

6110-6410, 6110L-6510L and 6310S-6510S Tractors Diagnostics



JOHN DEERE

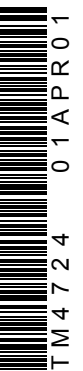
TECHNICAL MANUAL 6110-6410, 6110L-6510L and 6310S-6510S Tractors Diagnostics

TM4724 (01APR01) Englisch

FOR COMPLETE SERVICE INFORMATION ALSO SEE:
6110-6410, 6110L-6510L AND
6310S-6510S TRACTORS
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6110-6410, 6110L-6510L AND
6310S-6510S TRACTORS REPAIR.....TM4574
FRONT WHEEL DRIVE AXLES.....CTM4509
POWERTECH® DIESEL ENGINES.....CTM104
MECHANICAL FUEL INJECTION SYSTEMS.....CTM207
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Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Remove paint before heating:

- Remove paint a minimum of 76 mm (3 in.) from area to be affected by heating.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Do all work in an area that is ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.



TS220 -UN-23AUG88

DX,PAINT -19-22OCT99-1/1

Avoid Heating Near Pressurized Fluid Lines

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.



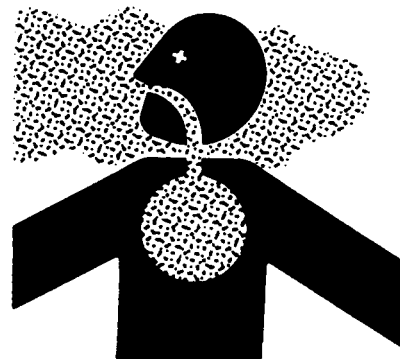
TS953 -UN-15MAY90

DX,TORCH -19-03MAR93-1/1

Work In Ventilated Area

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area



TS220 -UN-23AUG88

DX,AIR -19-17FEB99-1/1

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Continued on next page

BCU Service Code Diagnostics

<p>② Rear PTO Function</p>	<ul style="list-style-type: none"> • Start engine. • Access Address BCU 04. • Check with running engine: <p style="text-align: center;">BCU 04 — Rear PTO Speed Sender (B06) Signal—Specification</p> <p>Rear PTO Disengaged:—Status X0X Rear PTO Engaged:—Status X1X</p>	<p>OK: Check all connectors of the rear PTO circuit for bad, loose, widened or corroded contacts.</p> <p>NOT OK: GOTO 3.</p> <p style="text-align: right;">-- -1/1</p>
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211
BCU
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<p>③ PTO Solenoid Valve (Y04) Power Supply</p>	<p>Check PTO solenoid valve (Y04) power supply: see “Rear PTO Solenoid Valve (Y04) Circuit Test”, Section 245, Group BCU.</p>	<p>OK: Check rear PTO speed sender circuit, see reference “Rear PTO Speed Sender (B06) Circuit Test”, Section 245, Group BCU.</p> <p>NOT OK: Check Ground Connection of solenoid valve and all relevant connectors of solenoid valve circuit for bad, loose, widened or corroded contacts.</p> <p style="text-align: right;">-- -1/1</p>
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BCU 106 — Internal BCU Fault

AG,LX12234,387 -19-01MAY00-1/1

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BCU
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Service Code Diagnosis

NOTE: Service Code BCU 106 indicates an internal BCU fault or the BCU was incorrectly or incompletely calibrated.

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① BCU Calibration Addresses Check

Check all BCU calibration addresses, see Calibration Address List (BCU), Section 240, Group 20.

OK: BCU is correct calibrated, delete Service Code and carry out an operation test.

IF OK: If the Service Code does reappear, replace the BCU.

NOT OK: Recalibrate the BCU.

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Service Code Diagnosis

NOTE: Service Code BIF 010 indicates that the engine coolant temperature is/was between 105°C and 110°C, caused by:

- *a heavy load on engine.*
- *a low coolant fluid level.*
- *trash on grill.*
- *a broken fan belt.*
- *a defective temperature sensor.*
- *a defective viscous fan drive.*

Additional References:

- “Cooling System Operation”, Base Engine CTM.
- “Description of Radiator”, Section 230, Group 20C.
- “Viscous Fan Drive — Theory of Operation”, Section 230, Group 20C.
- “Calibration (BIF)”, Section 240, Group 20.
- “General Information Concerning the Basic Informator (BIF)”, Section 240, Group 20.
- “Diagnostic Structure (BIF)”, Section 240, Group 20.
- “Electrical Circuit Malfunctions”, Section 240, Group 05.

BIF Service Code Diagnostics

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BIF
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<p>1 Preliminary Checks</p>	<p>1.1</p> <p><i>NOTE: Recall and record Service Codes before proceeding to ensure that no priority Service Codes are stored which should be troubleshooted first. See Recall Codes Procedure, Section 245, Group 05.</i></p>	<p>OK: No other Service Codes are stored, GO TO 1.2</p> <p>NOT OK: Additional Service Codes (related/combined to hydraulic/transmission circuit) are stored, troubleshoot them first.</p>
	<p>1.2</p> <p>Perform a visual inspection of the transmission/hydraulic system:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check and clean side panels, front cover and screens (if equipped). <input type="checkbox"/> Check transmission oil level. <input type="checkbox"/> Check for oil leaks. <input type="checkbox"/> Check filters. <input type="checkbox"/> Check relevant oil tubes and pipes for bendings. <input type="checkbox"/> "Check the Viscous Fan Drive" and drive belt. <input type="checkbox"/> Check for visual signs of damage at the oil cooling system. 	<p>OK: No visual damage of cooling system recognizable, GO TO 2.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p> <p style="text-align: right;">-- -1/1</p>
<p>2 Isolate or Identify the Cause of the Overheating</p>	<p>Ask the operator:</p> <ul style="list-style-type: none"> • How does the machine function? • When does the fault occur? • During what type of work does the failure occur? <ul style="list-style-type: none"> – Fault comes along with unusual noise? – Fault occurs during work with special implement? (Does the implement fully comply with technical specifications?) • Does the tractor fully comply with technical specifications? 	<p>OK: Problem identified in hydraulic circuit, GO TO 6.</p> <p>OK: Problem identified in Brake Circuit, GO TO 7</p> <p>OK: Problem identified in transmission circuit, GO TO 8.</p> <p>NOT OK: Temperature reading of BIF does not correspond to actual transmission oil temperature, GO TO 3.</p> <p>NOT OK: Problem (Cause) cannot be identified, GO TO 6.</p> <p style="text-align: right;">-- -1/1</p>
<p>3 Check Transmission / Hydraulic Oil Temperature in °C</p>	<p>Compare actual transmission oil temperature with BIF temperature reading (Heat up Hydraulic Oil, see reference "Hydraulic Oil Warmup", Section 270, Group 15) and access Address BIF 33.</p> <p style="text-align: center;">BIF 33 — Transmission Oil Temperature Sensor B60—Specification</p> <p>Transmission/hydraulic oil temperature in °C:—Temperature (050 is equivalent to 50 °C) 040 - 100 (Measurement reading starts at +40°C)</p>	<p>OK: BIF Temperature reading is equivalent to actual transmission temperature. Warning may be created by a heavy hydraulic load. Carry out an operational test.</p> <p>NOT OK: BIF Temperature reading is NOT equivalent to actual transmission temperature, GO TO 4.</p> <p style="text-align: right;">-- -1/1</p>

