

PREVIEW - YOUFIXTHIS.COM

Test/Check Point	Normal Condition	If Not Normal
Oil pressure sender port	Oil pressure to specification.	Test engine oil pressure. (See Engine Oil Pressure Test in Section 30, Group 25.)
Thermostat	Opening temperature within specification.	Perform thermostat opening test. (See Thermostat Opening Test in Section 30, Group 25.)
Muffler	Not restricted.	Replace muffler.

Disconnect banjo bolt (C), seal washers, and oil inlet line from center housing.

- [7] - Remove two cap screws (D). Disconnect the oil return tube from the center housing.
- [8] - Remove four nuts (E). Remove the exhaust adaptor from the turbine housing.
- [9] - Remove three turbocharger mounting nuts securing turbocharger to exhaust manifold. Remove turbocharger.
- [10] - Cap or plug all openings on engine (exhaust and intake manifold related). Place turbocharger on a clean flat table for inspection.
- [11] - Perform turbocharger inspection. (See [Turbocharger Inspection](#) in Section 30, Group 25.)

Installation:

- [1] -
 - IMPORTANT:**
 - Avoid Damage! If turbocharger failed because of foreign material entering the air intake system, be sure to examine the system. Clean as required to prevent a repeat failure.**
 - DO NOT spin the rotor assembly with compressed air. Damage to bearings can occur.**

Fill oil return (drain) port with clean engine oil. Spin rotating assembly by hand to lubricate bearings.
If turbocharger is to be stored for an extended period of time, lubricate internally and install protective covers on all openings.

- [2] - Put a new gasket on turbocharger-to-exhaust manifold mounting surface.
- [3] - Position turbocharger against gasket on exhaust manifold.
- [4] - Apply PT569 NEVER-SEEZ[™] Compound to turbocharger mounting studs.
- [5] - Install nuts. Tighten to specifications.

Number	Name	Use
• PT569 (us)	NEVER-SEEZ	Turbocharger Mounting Studs

Item	Measurement	Specification
Turbocharger-to-Exhaust Manifold Nuts	Torque	32 N·m (22 lb.-ft.)

- [6] -
 - NOTE:**
 - Remove caps or plugs from turbocharger.**

Install turbocharger oil return (drain) tube using a new O-ring. Tighten cap screws to specifications.

Item	Measurement	Specification
Turbocharger Oil Return Line Cap Screws	Torque	11 N·m (97 lb.-in.)

- [7] - Position the seal washers (one on each side) on the oil inlet line. Install the banjo bolt. Tighten to specification.

Item	Measurement	Specification
Turbocharger Oil Inlet Line Banjo Bolt	Torque	10 N·m (88.5 lb.-in.)

- [8] - Connect air intake hoses to turbocharger. Tighten connections securely.
- [9] - Install the exhaust adaptor to the turbine housing and tighten the nuts to specification.

Item	Measurement	Specification
Exhaust Adaptor-to-Turbocharger Nuts	Torque	32 N·m (22 lb.-ft.)

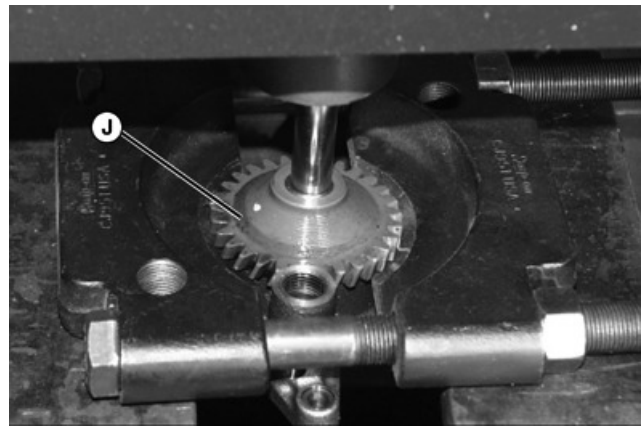
- Replace the pump if clearance is more than**0.15 mm (0.006 in.)** .

Item	Measurement	Specification
Oil Pump—Inner-to-Outer Rotor	Clearance	0.15 mm (0.006 in.)

[5] - Check the oil pressure relief valve. If the relief valve piston (H) is sticking in the pump body, clean parts to allow free movement of the piston in pump body.

[6] - Inspect the spring (I) for cracks. The spring is not serviceable. If damage is identified, replace the oil pump assembly.

[7] -

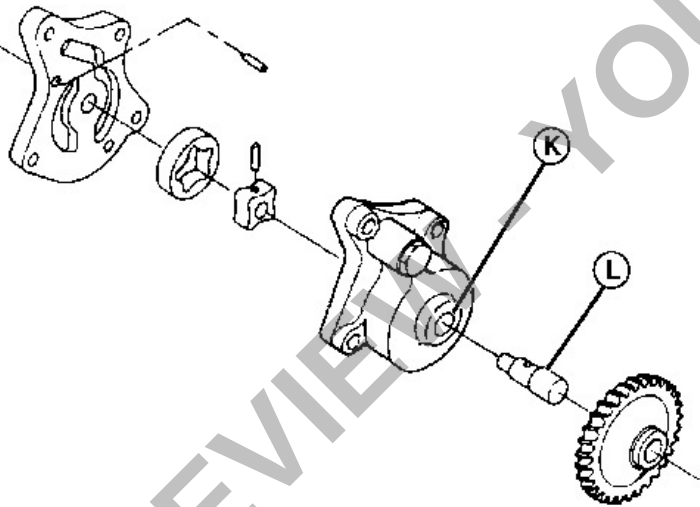


LEGEND:
J Drive Gear

Drive Gear

Press drive gear (J) from pump shaft as shown.

