318D and 320D Skid Steer Loader with Manual Controls Diagnostic

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OPERATION AND TEST MANUAL

Manual Controls models 318D, 320D

TM11398 01 DEC 15 (ENGLISH)

For complete service information also see:

318D, 319D, 320D and 323D Skid Steer Loader (Manual Controls) Repair	TM11399
Super Caddy Oil Cleanup Procedure	CTM310
120 Series Hydraulic Cylinders	CTM120519
120 Series Hydraulic Cylinders	CTM114319
PowerTech E 2.4L & 3.0L Diesel Engines	CTM101019
COOLANT HEATER SERVICE MANUAL	CTM10090X19

John Deere Commercial Worksite Products
Pinted by Belgreen

TM11398

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Group 01 - Safety

Recognize Safety Information



Safety Alert Symbols



Safety Alert Symbols

This is the safety alert symbol. When this symbol is noticed on the machine or in this manual, be alert for the potential of personal injury.

Follow the precautions and safe operating practices highlighted by this symbol.

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

On the machine, DANGER signs are red in color, WARNING signs are orange, and CAUTION signs are yellow. DANGER and WARNING signs are located near specific hazards. General precautions are on CAUTION labels.

Follow Safety Instructions



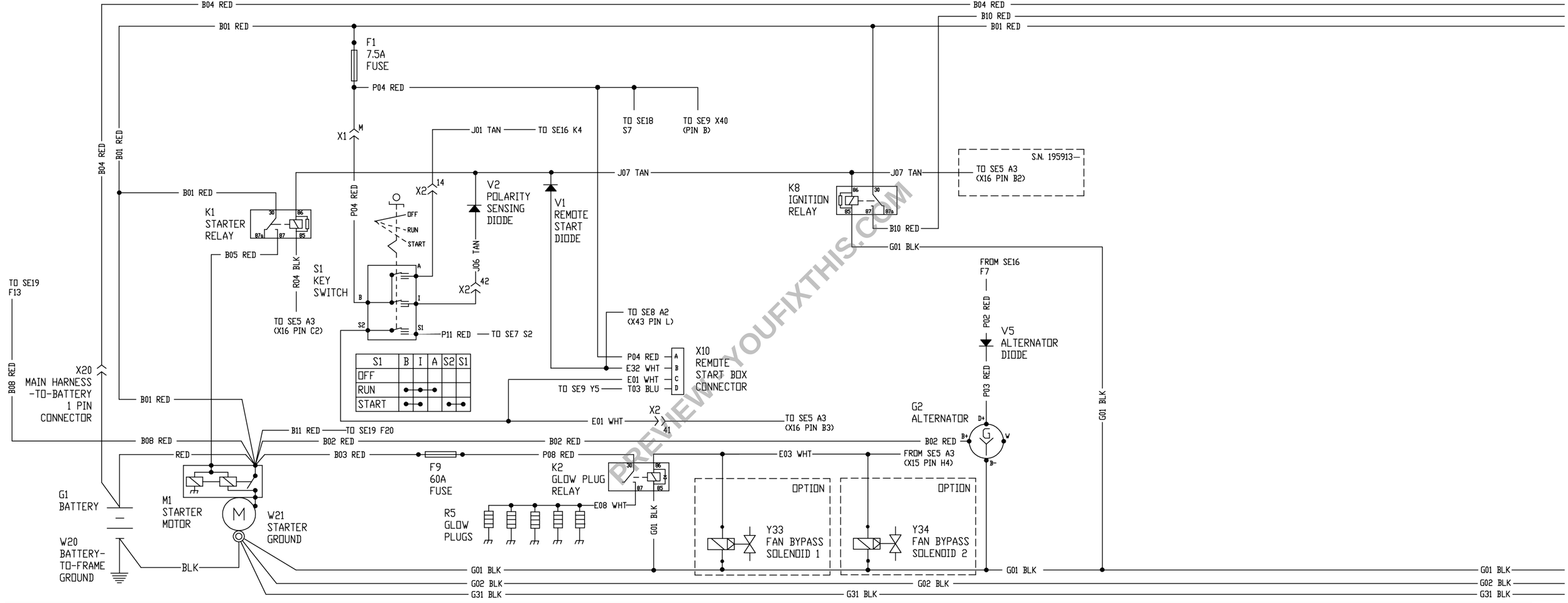
Safety Messages

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in

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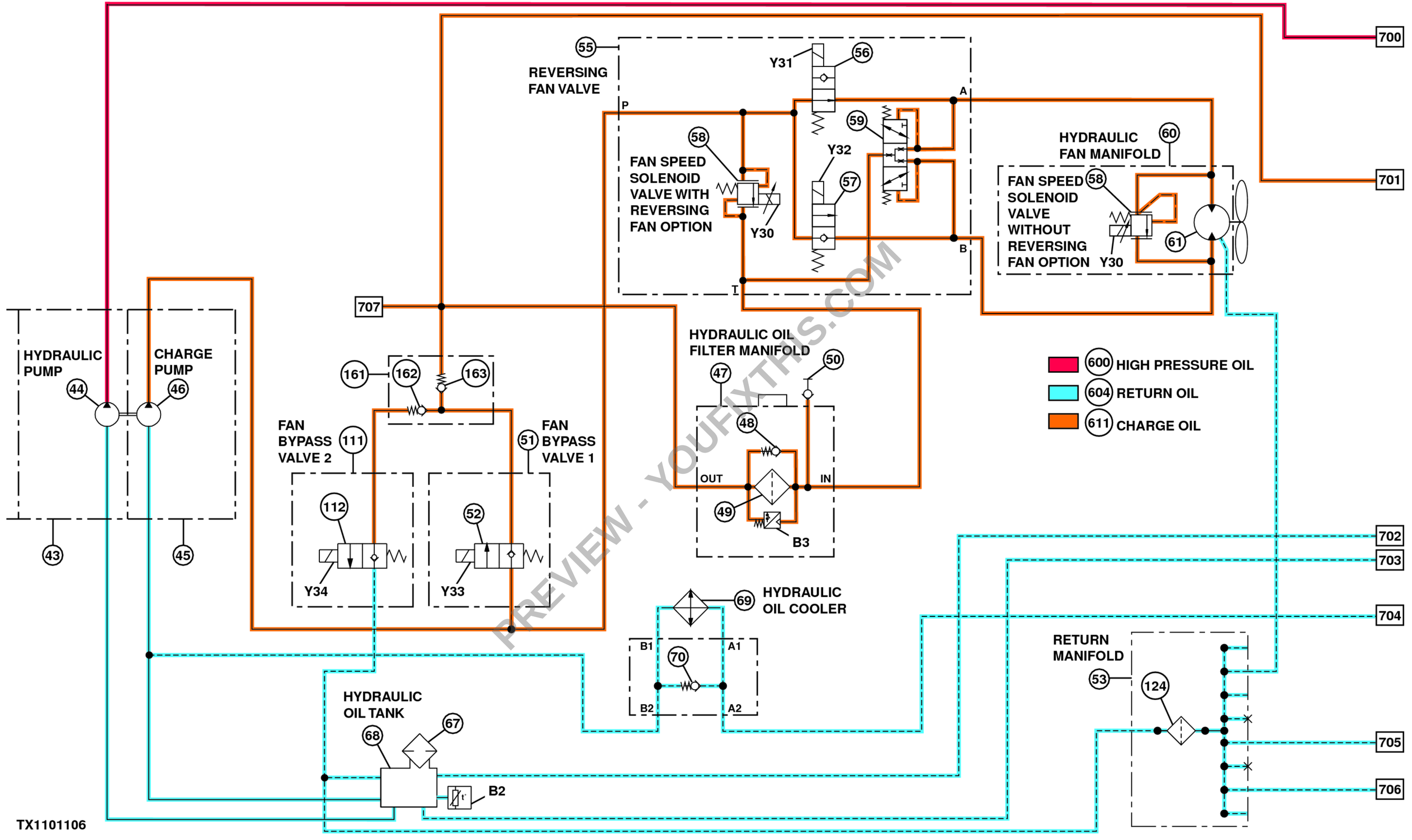
TX1101625

MANUAL CONTROLS SYSTEM FUNCTIONAL SCHEMATIC (1 OF 6)

System Functional Schematic (SE1—SE3)

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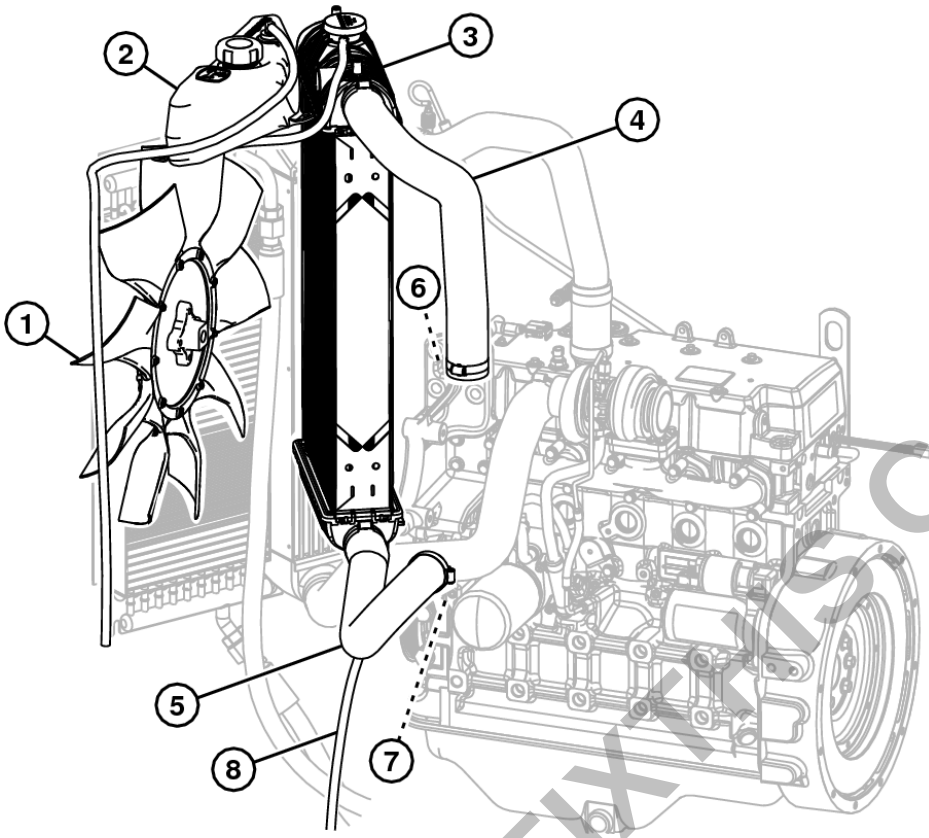


Hydraulic System Schematic (page 1 of 2)

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Engine Cooling System Component Location



TX1064677

Engine Cooling System Component Location

LEGEND:

1	Fan
2	Coolant Surge Tank
3	Radiator
4	Thermostat Housing-to-Radiator Pipe
5	Radiator-to-Coolant Pump Pipe
6	Thermostat Housing
7	Coolant Pump
8	Radiator Drain Hose

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Group 10 - Engine Control Unit (ECU) Diagnostic Trouble Codes

Engine Control Unit (ECU) Diagnostic Trouble Codes

The diagnostic trouble code number is indicated by a suspect parameter number (SPN) and a failure mode indicator (FMI) number. In the example 000744.04, 000744 is the SPN and 04 is the FMI number.

