Group 05 - Safety

Recognize Safety Information



Safety-alert symbol

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.

Understand Signal Words



Signal Words

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

Follow Safety Instructions

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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

JT01748

Used to remove and install engine.

Flywheel Turning Tool

JDE83

Rotates flywheel

Specifications

Item	Measurement	Specification
Engine/Flywheel Housing-to-Clutch Housing Cap Screw	Torque	260 N˙m (192 lb-ft)
Clutch Housing-to-Engine M20 Cap Screw	Torque	430 N˙m (317 lb-ft)
Engine-to-Front Support Top Cap Screw	Torque	318 N˙m (235 lb-ft)
Engine-to-Front Support Lower Cap Screw	Torque	162 N˙m (119 lb-ft)
Engine-to-Front Support Nut	Torque	318 N˙m (235 lb-ft)

John Deere Engine Repair—Use CTM104



Component Technical Manual

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

- 4-cylinder 4.5 L engines—Use CTM104

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Group 05 - Fuel System

Injection Pump, Nozzle and Governor Repair—Use CTM104



Component Technical Manual

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

- 4-cylinder 4.5 L engines—Use CTM104

Remove, Inspect and Install Fuel Tank—Reference Listing

- Remove, Inspect and Install Fuel Tank—OOS (-XXXXXX)
- Remove, Inspect and Install Fuel Tank—OOS (XXXXXX-)
- Remove and Install Fuel Tank—Cab and IOOS
- Remove, Inspect, and Install Fuel Tank—Narrow

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Group 05 - Battery, starter and alternator

Starter Repair—Use CTM77



Component Technical Manual

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



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).

Remove and Install Battery

[1] -

CAUTION:

Keep all sparks and flames away from batteries, as gas given off by electrolyte is explosive. To avoid sparks, connect ground cable last and disconnect it first.

To avoid shocks and burns, disconnect battery ground cable before servicing any part of electrical system.

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Group 05 - Clutch Housing

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.

Flywheel Turning Tool

JDE83

Used to rotate flywheel (4-cylinder)

Bushing, Bearing, and Seal Driver Set

Used to install bushings in clutch pedal.

Other Material

Number	Name	Use
• TY6333 (us) • CXTY6333 (canadian)	Moly High Temperature EP Grease	Apply to splined ends of traction and PTO clutch shafts. Apply to ID of clucth pedal bushings.

Specifications

Item	Measurement	Specification
Clutch Housing-to-Engine M20 Cap Screw	Torque	430 N˙m (317 lb-ft)
Engine/Flywheel Housing-to-Clutch Housing Cap Screw	Torque	260 N˙m (192 lb-ft)

Separate Engine from Clutch Housing—Reference Listing

- Separate Engine from Clutch Housing—OOS and IOOS
- Separate Engine from Clutch Housing—Cab

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Group 05 - Steering Repair

Other Material

Number	Name	Use
• PM37477 (us) • 242 LOCTITE ™ (loctite)	Thread Lock and Sealer (Medium Strength)	Apply to steering cylinder-to-axle cap screws (2WD axle).
• TY6333 (us) • CXTY6333 (canadian)	Moly High Temperature EP Grease	Apply to mating surfaces of steering cylinder and differential case (MFWD axle) and to tie rod sleeves (2WD axle).

Specifications

Item	Measurement	Specification
Straight Steering Column Mounting Cap Screw	Torque	50 N˙m (37 lb-ft)
Steering Wheel Nut—Straight Column	Torque	30 N˙m (22 lb-ft)
Steering Column Mounting Cap Screw—Tilt/Telescoping Column	Torque	50 N˙m (37 lb-ft)
Steering Wheel Nut—Tilt/Telescoping Column	Torque	30 N˙m (22 lb-ft)
Steering Valve Mounting Cap Screw—Telescoping Column	Torque	30 N˙m (22 lb-ft)
Steering Valve Cover Cap Screws	Torque	30 N˙m (22 lb-ft)
Steering Cylinder Cap Screws—2WD Axle	Torque	200 N˙m (147 lb-ft)
Steering Cylinder Mounting Clamp—MFWD Axle	Torque	70 N˙m (52 lb-ft)
Ball Joint—2WD Axle	Torque	300 N˙m (221 lb-ft)
Tie Rod Sleeve Cap Screws—2WD Axle	Torque	90 N˙m (66 lb-ft)
Tie Rod End Lock Nut—2WD Axle	Torque	165 N˙m (122 lb-ft)
Ball Joint to Piston Rod—MFWD Axle	Torque	300 N˙m (221 lb-ft)
Ball Joint Nut—MFWD Axle	Torque	120 N˙m (89 lb-ft)
Tie Rod End Lock Nut—MFWD Axle	Torque	165 N˙m (122 lb-ft)

Service Parts Kits

The following kits are available through your parts catalog:

Steering Valve Seal Kit

Steering Cylinder Seal Kit

Remove and Install Steering Column and Valve—Reference Listing

- Remove and Install Straight Steering Column and Valve (without oil cooler)
- Remove and Install Tilt Steering Column (if equipped)
- Remove and Install Steering Valve (with oil cooler)

