

Diagnostic Procedure

Blue iQ® Fault Code 6947



FC	SPN	FMI	Title
6947	8247	7	Fuel Tank Receptacle Cover - Mechanical System Not Responding or Out of Adjustment

Part(s) Affected

Receptacle Cover 1
Receptacle Cover 2
Receptacle Cover 3
Receptacle Cover 4
Receptacle Cover 5

NOTE: The above terms are used by INSITE™. Depending upon cover type and configuration, Hexagon Agility® refers to these drive away protection (DAP) components as follows:

- fuel fill door (box FMMs)
- fuel receptacle dust cap
- fuel receptacle kill cap (remote fill panels)

Diagnostic Overview

Fault Code 6947 triggers when an engine crank is attempted and the Blue iQ® Fuel System Control Module (FSCM) detects one or more of the following conditions related to DAP components:

- fuel fill door open or damaged
- dust cap not installed on a fuel receptacle
- kill cap not installed on fuel receptacle
- cap magnet missing
- faulty reed switch
- damage to DAP circuit

Fault Code 9647 will trigger every time a crank is attempted due to the incorrect state of the DAP component.

Because multiple components are potentially responsible for FC 6947, consult relevant sections of the **DSM.0001 Blue iQ® Diagnostic Service Manual**, vehicle-specific **Drive Away Protection Circuit Diagram** for fuel receptacle configuration and follow corresponding **Circuit / System Verification** steps below.

Warning Statements Used in this Procedure

NOTICE

NOTICE is used to address practices not related to physical injury, such as best practices or tips to help an operation or procedure go smoothly and prevent equipment damage.

Tools Required

Item	Purpose
J1939 OBD-II diagnostic interface	connect vehicle to Cummins® INSITE™ on PC
Cummins® INSITE™	diagnostic software
digital multimeter (DMM)	resistance and voltage measurements
test probe kit	properly test and back probe circuit terminals

NOTICE

Perform Initial Vehicle Check (refer to *DSM.0009*) prior to performing diagnostic instructions listed below.

Circuit / System Verification

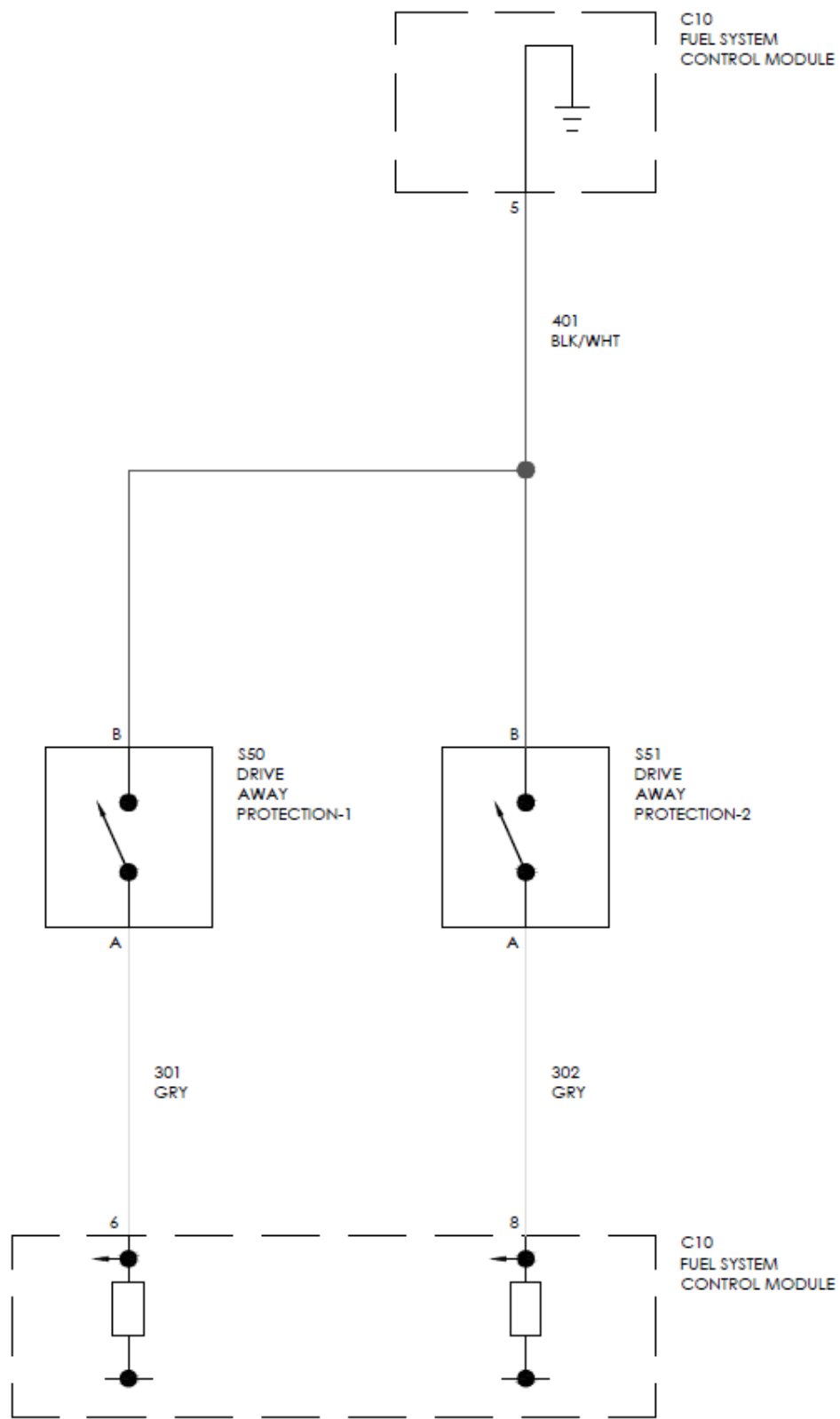
1. Connect Cummins® INSITE™ to vehicle using J1939 OBD-II diagnostic interface and PC and navigate to the “Agility® Fuel Delivery System, CM1881 AFS(18)”.
2. Record all active and stored fault codes and parameters prior to clearing fault codes using INSITE™.
3. While systematically removing and reinstalling each FMM fuel door* / receptacle fuel cap*, simultaneously observe INSITE™ **Fuel Tank Receptacle Cover** data for **status change (OPEN or CLOSED)** and record status.