[8] -



LEGEND:
K Shaft Hole
L Rotor Shaft

Rotor Shaft

Measure the outer diameter of rotor shaft (L) and the inner diameter of shaft hole (K) in cover.

- Standard clearance is**0.01—0.04 mm (0.001—0.002 in.)** .

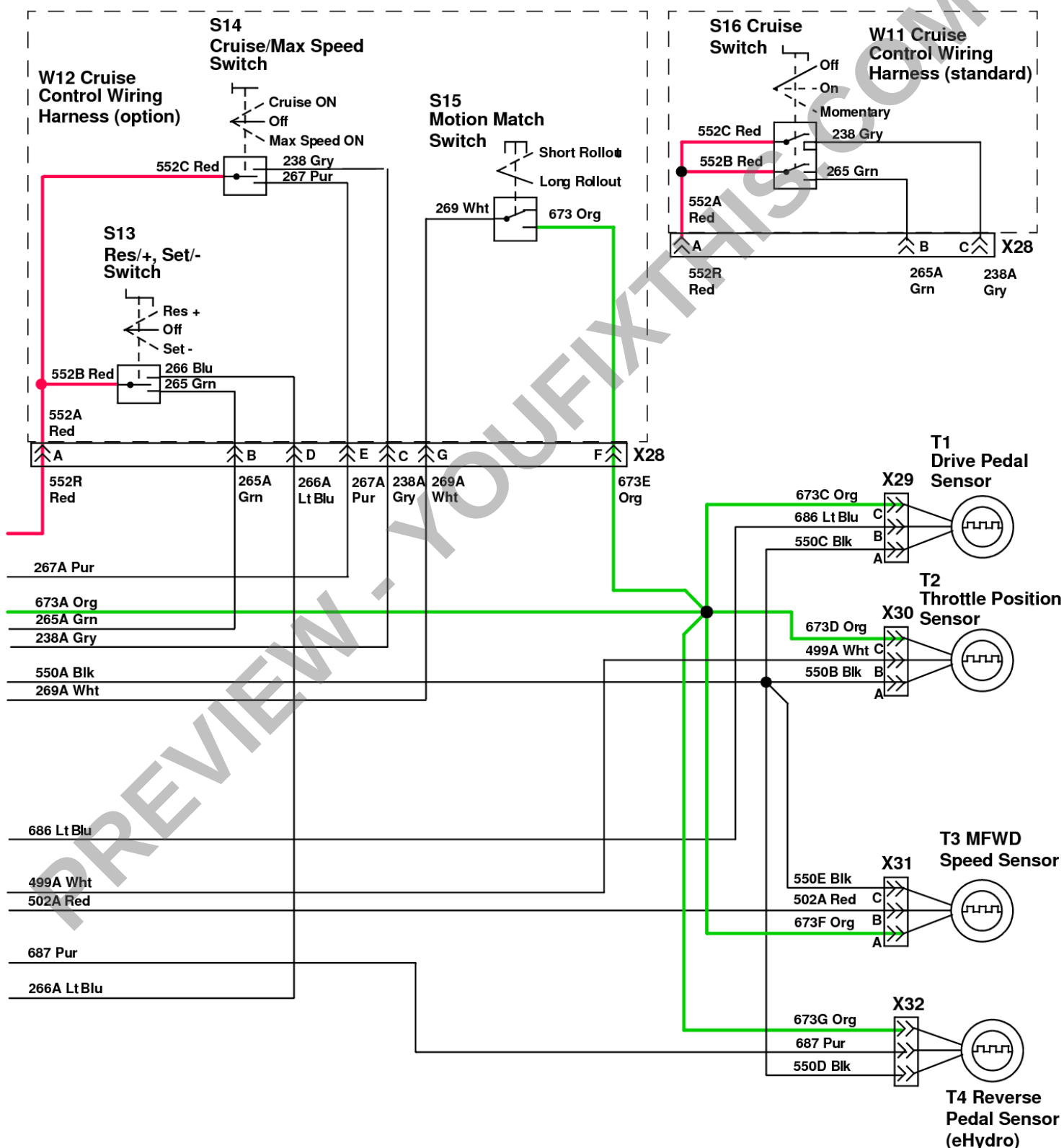
Item	Measurement	Specification
Outer Diameter of Rotor Shaft-to-Inner Diameter of Shaft Hole	Clearance	0.01—0.04 mm (0.001—0.002 in.)

- Replace the pump if the clearance is greater than**0.2 mm (0.008 in.)** .

Item	Measurement	Specification
Outer Diameter of Rotor Shaft-to-Inner Diameter of Shaft Hole—Wear Limit	Clearance	0.2 mm (0.008 in.)

H2	Backup Alarm
S12	Load Match Switch (eHydro™)
S18	FNR Switch (Auto HST)
X4	W1 Main Wiring Harness-to-W9 eHydro™/Auto HST Wiring Harness
X5	W1 Main Wiring Harness-to-W9 eHydro™ Wiring Harness
X26	W9 eHydro™ Wiring Harness-to-A2 Electronic Drive Controller
X27	W9 eHydro™ Wiring Harness-to-W10 Proportional Valve Wiring Harness
Y4	Reverse Proportional Solenoid
Y5	Forward Proportional Solenoid

W9 eHydro™/Auto HST Schematic—MY08 (2 of 2)



W9 eHydro™/Auto HST and Cruise Control Electrical Schematic (2 of 2)

Switched Power Circuits

(1) Step 1

Action:

Does display panel complete self test?