Diagnostic trouble codes can be displayed using the engagement and monitor unit (EMU) or by using the Service ADVISOR ™ diagnostic application. See Reading Diagnostic Trouble Codes (DTCs) . (Group 9015-16.)

For in-depth diagnostics on machine specific ECU diagnostic trouble codes, see specific code diagnostic procedures in this group. Additional engine control unit DTC diagnostic procedures for John Deere PowerTech E ™ engines are located in the component technical manual (CTM), PowerTech™ E 2.4L and 3.0L Diesel Engines Component Technical Manual . (CTM101019.)

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Oil Leak From Power Train

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Oil Leak From Power Train Diagnostic Procedure

(1) Chain Case Drain Plug

Action:

Is leakage from chain case drain plug?

Result:

YES: Replace O-ring at chain case drain plug.

NO: Go to Chain Case Access Plate.

(2) Chain Case Access Plate

Action:

Is leakage from chain case access plate?

Result:

YES: Replace sealant on chain case access plate. See Chain Case Access Plate Remove and Install . (Group 0250.)

NO: Go to Chain Case Fill Plug.

(3) Chain Case Fill Plug

Action:

Is leakage from chain case fill plug?

Result:

YES: Replace O-ring at chain case fill plug.

NO: Go to Axle Housing O-Ring.

(4) Axle Housing O-Ring

Action:

Is leakage from axle housing mounting area?

Result:

YES: Replace O-ring on axle housing. See Axle Housing Remove and Install . (Group 0201.)

NO: Go to Axle Oil Seal.

(5) Axle Oil Seal

Action:

Is leakage from axle oil seal?

Result:

YES: Replace axle oil seal. See Axle Housing Disassemble and Assemble . (Group 0201.)

NO: Go to Weld Joint.

(6) Weld Joint

Action:

Is leakage from chain case weld joint?

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Engine Power Test Using Turbocharger Boost Pressure

Specifications

SPECIFICATIONS	
Engine Coolant Temperature	88—94°C 190—200°F
318D	
Engine Speed Fast Idle	2800 rpm
Engine Speed Rated	2600 rpm
Turbocharger Boost Pressure	122 kPa at 2600 rpm 1.2 bar at 2600 rpm 17 psi at 2600 rpm
319D (S.N. —203036)	
Engine Speed Fast Idle	2800 rpm
Engine Speed Rated	2600 rpm
Turbocharger Boost Pressure	122 kPa at 2600 rpm 1.2 bar at 2600 rpm 17 psi at 2600 rpm
319D (S.N. 203037—)	
Engine Speed Fast Idle	2800 rpm
Engine Speed Rated	2600 rpm
Turbocharger Boost Pressure	132 kPa at 2600 rpm 1.3 bar at 2600 rpm 19 psi at 2600 rpm
320D	
Engine Speed Fast Idle	2800 rpm
Engine Speed Rated	2600 rpm
Turbocharger Boost Pressure	132 kPa at 2600 rpm 1.3 bar at 2600 rpm 19 psi at 2600 rpm
323D (S.N. —202965)	
Engine Speed Fast Idle	2800 rpm
Engine Speed Rated	2600 rpm
Turbocharger Boost Pressure	132 kPa at 2600 rpm 1.3 bar at 2600 rpm 19 psi at 2600 rpm
323D (S.N. 202966—)	
Engine Speed Fast Idle	3000 rpm
Engine Speed Rated	2800 rpm
Turbocharger Boost Pressure	138 kPa at 2800 rpm 1.4 bar at 2800 rpm 20 psi at 2800 rpm

This procedure should only be used as a general guide to determine engine condition and power level.

[1] - Raise and block machine. See Raising and Blocking Machine . (Operator′s Manual.)

[2] - Raise cab. See Raising Operator′s Station . (Operator′s Manual.)

[3] -

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000029.03- Foot Throttle Sensor Out of Range High

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Input from engine speed control pedal (B19) is shorted to power (5 volts or greater).

Foot Throttle Sensor Out of Range High Diagnostic Procedure

(1) Short to Power Check

Action:

Key switch OFF.

Disconnect engine control unit (ECU) J2 connector (X16). See Main Harness (W3) Component Location . (Group 9015-10.)

Disconnect engine speed control pedal (B19) connector.

Turn key switch ON.

Using a multimeter, check for voltage on wire E34 WHT between pin F3 of ECU J2 connector (X16) and machine ground.

Is voltage indicated?

Result:

YES: Short to power in wire harness. Repair or replace harness. See Main Harness (W3) Wiring Diagram . (Group 9015-10.)

NO: Go to Connector Check.

(2) Connector Check

Action:

Turn key switch OFF.

Check ECU J2 connector (X16) and engine speed control pedal (B19) connector for any damage, corrosion, or debris that could cause short to power condition for E34 WHT wire.

Are connectors in good condition and free of corrosion and debris?

Result:

YES: Go to Wire Check.

NO: Repair or replace connector. See Main Harness (W3) Wiring Diagram . (Group 9015-10.)

(3) Wire Check

Action:

Key switch OFF.

ECU J2 connector (X16) disconnected.

Engine speed control pedal (B19) disconnected.

Using a multimeter, check for continuity between pin F3 (wire E34 WHT) of ECU J2 connector (X16) and other pins in same connector.

Is continuity indicated between any circuits?

Result:

YES: Short circuit in wire harness. Repair or replace harness. See Main Harness (W3) Wiring Diagram . (Group 9015-10.)

NO: Engine speed control pedal (B19) malfunction. Replace pedal sensor.