NOTICE

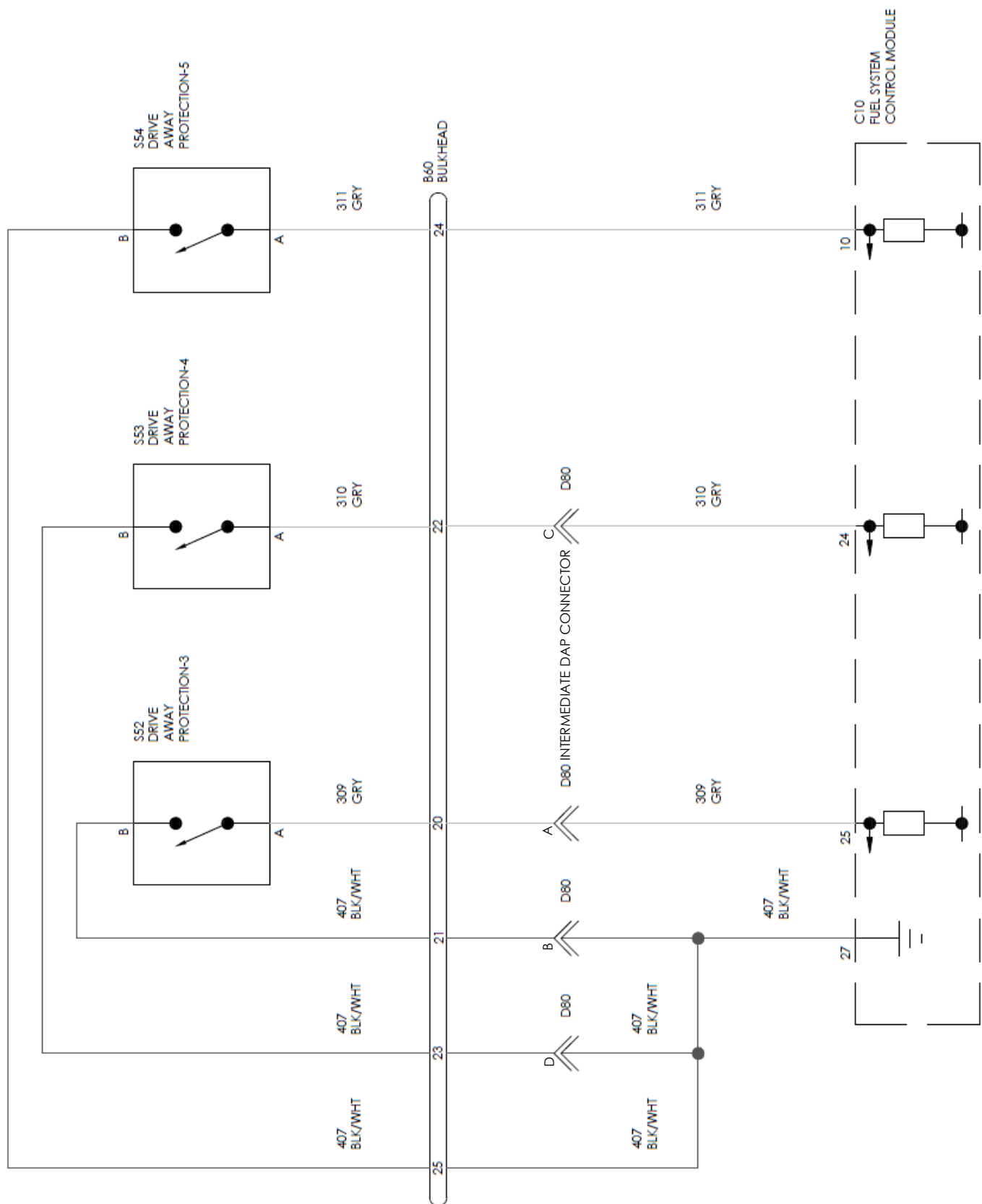
*DAP component numbering may vary with vehicle OEM or fuel system type; always correlate actual component location with INSITE™ data.

