lines (A and C). Tighten to specification.

Item	Measurement	Specification
Receiver/Dryer Lines	Torque	14—20 N˙m (10—15 lb-ft)

[6] - Evacuate and charge the system. (See Evacuate Air Conditioning System and Charge Air Conditioning System in Section 90, Group 25.)

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