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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

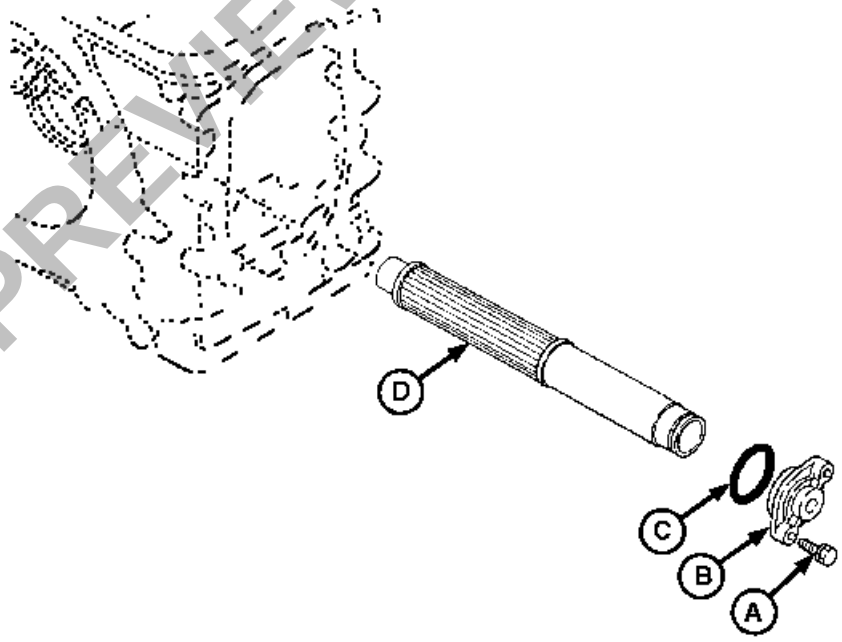
Used to remove and install hydraulic pump seals.

Specifications

Item	Measurement	Specification
Pick-Up Screen Cover Cap Screw	Torque	23 N˙m (17 lb-ft)
Hydraulic Pump Mounting Cap Screw	Torque	125 N˙m (92 lb-ft)
Hydraulic Pump Body Cap Screw	Torque	68 N˙m (50 lb-ft)
Hydraulic Pump Rear Outlet Fitting	Torque	28 N˙m (21 lb-ft)
Hydraulic Pump Front Outlet Fitting	Torque	46 N˙m (34 lb-ft)
Hydraulic Pump Gear Nut	Torque	90 N˙m (66 lb-ft)
Hydraulic Pump Inlet Manifold Socket Head Cap Screws	Torque	25 N˙m (18 lb-ft)
Hydraulic Oil Filter/Manifold Cap Screw	Torque	55 N˙m (41 lb-ft)
Rear Wheel-to-Axle Cap Screw M20	Torque	600 N˙m (442 lb-ft)

Remove, Inspect, and Install Hydraulic Oil Pick-Up Screen

[1] -



Pick-Up Screen Assembly

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Group 05 - Front Axle—2WD

Remove and Install Front Axle—2WD—Reference Listing

- Remove and Install Front Axle—2WD
- Remove and Install Front Axle—2WD (Narrow Tractors)
- Remove and Install Front Axle—2WD (High Clearance Tractors)

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Group 05 - Seat and Support

Remove and Install Seat and Support—Reference Listing

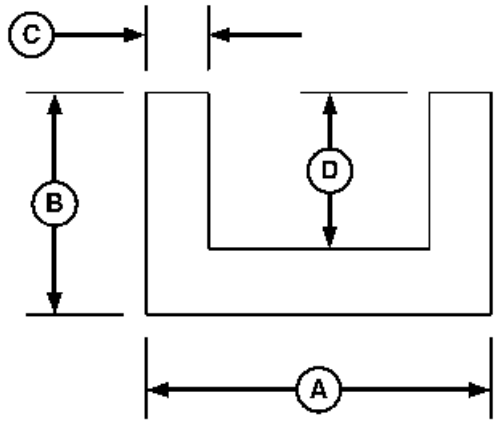
- Remove and Install Seat and Support—OOS
- Remove and Install Seat and Support—Cab and IOOS

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Group 00 - Dealer Fabricated Tools

PTO Clutch Finger Height Gauge



PTO Clutch Finger Height Gauge

Table

PTO Clutch Finger Height Gauge JDG826

Measures PTO clutch finger height.

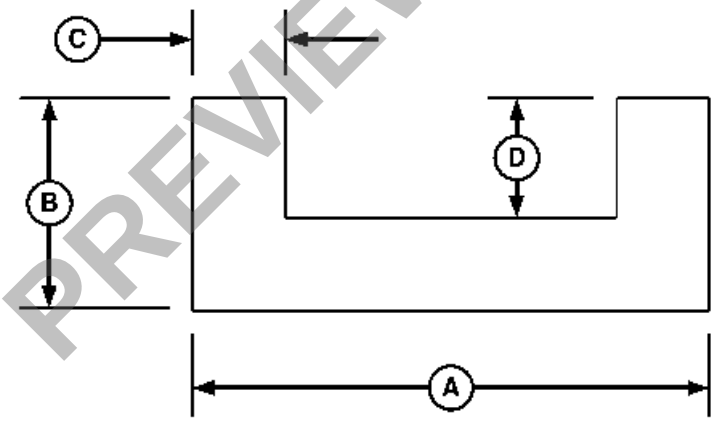
Fabrication Specifications

FABRICATION SPECIFICATIONS

Plate Minimum Thickness ..... 1.587 mm (0.0625 in.)

