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Service Information Bulletin

SUBJECT	DATE
SPN 2623 (CPC)(GHG17), SPN 2623 (CPC)(GHG14), and SPN 2623 (CPC)(EPA07;EPA10;GHG14)	May 2016

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0193	GHG17 DD Medium Duty	SPN 2623/FMI 2, 8, 14 - GHG17	New DD5 and DD8 diagnostic procedures
DDC-SVC-MAN-0191	DD Platform HDEP	SPN 2623/FMI 2, 8, 14 - GHG17	Updated GHG17 HDEP diagnostic procedures
DDC-SVC-MAN-0084	DD Platform HDEP	SPN 2623/ FMI 2, 8 - GHG14	Updated EPA07, EPA10 & GHG14 HDEP diagnostic procedures
		SPN 2623/FMI 14 - EPA07-EPA10-GHG14	

DiagnosticLink users: Please update the troubleshooting guides in DiagnosticLink with this newest version. To update the tool troubleshooting guide, open DiagnosticLink and from the Help – Troubleshooting Guides menu, select the appropriate troubleshooting manual, then click Update.

DEMAND PERFORMANCE™

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2 SPN 2623/FMI 2 - GHG17

Accelerator Pedal "In-Range" Fault

Table 1.

SPN 2623/FMI 2	
Description	Pedal Position Sensors Deviation Too High
Monitored Parameter	GAS1, GAS2
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	None
Engine Reaction	None
Verification	Key Cycle - Ignition ON

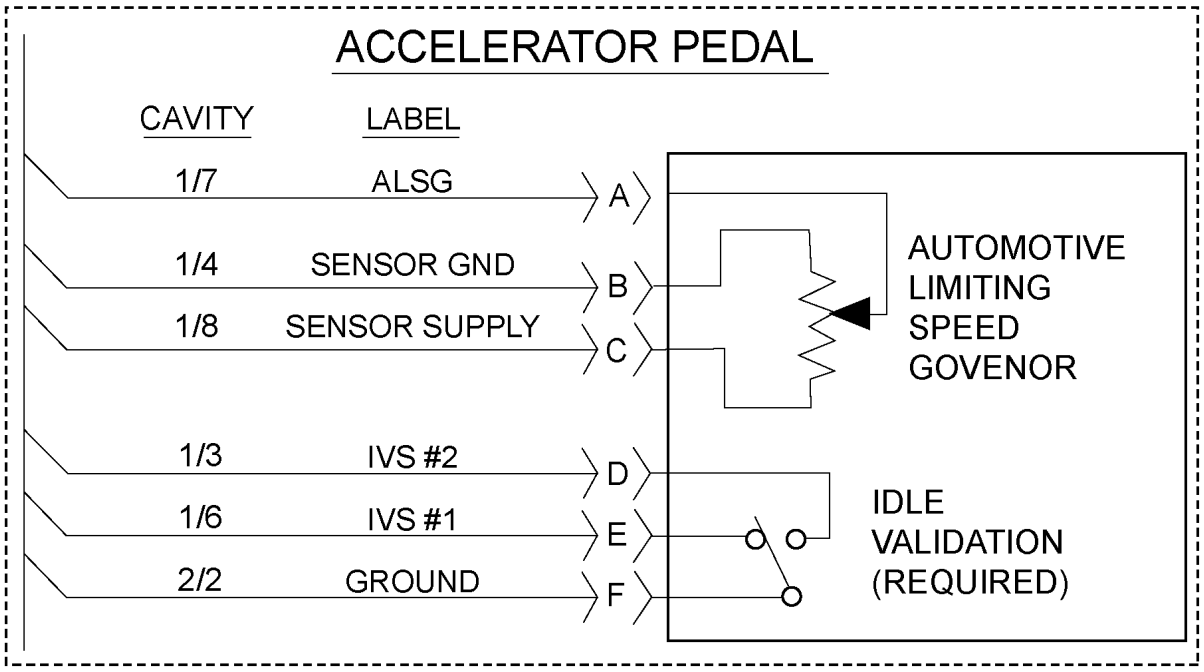


Figure 1. Analog Pedal Type

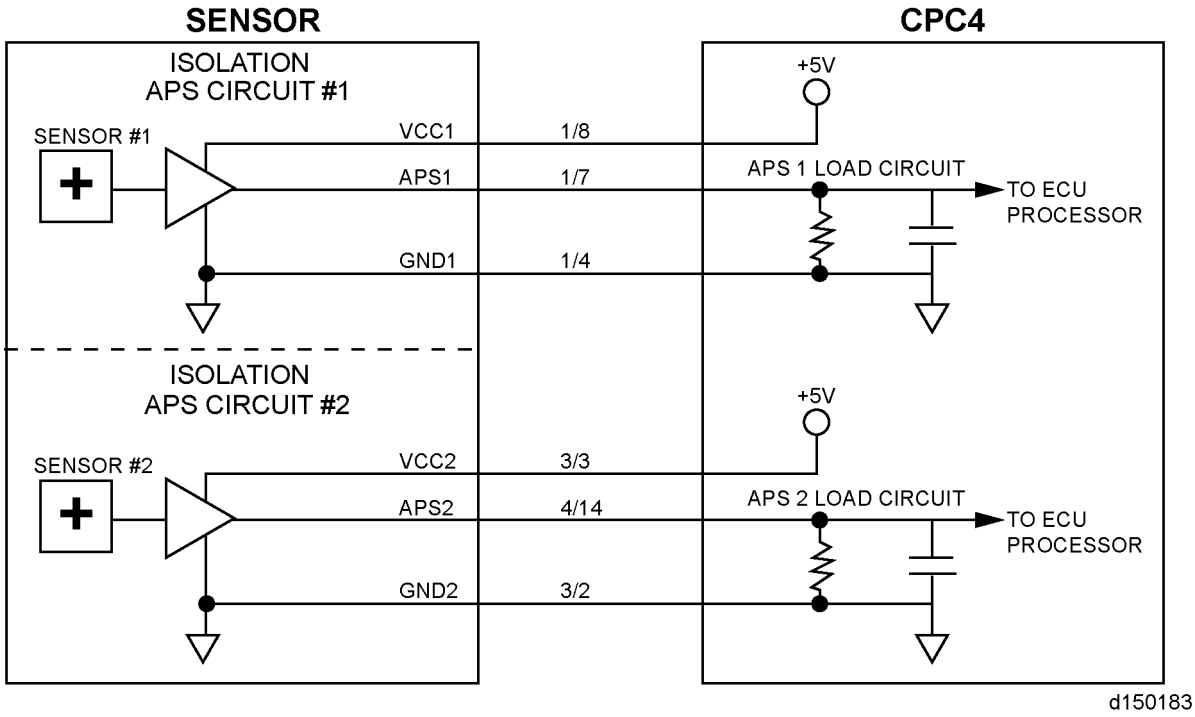
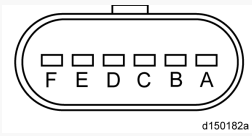


Figure 2. Dual-Channel Analog Pedal

Table 2.