000029.04- Foot Throttle Sensor Out of Range Low

220

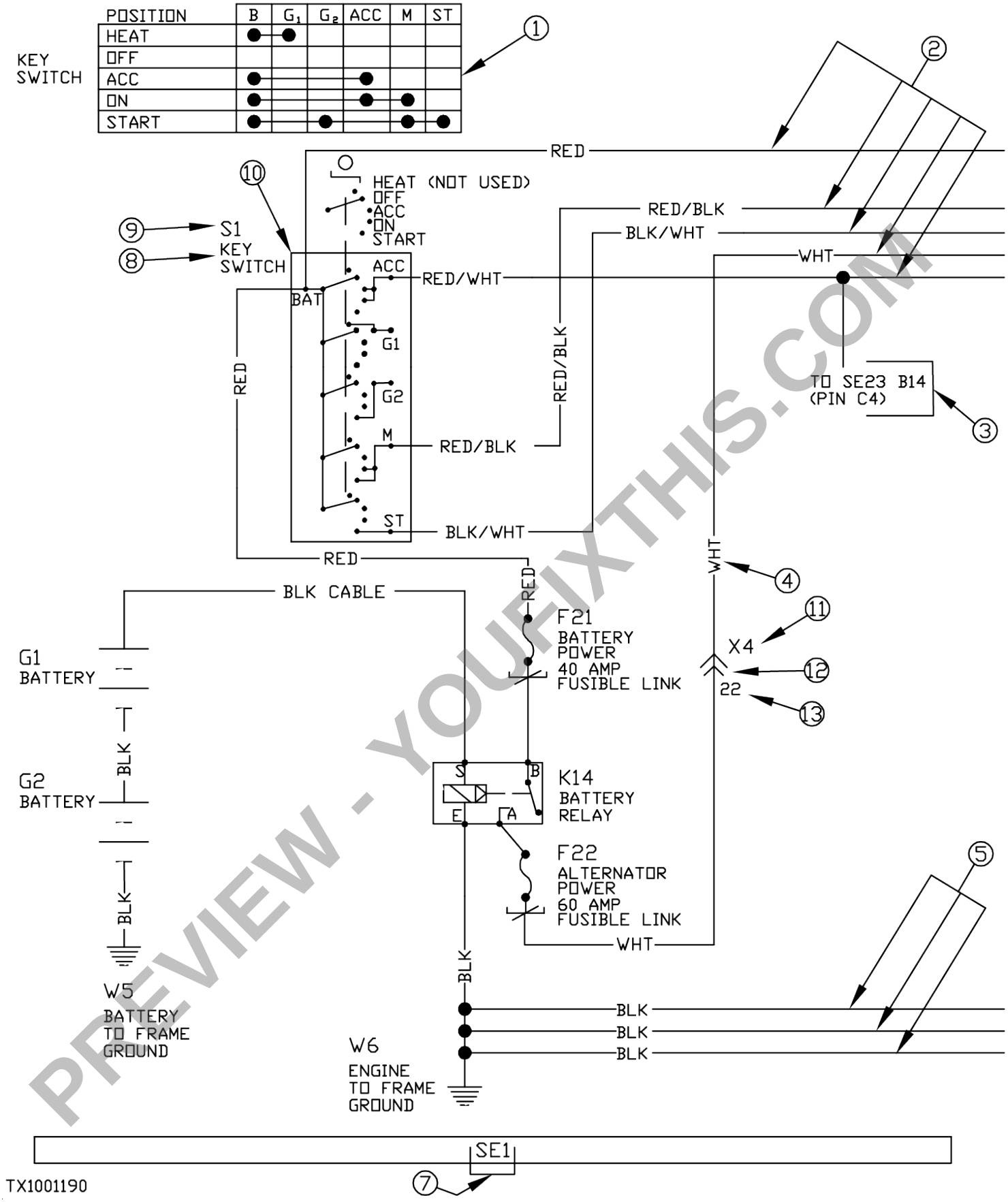
Input from engine speed control pedal (B19) is open or shorted to ground.

Foot Throttle Sensor Out of Range Low Diagnostic Procedure

(1) Connector Check

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System Functional Schematic Example

LEGEND:

1	Continuity Chart
2	Power Wires
3	Routing Location Information
4	Wire Identification
5	Ground Wires
7	Section Number

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Group 25 - Tests

Drive Chain Tension Check and Adjustment

Specifications

SPECIFICATIONS	
Chain Tension Play (at tire tread) (maximum, used)	6.35 mm 0.25 in.
Drive Chain Play (up and down) (maximum, used)	5 mm 0.197 in.
Axle Housing Nut Torque	305 N˙m 225 lb-ft

[1] -



Check Wheel Play

Park machine on flat level surface.

[2] - Lower boom and bucket, engage park brake and turn engine off.

[3] - Raise and block skid steer loader. See Raising and Blocking Machine . (Operator´s Manual.)

[4] - Check chain tension by rotating each wheel by hand forward and rearward. If wheel play is not below specification, adjust chain tension.

Item	Measurement	Specification
Chain Tension	Play (at tire tread) (maximum, used)	6.35 mm 0.25 in.

[5] - As necessary, drain chain case oil.

[6] - Remove chain case access plate. See Chain Case Access Plate Remove and Install . (Group 0250.)

[7] -

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Auxiliary Hydraulics Calibration

This procedure calibrates the control valve threshold values for the auxiliary functions of the machine.

[1] -

→NOTE:

Calibration will quit if hydraulic oil temperature falls below operating temperature specification. Make sure system oil is warm enough to maintain oil temperature during calibration procedure.

Operate machine to warm hydraulic system to operating temperature.

Item	Measurement	Specification
Hydraulic Oil	Temperature	60°C 140°F

[2] - Remove front attachment and park machine on flat level surface.

[3] - Start engine and enable hydraulics.

[4] - If equipped with pattern select, place pattern select switch in ISO mode.

[5] - Operate engine at fast idle.

Item	Measurement	Specification
Engine	Speed	Fast Idle

[6] - Press and hold the MENU button on the engagement and monitor unit (EMU) for 5 seconds to access the service menu.

[7] - Press NEXT until MAIN MENU CALIBRATION displays. Press SELECT.