- a. **If status does not change** proceed to **Circuit/System Testing** on affected door or caps.
 - b. **If status changes** proceed to Step 4.
4. Operate the vehicle in the same conditions for enabling the fault code or within the same conditions that triggered the fault code based on recorded data.
 5. Verify that the fault code does not set. **If any fault code sets** proceed to **Circuit/System Testing**.
 6. While observing the **Fuel Tank Receptacle Cover** parameters in INSITE™ perform a wiggle test on the harness and connectors to test for poor or intermittent connections.
 - a. **If any fault code sets**, proceed to **Circuit/System Testing**.
 - b. **If no fault code sets**, system is functioning to design intent.
 7. Review **Circuit Diagrams** and **Connector End Views** (both below) to locate test points.

Circuit Diagram – Standard two DAP sensor configurations: DAP 1 and 2



Circuit Diagram – Optional: Three to Five DAP Sensor Configurations: DAP 3, 4, and 5



Circuit / System Verification

Step 1

If present, check each of the following items:

- Is **FMM fuel door** fully closed?
- Are **all FMM fuel receptacle dust cap(s)** properly installed?
- Are **all auxiliary and/or remote fill fuel receptacle kill cap(s)** properly installed?

Yes

↳ **Proceed to Step 2.**

No

- ↳ **Close FMM fuel door / install fuel receptacle cap(s).**
- ↳ **Operate vehicle to verify if fault code returns.**

NOTICE

Never probe an electrical connection with anything other than an appropriately sized and shaped test lead; doing so may result in damage to components.

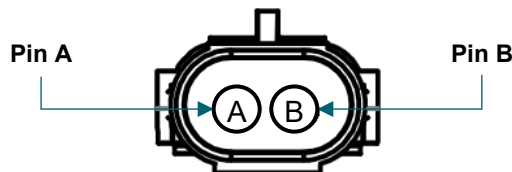
Step 2

- Ignition **OFF**.
- Disconnect **2-pin reed switch harness connector** for the circuit which indicated "OFF" in INSITE™.

NOTICE

Verify all fuel doors are closed / fill caps are installed.

- Use a DMM and appropriate test leads to check resistance across 2-pin reed switch assembly connector **Pin A** and **Pin B**.



2-pin reed switch connector end view

Resistance between zero and 1 ohms?

Yes

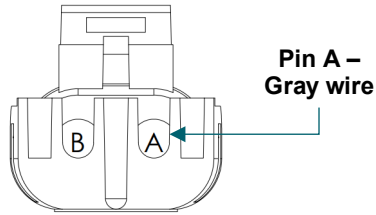
↳ **Proceed to Step 3.**

No

- ↳ **Replace FMM fuel door switch / reed switch assembly.**
- ↳ **After repair is complete, proceed to Reassembly and Validation.**

**Step
3**

- Ignition **ON**.
- Open **FMM fuel door** / remove **fuel receptacle dust caps** or **fuel receptacle kill cap(s)**.
- Use a DMM to check for voltage between 2-pin reed switch harness connector **Pin A** and **known good ground**.



2-pin reed switch harness connector end view

Voltage between 4.8 V and 5.2 V?