Williams Dual-Channel Pedal Connector and Pinout				
Function	**CPC Pinout**	**Connector Pinout**	**Comments**	**Connector Body**
APS1	1/7	A	Sensor 1	
GND1	1/4	B	APS 1 GND	
VCC1 (+5V)	1/8	C	APS1 Power Supply	
VCC2 (+5V)	3/3	D	APS2 Power Supply	
GND2	3/2	E	APS2 GND	
APS2	4/14	F	Sensor 2	

Check as follows:

1. Turn the ignition ON (key ON, engine OFF).
2. Connect DiagnosticLink®; are any SPN 91/FMI 0, FMI 2, FMI 4, or FMI 8 fault codes active?
   a. Yes; troubleshoot other faults first.
   b. No; Go to step 3.
3. Check for proper configuration of the CPC against the server information. Does the CPC pedal type have the proper configuration?
   a. Yes; Go to step 4.
   b. No; reprogram the CPC with the correct information as necessary. Verify repair.
4. Disconnect the AP.
5. Inspect the AP and harness side connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connector. Is any damage found?
   a. Yes; repair as necessary. Verify repair.
   b. No; Go to step 6.
6. Measure the voltage between pin B of the AP harness connector and ground. Is voltage present?

a. Yes; repair a short to power between pin B of the AP harness connector and pin 4 of the CPC #1 connector. Verify repair.
b. No; Go to step 7.

7. Measure the voltage between pin A of the AP harness connector and ground. Is voltage present?
   a. Yes; repair a short to power between pin A of the AP harness connector and pin 7 of the CPC #1 connector. Verify repair.
   b. No; Go to step 8.
8. Is the vehicle equipped with a Williams Dual-Channel Analog Pedal?
   a. Yes; Go to step 9.
   b. No; Go to step 11.
9. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
   a. Yes; repair a short to power between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
   b. No; Go to step 10.
10. Measure the voltage between pin E of the AP harness connector and ground. Is voltage present?
    a. Yes; repair a short to power between pin E of the AP harness connector and pin 2 of the CPC #3 connector. Verify repair.
    b. No; Go to step 12.
11. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair a short to power between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Verify repair.
    b. No; Go to step 12.
12. Reconnect the AP.
13. Using DiagnosticLink, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the Instrumentation/Chart tab.
14. Cycle Accelerator Pedal (AP) slowly several times with a full sweep from top to bottom of travel. Does voltage sweep smoothly in relation to pedal travel? Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 15.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature.
15. Clear codes and cycle ignition OFF.
16. Turn the ignition ON (key ON, engine OFF).
17. Does the code return?
    a. Yes; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer's (OEM) literature.
    b. No; Go to step 18.
18. Gently wiggle pedal and harness connector to simulate road vibration.

NOTICE: Do not tap on AP with metal object or tool as this may damage component.

NOTICE: A second technician may be required to monitor values during wiggle testing.

19. While performing wiggle test, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the DiagnosticLink Instrumentation/Chart tab.
20. Cycle AP slowly several times with a full sweep from top to bottom of travel. Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 21.
    b. No; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer (OEM) literature.
21. Gently wiggle the Common Powertrain Controller (CPC) harness connectors to simulate road vibration.
22. While performing wiggle test, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the DiagnosticLink Instrumentation/Chart tab.
23. Cycle AP slowly several times with a full sweep from top to bottom of travel. Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 24.

b. No; isolate that section of harness and inspect for wire chaffing, corrosion, improper connections or physical damage and repair as necessary. Verify repair.

24. Disconnect the CPC #1 connector.
25. Disconnect the CPC #3 connector.
26. Disconnect the CPC #4 connector.
27. Inspect the CPC and the harness connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connectors. Is any damage found?
    a. Yes; repair as necessary. Verify repair.
    b. No; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer (OEM) literature. Verify repair.

3 SPN 2623/FMI 8 - GHG17

2-Channel Accelerator Pedal Signal 2 Missing

Table 3.

SPN 2623/FMI 8	
Description	Channel 2 Sensor Signal Failed (High Or Low)
Monitored Parameter	GAS2
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	CEL
Engine Reaction	None
Verification	Key Cycle - Ignition ON