[8] - Press NEXT until CALIBRATION AUX HYDRAULICS displays.

[9] - Press SELECT. The display shows BEGINNING AUX THRESHOLD CAL.

→NOTE:

If any of the calibration preconditions are not met, the EMU displays a message:

ENGINE RPM TOO LOW FOR CAL

HYD OIL TEMP TOO LOW FOR CAL

MOVE ROLLER TO NEUTRAL (auxiliary proportional switch not in neutral)

[10] - If all calibration preconditions are met, the display shows AUX EXTEND UNTIL PRESSURE.

[11] -

→NOTE:

Press the MENU button to end the calibration procedure. At the prompt, press SELECT to end calibration or BACK, NEXT, or MENU to resume calibration.

→NOTE:

If operator does not return auxiliary proportional switch to neutral immediately after the rise in pressure is heard, AUX CALIBRATION FAILED will appear on the display for 2 seconds and the calibration procedure will end. Normal runtime data appears on the screen and the previous calibration values are resumed.

Slowly move the auxiliary proportional switch forward until rise in pressure is heard. Return auxiliary proportional switch to neutral.

The display shows AUX RETRACT UNTIL PRESSURE.

[12] - Slowly move the auxiliary proportional switch to rear until rise in pressure is heard. Return auxiliary proportional switch to neutral.

[13] - Once the auxiliary thresholds have been calibrated, AUX CALIBRATION COMPLETE displays for 2 seconds before the EMU

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Result:

YES: Go to Engine Cranking Time Check .

NO: Allow diesel fired coolant heater to run and heat engine for a minimum of 4 hours.

(5) Fan Bypass Valve Check

Action:

Observe hydraulic fan while cranking engine or after engine starts.

Is fan spinning while engine is cranking or within first 60 seconds after engine starts?

Result:

YES: Fan bypass valve malfunction. See Fan Bypass Valve Test . (Group 9025-25.)

NO: Go to Engine Cranking Time Check.

(6) Engine Cranking Time Check

Action:

Record engine coolant temperature as displayed on engagement and monitor unit (EMU).

Record hydraulic oil temperature as displayed on EMU.

Record ambient air temperature.

Cycle ignition power/glow plugs and attempt to start machine. Crank engine until starter times out or engine starts. Record engine cranking time.

Using the coldest of the three temperatures recorded, use the table, below, to compare model, cranking time and temperature to evaluate cold start performance.

Cold Start Performance Table

Model	Cold Start Package	5°C (41°F)	0°C (32°F)	-5°C (23°F)	-10°C (14°F)	-15°C (5°F)	-20°C (-4°F)	-25°C (-13°F)	-30°C (-22°F)
318D, 320D 319D, 323D (4)	NO	8 sec.	8 sec.	(1)	(1)	(1)	(1)	(1)	(1)
318D, 320D 319D, 323D (4)	YES	8 sec.	8 sec.	20 sec.	34 sec.	44 sec.	14 sec. (2)	18 sec. (3)	24 sec. (3)
326D, 328D, 332D, 329D, 333D (5)	NO	8 sec.	8 sec.	(1)	(1)	(1)	(1)	(1)	(1)
326D, 328D, 332D, 329D, 333D (5)	YES	8 sec.	8 sec.	10 sec.	20 sec.	30 sec.	14 sec. (2)	18 sec. (3)	24 sec. (3)
(1) Cold start package required.									
(2) Block heater required for temperatures below -15°C (5°F). Performance based on block heater plugged in for a minimum of 4 hours.									
(3) Diesel fired coolant heater required for temperatures below -20°C (-4°F). Performance based on diesel fired coolant heater run for a minimum of 4 hours.									
(4) 318D, 319D, 320D, 323D cold start performance data does not include machines with high flow hydraulics option. High flow hydraulics option will degrade starting performance and is not included in the table.									
(5) 326D, 328D, 329D, 332D, 333D cold start performance data includes machines with high flow hydraulics option.									

Does machine cold start performance match table data?

Result:

YES: Checks complete. Normal machine operation.

NO: Contact dealer technical assistance center (DTAC) for further assistance. Include all data obtained during this diagnostic procedure when contacting DTAC.

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Group 10 - Operational Checkout Procedure

Operational Checkout

Use this procedure to make a quick check of machine operation by doing a walk around inspection and performing specific checks from operator's seat.

Complete visual checks (oil levels, oil condition, external leaks, loose hardware, linkage, wiring, etc.) before performing checkout.

Most checks will require machine systems to be at normal operating temperatures and a level area with adequate space to operate machine. Some checks may require varied surfaces.

No special tools are necessary to perform the checkout.

If no problem is found, go to next check. If problem is indicated, an additional check or repair procedure will be suggested.

Key Switch OFF, Engine OFF Checks

(1) Diagnostic Trouble Code Check

Action:

Always check for diagnostic trouble codes and correct them before performing the operational checkout.

Diagnostic trouble codes are displayed on the engagement and monitor unit (EMU).

Sit in seat and access diagnostic trouble code menu. See Reading Diagnostic Trouble Codes (DTCs) . (Group 9015-20.)

sss:

Are diagnostic trouble codes present?

Result:

YES: Correct all diagnostic trouble codes.

NO: Proceed with operational checkout.

(2) Engagement and Monitor Unit (EMU) Circuits Check

Action:

Sit in operator's seat.

sss:

Do all indicators illuminate and then go out depending on machine status?

sss:

Do all EMU display segments turn on, turn off, display TMC BY DEERE for 2 seconds, display correct machine model and speed setting for 2 seconds, and then display the hour meter?

Lower interlocking seat bar.

sss:

Do seat and interlocking seat bar indicators go off?

Result:

YES: Go to next check.

NO: Check monitor unswitched power 10 amp fuse (F2). See Fuse and Relay Specifications . (Group 9015-10.)

