

Shift Control Module Fault Codes

There are two LEDs inside the Shift Control Module that you can see through the clear lid. One is the “Power” LED and the other is the “Fault Code” LED. The Power LED is green when the unit is on and functioning properly. It is red when the unit is on, but a fault was detected and caused the Shift Control Module to disengage both the Low and High range clutches. When this LED is red, the sentry fault lamp on the tractor instrument panel should also be on. The Power LED is off when the unit has powered itself off or it is not getting power. NOTE: Fully pressing the clutch pedal turns the Shift Control Module on and/or resets the Shift Control Module if it was already on. When the clutch pedal is fully pressed, the Power LED should always be green and no fault codes will be generated or changed during that time. Also, if the Power LED is red for 1 minute; the Shift Control Module will power itself off.

The Fault Code LED will flash a sequence of red pulses and green pulses that indicates the last fault detected. This will help greatly in troubleshooting what caused the Shift Control Module to disengage the clutches and what fault was detected. This LED is off at power up and will remain off until a fault is detected. Once a fault is detected; the corresponding flash code will be displayed and will continually repeat until the unit is powered down or a different fault is detected. This code will continue to flash no matter if the Power LED is red or green. NOTE: Shutting off the tractor will cause a new error code to be displayed due to the loss of hydraulic pressure. Also, if the Shift Control Module loses power or shuts down, the fault code will be lost.

There are two faults that do not produce fault codes. These faults are different in the fact that they will still let the transmission work in one of the ranges (High or Low). These faults are caused by the following conditions:

- 1) When the Shift Control Module detects that the inputs, from the High/Low Range select lever, are either both shorted to ground or both open/poor connection. This fault does not let the User change ranges; the tractor is stuck in one range. The Sentry dash lamp does not come on for this issue and the Power LED will stay green inside the Shift Control Module. Possible causes for this issue are: a bad Range Select Switch, poor or shorted wiring to that switch, or a Shift Control Module that failed.
- 2) When the clutch pedal is fully pressed, and the Shift Control Module detects that one or both of the High/Low Range clutches are staying engaged. The Shift Control Module Power LED will stay green, but the dash warning lamp will turn on when the High/Low Range select lever is in the opposing position of the clutch that is staying engaged. If the clutch pedal is released when the dash lamp is on, a **(10-Red, 1 or 2 Green)** fault code will be produced. The Shift Control Module will keep the solenoid power relay off and both of the solenoid drivers off, but the tractor could still move if the clutch is truly engaged.

The faults that will produce a fault code are the faults that disengage the transmission. These “fault-code faults” will only attempt to re-engage the transmission when the Shift Control Module is reset by fully pressing the clutch pedal. The fault codes and their descriptions are on the following pages.

1 Red pulse (Notes that the fault happened when the User released the clutch pedal in an attempt to go into a High-Range. The shift timer timed out prior to proper operation happening in the 1-Second(Hot) or 3-Second(Cold) allowed time.)

followed by:

1 Green pulse: Solenoid current was extremely high (Greater than 9.25 Amps).

Possible Causes:

- The solenoid is defective/shorted.
- The drive/power wire from the Shift Control Module to the solenoid is shorted to the tractor frame.
- The Shift Control Module failed.

2 Green pulses: No solenoid voltage.

Possible Causes:

- The High-Range fuse is open/bad.
- The power connection from the fuse to the Shift Control Module is open/broke (poor connection).
- The Shift Control Module failed.

3 Green pulses: Solenoid voltage is below the safe operation level of 10.0 Volts.

Possible Causes:

- The power connection to the Shift Control Module is poor.
- The tractor battery is getting low.
- The Shift Control Module has failed.

4 Green pulses: High-Range solenoid current fault. (No Current)

Possible Causes:

- The High-Range fuse is open/blown.
- The solenoid is defective/open.
- The power cables or connections to the Shift Control Module or to the solenoid are bad/open.
- The Shift Control Module has failed.

5 Green pulses: High-Range solenoid current fault. (Low Current – less than 1.25 Amps)

Possible Causes:

- The High-Range solenoid is failing and/or becoming weak.
- Poor wiring and/or connections to the Shift Control Module or to the solenoid.
- The Shift Control Module has failed.

6 Green pulses: High-Range solenoid current fault. (High Current – more than 8.00 Amps)

Possible Causes:

- The High-Range solenoid is bad (internal coil wires shorting together).
- The solenoid drive wire is shorted to the tractor frame.
- The Shift Control Module has failed.

7 Green pulses: No Hydraulic pressure detected. (All Voltage & Current tests passed)

Possible Causes:

- The pressure sensor is bad/shorted.
- The valve is stuck closed.
- The pressure sensor signal wire is shorted to the tractor frame.
- The Shift Control Module failed.

8 Green pulses: Detected that the Low-Range clutch (hydraulic pressure sensor) also became energized.

Possible Causes:

- The Low-Range pressure sensor is bad/open.
- The cable or connections to this sensor are poor/open.
- The Low-Range valve is stuck open.
- The Shift Control Module has failed.
- The High & Low solenoid power/control wires are shorted together.

9 Green pulses: The previous test passed but it was detected that there is current flow to the Low-Range solenoid.

Possible Causes:

- The Shift Control Module has failed.

2 Red pulses (Notes that the tractor was in the normal/stable state of High-Range operation and the Shift Control Module detected one of the following faults.)

followed by:

1 Green pulse: Solenoid current became extremely high (Greater than 9.25 Amps).

Possible Causes:

- The solenoid became defective/shorted.
- The drive/power wire from the Shift Control Module to the solenoid is shorted to the tractor frame.
- The Shift Control Module failed.

2 Green pulses: The solenoid voltage dropped to zero.

Possible Causes:

- The High-Range fuse became open/blew.
- The power connection from the fuse to the Shift Control Module became open/broke (poor connection).
- The Shift Control Module failed.

3 Green pulses: Solenoid voltage went below the safe operation level of 10.0 Volts for longer than 400 milli-seconds.

Possible Causes:

- The power connection to the Shift Control Module is poor.
- The tractor battery is getting low.
- The Shift Control Module has failed.

4 Green pulses: High-Range solenoid current fault. (No Current)

Possible Causes:

- The High-Range fuse became open/blew.
- The solenoid failed/opened.
- A wiring connection became open/broke (poor connection).
- The Shift Control Module has failed.

5 Green pulses: High-Range solenoid current fault. (Low Current – less than 1.25 Amps for longer than 400 milli-seconds)

Possible Causes:

- The High-Range solenoid is failing and/or becoming weak.
- Poor wiring and/or connections to the Shift Control Module or to the solenoid.
- The Shift Control Module has failed.

6 Green pulses: High-Range solenoid current fault. (High Current – more than 8.0 Amps for longer than 400 milli-seconds)

Possible Causes:

- The High-Range solenoid is failing (internal coil wires shorting together).
- The solenoid drive wire became shorted to the tractor frame.
- The Shift Control Module has failed.

7 Green pulses: No Hydraulic pressure detected. (All Voltage & Current tests passed)

Possible Causes:

- The pressure sensor went bad/shorted.
- The valve went closed.
- The pressure sensor signal wire shorted to the tractor frame.
- The Shift Control Module failed.

8 Green pulses: Detected that the Low-Range clutch (hydraulic pressure sensor) also became energized.

Possible Causes:

- The Low-Range pressure sensor became bad/open.
- The cable or connections to this sensor became poor/open.
- The Low-Range valve went open.
- The Shift Control Module has failed.
- The High & Low solenoid power/control wires shorted together.

9 Green pulses: The previous test passed but it was detected that there is current flow to the Low-Range solenoid.

Possible Causes:

- The Shift Control Module has failed.

3 Red pulses (Notes that an on-the-go shift from High to Low Range has just been requested and the Shift Control Module was in the first half of performing this function; engaging the Low-Range Clutch.)

followed by:

1 Green pulse: Solenoid current was extremely high (Greater than 9.25 Amps).

Possible Causes:

- The solenoid is defective/shorted.
- The drive/power wire from the Shift Control Module to the solenoid is shorted to the tractor frame.
- The Shift Control Module failed.

2 Green pulses: No solenoid voltage.

Possible Causes:

- The Low-Range fuse is open/bad.
- The power connection from the fuse to the Shift Control Module is open/broke (poor connection).
- The Shift Control Module failed.

3 Green pulses: Solenoid voltage is below the safe operation level of 10.0 Volts.

Possible Causes:

- The power connection to the Shift Control Module is poor.
- The tractor battery is getting low.
- The Shift Control Module has failed.

4 Green pulses: Low-Range solenoid current fault. (No Current)

Possible Causes:

- The Low-Range fuse is open/blown.
- The solenoid is defective/open.
- The power cables or connections to the Shift Control Module or to the solenoid are bad/open.
- The Shift Control Module has failed.

5 Green pulses: Low-Range solenoid current fault. (Low Current – less than 1.25 Amps)

Possible Causes:

- The Low-Range solenoid is failing and/or becoming weak.
- Poor wiring and/or connections to the Shift Control Module or to the solenoid.
- The Shift Control Module has failed.

6 Green pulses: Low-Range solenoid current fault. (High Current – more than 8.00 Amps)

Possible Causes:

- The Low-Range solenoid is bad (internal coil wires shorting together).
- The solenoid drive wire is shorted to the tractor frame.
- The Shift Control Module has failed.

7 Green pulses: No Hydraulic pressure detected. (All Voltage & Current tests passed)

Possible Causes:

- The pressure sensor is bad/shorted.
- The valve is stuck closed.
- The pressure sensor signal wire is shorted to the tractor frame.
- The Shift Control Module failed.

4 Red pulses (Notes that an on-the-go shift from High to Low Range has just been requested and the Shift Control Module was in the second half of performing this function; disengaging the High-Range Clutch.)

followed by:

1 Green pulse: High-Range solenoid current did not go to zero.

Possible Causes:

- The Shift Control Module has failed.

2 Green pulses: The shift timer timed out due to not seeing the High-Range hydraulic pressure going away in the 1-Second(Hot) or 3-Second(Cold) allowed time.

Possible Causes:

- The High-Range pressure sensor is bad/open.
- The cable or connections to this sensor are bad/open.
- The High-Range valve is stuck open.
- The Shift Control Module has failed.

3 Green pulses: Low-Range hydraulic pressure was lost.

Possible Causes:

- The Low-Range pressure sensor went bad/shorted.
- The cable or connections to this sensor are bad (shorted to tractor frame).
- The Low-Range valve went closed.
- The Shift Control Module has failed.

5 Red pulses (Notes that the tractor was in the normal/stable state of Low-Range operation and the Shift Control Module detected one of the following faults.)

followed by:

1 Green pulse: Solenoid current became extremely high (Greater than 9.25 Amps).

Possible Causes:

- The solenoid became defective/shorted.
- The drive/power wire from the Shift Control Module to the solenoid is shorted to the tractor frame.
- The Shift Control Module failed.

2 Green pulses: The solenoid voltage dropped to zero.

Possible Causes:

- The Low-Range fuse became open/blew.
- The power connection from the fuse to the Shift Control Module became open/broke (poor connection).
- The Shift Control Module failed.

3 Green pulses: Solenoid voltage went below the safe operation level of 10.0 Volts for longer than 400 milli-seconds.

Possible Causes:

- The power connection to the Shift Control Module is poor.
- The tractor battery is getting low.
- The Shift Control Module has failed.

4 Green pulses: Low-Range solenoid current fault. (No Current)

Possible Causes:

- The Low-Range fuse became open/blew.
- The solenoid failed/opened.
- A wiring connection became open/broke (poor connection).
- The Shift Control Module has failed.

5 Green pulses: Low-Range solenoid current fault. (Low Current – less than 1.25 Amps for longer than 400 milli-seconds)

Possible Causes:

- The Low-Range solenoid is failing and/or becoming weak.
- Poor wiring and/or connections to the Shift Control Module or to the solenoid.
- The Shift Control Module has failed.

6 Green pulses: Low-Range solenoid current fault. (High Current – more than 8.0 Amps for longer than 400 milli-seconds)

Possible Causes:

- The Low-Range solenoid is failing (internal coil wires shorting together).
- The solenoid drive wire became shorted to the tractor frame.
- The Shift Control Module has failed.

7 Green pulses: No Hydraulic pressure detected. (All Voltage & Current tests passed)

Possible Causes:

- The pressure sensor went bad/shorted.
- The valve went closed.
- The pressure sensor signal wire shorted to the tractor frame.
- The Shift Control Module failed.

8 Green pulses: Detected that the High-Range clutch (hydraulic pressure sensor) also became energized.

Possible Causes:

- The High-Range pressure sensor became bad/open.
- The cable or connections to this sensor became poor/open.
- The High-Range valve went open.
- The Shift Control Module has failed.
- The High & Low solenoid power/control wires shorted together.

9 Green pulses: The previous test passed but it was detected that there is current flow to the High-Range solenoid.

Possible Causes:

- The Shift Control Module has failed.

6 Red pulses (Notes that an on-the-go shift from Low to High Range has just been requested and the Shift Control Module was in the first half of performing this function; engaging the High-Range Clutch.)

followed by:

1 Green pulse: Solenoid current was extremely high (Greater than 9.25 Amps).

Possible Causes:

- The solenoid is defective/shorted.
- The drive/power wire from the Shift Control Module to the solenoid is shorted to the tractor frame.
- The Shift Control Module failed.

2 Green pulses: No solenoid voltage.

Possible Causes:

- The High-Range fuse is open/bad.
- The power connection from the fuse to the Shift Control Module is open/broke (poor connection).
- The Shift Control Module failed.

3 Green pulses: Solenoid voltage is below the safe operation level of 10.0 Volts.

Possible Causes:

- The power connection to the Shift Control Module is poor.
- The tractor battery is getting low.
- The Shift Control Module has failed.

4 Green pulses: High-Range solenoid current fault. (No Current)

Possible Causes:

- The High-Range fuse is open/blown.
- The solenoid is defective/open.
- The power cables or connections to the Shift Control Module or to the solenoid are bad/open.
- The Shift Control Module has failed.

5 Green pulses: High-Range solenoid current fault. (Low Current – less than 1.25 Amps)

Possible Causes:

- The High-Range solenoid is failing and/or becoming weak.
- Poor wiring and/or connections to the Shift Control Module or to the solenoid.
- The Shift Control Module has failed.

6 Green pulses: High-Range solenoid current fault. (High Current – more than 8.00 Amps)

Possible Causes:

- The High-Range solenoid is bad (internal coil wires shorting together).
- The solenoid drive wire is shorted to the tractor frame.
- The Shift Control Module has failed.

7 Green pulses: No Hydraulic pressure detected. (All Voltage & Current tests passed)

Possible Causes:

- The pressure sensor is bad/shorted.
- The valve is stuck closed.
- The pressure sensor signal wire is shorted to the tractor frame.
- The Shift Control Module failed.

7 Red pulses (Notes that an on-the-go shift from Low to High Range has just been requested and the Shift Control Module was in the second half of performing this function; disengaging the Low-Range Clutch.)

followed by:

1 Green pulse: Low-Range solenoid current did not go to zero.

Possible Causes:

- The Shift Control Module has failed.

2 Green pulses: The shift timer timed out due to not seeing the Low-Range hydraulic pressure going away in the 1-Second(Hot) or 3-Second(Cold) allowed time.

Possible Causes:

- The Low-Range pressure sensor is bad/open.
- The cable or connections to this sensor are bad/open.
- The Low-Range valve is stuck open.
- The Shift Control Module has failed.

3 Green pulses: High-Range hydraulic pressure was lost.

Possible Causes:

- The High-Range pressure sensor went bad/shorted.
- The cable or connections to this sensor are bad (shorted to tractor frame).
- The High-Range valve went closed.
- The Shift Control Module has failed.

8 Red pulses (Notes that the fault happened when the User released the clutch pedal in an attempt to go into Low-Range. The shift timer timed out prior to proper operation happening in the 1-Second(Hot) or 3-Second(Cold) allowed time.)

followed by:

- 1 Green pulse:** Solenoid current was extremely high (Greater than 9.25 Amps).
Possible Causes:
- The solenoid is defective/shorted.
 - The drive/power wire from the Shift Control Module to the solenoid is shorted to the tractor frame.
 - The Shift Control Module failed.
- 2 Green pulses:** No solenoid voltage.
Possible Causes:
- The Low-Range fuse is open/bad.
 - The power connection from the fuse to the Shift Control Module is open/broke (poor connection).
 - The Shift Control Module failed.
- 3 Green pulses:** Solenoid voltage is below the safe operation level of 10.0 Volts.
Possible Causes:
- The power connection to the Shift Control Module is poor.
 - The tractor battery is getting low.
 - The Shift Control Module has failed.
- 4 Green pulses:** Low-Range solenoid current fault. (No Current)
Possible Causes:
- The Low-Range fuse is open/blown.
 - The solenoid is defective/open.
 - The power cables or connections to the Shift Control Module or to the solenoid are bad/open.
 - The Shift Control Module has failed.

5 Green pulses: Low-Range solenoid current fault. (Low Current – less than 1.25 Amps)

Possible Causes:

- The Low-Range solenoid is failing and/or becoming weak.
- Poor wiring and/or connections to the Shift Control Module or to the solenoid.
- The Shift Control Module has failed.

6 Green pulses: Low-Range solenoid current fault. (High Current – more than 8.00 Amps)

Possible Causes:

- The Low-Range solenoid is bad (internal coil wires shorting together).
- The solenoid drive wire is shorted to the tractor frame.
- The Shift Control Module has failed.

7 Green pulses: No Hydraulic pressure detected. (All Voltage & Current tests passed)

Possible Causes:

- The pressure sensor is bad/shorted.
- The valve is stuck closed.
- The pressure sensor signal wire is shorted to the tractor frame.
- The Shift Control Module failed.

8 Green pulses: Detected that the High-Range clutch (hydraulic pressure sensor) also became energized.

Possible Causes:

- The High-Range pressure sensor is bad/open.
- The cable or connections to this sensor are poor/open.
- The High-Range valve is stuck open.
- The Shift Control Module has failed.
- The High & Low solenoid power/control wires are shorted together.

9 Green pulses: The previous test passed but it was detected that there is current flow to the High-Range solenoid.

Possible Causes:

- The Shift Control Module has failed.

10 Red pulses (Notes that the fault happened immediately after the User released the clutch pedal and prior to the Shift Control Module turning on the solenoid power relay or either of the solenoid drivers)

followed by:

1 Green pulse: The Shift Control Module sees that the User has a High-Range selected but that the Low-Range clutch is stuck on/engaged.

Possible Causes:

- The Low-Range pressure sensor is bad/open.
- The cable or connections to this sensor are bad/open.
- The Low-Range valve is stuck open.
- The Shift Control Module has failed.
(Applying power to the Low-Range solenoid)

2 Green pulses: The Shift Control Module sees that the User has a Low-Range selected but that the High-Range clutch is stuck on/engaged.

Possible Causes:

- The High-Range pressure sensor is bad/open.
- The cable or connections to this sensor are bad/open.
- The High-Range valve is stuck open.
- The Shift Control Module has failed.
(Applying power to the Low-Range solenoid)

Connector Pin-Out

Connector #1 6-Pos. Weather-Pack tower with socket(female) contacts

- A: Red w/Black stripe (Power) Tractor 10-Amp fused supply power for High-Range Solenoid.
- B: Orange w/White stripe (Input) Low-Range select from range select lever. [Active Low]
- C: Yellow (Output) Sentry Dash Lamp On/Off control. [Active Low]
- D: Blue w/Black stripe (Output) High-Range Solenoid On/Off control/power. [Active High]
- E: Orange w/Black stripe (Input) High-Range select from range select lever. [Active Low]
- F: Red (Power) Tractor 3-Amp Switched Power (not used on most tractors)

Connector #2 6-Pos. Weather-Pack shroud with pin(male) contacts

- A: Red w/White stripe (Power) Tractor 10-Amp fused supply power for Low-Range Solenoid.
- B: Green w/White stripe (Input) Low-Range Hydraulic Pressure Sensor signal. [Active Open]
- C: Brown (Input) Clutch Pedal Fully Pressed Switch. [Active Low]
- D: Blue w/White stripe (Output) Low-Range Solenoid On/Off control/power. [Active High]
- E: Green w/Black stripe (Input) High-Range Hydraulic Pressure Sensor signal. [Active Open]
- F: Black (Power) Tractor Ground (Battery Negative)

**Connector #3 1-Pos. Weather-Pack tower with
socket(female) contacts**

A: Black
(Battery Negative)

(Power) Tractor Ground