

750K and 850K Crawler Dozer Operation and Test

(PIN:1T0750KX__F271593—)

(PIN:1T0850KX__F271510—)

OPERATION & TEST TECHNICAL MANUAL

750K and 850K Crawler Dozer

(PIN:1T0750KX__F271593—)

(PIN:1T0850KX__F271510—)

TM13280X19 30MAR17 (ENGLISH)

For complete service information also see:

750K and 850K Crawler Dozer Repair.....	TM13282X19
750K and 850K Crawler Dozer Operator's Manual	OMT355293X19
PowerTech™ 6.8 L OEM Diesel Engines — Final Tier 4/Stage IV Platform.....	CTM120019
Hydraulic Cylinders.....	CTM120519
Specifications Manual.....	SP458VOL2
Undercarriage Appraisal Manual	SP326VOL1
JDLINK™ (MTG) Technical Manual.....	TM114519

**Worldwide Construction
And Forestry Division**

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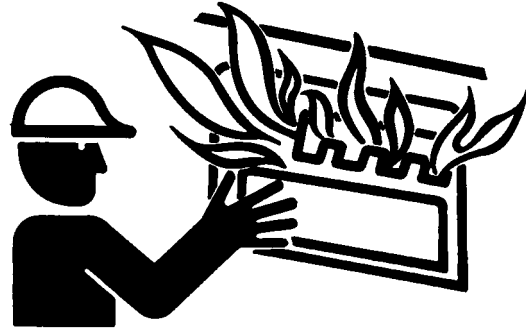
Clean Debris from Machine

Keep engine compartment, radiator, batteries, hydraulic lines, exhaust components, fuel tank, and operator's station clean and free of debris.

Clean any oil spills or fuel spills on machine surfaces.

Temperature in engine compartment could go up immediately after engine is stopped. **BE ON GUARD FOR FIRES DURING THIS PERIOD.**

Open access door(s) to cool the engine faster, and clean engine compartment.



T6669AG —UN—15APR13

TX,DEBRIS -19-20JAN11-1/1

Add Cab Guarding for Special Uses

Special work situations or machine attachments could create an environment with falling or flying objects. Working near an overhead bank, demolition work, using a hydraulic hammer or winch, working in a forestry application or wooded area, or working in a waste management application, for example, could require added guarding to protect the operator.

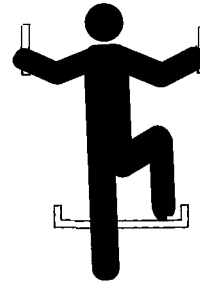
Additional level II FOPS (falling object protective structure), forestry protection packages, and special screens or guarding should be installed when falling or flying objects could enter or damage the machine. A rear screen should always be used with a winch to protect against a snapping cable. Before operating in any special work environments, follow the operator protection recommendations of the manufacturer of any specialized attachment or equipment. Contact your authorized John Deere dealer for information on protective guarding.

TX,CABGUARD -19-12FEB13-1/1

Use Steps and Handholds Correctly

Prevent falls by facing the machine when you get on and off. Maintain 3-point contact with steps and handrails. Never use machine controls as handholds.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.



T133468 —UN—15APR13

TX,STEPS -19-09FEB11-1/1

Start Only From Operator's Seat

Avoid unexpected machine movement. Start engine only while sitting in operator's seat. Ensure that all controls and working tools are in proper position for a parked machine.

Never attempt to start engine from the ground. Do not attempt to start engine by shorting across the starter solenoid terminals.



T133715 —UN—15APR13

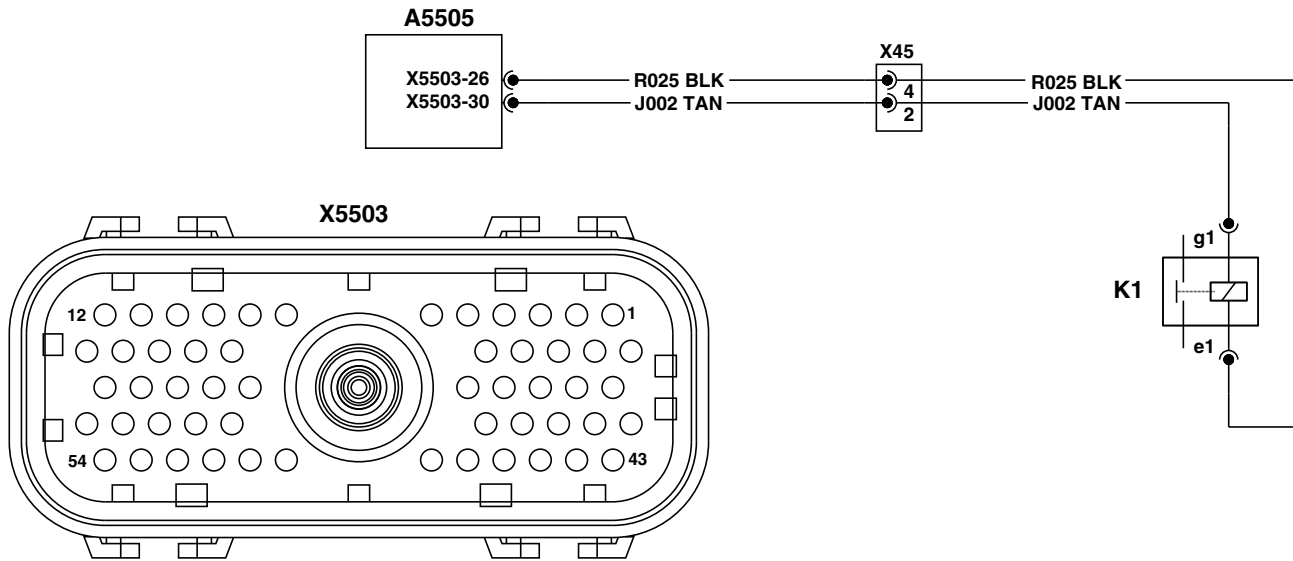
TX,SOFOS -19-20JAN11-1/1

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001321.06 — Starter Relay High Current

Start relay (K1) circuit output is out of range high or shorted to ground.



TX1170313

Start Relay (K1) Circuit Schematic

A5505—Engine Control Unit (ECU) X45— Engine Auxiliary Harness-to-Vehicle Harness 12-Pin Connector X5503—Engine Control Unit (ECU) Connector 3 X5503—30—Signal
 K1—Start Relay

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Start and Charge Circuits Theory of Operation. (Group 9015-05.)

Component Location:

- See Engine Auxiliary Harness (W11) Component Location. (Group 9015-10.)
- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

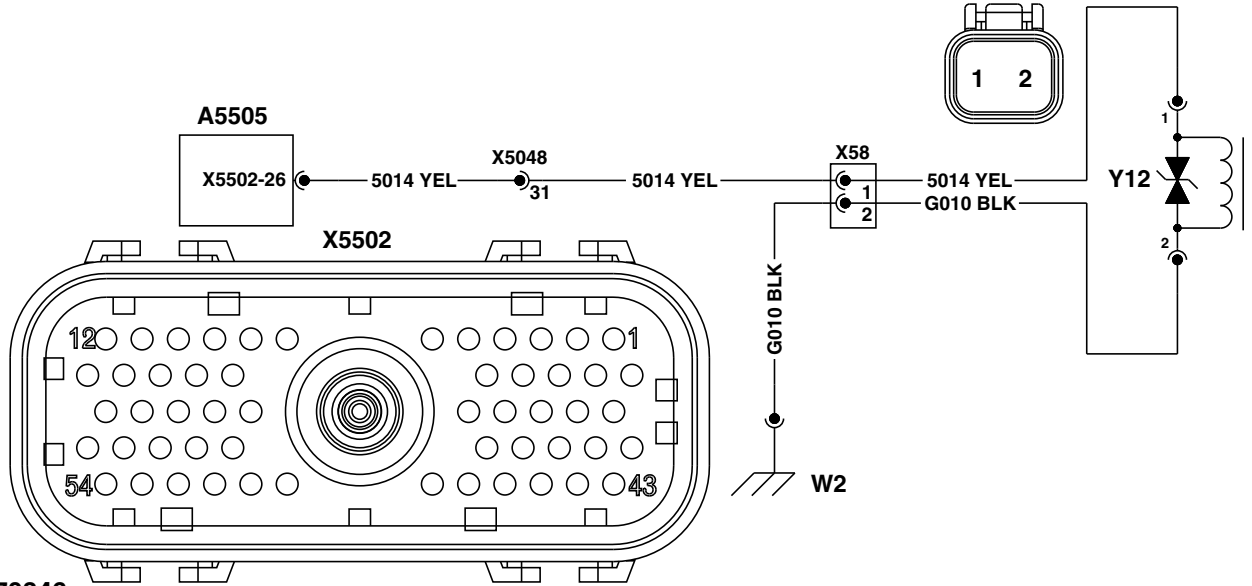
1. Component malfunction.
2. Circuit is shorted to ground.
3. Software malfunction. Program controller.

TX1170313—UN—14OCT14

JD29379,000027E -19-26AUG14-1/1

005484.05 — Fan Reversing Solenoid

Hydraulic fan reversing solenoid (Y12) circuit is open.



TX1170346

Hydraulic Fan Reversing Solenoid (Y12) Circuit Schematic

A5505—Engine Control Unit (ECU)
 W2—Frame Ground
 X58— Fan Harness Connector

X5502—Engine Control Unit (ECU) Connector 2
 X5502—26—Signal

X5048—Vehicle Harness-to-Engine Harness 31-Pin Connector
 Y12— Hydraulic Fan Reversing Solenoid

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Fan Reverse Driver Disabled

Circuit Information:

- See Engine Control Unit (ECU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Fan Harness (W14) Component Location. (Group 9015-10.)
- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Circuit is open.
2. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
3. Software malfunction. Program controller.

TX1170346 —UN—14OCT14

JD29379,0000285 -19-11MAR15-1/1

520754.04 — SSM Button Stuck

Auto-idle switch on sealed switch module (SSM) is stuck.

NOTE: The sealed switch module (SSM) does not store diagnostic trouble codes; when switched power is restored, the SSM resets and all codes are lost.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Primary Display Unit (PDU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

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- See Cab Roof Harness (W27) Component Location or see Canopy Roof Harness (W28) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Perform SSM test to verify keypad is malfunctioning. See Diagnostics—Sealed Switch Module (SSM), PDU. (Operator's Manual.)
2. Hardware malfunction. Replace SSM. See Controller Remove and Install. (Group 1600.)

JD29379,0000299 -19-13AUG14-1/1

520754.09 — Communication System Message Missing

No LED response from vehicle control unit (VCU) for auto-idle switch on sealed switch module (SSM).

NOTE: The sealed switch module (SSM) does not store diagnostic trouble codes; when switched power is restored, the SSM resets and all codes are lost.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Primary Display Unit (PDU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station

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(SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

- See Cab Roof Harness (W27) Component Location or see Canopy Roof Harness (W28) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Perform SSM test to verify keypad is malfunctioning. See Diagnostics—Sealed Switch Module (SSM), PDU. (Operator's Manual.)
2. Circuit is open or shorted. See Controller Area Network (CAN) Circuit Test. (Group 9015-25.)
3. Software malfunction. Program VCU.
4. Hardware malfunction. Replace SSM. See Controller Remove and Install. (Group 1600.)

JD29379,0000299A -19-13AUG14-1/1

523856.09 — Communication System Message Missing

No LED response from vehicle control unit (VCU) for cab work light switch on sealed switch module (SSM).

NOTE: The sealed switch module (SSM) does not store diagnostic trouble codes; when switched power is restored, the SSM resets and all codes are lost.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Primary Display Unit (PDU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station

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(SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

- See Cab Roof Harness (W27) Component Location or see Canopy Roof Harness (W28) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Perform SSM test to verify keypad is malfunctioning. See Diagnostics—Sealed Switch Module (SSM), PDU. (Operator's Manual.)
2. Circuit is open or shorted. See Controller Area Network (CAN) Circuit Test. (Group 9015-25.)
3. Software malfunction. Program VCU.
4. Hardware malfunction. Replace SSM. See Controller Remove and Install. (Group 1600.)

JD29379,00002B2 -19-11NOV14-1/1

523857.04 — SSM Button Stuck

Pitch select switch on sealed switch module (SSM) is stuck.

NOTE: The sealed switch module (SSM) does not store diagnostic trouble codes; when switched power is restored, the SSM resets and all codes are lost.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Primary Display Unit (PDU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

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- See Cab Roof Harness (W27) Component Location or see Canopy Roof Harness (W28) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

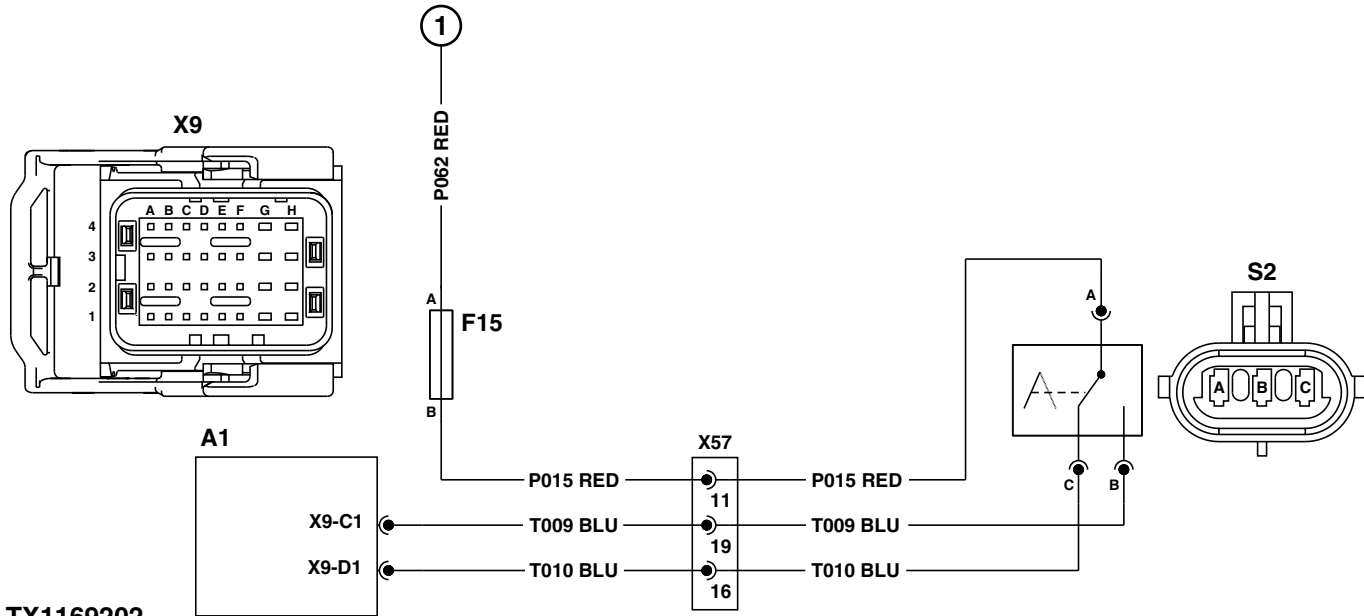
1. Perform SSM test to verify keypad is malfunctioning. See Diagnostics—Sealed Switch Module (SSM), PDU. (Operator's Manual.)
2. Hardware malfunction. Replace SSM. See Controller Remove and Install. (Group 1600.)

JD29379,00002B3 -19-11NOV14-1/1

000070.00 — Left Park Lock Lever Circuit Fault

Left park lock lever switch (S2) circuit has short to power. Park and run signals on at same time.

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.



TX1169202

Left Park Lock Lever Switch (S2) Circuit Schematic

- | | | |
|-------------------------------------|---------------------------------|---|
| 1— Switched Power | S2— Left Park Lock Lever Switch | X9—D1—Park Signal |
| A1—Vehicle Control Unit (VCU) | X9—VCU Connector 1 | X57— Vehicle Harness-to-Operator's Station Harness 35-Pin Connector |
| F15— Transmission Switches 5 A Fuse | X9—C1—Run Signal | |

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Transmission Control Set to Neutral

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station

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(SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

- Circuit is shorted to power.
- Component malfunction. Replace park lock lever switch (S2).
- Software malfunction. Program controller.

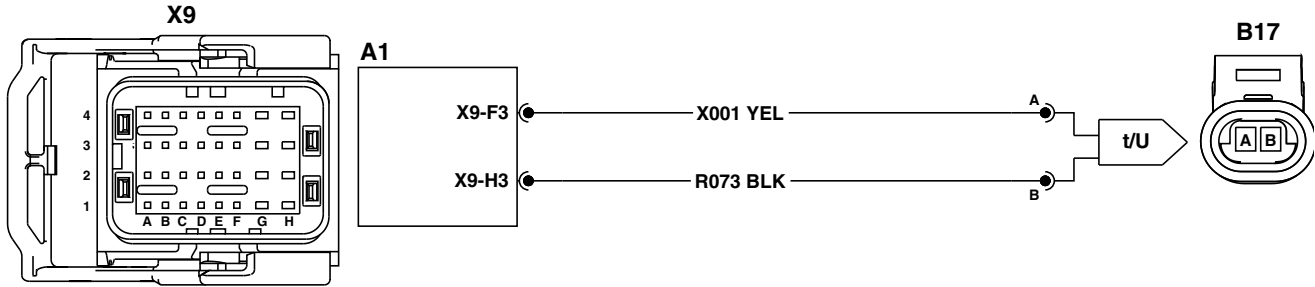
TX1169202—UN—14OCT14

JD29379,00002C9 -19-18AUG14-1/1

000177.04 — Transmission Oil Temperature Circuit Fault

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.

Hydrostatic oil temperature sensor (B17) circuit has short to ground (output is less than 0.25 V).



TX1169260

Hydrostatic Oil Temperature Sensor (B17) Circuit Schematic

A1—Vehicle Control Unit (VCU) B17— Hydrostatic Oil Temperature Sensor X9—VCU Connector 1 X9—H3—Return
 X9—F3—Signal

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

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- Test Box S1 Setting: **8**
- Service ADVISOR™ Reading: **Transmission Temperature**
- See Three Wire Sensor Circuit Check—Out of Range Low. (Group 9015-17.)

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

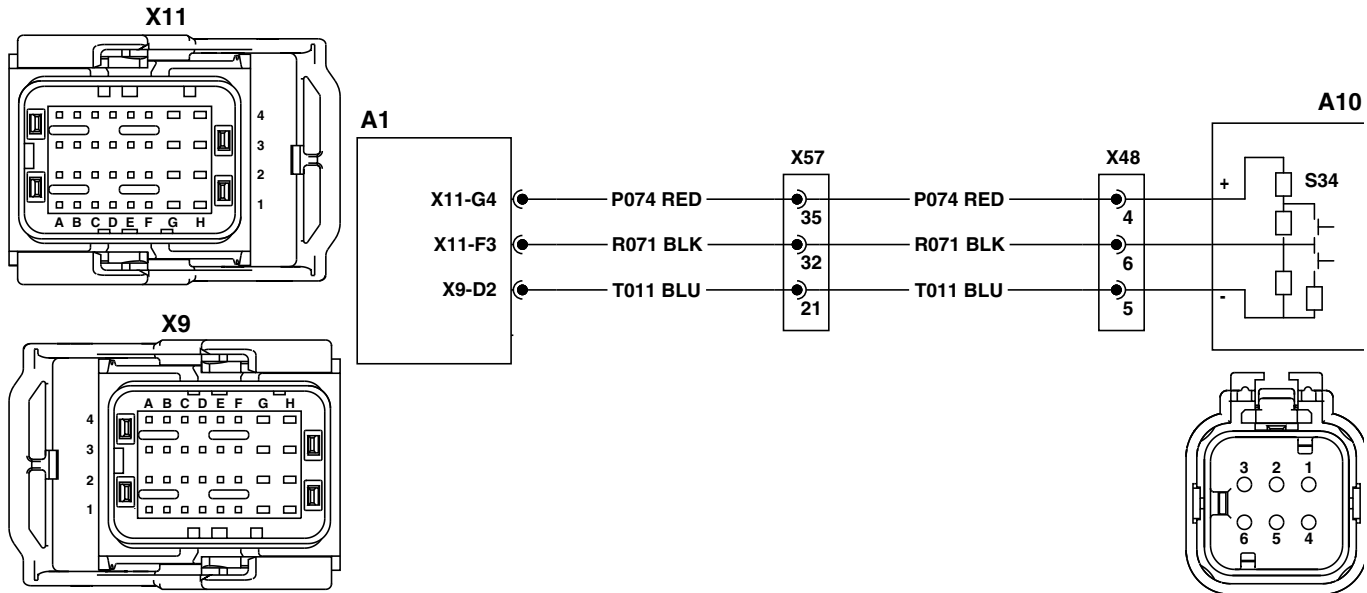
- Circuit is shorted to ground.
- Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
- Software malfunction. Program controller.

TX1169260—UN—14OCT14

000581.03 — Speed in Grip Switch Circuit Fault

Transmission speed control switch (S34) voltage out of range high or shorted to power (above 4.75 V).

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.



TX1169299

Transmission Speed Control Switch (S34) Circuit Schematic

A1—Vehicle Control Unit (VCU)
A10—Transmission Control Lever (TCL)
S34—Transmission Speed Control Switch (in TCL)

X9—VCU Connector 1
X9—D2—Signal
X11—VCU Connector 3
X11—F3—Return
X11—G4—Supply (5 V)

X48—Transmission Control Lever (TCL) Connector
X57—Vehicle Harness-to-Operator's Station Harness 35-Pin Connector

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Transmission Speed Limited to 1.0

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station (SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

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Diagnostic Test Box Information:

- Test Box S1 Setting: **6**
- Service ADVISOR™ Reading: **Transmission Speed Button Voltage**
- See Three Wire Sensor Circuit Check—Out of Range High. (Group 9015-17.)

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Circuit is shorted to power.
2. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
3. Software malfunction. Program controller.

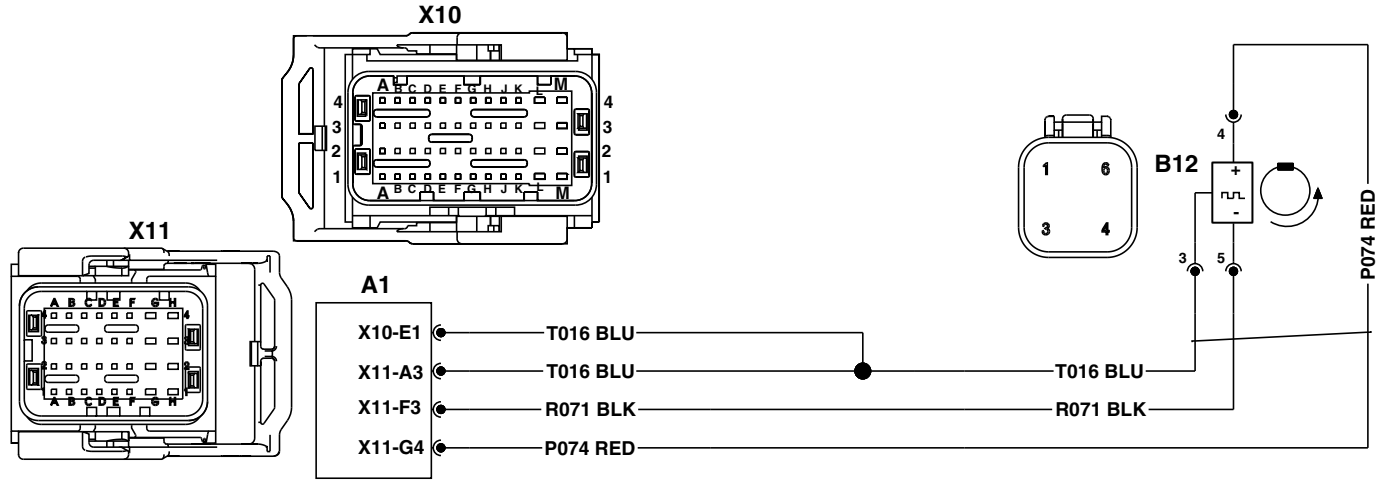
JD29379.00002E6 -19-18AUG14-1/1

TX1169299—UN—14OCT14

000907.00 — Left Motor Speed Sensor Circuit Fault

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.

Left motor speed sensor (B12) voltage high or R071 BLK return circuit is open.



TX1169528

Left Motor Speed Sensor (B12) Circuit Schematic

A1—Vehicle Control Unit (VCU)
B12—Left Motor Speed Sensor

X10—VCU Connector 2
X10—E1—Signal
X11—VCU Connector 3

X11—A3—Signal
X11—F3—Return
X11—G4—Supply (5 V)

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Tracker Control Disabled

Circuit Information:

- See [Transmission Control Unit \(TCU\) Circuit Theory of Operation](#). (Group 9015-05.)

Component Location:

- See [Vehicle Harness \(W15\) Component Location](#) or with SmartGrade™, see [Vehicle \(SmartGrade™ and IGC Controls\) Harness \(W16\) Component Location](#). (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See [Intermittent Diagnostic Trouble Code \(DTC\) Diagnostics](#). (Group 9015-15.)
- Service ADVISOR™ Remote: See [Using Service ADVISOR™ Remote](#). (Group 9015-15.)

Possible Causes:

1. R071 BLK return circuit is open.
2. Component malfunction. See [Electrical Component Specifications](#). (Group 9015-15.)
3. Software malfunction. Program controller.

JD29379,00002F4 -19-19AUG14-1/1

002660.00 — Steer Sensor Calibration Fault

Steer sensor (B3) voltage is out of range high for maximum calibration value.

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Machine Speed Limited to 3.2 km/h (2.0 mph)
- Steering Disabled

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

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- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station (SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Transmission control lever (TCL) out of adjustment. See Transmission Control Lever (TCL) Adjustment. (Group 9015-20.)
2. Component not calibrated. See Transmission Control Unit (TCU) Calibration. (Group 9015-20.)
3. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
4. Software malfunction. Program controller.

JD29379,0000303 -19-20AUG14-1/1

002660.01 — Steer Sensor Calibration Fault

Steer sensor (B3) voltage is out of range low for minimum calibration value.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Machine Speed Limited to 3.2 km/h (2.0 mph)
- Steering Disabled

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station

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(SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

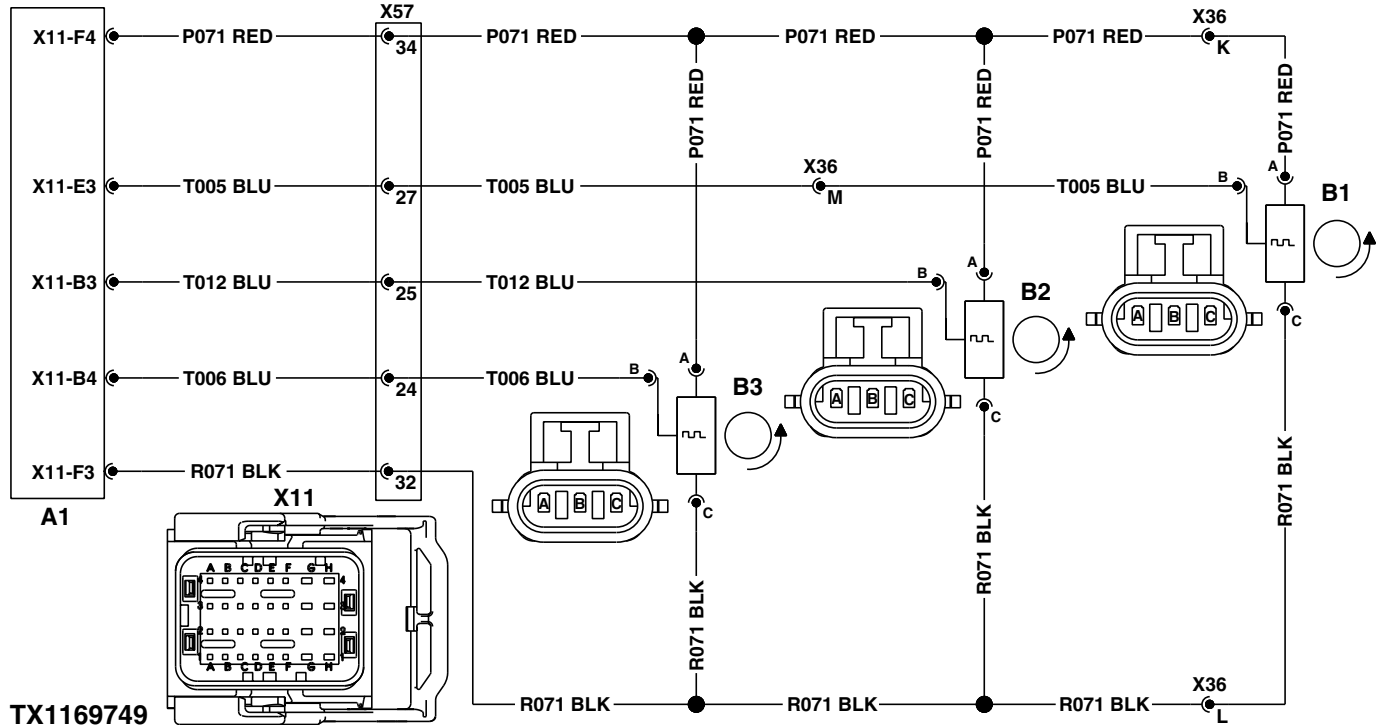
1. Transmission control lever (TCL) out of adjustment. See Transmission Control Lever (TCL) Adjustment. (Group 9015-20.)
2. Component not calibrated. See Transmission Control Unit (TCU) Calibration. (Group 9015-20.)
3. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
4. Software malfunction. Program controller.

JD29379,0000304 -19-20AUG14-1/1

003509.03 — Sensor Supply 1 Circuit Fault

P071 RED sensor supply voltage is out of range high (above 5.25 V).

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.



TX1169749

Sensor Supply 1 Circuit Schematic

- | | | |
|---|--|--|
| A1—Vehicle Control Unit (VCU) | X11— TCU Connector 3 | X11—F3—Return |
| B1—Decelerator Sensor | X11—B3—Forward, Neutral, and Reverse (FNR) Sensor Signal | X11—F4—Supply (5 V) |
| B2—Forward, Neutral, and Reverse (FNR) Sensor | X11—B4—Steer Sensor Signal | X36— Operator's Station Harness-to-Front Dash Harness 23-Pin Connector |
| B3—Steer Sensor | X11—E3—Decelerator Sensor Signal | X57— Vehicle Harness-to-Operator's Station Harness 35-Pin Connector |

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- No Forward or Reverse Operation

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station

(SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

- See Front Dash (PDU) Harness (W24) Component Location or see Front Dash (SDM) Harness (W25) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. P071 RED sensor supply circuit is shorted to power.
2. Software malfunction. Program controller.