NO: Check seat switch (S4) and interlocking seat bar switch (S5). See Engagement and Monitor Unit Data Items . (Group 9015-16.)

NO: Check EMU circuits. See System Functional Schematic . (Group 9015-10.)

Key Switch ON, Engine OFF Checks

(1) EMU Circuits Check

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Foreword

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.

CAUTION:

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

Technical manuals are divided in two parts: repair and operation and tests. Repair sections tell how to repair the components. Operation and tests sections help you identify the majority of routine failures quickly.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values.

Technical Manuals are concise guides for specific machines. They are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

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000096.04- Fuel Level Sensor Out of Range Low

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Fuel level sensor (B4) input shorted to ground. Sensor input is less than 0.2 volts for more than 30 seconds.

Fuel Level Sensor Out of Range Low Diagnostic Procedure

(1) Connector Check

Action:

Turn key switch OFF.

Check fuel level sensor (B4) connector, cab harness-to-main harness connector (X2), engagement and monitor unit (EMU) J1 connector (X41), and EMU J2 connector (X42) for corrosion, loose fit, bent/pushed out terminals or crimp malfunctions. See Cab Harness (W2) Component Location . See Main Harness (W3) Component Location . (Group 9015-10.)

Are connectors in good condition?

Result:

YES: Go to Wire Harness Check.

NO: Repair or replace connector(s) or terminal(s) as needed.

(2) Wire Harness Check

Action:

Key switch OFF.

Disconnect fuel level sensor (B4).

Disconnect EMU J1 connector (X41).

Disconnect EMU J2 connector (X42).

Using a multimeter, check for continuity between wire Y01 YEL and wire R01 BLK at fuel level sensor (B4) connector.

Is continuity indicated?

Result:

YES: Short circuit in wire harness. Repair or replace harness. See Cab Harness (W2) Wiring Diagram . See Main Harness (W3) Wiring Diagram . (Group 9015-10.)

NO: Go to next step in this check.

Action:

Key switch OFF.

Fuel level sensor (B4) disconnected.

EMU J1 connector (X41) disconnected.

Using a multimeter, check for continuity to ground at pin L (wire Y01 YEL) of EMU J1 connector (X41).

Is continuity indicated?

Result:

YES: Go to Sensor Check.

NO: Short to ground in wire harness. Repair or replace harness. See Cab Harness (W2) Wiring Diagram . See Main Harness (W3) Wiring Diagram . (Group 9015-10.)

(3) Sensor Check

Action:

Check resistance of fuel level sensor. See Electrical Component Specifications . (Group 9015-20.)

Is fuel level sensor resistance within specification?

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523694.03- Aux Hyd Channel 2 Input Out of Range High

239

Auxiliary hydraulic control channel 2 input from auxiliary proportional switch (B15) is above maximum valid input or shorted to power.

Aux Hyd Channel 2 Input High Diagnostic Procedure—Manual Control Machines

(1) Short to Power Check

Action:

Key switch OFF.

Disconnect EMU J3 connector (X43). See Cab Harness (W2) Component Location . (Group 9015-10.)

Disconnect right control lever 12-pin connector (X22). See Control Lever Harness (W6) Component Location . (Group 9015-10.)

Turn key switch ON.

Using a multimeter, check for voltage on wire H21 GRN between pin D of EMU J3 connector (X43) and machine ground.

Is voltage indicated?

Result:

YES: Short to power in wire harness. Repair or replace harness. See Cab Harness (W2) Wiring Diagram . See Main Harness (W3) Wiring Diagram . See Control Lever Harness (W6) Wiring Diagram . (Group 9015-10.)

NO: Go to Connector Check.

(2) Connector Check

Action:

Turn key switch OFF.

Check EMU J3 connector (X43), cab harness-to-main harness 47-pin connector (X2), main harness-to-control lever harness 12-pin connector (X28), and right control lever 12-pin connector (X22) for any damage, corrosion, or debris that could cause short to power condition for H21 GRN wire.

Are connectors in good condition and free of corrosion and debris?

Result:

YES: Go to Wire Check.

NO: Repair or replace connector. See Cab Harness (W2) Wiring Diagram . See Main Harness (W3) Wiring Diagram . See Control Lever Harness (W6) Wiring Diagram . (Group 9015-10.)

(3) Wire Check

Action:

Key switch OFF.

EMU J3 connector (X43) disconnected.

Right control lever 12-pin connector (X22) disconnected.

Using a multimeter, check for continuity between pin D (wire H21 GRN) of EMU J3 connector (X43) and other pins in same connector.

Is continuity indicated between any circuits?

Result:

YES: Short circuit in wire harness. Repair or replace harness. See Cab Harness (W2) Wiring Diagram . See Main Harness (W3) Wiring Diagram . See Control Lever Harness (W6) Wiring Diagram . (Group 9015-10.)

NO: Auxiliary proportional switch (B15) malfunction. Replace switch.

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IMPORTANT:

Install fuse with correct amperage rating to prevent electrical system damage from overload.

Prevent electrical malfunctions from incorrectly installed relays. Install relays with the correct orientation.

IMPORTANT: To prevent damage to relay. Do not connect relay directly to battery. Use a fused power source such as accessory power switch 1-Pin connector (X60) or fused external power supply.

Connect multimeter to terminals 1 and 2. For specifications, see Electrical Component Specifications . (Group 9015-20.)

- Connect multimeter to terminals 3 and 4. Multimeter must read open.
- Connect 12 V DC (+) to terminal 1, ground (-) terminal 2 then connect multimeter to terminals 3 and 4. Multimeter must read less than 0.4 Ω.