BIF Service Code Diagnostics

1 Preliminary Checks	<p>1.1</p> <p><i>NOTE: Recall and record Service Codes before proceeding to ensure that no priority Service Codes are stored which should be troubleshooted first. See Recall Codes Procedure, Section 245, Group 05.</i></p>	<p>OK: No other Service Codes are stored, GO TO 1.2</p> <p>NOT OK: Additional Service Codes (related/combined to engine) are stored, troubleshoot them first.</p>
	<p>1.2 Perform a visual inspection of the engine (lubrication system):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check for fluid leaks. <input type="checkbox"/> Check engine oil level. <input type="checkbox"/> Check filter. <input type="checkbox"/> Check for oil leaks (visual signs of damages at the engine), see reference “Check for Head Gasket Failures”, Base Engine CTM. <input type="checkbox"/> With the engine stopped, inspect engine coolant for oil film (condition would indicate problems which require engine repairs, see reference “C3 - Coolant in Oil or Oil in Coolant”, Base Engine CTM). 	<p>OK: Visual inspection does not reveal any problems, GO TO 2.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p>

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BIF
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2 Check Engine Oil Pressure	<p>Access Address BIF 13:</p> <p style="text-align: center;">BIF 13 — Engine Oil Pressure Sender B04—Specification</p> <p>Engine NOT RUNNING.—Status (Pressure)..... XX1 (No pressure, Sender is closed)</p> <p>Engine RUNNING:—Status (Pressure)..... XX0 (Pressure in circuit, Sender is OPEN)</p>	<p>OK: Diagnostic completed.</p> <p>NOT OK: Perform circuit test, see reference “Engine Oil Pressure Sender Circuit (B04) Test”, Section 245, Group BIF.</p>
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BIF 023 — Missing Engine Speed Signal

AG,LX12234,424 -19-01MAY00-1/1

Service Code Diagnosis

NOTE: Service Code BIF 046 does not necessarily have any real meaning. It is often stored by accident when the engine is started or shut off. For this reason, this Service Code requires diagnosis only if it occurs in conjunction with one or more of the malfunctions associated with it.

NOTE: Service Code BIF 046 indicates less than 12.5 Volts at engine speed over 1500 rpm, caused by:

- *a low battery charge.*
- *a high load demand.*
- *a broken or slipping belt.*
- *a high resistance in harness between battery and BIF.*

Additional References:

- “General Information Concerning the Basic Informator (BIF)”, Section 240, Group 20.
- “Diagnostic Structure (BIF)”, Section 240, Group 20.
- “Troubleshooting on batteries”, Section 240, Group 05.
- “Alternator checks”, See Section 240, Group 25.
- “Battery checks”, See Section 240, Group 25.
- “Electrical Circuit Malfunctions”, Section 240, Group 05.

Service Code Diagnosis

NOTE: Service Code BIF 136 indicates a CCD-BUS wiring problem. No CCD messages are received for more than 5 seconds with Ignition ON.

Additional References:

- “General Information Concerning the Basic Informator (BIF)”, Section 240, Group 20.
- “Diagnostic Structure (BIF)”, Section 240, Group 20.
- “Electrical Circuit Malfunctions”, Section 240, Group 05.
- “DATA BUS Systems”, Section 240, Group 16A.
- “CCD BUS System”, Section 240, Group 16A.

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<p>1 Check CCD-BUS</p>	<p>1.1</p> <p><i>NOTE: Recall, record and clear codes before proceeding (See Recall Codes Procedure, Section 245, Group 05) to ensure that the Service Code which you are trouble shooting is an active code.</i></p> <p>1.2 Check CCD-circuit, see reference:</p> <ul style="list-style-type: none"> • “CCD-Circuit Test for cab tractors without RCU and/or SFA”, Section 240, Group 16B. • “CCD-Circuit Test for cab tractors with RCU and/or SFA”, Section 240, Group 16B. 	<p>OK: CCD circuit does not show any problems, replace BIF and carry out an operational test.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p>
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BIF 140 — Rear PTO Speed Warning

AG,LX12234,445 -19-01JUN00-1/1

ECU Service Code Diagnostics

<p>1 Check Supply Circuit</p>	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See Recall Service Codes in Section 245, Group 05).</i></p> <p>Ignition OFF.</p> <p>Disconnect X236 (W4; SE23).</p> <p><i>NOTE: Disconnection causes additional Service Code ECU 014.</i></p> <p>Ignition ON.</p> <p>Measure with multimeter supply voltage between pin A and pin D at X236:</p> <p style="text-align: center;">Supply Voltage Cruise Control Potentiometer—Specification</p> <p>Measure between pin A and pin D at X236—Voltage between 4.7 and 5.3 V</p> <p>For component location and pin arrangement see W4; for Circuit Diagram see SE23.</p>	<p>OK: GO TO 2.</p> <p>NOT OK: Supply voltage over 5.3V, perform “Cruise Control Potentiometer Supply Circuit Test”, Section 245, Group ECU.</p>
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ECU
7

<p>2 General Harness and Connector Test</p>	<p>Most of the harness problems are related to connector problems and/or bad ground connections (Gently tug at the affected wires).</p> <p>Following connectors are suspect (Service Code: ECU 021):</p> <ul style="list-style-type: none"> <input type="checkbox"/> X236, X238, X215 and X222 (W4; SE23) <input type="checkbox"/> X222 and X218 (W34; SE23) <input type="checkbox"/> X215 and X261 (W3; SE23) <p>For component location and pin arrangement see W3, W4 and W34; for Circuit Diagram see SE23.</p>	<p>OK: Delete Service Code. If Service Code still persists and no other Service Codes are stored, replace ECU Controller and calibrate new Controller.</p> <p>NOT OK: Repair as needed. Diagnostic completed.</p>
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ECU 022 — Sensor Supply Voltage Too Low

AG.LX25546,385_NA -19-01JAN01-1/1

<p>Service Code Diagnosis</p> <p><i>NOTE: Service Code ECU 022 occurs when the ECU Sensor 5 volt supply at ECU terminal 37 is lower than the normal operating range. (normal range between 4.7 and 5.3V).</i></p> <p>Additional References:</p> <ul style="list-style-type: none"> • Fuel System Symptoms, Section 230, Group 10 • Electrical Circuit Malfunctions, Section 240, Group 05

**ECU 081 — Internal ECU Failure (Pump Y13
Current Feedback Voltage Too High)**

AG.LX25546,398_NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code ECU 081 occurs when the pump feedback voltage (an internal voltage in the ECU) is higher than the normal operating range.

