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.

Understand 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

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Group CCU - CCU Code Diagnostics (If Equipped)

CCU 000629.12- CCU Control Unit Fault

11

Code caused by: CCU software failed to execute in allotted time.

Code Diagnosis

Control Unit Response: Limited Function

Additional References:
Functional Schematics Listing (See Reference 240-20).
Electro-Hydraulic Control Unit General Information (See Reference 245-05-001).
CCU Control Unit Theory of Operation (See Reference 245-CCU-201).
Control Unit Power Supply Wiring Diagram—Straddle Mount (See Reference 245-15-301).
Control Unit Power Supply Wiring Diagram—Isolated Open Operator Station and Cab Tractors (See Reference 245-15-302).

The Following Tools May Be Required for Proper Diagnosis:
JT05791 —Digital Multimeter
See Section 299, Group 10 for tool listings.

(1) Preliminary Checks

Action:

No preliminary checks required.

Result:

YES: GO TO 2.

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Group 05 - General Information

John Deere Engine Repair—Use CTM104



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 - General Information

John Deere Engine Fuel Systems Repair—Use CTM207



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 engine fuel systems—Use CTM207

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Group 15 - Diagnosis, Test and Adjust

Wire Color Chart

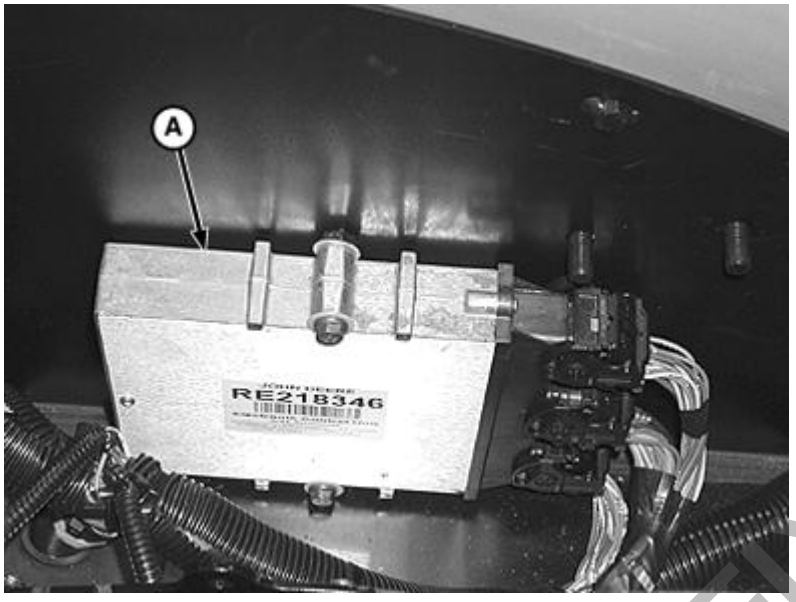
WIRE COLOR ABBREVIATION	WIRE COLOR
Blu	Blue
Blu/Blk	Blue/Black
Blu/Red	Blue/Red
Blk	Black
Blk/Wht	Black/White
Blk/Yel	Black/Yellow
Brn	Brown
Brn/Wht	Brown/White
Brn/Yel	Brown/Yellow
Clr	Clear
Dk Blu	Dark Blue
Dk Brn/Lt Grn	Dark Brown/Light Green
Dk Brn/Red	Dark Brown/Red
Dk Brn/Yel	Dark Brown/Yellow
Dk Grn	Dark Green
Grn	Green
Grn/Wht	Green/White
Gry	Gray
Lt Blu	Light Blue
Lt Grn	Light Green
Org	Orange
Org/Wht	Orange/White
Pnk	Pink
Pur	Purple
Pur/Blk	Purple/Black
Pur/Wht	Purple/White
Red	Red
Red/Blk	Red/Black
Red/Blu	Red/Blue
Red/Wht	Red/White
Red/Yel	Red/Yellow
Tan	Tan
Wht	White
Wht/Blk	White/Black
Wht/Blu	White/Blue
Wht/Red	White/Red
Yel	Yellow
Yel/Blk	Yellow/Black
Yel/Red	Yellow/Red
Yel/Wht	Yellow/White