Yes

↳ **Proceed to Step 7.**

No

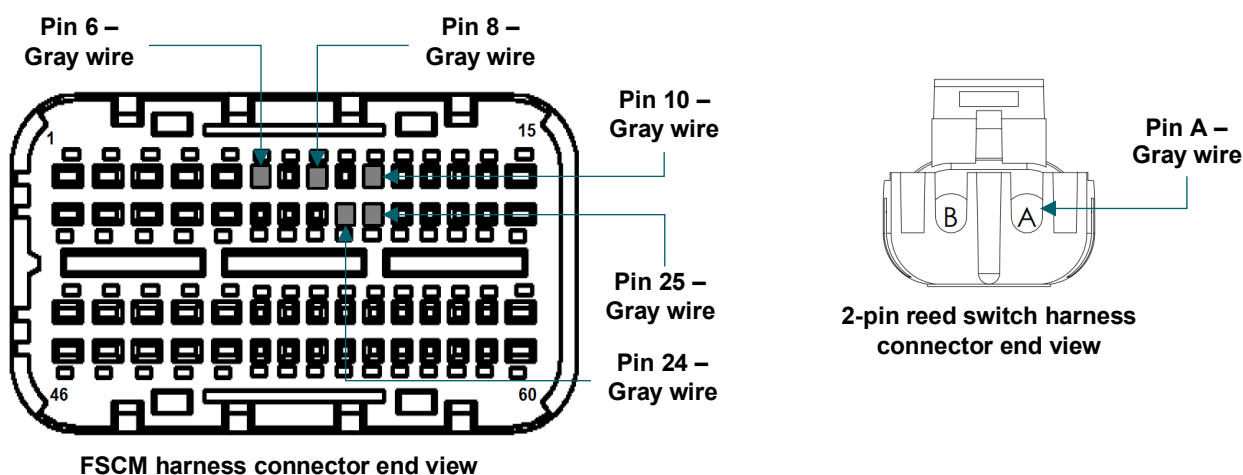
↳ **Proceed to Step 4.**

Step 4

- Ignition **OFF**.
- Disconnect **Blue iQ®** harness **FSCM** connector.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the **5V Supply** circuit for which INSITE™ indicated a fault.

Standard (all systems): Two DAP sensor configurations			
From		To	
2-pin Connector	Pin	Connector	Pin
DAP #1	A	FSCM	6
DAP #2	A	FSCM	8

Optional: Three to five DAP sensor configurations			
From		To	
2-pin Connector	Pin	Connector	Pin
DAP #3	A	FSCM	25
DAP #4	A	FSCM	24
DAP #5	A	FSCM	10



Resistance between zero and 1 ohms?

Yes

- ↳ Contact Hexagon Agility® Technical Support.

No

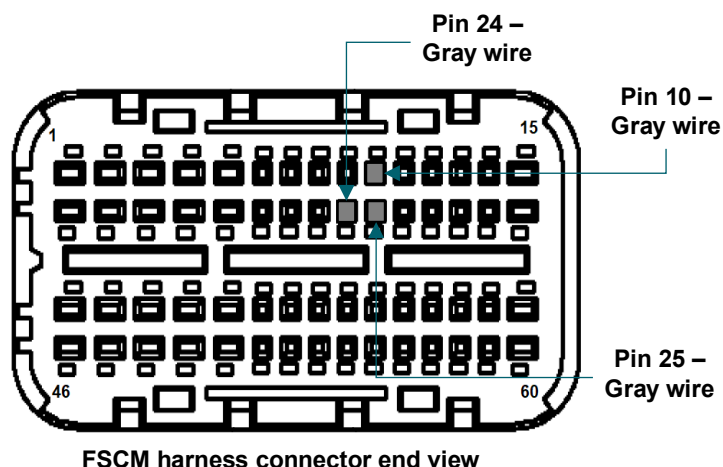
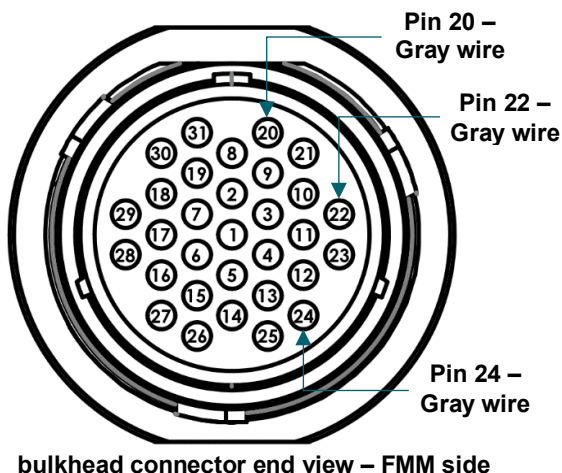
- ↳ If the fault is in the circuit for DAP #3, #4, or #5, proceed to Step 5.
- ↳ If the fault is in the circuit for DAP #1 or DAP #2, repair open / high resistance in 5V Supply circuit. Refer to DSM.0036 Harness and Wire Repair Manual..
- ↳ After repair is complete, **proceed to Reassembly and Validation.**

Step 5

- Ignition **OFF**.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the FMM harness bulkhead to FSCM 5V Supply circuit for which INSITE™ indicated a fault.

Optional: Three to five DAP sensor configurations

Circuit	From		To	
	Connector	Pin	Connector	Pin
DAP #3	Bulkhead, FMM side	20	FSCM	25
DAP #4	Bulkhead, FMM side	22	FSCM	24
DAP #5	Bulkhead, FMM side	24	FSCM	10



Resistance between zero and 1 ohms?

Yes

➤ Proceed to Step 6.