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**1 Replace ECU
Controller**

NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See Recall Service Codes in Section 245, Group 05).

IMPORTANT: If Service Code ECU 081 appears with Service Code ECU 085, trouble shoot Service Code ECU 085 first. If only Service Code ECU 081 is stored, replace ECU Controller.

Internal ECU Controller failure. Replace defective ECU Controller.

OK: Calibrate (see reference "Calibration Mode" in Section 230, Group 15) new ECU Controller.

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**ECU 082 — Internal ECU Failure (Pump Y13
Current Feedback Voltage Too Low)**

AG.LX25546,399_NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code ECU 082 occurs when the pump feedback voltage (an internal voltage in the ECU) is lower than the normal operating range.

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**1 Replace ECU
Controller**

NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See Recall Service Codes in Section 245, Group 05).

IMPORTANT: If Service Code ECU 082 appears with Service Code ECU 083 or ECU 084, trouble shoot these Service Codes first. If only Service Code ECU 082 is stored, replace ECU Controller.

Internal failure in ECU Controller. Replace defective ECU Controller.

OK: Calibrate (see reference "Calibration Mode" in Section 230, Group 15) new ECU Controller.

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HCU 042 — Stepper Motor Circuit Open

AG,LX12234,585NA -19-01JAN01-1/1

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HCU
7

Service Code Diagnosis

NOTE: Service Code HCU 042 indicates that the stepper motor circuit is open. Stepper motor will not operate. Power was interrupted for more than 0.6 seconds, caused by:

- a faulty lead.
- a defective stepper motor M08.
- an internal HCU failure

Stepper motor Service Codes are only stored for electrical failures, not hydraulic or mechanical failures. A seized stepper motor will not create Service Codes.

Additional References:

- Theory of Operation: “Rockshaft Control”, Section 270, Group 20D.
- Theory of Operation: “Stepper Motor / Rockshaft Valve”, Section 270, Group 20D.
- “Electrical Circuit Malfunctions”, Section 240, Group 05.

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<p>1 Preliminary Checks</p>	<p>1.1</p> <p><i>NOTE: Recall, record and clear codes before proceeding (See reference “Recall Codes Procedure”, Section 245, Group 05) to ensure that the Service Code which you are trouble shooting is an active code.</i></p> <p>1.2 Perform a visual inspection of the stepper motor and the stepper motor connector X92:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check for visual signs of damage. <input type="checkbox"/> Check the electrical connections for bad, loose, widened or corroded contacts. 	<p>OK: GO TO 2.</p> <p>NOT OK: Repair as needed, and perform stepper motor circuit check (GO TO 2).</p>
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HCU Service Code Diagnostics

1 RH Draft Sensor Signal Circuit Check	<p><i>NOTE: Recall, record and clear codes before proceeding (See reference "Recall Codes Procedure", Section 245, Group 05) to ensure that the Service Code which you are trouble shooting is an active code.</i></p> <p>IMPORTANT: Check signal voltage of RH Draft Sensor not under load. There should not be any draft links on the draft sensor bearing pin</p> <p>Access Address HCU 05 and perform "R.H. Draft Sensor (B19) Signal Circuit Test", Section 245, Group HCU.</p> <p style="text-align: center;">HCU 05 — R.H. Draft Sensor Signal Voltage—Specification</p> <p>R.H. Draft Sensor:—Voltage between 3.8 and 4.2 V</p>	<p>OK: Diagnostic completed.</p> <p>NOT OK: Repair as needed and repeat this test.</p> <p style="text-align: right;">-- -1/1</p>
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211
HCU
17

HCU 053 — Load/ Depth Control Potentiometer Circuit

AG,LX12234,593NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code HCU 053 indicates that the signal voltage of the load/depth potentiometer is not in spec, caused by:

- a faulty potentiometer (B26).
- a faulty lead.
- an internal HCU failure

Additional References:

- Theory of Operation: "Rockshaft Control", Section 270, Group 20D.
- "Operational Checks on Rockshaft Control", Section 270, Group 05.
- "Electrical Circuit Malfunctions", Section 240, Group 05.

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HCU Service Code Diagnostics

1 RH Draft Sensor Signal Circuit Check	<p><i>NOTE: Recall, record and clear codes before proceeding (See reference "Recall Codes Procedure", Section 245, Group 05) to ensure that the Service Code which you are trouble shooting is an active code.</i></p> <p>IMPORTANT: Check signal voltage of RH Draft Sensor not under load. There should not be any draft links on the draft sensor bearing pin</p> <p>Access Address HCU 05 and perform "R.H. Draft Sensor (B19) Signal Circuit Test", Section 245, Group HCU.</p> <p style="text-align: center;">HCU 05 — R.H. Draft Sensor Signal Voltage—Specification</p> <p>RH Draft Sensor:—Voltage between 3.8 and 4.2 V</p>	<p>OK: Diagnostic completed.</p> <p>NOT OK: Repair as needed and repeat this test.</p> <p style="text-align: right;">-- -1/1</p>
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211
HCU
27

HCU 251 — Right Draft Sensor Circuit out of specification during calibration

AG,LX12234,603NA -19-01JAN01-1/1

Service Code Diagnosis

*NOTE: Service Code HCU 251 indicates a **high signal voltage** of right draft sensor (not under load) during calibration, caused by:*

- a faulty draft sensor (B19).
- a wrong adjusted draft sensor.
- a faulty signal lead.
- an internal HCU failure.