- Dimension (A) ..... 124.617 mm (4.906 in.)
- Dimension (B) ..... 65.087 mm (2.562 in.)
- Dimension (C) ..... 19.842 mm (0.781 in.)
- Dimension (D) ..... 41.275 mm (1.625 in.)

Traction Clutch Finger Height Gauge



Traction Clutch Finger Height Gauge

Traction Clutch Finger Height Gauge

Traction Clutch Finger Height Gauge JDG827

Measures traction clutch finger height.

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Alternative and Synthetic Lubricants

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Consult your John Deere dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to both conventional and synthetic oils.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.

Lubricant Storage

Your equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.

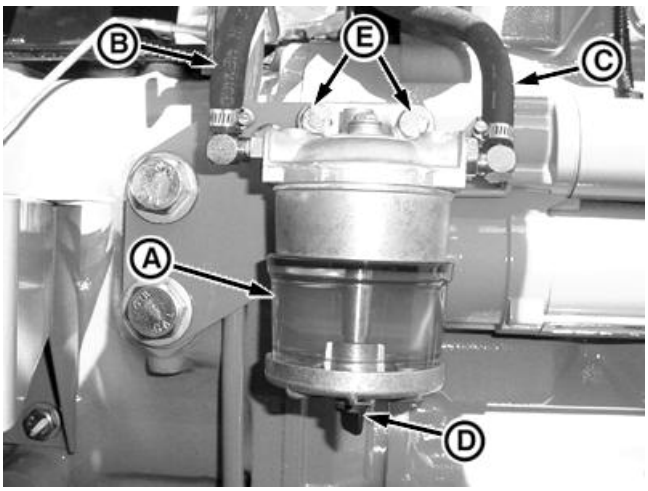
Whenever possible, store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

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LEGEND:

A	Water Separator
B	Fuel Line From Tank to Water Separator
C	Water Separator Line to Fuel Filter
D	Drain Screw
E	Assembly Screws

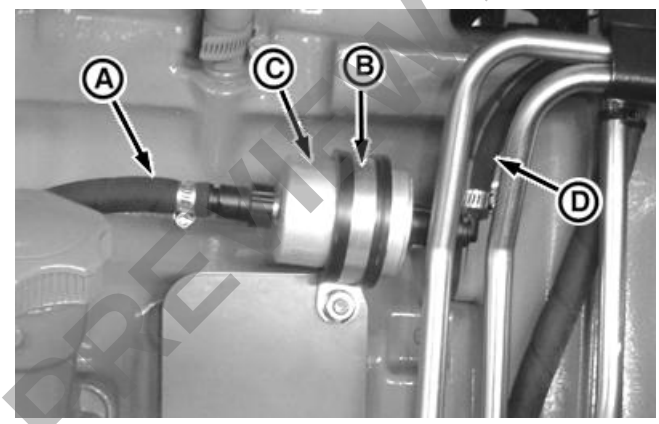
Water Separator

1. Disconnect fuel lines (B and C), close all openings using plugs.
2. Remove cap screws (E), remove the Water Separator assembly (A).
3. Install the Water Separator assembly with the screws.
4. Connect the fuel lines (B and C).
5. Bleed fuel system..

Replace Primary Fuel Filter—Cab and IOOS

CAUTION:

Comply with relevant safety instructions when working on the fuel system.



Replace Primary Fuel Filter

LEGEND:

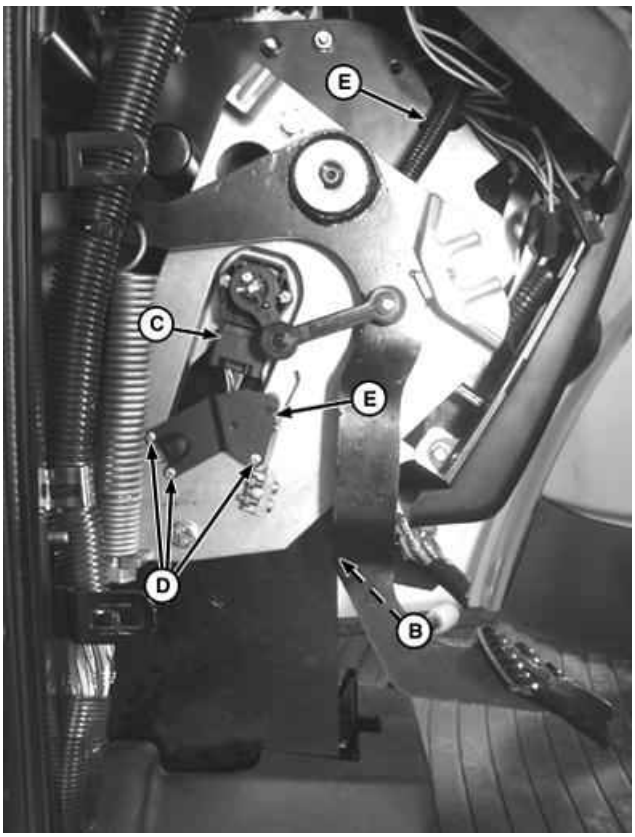
A	Hose
B	Clamp
C	Primary Fuel Filter
D	Hose

[1] -

Disconnect fuel hoses (A) and (D).