Do gauges on display panel sweep to full right pin then back to left to required position? Example; fuel gauge at half full mark.

Do all the indicator lights illuminate for 1 to 2 seconds?

Do the battery discharge and park brake lights remain illuminated? Is the engine oil pressure indicator light flashing?

Do all the segments of the LCD display illuminate for 1 to 2 seconds and then display the hours of operation?

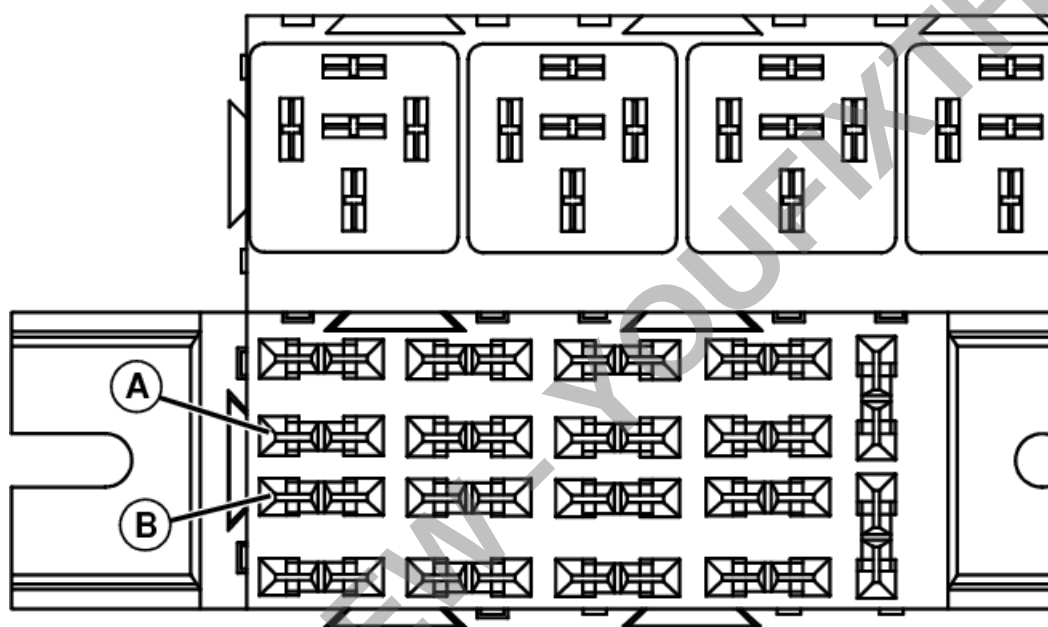
Result:

YES: Display panel is operational. Switched power circuit is functional. Go to next step.

NO: Check test conditions. Repeat test. Check unswitched power circuits. If OK, check individual circuits.

(2) Step 2

Action:



Fuse Box

LEGEND:

A Fuse F7, 072C Red Wire

B Fuse F11, 212B Red Wire

Remove F7 and F11 fuses. Are fuses OK? Is battery voltage present at F7 and F11 fuses, 072C (A) and 212 (B) Red wires?

Result:

YES: Install F7 and F11 fuses. Go to next step.

NO: Replace fuse(s).

NO: Test key switch. Check 072B, 072C and 212 Red wires and connections.

(3) Step 3

Action:

W3	Mid PTO Jumper (standard)
W4	Jumper (eHydro™ /Auto HST)
X6	W1 Main Wiring Harness-to-A1 Display Panel
X7	W1 Main Wiring Harness-to-A1 Display Panel
X8	W1 Main Wiring Harness to W3 Jumper Plug (standard), S9 Mid PTO Switch (optional)
X9	W1 Main Wiring Harness to S10 Transmission Neutral Switch (PRT), W4 Jumper Plug (eHydro™/Auto HST)
X10	W1 Main Wiring Harness-to-A1 Display Panel
X11	W1 Main Wiring Harness-to-A1 Display Panel

Lights Circuit Diagnosis

Test Procedure A

→NOTE:

Test the bulb in each light circuit before beginning the diagnosis steps for the specific circuit.

Test Conditions:

- Park brake locked.
- Key switch in run position, engine off.
- Light switch in hazard position.
- Check circuit grounds for continuity as tests are performed.

Hazard Lights Circuit

(1) Step 1

Action:

Is right amber light flashing?

Result:

YES:Right hazard light circuit is functional.

NO:Go to next step.

(2) Step 2

Action:

Is either fault code Err64 or Err65 showing on the display panel?

Result:

YES:Fault code Err64—Check 135 Grn wire for short to ground. Check right hazard bulb.

YES:Fault code Err65—Check right hazard bulb. Check 135 Grn wire for short to battery voltage or open circuit.

NO:Go to next step.

(3) Step 3

Action:

Is left amber light flashing?

Result:

YES:Left hazard light circuit is functional.

NO:Go to next step.

(4) Step 4

Action:

Is either fault code Err66 or Err67 showing on the display panel?

Result:

YES:Fault code Err66—Check 145 Grn wire for short to ground. Check left hazard bulb.

YES:Fault code Err67—Check left hazard bulb. Check 145 Grn wire for short to battery voltage or open circuit.

NO:Go to next step.

- Terminal K2 (696A Lt Blu)—voltage/current out to the forward proportional solenoid.
- Terminal K3 (697A Pur)—voltage/current out to the reverse proportional solenoid.

Grounds :

- Terminal C2 (550A Blk)—ground in from the position and speed sensors.
- Terminal E2 (050H Blk)—ground circuit for drive controller. Grounds back to frame ground through the X4 connector.