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Group 05 - General References

Reference 245-05-001, Electro-Hydraulic Controller General Information



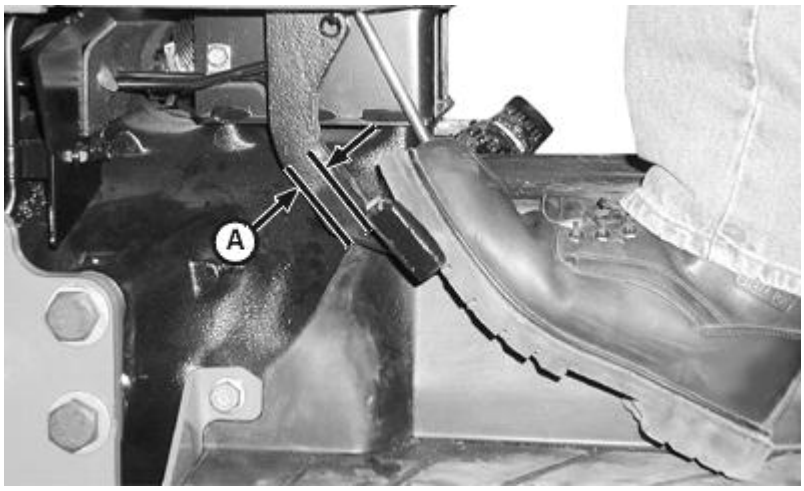
Electro-Hydraulic Controller

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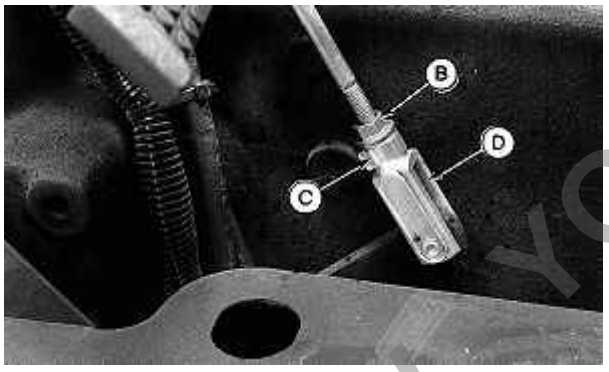
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Group 15 - Tests and Adjustments

Check and Adjust Clutch Pedal Free Play



OOS Shown



OOS Shown

LEGEND:

A	Clutch Pedal Allowable Free Play
B	Jam Nut
C	Clip Pin
D	Clevis

Measure free play at top of pedal stroke (A). Ensure free play is within specification.

Item	Measurement	Specification
Clutch Pedal	Free Play	35 mm (± 2 mm)

If free play is not within specification, adjust clutch linkage as shown below.

[1] - Remove clip pin (C).

[2] - Loosen jam nut (B).

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Group 10 - Preliminary and Operational Checks

Preliminary Checks

Reference

(1) Preliminary Checks

Action:

Make the following checks before installing test equipment:

[1] - Ask Operator:

- How is machine performing?
- When does it malfunction?
- In what applications?

[2] - Check maintenance records for:

- Proper service intervals.
- Unusual, frequent or similar failures.

[3] - If performing MFWD Preliminary Checks, check for:

- Damaged or missing MFWD driveline.
- Damaged MFWD solenoid valve.
- Kinked or dented oil line to MFWD solenoid valve.
- Disconnected, broken or damaged wiring to MFWD solenoid and MFWD switch.
- Other mechanical failures