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LEGEND:

B1	Air Filter Restriction Switch
B9	Air Conditioner Pressure Switch
B21	Fuel Pressure Sensor
B24	Ambient Air Temperature Sensor
E11	License Plate Light
F9	Glow Plug 60 A Fuse
F20	Fuel Filter Heater 15 A Fuse
K1	Starter Relay
K2	Glow Plug Relay
K4	Accessory Relay
K8	Ignition Relay
K10	Fuel Filter Heater Relay
M5	Windshield Washer Motor
M6	Heater Control Valve Actuator
V1	Remote Start Diode
V2	Polarity Sensing Diode
X1	Cab Harness-to-Main Harness 14-Pin Connector
X2	Cab Harness-to-Main Harness 47-Pin Connector
X8	Main Harness-to-Air Conditioner and Heater Harness 14-Pin Connector
X9	Service Engine Speed Control 3-Pin Connector
X10	Remote Start Box 4-Pin Connector
X12	Main Harness-to-Dual Flasher Harness 6-Pin Connector
X48	Main Harness-to-Rear Light Harness 6-Pin Connector
X60	Accessory Power Switch Connector 1-Pin
X61	Fuse Block 1 Connector
X62	Fuse Block 2 Connector
X63	Fuse Block 3 Connector
X64	Diode Block Connector
X65	Starter Relay Connector
X66	Glow Plug Relay Connector
X67	Ignition Relay Connector
X68	Accessory Relay Connector
X69	Maxi Fuse Block Connector
X70	Fuel Filter Heater Relay Connector
X137	T03 LT BLU Splice
X138	P10 RED Splice
X139	P09 RED Splice
X140	P06 RED Splice
X141	G01Y2 BLK Splice
X142	A08 ORG Splice
X143	P40 RED Splice
X144	P04 RED Splice
X145	P02 RED Splice 1
X146	E32 WHT Splice
X147	E01 WHT Splice
X148	B01 RED Splice
X149	J07 TAN Splice
X150	B07 RED Splice
X151	B10 RED Splice
X163	E03 WHT Splice
X171	L01 BRN Splice

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Group 16 - Monitor Operation

Engagement and Monitor Unit Operation

The engagement and monitor unit (EMU) can be used to display vital operating information, machine hours, diagnostic trouble codes (DTCs), diagnostics and to calibrate machine systems. It can also be used to lock the machine using an anti-theft security system (if equipped).

Power Up

The EMU can be powered up by turning the seat switch ON (sitting in the seat) or turning the key switch ON.

Upon initial power up, the EMU runs a self test to ensure that all functions are operating. If powered by the seat switch, the EMU self test turns the backlighting on, turns on all LCD pixels for 1 second, and turns on all indicator lights for 5 seconds. If powered by the key switch only, the EMU self test turns the backlighting on, turns on all LCD pixels for 1 second, turns on all indicator lights for 5 seconds, and then goes to normal runtime screens. The gauges calibrate to the right post, go to vertical position for 1 second, and then go to their runtime positions. If the key switch is turned ON after the seat switch is ON, the gauges calibrate to the right post, and then go to their runtime positions.

After the self test, the display initially reads TMC BY JOHN DEERE for 1.5 seconds before showing the machine model and speeds for 3 seconds. If the anti-theft system has not been enabled or is not active, the display defaults to the runtime screen. If the anti-theft system is enabled and unlocked, the display defaults to the runtime screen. If the anti-theft system is enabled on the machine, the operator is prompted to enter their code.

Switch Inputs

Four push-buttons on the left side of the EMU are provided for operator input. The switches are labeled with a menu icon (MENU), a left-pointing arrow (BACK), a down-pointing arrow (NEXT), and a check mark symbol (SELECT).

Menu Navigation

After the initial 5 second power up sequence, the operator can navigate through the various menus using the four EMU buttons. Press the MENU button to access the menus from the runtime display.

Pressing and holding MENU for 5 seconds accesses the service menu. The service menu can be used to display diagnostic information, clear diagnostic trouble codes, and calibrate machine systems. Once the service menu has been accessed, this menu remains accessible until power on the EMU is cycled off.

For more information, see Engagement and Monitor Unit Data Items and see Engagement and Monitor Unit Service Menu Operation . (Group 9015-16.)

Run Data Items

The run data items are the default display when the engagement and monitor unit is powered up. The run data items can also be displayed while cycling through the menu items by pressing the MENU button, or by pressing MENU at anytime while in a submenu. Pressing SELECT while viewing a run data item scrolls through all the run data items.

- Hours
- Volts
- Job Hours
- Hydraulic Oil Temperature
- Engine Temperature
- Engine RPM

Hour Meter

The EMU updates, maintains, and displays accumulated machine hours. Hours are displayed to the nearest tenth hour. If needed, the current hour meter value can be transferred to a new EMU. See Engagement and Monitor Unit Initial Configuration . (Group 9015-16.)

Diagnostic Trouble Codes (DTCs)

If a DTC becomes active, a pop-up message CHECK SERVICE CODE appears in the EMU display. The code menu displays any DTCs that are present in the machine. Each active DTC is stored immediately upon occurrence, provided the code is not already saved in memory. Any DTC still active is immediately stored again. For more information, See Reading Diagnostic Trouble Codes (DTCs) . (Group 9015-20.)

Monitor Menu

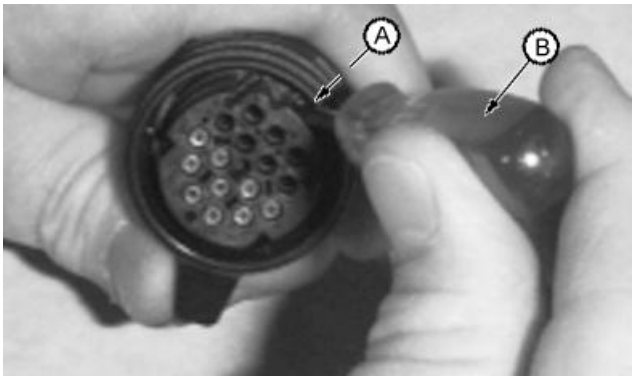
The Monitor Menu allows user to choose language and units format for their monitor.