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Continued on next page

JD29379,0000318 -19-02OCT14-1/2

TX1169749 —UN—14OCT14

Sensor Supply 4 Circuit Schematic

1— 750K Only

A1— Vehicle Control Unit (VCU)

A10— Transmission Control
Lever (TCL)

B11— Right Motor Speed Sensor

B12— Left Motor Speed Sensor

X9— VCU Connector 1

X9— B2— Signal

X9— D2— Supply (5 V)

X10— VCU Connector 2

X10— E1— Signal

X10— E2— Signal

X11— VCU Connector 3

X11— A3— Signal

X11— A4— Signal

X11— F3— Return

X11— G4— Supply (5 V)

X17— Right Motor Speed Sensor
Harness Connector (750K
only)X18— Left Motor Speed Sensor
Harness Connector (750K
only)X57— Vehicle Harness-to-
Operator's Station Harness
35-Pin Connector**Alarm Level:**

- Check Diagnostic Code Indicator

Machine Response:

- Transmission Speed Limited to 1.0
- Tracker Control Disabled

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station

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(SmartGrade™ and IGC Controls) Harness (W23)
Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

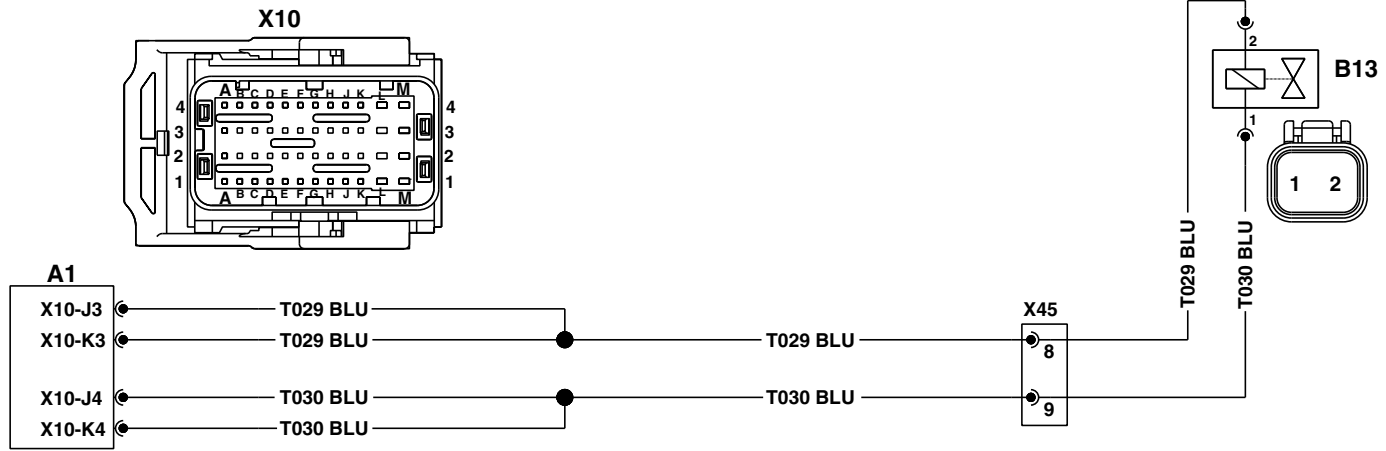
1. Sensor supply circuit P074 RED is shorted to ground.
2. Software malfunction. Program controller.

JD29379.000031D -19-20OCT14-2/2

522447.06 — Right Forward Pump Coil Circuit Fault

Front pump pressure control pilot (PCP) (B13) circuit for right forward command has short to power.

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.



TX1169777

Front Pump Pressure Control Pilot (PCP) (B13) Circuit Schematic

A1—Vehicle Control Unit (VCU)
B13—Front Pump Pressure Control Pilot (PCP)

X10— VCU Connector 2
X10—J3—Forward Signal
X10—J4—Reverse Signal

X10—K3—Reverse Return
X10—K4—Forward Return
X45— Engine Auxiliary Harness-to-Vehicle Harness 12-Pin Connector

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- No Forward Operation

Circuit Information:

- See [Transmission Control Unit \(TCU\) Circuit Theory of Operation](#). (Group 9015-05.)

Component Location:

- See [Engine Auxiliary Harness \(W11\) Component Location](#). (Group 9015-10.)
- See [Vehicle Harness \(W15\) Component Location](#) or with SmartGrade™, see [Vehicle \(SmartGrade™ and IGC Controls\) Harness \(W16\) Component Location](#). (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See [Intermittent Diagnostic Trouble Code \(DTC\) Diagnostics](#). (Group 9015-15.)
- Service ADVISOR™ Remote: See [Using Service ADVISOR™ Remote](#). (Group 9015-15.)

Possible Causes:

1. Circuit is shorted to power.
2. Component malfunction. See [Electrical Component Specifications](#). (Group 9015-15.)
3. Software malfunction. Program controller.

TX1169777—UN—14OCT14

JD29379,0000329 -19-14AUG14-1/1

522450.15 — Left Forward Pump Coil Calibration Fault

Rear pump pressure control pilot (PCP) (B14) forward threshold (point of track movement) is too high.

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- No Forward Operation

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Engine Auxiliary Harness (W11) Component Location. (Group 9015-10.)

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- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Component not calibrated. See Transmission Control Unit (TCU) Calibration. (Group 9015-20.)
2. TCU calibration malfunction. See TCU Calibration Malfunctions. (Group 9026-15.)
3. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
4. Software malfunction. Program controller.

JD29379.000033C -19-11NOV14-1/1

522450.16 — Left Forward Pump Coil Calibration Fault

Rear pump pressure control pilot (PCP) (B14) maximum calibration speed value is too high in forward.

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Machine Speed Limited to 3.2 km/h (2.0 mph)

Circuit Information:

- See Transmission Control Unit (TCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Engine Auxiliary Harness (W11) Component Location. (Group 9015-10.)

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- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

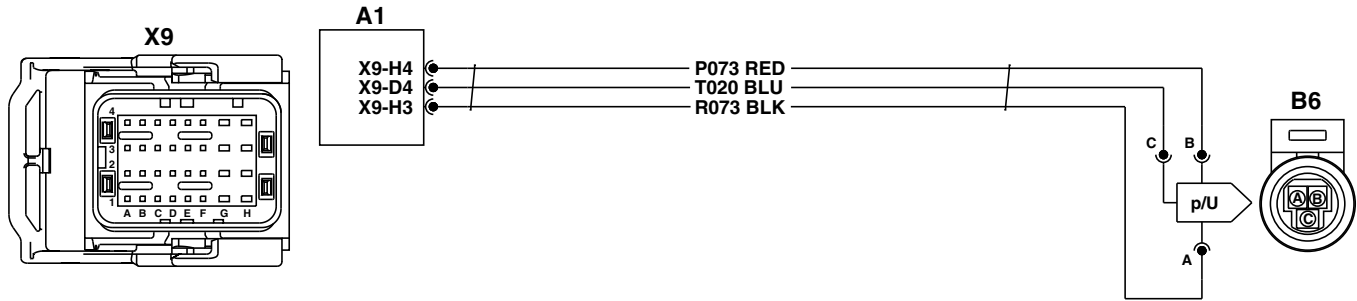
1. Component not calibrated. See Transmission Control Unit (TCU) Calibration. (Group 9015-20.)
2. TCU calibration malfunction. See TCU Calibration Malfunctions. (Group 9026-15.)
3. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
4. Software malfunction. Program controller.

JD29379.000033D -19-11NOV14-1/1

524089.03 — Left System Pressure Sensor Circuit Fault

NOTE: Transmission control unit (TCU) software is contained within vehicle control unit (VCU) (A1), but TCU software functions independently of VCU.

Left hydrostatic pressure sensor (B6) circuit has short to power.



TX1169840

Left Hydrostatic Pressure Sensor (B6) Circuit Schematic

A1—Vehicle Control Unit (VCU)
B6—Left Hydrostatic Pressure Sensor

X9—VCU Connector 1
X9—D4—Signal

X9—H3—Return
X9—H4—Supply (5 V)

Alarm Level:

- None

Machine Response:

- None

Circuit Information:

- See [Transmission Control Unit \(TCU\) Circuit Theory of Operation](#). (Group 9015-05.)

Component Location:

- See [Vehicle Harness \(W15\) Component Location](#) or with SmartGrade™, see [Vehicle \(SmartGrade™ and IGC Controls\) Harness \(W16\) Component Location](#). (Group 9015-10.)

Diagnostic Test Box Information:

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- Test Box S1 Setting: **6**
- Service ADVISOR™ Reading: **Left HST System Pressure Voltage**
- See [Three Wire Sensor Circuit Check—Out of Range High](#). (Group 9015-17.)

Additional References:

- Intermittent DTCs: See [Intermittent Diagnostic Trouble Code \(DTC\) Diagnostics](#). (Group 9015-15.)
- Service ADVISOR™ Remote: See [Using Service ADVISOR™ Remote](#). (Group 9015-15.)

Possible Causes:

1. Circuit is shorted to power.
2. Component malfunction. See [Electrical Component Specifications](#). (Group 9015-15.)
3. Controller malfunction. Program controller.

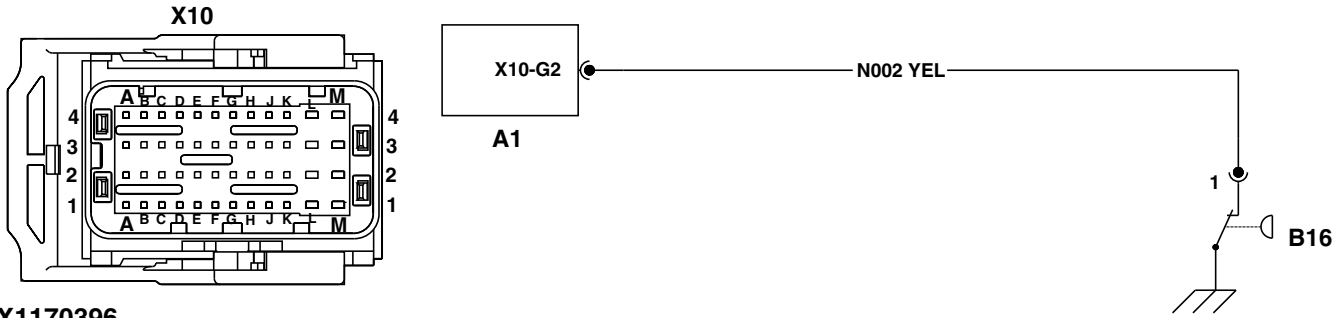
TX1169840—UN—14OCT14

JD29379,0000353 -19-14AUG14-1/1

001713.03 — Hydraulic Oil Filter Restriction Switch Circuit Fault

NOTE: This code will not be enabled until hydraulic oil temperature is greater than 40°C (104°F).

Hydraulic oil filter restriction switch (B16) is shorted to power.



TX1170396

Hydraulic Oil Filter Restriction Switch (B16) Circuit Schematic

A1—Vehicle Control Unit (VCU)

B16— Hydraulic Oil Filter Restriction Switch

X10— VCU Connector 2
X10—G2—Signal

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Vehicle Control Unit (VCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

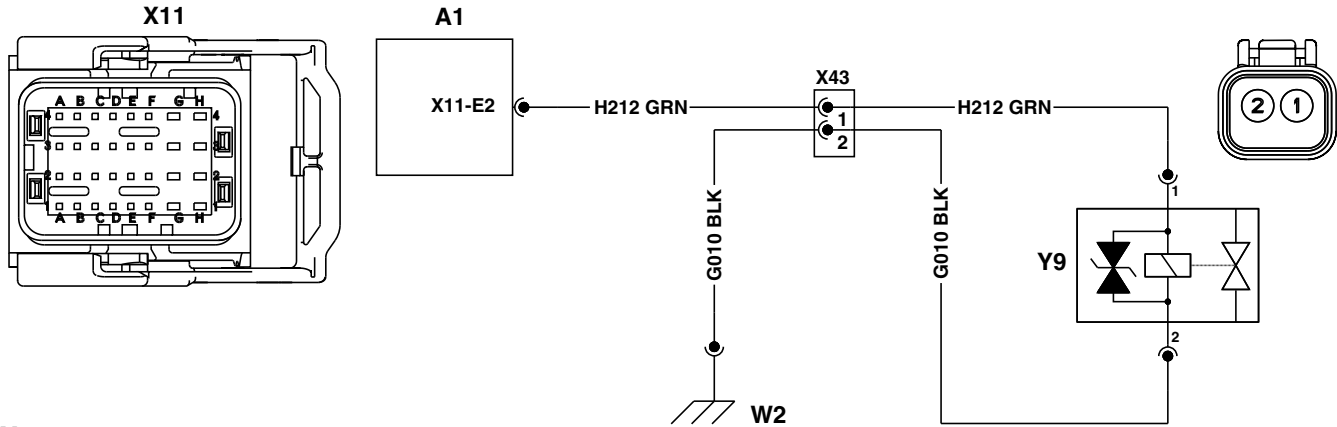
1. Component is shorted to power.
2. Software malfunction. Program controller.

TX1170396 —UN—14OCT14

JD29379,0000379 -19-27AUG14-1/1

520688.05 — Hydraulic Enable Solenoid Circuit Fault

Hydraulic enable solenoid (Y9) circuit is open.



Hydraulic Enable Solenoid (Y9) Circuit Schematic

TX1171051

A1—Vehicle Control Unit (VCU)
W2—Frame Ground

X11— VCU Connector 3
X11—E2—Supply
X43— Control Valve Harness Connector 1 (IGC only)

Y9—Hydraulic Enable Solenoid

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- Hydraulics Disabled

Circuit Information:

- See Vehicle Control Unit (VCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Control Valve (PAT, 4-Spool) Harness (W17) Component Location, see Control Valve (PAT, 5-Spool) Harness (W18) Component Location, or see Control

Valve (OSD) Harness (W19) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Circuit is open.
2. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
3. Software malfunction. Program controller.

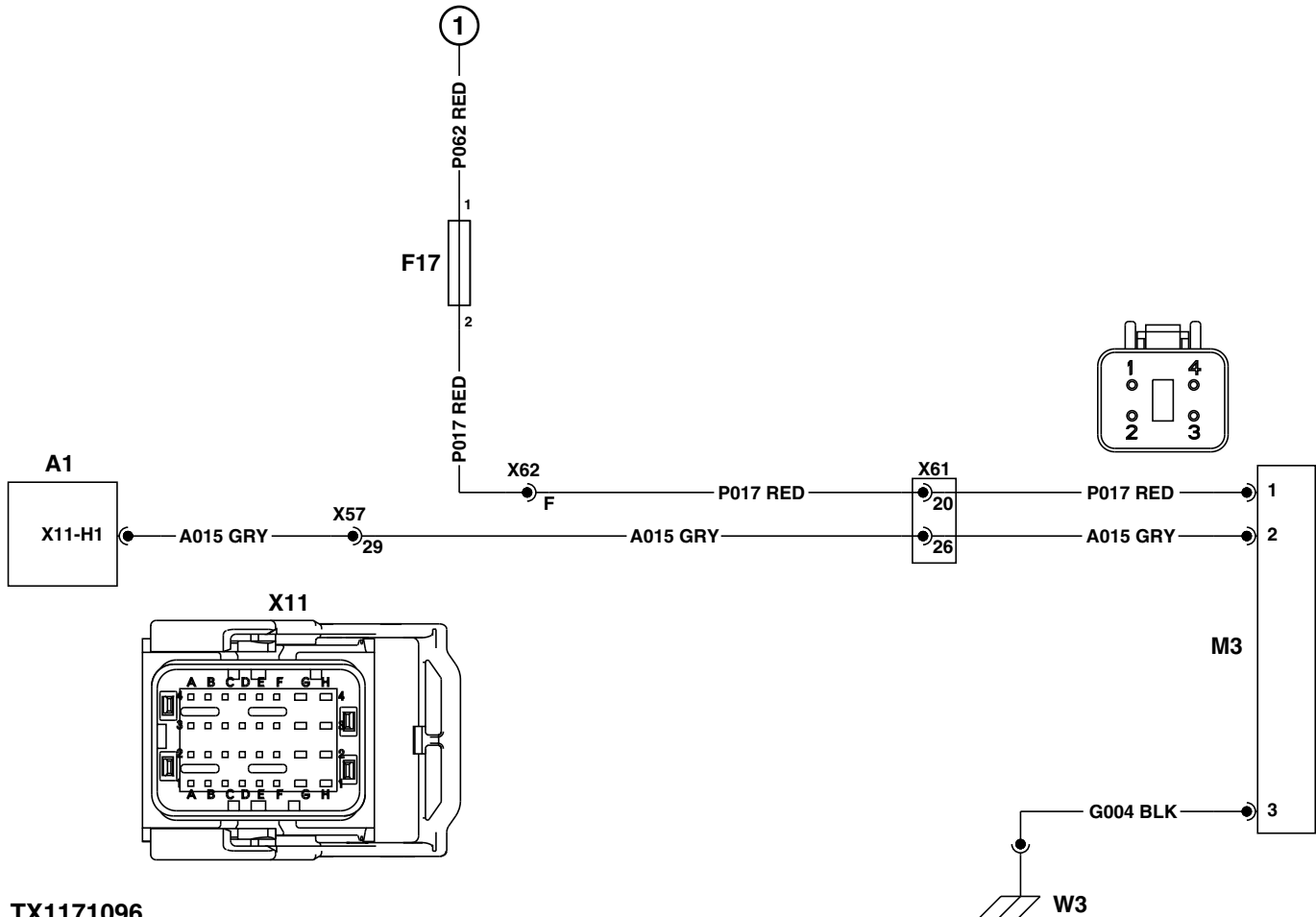
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JD29379,00003A0 -19-18NOV16-1/1

TX1171051—UN—14OCT14

522433.05 — Rear Wiper Circuit Fault

Rear wiper motor (M3) signal circuit has open or short to power.



TX1171096

Rear Wiper Motor (M3) Circuit Schematic

- | | | |
|-------------------------------|--|--|
| 1—Switched Power | W3—Roof Ground | X61— Operator's Station
Harness-to-Roof Harness
31-Pin Connector |
| A1—Vehicle Control Unit (VCU) | X11— VCU Connector 3 | X62— Vehicle Harness-to-
Operator's Station Harness
23-Pin Connector |
| F17— Window Wipers 15 A Fuse | X11—H1—Signal | |
| M3—Rear Wiper Motor | X57— Vehicle Harness-to-
Operator's Station Harness
35-Pin Connector | |

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Vehicle Control Unit (VCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station

- (SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)
- See Cab Roof Harness (W27) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

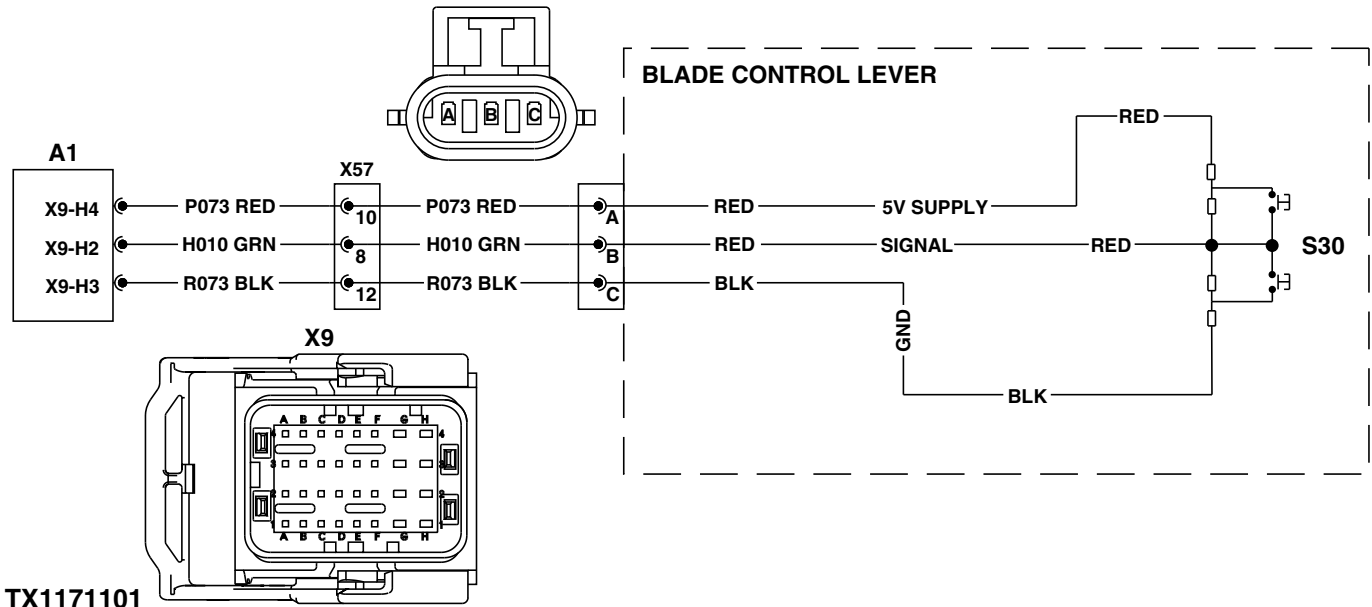
1. Signal circuit is open or short to power.
2. Component malfunction.

Continued on next page

SK44377,0000401 -19-09DEC15-1/2

522442.07 — Blade Angle Buttons Stuck Button

Blade control switch 2 (S30) is stuck.



Blade Control Switch 2 (S30) Circuit Schematic

A1—Vehicle Control Unit (VCU)
S30— Blade Control Switch 2

X9— Vehicle Control Unit (VCU)
Connector 1
X9—H2—Signal

X9—H3—Ground
X9—H4—Supply (5 V)
X57— Vehicle Harness-to-
Operator's Station Harness
35-Pin Connector

Alarm Level:

- Diagnostic Code Indicator Icon

Machine Response:

- None

Circuit Information:

- See [Vehicle Control Unit \(VCU\) Circuit Theory of Operation](#). (Group 9015-05.)

Component Location:

- See [Vehicle Harness \(W15\) Component Location](#). (Group 9015-10.)
- See [Operator's Station Harness \(W22\) Component Location](#). (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See [Intermittent Diagnostic Trouble Code \(DTC\) Diagnostics](#). (Group 9015-15.)
- Service ADVISOR™ Remote: See [Using Service ADVISOR™ Remote](#). (Group 9015-15.)

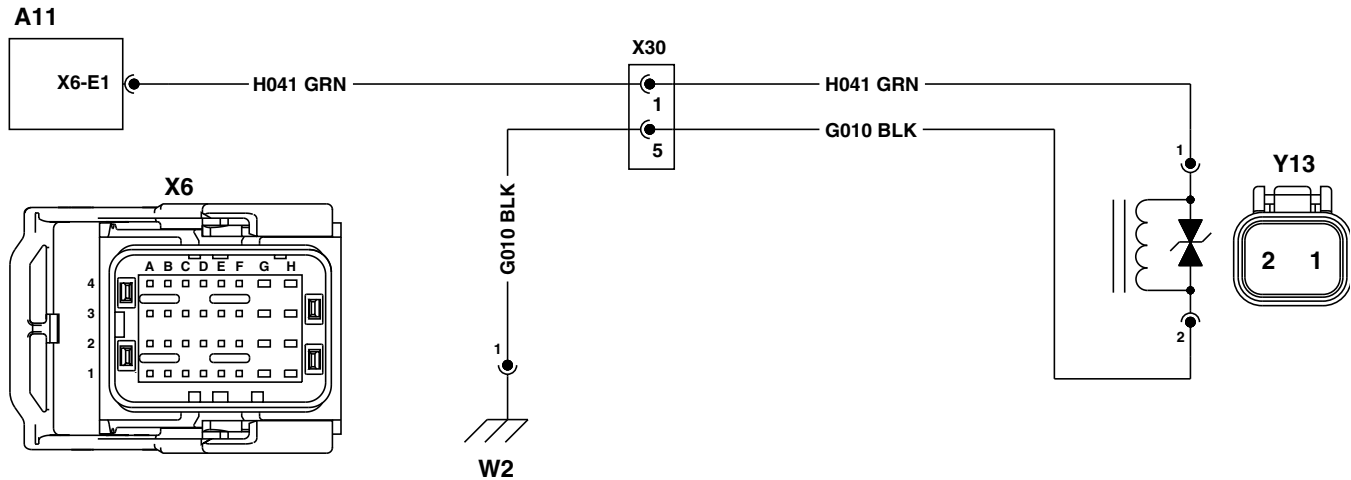
Possible Causes:

1. Blade control switch 2 is stuck.
2. Component malfunction.
3. Software malfunction. Program controller.

TX1171101—UN—14OCT14

001908.05 — Quick-Drop Solenoid Circuit Fault

Quick-drop solenoid (Y13) circuit is open.



TX1171772

Quick-Drop Solenoid (Y13) Circuit Schematic

A11— Hydraulic Valve Controller (HVC) X6— Hydraulic Valve Controller (HVC) Connector 3 X30— Cooling Package Harness-to-Vehicle Harness Connector Y13— Quick-Drop Solenoid
 W2—Frame Ground X6—E1—Supply

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Integrated Grade Control (IGC) Circuit Theory of Operation—If Equipped. (Group 9015-05.)

Component Location:

- See Cooling Package (IGC Controls) Harness (W13) Component Location. (Group 9015-10.)
- For machines with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

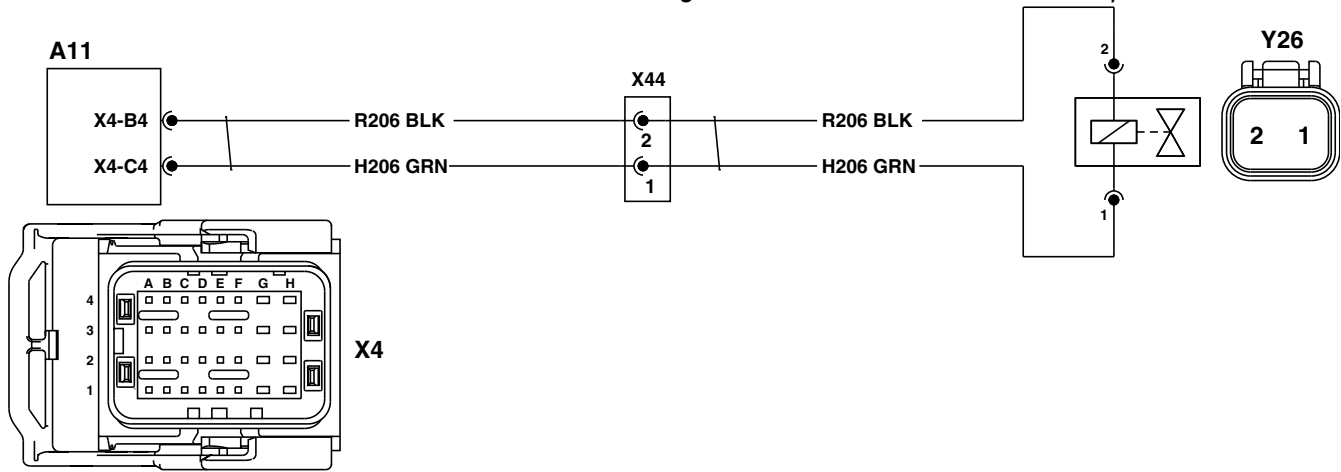
1. Circuit is open.
2. Component malfunction. See Electrical Component Specifications. (Group 9015-20.)
3. Software malfunction. Program controller.

TX1171772—UN—14OCT14

JD29379.00003CC -19-28OCT14-1/1

001923.06 — Blade Angle Right Valve Circuit Fault

Angle port A solenoid (Y26) supply circuit has short to ground or return circuit has short to power.



TX1171781

Angle Port A Solenoid (Y26) Circuit Schematic

- | | | |
|--|--|----------------------------|
| A11— Hydraulic Valve Controller (HVC) | X4—B4—Return | Y26— Angle Port A Solenoid |
| X4— Hydraulic Valve Controller (HVC) Connector 1 | X4—C4—Supply | |
| | X44— Control Valve Harness Connector 2 | |

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Integrated Grade Control (IGC) Circuit Theory of Operation—If Equipped. (Group 9015-05.)

Component Location:

- For machines with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Control Valve (PAT, 4-Spool) Harness (W17) Component Location. (Group 9015-10.)
- See Control Valve (PAT, 5-Spool) Harness (W18) Component Location. (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

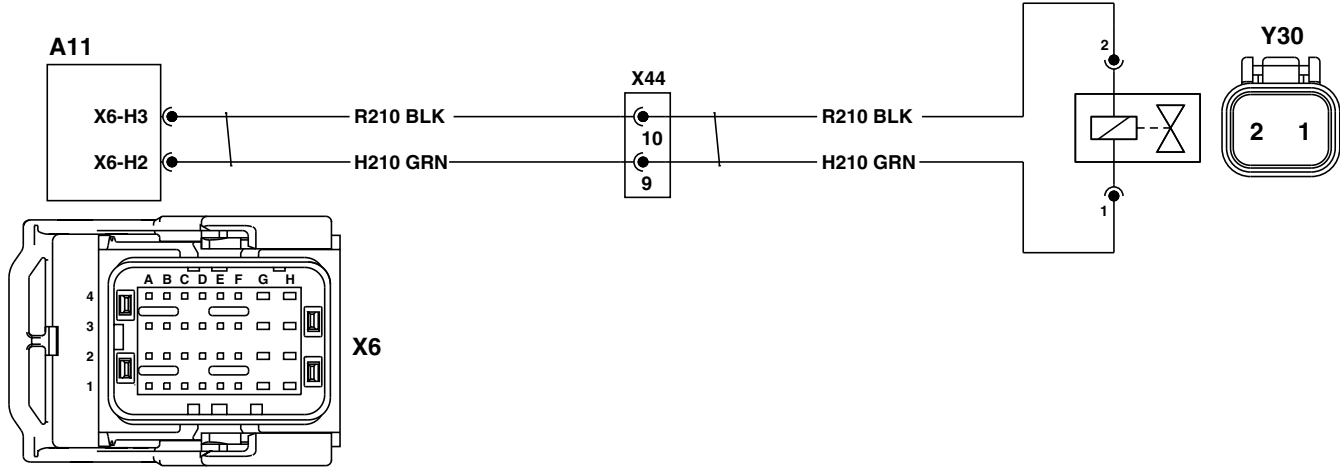
1. Supply circuit is shorted to power.
2. Return circuit is shorted to ground.
3. Component malfunction. See Electrical Component Specifications. (Group 9015-20.)
4. Software malfunction. Program controller.

TX1171781 —JUN—14OCT14

JD29379,0000416 -19-28OCT14-1/1

001947.03 — Rear Auxiliary 2 Valve Circuit Fault

Auxiliary port A solenoid (Y30) supply circuit has short to power.



TX1171797

Auxiliary Port A Solenoid (Y30) Circuit Schematic

- | | | |
|--|--|--------------------------------|
| A11— Hydraulic Valve Controller (HVC) | X6—H2—Supply | Y30— Auxiliary Port A Solenoid |
| X6— Hydraulic Valve Controller (HVC) Connector 3 | X6—H3—Return | |
| | X44— Control Valve Harness Connector 2 | |

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Integrated Grade Control (IGC) Circuit Theory of Operation—If Equipped. (Group 9015-05.)