Result:

YES: Connect the X26 connector to the drive controller. If all the inputs in steps 3 through 6 are correct and the cruise control function does not operate, replace the drive controller.

NO: Test the cruise control switch. Check the 265 Grn wire and connections.

PREVIEW - YOUFIXTHIS.COM

[4] - Connect battery tester to battery.

[5] -

IMPORTANT:

Avoid Damage! Perform these tests quickly to prevent damage to battery tester. Do not apply full load to battery for more than 10 seconds.

Turn load knob (A) clockwise until voltage on voltage tester scale reads 11 volts for 5 seconds only to partially drain battery.

[6] - Quickly turn load knob completely counterclockwise to off position.

[7] - Start and run engine at high idle. Battery voltage should read within specifications.

Item	Measurement	Specification
Battery	Voltage	14.3—14.8 VDC
Battery	Temperature	25°C (77°F)

[8] - Turn load knob clockwise until voltage on tester voltage scale (B) reads 11 volts and look at current for a minimum reading of amps (see specification).

Item	Measurement	Specification
Minimum	Amperage	13.5 A

[9] - Quickly turn load knob completely counterclockwise to off position.

[10] - After load test, battery voltage should return to the voltage level prior to test.

Results

- If current gun amp reading is below specification, and you have verified voltage to ground to regulator/rectifier, replace regulator/rectifier.
- If at any time voltage increase exceeds specifications, replace regulator/rectifier.

Item	Measurement	Specification
Battery	Voltage	14.8 VDC

Set the multimeter to measure frequency (Hz).

[20] - Move the red lead on the connector box from the C terminal (B) to the B terminal (O).

[21] - Press and hold the forward drive pedal at the full drive position.

[22] - The frequency reading (terminals A to B signal Hz at slow idle) should be at specification. If not, replace the MFWD speed sensor.

[23] - Move the throttle lever to the fast idle position.

[24] - The frequency reading (terminals A to B signal Hz at fast idle) should be at specification. If not, replace the MFWD speed sensor.

[25] - Release the forward drive pedal and move the throttle lever to the slow idle position.

[26] - Place the range transmission in gear position B.

[27] - The frequency reading (terminals A to B signal Hz at slow idle) should be at specification. If not, replace the MFWD speed sensor.

[28] - Move the throttle lever to the fast idle position.

[29] - The frequency reading (terminals A to B signal Hz at fast idle) should be at specification. If not, replace the MFWD speed sensor.

[30] - Release the forward drive pedal and move the throttle lever to the slow idle position.

[31] - Place the range transmission in gear position C.

[32] - The frequency reading (terminals A to B signal Hz at slow idle) should be at specification. If not, replace the MFWD speed sensor.

[33] - Move the throttle lever to the fast idle position.

[34] - The frequency reading (terminals A to B signal Hz at fast idle) should be at specification. If not, replace the MFWD speed sensor.

[35] - Release the forward drive pedal and move the throttle lever to the slow idle position.

[36] - Lock the park brake and stop engine.

[37] - Disconnect the speed sensor adapter harness from the machine wiring harness and the MFWD speed sensor.

[38] - Connect the machine wiring harness to the MFWD speed sensor. Secure with plastic tie.

Item	Measurement	Specification
MFWD		
Input	Voltage	5.0 ± 0.2 V
Gear A—Low Idle	Frequency	233 ± 0.1 kHz
Gear A—High Idle	Frequency	650 ± 2.0 kHz
Gear B—Low Idle	Frequency	414 ± 0.1 kHz
Gear B—High Idle	Frequency	710 ± 2.0 kHz
Gear C—Low Idle	Frequency	970 ± 0.1 kHz
Gear C—High Idle	Frequency	2923 ± 2.0 kHz

[8] - Using a small screwdriver to hold brushes, install brush holder (K).

[9] -

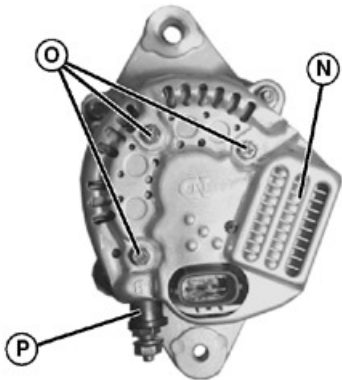


- LEGEND:**
- L Black Screw
 - M Light Screw (4 used)

Alternator

Install brush holder screws as shown; black screw (L) and light screws (M).

[10] -



- LEGEND:**
- N Regulator Cover
 - O Screw (3 used)
 - P Insulator

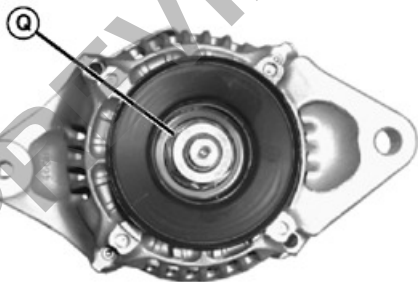
Alternator

Install regulator cover (N) and screws (O).

[11] - Install insulator (P) and nut.

[12] - Install sheave.