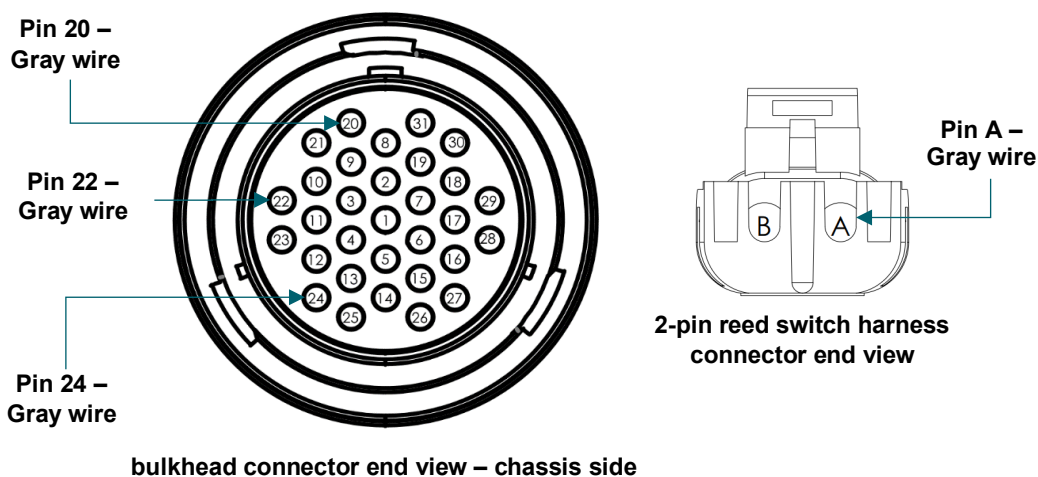
No

- If the fault is in the circuit for DAP #5, repair open / high resistance in 5V Supply circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.
- If the fault is in the circuit for DAP #3 or #4, proceed to Step 10.
- After repair is complete, proceed to Reassembly and Validation.

Step 6

- Ignition **OFF**.
- Disconnect **Blue iQ® Chassis Bulkhead harness connector**.
- Disconnect the Reed switch harness connector.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the chassis harness bulkhead to DAP reed switch **5V Supply** circuit for which INSITE™ indicated a fault.

Optional: Three to five DAP sensor configurations				
Circuit	From		To	
	Connector	Pin	2-pin Connector	Pin
DAP #3	Bulkhead, chassis side	20	DAP #3	A
DAP #4	Bulkhead, chassis side	22	DAP #4	A
DAP #5	Bulkhead, chassis side	24	DAP #5	A



Resistance between zero and 1 ohms?

Yes

↳ Contact Hexagon Agility® Technical Support.

No

↳ Repair open / high resistance in chassis harness **5V Supply** circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.

↳ After repair is complete, **proceed to Reassembly and Validation**.

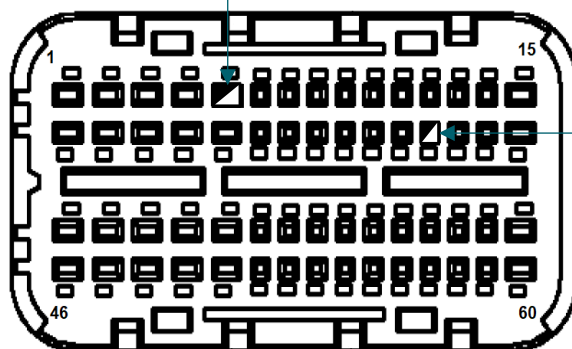
Step 7

- Ignition **OFF**.
- Disconnect **Blue iQ®** harness **FSCM** connector.
- Using a DMM and appropriate test leads, refer to the chart below to measure resistance of the bulkhead to FSCM **5V Low-Reference** circuit for which INSITE™ indicated a fault.

Standard (all systems): Two DAP sensor configurations				
Circuit	From		To	
	2-pin Connector	Pin	Connector	Pin
DAP #1	DAP 1	B	FSCM	5
DAP #2	DAP 2	B	FSCM	5

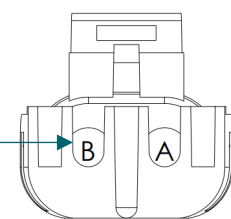
Optional: Three to five DAP sensor configurations				
Circuit	From		To	
	2-pin Connector	Pin	Connector	Pin
DAP #3	DAP 3	B	FSCM	27
DAP #4	DAP 4	B	FSCM	27
DAP #5	DAP 5	B	FSCM	27

Pin 5 –
Black/White
wire



FSCM harness connector end view

Pin B –
Black/White
wire



2-pin reed switch harness
connector end view

Resistance between zero and 1 ohms?

Yes

↳ Contact Hexagon Agility® Technical Support.