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LEGEND:

B	Wire Connector
C	Wire Connector
D	Screw (3 used)
E	Clutch Disengage Switch and Harness

Remove Clutch Disengage Switch

Disconnect wire connector (C) from clutch position sensor.

[6] - Remove three screws (D).

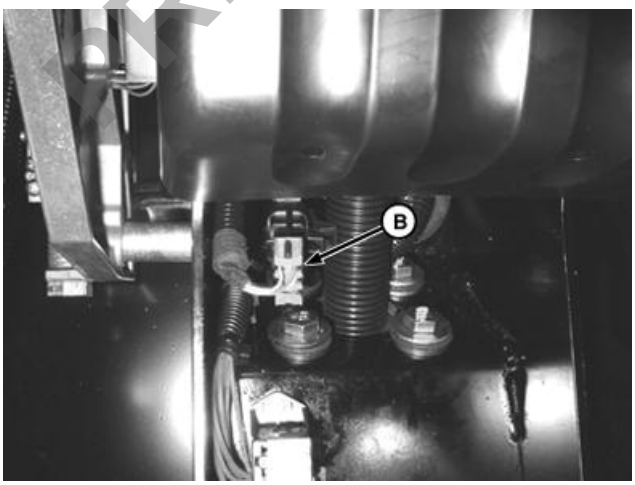
[7] - Remove clutch disengage switch and harness (E) from the console.

[8] - Route the new clutch disengage switch and harness (E) between the bracket and console and route the wire connector (B) to the bottom of the console.

[9] - Connect wire connector (C) to the clutch position sensor.

[10] - Install the clutch disengage switch and harness (E) with three screws (D).

[11] -

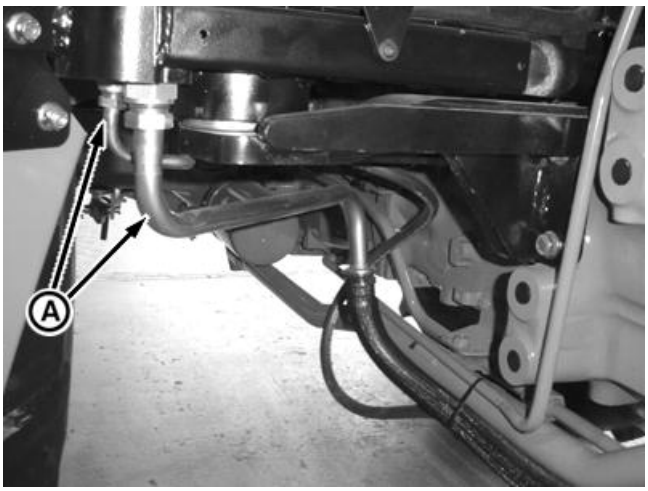


LEGEND:

A	Lower Access Cover
B	Wire Connector

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LEGEND:
A Air Conditioning Line (2 used)

A/C Line Removal

Connect air conditioning lines (A). Replace both O-rings. Used or damaged O-rings and seals will leak.

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

[24] - Fill radiator with coolant.

[25] - Connect battery, negative (—) cable last.

[26] - Flush, evacuate and charge air conditioning system. (See " Flush Air Conditioning System ", " Evacuate Air Conditioning System ", and " Charge Air Conditioning System " in Section 90, Group 20.)

[27] - Run engine to circulate coolant. Check coolant level and replenish as necessary.

[28] -

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[36] - Remove three cap screws and washers (not shown) securing SCV support plate to bottom of SCV valve (E). Remove SCV support plate.

[37] -



Floor Jack and Support Stand in Place

Install wood blocks between the front axle pivot stops and tractor frame.

[38] - Chock front and back of rear wheels.

[39] - Position a floor jack under the transmission and a support stand under end of drawbar.

[40] - Install lifting chains or strap around clutch housing and attach to a hoist.

[41] - Place range shift lever in neutral and move gear shift lever fully left to neutral position between 1st and 2nd gears. Use wire or rope to hold gear shift lever in this position.