[13] -



- LEGEND:**
- Q Sheave Nut

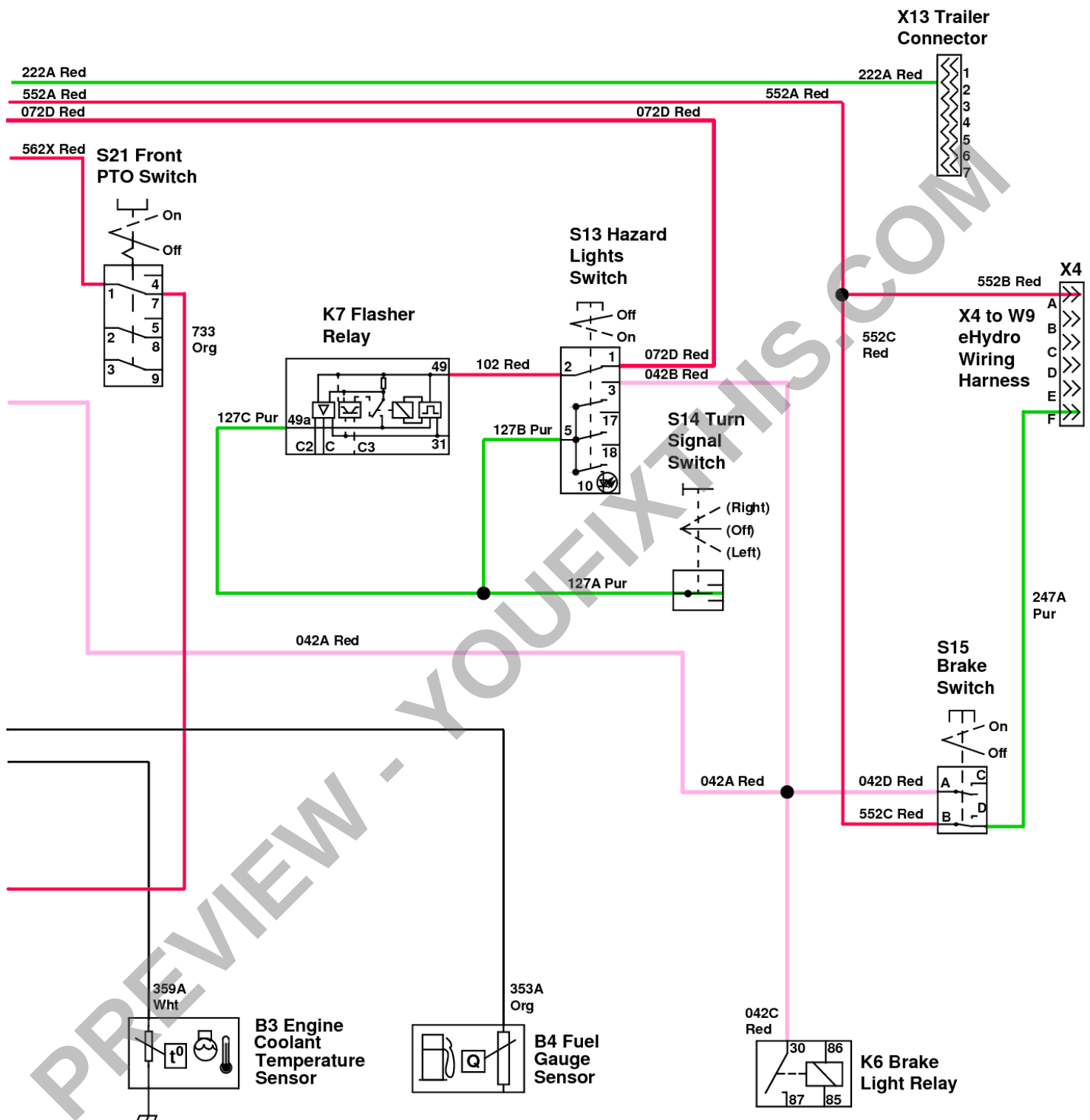
Alternator

Clamp sheave in soft jaw vise. Install sheave nut (Q) and tighten to specification.

Item	Measurement	Specification
Sheave Nut	Torque	69 N·m (51 lb.-ft.)
Pulley Nut	Torque	54 N·m (40 lb.-ft.)

Fuel Gauge Sensor Removal and Installation

Size/No./Color	Wire Connection Points
0.8 562X Red	Splice, S21
0.8 572A Red	Splice, X7
1.0 572B Red	S2, Splice
1.0 572C Red	Splice, K2
0.5 573 Org	S4, X7
0.8 574A Yel	S4, Y3
0.8 586A Blu	S12, X10
0.8 594A Yel	X8, X11
0.8 733 Org	X11, S21
0.8 737A Pur	S21, Y6
0.8 777A Pur	X6, S7
0.8 903B Org	S1, X3
0.8 908 Gry	S5, X7
0.8 924A Yel	X5, X7
0.8 925A Grn	X5, X7



Power Circuit Electrical Schematic—W1 PRT and eHydro™—MY08 (4 of 4)