Component Location:

- For machines with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Control Valve (PAT, 5-Spool) Harness (W18) Component Location. (Group 9015-10.)

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Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Supply circuit is shorted to power.
2. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
3. Software malfunction. Program controller.

TX1171797 —JUN—14OCT14

JD29379,00003DE -19-28OCT14-1/1

Hydraulic Valve Controller (HVC) Diagnostic Trouble Codes

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
 - Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)
1. Blade control switch 1 signal circuit is shorted to power.
 2. Component malfunction. See Electrical Component Specifications. (Group 9015-15.)
 3. Software malfunction. Program controller.

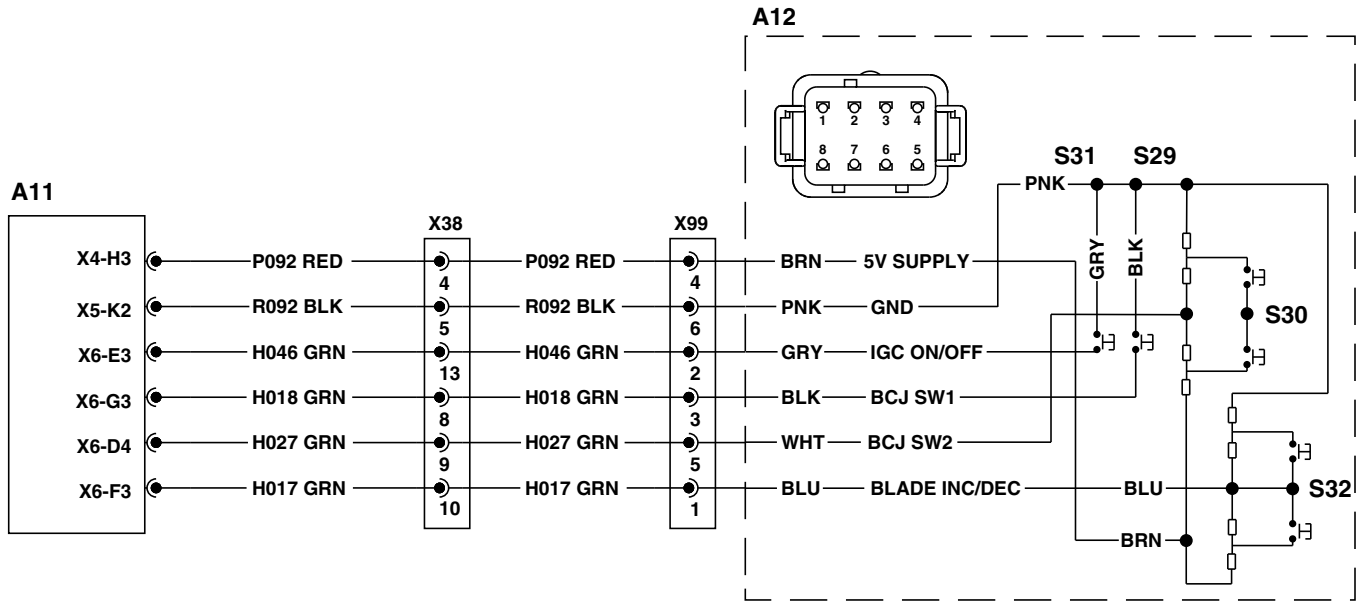
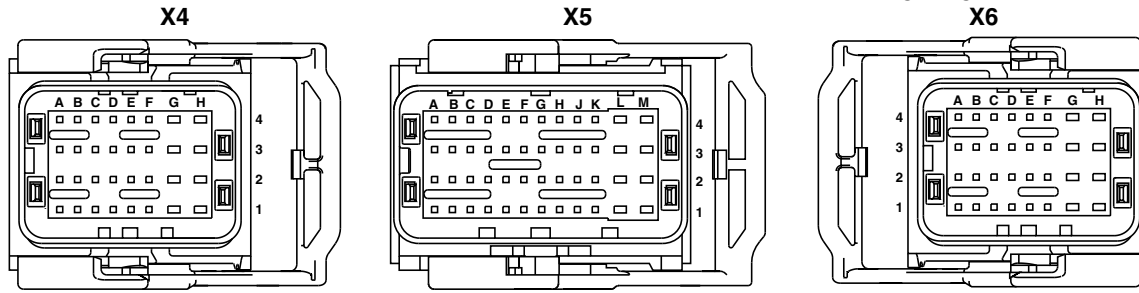
Possible Causes:

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JD29379,00003F2 -19-28OCT14-2/2

002725.03 — Right Hand Joystick Upper Rocker Circuit Fault

Blade height increment/decrement switch (S32) signal circuit is out of range high or has short to power.



TX1205126—UN—04NOV15

TX1205126

Joystick Switch Module (A12) Circuit Schematic

- | | | | |
|---|--|--|---|
| A11— Hydraulic Valve Controller (HVC) | X4— Hydraulic Valve Controller (HVC) Connector 1 | X6—D4—Blade Control Switch 2 Signal | X38— Vehicle Harness-to-Operator's Station Harness 31-Pin Connector |
| A12— Joystick Switch Module | X4—H3—Supply | X6—E3—Integrated Grade Control (IGC) Enable Signal | X99— Switch Module Connector |
| S29— Blade Control Switch 1 | X5— Hydraulic Valve Controller (HVC) Connector 2 | X6—F3—Integrated Grade Control (IGC) Blade Height Increment/Decrement Signal | |
| S30— Blade Control Switch 2 | X5—K2—Return | X6—G3—Blade Control Switch 1 Signal | |
| S31— Integrated Grade Control (IGC) On/Off Switch | X6— Hydraulic Valve Controller (HVC) Connector 3 | | |
| S32— Blade Height Increment/Decrement Switch | | | |

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Integrated Grade Control (IGC) Circuit Theory of Operation—If Equipped. (Group 9015-05.)

Component Location:

- For machines with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- For machines with SmartGrade™, see Operator's Station (SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

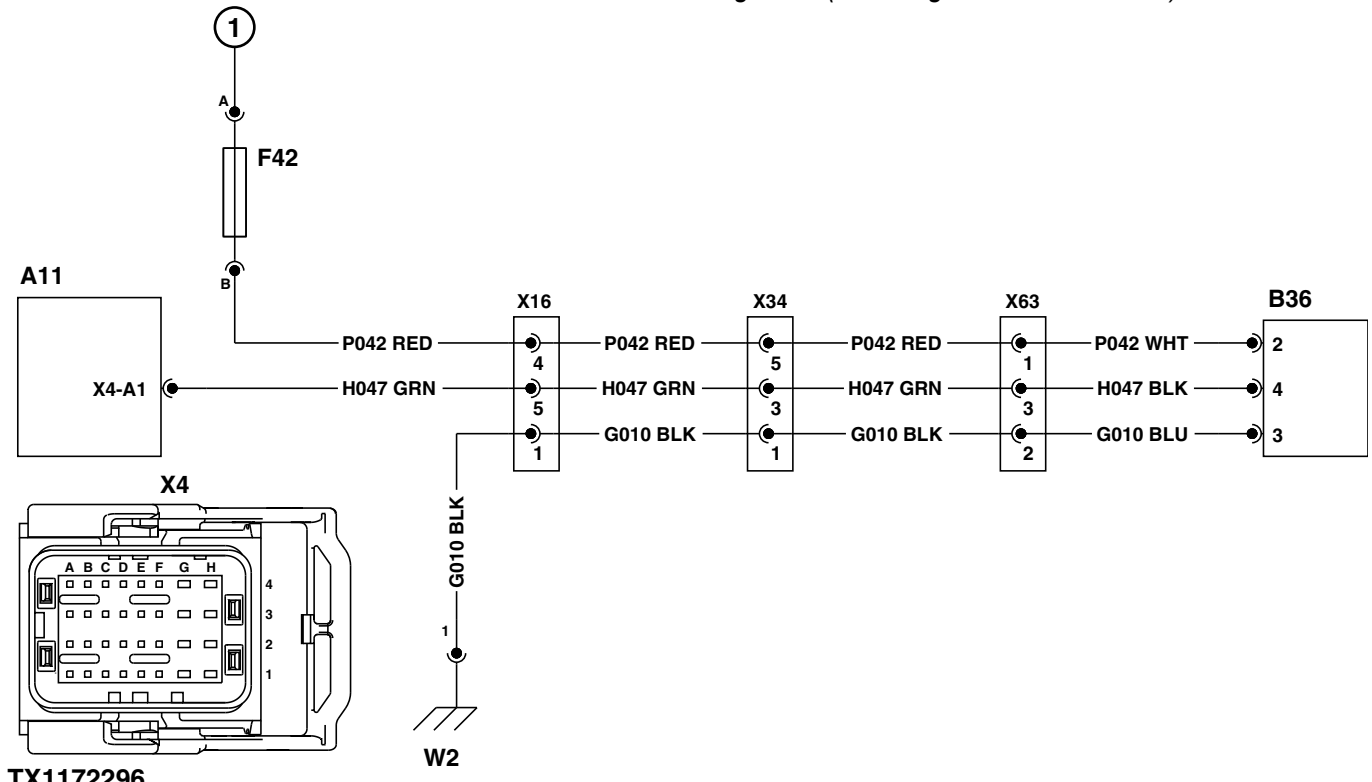
Additional References:

Continued on next page

JD29379,00003F9 -19-28OCT14-1/2

516647.04 — Blade Pitch Position Sensor Circuit Fault

Pitch cylinder position sensor (B36) circuit is shorted to ground (PWM signal is below 2.25%).



Pitch Cylinder Position Sensor (B36) Circuit Schematic

- 1— Switched Power
- A11— Hydraulic Valve Controller (HVC)
- B36— Pitch Cylinder Position Sensor
- F42— Pitch Cylinder Position Sensor 5 A Fuse
- W2—Frame Ground
- X4—Hydraulic Valve Controller (HVC) Connector 1
- X4—A1—Signal
- X16— Blade Pitch Frame Harness Connector
- X34— Blade Pitch Harness Connector
- X63— Pitch Cylinder Harness Connector

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Integrated Grade Control (IGC) Circuit Theory of Operation—If Equipped. (Group 9015-05.)

Component Location:

- For machines with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Blade Pitch Harnesses (W35, W36, and W37) Component Location. (Group 9015-10.)

SmartGrade is a trademark of Deere & Company
Service ADVISOR is a trademark of Deere & Company

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Signal circuit is shorted to ground.
2. Position sensor malfunction. See Electrical Component Specifications. (Group 9015-15.) See Unseat Position Sense Sensor. (CTM120519.)
3. Software malfunction. Program controller.

TX1172296 —UN—14OCT14

524259.00 — Control Unit Failure

Internal temperature sensor reading over 90°C (194°F).
Blade control joystick (BCJ) internal malfunction.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Integrated Grade Control (IGC) Circuit Theory of Operation—If Equipped. (Group 9015-05.)

Component Location:

- For machines with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

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Service ADVISOR is a trademark of Deere & Company

- For machines with SmartGrade™, see Operator's Station (SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

Possible Causes:

1. Software malfunction. Program controller.
2. Component malfunction. Replace component.

JD29379,000043C -19-18SEP14-1/1

523455.01 — Control Unit Failure

Internal temperature sensor reading under -45°C (-49°F).
Blade control joystick (BCJ) internal malfunction.

Alarm Level:

- Check Diagnostic Code Indicator

Machine Response:

- None

Circuit Information:

- See Integrated Grade Control (IGC) Circuit Theory of Operation—If Equipped. (Group 9015-05.)

Component Location:

- For machines with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)

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- For machines with SmartGrade™, see Operator's Station (SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

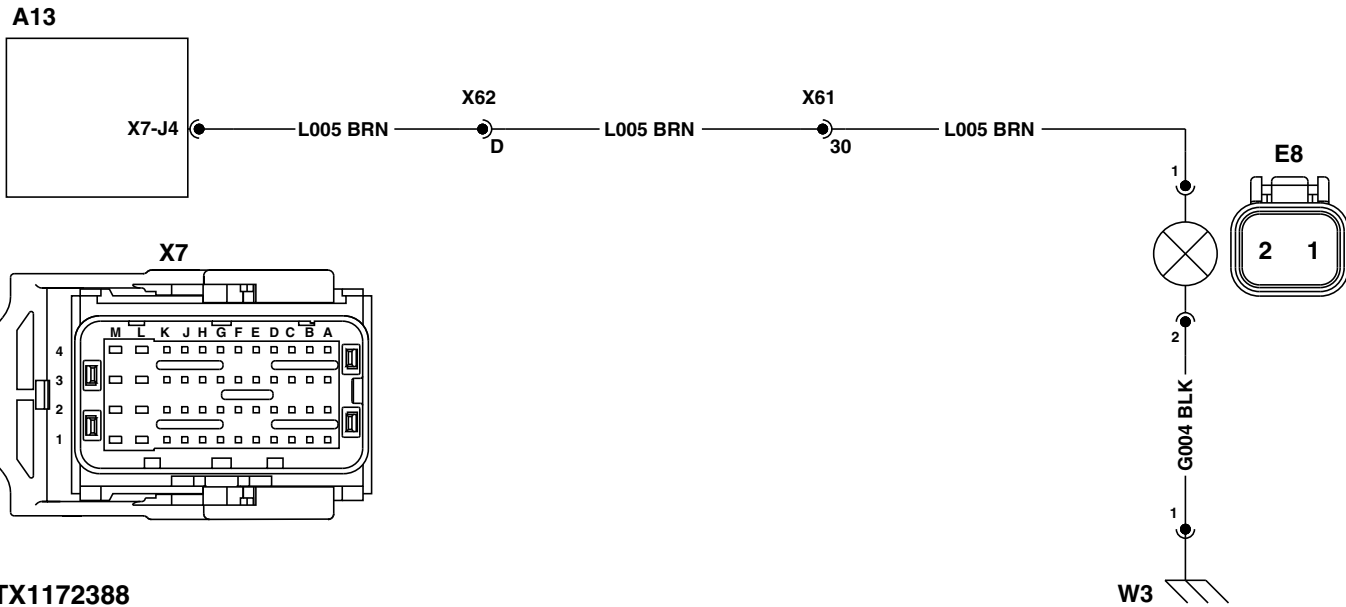
Possible Causes:

1. Software malfunction. Program controller.
2. Component malfunction. Replace component.

JD29379,000043D -19-18SEP14-1/1

**521555.06 — Front Right Work Light Circuit
Fault**

Right front cab work light (E8) circuit is shorted to ground.



TX1172388

Right Front Cab Work Light (E8) Circuit Schematic

- A13— Vehicle Control Unit 2 (VC2)
- E8—Right Front Cab Work Light
- W3—Roof Ground
- X7—Vehicle Control Unit 2 (VC2) Connector
- X7—J4—Supply
- X61— Operator's Station Harness-to-Roof Harness 31-Pin Connector
- X62— Vehicle Harness-to-Operator's Station Harness 23-Pin Connector

Alarm Level:

- Diagnostic Code Indicator Icon

Machine Response:

- None

Circuit Information:

- See Vehicle Control Unit (VCU) Circuit Theory of Operation. (Group 9015-05.)

Component Location:

- See Vehicle Harness (W15) Component Location or with SmartGrade™, see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location. (Group 9015-10.)
- See Operator's Station Harness (W22) Component Location or with SmartGrade™, see Operator's Station (SmartGrade™ and IGC Controls) Harness (W23) Component Location. (Group 9015-10.)

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- See Cab Roof Harness (W27) Component Location or see Canopy Roof Harness (W28) Component Location. (Group 9015-10.)

Diagnostic Test Box Information:

- Not Applicable

Additional References:

- Intermittent DTCs: See Intermittent Diagnostic Trouble Code (DTC) Diagnostics. (Group 9015-15.)
- Service ADVISOR™ Remote: See Using Service ADVISOR™ Remote. (Group 9015-15.)

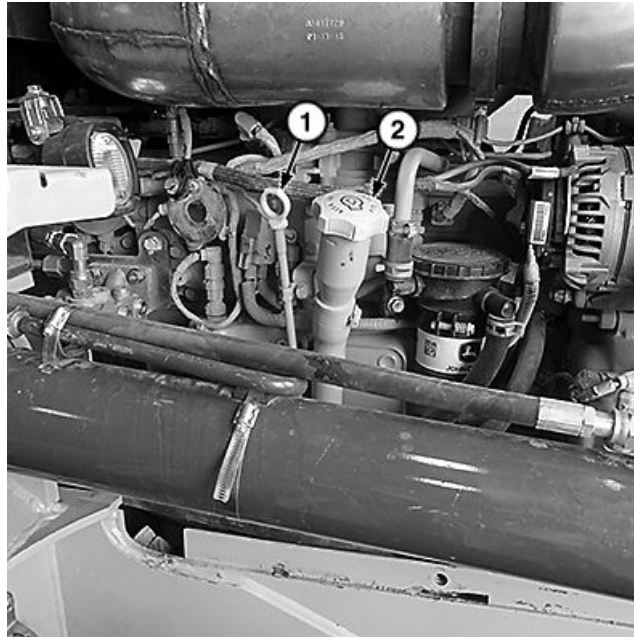
Possible Causes:

1. Component malfunction.
2. Circuit is shorted to ground.
3. Software malfunction. Program controller.

TX1172388—UN—14OCT14

JD29379,0000448 -19-05NOV14-1/1

Engine Oil Level Check



TX1169422A —UN—26AUG14

Oil Dipstick and Fill Port Cap

- 1— Dipstick
- 2— Fill Port Cap

Open right engine compartment door.

Remove dipstick (1). Check oil level and condition.

LOOK: Is engine oil below minimum mark?

NOTE: If oil level is high, check for fuel or coolant in oil. If there is fuel in oil, oil will have a fuel smell. To check for coolant in oil, remove small amount of oil from engine oil test port. See Fluid Sampling Procedure—If Equipped. (Group 9010-25.) Check sample for water (coolant) content. If oil level is low, check for oil leaks or oil seal problems in engine.

SMELL: Does engine oil have fuel smell?

LOOK: Does engine oil appear milky or grainy?

LOOK: Is engine oil above maximum mark?

YES: Add oil. See [Check Engine Oil Level](#). (Operator's Manual.)

NO: Go to next step in this check.

YES: Replace oil. See [Drain and Refill Engine Oil and Replace Filter](#). (Operator's Manual.)

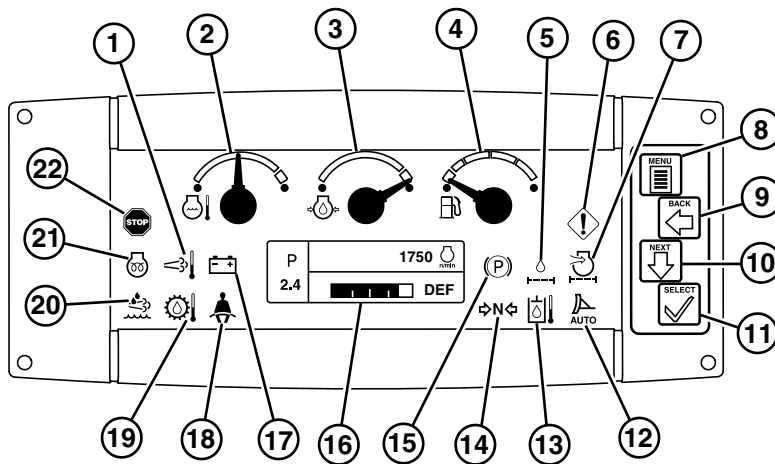
NO: Go to next step in this check.

YES: Remove engine oil drain plug and drain oil to proper level.

NO: Go to next check.

Continued on next page

MM12851,000039D -19-22JUL16-10/76



TX1170825 —UN—24SEP14

Indicators (SDM)

- 1— Exhaust Filter Cleaning Indicator
- 2— Engine Coolant Temperature Gauge
- 3— Engine Oil Pressure Gauge
- 4— Fuel Level Gauge
- 5— Engine Oil Filter Restriction Indicator
- 6— Caution Indicator
- 7— Engine Air Filter Restriction Indicator
- 8— MENU Button
- 9— BACK Button
- 10— NEXT Button
- 11— SELECT Button
- 12— Auto Blade Indicator (if equipped)
- 13— Hydraulic Oil Temperature Indicator
- 14— Return to Neutral Indicator
- 15— Park Brake Indicator
- 16— Display
- 17— Engine Alternator Voltage Indicator
- 18— Fasten Seat Belt Indicator
- 19— Transmission Oil Temperature Indicator
- 20— Diesel Exhaust Fluid (DEF) Indicator
- 21— Wait to Start Indicator
- 22— STOP Indicator

After bulb check with engine running, check the following:

NOTE: Park brake indicator will stay illuminated, due to machine being in park.

LOOK: Do all indicators except park brake indicator (2) turn off?

LOOK: Does display show engine speed?

YES: Go to next check.

NO: Check primary display unit (PDU) circuit. See [System Functional Schematic](#) or see [System Functional Schematic—Integrated Grade Control \(IGC\)](#). (Group 9015-10.)

Continued on next page

MM12851,000039D -19-22JUL16-43/76

Tracking and Maximum Speed Check



TX1173336A —UN—30SEP14

Decelerator Mode Switch (IGC shown)

- 1— Decelerator Mode Switch**
- 2— LED**

NOTE: Track sag must be at specification and machine must be driven on a level surface for all tracking checks.

Press decelerator mode switch (1) to off position.

Operate engine at fast idle.

Set transmission speed to 3.0.

Move park lock levers to full down (unlocked) position.

Depress decelerator/brake pedal fully to stop.

Move TCL to forward.

Slowly increase engine speed from slow to fast idle by slowly raising the decelerator/brake pedal.

Depress decelerator/brake pedal fully to stop.

Move TCL to reverse.

Slowly increase engine speed from slow to fast idle by slowly raising the decelerator/brake pedal.

LISTEN/LOOK: Does machine speed increase as engine speed increases?

FEEL/LOOK: Is tracking straight at all speeds?

YES: Go to next step in this check.

NO: Diagnose cause of full speed malfunction. [See Machine Full Speed Malfunctions.](#) (Group 9026-15.)

YES: Go to next check.

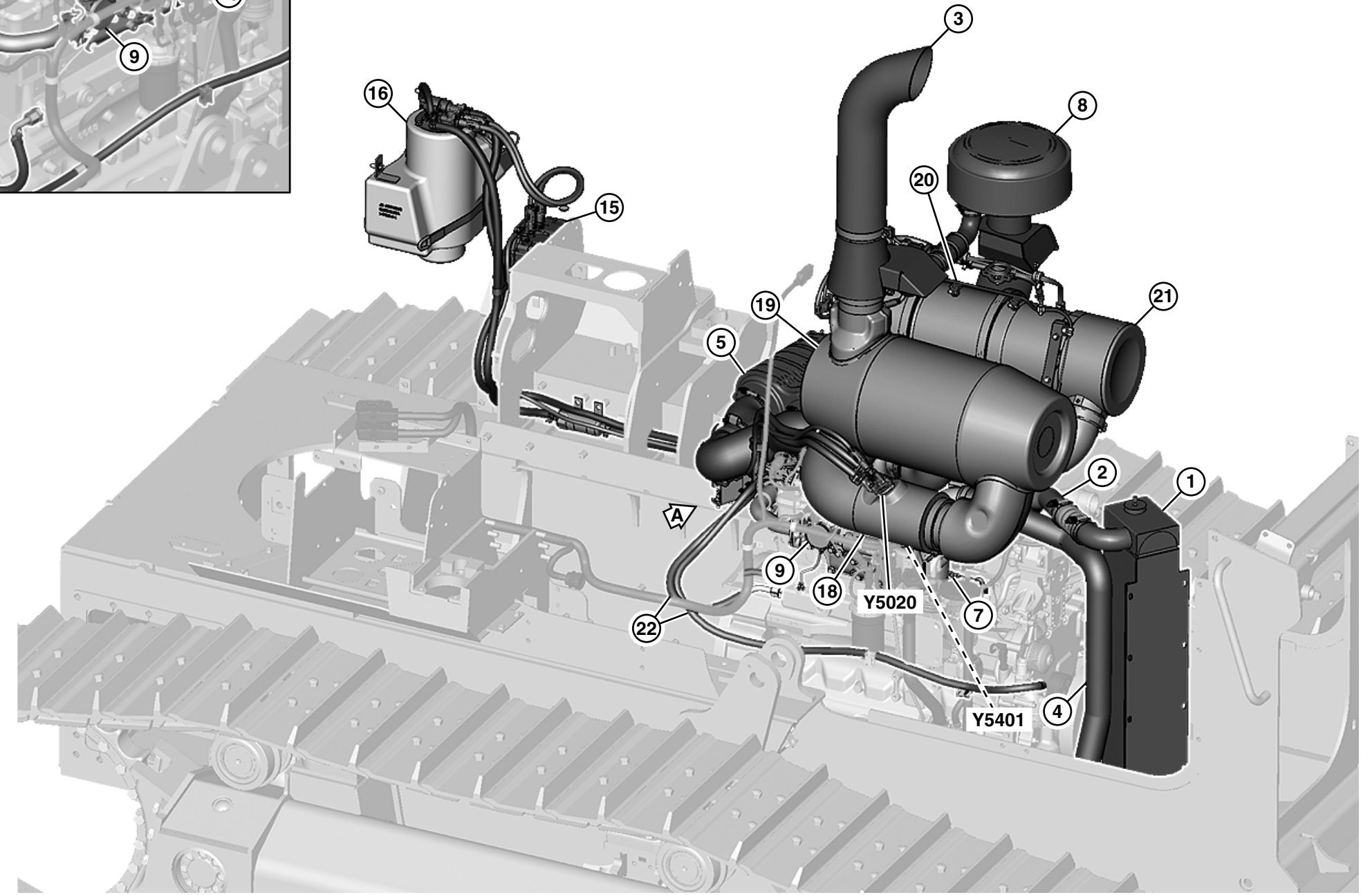
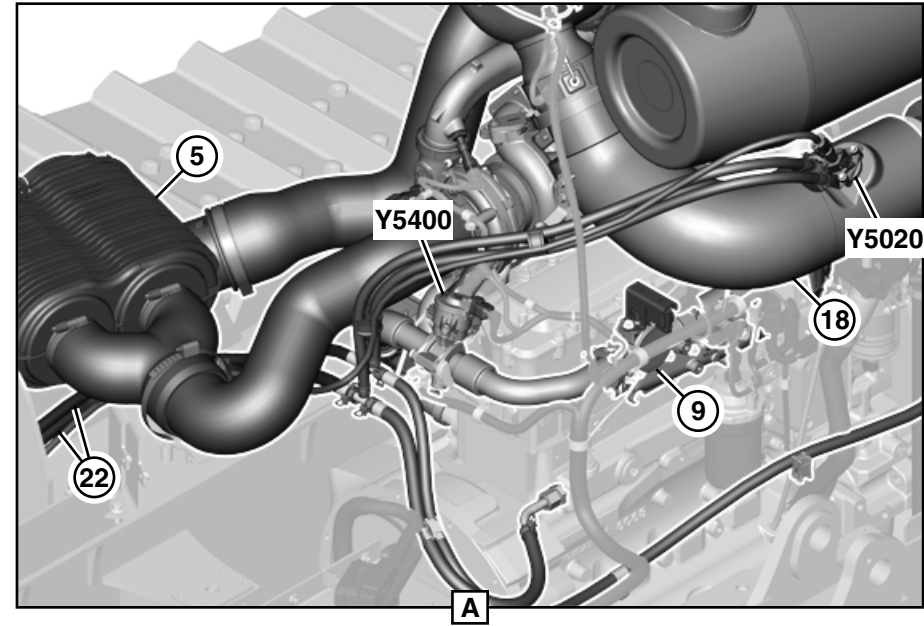
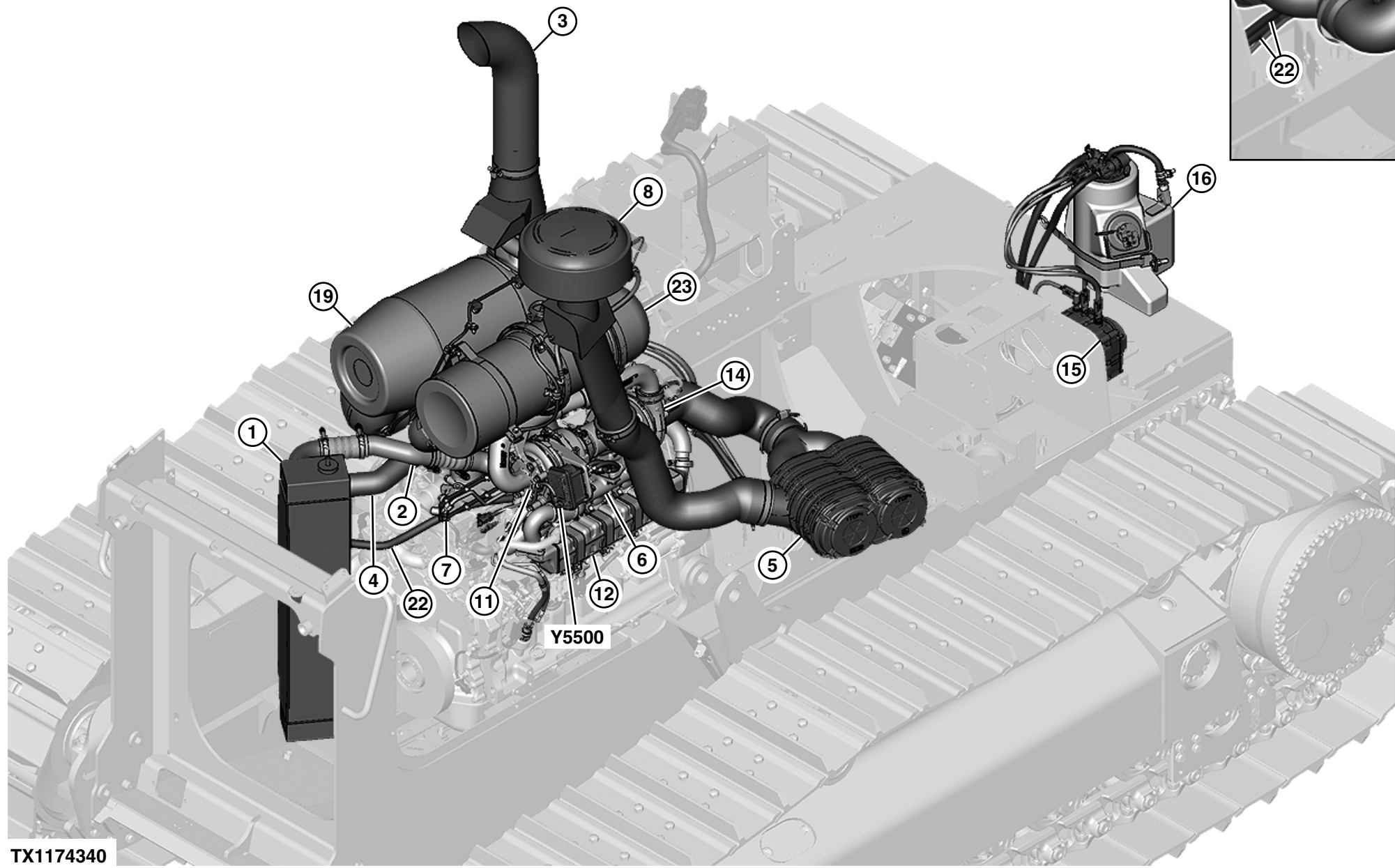
NO: Diagnose cause of mistracking. [See Mistrack/Index Malfunctions.](#) (Group 9026-15.)

Continued on next page

MM12851,000039D -19-22JUL16-59/76

Engine Intake and Exhaust Component Location

TX1174340 —UN—03NOV14



TX1174340

Continued on next page

Engine Intake and Exhaust System Component Location

MM12851,00003A8 -19-20OCT14-1/2

Engine Idle Speeds and Auto-Shutdown Check

SPECIFICATIONS	
Engine Operating Temperature	85—97°C 185—207°F
Engine Slow Idle Speed	875—925 rpm
Engine Fast Idle Speed	2250—2300 rpm

1. Warm engine to operating temperature.

Specification

Engine Operating—Temperature.....85—97°C
185—207°F

2. Operate engine at slow idle.
3. Observe display monitor to see if engine slow idle speed is within specification.

Specification

Engine Slow Idle—Speed..... 875—925 rpm

4. Operate engine at fast idle.
5. Observe display monitor to see if engine fast idle speed is within specification.

Specification

Engine Fast Idle—Speed..... 2250—2300 rpm

6. If engine slow idle and fast idle are not within specification, check the following:
 - Check diagnostic trouble codes (DTCs).
 - Check decelerator sensor (B1) for proper adjustment and calibration. See Decelerator/Brake Pedal

Adjustment and see Transmission Control Unit (TCU) Calibration. (Group 9015-20.)

- Check engine speed control switches on sealed switch module (SSM). See Diagnostics—Sealed Switch Module (SSM), PDU. (Operator's Manual.)
7. Set auto-shutdown for 1 minute. See Setup—Machine Setup, PDU or see Setup—Machine Setup, SDM. (Group 9015-16.)

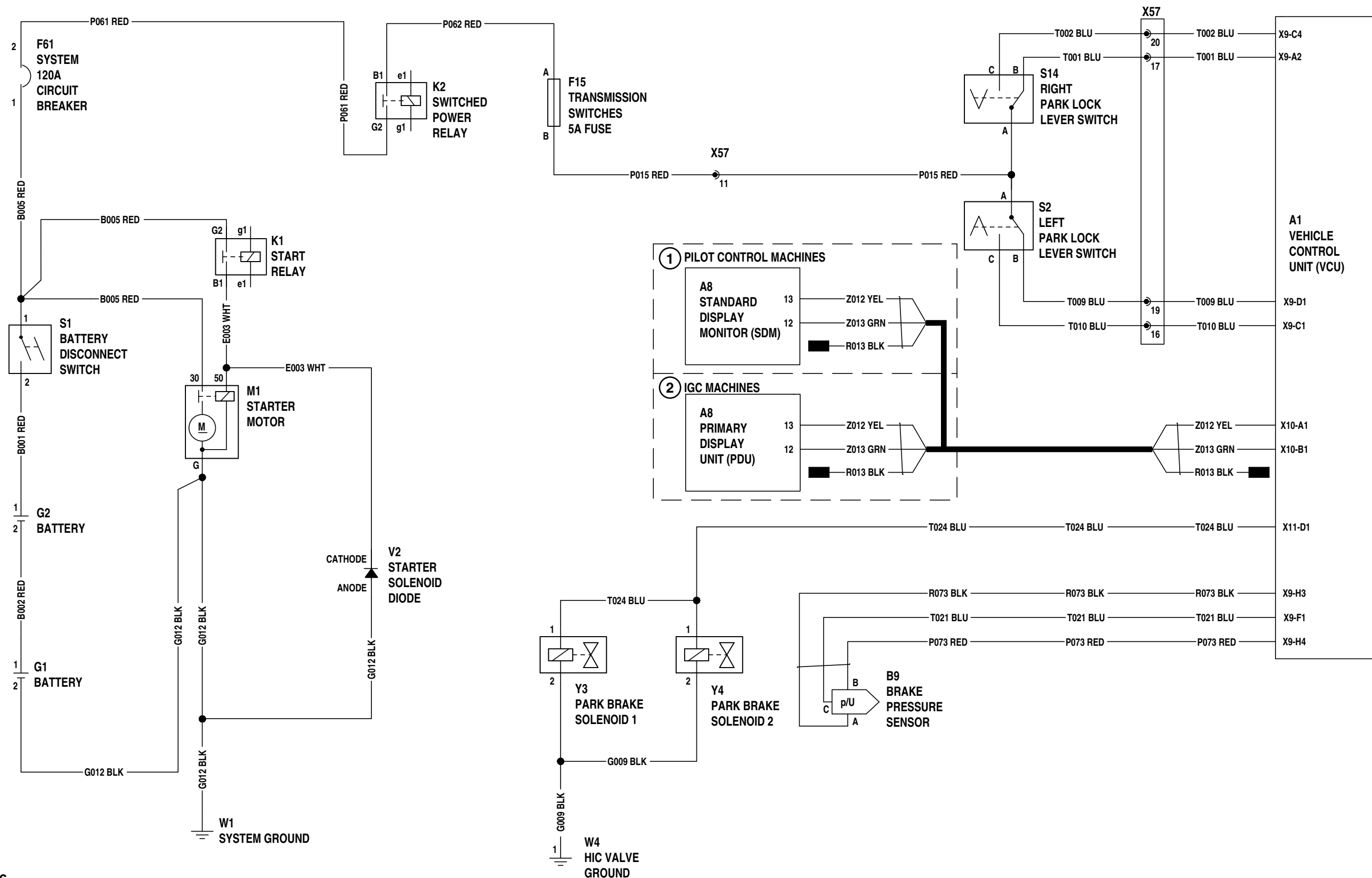
NOTE: The following are the requirements for maintaining auto-shutdown:

- If auto-shutdown time is changed, auto-shutdown will abort.
 - Engine speed less than 945 rpm.
 - Park lock levers in full up (locked) position (if lowered, auto-shutdown will abort).
 - Transmission control unit (TCU) not in calibration mode (if TCU is in calibration mode, auto-shutdown will be disabled).
 - Hydraulic valve controller (HVC) not in calibration mode (if HVC is in calibration mode, auto-shutdown will be disabled).
8. Allow engine to run at slow idle while monitoring idle time. Verify that auto-shutdown activates (engine stops) after 1 minute elapses.
 9. If auto-shutdown is not within specification, perform the following:
 - Check for DTCs.
 - Make sure auto-shutdown parameters are maintained. For information on auto-shutdown, see Vehicle Control Unit (VCU) Circuit Theory of Operation. (Group 9015-05.)

MM12851,00003B8 -19-11NOV14-1/1

Park Brake Circuit Theory of Operation

TX1174276 —UN—04NOV14



Continued on next page

Park Brake Circuit Schematic

JD29379,0000456 -19-01JUN16-1/2

A5505—Engine Control Unit (ECU)	R5603—Engine CAN Terminator	X5501—Engine Control Unit (ECU) Connector 1	Y5501—Low-Pressure Fuel Pump
B5500—Intake Air Sensor	R5605—Aftertreatment CAN Terminator	X5502—Engine Control Unit (ECU) Connector 2	
B5502—Aftertreatment Inlet NOx Sensor	X5039—Aftertreatment Connector	Y5500—Variable Geometry Turbocharger (VGT) Actuator	
B5503—Aftertreatment Outlet NOx Sensor	X5048—Vehicle Harness-to-Engine Harness 31-Pin Connector		

Engine CAN

Provides the communication link for the following items:

- Engine Control Unit (ECU) (A5505)
- Intake Air Sensor (B5500)
- Variable Geometry Turbocharger (VGT) Actuator (Y5500)

Operations and functions of the individual devices on engine CAN are covered separately.

- See Engine Control Unit (ECU) Circuit Theory of Operation. (Group 9015-05.)
- See Electronic Fuel System. (CTM120019.)
- See Air Intake and Exhaust System. (CTM120019.)
- See Electrical Control System. (CTM120019.)

The engine CAN also has two termination resistors: One located inside the ECU and not accessible, and engine CAN terminator (R5603) within the engine harness.

Aftertreatment CAN

Provides the communication link for the following items:

- Engine Control Unit (ECU) (A5505)
- Aftertreatment Inlet NOx Sensor (B5502)
- Aftertreatment Outlet NOx Sensor (B5503)

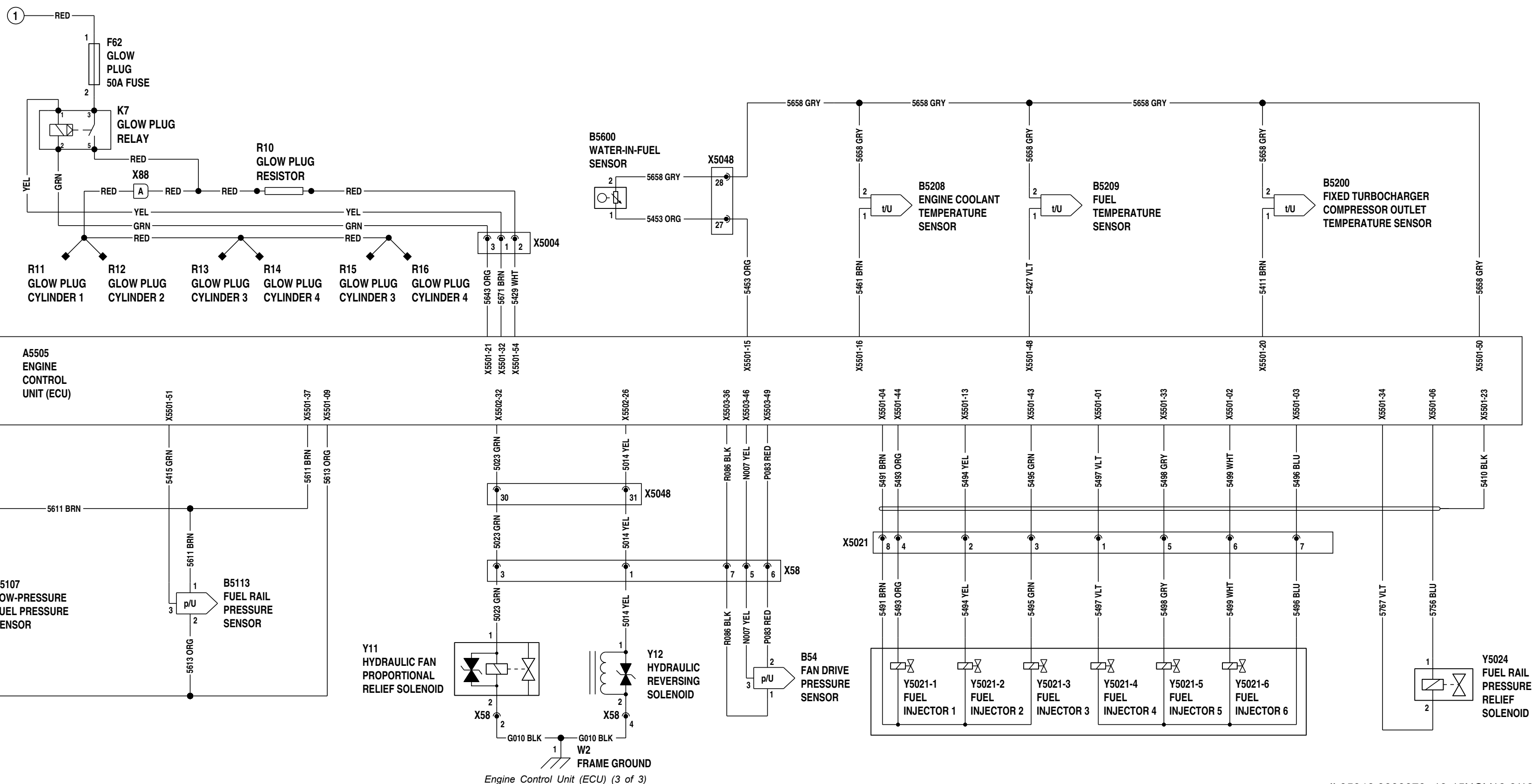
Operations and functions of the individual devices on aftertreatment CAN are covered separately.

- See Engine Control Unit (ECU) Circuit Theory of Operation. (Group 9015-05.)
- See Exhaust Aftertreatment Circuit Theory of Operation. (Group 9015-05.)
- See Aftertreatment System Operation. (CTM120019.)
- See Electrical Control System. (CTM120019.)

The aftertreatment CAN also has two termination resistors: One located inside the ECU and not accessible, and aftertreatment CAN terminator (R5605) within the aftertreatment harness.

Continued on next page

JD29379,0000470 -19-01DEC16-7/9



Engine Control Unit (ECU) (3 of 3)

On pilot control machines with power angle tilt (PAT), VCU provides outputs to two proportional solenoids for control of blade angle function, blade angle left solenoid (Y38) and blade angle right solenoid (Y39). Pressing upper button of blade control switch on blade control lever sends approximately 3.4 volts to pin H2 of VCU connector 1 (X9). With upper button of blade control switch pressed, VCU provides an analog signal at pin A3 and return at pin B4 of VCU connector 2 (X10), energizing blade angle right solenoid, causing angle cylinder to extend and blade to angle right. Pressing lower button of blade control switch on blade control lever sends approximately 1 volt to pin H2 of VCU connector 1. With lower button of blade control switch pressed, VCU provides an analog signal at pin A4 and return at pin B3 of VCU connector 2, energizing blade angle left solenoid, causing angle cylinder to retract and blade to angle left. When blade control switch is in a neutral position, the joystick switch module sends approximately 2.50 volts to pin H2 of VCU connector 1,

causing the VCU to take no action in regard to blade angle. For blade angle control specific to integrated grade control (IGC) machines, [see Integrated Grade Control \(IGC\) Circuit Theory of Operation](#). (Group 9015-05.)

Fan Unloading Solenoid (Y37)

Fan unloading valve solenoid controls the hydraulic fan unloading valve oil flow in the fan drive circuit during cold start to reduce the load on the engine. When the hydraulic oil temperature is less than 0°C (32°F) the VCU applies power from pin D2 of VCU connector 3 (X11). The hydraulic fan unloading solenoid (Y37) becomes energized, opening the fan unloading valve and allowing hydraulic oil to flow from the fan pump outlet to the fan pump inlet. When the solenoid on the fan unloading valve is de-energized, the valve closes to prevent hydraulic oil flow from the pump outlet to inlet and allows for normal hydraulic fan operation.

Continued on next page

DP27668,00008D2 -19-20OCT15-6/9

1—Switched Power	A5505—Engine Control Unit (ECU)	S14— Right Park Lock Lever Switch	X48— Transmission Control Lever (TCL) Connector
A1—Vehicle Control Unit (VCU)	B1—Decelerator Sensor	W5—Cab Ground	X57— Vehicle Harness-to-Operator's Station Harness 35-Pin Connector
A4—Sealed Switch Module (SSM)	B2—FNR Sensor	X9—Vehicle Control Unit (VCU) Connector 1	X5503—Engine Control Unit (ECU) Connector 3
A8—Primary Display Unit (PDU)	B3—Steer Sensor	X10— Vehicle Control Unit (VCU) Connector 2	
A10— Transmission Control Lever (TCL)	F15— Transmission Switches 5 A Fuse	X11— Vehicle Control Unit (VCU) Connector 3	
A13— Vehicle Control Unit 2 (VC2)	S2— Left Park Lock Lever Switch	X25— Fuse Box 1 Connector	
	S12— Neutral Start Switch		

Transmission Control Lever (TCL) (A10)

Located in the TCL, the transmission speed control switch (S34) increases and decreases ground speed. The transmission speed control switch receives 5-volt power from pin G4 and reference ground from pin F3, both of vehicle control unit (VCU) connector 3 (X11). When neither the up or down buttons are pressed, the transmission speed control switch applies a voltage to pin D2 of vehicle control unit (VCU) connector 1 (X9). When either the up or down buttons are pressed, a different voltage is applied to the VCU.

When either the up or down buttons are pressed, the TCU broadcasts the transmission speed over CAN to the PDU or SDM. The PDU or SDM displays the transmission speed in the display window.

For more information on the PDU, [see Primary Display Unit \(PDU\) Circuit Theory of Operation.](#) (Group 9015-05.)

For more information on the SDM, [see Standard Display Monitor \(SDM\) Circuit Theory of Operation.](#) (Group 9015-05.)

For more information on the CAN, [see Controller Area Network \(CAN\) Theory of Operation.](#) (Group 9015-05.)

The 5-volt sensor supply from pin G4 and the reference ground from pin F3 of vehicle control unit (VCU) connector 3 are distributed to various sensors.

If this sensor causes a DTC, the transmission speed is limited and PDU or SDM displays 1.0 for speed setting.

When ECO mode switch is enabled on the SSM, the TCU enables economy mode. Economy mode is a power management routine that controls engine speed according to operator speed and load demands. Economy mode will shift the transmission up and reduce engine speed to maintain a desired machine speed and reduce fuel consumption at low load demands. The control shall increase engine speed when the load demand increases.

Decelerator Sensor (B1)

Decelerator sensor is located on a rotating shaft on the decelerator/brake pedal. The decelerator sensor is a rotary Hall effect sensor without contacts. The sensor receives 5-volt power from pin F4 and reference ground from pin F3, both of vehicle control unit (VCU) connector 3. When the decelerator/brake pedal is pressed down, the rotating shaft turns a keyed slot on the sensor and the sensor applies a varied voltage to pin E3 of vehicle control unit (VCU) connector 3. The voltage of this sensor

at certain decelerator positions (including brake positions) is stored in the TCU during calibration.

The 5-volt sensor supply from pin F4 and the reference ground from pin F3, both of vehicle control unit (VCU) connector 3, are distributed to various sensors.

If this sensor causes a DTC, the maximum machine speed is limited to 3.2 km/h (2.0 mph), commanded engine speed is set to 0%, and the transmission control set to neutral.

Forward, Neutral, and Reverse (FNR) Sensor (B2)

FNR sensor is located on a rotating shaft on the TCL. The FNR sensor is a rotary Hall effect sensor without contacts. The sensor receives 5-volt power from pin F4 and reference ground from pin F3, both of vehicle control unit (VCU) connector 3. When the TCL is moved into forward or reverse, the rotating shaft turns a keyed slot on the sensor and the sensor applies a varied voltage to pin B3 of vehicle control unit (VCU) connector 3. The voltage of this sensor at certain TCL positions is stored in the TCU during calibration.

The 5-volt sensor supply from pin F4 and the reference ground from pin F3, both of vehicle control unit (VCU) connector 3, are distributed to various sensors.

If this sensor causes a DTC, the forward and reverse functions are disabled.

Steer Sensor (B3)

Steer sensor is located on a rotating shaft on the transmission control lever (TCL). The steer sensor is a rotary Hall effect sensor without contacts that receives 5-volt power from pin F4 and reference ground from pin F3, both of vehicle control unit (VCU) connector 3. When the TCL is moved left or right, the rotating shaft turns a keyed slot on the sensor and the sensor applies a varied voltage to pin B4 of vehicle control unit (VCU) connector 3. The voltage of this sensor at certain TCL positions is stored in the TCU during calibration.

The 5-volt sensor supply from pin F4 and the reference ground from pin F3, both of vehicle control unit (VCU) connector 3, are distributed to various sensors.

If this sensor causes a DTC, the steer functions are disabled and the maximum machine speed is limited to 3.2 km/h (2.0 mph).

Park Lock Lever Switch (S2, S14)

For information on the park lock lever switch, [see Park Brake Circuit Theory of Operation.](#) (Group 9015-05.)

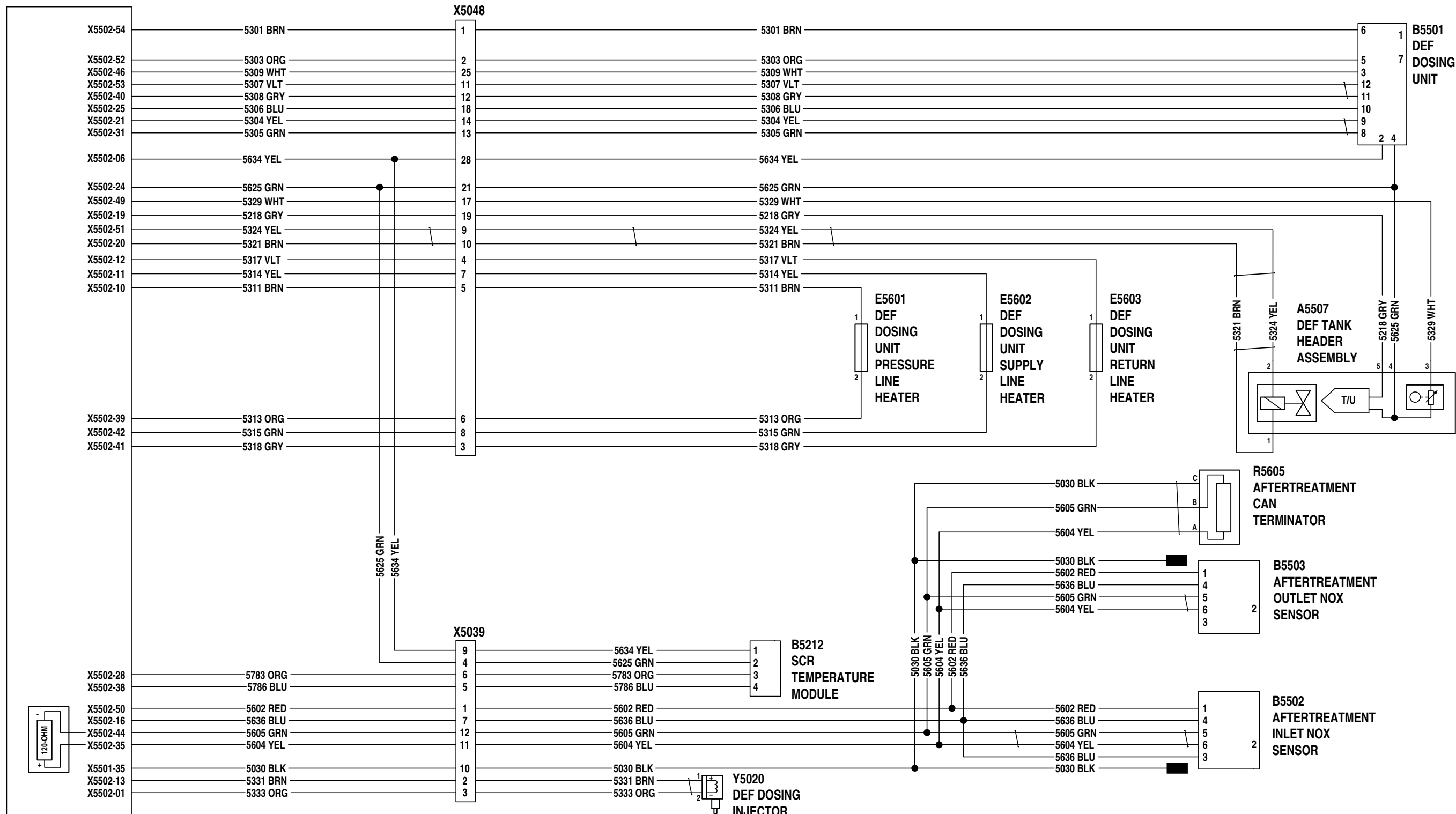
- Left Door Window Wiper Switch
- Front and Door Window Wiper Speed Switch
- Right Door Window Wiper Switch
- Pitch Select Switch
- Cab Work Light Switch—If Equipped
- Rear Window Wiper Switch
- Auxiliary Power Switch
- Air Conditioner Switch
- Auto Idle Switch
- Decelerator Mode Switch
- Reverse Ratio Switch
- ECO Mode Switch

Once the CAN bus is initialized and functioning, the VCU broadcasts CAN messages to the VC2, which relays LIN messages to SSM, to continuously update all LED indicators to the actual state. The correct power-up state is identified by each application.

If a button on the SSM becomes stuck in the pressed state, the SSM generates a diagnostic trouble code (DTC) associated with the stuck button. The function of the stuck button will go to its default state.

MM12851,00003D6 -19-11NOV14-3/3

**A5505
ENGINE CONTROL
UNIT (ECU)**



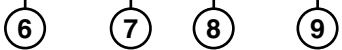
TX1174413

Selective Catalytic Reduction (SCR) and Diesel Exhaust Fluid (DEF) Circuit Schematic 750K (S.N. —304245) 850K (S.N. —305046)
Continued on next page

DP27668,00008D0 -19-12DEC16-3/9

Wiring Diagram

CIRCUIT DATA TABLE			
END#1	WIRE	COLOR	END#2
X25-B	G031E	BLK	SP_G031_B
SP_G031_B	G031F	BLK	S50
Y27	G031G	BLK	SP_G031_B
Y28	G031H	BLK	SP_G031_B
Y28	H011A	GRN	SP_H011_A
SP_H011_A	H011B	GRN	Y27
S50	H011C	GRN	SP_H011_A
S50	P047A	RED	X25-A



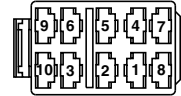
X25-A	
CAV	WIRE
1	P047A



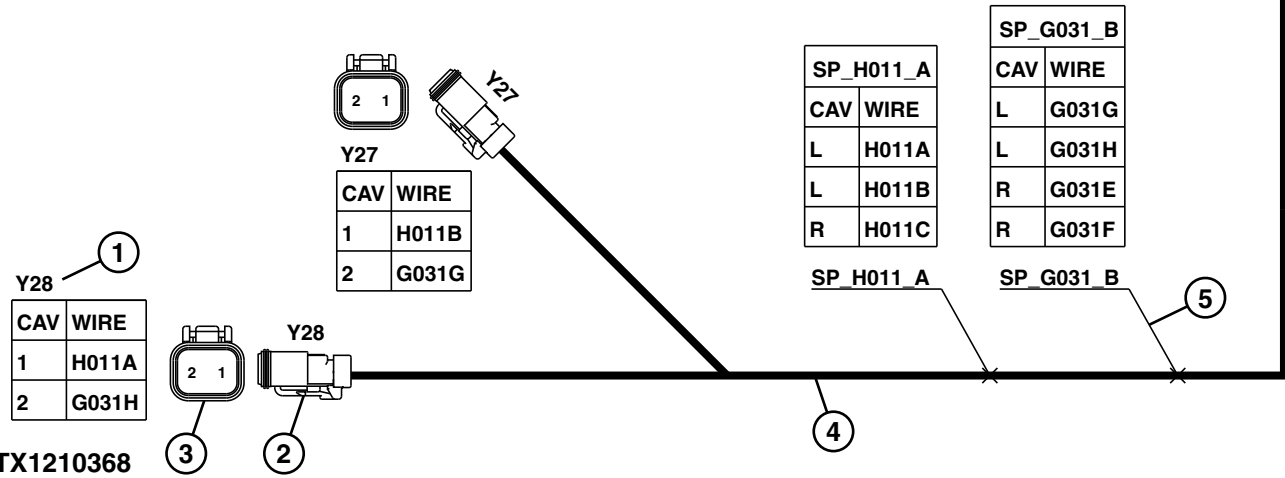
X25-B	
CAV	WIRE
1	G031E



S50		S50	
CAV	WIRE	CAV	WIRE
1	—	6	—
2	P047A	7	G031F
3	H011C	8	—
4	—	9	—
5	—	10	—



S50



TX1210368

Wiring Diagram Example

- 1—Component Identification Number
- 2—Connector
- 3—Connector End View
- 4—Wire Harness
- 5—Wire Splice
- 6—Wire End #1 Termination Location
- 7—Wire Number
- 8—Wire Color
- 9—Wire End #2 Termination Location

Each harness on the machine is drawn showing connectors, wires, and splices. A “W” component identification number identifies harnesses (for example, W6). The harness is drawn showing spatial arrangement of components and branches.

A component identification number (1) identifies each component. The wire harness (4) is terminated by a top or side view of the connector (2). If more than one wire is supplied to the connector, a connector end view (3) is provided. Each wire number is labeled for the appropriate pin. If only one wire is supplied to the connector, the wire number (5) is indicated.

An SP component identifies splices (6). Each splice lists side A wires and side B wires to differentiate the side of the harness that the wires come from.

A wire legend is provided for each harness. A component identification number is listed in the wire end #1

termination location (6) column to indicate the termination location of one end of a wire. In the center, the wire number (7) and wire color (8) are listed. A component identification number in the wire end #2 termination location (9) column identifies the opposite end of the wire.

Component Location Diagram

The component location diagram is a pictorial view by harness showing location of all electrical components, connectors, harness main ground locations and harness band and clamp location. Each component will be identified by the same identification letter/number and description used in the system functional schematic diagram.

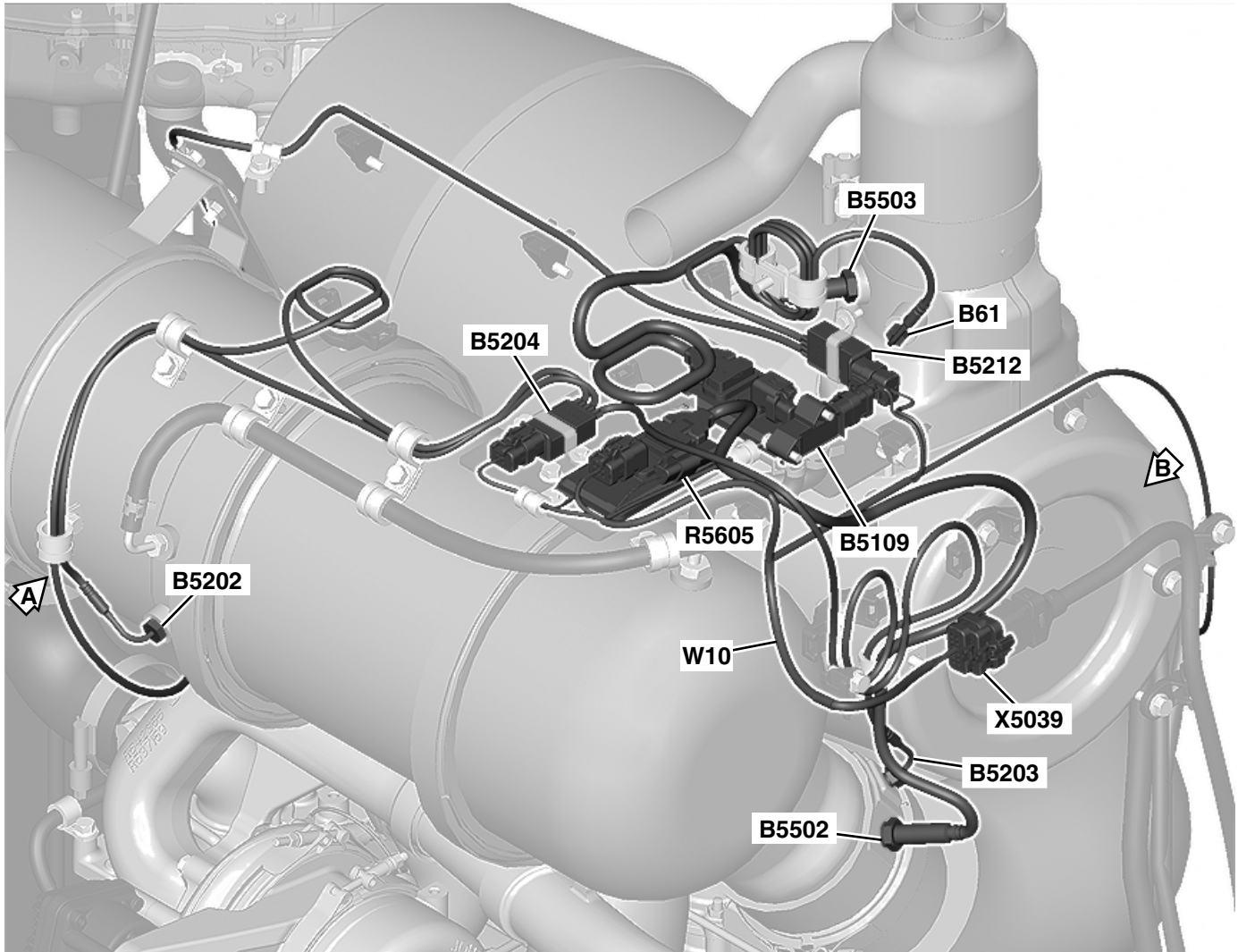
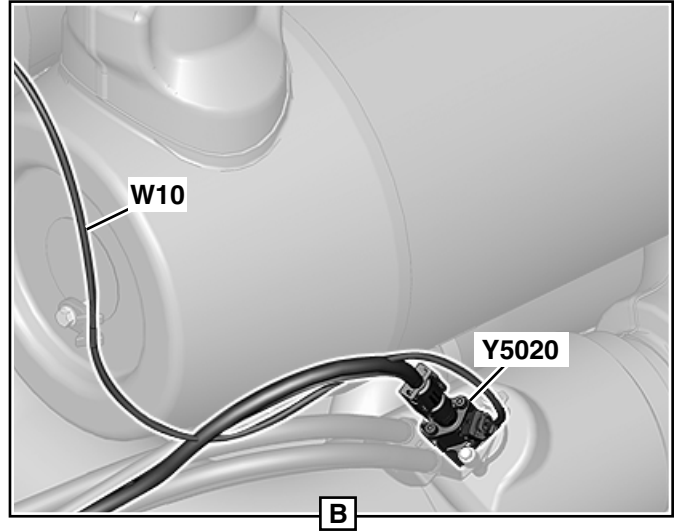
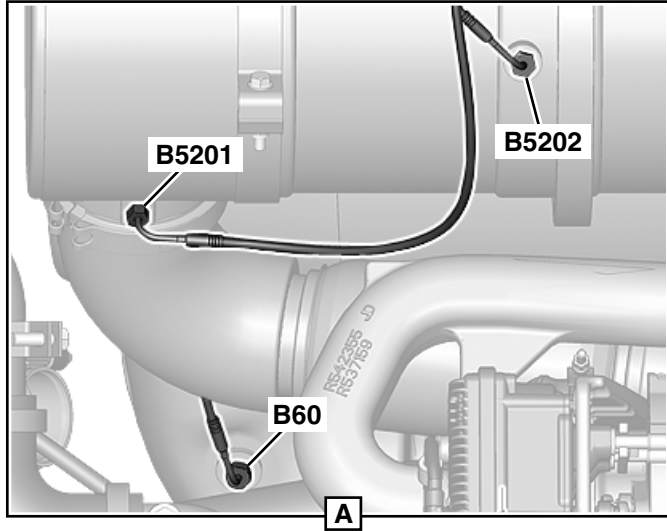
TX1210368—UN—09FEB16

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JL05046,0000082 -19-15NOV16-2/4

Aftertreatment Harness (W10) Component Location

Aftertreatment Harness (W10) Component Location
(750K S.N. —304299, 850K S.N. —305046)



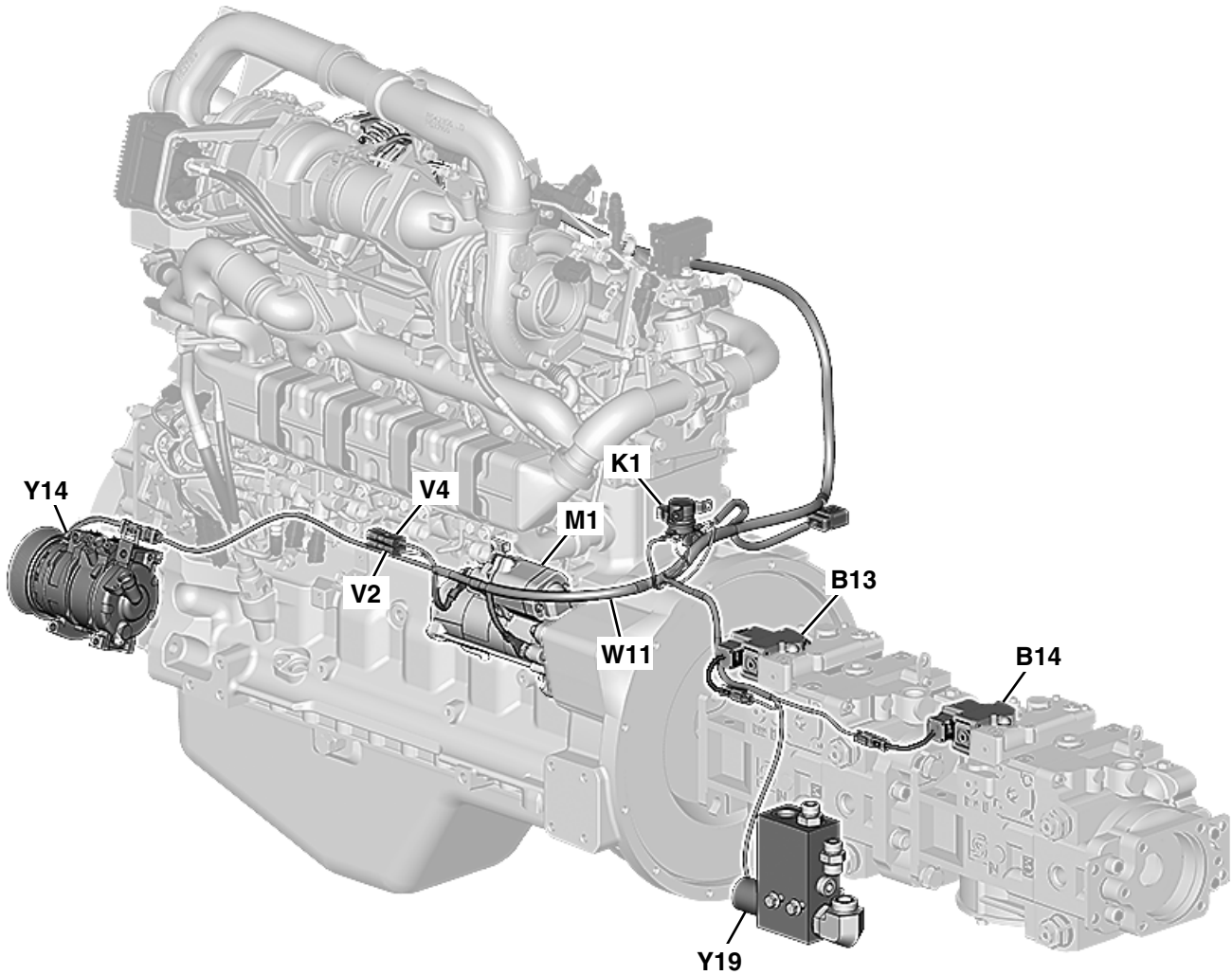
TX1175692

Aftertreatment Harness (W10) Component Location (750K S.N. —304299, 850K S.N. —305046)

Continued on next page

JL05046,0000049 -19-10NOV16-1/4

TX1175692 —UN—06/JAN17



TX1172938

Engine Auxiliary Harness (W11) Component Location 750K (S.N. —304245) 850K (S.N. —305046) (left side view)

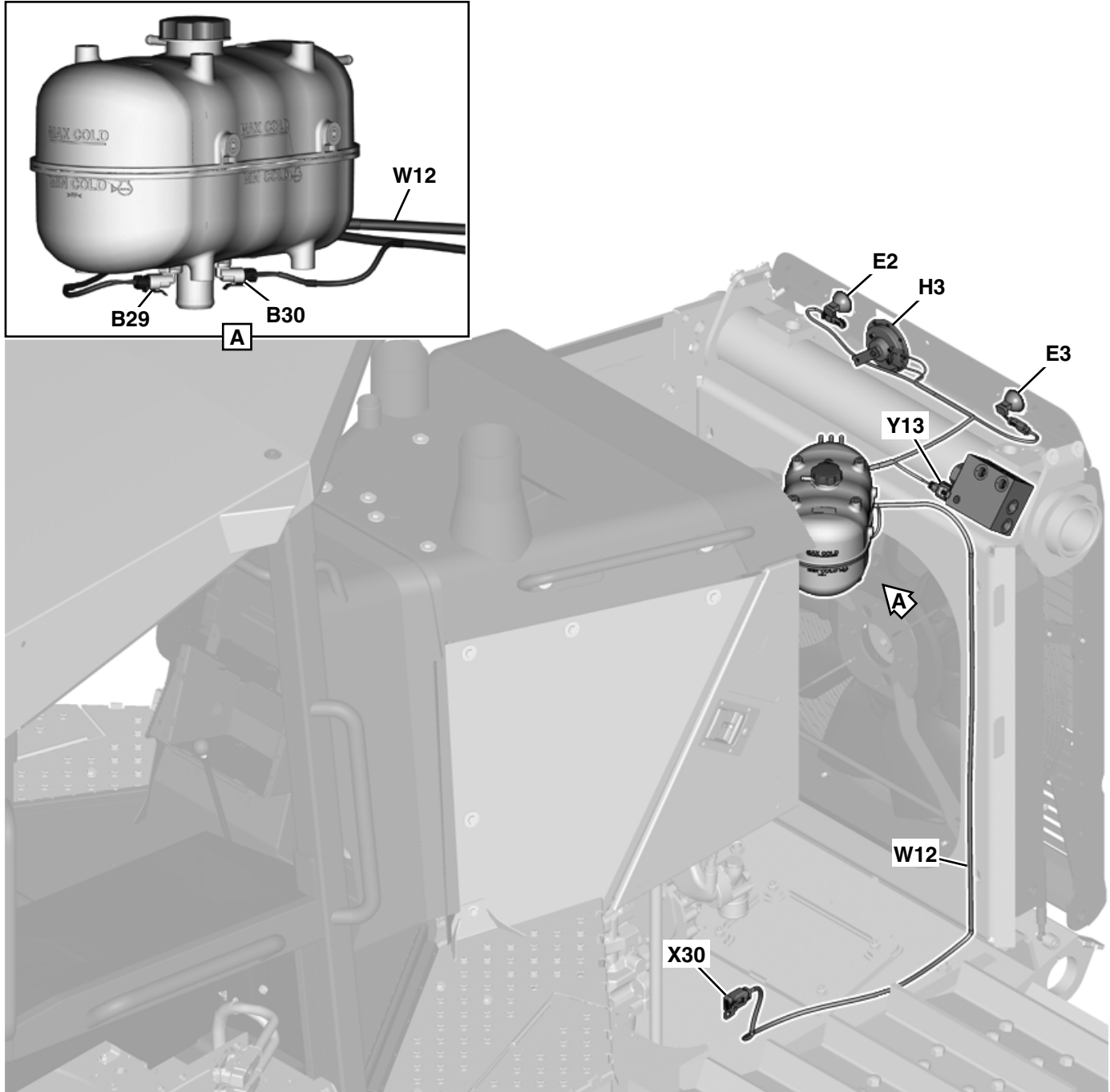
- | | | | |
|--|---|---|---|
| B13 — Front Pump Pressure Control Pilot (PCP) | K1 —Start Relay | W11 —Engine Auxiliary Harness | Y19 — Transmission Cold Start Solenoid |
| B14 — Rear Pump Pressure Control Pilot (PCP) | M1 —Starter Motor | Y14 — Air Conditioner Compressor Clutch Solenoid | |
| | V2 — Starter Solenoid Diode | | |
| | V4 — Air Conditioner Compressor Clutch Diode | | |

Continued on next page

JL05046,000004A -19-16NOV16-2/4

TX1172938 —UN—10OCT14

Cooling Package Harness (W12) Component Location



TX1172848

TX1172848—UN—08OCT14

Cooling Package Harness (W12) Component Location

- | | | | |
|----------------------------------|-----------------------------|---|--------------------------|
| B29— Engine Coolant Loss Switch | E2— Left Front Drive Light | W12— Cooling Package Harness | Y13— Quick-Drop Solenoid |
| B30— Engine Coolant Level Switch | E3— Right Front Drive Light | X30— Cooling Package Harness-to-Vehicle Harness Connector | |
| | H3— Horn | | |

JL05046,000004B -19-08OCT14-1/1

System Diagrams

B54— Fan Drive Pressure Sensor **Y11— Hydraulic Fan Proportional** **Y12— Hydraulic Fan Reversing**
X58— Fan Harness Connector **Relief Solenoid** **Solenoid**

JL05046,0000025 -19-27FEB15-2/2

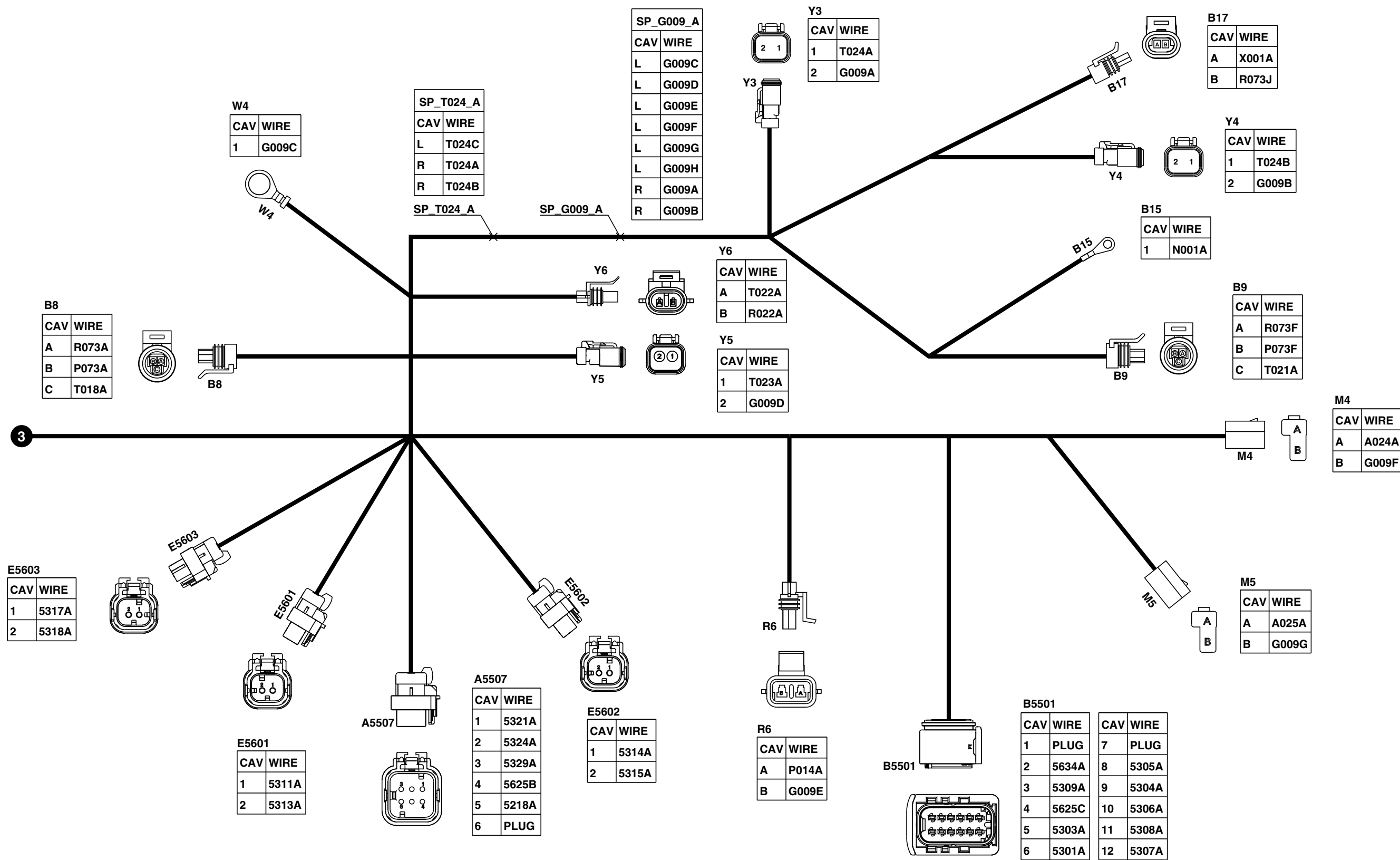
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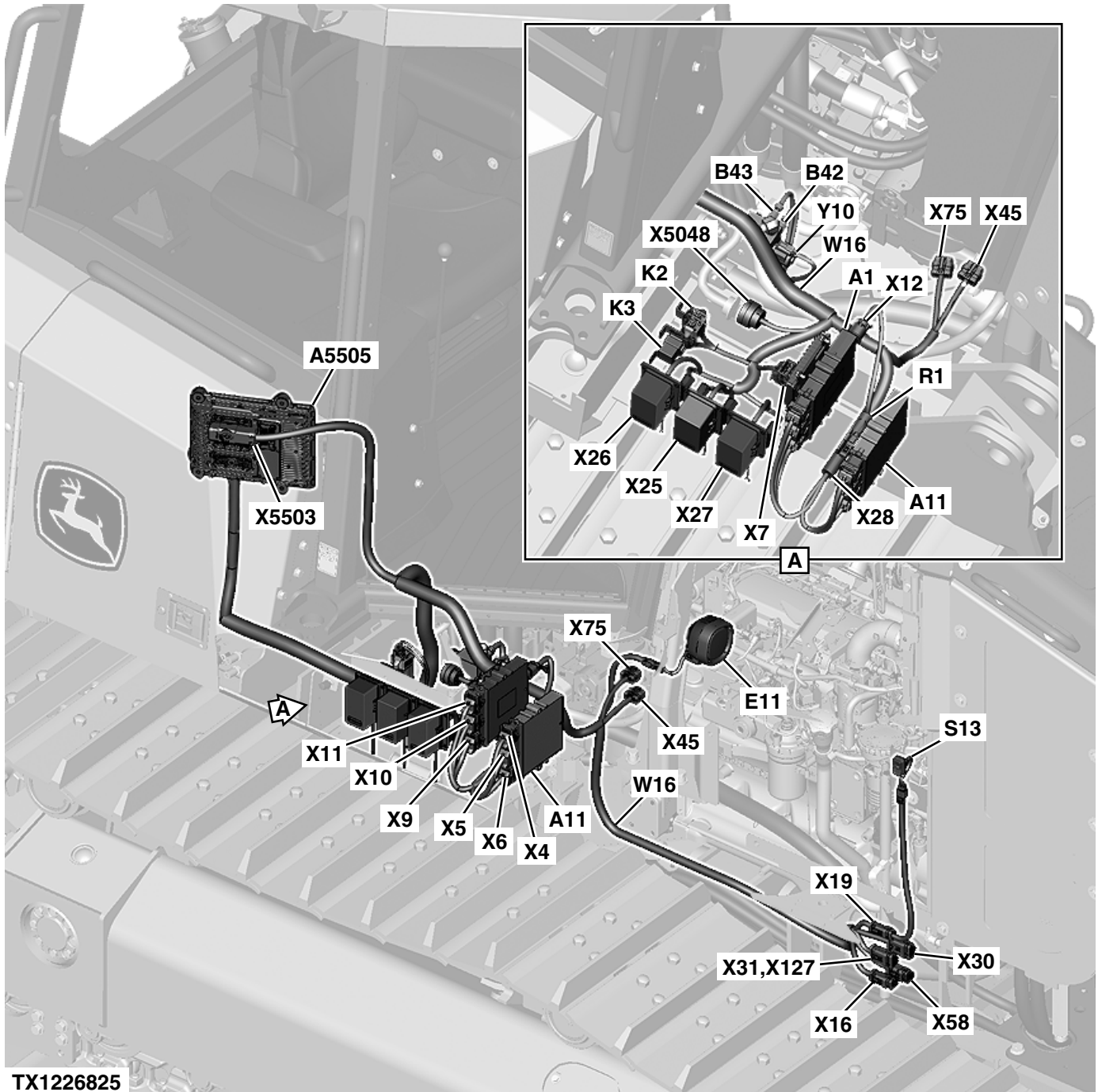
TX1167134

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Vehicle Harness (W15) Wiring Diagram 750K (S.N. —304245) 850K (S.N. —305046) (5 of 5)

JL05046,0000027 -19-15NOV16-8/18

**Vehicle (SmartGrade™ and IGC Controls) Harness
(W16) Component Location 750K (S.N. 304246—
) 850K (S.N. 305047—)**



TX1226825—UN—26OCT16

TX1226825

Vehicle (SmartGrade™ and IGC controls) Harness (W16) Component Location 750K (S.N. 304246—) 850K (S.N. 305047—) (right front shown)

System Diagrams

5—Continued on Sheet 5	E5601—DEF Dosing Unit Pressure Line Heater	SP_T024_A—T024 BLU Splice	X62— Vehicle Harness-to- Operator's Station Harness 23-Pin Connector
6—Continued on Sheet 5	E5602—DEF Dosing Unit Supply Line Heater	U1—24 V-to-12 V Converter	Y3— Park Brake Solenoid 1
A5507—Diesel Exhaust Fluid (DEF) Tank Header Assembly	E5603—DEF Dosing Unit Return Line Heater	U2—24 V-to-12 V Converter (if equipped)	Y4— Park Brake Solenoid 2
B8—Hydrostatic Charge Pressure Sensor	M4—Front Washer Motor	W2—Frame Ground	Y5—Hydrostatic Oil Cooler Bypass Solenoid
B9—Brake Pressure Sensor	M5—Rear Washer Motor	W4—Hydraulic Integrated Circuit (HIC) Valve Ground	Y6—Hydrostatic Oil Reservoir Bypass Solenoid
B15— Hydrostatic Oil Filter Restriction Switch	R6—Fuel Filter Heater	X38— Vehicle Harness-to- Operator's Station Harness 31-Pin Connector	
B17— Hydrostatic Oil Temperature Sensor	SP_5625_A—5625 GRN Splice 1	X40— Fuel Tank Harness Connector	
B5501—DEF Dosing Unit	SP_G009_A—G009 BLK Splice	X57— Vehicle Harness-to- Operator's Station Harness 35-Pin Connector	
	SP_P019_A—P019 RED Splice		

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JL05046,000002E -19-16NOV16-11/24

System Diagrams

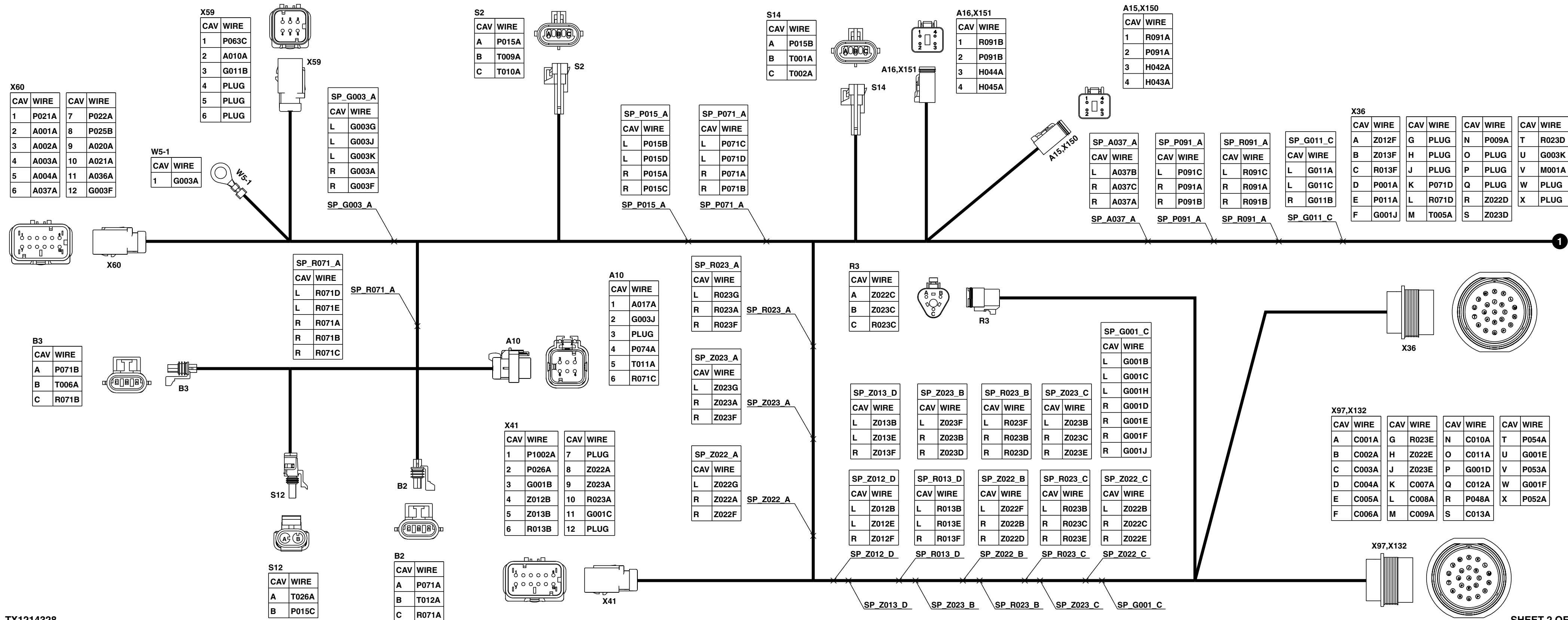
X43— Control Valve Harness
Connector 1
X44— Control Valve Harness
Connector 2
Y9—Hydraulic Enable Solenoid

Y21— Lift Port B Solenoid
Y22— Lift Port A Solenoid
Y23— Tilt Port B Solenoid
Y24— Tilt Port A Solenoid

Y25— Angle Port B Solenoid
Y26— Angle Port A Solenoid
Y27— Auxiliary Port B Solenoid

Y28— Auxiliary Port A Solenoid

JL05046,0000030 -19-18SEP14-2/2



System Diagrams

A4—Sealed Switch Module (SSM) E5—Right Rear Drive Light E6—Left Rear Drive Light E7—Left Front Cab Work Light	E8—Right Front Cab Work Light E12— Rotary Beacon Light SP_G004_A—G004 BLK Splice 1 SP_G004_B—G004 BLK Splice 2	SP_G011_A—G011 BLK Splice SP_L003_A—L003 BRN Splice SP_P063_A—P063 RED Splice W3—Roof Ground X14— Power Outlet Harness Connector	X61— Operator's Station Harness-to-Roof Harness 31-Pin Connector
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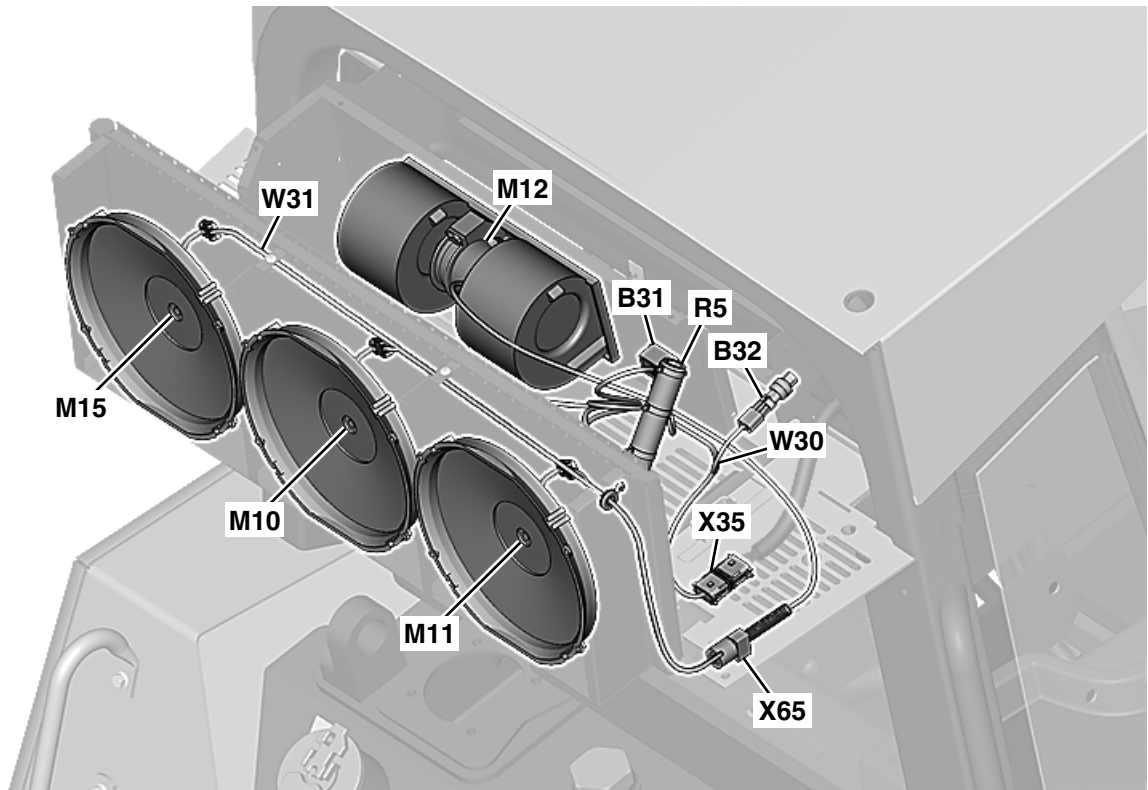
JL05046,000003A -19-02SEP14-2/2

Radio Auxiliary Harness (W29) Component Location

See Cab Roof Harness (W27) Component Location.
(Group 9015-10.)

JL05046,000005C -19-13OCT14-1/1

Heater and Air Conditioner Harness (W30) Component Location



TX1172381 —UN—07OCT14

TX1172381

Heater and Air Conditioner Harness (W30) Component Location

B31— Air Conditioner Freeze Control Switch B32— Air Conditioner High/Low-Pressure Switch M10— Condenser Fan Motor 1	M11— Condenser Fan Motor 2 M12— Blower Motor M15— Condenser Fan Motor 3 R5— Blower Motor Speed Resistor	W30—Heater and Air Conditioner Harness W31—Condenser Harness X35— Heater and Air Conditioner Harness Connector	X65— Condenser Harness Connector
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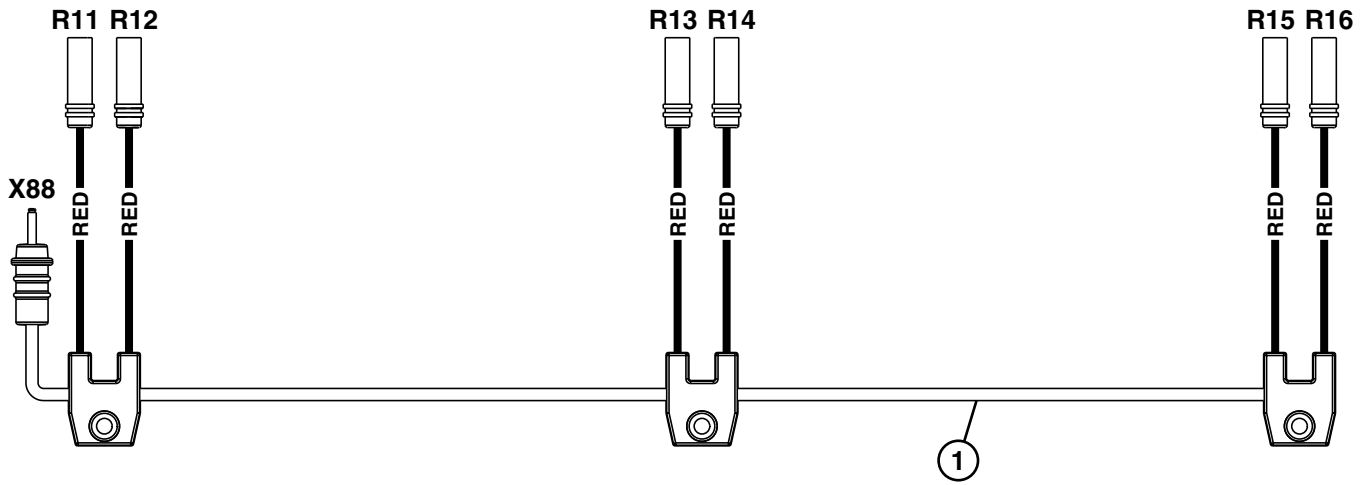
JL05046,000005D -19-01OCT14-1/1

System Diagrams

B5101—Engine Oil Pressure Sensor	B5301—Crankshaft Position Sensor	SP_5624—5624 YEL Splice	X5021—Fuel Injector Harness Connector
B5102—Exhaust Manifold Pressure Sensor	B5302—Camshaft Position Sensor	SP_5625—5625 DK GRN Splice	X5039—Aftertreatment Harness-to-Engine Harness 12-Pin Connector
B5103—Exhaust Gas Recirculation (EGR) Flow Sensor	B5500—Intake Air Sensor	SP_5626—5626 LT BLU Splice	X5048—Vehicle Harness-to-Engine Harness 31-Pin Connector
B5104—Manifold Air Pressure Sensor	G5—Alternator	SP_5628—5628 GRY Splice	X5501—Engine Control Unit (ECU) Connector 1
B5105—Engine Crankcase Pressure Sensor	SP_5030_A—5030 BLK Splice 1	SP_5631—5631 BRN Splice	X5502—Engine Control Unit (ECU) Connector 2
B5107—Low-Pressure Fuel Pressure Sensor	SP_5030_B—5030 BLK Splice 2	SP_5633—5633 ORG Splice	Y5022—Pressure Control Valve 1
B5108—Engine Coolant Pressure Sensor	SP_5030_C—5030 BLK Splice 3	SP_5634—5634 YEL Splice	Y5023—Pressure Control Valve 2
B5113—Fuel Rail Pressure Sensor	SP_5030_D—5030 BLK Splice 4	SP_5658—5658 GRY Splice	Y5024—Fuel Rail Pressure Release Solenoid Valve
B5205—Charge Air Cooler Outlet Temperature Sensor	SP_5030_E—5030 BLK Splice 5	SP_5761—5761 BRN Splice	Y5400—Exhaust Gas Recirculation (EGR) Valve
B5206—Manifold Air Temperature Sensor	SP_5030_C SHLD—5030 SHLD Splice 1	SP_5783—5783 ORG Splice	Y5401—Air Throttle Actuator
B5207—Exhaust Gas Recirculation (EGR) Temperature Sensor	SP_5030_D SHLD—5030 SHLD Splice 2	SP_5804_A—5804 YEL Splice 1	Y5500—Variable Geometry Turbocharger (VGT) Actuator
B5208—Engine Coolant Temperature Sensor	SP_5030_E SHLD—5030 SHLD Splice 3	SP_5804_B—5804 YEL Splice 2	
B5209—Fuel Temperature Sensor	SP_5030_F SHLD—5410 SHLD Splice 4	SP_5804_C—5804 YEL Splice 3	
B5300—Variable Geometry Turbocharger (VGT) Speed Sensor	SP_5410_C SHLD—5410 SHLD Splice 1	SP_5805_A—5805 DK GRN Splice 1	
	SP_5410_D—5410 BLK Splice 2	SP_5805_B—5805 DK GRN Splice 2	
	SP_5410_E SHLD—5410 SHLD Splice 2	SP_5805_C—5805 DK GRN Splice 3	
	SP_5410_F SHLD—5410 SHLD Splice 3	SP_RESA01—RESA01 DK GRN Splice	
	SP_5614—5614 YEL Splice	SP_RESA02—RESA02 YEL Splice	
	SP_5623—5623 ORG Splice	X5001—Engine Control Unit (ECU) Static Ground	
		X5004—Engine Harness-to-Glow Plug Relay Harness 3-Pin Connector	

Continued on next page

JL05046,0000044 -19-07NOV14-3/6



TX1121458

Glow Plug Harness (W42) Wiring Diagram

- | | | |
|---------------------------|---------------------------|---|
| 1— Buss Bar | R13— Glow Plug Cylinder 3 | R16— Glow Plug Cylinder 6 |
| R11— Glow Plug Cylinder 1 | R14— Glow Plug Cylinder 4 | X88— Glow Plug Relay |
| R12— Glow Plug Cylinder 2 | R15— Glow Plug Cylinder 5 | Harness-to-Glow Plug
Harness Connector |

TX1121458 —UN—13SEP12

JL05046,000046 -19-04NOV14-2/2

Using Service ADVISOR™ Remote

Service ADVISOR™ Remote (SAR) Operation

Service ADVISOR™ is a diagnostic tool used by John Deere dealers to perform diagnostics as well as updates to machine settings and software. Dealers can access diagnostic trouble codes and diagnostic addresses, create readings and recordings, and program controllers. This technology consists of both software and hardware. Technicians attend a minimum of 8 hours of training to become certified in utilizing this tool.

Service ADVISOR™ Remote (SAR) is a function of Service ADVISOR™. It allows the dealer technician to connect to a SAR-enabled machine via the JDLINK™ network to remotely access diagnostic trouble code information and record diagnostic data, as well as program controllers.

Similar to software (payload) updates in the computer industry, SAR enables John Deere to remotely deliver updated software via the JDLINK™ hardware on board. Remote programming gives John Deere the ability to update software to enhance performance of the machine. This capability can be used to reprogram most machine controllers. The user actively participates with the dealer in this process by both downloading the software update and installing the software update.

NOTE: Some vehicle controllers may not be compatible for SAR reprogramming.

Program Controller Procedure

NOTE: Factory setting is set to always accept software downloads. To change this setting, consult your John Deere dealer to either be prompted for software updates or deny all software updates.

Normal machine operation can continue during the software download process.

Customer will be notified by John Deere or a John Deere dealer of pending software updates with appropriate installation instructions via letter or phone.

Customer will determine the appropriate time and place to install the new software on the machine via the machine

monitor. For more information, [see Operation—Software Update, PDU](#) or [see Operation—Software Update, SDM](#). (Operator's Manual.)

Once the customer initiates delivery and installation of the software, SAR will start and manage the installation of the new payload to the appropriate machine controllers.

NOTE: Software download speed capability depends on JDLINK cellular coverage.

Service ADVISOR™ Remote (SAR) Connection Procedure

1. Verify machine is able to receive Service ADVISOR™ Remote (SAR) connection.
 - Switched power ON.
 - Engine OFF.
 - Verify machine has a valid JDLINK™ Select or Ultimate registration, [see Service ADVISOR™ Remote \(SAR\)—SOFTWARE TERMS AND CONDITIONS](#). (Operator's Manual.)
 - Verify adequate cellular signal, [see Diagnostics—JDLINK Readings, PDU](#) or [see Diagnostics—JDLINK Readings, SDM](#). (Operator's Manual.)
 - Dealer is authorized by customer to access machine information.
2. Collect machine model number, product identification number (PIN), and communicate to dealer technician with access to the following:
 - Computer with Service ADVISOR™ 4.0 or equivalent installed and updated to most recent edition.
 - Internet connection.
3. Open Service ADVISOR™ application and accept licensing agreement.
4. Search for machine model, or enter machine PIN number in Add/Remove Models screen.
5. Select Add to place machine model in Currently Selected Models queue, and select OK.

Diagnostic Information

Item	Measurement	Specification
Y27—Auxiliary Port B Solenoid	Resistance	21.5 ohms at 20°C (68°F)
Y28—Auxiliary Port A Solenoid	Resistance	21.5 ohms at 20°C (68°F)
Y29—Auxiliary Port B Solenoid	Resistance	21.5 ohms at 20°C (68°F)
Y30—Auxiliary Port A Solenoid	Resistance	21.5 ohms at 20°C (68°F)
Y32—Power Pitch Enable Solenoid	Resistance	18.3 ohms at 20°C (68°F)
Y36—Blade Float Detent Solenoid	Resistance	24.2—27.3 ohms at -40°C (-40°F) 26.7—30.2 ohms at -20°C (-4°F) 29.2—33.0 ohms at 0°C (32°F) 31.8—35.8 ohms at 20°C (68°F) 34.2—38.6 ohms at 40°C (104°F)
Y37—Fan Unloading Solenoid	Resistance	27.1—29.9 ohms at 20°C (68°F)
Y38—Blade Angle Left Solenoid	Resistance	21.5 ohms at 20°C (68°F)
Y39—Blade Angle Right Solenoid	Resistance	21.5 ohms at 20°C (68°F)
Y5021—Fuel Injectors	Resistance	24.2—27.3 ohms at -40°C (-40°F) 26.7—30.2 ohms at -20°C (-4°F) 29.2—33.0 ohms at 0°C (32°F) 31.8—35.8 ohms at 20°C (68°F) 34.2—38.6 ohms at 40°C (104°F)
Y5400—Exhaust Gas Recirculation (EGR) Valve	Resistance	24.2—27.3 ohms at -40°C (-40°F) 26.7—30.2 ohms at -20°C (-4°F) 29.2—33.0 ohms at 0°C (32°F) 31.8—35.8 ohms at 20°C (68°F) 34.2—38.6 ohms at 40°C (104°F)
Y5401—Air Throttle Actuator	Resistance	24.2—27.3 ohms at -40°C (-40°F) 26.7—30.2 ohms at -20°C (-4°F) 29.2—33.0 ohms at 0°C (32°F) 31.8—35.8 ohms at 20°C (68°F) 34.2—38.6 ohms at 40°C (104°F)
Y5500—Variable Geometry Turbocharger (VGT) Actuator	Resistance	24.2—27.3 ohms at -40°C (-40°F) 26.7—30.2 ohms at -20°C (-4°F) 29.2—33.0 ohms at 0°C (32°F) 31.8—35.8 ohms at 20°C (68°F) 34.2—38.6 ohms at 40°C (104°F)
Y5501—Low-Pressure Fuel Pump	Resistance	24.2—27.3 ohms at -40°C (-40°F) 26.7—30.2 ohms at -20°C (-4°F) 29.2—33.0 ohms at 0°C (32°F) 31.8—35.8 ohms at 20°C (68°F) 34.2—38.6 ohms at 40°C (104°F)

MM12851.00003D0 -19-04NOV15-7/7

Setup—Machine Setup, PDU

NOTE: This manual only covers menu items visible in service mode. For information on remaining menu items, see operator's manual.

The SETUP menu allows a user to enable/disable various features and settings.

1. Access service mode. See [Accessing Service Mode, PDU](#). (Group 9015-16.)

2. Navigate through menu: MAIN MENU >> SETUP
3. Navigate to desired setting. Press SELECT button.
4. Press UP or DOWN button to highlight desired option.
5. Press SELECT button to save setting.

Monitor

Monitor Menu Items			
Menu Item		Submenu Item	Details
4: Menu Access	>>	1: Service Mode Only 2: Operation Menu Only 3: All Menus	View only service mode menu items, operation mode menu items, or all menu items.
5: Factory Defaults	>>		Press SELECT button to restore all monitor settings to default values.

Machine Preferences

Machine Preferences Menu Items			
Menu Item		Submenu Screen	Details
1: Transmission Settings	>>	9: Restore Factory Defaults	Restores all transmission settings to default values.
2: Hydraulic Settings	>>	5: Restore Factory Defaults	Restores all hydraulic settings to default values.
8: Brake Mode	>>	1: Normal 2: Test 3: Tow	Allows brake mode to be changed for testing or towing purposes.
9: Secure Service Mode	>>	1: Disabled 2: Enabled	Enable or disable pass code before entering service mode.

Machine Configuration

Configuration Menu Items				
Menu Item		Submenu Screen	Submenu	Details
3: Enable Options	>>	1: Rear Wiper 2: Power Pitch 3: Beacon Light 4: Reversing Fan 5: Optional Lights	1: Disabled 2: Enabled	Enables or disables selected function.
		6: Aux Hydraulic Valves	1: No Aux 2: Aux I 3: Aux II 4: Aux III	Setting for installed auxiliary function.

Calibration

Calibration Menu Items			
Menu Item		Submenu Screen	Details
1: Transmission	>>	1: Full Calibration 2: Sensor Calibration 3: Pump & Motor Calibration	Allows for full or sectional calibration of transmission components.
2: Hydraulic Valve	>>	1: Full Calibration 2: Sectional Calibration	Allows for full or sectional calibration of hydraulic components.

MM12851,00003CD -19-28OCT14-1/1

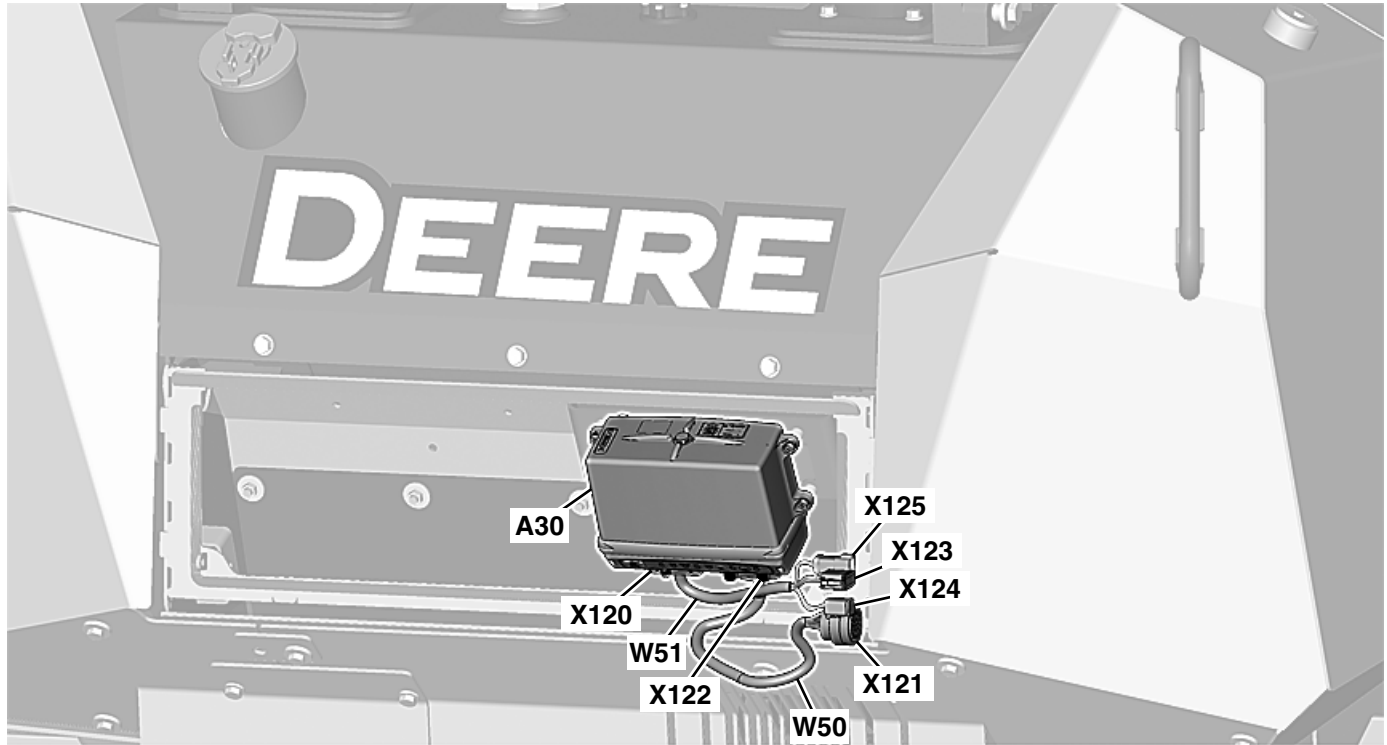
Diagnostic Test Box

Result	Condition	Action
Voltages match (within 0.2 volts).	Sensor malfunction.	Replace sensor.
Digital multimeter is less by 0.2 volts.	Signal wire is open.	Repair signal wire.
Voltages match but are less than 1.5 volts.	Signal wire is short to ground.	Repair signal wire.

Service ADVISOR is a trademark of Deere & Company

RG80575,0000BEC -19-22AUG13-2/2

SmartGrade™ Control Unit Harness 1 and 2 (W50 and W51) Component Location



TX1214025 —UN—12APR16

TX1214025

SmartGrade™ Control Unit Harness 1 and 2 (W50 and W51) Component Location

A30 — SmartGrade™ Controller/Receiver	X121 — SmartGrade™ Controller/Receiver Connector 1-to-Vehicle (SmartGrade™ and IGC controls) Harness 12-Pin Connector	X124 — SmartGrade™ Controller/Receiver Connector 2-to-Vehicle (SmartGrade™ and IGC controls) Harness 6-Pin Connector
W50 — SmartGrade™ Control Unit Harness 1	X122 — SmartGrade™ Controller/Receiver Connector 2	X125 — SmartGrade™ Controller/Receiver Connector 2-to-Chassis Inertial Measurement Unit (IMU) Connector
W51 — SmartGrade™ Control Unit Harness 2	X123 — SmartGrade™ Controller/Receiver Connector 2-to-Vehicle (SmartGrade™ and IGC controls) Harness 12-Pin Connector	
X120 — SmartGrade™ Controller/Receiver Connector 1		

SmartGrade is a trademark of Deere & Company

RG80575.0002FC2 -19-08APR16-1/1

**SmartGrade™ Control Unit Harness 1 (W50)
Wiring Diagram**

For SmartGrade™ control unit harness 1 (W50) wiring diagram, see [SmartGrade™ Display Unit Harness \(W56\) Wiring Diagram](#). (CTM10092X19.)

SmartGrade is a trademark of Deere & Company

JD29379.00007E2 -19-03DEC15-1/1

Tests

<p>9 CAN High/CAN Low Short Check</p>	<p>Switched power OFF.</p> <p>Using a multimeter, check for continuity between CAN high and CAN low circuits.</p> <p>Is continuity indicated?</p>	<p>YES: Short circuit between CAN high and CAN low wires. Check continuity between CAN high and CAN low circuits one controller at a time to locate harness where short is located. Repair or replace harness as necessary.</p> <p>NO: <u>Go to Service ADVISOR Fuse Test.</u></p> <p style="text-align: right; font-size: small;">MM12851,00003D4 -19-16NOV16-18/20</p>
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<p>10 Controller Fuse Check</p>	<p>Remove fuses for missing controller. Check fuses for continuity.</p> <p>Is continuity indicated in all fuses?</p>	<p>YES: Go to Controller Check.</p> <p>NO: Replace fuses that did not indicate continuity.</p> <p style="text-align: right; font-size: small;">MM12851,00003D4 -19-16NOV16-19/20</p>
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<p>11 Controller Check</p>	<p>Switched power OFF.</p> <p>Disconnect modular telematics gateway (MTG) control unit 48-pin connector (X6014). <u>See JDLINK™ Harnesses (W6002 and W6003) Component Location.</u> (Group 9015-10.) Locate suspected controller. Using schematics included with this test, locate CAN wires and disconnect appropriate connector. Using a multimeter, measure resistance between CAN high and CAN low wires. Is resistance between 55—65 ohms?</p>	<p>YES: Go to next step in this check.</p> <p>NO: An open or short circuit exists in one of the CAN wires. Work from controller back to main harness, checking CAN high and low wires for open and short circuit. Repair or replace harness as necessary.</p>
	<p>Switched power ON.</p> <p>Using schematics included with this test, check for power and ground at suspect controller. Is power and ground present?</p>	<p>YES: Program malfunctioning controller.</p> <p>NO: An open or short circuit exists in circuit with no power or ground. Work from controller back to main harness, checking power and ground circuits for an open or short circuit. Repair or replace harness as necessary.</p> <p style="text-align: right; font-size: small;">MM12851,00003D4 -19-16NOV16-20/20</p>

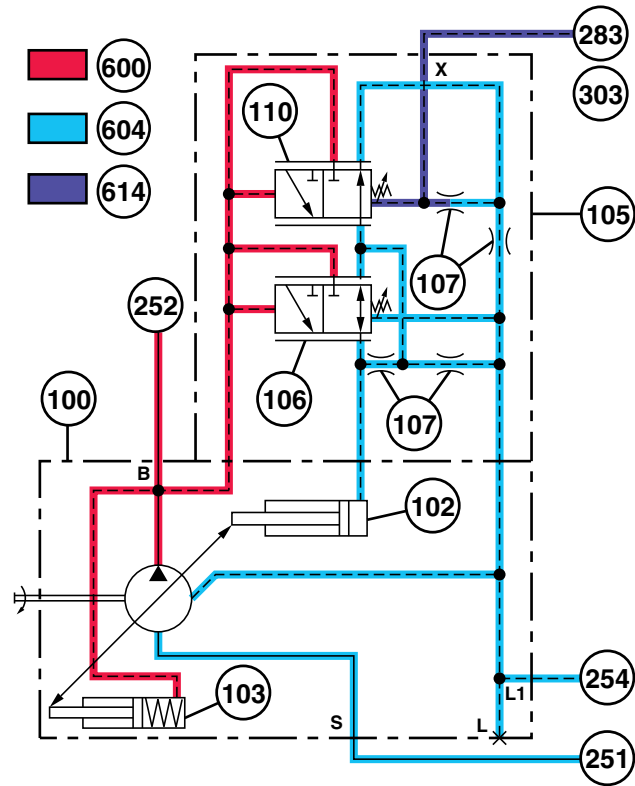
The hydraulic pump is an axial-piston, variable-displacement pump. The pump is mounted to and driven by the rear hydrostatic pump. The hydraulic system is a closed-center (pilot control) or open-center (IGC) load sense system. Load sense pressure is always equal to the highest work port pressure created by an activated function.

The pump has two pistons: bias piston (103) and displacement piston (102). With engine off, spring force acting on bias piston holds the pump at maximum displacement. As the engine is started, transmission begins to rotate turning pump drive shaft (2). Pump outlet pressure acts against the head end of load sense valve spool (13) and pressure cut-off valve spool (11). When pump outlet pressure is great enough to overcome the load sense valve spring (12) and pressure cut-off valve spring (10) pressure, the spools shift making a connection to the displacement piston (102) and allowing oil into displacement piston. The displacement piston then shifts to rotate swash plate (4) to minimum displacement, allowing a small amount of displacement for internal leakage. This condition is known as low-pressure standby.

When a function is activated, a load sense signal is sent to the main hydraulic pump control valve (105). This pressure in addition to spring force causes load sense valve spool (13) to shift, making a connection between the displacement piston and case return. This connection vents displacement piston oil to return, allowing the displacement piston to shift as the bias spring and piston forces the pump onto stroke. The pump will come onto stroke until demanded pressure settings are achieved.

Engine overspeed protection function is built into the machine load sense system. The engine overspeed protection valve located near the main hydraulic pump is used if diesel engine speed gets too high. In situations of excess engine speed, such as traveling downhill at a fast rate of speed, the vehicle control unit (VCU) energizes the solenoid valve. The shifting of the solenoid valve spool routes pump pressure oil instead of load sense oil to the spring end of the load sense valve spool, rotating the swash plate to have the hydraulic pump produce maximum pump output flow. If no loader or auxiliary functions are activated, excess hydraulic system pressure is discharged through the main system relief valve in the main control valve. The increased power demand created by running the hydraulic system at full output helps limit engine speed. See Engine Overspeed Protection Valve Operation. (Group 9025-05.)

If pump output pressure increases above the adjustable setting of pressure cut-off valve (106), the valve shifts to send pump output pressure oil directly to the head end of the dual-acting servo piston, rotating the swash plate



Hydraulic Pump Schematic

- | | |
|--|---|
| 100— Main Hydraulic Pump | 252— Main Hydraulic Pump-to-Main Control Valve (port IN) Line |
| 102— Displacement Piston (minimum displacement) | 254— Main Hydraulic Pump Case Drain Line |
| 103— Bias Piston with Spring (maximum displacement) | 283— Engine Overspeed Protection Valve (port 2)-to-Main Hydraulic Pump Control Valve (port X) Line (pilot control machines) |
| 105— Main Hydraulic Pump Control Valve | 303— Main Control Valve (port LX)-to-Main Hydraulic Pump Control Valve (port X) Line (IGC machines) |
| 106— Pressure Cut-Off Valve | 600— High-Pressure Oil |
| 107— Orifice | 604— Return Oil |
| 110— Load Sense Valve | 614— Load Sense Pressure Oil |
| 251— Hydraulic Oil Reservoir-to-Main Hydraulic Pump Line | |

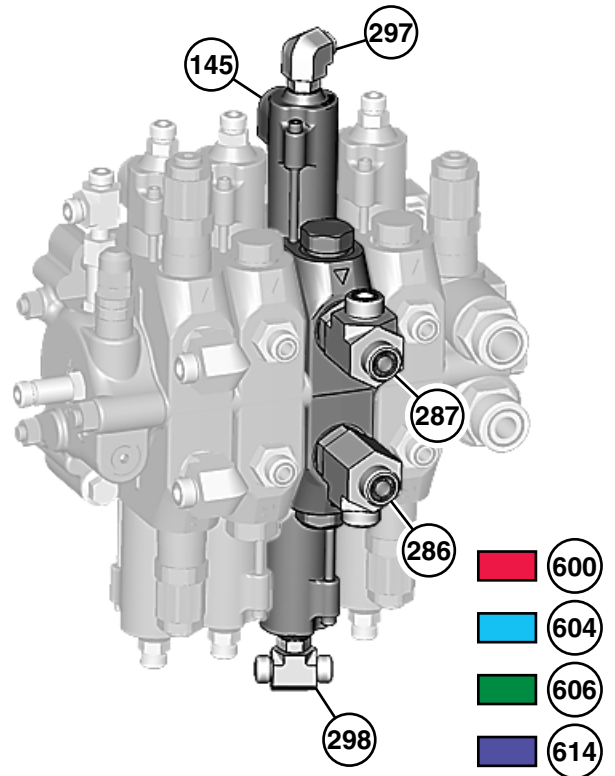
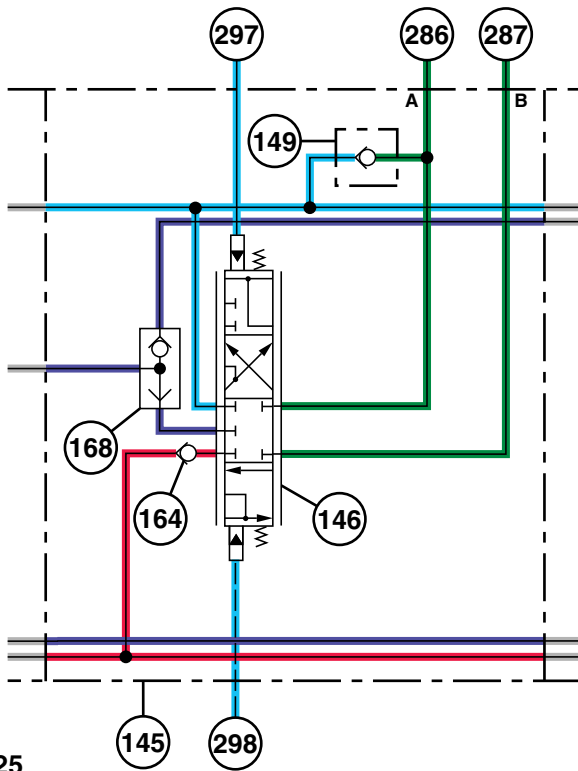
toward minimum displacement until pump output matches the requirements of maintaining maximum pump output pressure at the pressure cut-off valve setting.

On this machine, the pressure cut-off valve pressure is set higher than both load sense relief valve and system relief valve pressures.

Continued on next page

AB06447,0000B8C -19-06NOV14-4/10

TX1176088 —UN—31OCT14



TX1171025 —UN—13OCT14

TX1171025

Blade Lift Section (PAT)

- | | | | |
|---------------------------------|--|--|------------------------------|
| 145— Blade Lift Section | 286— Main Control Valve (port A)-to-Blade Lift Cylinder Line | 297— Pilot Control Valve (port 3)-to-Blade Lift Section Line | 600— High-Pressure Oil |
| 146— Blade Lift Valve Spool | 287— Main Control Valve (port B)-to-Blade Lift Cylinder Line | 298— Pilot Control Valve (port 1)-to-Blade Lift Section Line | 604— Return Oil |
| 149— Anticavitation Check Valve | | | 606— Trapped Oil |
| 164— Load Check Valve | | | 614— Load Sense Pressure Oil |
| 168— Load Sense Shuttle Valve | | | |

Blade Angle Section, Blade Tilt Section, and Auxiliary Section

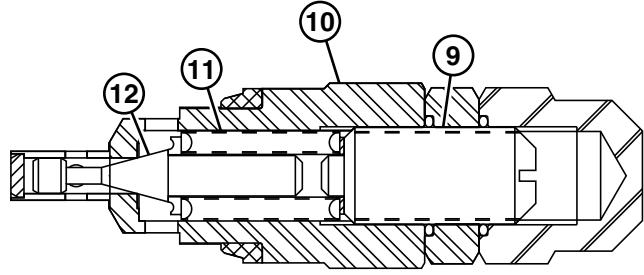
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AB06447.0000B8A -19-20MAY15-4/7

LS relief valve is a direct-acting, poppet (11) type design located in main control valve end section.

LS relief valve limits LS pressure and hydraulic system pressure. Pressure of hydraulic system at LS relief pressure equals sum of differential pressure plus setting of LS relief valve.

LS relief valve pressure is adjustable using adjustment screw.



9— Adjustment Screw
10— Body

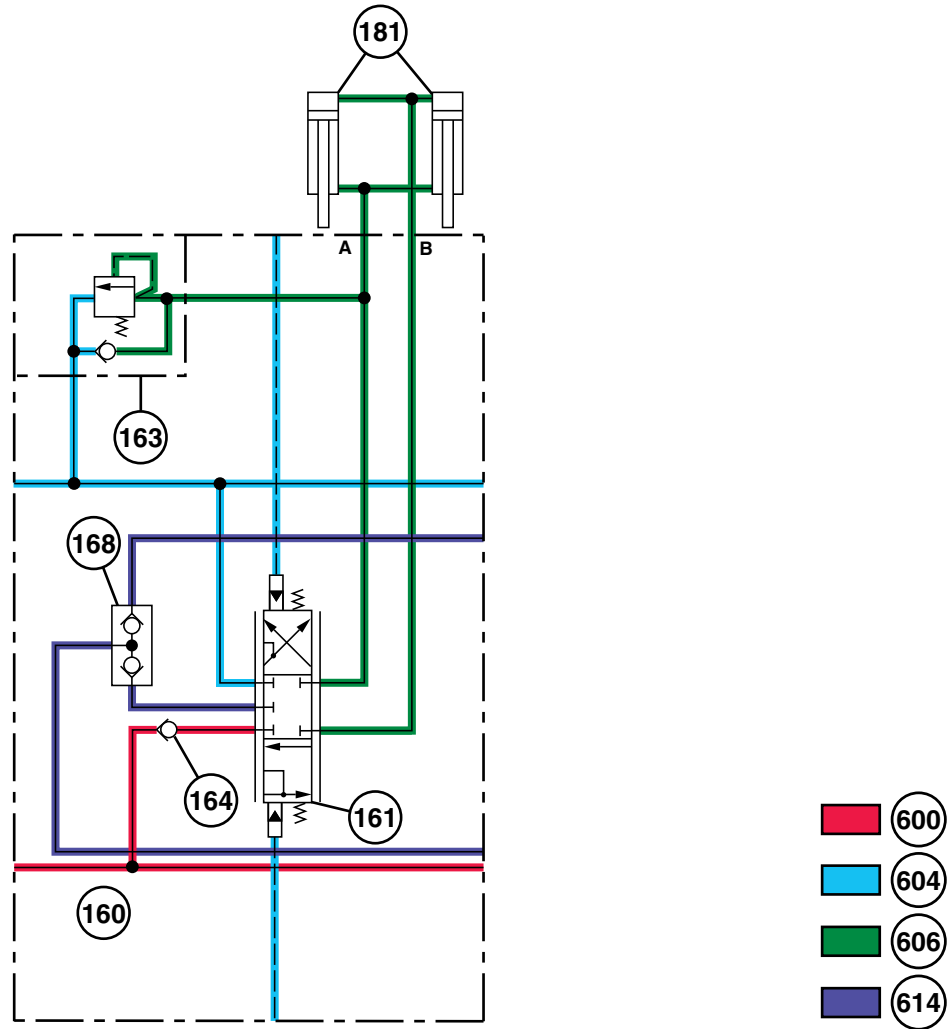
11— Poppet
12— Spring

Load Sense Relief Valve

AB06447,0000B80 -19-09OCT14-2/2

TX1173385—UN—02OCT14

Ripper Operation



TX1169628

Ripper Circuit Schematic

- | | | |
|---|-------------------------------|------------------------------|
| 160— Auxiliary Section | 164— Load Check Valve | 600— High-Pressure Oil |
| 161— Auxiliary Valve Spool | 168— Load Sense Shuttle Valve | 604— Return Oil |
| 163— Circuit Relief Valve (with anticavitation) | 181— Ripper Cylinder (2 used) | 606— Trapped Oil |
| | | 614— Load Sense Pressure Oil |

Ripper circuit consists of one control valve section and two hydraulic ripper cylinders (181). Ripper circuit is pilot controlled. For more information, [see Pressure Reducing Valve Operation](#). (Group 9025-05.)

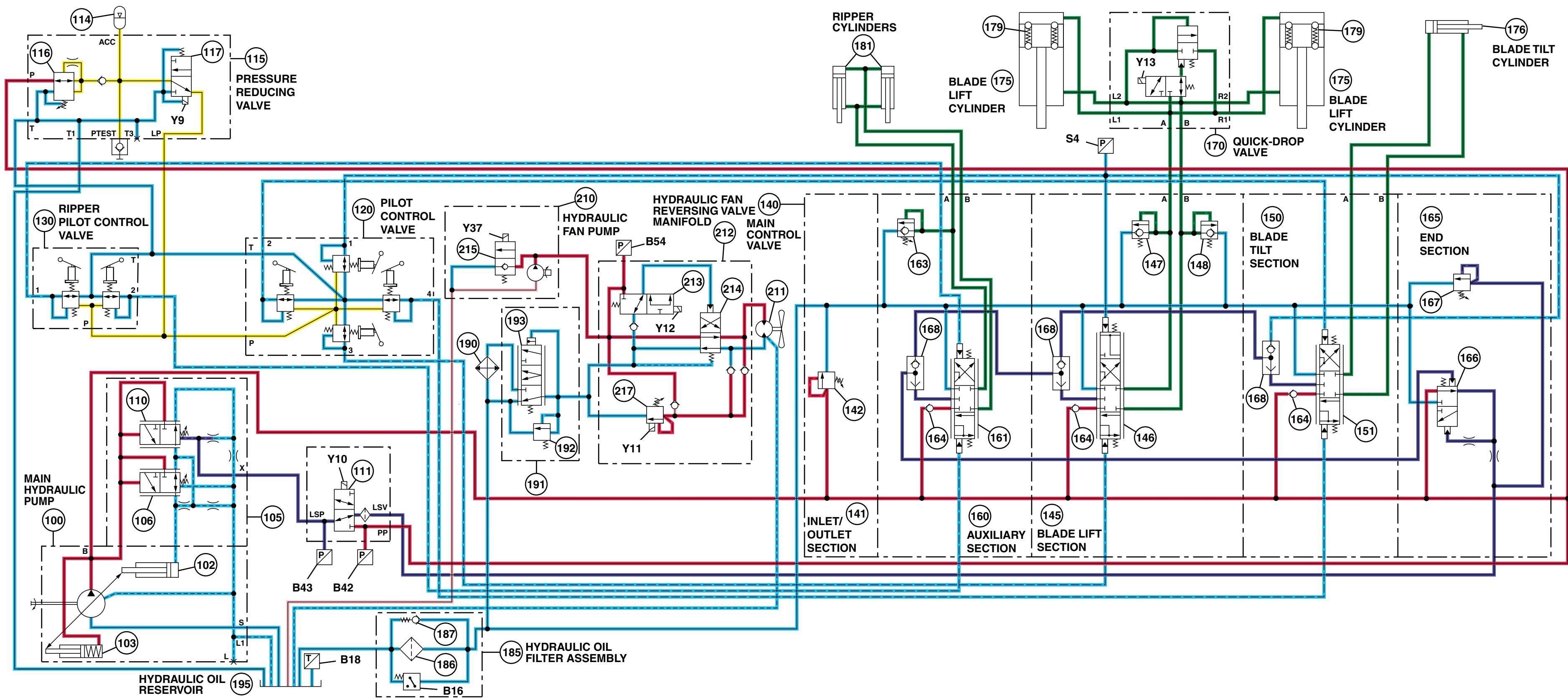
Ripper pilot control valve sends pilot pressure oil to shift auxiliary valve spool (161). Ripper lower circuit is protected by ripper lower circuit relief valve (163). Purpose of relief valve is to react against loads during reverse impacts when ripper is not fully raised. Like other

hydraulic circuits, ripper uses load sense (LS) system. Ripper valve section has LS shuttle valves (168) that LS system uses to direct highest system pressure to LS isolator. For more information, [see Load Sense Circuit Operation](#). (Group 9025-05.)

Ripper valve spools are three-position, five-way spools that are returned to neutral position by centering springs in spool end caps. For more information, [see Hydraulic Control Valve Operation](#). (Group 9015-05.)

AB06447,0000B86 -19-09SEP14-1/1

TX1169628—UN—09SEP14



- 600
- 602
- 604
- 606
- 609
- 614

TX1167844

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Hydraulic System Schematic, Outside Dozer (OSD), Ripper, Pilot Control

AB06447,0000B79 -19-12FEB16-9/14

System Diagrams

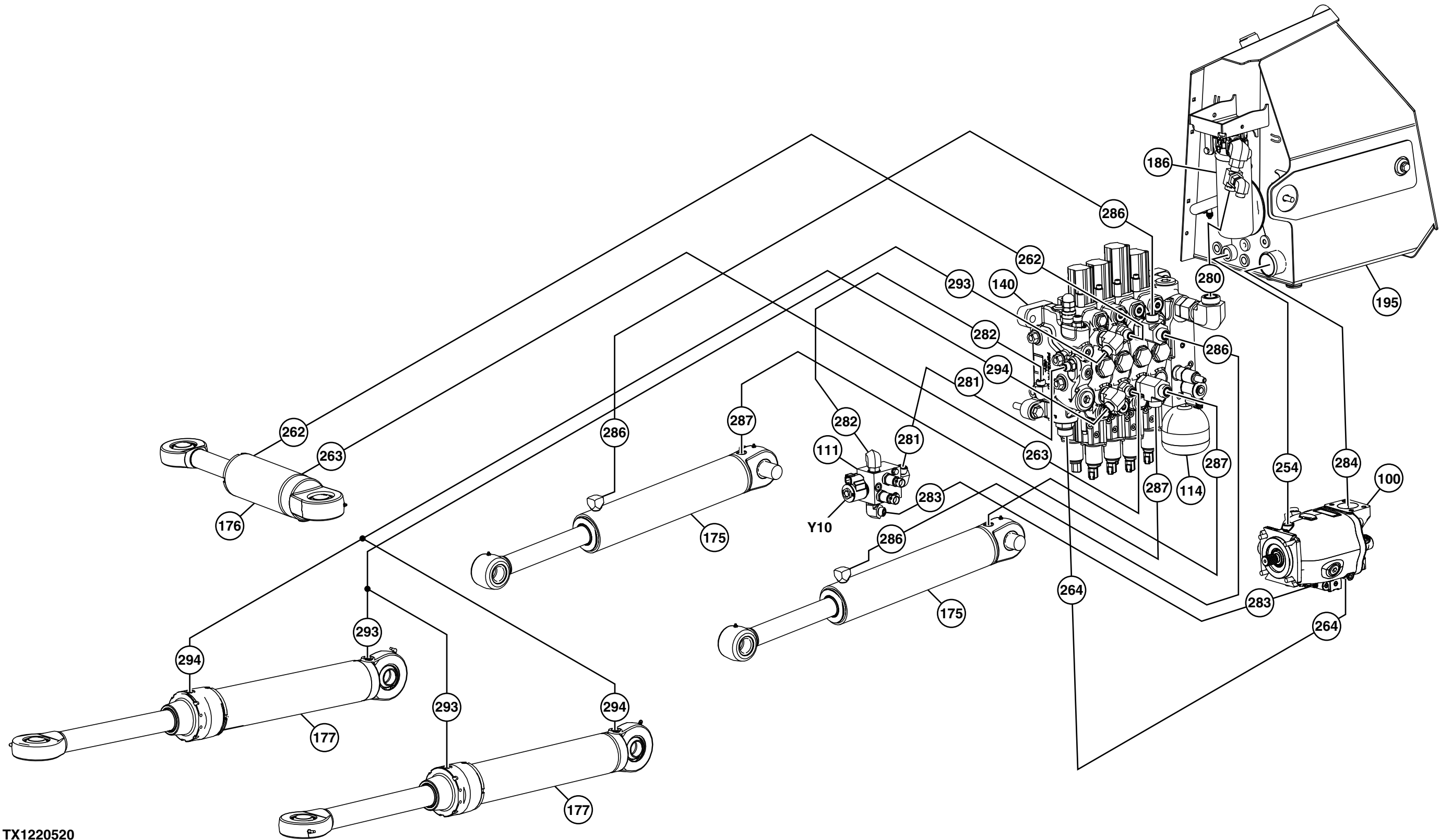
- | | | | |
|---|---|--|--|
| 100— Main Hydraulic Pump
101— Dual Acting Servo Piston
104— Bias Spring
105— Main Hydraulic Pump Control Valve
106— Pressure Cut-Off Valve
110— Load Sense Valve
111— Engine Overspeed Protection Valve
114— Hydraulic Accumulator
116— Pilot Pressure Regulating Valve
117— Hydraulic Enable Solenoid Valve
140— Main Control Valve
142— Hydraulic System Relief Valve
143— Inlet Section
145— Blade Lift Section
146— Blade Lift Valve Spool
147— Blade Lower Circuit Relief Valve (with anticavitation)
148— Blade Raise Circuit Relief Valve (with anticavitation)
150— Blade Tilt Section | 151— Blade Tilt Valve Spool
160— Auxiliary Section
161— Auxiliary Valve Spool
163— Circuit Relief Valve (with anticavitation)
164— Load Check Valve (3 used)
167— Load Sense Relief Valve
168— Load Sense Shuttle Valve
169— Outlet Section
170— Quick-Drop Valve
173— Power Pitch Valve
174— Power Pitch Solenoid Valve
175— Blade Lift Cylinder (2 used)
176— Blade Tilt Cylinder
178— Blade Pitch Cylinder
179— Piston Bypass Valve (2 used per lift cylinder)
181— Ripper Cylinder (2 used)
183— Winch Connections
185— Hydraulic Oil Filter Assembly
186— Hydraulic Oil Filter
187— Hydraulic Oil Filter Bypass Valve | 190— Hydraulic Oil Cooler
191— Thermal Bypass Valve
192— Thermal Bypass Relief Valve
193— Thermal Bypass Thermostat
195— Hydraulic Oil Reservoir
210— Hydraulic Fan Pump
211— Hydraulic Fan Motor
212— Hydraulic Fan Reversing Valve Manifold
213— Hydraulic Fan Reversing Valve
214— Hydraulic Fan Directional Valve
215— Hydraulic Fan Unloading Solenoid Valve
217— Hydraulic Fan Proportional Solenoid Valve
600— High-Pressure Oil
602— Low-Pressure Oil
604— Return Oil
606— Trapped Oil
609— Pilot Pressure Oil
614— Load Sense Pressure Oil
B16— Hydraulic Oil Filter Restriction Switch | B18— Hydraulic Oil Temperature Sensor
B42— Hydraulic Pump Pressure Sensor
B43— Hydraulic Load Sense Pressure Sensor
B54— Fan Drive Pressure Sensor
Y9— Hydraulic Enable Solenoid
Y10— Overspeed Solenoid
Y11— Hydraulic Fan Proportional Relief Solenoid
Y12— Hydraulic Fan Reversing Solenoid
Y13— Quick-Drop Solenoid
Y21— Lift Port B Solenoid
Y22— Lift Port A Solenoid
Y23— Tilt Port B Solenoid
Y24— Tilt Port A Solenoid
Y27— Auxiliary Port B Solenoid
Y28— Auxiliary Port A Solenoid
Y32— Power Pitch Enable Solenoid
Y37— Fan Unloading Solenoid |
|---|---|--|--|

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AB06447,0000B7A -19-03AUG16-8/16

Hydraulic System Line Identification—IGC

TX1220520 —UN—03AUG16



TX1220520

Continued on next page

Main Hydraulic System Line Identification—IGC, Power Angle Tilt (PAT)

AB06447,0000BA6 -19-03AUG16-1/4

System Diagrams

100— Main Hydraulic Pump	239— Pilot Control Valve (port P)-to-Auxiliary Pilot Control Valve (port P) Line	254— Main Hydraulic Pump Case Drain Line	290— Ripper Pilot Control Valve (port 2)-to-Main Control Valve Line
114— Hydraulic Accumulator	240— Pressure Reducing Valve (port LP)-to-Pilot Control Valve (Port P) Line	264— Main Hydraulic Pump (port B)-to-Main Control Valve (port P) Inlet/Outlet Section Line	600— High-Pressure Oil
115— Pressure Reducing Valve	241— Pressure Reducing Valve (port T)-to-Pilot Control Valve (port T) Line	280— Main Control Valve-to-Hydraulic Oil Filter Manifold Line	602— Low-Pressure Oil
120— Pilot Control Valve	249— Main Control Valve (port A)-to-Rear Auxiliary Port 1	284— Hydraulic Oil Reservoir-to-Main Hydraulic Pump Line	604— Return Oil
140— Main Control Valve	250— Main Control Valve (port B)-to-Rear Auxiliary Port 2	289— Ripper Pilot Control Valve (port 1)-to-Main Control Valve Line	606— Trapped Oil
162— Auxiliary Pilot Control Valve			609— Pilot Pressure Oil
181— Ripper Cylinder (2 used)			
186— Hydraulic Oil Filter			
195— Hydraulic Oil Reservoir			
238— Pilot Control Valve (port T)-to-Auxiliary Pilot Control Valve (port T) Line			

AB06447.0000BA9 -19-10OCT14-2/2

Diagnostic Information

<p>5 Hydraulic Enable Solenoid Stuck or Pilot Control Pressure Low</p>	<p>Check pilot control pressure. See Pressure Reducing Valve Pressure Test and Adjustment. (Group 9025-25.)</p> <p>Is pilot pressure regulating valve within specification?</p>	<p>YES: Go to Hydraulic System Relief Valve Stuck Open.</p> <p>NO: Adjust pilot pressure regulating valve to specification.</p>
---	---	---

AB06447,0000B9F -19-11NOV14-7/64

<p>6 Hydraulic System Relief Valve Stuck Open</p>	<p>Check hydraulic system pressure. See Hydraulic System Relief Valve Test. (Group 9025-25.)</p> <p>Is system relief valve to specification?</p>	<p>YES: Checks complete.</p> <p>NO: Adjust system relief valve to specification. Replace if system relief valve will not adjust correctly.</p>
--	--	--

AB06447,0000B9F -19-11NOV14-8/64

One Hydraulic Function Does Not Work Diagnostic Procedure

AB06447,0000B9F -19-11NOV14-9/64

<p>1 Diagnostic Trouble Codes (DTCs)</p>	<p>Check standard display monitor (SDM) for any DTCs. See Diagnostics—Codes, SDM. (Operator's Manual.) See Reading Diagnostic Trouble Codes with Service ADVISOR™ Diagnostic Application. (Group 9015-15.)</p> <p>Are DTCs present?</p>	<p>YES: Diagnose and repair displayed DTCs.</p> <p>NO: Go to Circuit Relief Valve Stuck Open.</p>
---	---	---

AB06447,0000B9F -19-11NOV14-10/64

<p>2 Circuit Relief Valve Stuck Open</p>	<p>Check circuit relief pressures. See Circuit Relief Valve Test. (Group 9025-25.)</p> <p>Are circuit relief valves within specification?</p>	<p>YES: Go to Anticavitation Valve Stuck Open.</p> <p>NO: Adjust or replace circuit relief valve as necessary.</p>
---	---	--

AB06447,0000B9F -19-11NOV14-11/64

<p>3 Anticavitation Valve Stuck Open</p>	<p>Remove and inspect anticavitation valves. See Hydraulic Control Valve Disassemble and Assemble. (Group 3260.)</p> <p>Is anticavitation valve worn or damaged?</p>	<p>YES: Repair or replace anticavitation valve.</p> <p>NO: Go to Hydraulic Lines Blocked or Damaged.</p>
---	--	--

AB06447,0000B9F -19-11NOV14-12/64

<p>4 Hydraulic Lines Blocked or Damaged</p>	<p>Inspect hydraulic lines. See Main Hydraulic Component Location and see Ripper Hydraulic Component Location. (Group 9025-15.)</p> <p>Are any lines against frame, damaged, kinked, or in a condition that would cause a line or hose to have a restriction?</p>	<p>YES: Repair or replace damaged lines.</p> <p>NO: Go to Hydraulic Cylinders Leaking Internally.</p>
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AB06447,0000B9F -19-11NOV14-13/64

Diagnostic Information

11 Pump Load Sense Differential and System Pressure Low	Check pump load sense differential and system pressure. <u>See Pump Load Sense Differential and System Pressure (Load Sense Relief) Test and Adjustment—IGC.</u> (Group 9025-25.) Is main hydraulic pump control valve within specification?	YES: Go to Pilot Control Pressure Low. NO: Adjust main hydraulic pump control valve to specification. AB06447,0000BA0 -19-17NOV16-28/76
--	---	---

12 Pilot Control Pressure Low	Check pilot control pressure. <u>See Pressure Reducing Valve Pressure Test and Adjustment.</u> (Group 9025-25.) Is pilot pressure regulating valve pressure within specification?	YES: Go to Hydraulic System Relief Valve Stuck Open. NO: Adjust pilot pressure regulating valve to specification. AB06447,0000BA0 -19-17NOV16-29/76
--------------------------------------	--	---

13 Hydraulic System Relief Valve Stuck Open	Check hydraulic system relief valve pressure. <u>See Hydraulic System Relief Valve Test—IGC.</u> (Group 9025-25.) Is hydraulic system relief valve pressure within specification?	YES: Go to Hydraulic Control Valve Spool Binding. NO: Replace hydraulic system relief valve. AB06447,0000BA0 -19-17NOV16-30/76
--	--	--

14 Hydraulic Control Valve Spool Binding	Remove and inspect suspected control valve spool. <u>See Hydraulic Control Valve Disassemble and Assemble.</u> (Group 3260.) Is control valve spool binding?	YES: Repair or replace control valve as necessary. NO: Go to Hydraulic Pump Worn or Damaged. AB06447,0000BA0 -19-17NOV16-31/76
---	---	--

15 Hydraulic Pump Worn or Damaged	Perform hydraulic pump flow test. <u>See Hydraulic Pump Flow Test.</u> (Group 9025-25.) Is pump flow within specification?	YES: Checks complete. NO: Repair or replace pump as necessary. AB06447,0000BA0 -19-17NOV16-32/76
--	---	--

Low Hydraulic Power Diagnostic Procedure

AB06447,0000BA0 -19-17NOV16-33/76

1 Pump Load Sense Differential and System Pressure Low	Check pump load sense differential and system pressure. <u>See Pump Load Sense Differential and System Pressure (Load Sense Relief) Test and Adjustment—IGC.</u> (Group 9025-25.) Is main hydraulic pump control valve within specification?	YES: Go to Circuit Relief Valve Pressure Low. NO: Adjust main hydraulic pump control valve to specification. AB06447,0000BA0 -19-17NOV16-34/76
---	---	--

Continued on next page

Hydraulic Accumulator Discharge Procedure

SPECIFICATIONS

Hydraulic Oil Temperature	60—71°C 140—160°F
---------------------------	----------------------

SERVICE EQUIPMENT AND TOOLS

JT02156A Digital Pressure and Temperature Analyzer
JT02162 34 000 kPa (350 bar) (5000 psi) Transducer

Purpose of this procedure is to ensure that no hydraulic pressure remains in accumulator prior to charging accumulator.

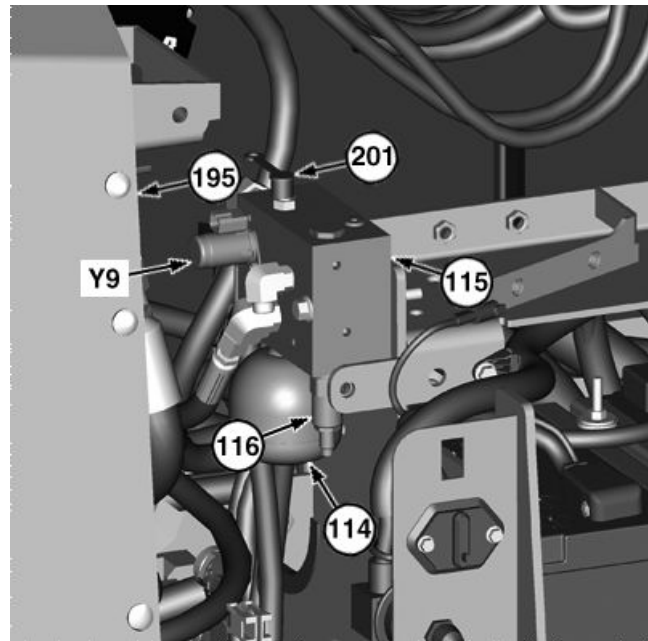
Pilot Control Machines

1. Install JT02156A Digital Pressure and Temperature Analyzer with JT02162 34 000 kPa (350 bar) (5000 psi) Transducer to pressure reducing valve test port (201).
2. Warm hydraulic oil to specification. Stop engine.

Specification

Hydraulic Oil—Temperature.....	60—71°C 140—160°F
--------------------------------	----------------------

3. Switched power ON. Enable hydraulics. Cycle blade control lever in all directions.
4. Hold blade control lever in forward position until digital pressure and temperature analyzer reads zero. All hydraulic accumulator pressure has been discharged.



Pilot Pressure Test Location

- | | |
|--------------------------------------|--|
| 114— Hydraulic Accumulator | 195— Hydraulic Oil Reservoir |
| 115— Pressure Reducing Valve | 201— Pressure Reducing Valve Test Port |
| 116— Pilot Pressure Regulating Valve | Y9— Hydraulic Enable Solenoid |

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AB06447,0000B8D -19-03NOV14-1/2

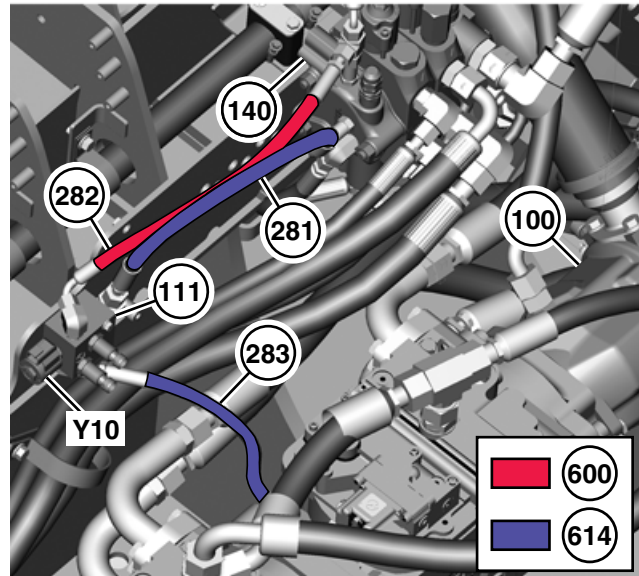
Reading Pressure With Test Equipment

CAUTION: To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

If necessary, pressure readings can be obtained by installing tee fitting and test equipment to engine overspeed protection valve (port PP)-to-main control valve line (282).

For more information:

- See Operator's Station Tilting Procedure. (Operator's Manual.)
- See Engine Overspeed Protection Valve Operation. (Group 9025-05.)
- See JT02156A Digital Pressure and Temperature Analyzer Kit Installation. (Group 9025-25.)



Engine Overspeed Protection Valve

- | | |
|--|---|
| 100— Main Hydraulic Pump | 283— Engine Overspeed Protection Valve (port LSP)-to-Main Hydraulic Pump Control Valve Line |
| 111— Engine Overspeed Protection Valve | 600— High-Pressure Oil |
| 140— Main Control Valve | 614— Load Sense Pressure Oil |
| 281— Engine Overspeed Protection Valve (port LSV)-to-Main Control Valve Line | Y10— Overspeed Solenoid |
| 282— Engine Overspeed Protection Valve (port PP)-to-Main Control Valve Line | |

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AB06447,0000BAC -19-05NOV14-4/5

TX1169212—UN—23SEP14

Cylinder Function Drift Test

SPECIFICATIONS	
Hydraulic Oil Temperature	60—72°C 140—160°F
Lift Cylinder Rod Drift (maximum)	4 mm/min. 0.16 in./min.
Tilt Cylinder Rod Drift (maximum)	2 mm/min. 0.08 in./min.
Pitch Cylinder Rod Drift (maximum)	2 mm/min. 0.08 in./min.
Ripper Lift Cylinder Rod Drift (maximum)	4 mm/min. 0.16 in./min.

SERVICE EQUIPMENT AND TOOLS
Tape and Ruler

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.

1. Warm hydraulic oil to specification.

Specification

Hydraulic Oil—Temperature.....	60—72°C 140—160°F
--------------------------------	----------------------

2. Raise blade approximately 0.61 m (2 ft.) from ground. Place control valve in neutral.

3. Stop engine.

4. Measure movement of lift, tilt, and pitch cylinder rods for 5 minutes. Divide measured rod movement by five to determine drift per minute. Compare to specification.

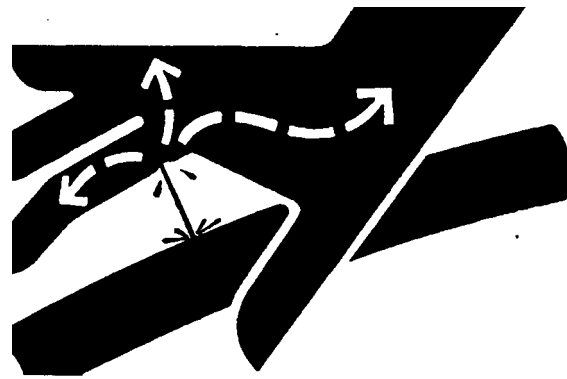
Specification

Lift Cylinder Rod—Drift (maximum).....	4 mm/min. 0.16 in./min.
Tilt Cylinder Rod—Drift (maximum).....	2 mm/min. 0.08 in./min.
Pitch Cylinder Rod—Drift (maximum).....	2 mm/min. 0.08 in./min.

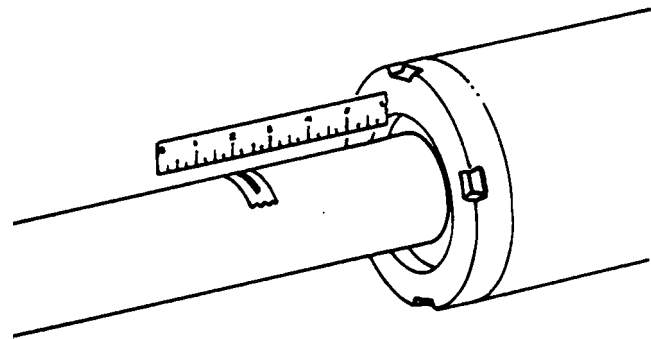
5. Start machine. Lower blade to ground.

6. Raise front of machine off ground 5.1—7.6 cm (2—3 in.) Place control valve in neutral.

7. Stop engine.



Escaping Fluid



Cylinder Rod Movement

8. Measure movement of lift, tilt, and pitch cylinder rods for 5 minutes. Divide measured rod movement by five to determine drift per minute. Compare to specification.

Specification

Lift Cylinder Rod—Drift (maximum).....	4 mm/min. 0.16 in./min.
Tilt Cylinder Rod—Drift (maximum).....	2 mm/min. 0.08 in./min.
Pitch Cylinder Rod—Drift (maximum).....	2 mm/min. 0.08 in./min.

9. Raise ripper approximately 0.61 m (2 ft.) from ground. Place control valve in neutral.

10. Stop engine.

11. Measure movement of ripper lift and ripper pitch cylinder rod for 5 minutes. Divide measured rod movement by five to determine drift per minute. Compare to specification.

Specification

Ripper Lift Cylinder Rod—Drift (maximum).....	4 mm/min. 0.16 in./min.
---	----------------------------

12. Start machine. Lower ripper to ground.

13. Raise rear of machine off ground 5.1—7.6 cm (2—3 in.) Place control valve in neutral.

Continued on next page

AB06447,0000B96 -19-06OCT14-1/2

X9811—UN—23AUG88

T622AM—UN—26MAY89

Section 9026 Hydrostatic System

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For information on the hydrostatic oil cooling circuit, see Oil Cooler and Reservoir Bypass Operation. (Group 9026-05.)

Third, the HIC valve contains components for the park brake circuit:

- Park Brake Solenoid Valve 1
- Park Brake Solenoid 1 (Y3)
- Park Brake Solenoid Valve 2
- Park Brake Solenoid 2 (Y4)
- Park Brake Pressure Sensor (B9)

For information on the park brake circuit, see Park Brake Valve Operation. (Group 9026-05.)

Fourth, the HIC valve contains components for the hydraulic hand pump circuit:

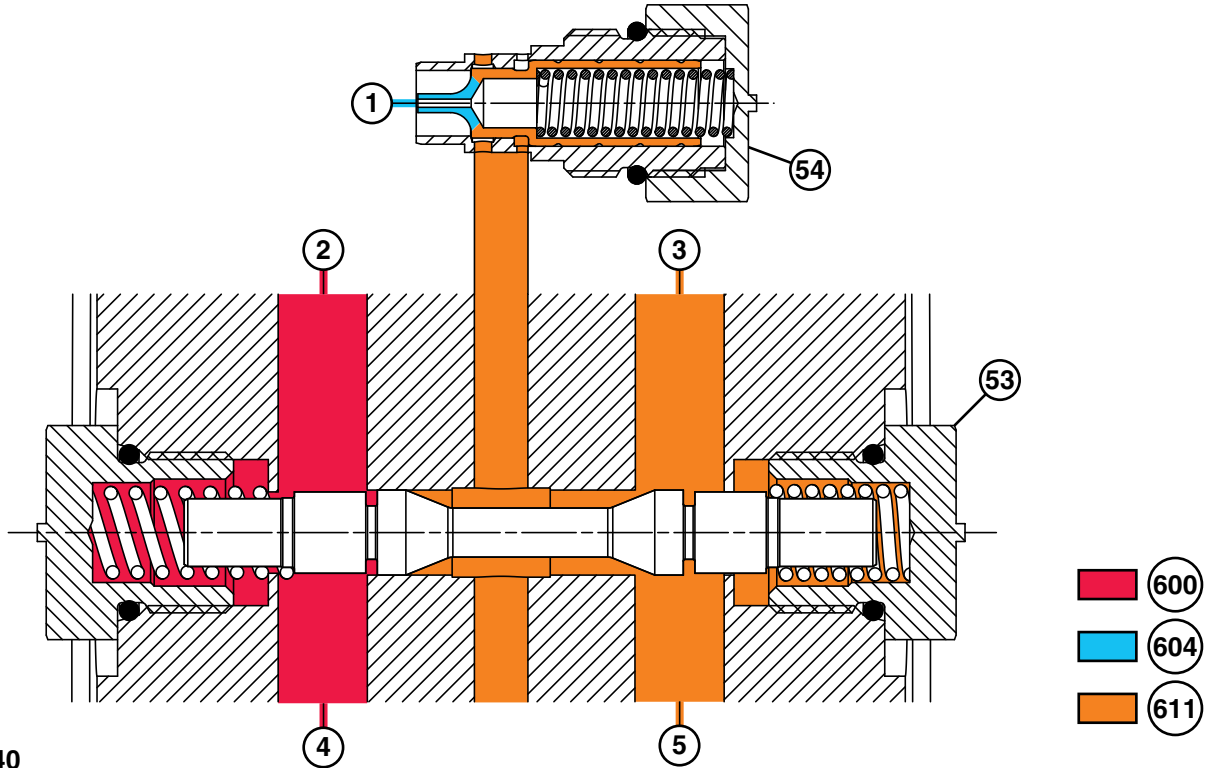
- Hand Pump (91)
- Hand Pump Selector Valve 1 (92)
- Hand Pump Selector Valve 2 (93)
- Hand Pump Park Brake Relief Valve (94)
- Hand Pump Cab Tilt Relief Valve (95)
- Ball Shuttle Valve (97)

The hand pump can be used to either release park brake for towing machine or for raising operator's station. For more information on hand pump operation, see Releasing Park Brake to Tow the Machine and see Operator's Station Tilting Procedure. (Operator's Manual.)

For more HIC valve information, see Hydrostatic System Schematic—Neutral (Park Brake On). (Group 9026-15.)

SK32938,000087B -19-02OCT14-2/2

Flushing Valve and Operating Charge Relief Valve Operation



TX1159440

Hydrostatic Motor Flushing Valve Operation (forward travel)

- | | | | |
|--|--|---|------------------------|
| 1— Flushing Flow to Hydrostatic Motor Case | 3— Hydrostatic Circuit Pressure (port B, reverse travel) | 5— Flow to Shuttle Valve (port B, reverse travel) | 600— High-Pressure Oil |
| 2— Hydrostatic Circuit Pressure (port A, forward travel) | 4— Flow to Shuttle Valve (port A, forward travel) | 53— Flushing Valve | 604— Return Oil |
| | | 54— Operating Charge Pressure Relief Valve | 611— Charge Oil |

The flushing valve (53) and the operating charge pressure relief valve (54) are a part of the closed-loop circuit and are used to cool both the oil and the hydraulic components of the closed-loop circuit. Valves are located in the hydrostatic motors.

The flushing valve is a spring balanced spool that senses pressure on both sides of the closed-loop circuit. The operating charge pressure relief valve is of the direct-acting, orificed, poppet-type design.

In neutral with equal pressure on both sides of the closed-loop circuit, the springs center the flushing valve spool. In the centered position, operating charge pressure relief valve is not connected to the closed-loop circuit. The closed-loop circuit pressure is controlled by the neutral charge valve.

In forward, one side of the closed-loop circuit will be at a higher pressure than the other. The flushing valve senses this and shifts away from the high pressure. In this

position the lower pressure side of the closed-loop circuit is connected to the operating charge pressure relief valve. Its setting is lower than the neutral charge valve. With this pressure difference relationship and with pressure oil taking the path of least resistance, there will be oil flow through the operating charge pressure relief valve. In this condition, oil on the low pressure side of the closed-loop circuit will be lost through the flushing and operating charge pressure relief valves. To make up for this loss, cool filtered oil from the charge circuit will enter the low side of the closed-loop circuit through the multi-function valve. Thus there is constant flow of clean cool oil into the closed-loop circuit when in forward.

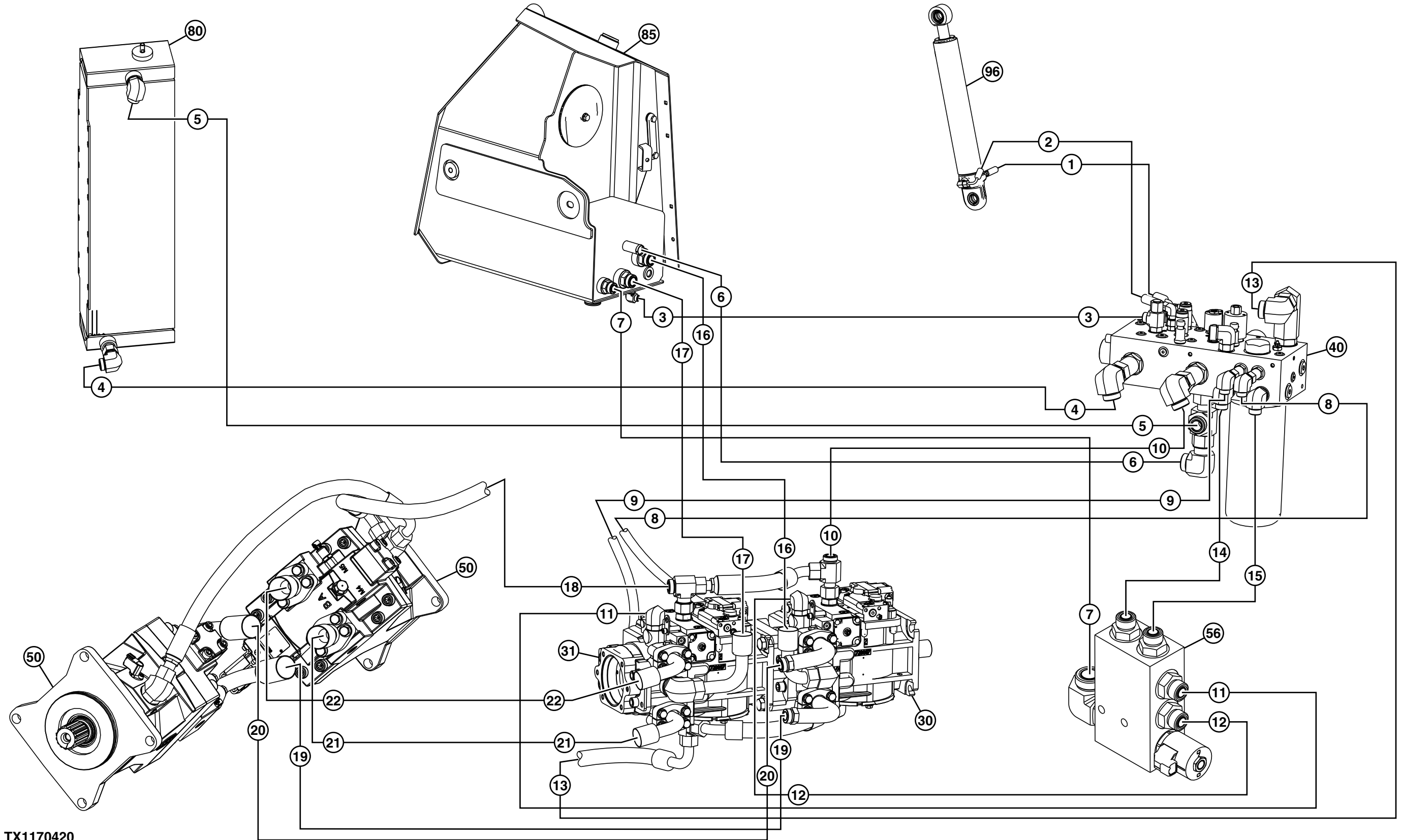
In reverse, the closed-loop circuit pressures switch from one side to the other, the flushing valve shifts to the opposite side and the low side pressure is again connected to the operating charge pressure relief valve. As in forward the hot oil in the closed-loop circuit is routed out and clean oil is directed in.

SK32938,0000883 -19-08SEP14-1/1

TX1159440 —UN—29APR14

Hydrostatic System Line Identification

TX1170420 —UN—08OCT14



TX1170420

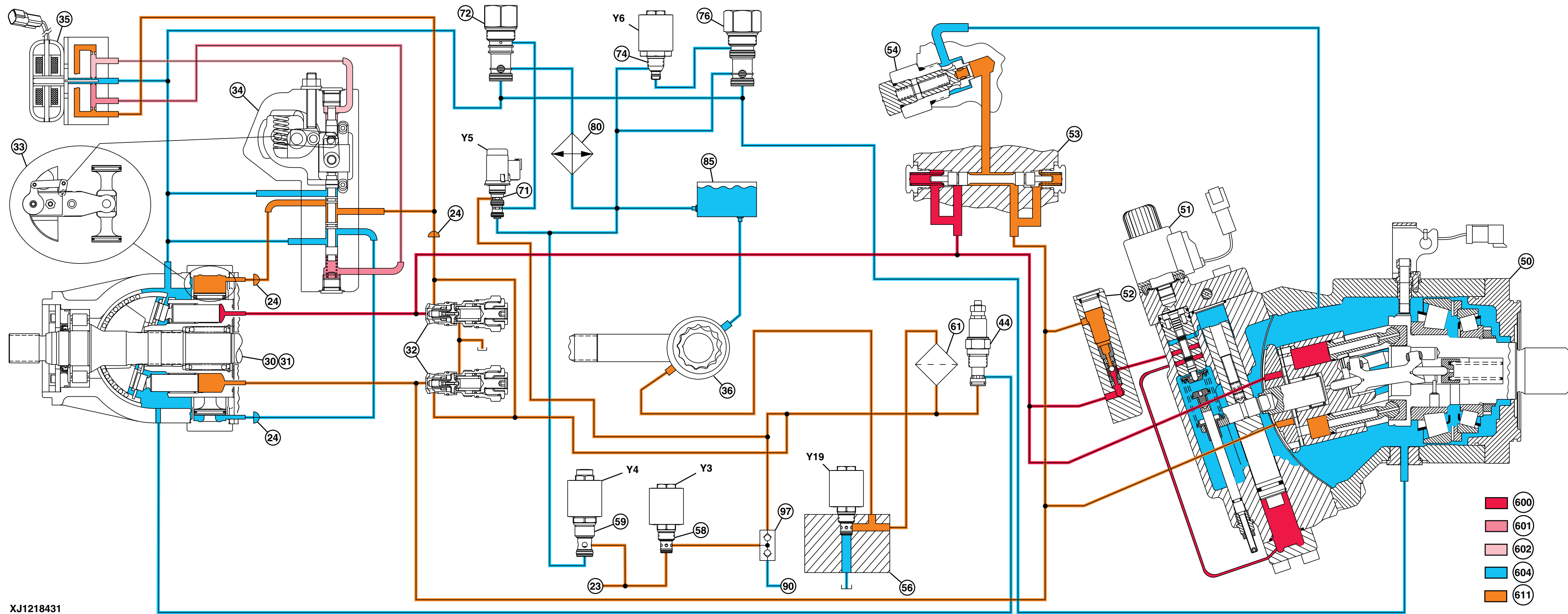
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Hydrostatic System Line Identification (750K [S.N. —297255] and 850K shown)

SK32938,0000871 -19-29JUN16-1/4

Hydrostatic System Diagram—Forward (Fast Speed)

XJ1218431 —UN—05JUL16



XJ1218431

Continued on next page

Hydrostatic System Diagram—Forward (fast speed)—750K (S.N. —297255)

SK32938,0000887 -19-19JUL16-1/4

Mistrack/Index Malfunctions

SK32938,000088C -19-17NOV16-1/12

Mistrack or Index Diagnostic Procedure

SK32938,000088C -19-17NOV16-2/12

<p>1 Diagnostic Trouble Codes (DTCs)</p>	<p>Check primary display unit (PDU) or standard display monitor (SDM) for any DTCs. <u>See Diagnostics—Codes, PDU</u> or <u>see Diagnostics—Codes, SDM</u>. (Operator's Manual.) <u>See Reading Diagnostic Trouble Codes with Service ADVISOR™ Diagnostic Application</u>. (Group 9015-15.)</p> <p>Are DTCs present?</p>	<p>YES: Diagnose and repair displayed DTCs.</p> <p>NO: Go to Track Tension Check.</p> <p>SK32938,000088C -19-17NOV16-3/12</p>
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<p>2 Track Tension Check</p>	<p>Check track tension. <u>See Check and Adjust Track Sag</u>. (Operator's Manual.)</p> <p>Is track tension within specification?</p>	<p>YES: Go to Tracker OFF Check.</p> <p>NO: Adjust tracks.</p> <p>SK32938,000088C -19-17NOV16-4/12</p>
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<p>3 Tracker OFF Check</p>	<p>Turn off tracker control. <u>See Diagnostics—Transmission Test Modes, PDU</u> or <u>see Diagnostics—TCU Diagnostics, SDM</u>. (Group 9015-16.)</p> <p>Does mistracking improve with tracker OFF?</p>	<p>YES: Repair or replace motor speed sensors. <u>See Vehicle Harness (W15) Component Location</u> or <u>see see Vehicle (SmartGrade™ and IGC Controls) Harness (W16) Component Location</u>. (Group 9015-10.)</p> <p>NO: Go to Motor Shift Solenoid Valve Check.</p> <p>SK32938,000088C -19-17NOV16-5/12</p>
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<p>4 Motor Shift Solenoid Valve Check</p>	<p>Check motor shift solenoid valves for proper adjustment. <u>See Motor Shift Solenoid Valve Adjustment</u>. (Group 9026-25.)</p> <p>Are motor shift solenoid valves adjusted properly?</p>	<p>YES: Go to Transmission Control Unit (TCU) Calibration Check.</p> <p>NO: Repair or adjust motor shift solenoid valves as necessary.</p> <p>SK32938,000088C -19-17NOV16-6/12</p>
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<p>5 Transmission Control Unit (TCU) Calibration Check</p>	<p>Turn diagnostic mode ON in PDU or SDM. <u>See Diagnostics—Transmission Test Modes, PDU</u> or <u>see Diagnostics—TCU Diagnostics, SDM</u>. (Group 9015-16.)</p> <p>Does mistracking improve with diagnostic mode ON?</p>	<p>YES: Calibrate TCU. <u>See Transmission Control Unit (TCU) Calibration</u>. (Group 9015-20.)</p> <p>NO: Go to Neutral and Operating Charge Pressure Check.</p> <p>SK32938,000088C -19-17NOV16-7/12</p>
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Diagnostic Information

<p>16 Hydrostatic Motor Min./Max. Angle Servo Piston Pressure Check</p>	<p>Check hydrostatic motor min./max. angle servo piston pressure. See Hydrostatic Motor Min./Max. Angle Servo Piston Pressure Test. (Group 9026-25.)</p> <p>Is hydrostatic motor min./max. angle servo piston pressure within specification?</p>	<p>YES: Go to Track Tension Check.</p> <p>NO: Repair or replace hydrostatic motor as necessary.</p> <p style="text-align: right; font-size: small;">SK32938,0000890 -19-18NOV16-18/26</p>
<p>17 Track Tension Check</p>	<p>Is track tension within specification? See Check and Adjust Track Sag. (Operator's Manual.)</p>	<p>YES: Go to Engine Speed Check.</p> <p>NO: Adjust tracks.</p> <p style="text-align: right; font-size: small;">SK32938,0000890 -19-18NOV16-19/26</p>
<p>18 Engine Speed Check</p>	<p>Set engine to fast idle.</p> <p>Is engine speed reading on PDU approximately 2250—2300 rpm?</p>	<p>YES: Go to Transmission Speed Check.</p> <p>NO: Follow engine diagnostic procedure. See Engine Idle Speeds and Auto-Shutdown Check. (Group 9010-25.)</p> <p style="text-align: right; font-size: small;">SK32938,0000890 -19-18NOV16-20/26</p>
<p>19 Transmission Speed Check</p>	<p>Set transmission speed to 3.0.</p> <p>Is engine speed during machine travel at least 2100 rpm?</p>	<p>YES: Go to Neutral and Operating Charge Pressure Check.</p> <p>NO: Diagnose low power malfunctions. See Low Power Malfunctions. (Group 9026-15.)</p> <p style="text-align: right; font-size: small;">SK32938,0000890 -19-18NOV16-21/26</p>
<p>20 Neutral and Operating Charge Pressure Check</p>	<p>Perform neutral charge relief and operating charge relief pressure test. See Neutral Charge Relief and Operating Charge Relief Pressure Test. (Group 9026-25.)</p> <p>Are the charge relief pressures within specification?</p>	<p>YES: Go to Transmission Efficiency Check.</p> <p>NO: Diagnose and repair charge pressure system. See Low Charge Pressure Malfunctions. (Group 9026-15.)</p> <p style="text-align: right; font-size: small;">SK32938,0000890 -19-18NOV16-22/26</p>

Continued on next page

13. Set engine speed to specification.

Specification

Engine—Speed..... Fast Idle

CAUTION: Prevent possible injury from unexpected track movement. Tracks will rotate when transmission control lever (TCL) is moved to forward or reverse. Be careful not to accidentally actuate controls when bystanders are present.

14. Move transmission control lever (TCL) to forward. Slowly release decelerator/brake pedal. Carefully

monitor the mA as the decelerator/brake pedal is released. The reading will go from 0 to a low reading (e.g., 15.9 mA), indicating the threshold or initial reading.

15. With the decelerator/brake pedal fully released, slowly increase speed in grip (SIG) to maximum speed position to continue increasing the mA.

16. Record milliamp and differential readings as follows:

Transmission Speed	Control Milliamp	Front Pump Control Pressure		Rear Pump Control Pressure		Calculated Pressure Differential	
		Forward	Reverse	Forward	Reverse	Front Pump	Rear Pump
Neutral Reading at (1.0)	0						
Initial Reading at (1.0) (record actual mA)	__mA						
Increase speed to get—	35 mA						
Increase speed to get—	50 mA						
Increase speed to get—	75 mA						
Maximum Reading at (3.0) (record actual mA)	__mA						

17. Repeat the procedure for reverse.

18. Analyze test results as follows:

The initial reading when coming out of neutral is the threshold of movement value (tracks begin to move).

The relationship between control milliamps and differential control pressure is approximately 7 kPa (0.07 bar) (1 psi) differential OUT of the pressure control pilot (PCP) for each milliamp IN.

The operation of the PCP can be considered acceptable if pressure reading is reasonably close to the theoretical value and linear to the milliamp values.

Specification

Input Current-to-
Control—Pressure..... 1 mA/6.89 kPa
1 mA/0.069 bar
1 mA/1 psi

SK32938,0000898 -19-03NOV14-2/2

Pump Servo Pressure Test

SPECIFICATIONS	
Engine Speed	Fast Idle
Transmission Speed Setting	3.0

SERVICE EQUIPMENT AND TOOLS	
Quick Coupler (2 used)	
JT02156A Digital Pressure and Temperature Analyzer	
JT02161 3500 kPa (35 bar) (500 psi) Transducer (2 used)	
JDG1932 Test Harness	
DFT1369 Pump Control Pilot (PCP) Test Harness [750K (S.N.—297255) and 850K]	
DFT1379 Pump Control Pilot (PCP) Test Harness 750K (S.N. 297256—)	

NOTE: This procedure tests only one pump servo control circuit and pump displacement control valve (PDCV) but can be done on each pump separately.

The purpose of this test is to check proper operation of the pump servo control circuit and pump displacement control valve (PDCV).

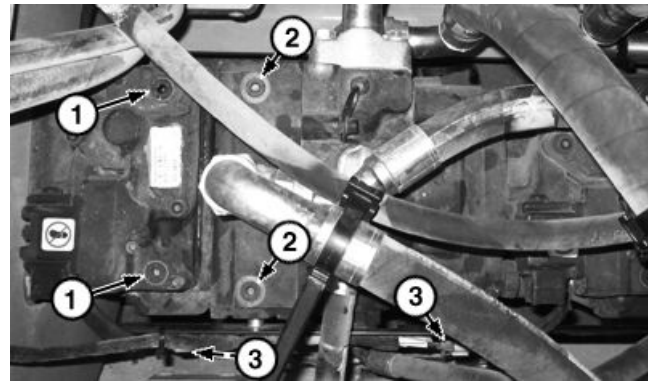
Diagnostic trouble codes will be recorded during this test and must be cleared when completed.

CAUTION: Prevent possible injury from unexpected track movement. Raise the machine off the ground and support with appropriate stands. Tracks MUST be clear of tools and objects before rotating.

1. Raise machine off the ground and support with appropriate stands. See Machine Supporting Procedure. (Group 9026-25.)

Lower blade to ground. Tracks MUST be free to rotate in either direction.
2. Tilt operator's station and install mechanical safety support lock pin. See Operator's Station Tilting Procedure. (Operator's Manual.)
3. Install quick couplers in pump servo test ports (2). Install JT02156A Digital Pressure and Temperature Analyzer with JT02161 3500 kPa (35 bar) (500 psi) Transducers or pressure gauges.
4. Lower operator's station.
5. Display Charge Pressure on primary display monitor (PDU) or standard display monitor (SDM). See Diagnostics—Transmission Readings, PDU or see Diagnostics—Transmission Readings, SDM. (Operator's Manual.)
6. Start engine and check that forward and reverse servo pressures on both pumps are equal, and less than charge pressure in neutral.

If pressures are not within specification, check neutral (null) adjustment or go to Mistrack/Index diagnostics. See Pump Displacement Control Valve



Hydrostatic Pump Test Ports

- 1— Pump Displacement Control Valve (PDCV) Test Port (4 used)
- 2— Pump Servo Test Port (4 used)
- 3— Pump Pressure Control Pilot (PCP) Connector (2 used)

(PDCV) Neutral (Null) Adjustment. (Group 9026-25.)
See Mistrack/Index Malfunctions. (Group 9026-15.)

7. Set engine speed to specification.

Specification

Engine—Speed..... Fast Idle

8. Set transmission speed to specification.

Specification

Transmission
Speed—Setting..... 3.0

9. Select transmission mode (LED on) using sealed switch module (SSM) decelerator mode switch.

CAUTION: Prevent possible injury from unexpected track movement. Tracks will rotate when TCL is moved to forward or reverse. Be careful not to accidentally actuate controls when bystanders are present.

10. Test forward servo pressure and charge pressure:
 - a. Push decelerator/brake pedal to floor.
 - b. Put park lock levers in down (unlocked) position.
 - c. Put TCL lever in forward.
 - d. Slowly release decelerator/brake pedal.
 - e. Record forward servo pressure and charge pressure.
11. Repeat test using reverse servo pressure and charge pressure.
12. Compare servo pressures with charge pressure. Servo pressures must be approximately equal or less than charge pressure.

- If servo pressures are equal and less than charge pressure, proceed to next step.

Continued on next page

SK32938,00008A3 -19-04AUG16-1/2

TX1174673A—UN—17OCT14

Hydrostatic Oil Reservoir Bypass Test

SPECIFICATIONS	
Transmission Oil Temperature	57—66°C 135—150°F
Engine Speed	Fast Idle
Hydrostatic Oil Reservoir Bypass Solenoid	
Case Return (Bypass ON) Pressure	69—172 kPa 0.69—1.72 bar 10—25 psi
Case Return (Bypass ON) Voltage	24 V
Hydrostatic Oil Reservoir Bypass Solenoid	
Case Return (Bypass OFF) Pressure	345—552 kPa 3.45—5.52 bar 50—80 psi
Case Return (Bypass OFF) Voltage	0 V
Hydrostatic Oil Cooler Reservoir Solenoid Coil Resistance at 20°C (68°F)	32.0—35.5 ohms
Hydrostatic Oil Reservoir Bypass Valve	
Case Return (Bypass ON) Pressure	241—345 kPa 2.41—3.45 bar 35—50 psi
Hydrostatic Oil Reservoir Bypass Valve	
Case Return (Bypass OFF) Pressure	414—621 kPa 4.14—6.21 bar 60—90 psi

ESSENTIAL TOOLS	
JDG10006 Test Harness	
JT07237-1 Single Pin Test Harness	

SERVICE EQUIPMENT AND TOOLS	
Quick Coupler (7/16-20UN M ORB)	
JT02156A Digital Pressure and Temperature Analyzer	
JT02162 35 000 kPa (350 bar) (5000 psi) Transducer	
Multimeter	

The purpose of this test is to determine if the reservoir bypass valves are operating properly.

Diagnostic trouble codes will be recorded during this test and must be cleared when completed.

Hydrostatic Oil Reservoir Bypass Solenoid Test

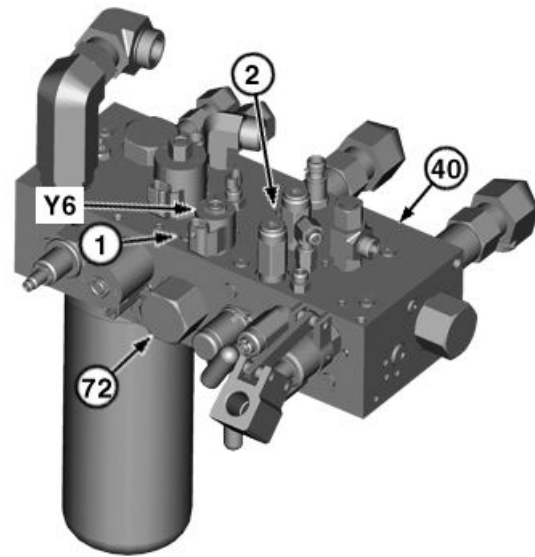
1. Warm transmission oil to specification. See [Transmission Oil Warm-Up Procedure](#). (Group 9026-25.)

Specification

Transmission Oil—Temperature.....	57—66°C 135—150°F
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2. Install quick coupler in test port 11 (1). Connect JT02161 35 000 kPa (350 bar) (5000 psi) Transducer and JT02156A Digital Temperature and Pressure Analyzer or a gauge.

3. Connect JDG10006 Test Harness between hydrostatic oil reservoir bypass solenoid and vehicle harness.



Hydraulic Integrated Circuit (HIC) Valve

- | | |
|--|---|
| 1— Test Port 11 | 72— Hydrostatic Oil Reservoir Bypass Valve |
| 2— Test Port 8 | Y6— Hydrostatic Oil Reservoir Bypass Solenoid |
| 40— Hydraulic Integrated Circuit (HIC) Valve | |

4. Connect multimeter using JT07237-1 Single Pin Test Harness.
5. Start engine and run at specification.

Specification

Engine—Speed..... Fast Idle

6. Set cooler bypass control to ON (cooler closed). See [Diagnostics—Transmission Test Modes, PDU](#) or see [Diagnostics—TCU Diagnostics, SDM](#). (Group 9015-16.)
7. Set tank bypass control to ON (tank open). See [Diagnostics—Transmission Test Modes, PDU](#) or see [Diagnostics—TCU Diagnostics, SDM](#). (Group 9015-16.)
8. Record pressure in test port 11. Record DC voltage at hydrostatic oil reservoir bypass solenoid.

Hydrostatic Oil Reservoir Bypass Solenoid —Specification

Case Return (Bypass ON)—Pressure.....	69—172 kPa 0.69—1.72 bar 10—25 psi
Voltage	24 V

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SK32938,00008AB -19-06NOV14-1/2

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