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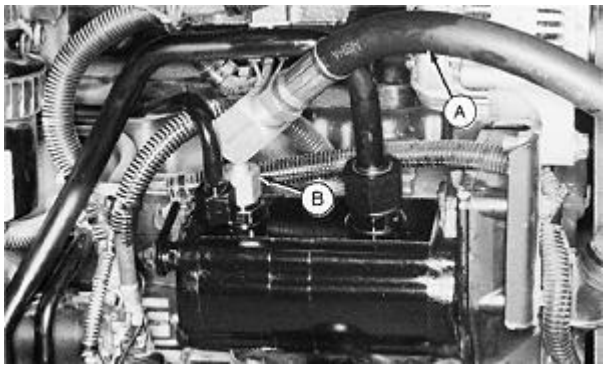
Group 05 - General Information

Install Test Equipment

Reference

(1) Steering Pump Flow Test Connections

Action:



LEGEND:

A	JT05469 Flowmeter
B	JT03368 Pump Adapter

[1] - Connect flowmeter inlet hose (A) to adapter (B).

[2] - Install adapter and flowmeter assembly.

[3] - Insert flowmeter return hose into hydraulic oil fill hole.

Result:

YES: Return to diagnosis in process.

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Group 05 - General Information

Install Test Equipment

Reference

(1) Install Test Equipment Listing

Action:

Following is a list of references to install various test equipment used in hydraulic system testing.

“GO TO” the reference of concern.

- Pump Flow Test Connections—Without SCV, GO TO 2
- Pump Flow Test Connection—With SCV, GO TO 3
- Main Relief Valve Test Connections—Without SCV, GO TO 4
- Main Relief Valve Test Connections—With SCV, GO TO 5
- Rockshaft Leakage Test Plug Installation, GO TO 6

Result:

YES:GO TO Reference of choice.

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Group 10 - Operational Tests

Air-Conditioning System, Heater and Operator's Seat——Summary of References

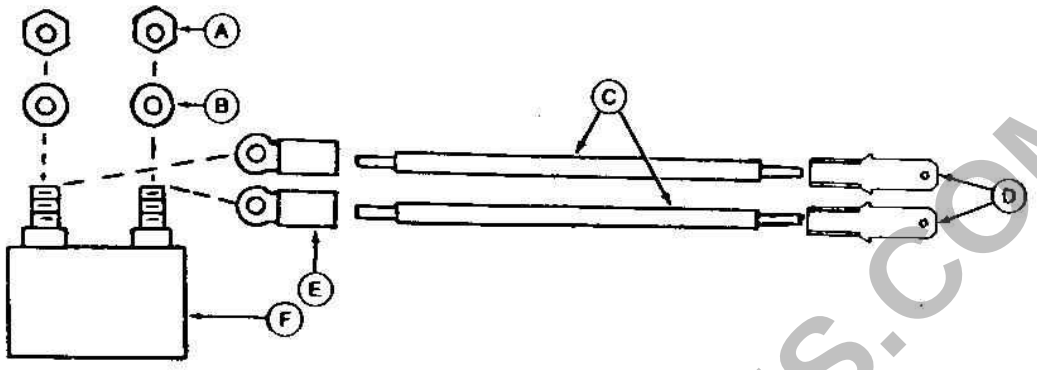
- Air-Conditioning System and Heater—Test Sequence
- Air Comfort Seat—Test Sequence

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Group 05 - Dealer Fabricated Tools

DFRW26—Test Lead for Automotive-Style Fuses



LEGEND:

A	14H631 Nut (2 used)
B	12H295 Washer (2 used)
C	12 in. 14-Gauge Wire (2 used)
D	R77485 Blade-Type Terminal (2 used)
E	R32018 Eyelet Terminal (2 used)
F	AR70052 (10-amp) Circuit Breaker or AR56671 (10-amp) Circuit Breaker

Make special test lead with circuit breaker for “Seven-Step Electrical Test Procedure” as follows:

Use R77485 blade-type terminals (D), R32018 eyelet terminals (E), AR70052 10-amp circuit breaker or AR56671 20-amp circuit breaker (F) from service parts and 14-gauge wire (C) to fabricate the test leads.

[1] - Cut two 305 mm (12 in.) lengths of 14-gauge wire (C) and strip approximately 11 mm (7/16 in.) of insulation from each end. Twist strands to prevent fraying.