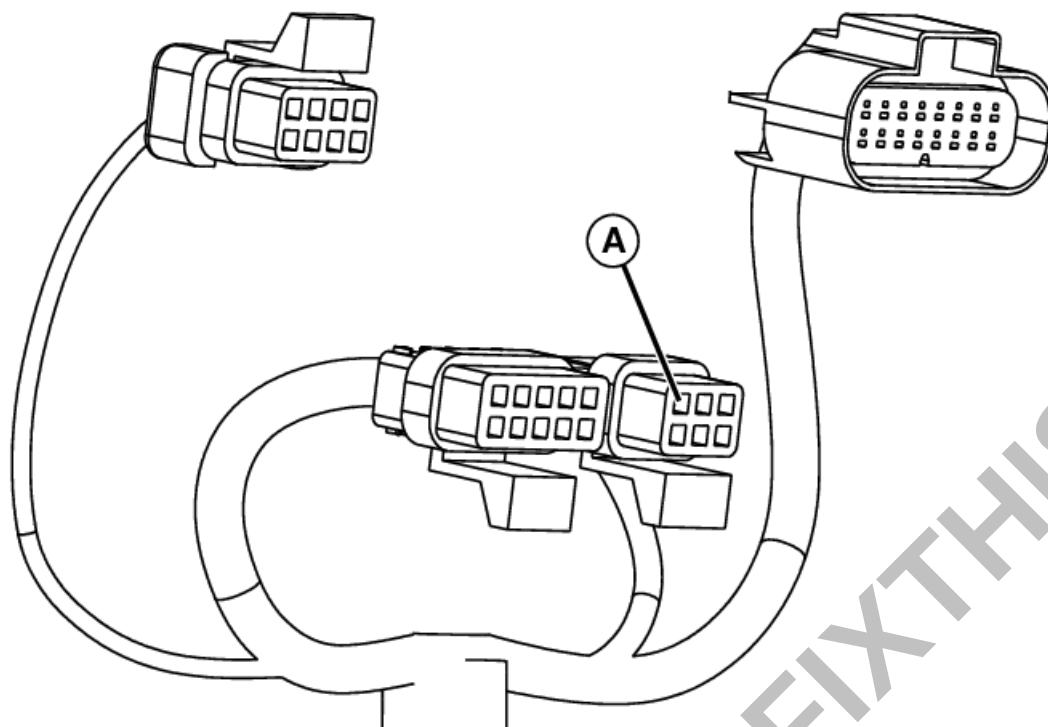
LEGEND:

B3	Engine Coolant Temperature Sensor
B4	Fuel Gauge Sensor
K6	Brake Light Relay
K7	Flasher Relay
S13	Hazard Lights Switch
S14	Turn Signal Switch

NO: Check 010 Blk wires and connections.

(5) Step 5

Action:



X6 Connector

LEGEND:

A X6 Connector Terminal C, 385A Grn Wire

Disconnect X6 connector at the display panel. Is battery voltage present at X6 connector, terminal C, 385A Grn wire (A) on older machines, or X6 connector, terminal C, 383C Org wire (A) on newer machines?

Result:

YES: Check for continuity to ground at A1 display panel 050 Blk wires. If ok, replace display panel.

NO: Older machines: Check 385A, 385B and 385C Grn wires and connections.

NO: Newer machines: Test K3 relay. Check 383C Org wire and connections.

F7	Fuse 20A
G1	Battery
M1	Starting Motor
S2	Key Switch
S10	MFWD Engagement Sensing Switch
X6	W1 Main Wiring Harness to A1 Display Panel
X7	W1 Main Wiring Harness to A1 Display Panel
X10	W1 Main Wiring Harness to A1 Display Panel
X11	W1 Main Wiring Harness to A1 Display Panel

MFWD Circuit Diagnosis

Test Procedure A

Test Conditions:

- Park brake locked.
- Key switch in the run position, engine off.
- MFWD engaged.

MFWD Indicator Circuit

(1) Step 1

Action:

Is MFWD indicator light illuminated?

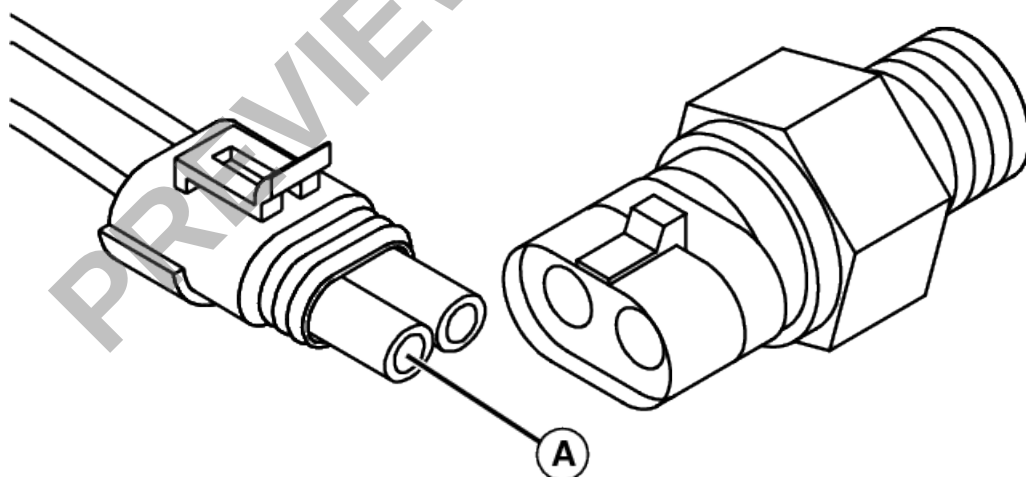
Result:

YES:Circuit is functional. If MFWD is not engaged, see Final Drive Section.

NO:Test MFWD engagement sensing switch. (See [Sensing Switch Test](#) in Section 40, Group 40.) Check 555 Grn wire and connections. If ok, and light does not illuminate, replace display panel.

(2) Step 2

Action:



S7 MFWD Engagement Sensing Switch Connector

LEGEND:

A 562 Red Wire

Is battery voltage present at the S7 MFWD engagement sensing switch, 562 Red wire (A)?