Additional References:

- Theory of Operation: "Rockshaft Control", Section 270, Group 20D.
- Theory of Operation: "Draft Sensor", Section 270, Group 20D.
- "Checking and Adjusting Draft Sensors", Section 270, Group 15.
- "Electrical Circuit Malfunctions", Section 240, Group 05.

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<p>② Potentiometer 2 Signal Voltage (Axis 2) Test</p>	<p>Access Address PEC 22:</p> <p style="text-align: center;">PEC 22 — Potentiometer 2 Signal Voltage (Axis 2)—Specification</p> <p>Multi-Function Lever in NEUTRAL position:—Voltage between 2.8 and 3.2 V</p> <p>Multi-Function Lever in RIGHT position (complete range, over noticeable resistance):—Voltage between 0.5 and 2.5 V</p> <p>Multi-Function Lever in LEFT position (complete range, over noticeable resistance):—Voltage between 3.5 and 4.5 V</p>	<p>OK: Diagnostic completed.</p> <p>NOT OK: Perform circuit test, see reference “E-ICV — Multi-Function Lever (S64) Axis 2 Circuit Test (Left and Right Lever Position)”, Section 245, Group PEC.</p> <p style="text-align: right;">-- -1/1</p>
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PEC
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PEC 053 — E-ICV No.3 Potentiometer - Voltage Out Of Specification

AG,LX12234,457NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code PEC 053 indicates a problem with the circuit of axis 3 (Rocker Switch in front of Multi-Function Lever - Upper and Lower Position for 3rd function), caused by:

- defective potentiometer of axis 3.
- defective paddle switch of axis 3.
- a harness problem (lead 579 or 578).

Only stored if E-ICV No.3 is enabled.

Additional References:

- “Armrest Integrated Multi-Function Lever”, Section 270, Group 15.
- “E-ICV Service Code List”, Section 270, Group 15.
- “E-ICV Calibration — Quick Reference”, Section 270, Group 15.
- “Enabling Function 2 or 3”, Section 270, Group 15.
- “Electrical Circuit Malfunctions”, Section 240, Group 05.

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PEC Service Code Diagnostics

<p>1 Check Stepper Motor</p>	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Service Codes in Section 245, Group 05)</i></p>	<p>OK: Diagnostic completed.</p> <p>NOT OK: If Service Code reoccurs, replace stepper motor driver SMD0 (A13) and carry out an operational test.</p>
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PEC
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PEC 131 — Excessive Deviation of Stepper Motor Switch Signal and Stepper Motor Position

AG.LX25546,414_NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code PEC 131 indicates a excessive step deviation (above 45 steps) due to a problem with the stepper motor assembly or stepper motor M15 itself.

Additional References:

- Electrical Circuit Malfunctions, Section 240, Group 05

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<p>1 Check resistance at stepper motor</p>	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Service Codes in Section 245, Group 05)</i></p> <p>Disconnect X257 (W35; SE21D) at stepper motor (M15).</p> <p>Stepper Motor (M15) Resistance Check at X257—Specification</p> <p>Measure resistance between pin C and pin D at X257—Resistance..... between 0.3 and 0.4 Ohm</p> <p>Measure resistance between pin B and pin E at X257—Resistance..... between 0.3 and 0.4 Ohm</p> <p><i>NOTE: Wait during measurement until a stable Ohm-value will appear at the multimeter.</i></p> <p><i>Value will fluctuate at the beginning of the measurement.</i></p>	<p>OK: Check harness, GO TO 2.</p> <p>NOT OK: Replace and adjust stepper motor M15, see reference "Adjusting the Stepper Motor" (Repair Manual, Section 55, Group 10).</p>
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PEC Service Code Diagnostics

<p>1 Preliminary Checks</p>	<p>1.1</p> <p><i>NOTE: Recall, record and clear codes before proceeding (See reference Recall Codes Procedure, Section 245, Group 05) to ensure that the Service Code which you are trouble shooting is an active code.</i></p> <p>1.2</p> <p>Perform a visual inspection of E-ICV no. 2 stepper motor (connector X251) and stepper motor driver (connector X254; marked with yellow PVC tape).</p> <p><input type="checkbox"/> Check for visual signs of damage.</p> <p><input type="checkbox"/> Check the electrical connections for bad, loose, widened or corroded contacts.</p> <ul style="list-style-type: none"> • For component location see reference Stepper Motor Driver wiring harness W35, Section 240, Group 10. 	<p>OK: Perform “E-ICV No.2 - Stepper Motor (M13) and Stepper Motor Driver (SMD A11) Circuit Test”, Section 245, Group PEC.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p>
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PEC 146 — E-ICV No.2 Stepper Motor Driver (SMD) Internal Fault

AG,LX12234,473NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code PEC 146 indicates a fault in the stepper motor driver no. 2 of electronic independent SCV.

Additional References:

- “E-ICV Service Code List”, Section 270, Group 15.

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<p>1 Preliminary Checks</p>	<p><i>NOTE: Recall, record and clear codes before proceeding (See reference Recall Codes Procedure, Section 245, Group 05) to ensure that the Service Code which you are trouble shooting is an active code.</i></p>	<p>OK: Service Code does not reappear after clearing: Diagnostic completed.</p> <p>NOT OK: Service Codes does reappear after clearing, replace SMD2 and carry out an operational test.</p>
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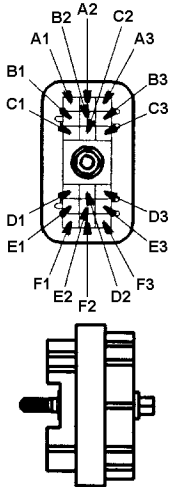
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<p>1 Preliminary Checks</p>	<p>1.1</p> <p><i>NOTE: Recall, record and clear codes before proceeding (See reference Recall Codes Procedure, Section 245, Group 05) to ensure that the Service Code which you are trouble shooting is an active code.</i></p> <p>Check Calibration Address PEC 36:</p> <p style="text-align: center;">PEC 36 — E-ICV Function Calibration—Specification</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Without E-ICV:—Calibration Value</td> <td style="text-align: right;">000</td> </tr> <tr> <td>2 E-ICV functions:—Calibration Value</td> <td style="text-align: right;">011</td> </tr> <tr> <td>3 E-ICV functions:—Calibration Value</td> <td style="text-align: right;">111</td> </tr> </table>	Without E-ICV:—Calibration Value	000	2 E-ICV functions:—Calibration Value	011	3 E-ICV functions:—Calibration Value	111	<p>OK: Calibration value in Address PEC 36 is correct, GO TO 1.2</p> <p>NOT OK: Recalibrate Address PEC 36 and delete Service Code.</p>
	Without E-ICV:—Calibration Value	000						
2 E-ICV functions:—Calibration Value	011							
3 E-ICV functions:—Calibration Value	111							
<p>1.2</p> <p>Perform a visual inspection of E-ICV No.1 stepper motor driver (connector X253; marked with red PVC tape).</p> <p><input type="checkbox"/> Check for visual signs of damage.</p> <p><input type="checkbox"/> Check the electrical connections for bad, loose, widened or corroded contacts.</p> <p>• For component location see reference Stepper Motor Driver wiring harness W35, Section 240, Group 10.</p>	<p>OK: Service Code PEC 201 is stored together with Service Code PEC 230, see reference “PEC 230 — Stepper Motor Driver Address Pin Problem” (Section 211, Group PEC).</p> <p>OK: Only Service Code PEC 201 is stored, GO TO 2.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p>							

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<p>2 E-ICV No. 1 - SMD Power Supply and Identification Circuit Test</p>	<p>Check power supply and identification pin circuit of E-ICV No. 1 - Stepper Motor Driver, see reference “E-ICV - Stepper Motor Driver (SMD) Power Supply and Identification Circuit Test”, Section 245, Group PEC.</p>	<p>OK: GO TO 3.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p>
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<p>3 E-ICV No. 1 - SMD CAN BUS Circuit Test</p>	<p>3.1</p>  <p style="text-align: center;">LX1022671 LX1022671 -UN-01APR99</p> <p>Check 11-BIT CAN-BUS voltage at connector X253 (W35):</p> <p style="text-align: center;">11-BIT CAN BUS Communication Lines - Voltage—Specification</p> <p>Measure between Pin D3 (lead 944) and Pin D1 (lead 310):—Voltage</p> <p>Measure between Pin E3 (lead 945) and Pin D1 (lead 310):—Voltage</p> <p>3.2 Check 11-BIT Bias lines (Shield Wire) voltage at connector X253 (W35):</p> <p style="text-align: center;">CAN BUS Bias lines (Shield Wire) - Voltage (940/942)—Specification</p> <p>Measure between Pin D2 (lead -940) and Pin E2 (lead +942):—Voltage</p>	<p>OK: Check CAN BUS connections at connector X253 for bad, loose, widened or corroded contacts.</p> <p>IF OK: GO TO 4.</p> <p>NOT OK: Repair connector as needed and carry out an operational test.</p> <p>NOT OK: Fault indicates a problem with 11-BIT CAN BUS circuit, see reference “Test procedure for 11-BIT CAN BUS”, Section 240, Group 16B.</p>
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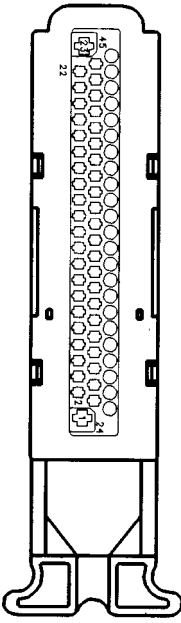
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PEC Service Code Diagnostics

<p>② Stepper Motor Driver Test</p>	<p><i>NOTE: Not each Stepper Motor Driver Malfunction is displayed by a Service Code.</i></p> <p>Check 11-BIT CAN BUS function, carry out an operational test of all stepper motor driver (SMD) controlled functions:</p> <ul style="list-style-type: none"> • SMD0 — PowrQuad Plus and AutoQuad transmission function. • SMD1 — Electronic independent SCV no. 1 (1st function: Boom). • SMD2 — Electronic independent SCV no. 2 (2nd function: Bucket). • SMD3 — Electronic independent SCV no. 1 (3rd function: Switch on front of Multi-Function lever). <ul style="list-style-type: none"> • Malfunction in circuit of SMD0, troubleshoot Service Code PEC 200. See reference “PEC 200 — AutoQuad Transmission Stepper Motor Driver Initialization Unsuccessful”, Section 211, Group PEC. • Malfunction in circuit of SMD1, troubleshoot Service Code PEC 200. See reference “PEC 201 — E-ICV No.1 Stepper Motor Driver (SMD) Initialization unsuccessful”, Section 211, Group PEC. • Malfunction in circuit of SMD2, troubleshoot Service Code PEC 200. See reference “PEC 202 — E-ICV No.2 Stepper Motor Driver (SMD) Initialization unsuccessful”, Section 211, Group PEC. • Malfunction in circuit of SMD3, troubleshoot Service Code PEC 200. See reference “PEC 203 — E-ICV No.3 Stepper Motor Driver (SMD) Initialization unsuccessful”, Section 211, Group PEC. 	<p>OK: Check 11 - BIT CAN BUS pins at PEC connector for bad, loose, widened or corroded contacts, GO TO 3</p> <p>NOT OK: Malfunctions at all (enabled/calibrated) functions, GO TO 3.</p>
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<p>③ Check 11 - BIT CAN BUS Pins at PEC</p>	 <p>LX1022672 LX1022672 -UN-01APR99</p> <p>Check following pins for bad, loose widened and corroded contacts at connector X221 (PEC):</p> <ul style="list-style-type: none"> • Pin 19 (lead 944) • Pin 42 (lead 945) • Pin 18 (lead 940) • Pin 41 (lead 942) 	<p>OK: Stepper motor driver (SMD) operational test does not reveal any problems: Diagnostic completed.</p> <p>OK: Malfunctions in stepper motor circuit: GO TO 4.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p>
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RCU 015 — Fault in Detent Solenoid Circuit

AG.LX25546,431_NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code RCU 015 indicates a fault in detent solenoid circuit of reverser. This fault is displayed only when the detent solenoid is on and the Reverse drive lever is in the position for "forward" or "reverse". This code refers to faults that persist for no longer than 0.3 seconds, but are nonetheless long enough to cause the Reverse drive lever to return to neutral. This Service Code is caused by:

- defective detent solenoid
- problem in detent solenoid circuit
- faulty RCU

Additional References:

- Operational Checkout, Section 255, Group 05
- Electrical Circuit Malfunctions, Section 240, Group 05
- Theory of Operation - Reverse Drive Lever, Section 255, Group 20A
- Theory of Operation - Reverser Control Unit (RCU), Section 255, Group 20A

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<p>1 Preliminary Check</p>	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Code Procedure for RCU in Section 245, Group RCU)</i></p> <p>IMPORTANT: All generated Service Codes will be saved by the RCU. Service Codes are not automatically cleared. For this reason the Service Codes of faults already corrected may still appear.</p> <p><i>NOTE: This Service Code can be a result of high voltage spikes that cause the RCU to indicate a fault.</i></p>	<p>OK: No Service Codes are stored. Diagnostic completed.</p> <p>NOT OK: Service Code RCU 015 is stored, GO TO 2.</p>
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RCU Service Code Diagnostics

<p>4 Check Enable Signal from Latch Relay</p>	<p>Access address RCU 03.</p> <p>Move reverser lever in and out of neutral:</p> <p style="text-align: center;">Diagnostic Address RCU 03—Specification</p> <p>Enable signal (from latch relay)— Reverser lever in and out of neutral XX1</p>	<p>OK: Check RCU address 01 for additional Service Codes and troubleshoot them.</p> <p>NOT OK: Display shows XX0, no valid enable signal. Perform “Test Procedure for Latch Relay Circuit”, Section 245, Group RCU.</p> <p style="text-align: right;">-- -1/1</p>
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RCU 031 — Fault in Enable Solenoid Circuit

AG.LX25546,437_NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code RCU 031 indicates a fault in the circuit of the detent solenoid on the reverser. It appears immediately if the reverse drive lever is in the "forward" or "reverse" positions, or after 0.3 seconds if the reverse drive lever is in neutral. While this Service Code persists , the enable solenoid remains closed and detent solenoid is off. The tractor cannot be driven. The fault is cancelled as soon as it has been rectified and neutral is indicated. This Service Code is caused by:

- *defective detent solenoid*
- *problem at detent solenoid circuit*
- *faulty RCU*

Additional References:

- Operational Checkout, Section 255, Group 05
- Electrical Circuit Malfunctions, Section 240, Group 05
- Theory of Operation - Reverse Drive Lever, Section 255, Group 20A
- Theory of Operation - Valve Housing on PowrQuad Module, Section 255, Group 20A
- Theory of Operation - Relays K210 up to K213 and Solenoids Y07 up to Y09, Section 255, Group 20A
- Theory of Operation - Reverser Control Unit (RCU), Section 255, Group 20A

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Service Code Diagnosis

NOTE: The forward switch and reverse switch are closed at the same time. Normally, only one of these switches can be closed at any given time. This Service Code is displayed after a time-lag of 0.7 seconds. Service Code RCU 041 is caused by:

- *defective forward switch*
- *defective reverse switch*
- *problem at forward switch circuit*
- *problem at reverse switch circuit*

Additional References:

- Operational Checkout, Section 255, Group 05
- Electrical Circuit Malfunctions, Section 240, Group 05
- Theory of Operation - Reverse Drive Lever, Section 255, Group 20A
- Theory of Operation - Relays K210 up to K213 and Solenoids Y07 up to Y09, Section 255, Group 20A
- Theory of Operation - Reverser Control Unit (RCU), Section 255, Group 20A

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<p>1 Preliminary Check</p>	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Code Procedure for RCU in Section 245, Group RCU).</i></p> <p>IMPORTANT: All generated Service Codes will be saved by the RCU. Service Codes are not automatically cleared. For this reason the Service Codes of faults already corrected may still appear.</p>	<p>OK: No Service Codes are stored. Diagnostic completed.</p> <p>NOT OK: Service Code RCU 041 is stored, GO TO 2.</p>
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Service Code Diagnosis

NOTE: Whenever the engine is started, the RCU checks whether the valid neutral signal is present. This signal is required for the detent solenoid and the enable solenoid to operate. This Service Code is displayed if the required neutral signal does not appear within 3 seconds of the engine starting. Service Code RCU 047 is caused by:

- *defective reverser lever*
- *problem at reverser lever circuit*
- *neutral start switch is stuck in open position*

Additional References:

- Operational Checkout, Section 255, Group 05
- Electrical Circuit Malfunctions, Section 240, Group 05
- Theory of Operation - Reverse Drive Lever, Section 255, Group 20A
- Theory of Operation - Valve Housing on PowrQuad Module, Section 255, Group 20A
- Theory of Operation - Relays K210 up to K213 and Solenoids Y07 up to Y09, Section 255, Group 20A
- Theory of Operation - Reverser Control Unit (RCU), Section 255, Group 20A

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<p>1 Preliminary Check</p>	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Code Procedure for RCU in Section 245, Group RCU).</i></p> <p>IMPORTANT: All generated Service Codes will be saved by the RCU. Service Codes are not automatically cleared. For this reason the Service Codes of faults already corrected may still appear.</p>	<p>OK: No Service Codes are stored. Diagnostic completed.</p> <p>NOT OK: Service Code RCU 047 is stored, GO TO 2.</p>
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RCU Service Code Diagnostics

<p>② Check Enable Solenoid Circuit</p>	<p>Ignition ON.</p> <p>Access address RCU 07.</p> <p>Move range lever into park and reverser lever in and out of neutral:</p> <p style="text-align: center;">Diagnostic Address RCU 07—Specification</p> <p>Enable solenoid circuit—Range lever in park and reverser lever in/out of neutral..... X1X</p>	<p>OK: GO TO 3.</p> <p>NOT OK: Display shows X0X, fault in the enable solenoid circuit. Perform “Test Procedure for Enable Solenoid Circuit”, Section 245, Group RCU.</p>
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<p>③ Check Address RCU 06</p>	<p>3.1</p> <p><i>NOTE: Service Code can be operator generated. Service Code appears if the engine is not running (ignition ON) and reverse drive lever is put into forward or reverse.</i></p> <p>Access address RCU 06.</p> <p><i>NOTE: Only in diagnostic mode with range lever in park and reverser lever in neutral position the RCU will send 12 V to the enable solenoid</i></p> <p>Ignition ON.</p> <p style="text-align: center;">Diagnostic Address RCU 06—Specification</p> <p>Enable pressure switch B52 and enable solenoid valve test—Range shift lever in neutral position; reverse drive lever in neutral position XX1</p>	<p>OK: GO TO 3.2.</p> <p>NOT OK: Display shows XX0 (pressure present), perform “Test Procedure for Enable Pressure Switch”, Section 245, Group RCU.</p>
<p>3.2</p>	<p>Engine ON.</p> <p>Access address RCU 06.</p> <p>Move range shift lever into park and reverse drive lever in neutral position:</p> <p style="text-align: center;">Diagnostic Address RCU 06—Specification</p> <p>Enable pressure switch B52 and enable solenoid valve test.—Range shift lever into park and reverse drive lever in neutral position XX0</p>	<p>OK: GO TO 5.</p> <p>NOT OK: Display shows XX1 (no pressure), GO TO 4.</p>
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RCU Service Code Diagnostics

<p>2 Check Address RCU 06</p>	<p>2.1</p> <p>Engine ON.</p> <p>Access address RCU 06.</p> <p>Move range lever in neutral and reverse drive lever in neutral position:</p> <p style="text-align: center;">Diagnostic Address RCU 06 - Neutral Check—Specification</p> <p>Park switch (S46)—Range lever in neutral and reverse drive lever in neutral position 0XX</p> <p>Neutral start switch B36—Range lever in neutral and reverse drive lever in neutral position X1X</p> <p>Enable pressure switch B52—Range lever in neutral and reverse drive lever in neutral position XX1</p>	<p>OK: GO TO 2.2.</p> <p>NOT OK: Display does not show 011 in neutral position, perform “Test Procedure for Diagnostic Address RCU 06”, Section 245, Group RCU.</p>
	<p>2.2</p> <p>Move range lever into park and reverse drive lever in forward or reverse position:</p> <p style="text-align: center;">Diagnostic Address RCU 06 - Forward/Reverse Check—Specification</p> <p>Park switch (S46)—Range lever in park and reverse drive lever in forward or reverse position 1XX</p> <p>Neutral start switch B36—Range lever in park and reverse drive lever in forward or reverse position..... X0X</p> <p>Enable pressure switch B52—Range lever in park and reverse drive lever in forward or reverse position XX0</p>	<p>OK: Check starter relay (K01) circuit, GO TO 3.</p> <p>NOT OK: Display does not show 100 in forward or reverse position, perform “Test Procedure for Diagnostic Address RCU 06”, Section 245, Group RCU.</p>

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SFA Service Code Diagnostics

1 Calibrate SFA Controller	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Service Codes in Section 245, Group 05).</i></p> <p>Calibrate SFA Controller, see reference “Calibration”, Section 280, Group 10.</p>	<p>OK: Service Code SFA 031 does not appear after calibration. Diagnostic completed.</p> <p>NOT OK: Service Code SFA 031 appears again after calibration. Delete Service Code. If Service Code still persists, replace SFA Controller and calibrate new SFA Controller.</p> <p style="text-align: right;">-- -1/1</p>
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SFA 041 — Internal SFA Controller Malfunction for Valve No. 1 (Y10)

AG.LX25546,293_NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code SFA 041 indicates the SFA is malfunctioning.

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1 Replace SFA Controller	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Service Codes in Section 245, Group 05).</i></p> <p>Delete SFA Service Codes. If Service Code reappears and no other SFA Service Codes are stored, replace SFA Controller.</p>	<p>OK: Calibrate SFA Controller, see reference “Calibration”, Section 280, Group 10. Diagnostic completed.</p> <p style="text-align: right;">-- -1/1</p>
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SFA 042 — Short to Ground in Circuit Between SFA and Solenoid Valve No. 1 (Y10)

AG.LX25546,294_NA -19-01JAN01-1/1

SFA 049 — SFA Commands “UP” but TLS Front Drive Axle Moves “DOWN” during Calibration

AG.LX25546,656_NA -19-01JAN01-1/1

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Service Code Diagnosis

IMPORTANT: If Service Code SFA 049 is stored either together with Service Code SFA 042 or with Service Code SFA 043, then trouble shoot these Service Codes first.

NOTE: Service Code SFA 049 indicates a problem in circuitry of the solenoid valve Y10, caused by:

- a defective solenoid valve Y10
- a problem in supply lead 706 or ground lead 310
- a problem with the hydraulic circuit of the SFA

Additional References:

- Troubleshooting notes, Section 280, Group 05
- Electrical Circuit Malfunctions, Section 240, Group 05
- Location of SFA components for 6110 to 6410 series tractors, Section 280, Group 20
- Hydraulic Circuit Schematic - Level Control (UP), Section 240, Group 20
- Hydraulic Circuit Schematic - Level Control (DOWN), Section 240, Group 20
- Theory of Operation, Section 280, Group 20

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SFA Service Code Diagnostics

③ General Harness and Connector Test	<p>Access beep mode address SFA 02.</p> <p>Most of the harness problems are related to connector problems and/or bad ground connections (gently tug at the affected wires). See "SFA Beep Mode Test (SFA 02)" (Section 245, Group SFA). Following connectors are suspect (Service Code: SFA 064):</p> <ul style="list-style-type: none"><input type="checkbox"/> X205 and X209 (W36; SE20)<input type="checkbox"/> X205 and X03/2 (W3; SE20)<input type="checkbox"/> X03 and X222 (W4; SE20)<input type="checkbox"/> X222 and X211 (W34; SE20)<input type="checkbox"/> XGND2 (lead 050) <p><i>NOTE: If the warning horn "beeps" while tugging on the wires, a harness or connector defect is indicated.</i></p>	<p>OK: Delete Service Code. If Service Code still persists and no other Service Codes are stored, replace SFA Controller.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p> <p style="text-align: right;">-- -1/1</p>
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SFA 065 — During Downward Movement: Sensor Output Signal Less Than 0.25 Volt

AG.LX25546.646_NA -19-01JAN01-1/1

Service Code Diagnosis

IMPORTANT: If Service Code SFA 065 is stored together with SFA 064, then trouble shoot Service Code SFA 064 first.

NOTE: Service Code SFA 065 indicates a problem with the position sensor circuit, caused by:

- defective position sensor
- position sensor linkage problem
- problem at wiring harness

Additional References:

- Troubleshooting notes, Section 280, Group 05
- Electrical Circuit Malfunctions, Section 240, Group 05
- Location of SFA components for 6110 to 6410 series tractors, Section 280, Group 20
- Theory of Operation, Section 280, Group 20

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SFA Service Code Diagnostics

<p>4 General Harness and Connector Test</p>	<p>Access beep mode address SFA 02.</p> <p>Most of the harness problems are related to connector problems and/or bad ground connections (gently tug at the affected wires). See “SFA Beep Mode Test (SFA 02)” (Section 245, Group SFA). Following connectors are suspect (Service Code: SFA 069):</p> <ul style="list-style-type: none"> <input type="checkbox"/> X205 and X209 (W36; SE20) <input type="checkbox"/> X205 and X03/2 (W3; SE20) <input type="checkbox"/> X03 and X222 (W4; SE20) <input type="checkbox"/> X222 and X211 (W34; SE20) <input type="checkbox"/> XGND2 (lead 050) <p><i>NOTE: If the warning horn “beeps” while tugging on the wires, a harness or connector defect is indicated.</i></p>	<p>OK: Delete Service Code. If Service Code still persists and no other Service Codes are stored, replace SFA Controller.</p> <p>NOT OK: Repair as needed and carry out an operational test.</p>
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SFA 071 — Engine Speed Signal Missing From CCD Bus Line

AG.LX25546.651_NA -19-01JAN01-1/1

Service Code Diagnosis

NOTE: Service Code SFA 071 indicates a problem with the engine speed signal. Service Code SFA 071 occurs if no engine speed signal available after 5 seconds. Service Code is caused by:

- defective engine speed sensor B01
- problem at engine speed sensor circuit
- problem at CCD BUS circuit

Additional References:

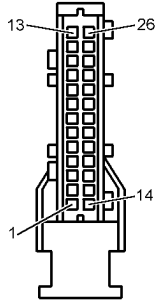
- Troubleshooting notes, Section 280, Group 05
- Electrical Circuit Malfunctions, Section 240, Group 05
- Location of SFA components for 6110 to 6410 series tractors, Section 280, Group 20

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<p>1 Preliminary Checks</p>	<p><i>NOTE: Recall, record and clear Service Codes before proceeding to ensure that the Service Code which you are trouble shooting is an active Service Code (See reference Recall Service Codes in Section 245, Group 05).</i></p> <p>Perform a visual inspection if applicable. Repair or replace components as necessary:</p> <ul style="list-style-type: none"> • Check fuse F202. • Check fuse F111. • Check for visual signs of damage on SFA components (see “Location of SFA components”). 	<p>OK: GO TO 2.</p> <p>NOT OK: Repair or replace components as necessary and repeat check.</p>
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4 BIF Connector Check



LX1024131
LX1024131 -UN-14JUN00
BIF connector X25 or X26

1. Check power supply.
2. Check diagnostic fuse (F115) signal (only for BCU).
 - BIF receives diagnostic signal via CCD BUS from BCU.
3. Check BUS connections for bad, loose widened or corroded contacts.

BIF — Connector X25 (W4)—Specification

Power Supply:—Ground
(lead 050)..... at Pin 3
 CCD-Circuit:—CCD+
(lead 925)..... Pin 5
 CCD- (lead 924) Pin 7

BIF — Connector X26 (W4)—Specification

Power Supply:—Voltage
(lead 971)..... 12 Volt at Pin 14
 Voltage (lead 912) 12 Volt at Pin 10

For connector location and pin arrangement see W4; for circuit diagram see CCD BUS Diagnostic Schematic.

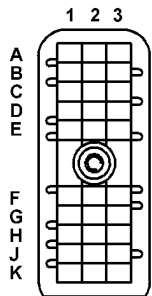
OK: Check CCD circuit, GO TO 8.

NOT OK: Repair as needed, then call up controller.

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5 HCU Connector Check



LX1024135
LX1024135 -UN-27JUN00
HCU Connector X13

1. Check power supply.
2. Check diagnostic fuse (F115) signal.
3. Check BUS connections for bad, loose widened or corroded contacts.

HCU — Connector X13 (W4)—Specification

Power Supply:—Voltage
(lead 856)..... 12 Volt at Pin A2
 Ground (lead 050) at Pin A3
 Diagnostic Fuse Signal
 (F115):—Voltage..... 12 Volt at Pin H2 with
 CAL Fuse F115 inserted
 CCD-Circuit:—CCD+
 (lead 925)..... Pin B2
 CCD- (lead 924) Pin C3

For connector location and pin arrangement see W4; for circuit diagram see CCD BUS Diagnostic Schematic.

OK: Check CCD circuit, GO TO 8.

NOT OK: Repair as needed, then call up controller.

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<p>⑧ Check for Leakage at Transmission Hydraulic System</p>	<p>Check lube pressures at "Test Record Sheet", Section 55, Group 10A.</p>	<p>OK: No leakage in transmission circuit.</p> <p>NOT OK: Repair corresponding circuit and carry out an operational test.</p>
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<p>② Check Front PTO Solenoid Y01</p>	<p>2.1 — Resistance Check:</p> <p>IMPORTANT: Ignition has to be “OFF” for this measurement.</p> <p>Disconnect connector X166 and measure at solenoid valve between pin A (lead 607) and pin B (lead 310):</p> <p style="text-align: center;">Front PTO Solenoid Y01 Valve - Resistance—Specification</p> <p>Coil:—Resistance 10 - 12 Ohm at 20°C (68° F)</p> <p>For connector location and pin arrangement see W39; for Circuit Diagram see SE5.</p>	<p>OK: GO TO 2.2</p> <p>NOT OK: Replace solenoid and carry out an operational check.</p>
	<p>2.2 — Voltage Check:</p> <p>IMPORTANT: Front PTO relay interrupts power supply to solenoid valve after defined “PTO Speed Detection Time”.</p> <p>Engine OFF.</p> <p>Ignition ON.</p> <p>Install adapter wiring harness DFLX14 between solenoid valve and plug X166. Measure between pin A and pin B at test-plug of DFLX14:</p> <p style="text-align: center;">Front PTO Solenoid Y01 Valve - Supply Voltage—Specification</p> <p>Front PTO Engaged:—Voltage 12 V</p> <p>For connector location and pin arrangement see W39; for Circuit Diagram see SE5.</p>	<p>OK: GO TO 2.3</p> <p>NOT OK: GO TO 3.</p>
	<p>2.3 — Amperage Check:</p> <p>Engine OFF.</p> <p>IMPORTANT: Front PTO relay interrupts power supply to solenoid valve after defined “PTO Speed Detection Time”.</p> <p>IMPORTANT: Connect the multimeter between the additional connector of adapter wiring harness DFLX14 before the Front PTO switch will be engaged otherwise the relay will detect an open circuit and immediately interrupt the power supply to the solenoid.</p> <p>Disconnect additional plug for amperage-measurement at adapter wiring harness DFLX14 and measure with multimeter between connections:</p> <p style="text-align: center;">Front PTO Solenoid Valve - Amperage—Specification</p> <p>Front PTO Engaged:—Amperage 1 - 1.2 A at 20°C (68° F) and nominal 12V</p> <p>For connector location and pin arrangement see W39; for Circuit Diagram see SE5.</p>	<p>OK: Check Front PTO hydraulic circuit, GO TO 6.</p> <p>NOT OK: Check ground connection of solenoid valve (XGND9 at wiring harness W3).</p>

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