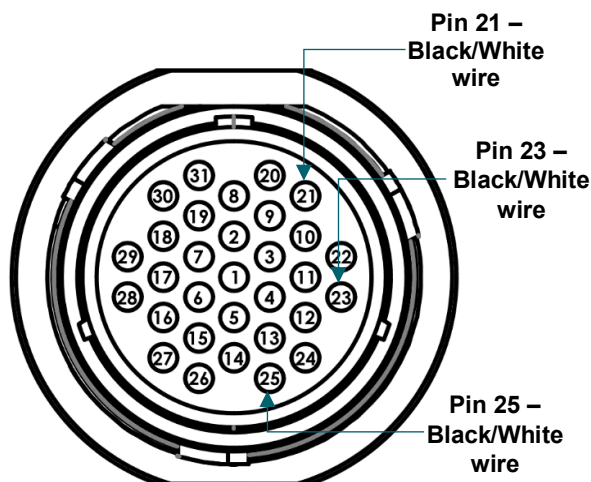
No

- ↳ If the fault is in the circuit for DAP #3, #4, or #5, proceed to Step 8.
- ↳ If the fault is in the circuit for DAP #1 or DAP #2, repair open / high resistance in harness 5V Reference circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.
- ↳ After repair is complete, proceed to **Reassembly and Validation**.

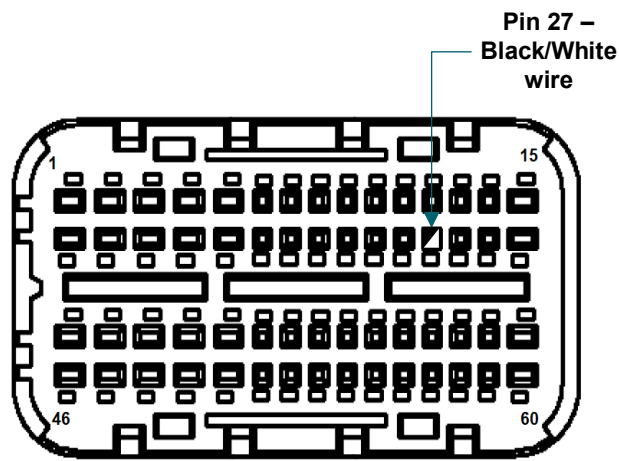
Step 8

- Ignition **OFF**.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the FMM harness bulkhead to FSCM **5V Low-Reference** circuit for which INSITE™ indicated a fault.

Optional: Three to five DAP sensor configurations				
Circuit	From		To	
	Connector	Pin	Connector	Pin
DAP #3	Bulkhead, FMM side	21	FSCM	27
DAP #4	Bulkhead, FMM side	23	FSCM	27
DAP #5	Bulkhead, FMM side	25	FSCM	27



bulkhead connector end view – FMM side



FSCM harness connector end view

Resistance between zero and 1 ohms?

Yes

➤ Proceed to Step 9.

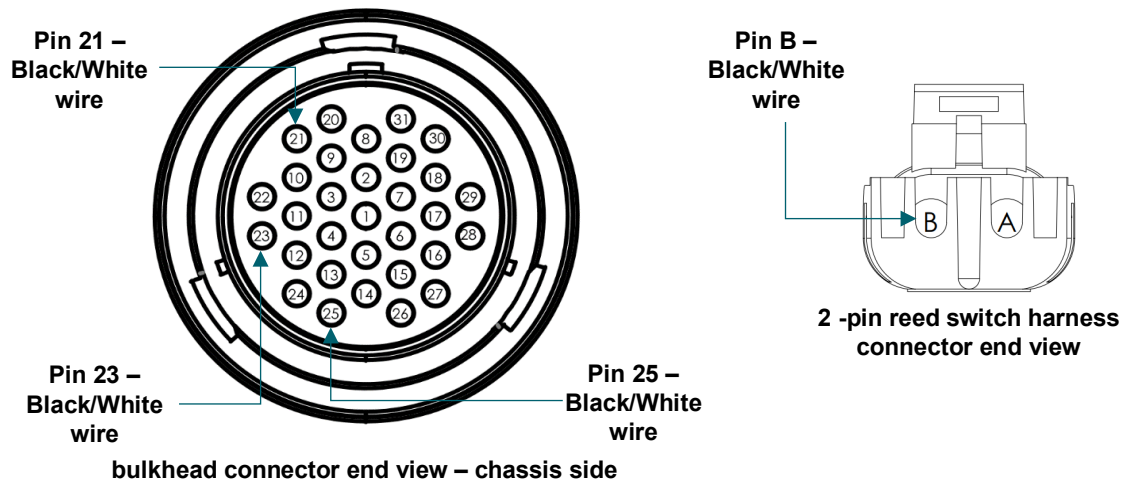
No

- If the fault is in the circuit for DAP #5, repair open / high resistance in 5V Low-Reference circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.
- If the fault is in the circuit for DAP #3 or #4, proceed to Step 12.
- After repair is complete, proceed to Reassembly and Validation.

Step 9

- Ignition **OFF**.
- Disconnect **Blue iQ® chassis harness bulkhead connector**.
- Disconnect **2-pin reed switch harness connector**.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the chassis harness bulkhead to DAP reed switch **5V Low-Reference** circuit for which INSITE™ indicated a fault.

Optional: Three DAP sensor configurations				
Circuit	From		To	
	Connector	Pin	2-pin Connector	Pin
DAP #3	Bulkhead, chassis side	21	DAP #3	B
DAP #4	Bulkhead, chassis side	23	DAP #4	B
DAP #5	Bulkhead, chassis side	25	DAP #5	B



Resistance between zero and 1 ohms?

Yes

↳ Contact Hexagon Agility® Technical Support.

No

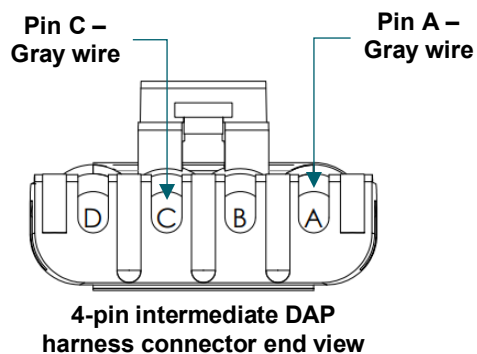
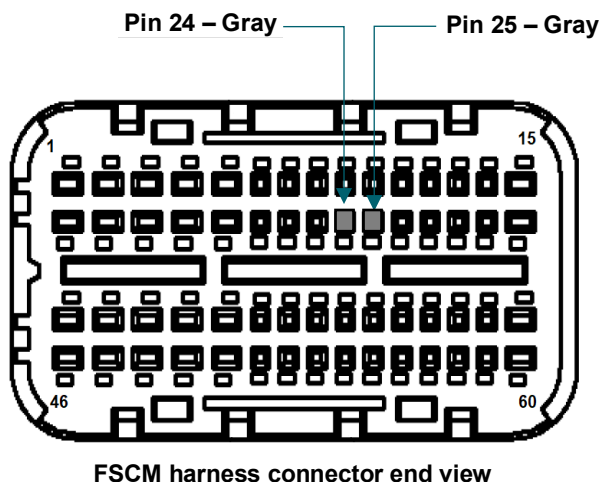
↳ Repair open / high resistance in chassis harness **5V Low-Reference** circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.

↳ After repair is complete, **proceed to Reassembly and Validation**.

Step 10

- Ignition **OFF**.
- Disconnect **4-pin intermediate DAP harness connector**.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the FSCM **5V Supply** to 4-pin intermediate DAP connector for which INSITE™ indicated a fault.

Optional: Three to five DAP sensor configurations					
Circuit	From		To		Circuit #
	Connector	Pin	4-pin Connector	Pin	
DAP #3	FSCM	25	DAP #3	A	309
DAP #4	FSCM	24	DAP #4	C	310



Resistance between zero and 1 ohms?

Yes

↳ Proceed to Step 11.

No

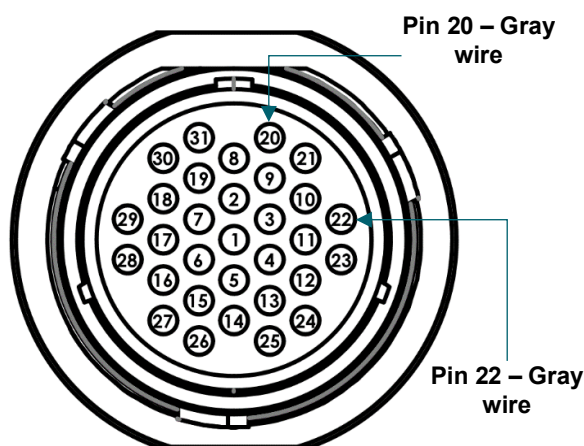
↳ Repair open / high resistance in chassis harness **5V Reference circuit**. Refer to *DSM.0036 Harness and Wire Repair Manual*.

↳ After repair is complete, **proceed to Reassembly and Validation**.

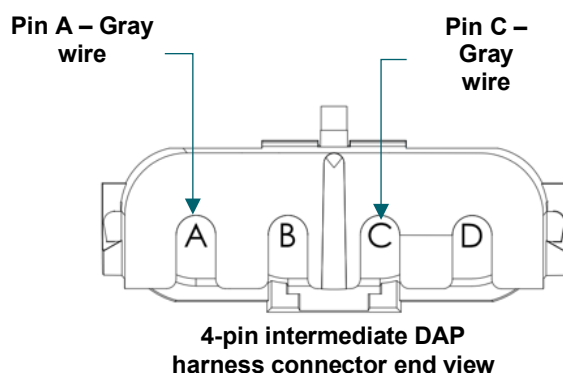
Step 11

- Ignition **OFF**.
- Disconnect **Blue iQ® chassis bulkhead connector**.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the chassis harness bulkhead to 4-pin intermediate DAP connector reed switch **5V Supply** circuit for which INSITE™ indicated a fault.