E9	Right Brake Light
E11	Left Front Turn/Hazard Light
E12	Left Front Marker Light
E13	Left Rear Turn/Hazard Light
E14	Left Rear Marker Light
E15	Left Brake Light
S13	Hazard Lights Switch
S14	Turn Signal Switch
X13	W1 Main Wiring Harness Trailer Connector
X18	W1 Main Wiring Harness to W8 Right Rear Lights Wiring Harness
X20	W1 Main Wiring Harness to W8 Right Rear Lights Wiring Harness
X21	W1 Main Wiring Harness to W8 Right Rear Lights Wiring Harness
X24	W1 Main Wiring Harness to W8 Right Rear Lights Wiring Harness
X26	W1 Main Wiring Harness to W7 Left Rear Lights Wiring Harness
X28	W1 Main Wiring Harness to W7 Left Rear Lights Wiring Harness
X29	W1 Main Wiring Harness to W7 Left Rear Lights Wiring Harness
X32	W1 Main Wiring Harness to W7 Left Rear Lights Wiring Harness

W11	Cruise Control Wiring Harness (standard)
X4	W1 Main Wiring Harness to W9 eHydro™ Wiring Harness
X5	W1 Main Wiring Harness to W9 eHydro™ Wiring Harness
X33	W9 eHydro™ Wiring Harness to A2 Electronic Drive Controller
X34	W9 eHydro™ Wiring Harness to W10 Proportional Valve Wiring Harness
X35	W9 eHydro™ Wiring Harness to W11 Cruise Control Wiring Harness (standard)
X36	W9 eHydro™ Wiring Harness to T1 Forward Pedal Sensor
X37	W9 eHydro™ Wiring Harness to T2 Throttle Position Sensor
X38	W9 eHydro™ Wiring Harness to T3 MFWD Speed Sensor
X39	W9 eHydro™ Wiring Harness to T4 Reverse Pedal Sensor
Y5	Forward Proportional Solenoid