[42] -

→NOTE:

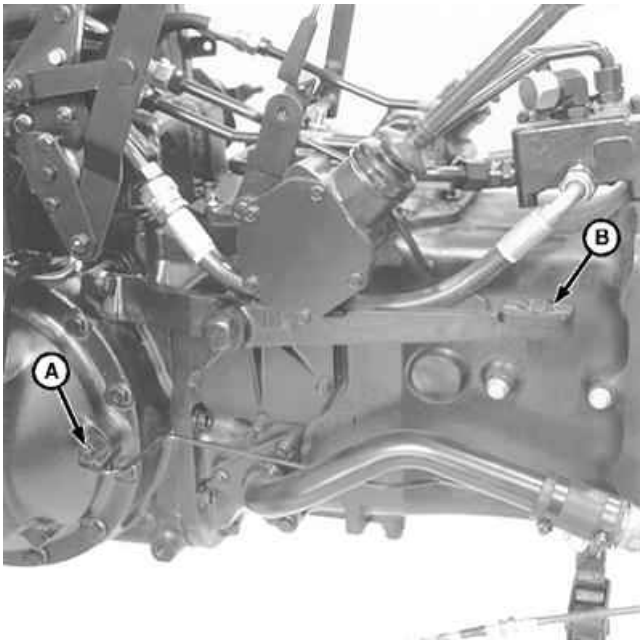
When separating clutch housing from transmission, the main outer shaft, gear fork shaft, and driven shaft assemblies must remain in transmission case.

Remove eight cap screws and two nuts securing transmission to rear of clutch housing. Roll front section of tractor (clutch housing) away from rear section (transmission).

[43] - Install a support stand under clutch housing and transmission.

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LEGEND:

A	Brake Line
B	Differential Lock Pedal

Differential Lock Pedal

Install brake line (A).

[35] - Install differential lock pedal (B).

[36] - Install selective control valve (SCV) and reconnect lines.

[37] -

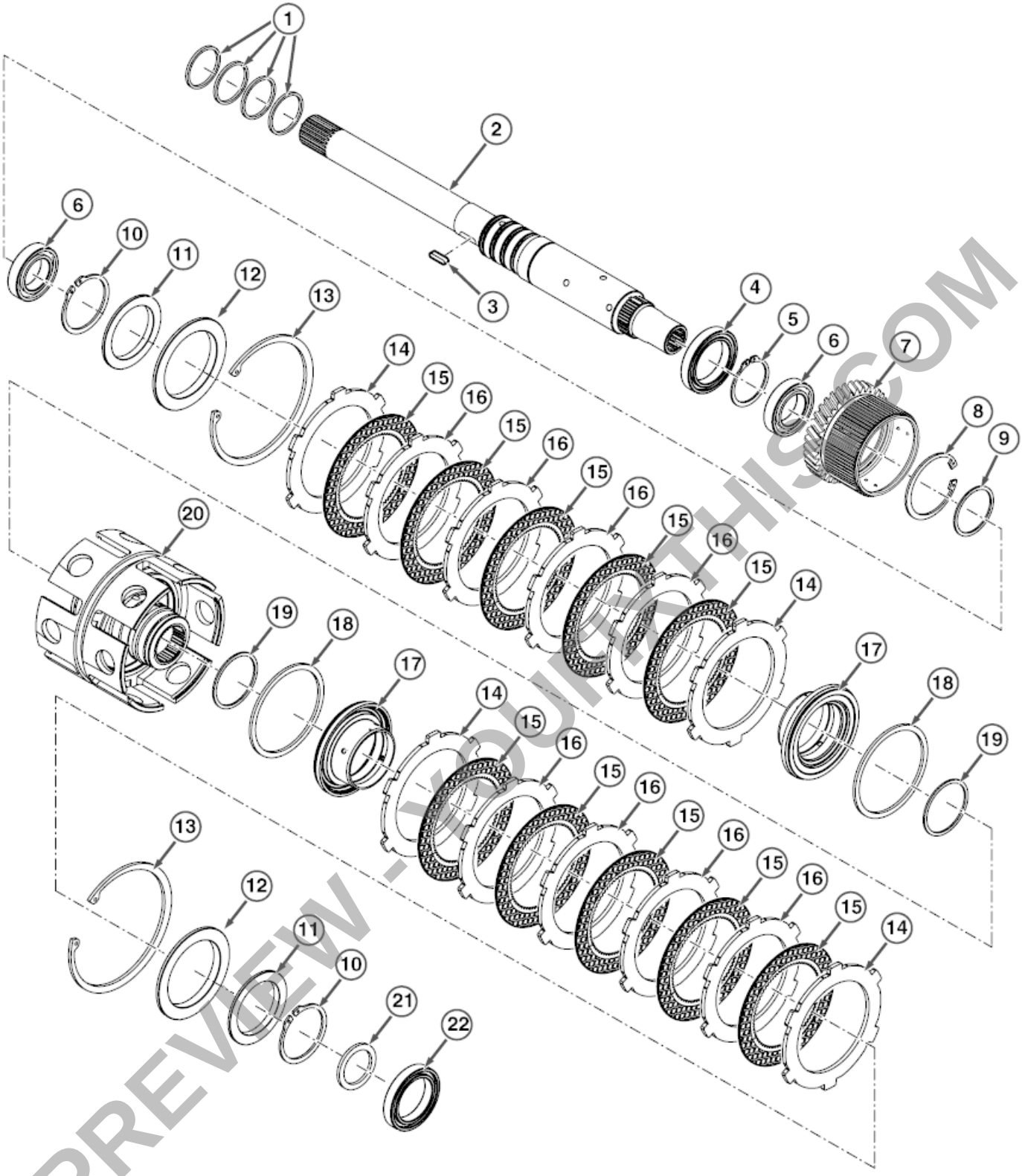


Floor Jack and Support Stand in Place

Install fenders. (See " Remove and Install Fenders—Reference Listing " in Section 80, Group 20.)

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PR Clutch

LEGEND:

1	Seal
2	Shaft
3	Key
4	Bearing
5	Snap Ring
6	Bearing
7	Hub
8	Snap Ring
9	Thrust Washer
10	Snap Ring
11	Retaining Ring

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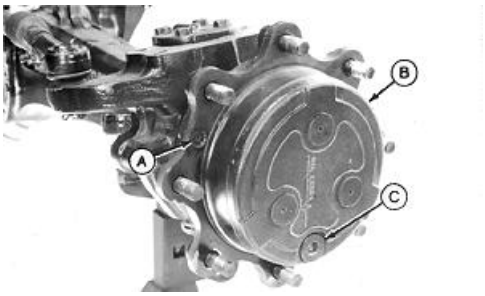
Differential Cone Point Adjustment—Reference Listing

- CollarShift Transmission (PY008), see CTM8135
- CollarShift Transmission (PY021), see CTM8134
- CollarShift Transmission (CM), see “ Differential Cone Point Adjustment ” in this group.
- SyncShuttle™ Transmission (TM, AP, NM, NP, TU05, AP05, NM05, NP05), see “ Differential Cone Point Adjustment ” in this group.

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Disassemble and Inspect MFWD Outer Drive (High Clearance Tractors)



Disassemble and Inspect MFWD Outer Drive

→NOTE:

Outer drive assembly can be serviced without removing axle.

[1] - Raise and support MFWD axle.

[2] - Remove front wheel.

[3] - Drain planetary drive.

→NOTE:

Approximate capacity of wheel hub is 0.7 L (0.74 U.S. qt.)

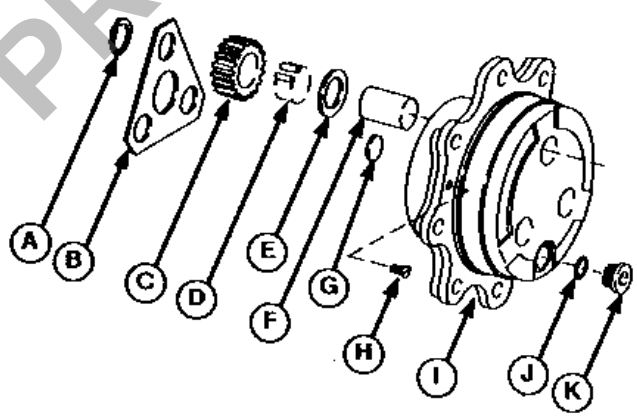
[4] - Remove two socket head screws (A)

[5] - Remove planetary carrier (B).

[6] -

IMPORTANT:

Keep each planet gear assembly together as a set.



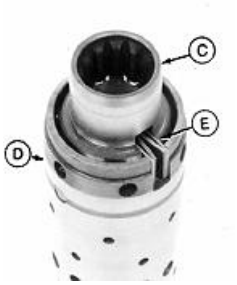
LEGEND:

A	Snap Ring (3 used)
B	Planetary Gear Plate
C	Planetary Gear (3 used)
D	Needle Bearings (30 per gear)
E	Thrust Washer (3 used)
F	Planetary Gear Shaft (3 used)
G	Thrust Pad
H	Socket Head Screw (2 used)
I	Planetary Carrier
J	O-Ring
K	Plug

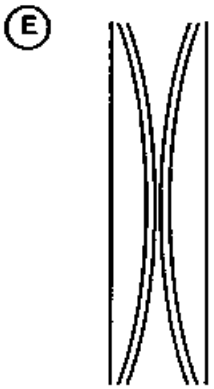
Disassemble and Inspect MFWD Outer Drive

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Steering Valve



Steering Valve

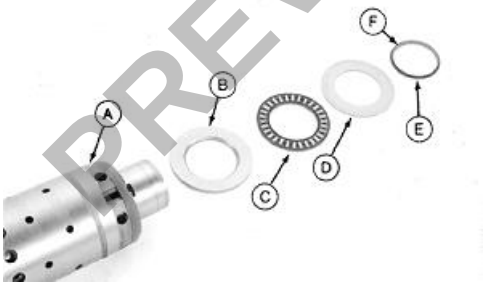
Install two flat leafs of spring set (E) in slot of spool (C). Install curved leafs so their centers touch and curved leafs fit between the flat leafs.

[4] - Slide spool and springs into sleeve (D). Squeeze spring ends together so springs fit into slot of sleeve. Make sure leaf ends are aligned and centered.

[5] - Install ring (B) with rounded end away from sleeve. Ring must rotate freely on sleeve.

[6] - Install pin (A).

[7] -



LEGEND:

A	Spool and Sleeve Assembly
B	Thick Bearing Race
C	Needle Bearing Race
D	Thin Bearing Race
E	O-Ring
F	Kin-Ring

Steering Valve

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→NOTE:

To access links inside rockshaft case, rockshaft case must be placed upside down.

[6] - Turn rockshaft case upside down.

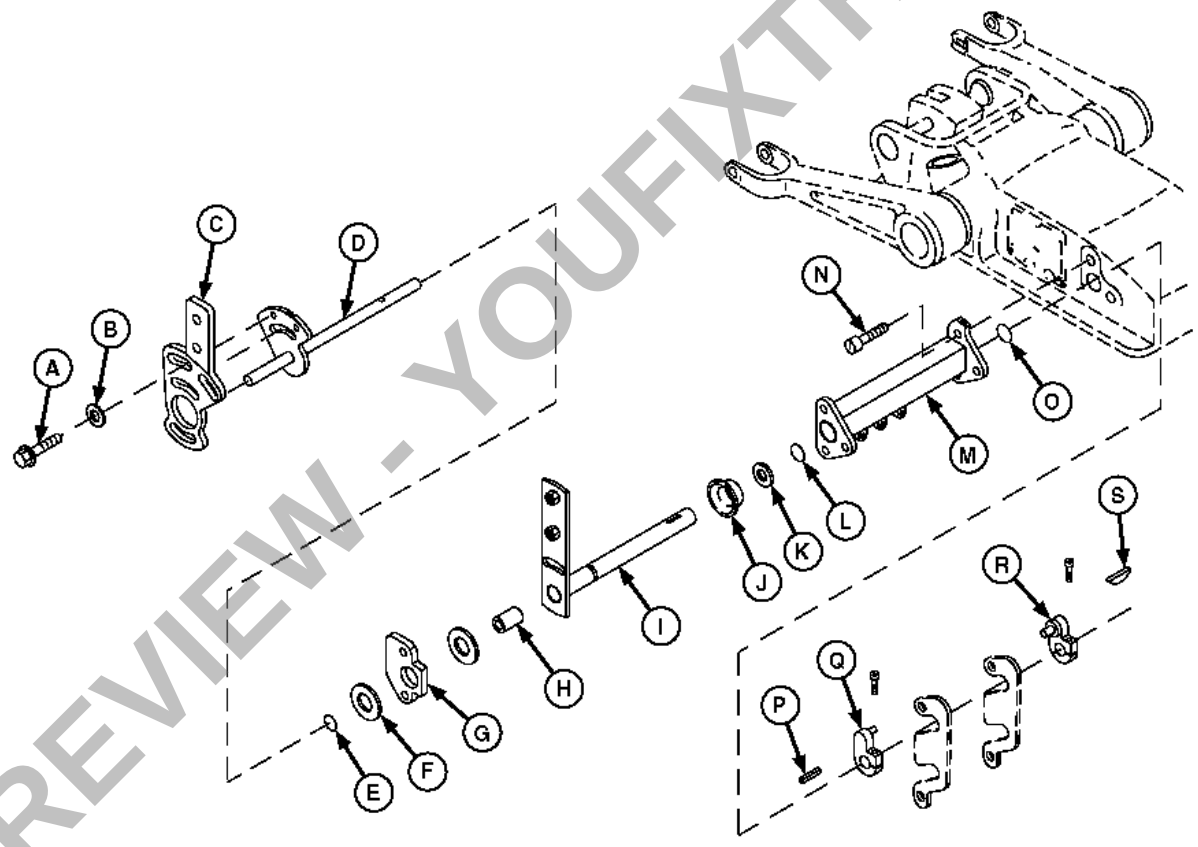
[7] - Remove clips (B). Disconnect links from levers (A).

[8] - Rotate levers and remove socket head cap screws (C).

[9] -

→NOTE:

Levers (Q and R) are keyed to shafts (I) and (D) respectively inside rockshaft case. Levers and keys (P and S) will drop into case when lever assembly is removed.



Rockshaft Control Lever Assembly

LEGEND:

A	Cap Screw (2 used)
B	Washer (21 used)
C	Alignment Plate
D	Position Control Shaft
E	O-Ring
F	Friction Disk (2 used)
G	Alignment Plate
H	Bushing
I	Draft Control Shaft
J	Spacer
K	Washer

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M	Detent Ball (4 used)
N	Pilot Ball
O	Backup Ring
P	O-Ring
Q	Detent Spring
R	Housing
S	O-Ring
T	Spool

Install parts (H—K). Tighten socket head cap screw (I) to specification.

Item	Measurement	Specification
Plug	Torque	26—30 N˙m (19—22 lb-ft)

[16] -

IMPORTANT:

Always use new seals and O-rings. Damaged or used seals and O-rings will leak.

Apply clean hydraulic oil to all internal parts before assembly.

Install new O-rings (S and P) and backup ring (O).

[17] - Install seal plate (E).

[18] - Coat spool and bore with clean transmission/hydraulic oil.

[19] - Install spool.

[20] - Lightly coat detent assembly with multipurpose grease.

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

Number	Name	Use
• MT1247 (us)	Locking Liquid	Used on threads of Mid-Mount socket head cap screws.

[22] - Install cap (G) using socket head cap screws (F). Tighten screws to specification.

Item	Measurement	Specification
Spool Cap Socket Head Cap Screw	Torque	12—15 N˙m (106—133 lb-in.)

[23] - Install parts (A—D). Tighten cap (A) to specification.

Item	Measurement	Specification
Load Check Cap	Torque	34—41 N˙m (25—30 lb-ft)

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LEGEND:

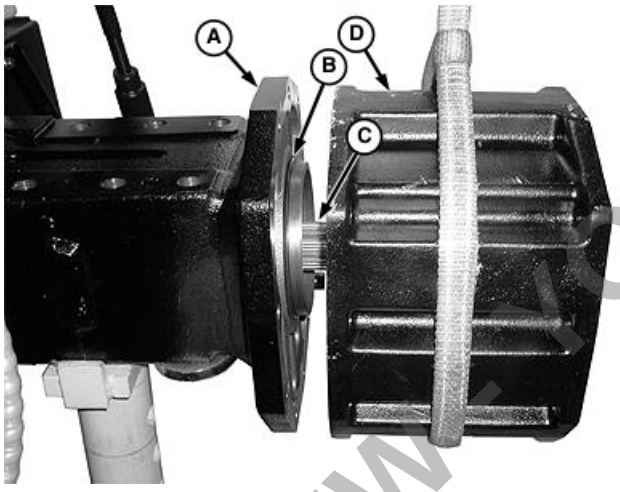
A	Coupler

Coupler

Install coupler (A) on tractor rear axle shaft.

[7] -

→NOTE:



Axle spacer instalation

LEGEND:

A	Axle housing
B	O-ring
C	Shaft splines
D	Axle spacer

Make sure O-ring (B) is in place before installing axle spacer on axle housing.

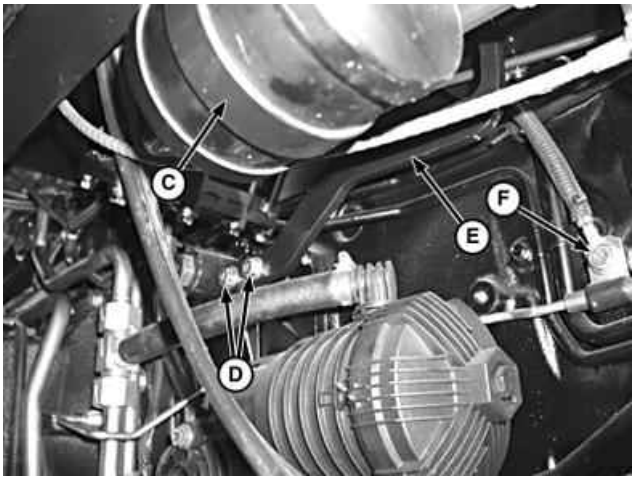
Clean the machined surface of the final drive axle housing (A) and the axle spacer (D) using a dielectric solvent and a clean rag.

[8] - Attach lifting strap on axle spacer (D) so dowel pin hole will line up with dowel pin on axle housing (A). Lift axle spacer and line up shaft splines (C) with splines in coupler. Use two cap screws from kit to line up holes and install axle spacer.

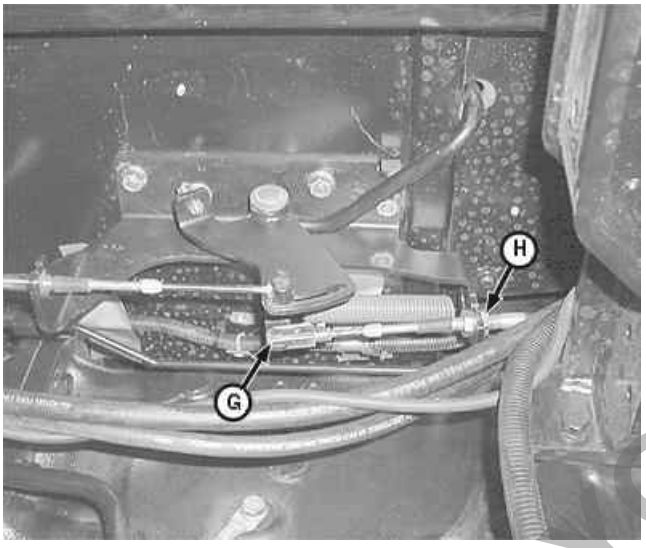
[9] -

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Diff Lock Lever



Foot Throttle Controls

Install foot throttle cable on mount and tighten jam nut (H). Install spring locking pin (G) through cable end and throttle linkage.

[21] - Connect ground lead (F).

[22] - Install differential lock lever (E) with cap screws (D).

[23] - Install receiver/dryer with clamp (C).

[24] - Install differential lock lever pedal (A) with cap screw and nut (B).

[25] -

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