Component Code: 51 (PID 60, FMI 2, 3, 4, 10) Rail Select Sensor

Overview

This fault code indicates an electrical failure of the Rail Select Sensor on the Electric Shifter.

Detection

Starting at key-on and throughout operation, the Transmission Controller constantly monitors the feedback from the sensor. If the feedback is below 10% or above 90% of the sensor's full value, the fault code is set. This type of failure represents a short to ground or battery. The Transmission Controller also monitors the sensor feedback for a zero value, indicating an open circuit.

Fallback

This fault causes an In Place fallback.

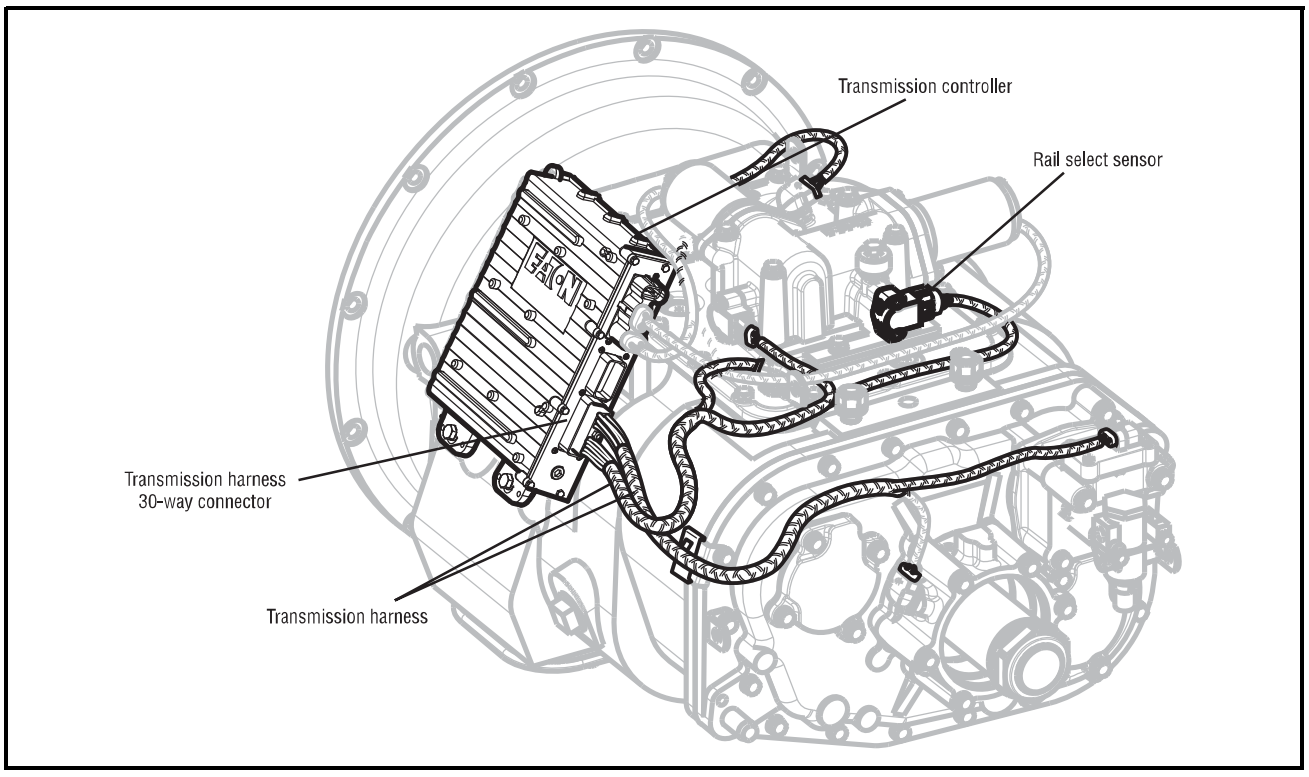
Required Tools

- Basic Hand Tools
- Eaton Test Adapter Kit
- Digital Volt/Ohm Meter
- Troubleshooting Guide

Possible Causes

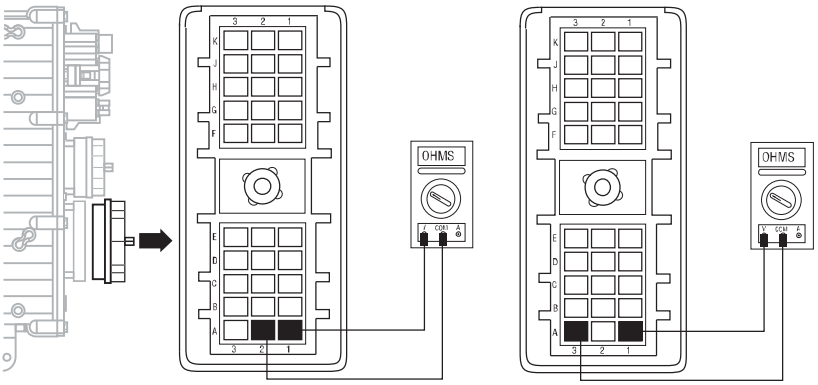
This fault code can be caused by any of the following:

- Transmission Harness
- Rail Select Sensor
- Transmission Controller



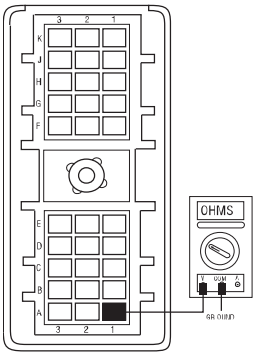
Code 51 (PID 60, FMI 2, 3, 4, 10) Rail Select Sensor Test

Step A	Procedure	Condition	Action
	1. Key off.		
	2. Disconnect the Transmission Harness 30-way connector.		
	3. Measure resistance between the Transmission Harness 30-way connector pins: • A1 and A2 • A1 and A3 **Note:** An Auto Ranging Digital Volt/Ohm Meter must be used.	(White epoxy back sensor) If pin A1 and A2 resistance is 3.5M to 6.5M ohms and if pin A1 and A3 resistance is 13.5K to 18.5K ohms.	Go to **Step B.**
		(Black plastic back sensor) If pin A1 and A2 resistance is 100 to 200 ohms and if pin A1 and A3 resistance is 5K to 7K ohms	Go to **Step B.**
		If any of the above conditions are not met	Go to **Step C.**



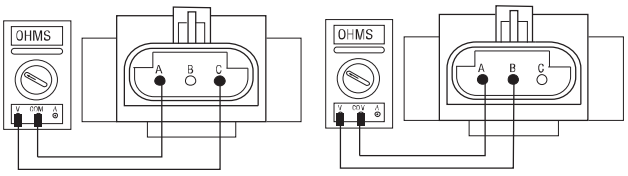
Code 51 (PID 60, FMI 2, 3, 4, 10) Rail Select Sensor Test, continued

Step B	Procedure	Condition	Action
	1. Measure resistance between transmission harness 30-way connector pin A1 to ground. →		
		If resistance is more than 10K ohms or open circuit [OL] →	Replace **Transmission Controller (Only if Fault Code is Active)** . Go to **Step V.**
		If resistance is less than 10K ohms →	Go to **Step C.**



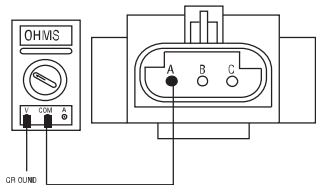
Code 51 (PID 60, FMI 2, 3, 4, 10) Rail Select Sensor Test, continued

Step C	Procedure	Condition	Action
	1. Disconnect transmission harness form rail select sensor.		
	2. Measure resistance between rail select sensor pins: • A and C • A and B **Note:** An Auto Ranging Digital Volt/Ohm Meter must be used.	(White epoxy back sensor) If pin A and C resistance is 13.5K to 18.5K ohms and If pin A and B resistance is 3.5M to 6.5M ohms →	Go to **Step D.**
		(Black plastic sensor) If pin A and C resistance is 5K to 7K ohms and If pin A and B resistance is 100 to 200 ohms →	Go to **Step D.**
		If any to the above conditions are not met →	**Replace Electric Shifter.** Go to **Step V.**



Code 51 (PID 60, FMI 2, 3, 4, 10) Rail Select Sensor Test, continued

Step D	Procedure	Condition	Action
	1. Measure resistance between rail select sensor pin A and ground. →		
		If resistance is more than 10K ohms or open circuit [OL] →	Replace transmission harness. Go to **Step V.**
		If resistance is less than 10K ohms →	**Replace Electric Shifter.** Go to **Step V.**



Step V	Procedure	Condition	Action
	1. Key off.		
	2. Reconnect all connectors.		
	3. Key on.		
	4. Clear codes (see page 1-4)		
	5. Use Driving Techniques to attempt to reset the code (see page 1-6)		
	6. Check for codes (see page 1-4) →	If no codes →	Test complete.
		If code 51 appears →	Return to **Step A** to find error in testing.
		If code other than 51 appears →	Go to **Fault Code Isolation Procedure Index** (see page 1-11)

Code 51 (PID 60, FMI 2, 3, 4, 10) Rail Select Sensor Test, continued

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