Group 25 - Troubleshooting

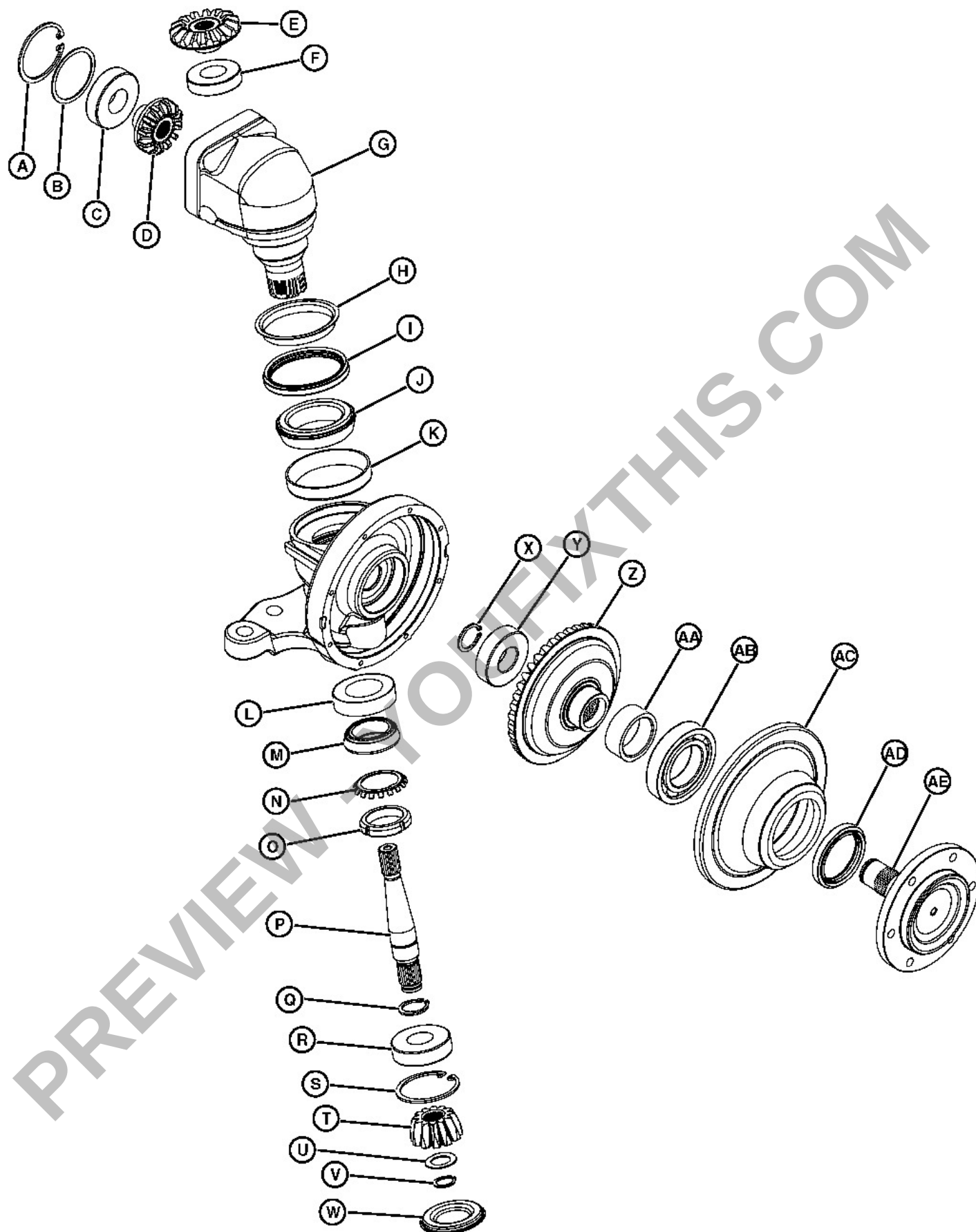
PowrReverser (PRT) Troubleshooting

78

Symptom	Problem	Solution
Poor PowrReverser (PRT) Performance	Poor Transmission Performance.	Parking brake is on or misadjusted.
		Low hydraulic fluid level.
		Plugged screens filter.
		Clutch linkage misadjusted.
		Loss of charge pressure.
		Oil leakage within the valve body.
		Worn drive clutch pack.
		Ballast and/or tow load too heavily.
		Damaged gear(s).
		Complete Loss of Transmission Power.
	Complete Loss of Transmission Power.	Low hydraulic fluid level.
		Loss of charge pressure.
		Failure of valve body.
		Failure of high-pressure components in pump.
		Failure of drive clutch.
	Machine Creeps In Neutral.	Mechanical failure at gearbox or drive line.
		Clutch linkage misadjusted.
		Forward/Reverse valve is leaking.
		Drive clutch stuck or binding.
		Machine Does Not Move in Forward.
	Machine Does Not Move in Forward.	Low hydraulic fluid level.
		PRT shift lever worn, bend, or broken.
		Oil leakage within the valve body.
		Oil leakage within the drive clutch pack.
		Worn drive clutch pack.
		Drive clutch stuck or binding.
		Forward/Reverse valve is stuck or leaking.
		Mechanical failure at gearbox or drive line.
		Machine Does Not Move in Reverse.
	Machine Does Not Move in Reverse.	Low hydraulic fluid level.
		PRT shift lever worn, bend, or broken.
		Oil leakage within the valve body.
		Oil leakage within the drive clutch pack.
		Worn drive clutch pack.
		Drive clutch stuck or binding.
		Forward/Reverse valve is stuck or leaking.
		Mechanical failure at gearbox or drive line.
		Loss of Charge Pressure.
	Loss of Charge Pressure.	Engine speed too low to develop required charge flow.
		Inefficient charge pump not providing required flow.
		Charge flow diverted to hydro (steering, PTO, and other components).
		Extreme temperature increases demand but reduces flow.
		Reduction in hydro efficiency increases charge flow demand.
		Cut or worn seal ring on servo piston.
		Leakage past the charge pressure relief valve.

	Charge pressure relief valve stuck open.	(See Charge Pump Pressure Test and Adjustment in Section 70, Group 35.)
		Repair or replace valve.
	Internal pump or motor damaged.	Repair or replace components as necessary
Symptom	Problem	Solution
Low Power	Hydraulic oil level low.	Fill to correct level.
	Air in the hydraulic system.	Bleed system. (See Hydraulic System Bleed Procedure in Section 90, Group 30.)
	Charge pressure low.	(See Charge Pump Pressure Test and Adjustment in Section 70, Group 35.)
		Adjust charge pressure.
	Directional relief valve stuck open.	(See Hydrostatic High Pressure Relief Test in Section 70, Group 35.)
		Repair or replace relief valve.
	Internal pump or motor damaged.	Repair or replace components as necessary
Symptom	Problem	Solution
Cruise Control Doesn't Work	Parking brake engaged or malfunctioning.	Disengage brake. Repair or replace faulty component.
	Transmission speed sensor malfunctioning.	Test speed sensor. Replace speed sensor as necessary.
Symptom	Problem	Solution
Load Match Doesn't Work	Transmission speed sensor malfunctioning.	Test speed sensor. Replace speed sensor as necessary.

MFWD Final Drive Component Location



MFWD Final Drive Components

LEGEND:

A	Snap Ring
B	Shim(s) A/R
C	Bearing
D	Bevel Gear, 12T

[5] - Apply John Deere TY6304 sealant to the mating surfaces of the MFWD housing and the spindle housing.

Number	Name	Use
• TY6304 (us)	Gasket Maker	Apply to mating surfaces

[6] - Install the spindle housing to the MFWD housing:

- a. Apply John Deere TY9371 to the threads, and install four cap screws fastening the spindle housing to the MFWD housing.
- b. Tighten the cap screws to specification.

Item	Measurement	Specification
Cap Screw	Torque	286-316 N·m (211-233 lb.-ft.)

Number	Name	Use
◦ TY9371 (us)	High Strength Thread Lock	Apply to cap screws

[7] - Install the final drive housing.

E	Implement Gear Pump (front)
F	Steering Gear Pump (rear)
G	To Rockshaft
H	Diverter Valve
I	PTO Clutch Solenoid Valve
J	Sump Oil
K	SCV Work Port Oil
L	Charge Pressure Oil (PTO Solenoid Valve)
M	High Pressure Oil

26	Nut (2 used)
27	SCV Valve
28	Link
29	Bellcrank (2 used)
30	Nut
31	Nut
32	Lock
33	Cap Screw
34	Lock Lever
35	Cap Screw
36	Ball joint
37	Spacer
38	Link
39	Nut (2 used)
40	Cover
41	Bolt (2 used)
42	Lock Handle

[1] - Remove control lever handle (2) and lock lever handle (42).

[2] - Remove cotter pin (20), washer (23) and pin (25) connecting each bellcrank to SCV valve spool.

[3] - Remove cotter pin and washer from pin (6). Remove pin.

[4] - Remove links (28) from bellcranks, shift lever base and drilled pin.

[5] - Remove nut (4) from drilled pin (24) and remove pin.

[6] - Remove remaining components.

[7] - Inspect all parts for wear or damage. Inspect ball joints on links (28) for wear. Inspect wear block (22) and ball joint (36) for wear. Replace any worn or damaged parts.

SCV Linkage Assemble:

Installation is performed in the reverse order of removal.

- Apply a heavy duty water resistant grease to the main shifter pivot points.

PREVIEW ONLY

You're viewing 25 of 1849 pages

The full manual includes:

- All 1849 pages, complete
 - Searchable PDF (find any keyword)
 - No watermarks
 - Instant download
 - Print-ready quality
-

GET FULL MANUAL NOW

John Deere 3120, 3320, 3520, 3720 Diagnostic and Repair



Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual