Section 260 - STEERING AND BRAKES
Group 05 - Troubleshooting
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Group 15 - Tests and Adjustments
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Group 20C - Rear Brakes
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Section 270 - HYDRAULIC SYSTEM
Group 10 - Operational Checks
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BCU 522507.31- Control Unit Not Calibrated

06 GOTO

The diagnostic trouble code is generated if the BCU has not been calibrated yet, is incorrectly calibrated or if calibration has not been completed. It is also possible that this diagnostic trouble code is generated by mistake during hitch calibration. It is not necessary to perform the calibration procedure again unless this diagnostic trouble code cannot be deleted.

Alarm level: Information.

Reaction of control unit: If the diagnostic trouble code is active all the calibratable values in the memory are replaced by basic settings defined at the factory. Warning remains active until the fault is corrected.

See " General Information - Electrical System, Approach to Tabular Diagnostic Procedures " in Section 210, Group 10.

Diagnostic information for diagnostic trouble code BCU 522507.31

Diagnostic information for diagnostic trouble code BCU 522507.31	
Verify diagnostic trouble codes	Ensure that only relevant diagnostic trouble codes are dealt with: Do an operational check on faulty component/function, or do a test drive. Thereafter refresh diagnostic trouble codes. For procedure and further information, see " Operation and General Information on Diagnostics - Processing Diagnostic Trouble Codes " in Section 245, Group 05.
Calibrate the hitch	For calibrating the hitch, see address " BCU122 - Hitch Control Calibration " in Section 245, Group BCU. **→NOTE:** **Interactive calibration possible with Service ADVISOR.**
Additional information:	Try to isolate the fault: • Which error message is displayed when calibration aborts? • At what stage does calibration stop? • See " General Information - Electrical System, Troubleshooting Unsolved Problems " in Section 210, Group 10. • Check DTAC to find out whether there is any more information on this diagnostic trouble code.

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→NOTE:

For additional information, please refer to the corresponding Component Technical Manual for 2V-HPCR L16 engines.

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EPC 000092.19- Incorrect CAN BUS Message, Engine Load from ECU

19 GOTO

The diagnostic trouble code is generated when the ECU is not able to supply the CAN BUS message concerning engine load (CAN BUS message incorrect or missing).

Alarm level: Information.

See " General Information - Electrical System, Approach to Tabular Diagnostic Procedures " in Section 210, Group 10.

Diagnostic information for diagnostic trouble code EPC 000092.19

Diagnostic information for diagnostic trouble code EPC 000092.19	
Verify diagnostic trouble codes	Ensure that only relevant diagnostic trouble codes are dealt with: Do an operational check on faulty component/function, or do a test drive. Thereafter refresh diagnostic trouble codes. For procedure and further information, see " Operation and General Information on Diagnostics - Processing Diagnostic Trouble Codes " in Section 245, Group 05.
Preliminary test	Check whether there are additional ECU diagnostic trouble codes that may be related to this problem.
Additional information:	• See " General Information - Electrical System, Troubleshooting Unsolved Problems " in Section 210, Group 10. • Check DTAC to find out whether there is any more information on this diagnostic trouble code.

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Diagnostic schematic:	For a summary of the circuit (layout of leads), see Diagnostic Schematic, SE15 - BCU Control Unit (Electronic Hitch Control) in Section 240.
Ascertain and verify the status of the software	1. Ascertain the current status of the BCU control unit software, and make a note of its status: ◦ BCU: Ascertain software status via addresses BCU233 and BCU234 , and make a note of status. 2. Check whether more up-to-date**BCU** reprogramming software can be downloaded via John Deere Intranet (John Deere Custom Performance). ***IMPORTANT: Before programming a control unit with more up-to-date software, always check with DTAC whether there is information concerning the new software.*** **→NOTE: For more information, go to DTAC and see the summary of software for 5R Series tractors.** **3. Download the current software for reprogramming the control unit from John Deere Intranet (John Deere Custom Performance). Reprogram the control unit with the current software file. See Procedure When Programming Control Units in Section 245.**
Checks for intermittent faults	Perform a visual inspection on the BCU control unit, all the components that can be related to the problem and all their associated connectors. 1. Check for signs of damage or dirt. 2. Check the electrical connections for bad, loose, widened, slid-back or corroded contacts; also check the leads. ◦ For back-up, see also additional references for circuit checks:Test Procedure in the Event of Occasional Malfunctions in the BCU Circuits (Basic Functions) (BCU Beep Mode)in Section 240. For a summary of the layout of leads (cross-references to details of location and component information), see diagnostic schematic SE15: • SE15 - BCU Control Unit (Electronic Hitch Control) - Summary of References in Section 240.
Additional information:	Check DTAC to find out whether there is any more information on this diagnostic trouble code.

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M Grooves

The viscous fan drive is a temperature-controlled hydraulic fan clutch with speed control. It consists of driving clutch half (F) with drive shaft (A) and driven clutch half (D) with reservoir (K). The fan carrier (B) is seated with bearings on drive shaft. The channels (H) of both clutch halves form the operating chamber. The system is filled with a silicone fluid.

Torque is transmitted by means of the inner friction between the fluid and the surface of the operating chamber. The operating chamber surface is enlarged by means of grooves.

The amount of silicone fluid in viscous fan drive exceeds the capacity of reservoir so that there is always some fluid in the operating chamber. Consequently, the driven clutch half turns even when the radiator is cold, but at a slower speed than the driving clutch half.

As the radiator gets warm, bimetallic spring (E) expands and opens reservoir cap (L). Centrifugal force causes fluid to flow from the reservoir into the operating chamber. The high friction of the fluid in the operating chamber causes the speed of the driven clutch half to increase until both halves are travelling at approx. the same speed.

Centrifugal force causes oil to be forced outwards through groove (I) and, due to rotational speed, to be carried via return channel (J) to the reservoir. A cycle takes place. Fluid is constantly forced back into the reservoir and at the same time fluid is flowing into the operating compartment.

Because of the high fan speed, the radiator temperature drops. The bimetallic spring coil contracts, closing the reservoir cap and preventing further silicone fluid from flowing to the operating chamber. Fluid continues to flow into the reservoir through groove (I). The amount of fluid in the operating chamber decreases, reducing friction, and fan speed slows.

Grooves (G and M) enable fluid to flow quicker out of the operating chamber, enabling the viscous fan drive to react more quickly to changes in the radiator temperature.

Cooling System - Automatic Drive Belt Tensioner, Theory of Operation

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(1) Check supply voltage

Action:

1.1 - Check light supply voltage:

- Disconnect light connector X156F (wiring harness W12).
  - For details of location and information on components, see W12 in Component Information - Wiring Harnesses - Summary of References in Section 240, Group 110.
- Turn on ignition and worklights.
- Use a JT05791A or JDG1478 multimeter to check the supply voltage at connector X156F:
  - between pin A (lead 1029) and pin B (lead 0310, ground):

Item	Measurement	Specification
Worklight supply voltage	Voltage	12 volts

Result:

YES: GO TO 2 .

NO:GO TO 1.2.

Action:

1.2 - Check the ground lead:

- Use a JT05791A or JDG1478 multimeter to check the supply voltage at connector X156F:
  - between pin A (lead 1029) and any defined ground connection:

Item	Measurement	Specification
Worklight supply voltage	Voltage	12 volts

Result:

YES: Check ground lead 0310, GO TO 2 .

NO: GO TO 2 .

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Plus or AutoQuad Transmission)
- Diagnostic Schematic, SE32 - Prewiring for GreenStar

[3] - Diagnostic Schematic, SE16_3 - BCU Control Unit (Basic Functions) (CAN BUS, HMS, Alternator Control Function, Power Supply, Brakes)

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Diagnostic Schematic, SE26 - EPC Control Unit (Transmission Control with PowrQuad Plus or AutoQuad Plus Transmission)

- Diagnostic Schematic, SE26_1 - EPC Control Unit (Transmission Control with PowrQuad Plus or AutoQuad Plus Transmission)
- Diagnostic Schematic, SE26_2 - EPC Control Unit (Transmission Control with PowrQuad Plus or AutoQuad Plus Transmission) (Cont.)

[1] - Diagnostic Schematic, SE26_1 - EPC Control Unit (Transmission Control with PowrQuad Plus or AutoQuad Plus Transmission)

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Connector layout

Connector layout		
Pin no.	Lead no.	Wire color
C1	6060A	black
NC2	6128A	gray
NO4	-	-

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Component information	
Circuit:	SE06 - Lights - Summary of References

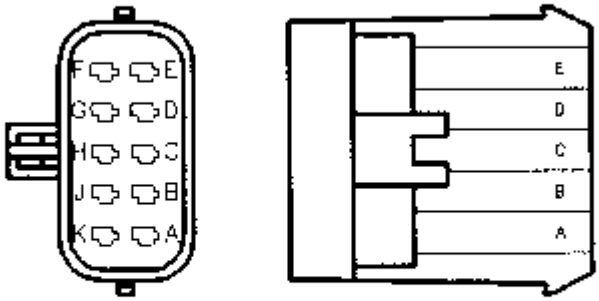
Connector layout

Connector layout		
Pin no.	Lead no.	Wire color
A	1028AC	gray
B	0310AU	black

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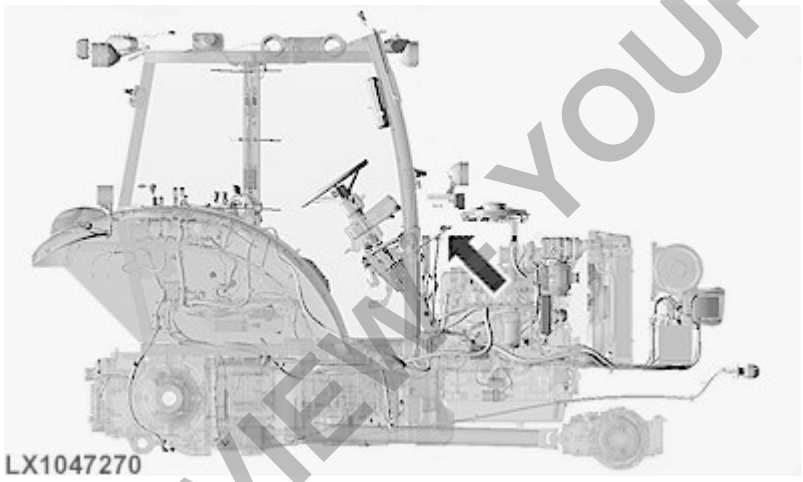
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X411M - Connecting Point between Harnesses W11 and W51



LX1017897

X411M



X411M

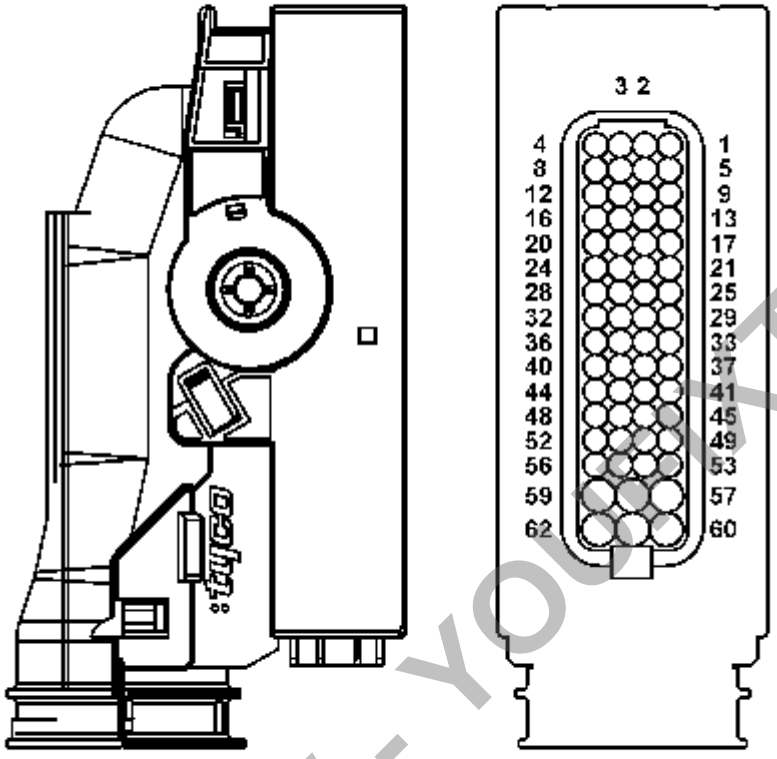
Component information

Component information	
Number of pins:	10
Spare part number:	57M7265
Manufacturer / repair information:	METRI PACK For repair information, see Section 40, Group 05 of the relevant repair manual.
Connection point:	X411M, see Section 240, Group 105.
Wiring harness:	W11, see Component Information - Wiring Harnesses - Summary of References in Section 240, Group 110.

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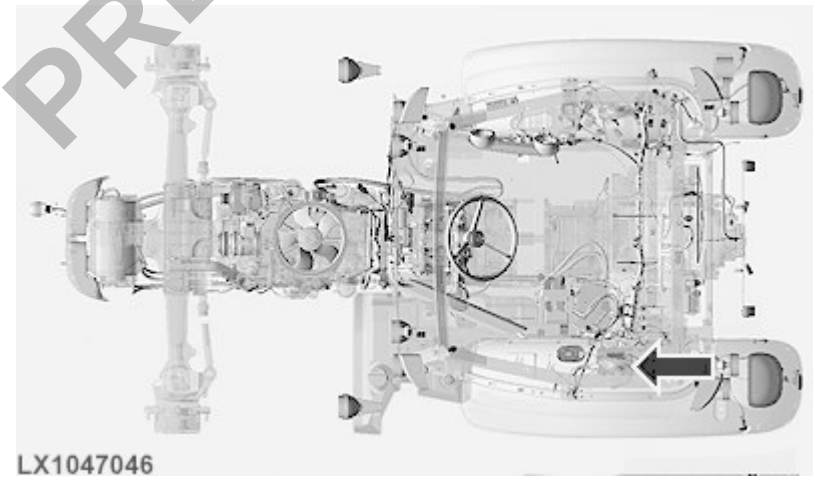
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X781F - Connecting Point between Harnesses W21 and W23



LX1040571

X781F



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Component information	
Task:	The ECU (Engine Control Unit) is responsible for controlling the 2-valve engine with HPCR.

Component check

(1) Check the ECU control unit (Level 16) (A86)

Action:

Perform a visual inspection of the Level 16 ECU control unit (A86) and of the connectors associated with it:

1. Check for signs of damage or dirt.
2. Check the electrical connections for bad, loose, widened, slid-back or corroded contacts; also check the leads.

Result:

YES: Test completed.

NO: Perform an operational check.

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Component information	
Circuit	SE23 - Level 16 ECU Control Unit (Electronic Engine Control) for 2-Valve HPCR Engine - Summary of References
Specifications:	Measuring range: 0 - 1600 bar (0 - 23206 psi; 0 - 160 mPa) Voltage: 0.3 - 6 volts For more information, see: • Component check
Components:	Compact component
Task:	Detects fuel pressure in the rail

Component check

(1) Check the rail pressure sensor (B137)

Action:

⚠ CAUTION:

Comply with the safety instructions in Section 210.

Perform a visual inspection of rail pressure sensor (B137) and of the connectors associated with it:

1. Check for signs of damage or dirt.
2. Check the electrical connections for bad, loose, widened, slid-back or corroded contacts; also check the leads.

Result:

YES: Test completed.

NO: Replace the component and perform an operational check.

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Component information	
Components:	Compact component
Task:	Shift up and down in gears. Turn Auto Mode of AutoQuad Plus transmission on and off. Engage and disengage clutch.

Component check

(1) Check switch (S158) for gear selector, Auto Mode and clutch

Action:

Perform a visual inspection of switch (S158) for gear selector, Auto Mode and clutch and of the connectors associated with it:

1. Check for signs of damage or dirt.
2. Check the electrical connections for bad, loose, widened, slid-back or corroded contacts; also check the leads.
3. Use a JT05791A or JDG1478 multimeter to check for continuity at the switch for gear selector, Auto Mode and clutch:

→NOTE: The switch for gear selector, Auto Mode and clutch must be disconnected from the electrical circuit when performing continuity tests.

Continuity table, with switch at various positions

No switch actuated	No continuity between pins C and B at connector X910F-1 No continuity between pins C and A at connector X910F-1 No continuity between pins C and D at connector X910F-1 No continuity between pins C at connector X910F-1 and A at connector X910F-2 Lighting (LED): pin B and C at connector X910F-2
Upshift switch actuated	Continuity between pins C and B at connector X910F-1 No continuity between pins C and A at connector X910F-1 No continuity between pins C and D at connector X910F-1 No continuity between pins C at connector X910F-1 and A at connector X910F-2 Lighting (LED): pin B and C at connector X910F-2
Downshift switch actuated	No continuity between pins C and B at connector X910F-1 Continuity between pins C and A at connector X910F-1 No continuity between pins C and D at connector X910F-1 No continuity between pins C at connector X910F-1 and A at connector X910F-2 Lighting (LED): pin B and C at connector X910F-2
Auto Mode switch actuated	No continuity between pins C and B at connector X910F-1 No continuity between pins C and A at connector X910F-1 Continuity between pins C and D at connector X910F-1 No continuity between pins C at connector X910F-1 and A at connector X910F-2 Lighting (LED): pin B and C at connector X910F-2

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(4) Check battery voltage

Action:

Surface charge must be removed before checking voltage of the battery.

To remove surface charge, ground battery negative terminal and turn light switch to position 4 (headlights and worklights) for one minute. Then turn light switch OFF, wait one minute and check battery voltage.

Result:

YES: If reading is 12.4 volts or more, GO TO 8

NO: If reading is less than 12.4 volts, GO TO 5

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ECU: Cylinder Misfire Test

→NOTE:

The interactive test can be performed only via Service ADVISOR.

ECU: Cylinder Misfire Test

ECU: Cylinder Misfire Test	
Description:	The Cylinder Misfire Test is used to compare the output of each cylinder relative to each of the other cylinders. The test will help identify problems such as an engine misfire or irregularly running engine.
Preparations:	1. Coolant must be at a temperature of at least 40° C (104° F). 2. Remove any load to the engine that may change during the test. For example, turn off the air-conditioning system. **→NOTE:** **The diagnostic software performs this test only when the coolant temperature is between 40°C (104°F) and 110°C (230°F).**
Procedure:	For a detailed description of the test, see: • ECU: Cylinder Misfire Test in the CTM for tractors with Level 16 ECU.
Result:	For assessment of test results, see detailed description of test in the relevant CTM.

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Address BCU099 - Input Address, Automatic Deletion of Diagnostic Trouble Codes

Input address, automatic deletion of diagnostic trouble codes

BCU099	Automatic Deletion of Diagnostic Trouble Codes	*5R.BIN datapoint - BCU_099*
Adjust the number of hours after which the diagnostic trouble codes are automatically deleted:	040 (factory setting) The possible input values are 0 - 255 hours.	

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Address BIF029 - Input Address, Electrical Starting Aid

Input Address, Electrical Starting Aid

BIF029	Input Address, Electrical Starting Aid	*5R.BIN datapoint - BIF_029_5R*
All tractor models without starting aid:	0	
All tractor models with starting aid:	1	

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Address EPC157 - Input Address, Parameters for Automatic Speed Matching

Input Address, Parameters for Automatic Speed Matching

EPC157	Parameters for automatic speed matching	*5R.BIN datapoint - EPC_157*
The values in this address indicate the requirements that must be met for automatic speed matching.		
Tractor model:		
5R	155	

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Item	Measurement	Specification
		205 psi

[5] - Upon completion of the test, install and tighten plug.

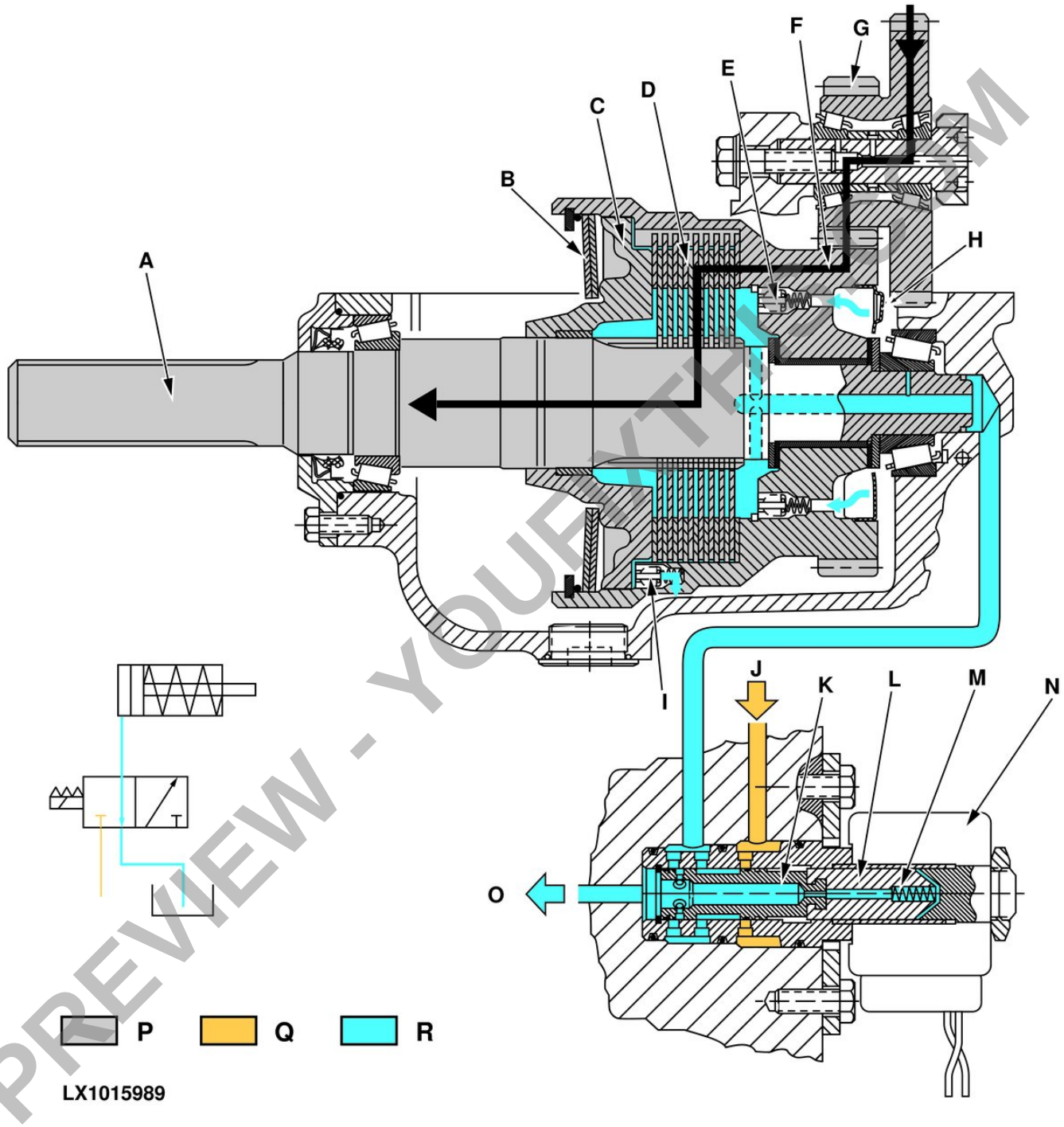
Item	Measurement	Specification
Plug	Torque	20 N˙m
		15 lb-ft

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Front-Wheel Drive Clutch - Oil and Power Flows

Oil flow and power flow with front-wheel drive engaged



Oil and power flow (front-wheel drive engaged)

LEGEND:

- A Clutch shaft
- B Belleville spring (2 used)
- C Piston
- D Disk pack
- E Check valve (2 used)

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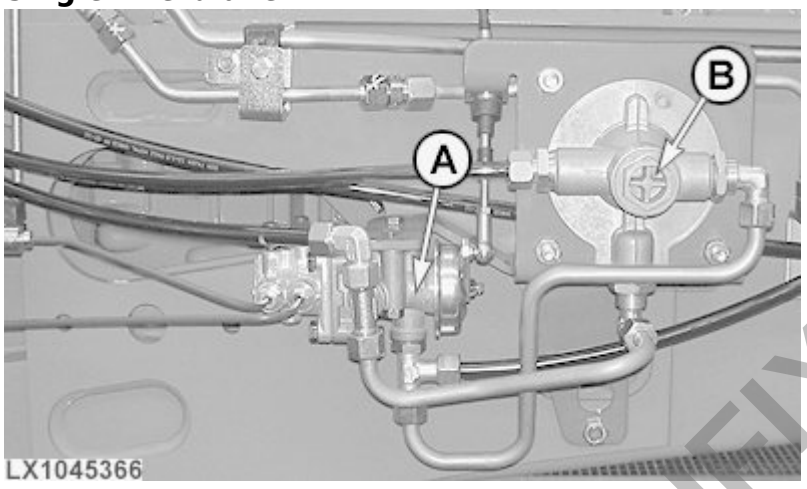
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When the park brake is activated, the control valve is also actuated via bowden cable (D).

→NOTE:

The control valve should be activated after the park brake reaches its second detent position; it must be activated by the third detent position.

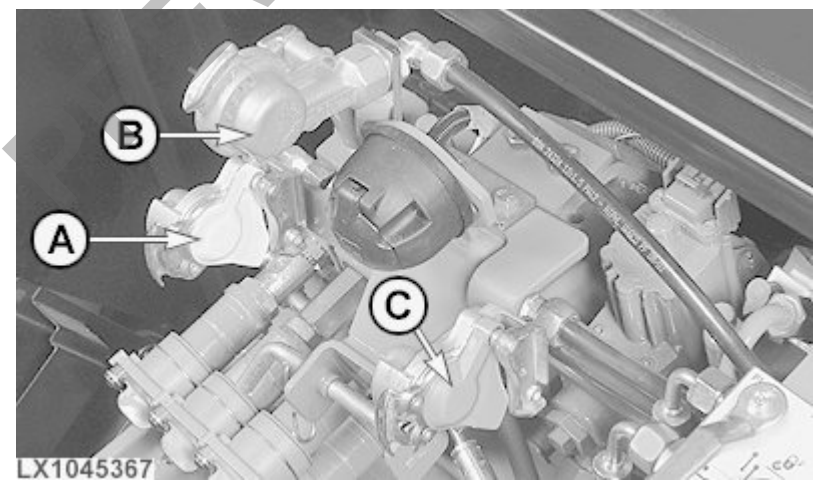
Single-line brake



Single-line brake

Together with trailer control valve (A) for the dual-line brake system, trailer control valve (B) controls the single-line brake system. The trailer control valve has an integral pressure-limiting device, which ensures that in an unbraked condition the pressure at the coupling end never exceeds a value of 510 to 550 kPa (5.1 to 5.5 bar; 74 to 80 psi). This pressure cut-off is required because the supply pressure in the compressed air tank is at least 690 kPa (6.9 bar; 100 psi).

Coupling end



Coupling ends

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Operational check:

⚠ ***CAUTION:***

Take extra care to avoid personal injury during these checks. Always perform checks which involve driving the tractor in an area that is large enough, well visible and not open to public traffic.

⚠ ***CAUTION:***

Comply with safety and repair instructions, see " General Safety and Repair Information " in Group 01 in the relevant Component Technical Manual (CTM).

[1] - Pay attention to unusual noise and reactions of the front wheel drive axle at all times when performing the following steps.

[2] - Start the engine, run it at mid idle, keep the tractor stationary and steer in both directions.

Neither the wheels nor the fenders must contact the tractor at full turn.

[3] - Drive the tractor forward at walking speed and turn the steering wheel alternately fully left and right.

[4] - Drive the tractor forward at medium speed and slowly turn the steering wheel by max. 1/8 of a turn left and right.

⚠ ***CAUTION:***

Depending on tires and ballast, the tractor may get out of control. In this case, stop the check immediately and re-start with smaller steering movements.

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