[1] - Press MENU to display EMU main menu.

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Replace Metri-Pack™ Connectors



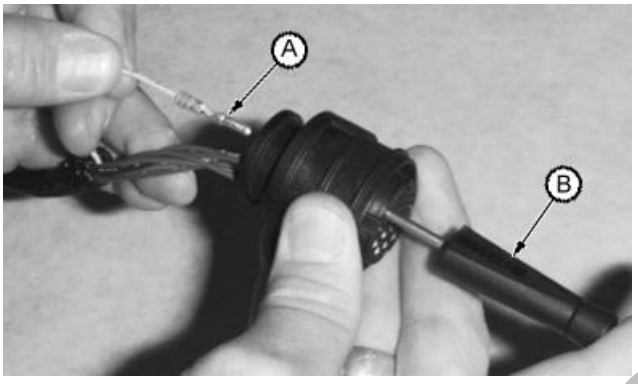
LEGEND:

A	Tab
B	Screwdriver

Metri-Pack® Connector

[1] - A small locking tab (A) is located inside the Metri-Pack ™ connector. Use a small screwdriver (B) to move tab outward to the first detent position; the tab will “click.”

[2] -



LEGEND:

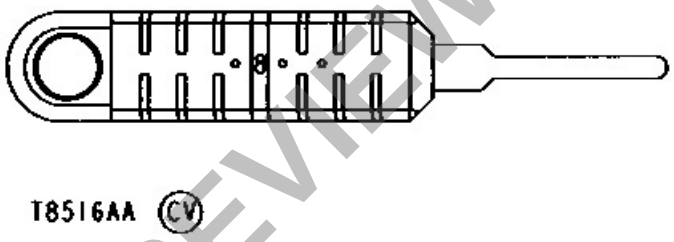
A	Wire
B	Extractor Tool

JDG939 Metri-Pack® Extractor Tool

Slide JDG939 Metri-Pack® Extractor Tool (B) into connector body until it is positioned over terminal contact.

Metri-Pack® Extractor Tool

JDG939



JDG939 Metri-Pack® Extractor Tool

Used to extract Metri-Pack® terminals.

[3] - Pull wire out of connector body.

[4] -

IMPORTANT:

Install contact in proper location using correct size grommet.

Push contact straight into connector body until positive stop is felt.

[5] - Pull on wire slightly to be certain contact is locked in place.

[6] - Transfer remaining wires to correct terminal in new connector.

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Boom Will Not Lower

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Boom Will Not Lower Diagnostic Procedure

(1) Diagnostic Trouble Codes (DTCs) Check

Action:

Check diagnostic trouble codes. See Reading Diagnostic Trouble Codes (DTCs) . (Group 9015-20.)

Are diagnostic trouble codes present?

Result:

YES: Resolve diagnostic trouble codes.

NO: Go to Boom Lock Engaged.

(2) Boom Lock Engaged

Action:

Check to see if boom lock is engaged. See Boom Lock . (Operator's Manual.)

Is boom lock engaged?

Result:

YES: Release boom lock.

NO: Go to Low Hydraulic Oil Level.

(3) Low Hydraulic Oil Level

Action:

Check hydraulic oil reservoir level. See Check Hydraulic Reservoir Oil Level . (Operator's Manual.)

Is oil level correct?

Result:

YES: Go to Port Lock Solenoid Valve and Port Lock Spool.

NO: Fill reservoir to correct level with appropriate hydraulic oil. For recommended oil, see Hydraulic and Hydrostatic Oil . (Operator's Manual.)

(4) Port Lock Solenoid Valve and Port Lock Spool

Action:

Do auxiliary hydraulic functions operate, but boom and bucket functions do not?

Result:

YES: Check port lock solenoid valve and port lock spool. See Port Lock Solenoid Valve and Port Lock Spool Test . (Group 9025-25.)

NO: Go to Boom and Bucket Spool Lock Solenoid.

(5) Boom and Bucket Spool Lock Solenoid

Action:

Do boom and bucket controls move freely?

Result:

YES: Go to Control Valve Linkage or Spool Binding.

NO: Check boom and bucket spool lock. See Boom and Bucket Spool Lock Solenoid Test . (Group 9025-25.)

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[4] - Fully roll back bucket.

[5] - Dump bucket half way.

[6] - Engage park brake.

[7] - Mark and record a distance on the bucket cylinder rod from the cylinder barrel.

[8] - Disengage park brake.

[9] - Allow machine to sit with engine speed at slow idle for 5 minutes.

Item	Measurement	Specification
Engine	Speed	Slow Idle

[10] - Engage park brake.

[11] - Measure marked distance on bucket cylinder rod.

Item	Measurement	Specification
Bucket Cylinder	Drift (maximum)	13 mm/5 min.
		0.5 in./5 min.

[12] - If bucket dump drift is more than specification, continue with the following steps.

[13] - Raise boom half way.

[14] - Fully roll back bucket.

[15] - Dump bucket half way.

[16] - Engage park brake.

[17] - Turn engine off.

[18] - Allow machine to sit for 5 minutes.

[19] - Measure marked distance on bucket cylinder rod.

Item	Measurement	Specification
Bucket Cylinder	Drift (maximum)	13 mm/5 min.
		0.5 in./5 min.

[20] - If bucket dump drift is more than specification, diagnose cause of bucket drift. See Bucket Drifts Down . (Group 9025-15.).

Bucket Curl Drift Check

→NOTE:

These checks will require two people if machine is equipped with cab door.

Machine must be equipped with a bucket (empty) for these checks.

[1] -

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NO: Done.

(6) Broken Steering Damper

Action:

Check steering dampers. See Steering Damper Inspection . (Group 0315.)

Are steering dampers working correctly?

Result:

YES: Done.

NO: Replace steering damper. See Steering Damper Remove and Install . (Group 0315.)

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