[2] - Crimp R77485 blade-type terminals (D) to one end of each lead.

[3] - Crimp R32018 eyelet terminals (E) to the other end of each lead.

[4] - Attach eyelet of each lead to terminal of a 10-amp circuit breaker, as illustrated, using a flat washer (B) and nut (A).

[5] - Make a second set of leads to attach to a 20-amp circuit breaker as described in steps 1—4.

DFRW51—Electronic Circuit Load Tester

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Group 15 - Tests and Adjustments
Group 20 - Theory of Operation
Section 299 - SERVICE TOOLS
Group 05 - Dealer Fabricated Tools
Group 10 - Service Tools and Kits

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Electrical Circuit Checks 150
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HCU 521002.06- Rear Hitch Lower Solenoid Current High

24

Code caused by: rear hitch lower valve solenoid current high.

Code Diagnosis

Control Unit Response: Limited Function

Additional References:
Functional Schematics Listing (See Reference 240-20).
Rear Hitch Raise and Lower Solenoids Theory of Operation (See Reference 245-HCU-208).
Rear Hitch Raise and Lower Solenoids Diagnostic Wiring Diagram (See Reference 245-HCU-305).

The Following Tools May Be Required for Proper Diagnosis:
JT05791 —Digital Multimeter
See Section 299, Group 10 for tool listings.

(1) Preliminary Checks

Action:

No preliminary checks required.

Result:

YES: GO TO 2.

(2) Verify Code

Action:

Recall, record and clear codes.

If using SERVICE ADVISOR ™ : This procedure can be performed by making a connection to the vehicle and using the “Diagnostics” tab to view and clear codes.

If using performance monitor: See Performance Monitor General Operation (See reference 245-05-001) for more information.

Recall codes again and check for return of this code.

Result:

YES: Code does not return. GO TO 3.

NO: Code returns. GO TO 4.

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(4) System Checks

Action:

No system checks required.

Result:

YES: GO TO 5.

(5) Electrical Circuit Checks

Action:

Perform the following:

Seat Switch Circuit Test (See reference 245-PTR-009).
Directional Reverser Switch Circuit Test (See reference 245-PTR-004).

Result:

YES: GO TO 6.

NO: Problem identified. Repair as needed. GO TO 2.

(6) Additional Checks and Intermittent Failure Evaluation

Action:

Perform Troubleshooting Unresolved Problems (See reference 210-15).

If applicable, perform PTR Control Unit Beep Mode Test With Speed Sensors (See reference 245-PTR-002).

Result:

YES: GO TO 2.

NO: Problem identified. Repair as needed. GO TO 2.

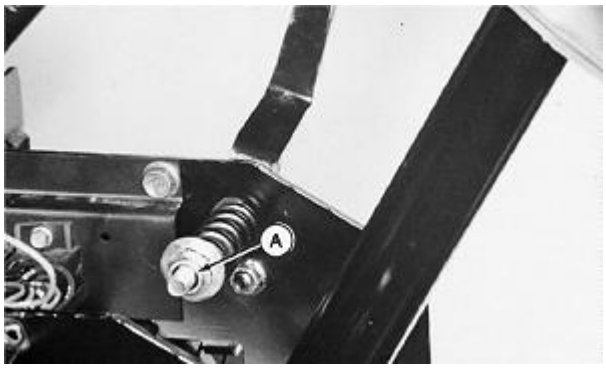
NO: Problem not identified.Replace control unit. Perform setups and calibrations as required.

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Group 15 - Tests and Adjustments

Throttle Lever Adjustment



OOS Shown; Cab Similar

LEGEND:

A	Lock Nut

[1] -

→NOTE:

Instrument panel removed for clarity.

Remove key switch panel.

[2] - Adjust spring tension by loosening or tightening lock nut (A) until throttle lever movement is smooth throughout range of travel with only slight drag.