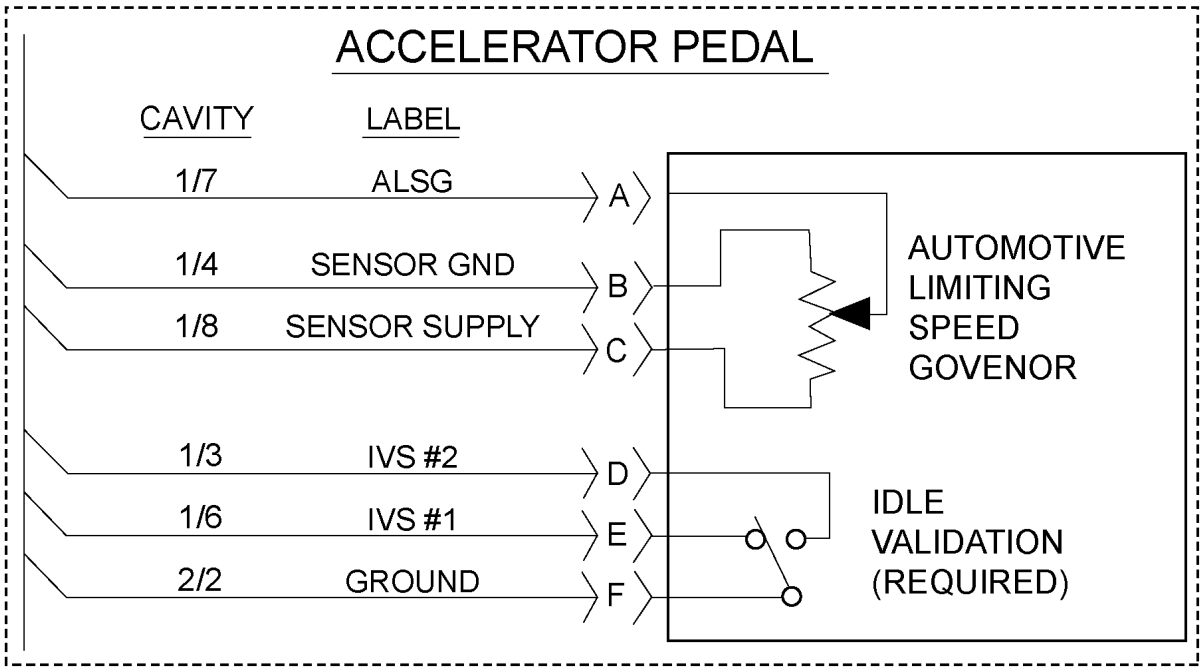


Figure 3. Analog Pedal Type

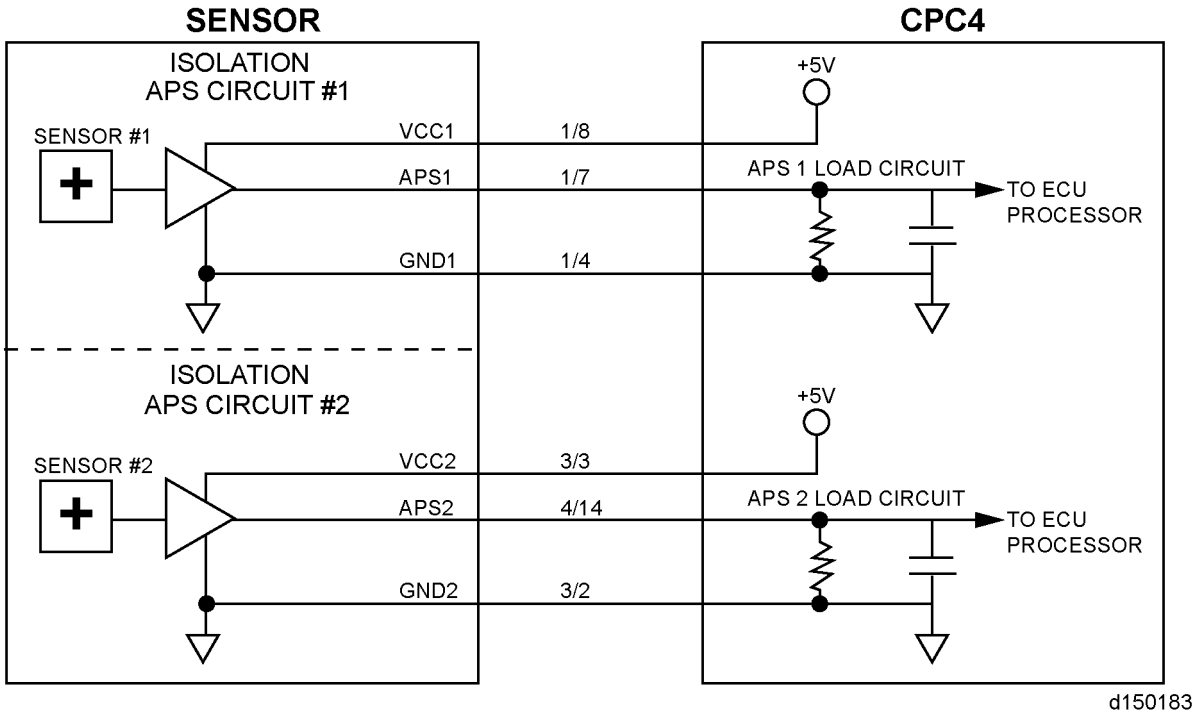
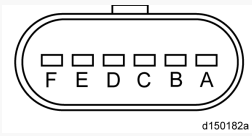


Figure 4. Dual-Channel Analog Pedal

Table 4.

Williams Dual-Channel Pedal Connector and Pinout				
Function	**CPC Pinout**	**Connector Pinout**	**Comments**	**Connector Body**
APS1	1/7	A	Sensor 1	
GND1	1/4	B	APS 1 GND	
VCC1 (+5V)	1/8	C	APS1 Power Supply	
VCC2 (+5V)	3/3	D	APS2 Power Supply	
GND2	3/2	E	APS2 GND	
APS2	4/14	F	Sensor 2	

Check as follows:

1. Disconnect the Accelerator Pedal (AP).
2. Inspect the AP and harness side connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connector. Is any damage found?
    a. Yes; repair as necessary. Verify repair.
    b. No; Go to step 3.
3. Turn the ignition ON (key ON, engine OFF).
4. Measure the voltage between pin B of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin B of the AP harness connector and pin 4 of the CPC #1 connector. Verify repair.
    b. No; Go to step 5.
5. Is the vehicle equipped with a Williams Dual-Channel Analog Pedal?
    a. Yes; Go to step 6.
    b. No; Go to step 12.
6. Measure the resistance between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Is the resistance less than five ohms?

a. Yes; Go to step 7.
b. No; repair the open circuit between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Verify repair.

7. Measure the voltage between pin D of the AP harness connector and ground. Is voltage greater than 5.5 volts?
   a. Yes; repair the short to battery power between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Verify repair.
   b. No; Go to step 8.
8. Measure the voltage between pin E of the AP harness connector and ground. Is voltage present?
   a. Yes; repair the short to power between pin E of the AP harness connector and pin 2 of the CPC #3 connector. Verify repair.
   b. No; Go to step 9.
9. Measure the resistance between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Is the resistance less than five ohms?
   a. Yes; Go to step 10.
   b. No; repair the open circuit between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
10. Measure the resistance between pin F of the AP harness connector and ground. Is the resistance greater than 10K ohms?
    a. Yes; Go to step 11.
    b. No; repair the short to ground circuit between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
11. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature.
12. Measure the resistance between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Is the resistance less than five ohms?
    a. Yes; Go to step 13.
    b. No; repair the open circuit between pin F and pin 2 of the CPC #2 connector. Verify repair.
13. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Verify repair.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature. Verify repair.

4 SPN 2623/FMI 14 - GHG17

2-Channel Accelerator Pedal GAS1 and GAS2 Signal Missing

Table 5.

SPN 2623/FMI 14	
Description	PWM Pedal Signal is Missing
Monitored Parameter	CAN Communication
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	None
Engine Reaction	None
Verification	Ignition Cycle

Check as follows:

1. Turn the ignition ON (key ON, engine OFF) .
2. Connect DiagnosticLink ® and check for multiple codes. Are there any SPN 168 (battery voltage) fault codes present?
    a. Yes; repair the battery voltage concern. Verify repair.
    b. No; Go to step 3.
3. Is SPN 625/FMI 9 fault code present?
    a. Yes; repair the Controller Area Network (CAN) line. Verify repair.
    b. No; Go to step 4.
4. Check for proper configuration of the CPC against the server information. Does the CPC pedal type have the proper configuration?
    a. Yes; refer to the OEM diagnostics for troubleshooting the loss of communication to the ABS module.
    b. No; reprogram the CPC with the correct information as necessary. Verify repair.

5 SPN 2623/FMI 2 - GHG17

Accelerator Pedal "In-Range" Fault

Table 6.

SPN 2623/FMI 2	
Description	Pedal Position Sensors Deviation Too High
Monitored Parameter	GAS1, GAS2
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	None
Engine Reaction	None
Verification	Key Cycle - Ignition ON

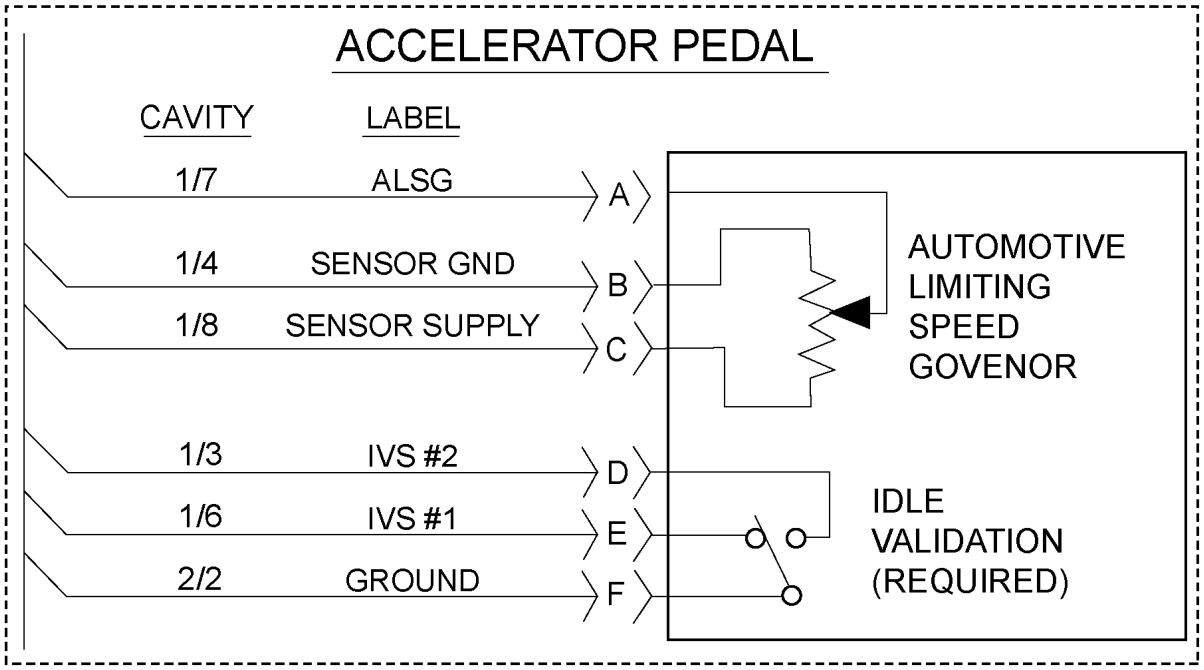


Figure 5. Analog Pedal Type

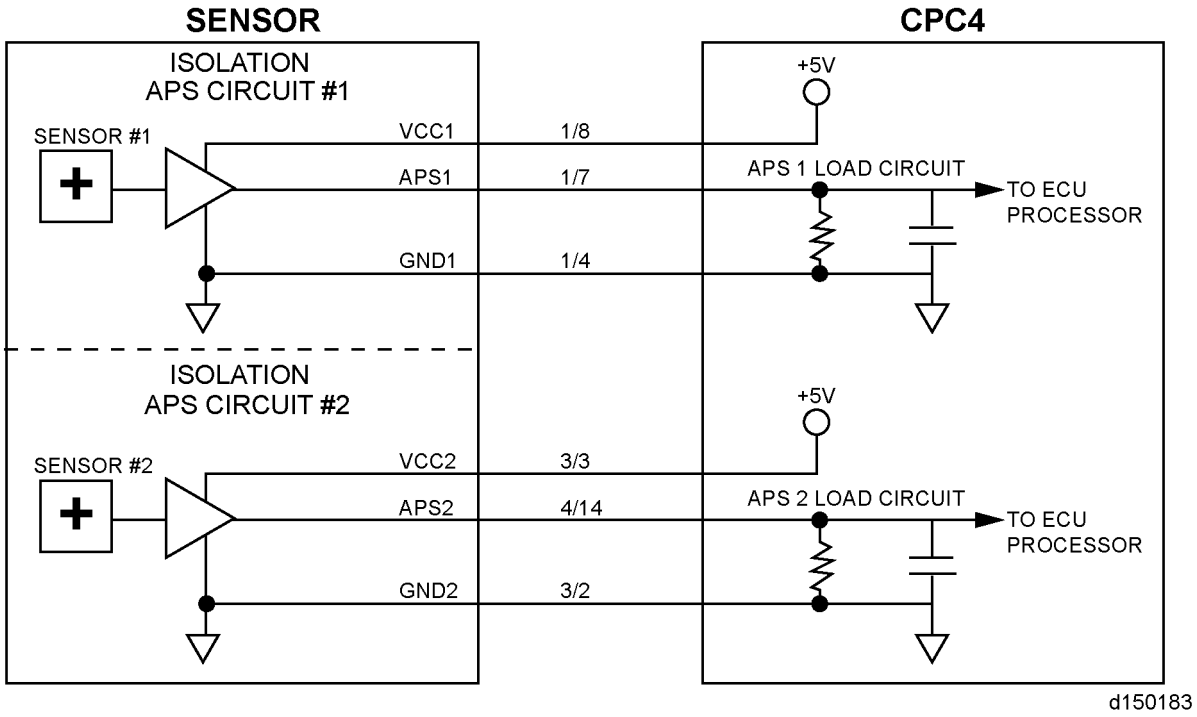
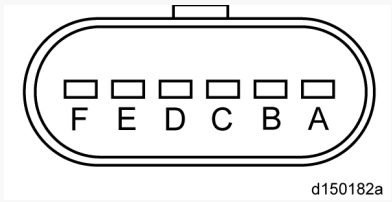


Figure 6. Dual-Channel Analog Pedal

Table 7.

Williams Dual-Channel Pedal Connector and Pinout				
Function	CPC Pinout	Connector Pinout	Comments	Connector Body
APS1	1/7	A	Sensor 1	
GND1	1/4	B	APS 1 GND	
VCC1 (+5V)	1/8	C	APS1 Power Supply	
VCC2 (+5V)	3/3	D	APS2 Power Supply	
GND2	3/2	E	APS2 GND	
APS2	4/14	F	Sensor 2	

Check as follows:

1. Turn the ignition ON (key ON, engine OFF).
2. Connect DiagnosticLink ®; are any SPN 91/FMI 0, FMI 2, FMI 4, or FMI 8 fault codes active?
   a. Yes; troubleshoot any other faults first.
   b. No; Go to step 3.
3. Check for proper configuration of the CPC against the server information. Does the CPC pedal type have the proper configuration?
   a. Yes; Go to step 4.
   b. No; reprogram the CPC with the correct information as necessary. Verify repair.
4. Disconnect the AP.
5. Inspect the AP and harness side connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connector. Is any damage found?
   a. Yes; repair as necessary. Verify repair.
   b. No; Go to step 6.
6. Measure the voltage between pin B of the AP harness connector and ground. Is voltage present?

a. Yes; repair a short to power between pin B of the AP harness connector and pin 4 of the CPC #1 connector. Verify repair.
b. No; Go to step 7.

7. Measure the voltage between pin A of the AP harness connector and ground. Is voltage present?
   a. Yes; repair a short to power between pin A of the AP harness connector and pin 7 of the CPC #1 connector. Verify repair.
   b. No; Go to step 8.
8. Is the vehicle equipped with a Williams Dual-Channel Analog Pedal?
   a. Yes; Go to step 9.
   b. No; Go to step 11.
9. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
   a. Yes; repair a short to power between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
   b. No; Go to step 10.
10. Measure the voltage between pin E of the AP harness connector and ground. Is voltage present?
    a. Yes; repair a short to power between pin E of the AP harness connector and pin 2 of the CPC #3 connector. Verify repair.
    b. No; Go to step 12.
11. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair a short to power between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Verify repair.
    b. No; Go to step 12.
12. Reconnect the AP.
13. Using DiagnosticLink, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the Instrumentation/Chart tab.
14. Cycle Accelerator Pedal (AP) slowly several times with a full sweep from top to bottom of travel. Does voltage sweep smoothly in relation to pedal travel? Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 15.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature.
15. Clear codes and cycle ignition OFF.
16. Turn the ignition ON (key ON, engine OFF).
17. Does the code return?
    a. Yes; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer's (OEM) literature.
    b. No; Go to step 18.
18. Gently wiggle pedal and harness connector to simulate road vibration.

NOTICE: Do not tap on AP with metal object or tool as this may damage component.

NOTICE: A second technician may be required to monitor values during wiggle testing.

19. While performing wiggle test, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the DiagnosticLink Instrumentation/Chart tab.
20. Cycle AP slowly several times with a full sweep from top to bottom of travel. Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 21.
    b. No; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer (OEM) literature.
21. Gently wiggle the Common Powertrain Controller (CPC) harness connectors to simulate road vibration.
22. While performing wiggle test, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the DiagnosticLink Instrumentation/Chart tab.
23. Cycle AP slowly several times with a full sweep from top to bottom of travel. Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 24.

b. No; isolate that section of harness and inspect for wire chaffing, corrosion, improper connections or physical damage and repair as necessary. Verify repair.

24. Disconnect the CPC #1 connector.
25. Disconnect the CPC #3 connector.
26. Disconnect the CPC #4 connector.
27. Inspect the CPC and the harness connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connectors. Is any damage found?
    a. Yes; repair as necessary. Verify repair.
    b. No; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer (OEM) literature. Verify repair.

6 SPN 2623/FMI 8 - GHG17

2-Channel Accelerator Pedal Signal 2 Missing

Table 8.

SPN 2623/FMI 8	
Description	Channel 2 Sensor Signal Failed (High Or Low)
Monitored Parameter	GAS2
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	CEL
Engine Reaction	None
Verification	Key Cycle - Ignition ON

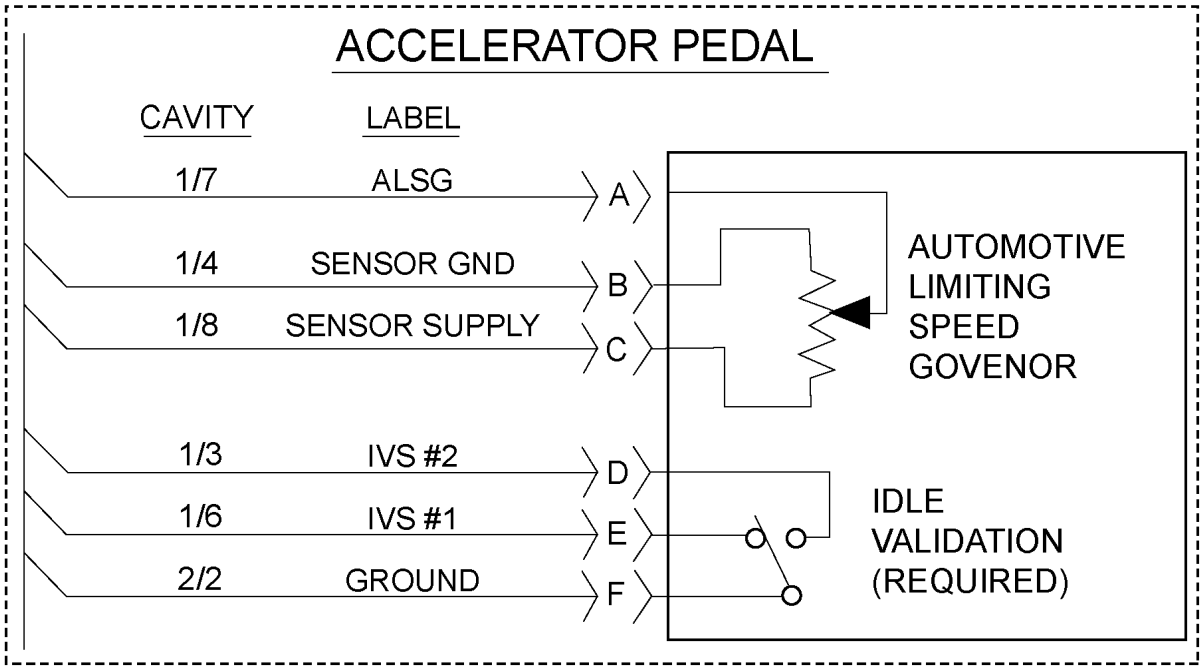


Figure 7. Analog Pedal Type

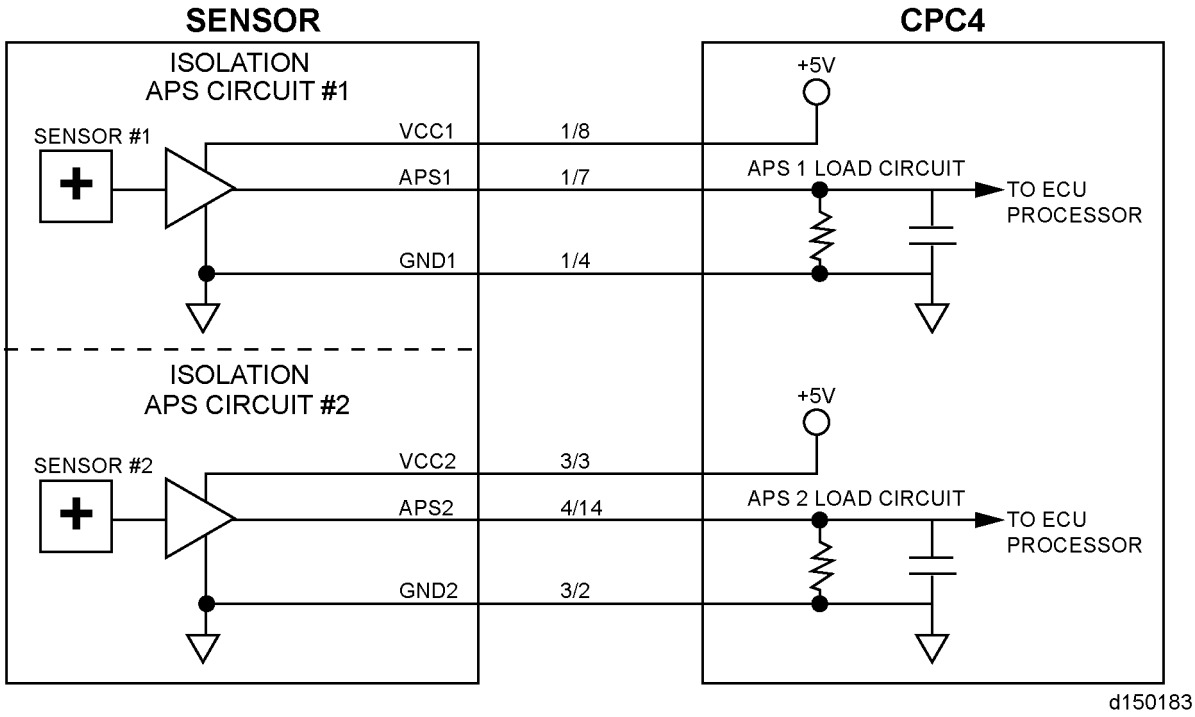
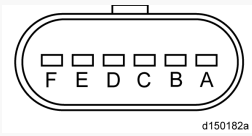


Figure 8. Dual-Channel Analog Pedal

Table 9.

Williams Dual-Channel Pedal Connector and Pinout				
Function	**CPC Pinout**	**Connector Pinout**	**Comments**	**Connector Body**
APS1	1/7	A	Sensor 1	
GND1	1/4	B	APS 1 GND	
VCC1 (+5V)	1/8	C	APS1 Power Supply	
VCC2 (+5V)	3/3	D	APS2 Power Supply	
GND2	3/2	E	APS2 GND	
APS2	4/14	F	Sensor 2	

Check as follows:

1. Disconnect the Accelerator Pedal (AP).
2. Inspect the AP and harness side connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connector. Is any damage found?
    a. Yes; repair as necessary. Verify repair.
    b. No; Go to step 3.
3. Turn the ignition ON (key ON, engine OFF).
4. Measure the voltage between pin B of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin B of the AP harness connector and pin 4 of the CPC #1 connector. Verify repair.
    b. No; Go to step 5.
5. Is the vehicle equipped with a Williams Dual-Channel Analog Pedal?
    a. Yes; Go to step 6.
    b. No; Go to step 12.
6. Measure the resistance between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Is the resistance less than five ohms?

a. Yes; Go to step 7.
b. No; repair the open circuit between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Verify repair.

7. Measure the voltage between pin D of the AP harness connector and ground. Is voltage greater than 5.5 volts?
   a. Yes; repair the short to battery power between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Verify repair.
   b. No; Go to step 8.
8. Measure the voltage between pin E of the AP harness connector and ground. Is voltage present?
   a. Yes; repair the short to power between pin E of the AP harness connector and pin 2 of the CPC #3 connector. Verify repair.
   b. No; Go to step 9.
9. Measure the resistance between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Is the resistance less than five ohms?
   a. Yes; Go to step 10.
   b. No; repair the open circuit between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
10. Measure the resistance between pin F of the AP harness connector and ground. Is the resistance greater than 10K ohms?
    a. Yes; Go to step 11.
    b. No; repair the short to ground circuit between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
11. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature.
12. Measure the resistance between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Is the resistance less than five ohms?
    a. Yes; Go to step 13.
    b. No; repair the open circuit between pin F and pin 2 of the CPC #2 connector. Verify repair.
13. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Verify repair.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature. Verify repair.

7 SPN 2623/FMI 14 - GHG17

2-Channel Accelerator Pedal GAS1 and GAS2 Signal Missing

Table 10.

SPN 2623/FMI 14	
Description	PWM Pedal Signal is Missing
Monitored Parameter	CAN Communication
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	None
Engine Reaction	None
Verification	Ignition Cycle

Check as follows:

1. Turn the ignition ON (key ON, engine OFF) .
2. Connect DiagnosticLink® and check for multiple codes. Are there any SPN 168 (battery voltage) fault codes present?
    a. Yes; repair the battery voltage concern. Verify repair.
    b. No; Go to step 3.
3. Is SPN 625/FMI 9 fault code present?
    a. Yes; repair the Controller Area Network (CAN) line. Verify repair.
    b. No; Go to step 4.
4. Check for proper configuration of the CPC against the server information . Does the CPC pedal type have the proper configuration?
    a. Yes; refer to the OEM diagnostics for troubleshooting the loss of communication to the ABS module.
    b. No; reprogram the CPC with the correct information as necessary. Verify repair.

8 SPN 2623/FMI 2 - GHG14

Accelerator Pedal In-Range Fault

Table 11.

SPN 2623/FMI 2	
Description	Pedal Position Sensors Deviation Too High
Monitored Parameter	GAS1, GAS2
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	None
Engine Reaction	None
Verification	Key Cycle - Ignition ON

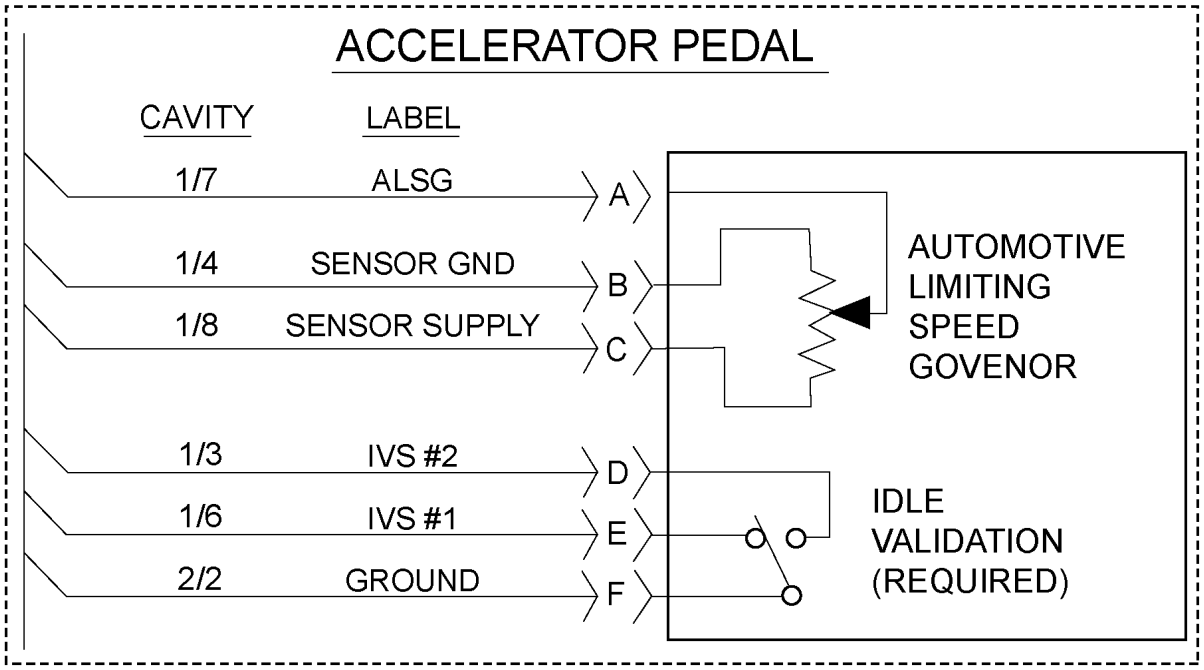


Figure 9. Analog Pedal Type

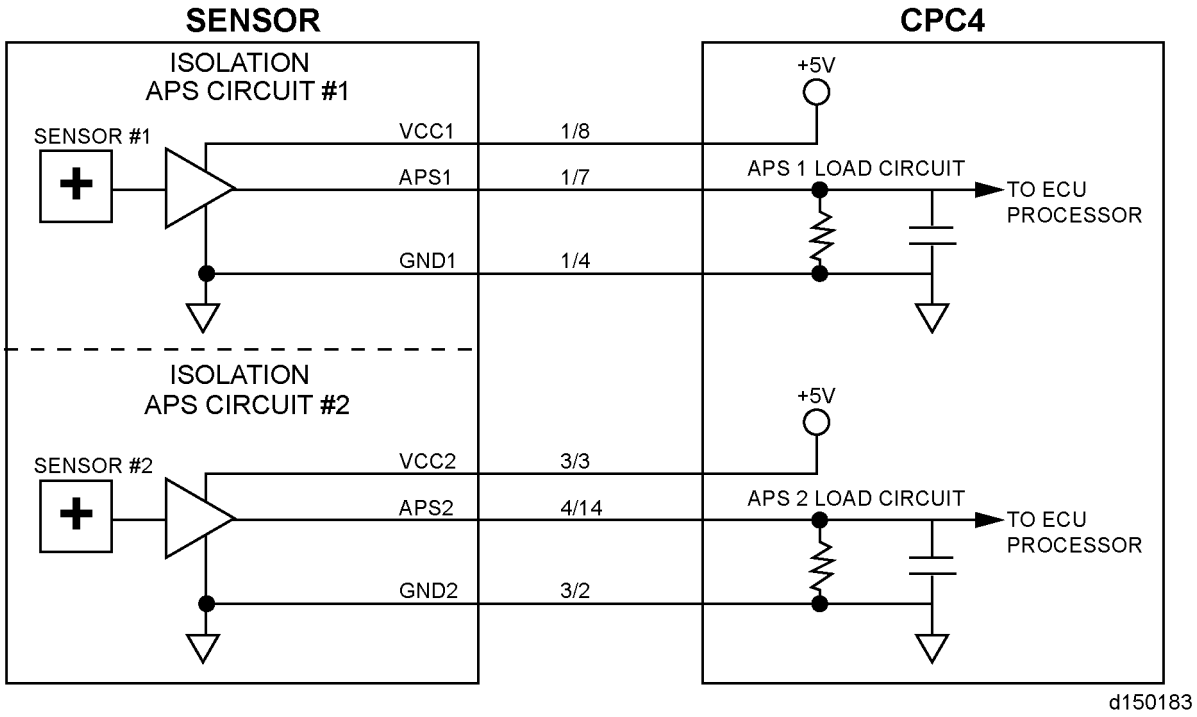
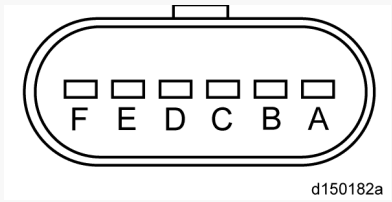


Figure 10. Dual-Channel Analog Pedal

Table 12.

Williams Dual-Channel Pedal Connector and Pinout				
Function	CPC Pinout	Connector Pinout	Comments	Connector Body
APS1	1/7	A	Sensor 1	
GND1	1/4	B	APS 1 GND	
VCC1 (+5V)	1/8	C	APS1 Power Supply	
VCC2 (+5V)	3/3	D	APS2 Power Supply	
GND2	3/2	E	APS2 GND	
APS2	4/14	F	Sensor 2	

Check as follows:

1. Turn the ignition ON (key ON, engine OFF).
2. Connect DiagnosticLink ®; are any SPN 91/FMI 0, FMI 2, FMI 4, or FMI 8 fault codes active?
   a. Yes; troubleshoot any other faults first.
   b. No; Go to step 3.
3. Check for proper configuration of the CPC against the server information. Does the CPC pedal type have the proper configuration?
   a. Yes; Go to step 4.
   b. No; reprogram the CPC with the correct information as necessary. Verify repair.
4. Disconnect the AP.
5. Inspect the AP and harness side connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connector. Is any damage found?
   a. Yes; repair as necessary. Verify repair.
   b. No; Go to step 6.
6. Measure the voltage between pin B of the AP harness connector and ground. Is voltage present?

a. Yes; repair a short to power between pin B of the AP harness connector and pin 4 of the CPC #1 connector. Verify repair.
b. No; Go to step 7.

7. Measure the voltage between pin A of the AP harness connector and ground. Is voltage present?
   a. Yes; repair a short to power between pin A of the AP harness connector and pin 7 of the CPC #1 connector. Verify repair.
   b. No; Go to step 8.
8. Is the vehicle equipped with a Williams Dual-Channel Analog Pedal?
   a. Yes; Go to step 9.
   b. No; Go to step 11.
9. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
   a. Yes; repair a short to power between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
   b. No; Go to step 10.
10. Measure the voltage between pin E of the AP harness connector and ground. Is voltage present?
    a. Yes; repair a short to power between pin E of the AP harness connector and pin 2 of the CPC #3 connector. Verify repair.
    b. No; Go to step 12.
11. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair a short to power between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Verify repair.
    b. No; Go to step 12.
12. Reconnect the AP.
13. Using DiagnosticLink, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the Instrumentation/Chart tab.
14. Cycle Accelerator Pedal (AP) slowly several times with a full sweep from top to bottom of travel. Does voltage sweep smoothly in relation to pedal travel? Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 15.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature.
15. Clear codes and cycle ignition OFF.
16. Turn the ignition ON (key ON, engine OFF).
17. Does the code return?
    a. Yes; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer's (OEM) literature.
    b. No; Go to step 18.
18. Gently wiggle pedal and harness connector to simulate road vibration.

NOTICE: Do not tap on AP with metal object or tool as this may damage component.

NOTICE: A second technician may be required to monitor values during wiggle testing.

19. While performing wiggle test, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the DiagnosticLink Instrumentation/Chart tab.
20. Cycle AP slowly several times with a full sweep from top to bottom of travel. Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 21.
    b. No; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer (OEM) literature.
21. Gently wiggle the Common Powertrain Controller (CPC) harness connectors to simulate road vibration.
22. While performing wiggle test, monitor PWM Pedal Signal GAS1 and PWM Pedal Signal GAS2 under the DiagnosticLink Instrumentation/Chart tab.
23. Cycle AP slowly several times with a full sweep from top to bottom of travel. Do the percentages sweep smoothly in relation to pedal travel?
    a. Yes; Go to step 24.

b. No; isolate that section of harness and inspect for wire chaffing, corrosion, improper connections or physical damage and repair as necessary. Verify repair.

24. Disconnect the CPC #1 connector.
25. Disconnect the CPC #3 connector.
26. Disconnect the CPC #4 connector.
27. Inspect the CPC and the harness connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connectors. Is any damage found?
    a. Yes; repair as necessary. Verify repair.
    b. No; replace the AP, clear codes and verify repair. Refer to Original Equipment Manufacturer (OEM) literature. Verify repair.

9 SPN 2623/FMI 8 - GHG14

2-Channel Accelerator Pedal Signal 2 Missing

Table 13.

SPN 2623/FMI 8	
Description	Channel 2 Sensor Signal Failed (High Or Low)
Monitored Parameter	GAS2
Typical Enabling Conditions	Always On
Monitor Sequence	None
Execution Frequency	Continuous When Enabling Conditions Met
Typical Duration	Two Seconds
Dash Lamps	CEL
Engine Reaction	None
Verification	Key Cycle - Ignition ON

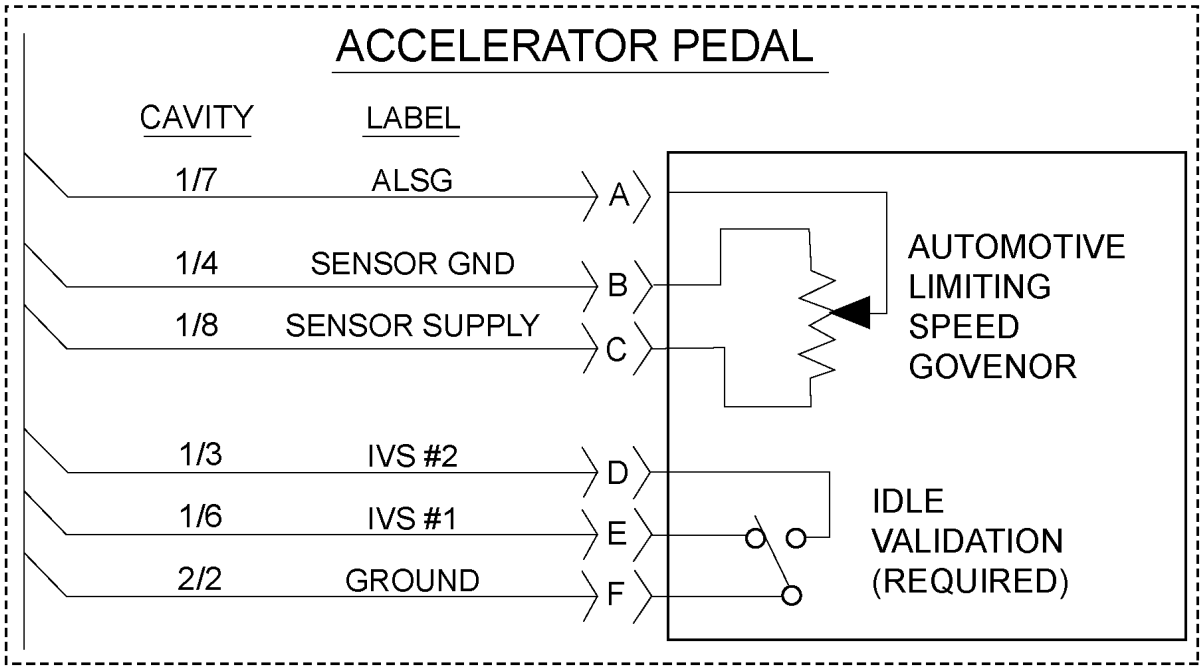


Figure 11. Analog Pedal Type

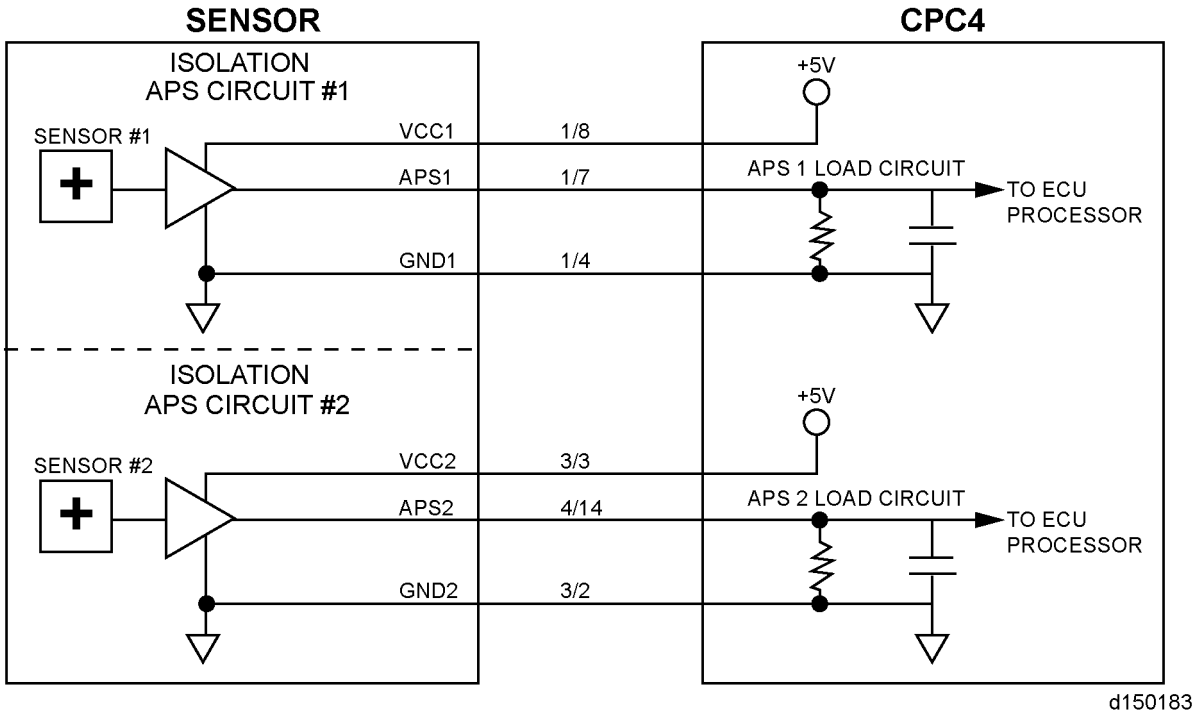
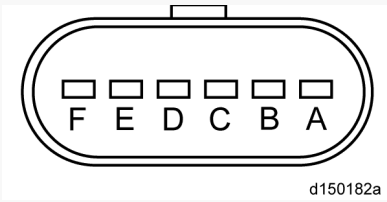


Figure 12. Dual-Channel Analog Pedal

Table 14.

Williams Dual-Channel Pedal Connector and Pinout				
Function	CPC Pinout	Connector Pinout	Comments	Connector Body
APS1	1/7	A	Sensor 1	
GND1	1/4	B	APS 1 GND	
VCC1 (+5V)	1/8	C	APS1 Power Supply	
VCC2 (+5V)	3/3	D	APS2 Power Supply	
GND2	3/2	E	APS2 GND	
APS2	4/14	F	Sensor 2	

Check as follows:

1. Disconnect the Accelerator Pedal (AP).
2. Inspect the AP and harness side connectors for signs of damaged, bent, spread, corroded or unseated (pushed out) pins and signs of moisture in the connector or wire damage near the connector. Is any damage found?
    a. Yes; repair as necessary. Verify repair.
    b. No; Go to step 3.
3. Turn the ignition ON (key ON, engine OFF).
4. Measure the voltage between pin B of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin B of the AP harness connector and pin 4 of the CPC #1 connector. Verify repair.
    b. No; Go to step 5.
5. Is the vehicle equipped with a Williams Dual-Channel Analog Pedal?
    a. Yes; Go to step 6.
    b. No; Go to step 12.
6. Measure the resistance between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Is the resistance less than five ohms?

a. Yes; Go to step 7.
b. No; repair the open circuit between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Verify repair.

7. Measure the voltage between pin D of the AP harness connector and ground. Is voltage greater than 5.5 volts?
   a. Yes; repair the short to battery power between pin D of the AP harness connector and pin 3 of the CPC #3 connector. Verify repair.
   b. No; Go to step 8.
8. Measure the voltage between pin E of the AP harness connector and ground. Is voltage present?
   a. Yes; repair the short to power between pin E of the AP harness connector and pin 2 of the CPC #3 connector. Verify repair.
   b. No; Go to step 9.
9. Measure the resistance between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Is the resistance less than five ohms?
   a. Yes; Go to step 10.
   b. No; repair the open circuit between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
10. Measure the resistance between pin F of the AP harness connector and ground. Is the resistance greater than 10K ohms?
    a. Yes; Go to step 11.
    b. No; repair the short to ground circuit between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
11. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin F of the AP harness connector and pin 14 of the CPC #4 connector. Verify repair.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature.
12. Measure the resistance between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Is the resistance less than five ohms?
    a. Yes; Go to step 13.
    b. No; repair the open circuit between pin F and pin 2 of the CPC #2 connector. Verify repair.
13. Measure the voltage between pin F of the AP harness connector and ground. Is voltage present?
    a. Yes; repair the short to power between pin F of the AP harness connector and pin 2 of the CPC #2 connector. Verify repair.
    b. No; replace the AP. Refer to Original Equipment Manufacturer (OEM) literature. Verify repair.

10 SPN 2623/FMI 14 - EPA07 - EPA10 - GHG14

2-Channel Accelerator Pedal GAS1 and GAS2 Signal Missing

Table 15.

SPN 2623/FMI 14	
Description	PWM Pedal Signal is Missing
Monitored Parameter	CAN Communication
Typical Enabling Conditions	Always Enabled
Monitor Sequence	None
Execution Frequency	Always Enabled
Typical Duration	Two Seconds
Dash Lamps	None
Engine Reaction	None
Verification	Ignition Cycle

1. Turn the ignition ON (key ON, engine OFF) .
2. Connect DiagnosticLink® and check for multiple codes. Are there any SPN 168 (battery voltage) fault codes present?
    a. Yes; repair the battery voltage concern. Verify repair.
    b. No; Go to step 3.
3. Is SPN 625/FMI 9 fault code present?
    a. Yes; repair the Controller Area Network (CAN) line. Verify repair.
    b. No; Go to step 4.
4. Check for proper configuration of the CPC against the server information . Does the CPC pedal type have the proper configuration?
    a. Yes; refer to the OEM diagnostics for troubleshooting the loss of communication to the ABS module.
    b. No; reprogram the CPC with the correct information as necessary. Verify repair.