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LEGEND:

A	PTO Horn
B	Fuel Level Sender
C	Coolant temp Sender
D	Air Filter Restrict Switch
E	Engine Oil Press Switch
F	Hand Brake Switch

SE-12 Seat Switch Circuit, SE-13 Electronics Relay/ PowrReverser ™ Fues Circuit, SE-14 PowrReverser ™ Transmission Circuit

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Reference 245-15-002, Electro-Hydraulic Controller Unswitched Supply Voltage and Ground Test

Reference

→NOTE:

The following tools may be required for proper diagnosis:

1. **JT05791 —Digital Multimeter**

See Section 299, Group 10 for tool listings

(1) Preliminary Check

Action:

- Visually inspect around the batteries and alternator for any visual signs of damage or accumulated debris.
- Check fuse F19.
- Visually inspect F26 fusible link for damage

Result:

YES: GO TO 2.

NO: Correct condition. GO TO 2.

(2) Battery Check

Action:

Perform Battery Inspection Test. See “Reference 240-15, Battery Voltage and Specific Gravity Tests ”.

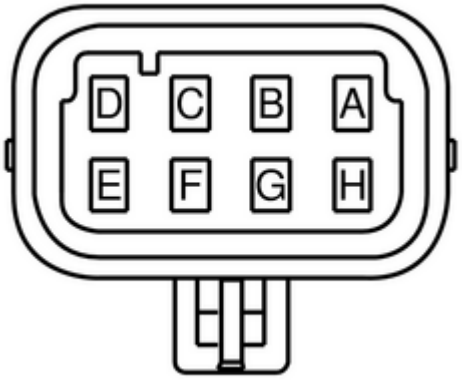
Result:

YES: GO TO 3.

NO: Repair as needed. Diagnosis complete.

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1.

Rear Hitch Control Assembly Connector

LEGEND:

A	Circuit 801
B	Circuit 803
C	Circuit 805
D	Circuit 808
E	Circuit 807
F	Circuit 804
G	Circuit 809
H	Circuit 806

Access HCU Address 007 . The display should read:

Item	Measurement	Specification
HCU Address 007		
Sensor Disconnected	Jumper Not Installed	0.00

2. Use a jumper wire to bridge from terminal B to terminal E of connector. Check the display at HCU Address 007 according to the specification below:

Item	Measurement	Specification
HCU Address 007		
Sensor Disconnected	Jumper Installed (Low Range)	4.80
	Jumper Installed (High Range)	5.20

Result:

YES: GO TO 6.

NO: See ”Reference 245-HCU-301 , Rear Hitch Control Assembly Diagnostic Wiring Diagram”. Repair circuit 807 as needed. GO TO 1.

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(5) Component Output Circuit Check

Action:

See “Reference 245-PTR-301A , Directional Reverser Switch Circuit Diagnostic Wiring Diagram—Straddle Mount Tractors”, or “Reference 245-PTR-301B , Directional Reverser Switch Circuit Diagnostic Wiring Diagram—Isolated Open Operator Station and Cab Tractors” to test for shorts, high resistance, and continuity on circuits 506, 507 and 508.

Result:

YES: Replace component. GO TO 1.

NO: Repair circuit(s) as needed. GO TO 1.

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technician mode. All diagnostic trouble codes can be accessed with the engine on or off and with the tractor in park or in motion.**Operator Mode:** The key switch must be on before connecting the performance monitor to the Service ADVISOR™ connector.Connect the performance monitor to the Service ADVISOR™ connector and wait a minimum of 5 seconds before pressing the service button.Hold the service button until the display changes to DIA.**Technician Mode:** Turn the key switch to OFF position.Turn the key switch back to ON before connecting the performance monitor to the Service ADVISOR™ connector.

→NOTE: If the service button is not pressed within 5 seconds, the operator mode is automatically selected.

Connect the performance monitor to the Service ADVISOR™ connector and within 5 seconds press and hold the service button.Hold the service button until the display changes to DIA.

5. Press the up button (A) or the down button (D) to scroll through the list of control units. Press the set/save button (C) once the desired control unit is displayed.



LEGEND:

A	Up Button
B	Next Button
C	Set/Save Button

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When forward clutch pack passage (J) is pressurized, pressurized oil (T) forces shuttle valve (F) to shift, allowing lubrication oil (U) to flow from shuttle valve inlet passage (B), through the shuttle valve to POWRREVERSER lubrication passage (D). Lubrication oil then flows through a drilled passage in the clutch housing, lubricating the forward and reverse clutch packs of the POWRREVERSER.

POWRREVERSER Control Valve Return to Neutral

When neutral is commanded by the EHC, the enable proportional valve (O) cuts off pressurized oil flow between inlet passage (A) and enable valve outlet passage (P). The forward solenoid valve (A) also closes, cutting off pressurized oil from inlet passage (M). Pressurized oil from the forward solenoid valve that is holding the forward pilot valve open, is returned to tank through the forward solenoid valve to the return-to-tank passage (L). The pilot valve then closes and allows pressurized oil from forward clutch pack passage (J) to return to tank through return-to-tank passage (L).

With no pressurized oil in forward clutch pack passage (J), the lubrication shuttle valve (F) closes, preventing lubrication oil from reaching the POWRREVERSER forward and reverse clutch packs. Any pressurized oil remaining in POWRREVERSER lubrication passage (D) is bled off through the POWRREVERSER.

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Pressurized oil (I) is supplied to the sleeve inlet groove and spool inlet following the same path as when the valve is in neutral.

The steering wheel is mechanically connected to the valve spool and gerotor gear by the steering column. Turning the steering wheel (right or left) rotates the valve spool within the sleeve to align pressure and return passages.

Oil flows through the pressure passage to the gerotor (D), where it fills the cavity between the gerotor gear and body.

The rotation of the gerotor gear is offset to the body to enlarge and reduce the size of the cavity as the gear turns. The gerotor gear is timed to the valve body passages so the cavity is filled with oil when it is at its largest and emptied when it is smallest. By enlarging and then reducing the size of the gerotor cavities, a greater volume of oil is metered to the steering cylinder, which improves steering efficiency. The gerotor cavities are filled and emptied six times faster when the steering wheel is turned.

Pressurized oil flows from the gerotor back to the sleeve and spool, where it is directed out of the valve through the open turn passage and turn port (A). Oil then flows through a hydraulic line to the steering cylinder, where it moves the piston which turns the front wheels.

Oil on the opposite side of the piston is forced from the cylinder and returns to the steering valve through a hydraulic line and the opposite turn port (B).

Return oil (J) flows through a valve passage to the open return passages in the sleeve and spool. Oil then flows to a common return passage located at the center of the spool. Oil leaves the valve by the common return passage and port (F).

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Slide LV2267

LEGEND:

1	Steering Pump
2	Hydraulic Pump
3	Engine
4	Steering Cylinder
5	Inlet Port
6	Inlet Check Valve
7	Steering System Relief Valve
8	Manual Steer Check Valve
9	Steering Valve
10	Control Valve
11	Mechanical Link
12	Metering Pump
13	Return Port
14	Hydraulic Filter Housing
15	Filter Relief Valve
16	Drainback Check Valve
17	Hydraulic Filter Canister
18	Mesh Filter
19	Inlet Check Valve
20	Brake Piston
21	Equalizing Valve
22	Outlet Check Valve
23	Right Brake Assembly
24	Left Brake Assembly
25	Brake Valve
26	Hydraulic Oil Cooler
27	Transmission Case
28	Lube Relief Valve
29	Transmission Lube Feed
30	Power Beyond Pressure Port
31	Power Beyond Return Port
32	Power Beyond Tank Port
33	Diverter Plug Port
34	Main Relief Valve
35	Boom Spool
36	Single (Third) SCV Housing
37	Bucket Spool
38	Rear Outlet Couplers
39	Single (Third) SCV Spool
40	Load Check Valve
41	Dual SCV Housing
42	Inlet Housing
43	Pressure Test Port
44	Rate-of-Drop Valve
45	Load Check Valve
46	High Flow Regulator Valve
47	Low Flow Regulator Valve
48	Rockshaft Valve Housing

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