Optional: Three to Five DAP sensor configurations					
Circuit	From		To		Circuit #
	Connector	Pin	4-pin Connector	Pin	
DAP #3	Bulkhead, chassis side	20	DAP #3	A	309
DAP #4	Bulkhead, chassis side	22	DAP #4	C	310



bulkhead connector end view – chassis side



4-pin intermediate DAP harness connector end view

Resistance between zero and 1 ohms?

Yes

↳ Contact Hexagon Agility® Technical Support.

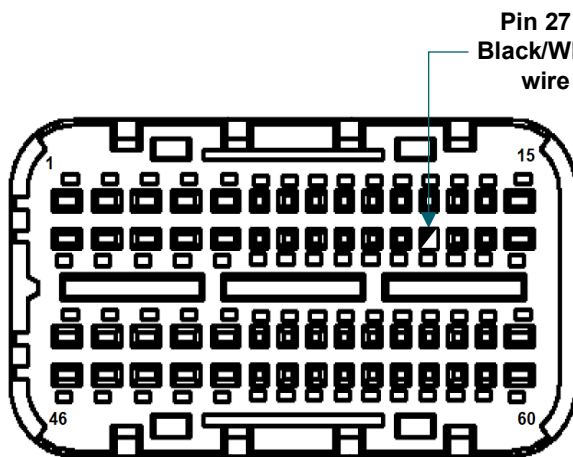
No

↳ Repair open / high resistance in chassis harness **5V Supply** circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.
 ↳ After repair is complete, **proceed to Reassembly and Validation**.

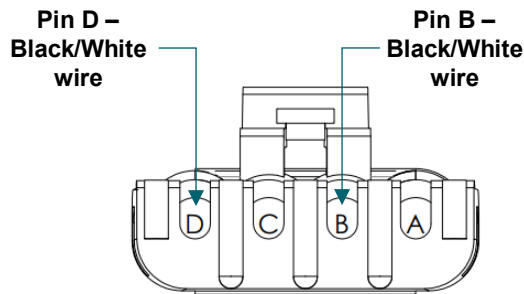
Step 12

- Ignition **OFF**.
- Disconnect **4-pin intermediate DAP harness connector**.
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the FSCM to DAP reed switch **5V Low-Reference** circuit for which INSITE™ indicated a fault.

Optional: Three to Five DAP sensor configurations					
Circuit	From		To		Circuit #
	Connector	Pin	4-pin Connector	Pin	
DAP #3	FSCM	27	DAP #3	B	407
DAP #4	FSCM	27	DAP #4	D	407



FSCM harness connector end view



4-pin intermediate DAP harness connector end view

Resistance between zero and 1 ohms?

Yes

↳ Proceed to Step 13

No

↳ Repair open / high resistance in chassis harness **Low-Reference** circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.

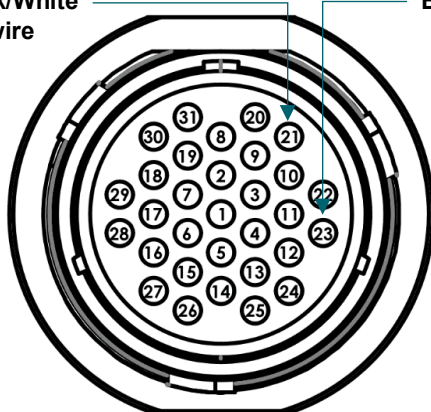
↳ After repair is complete, **proceed to Reassembly and Validation**.

Step 13

- Ignition **OFF**.
- Disconnect **4-pin intermediate DAP harness connector**.
- Disconnect **Blue iQ® chassis bulkhead** connector
- Use a DMM and appropriate test leads, refer to the chart below to measure resistance of the chassis harness bulkhead to DAP reed switch **5V Low-Reference** circuit for which INSITE™ indicated a fault.

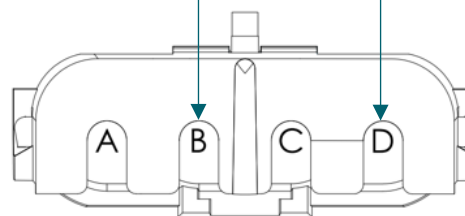
Three DAP sensor configurations					
Circuit	From		To		Circuit #
	Connector	Pin	4-pin Connector	Pin	
DAP #3	Bulkhead, FMM side	21	DAP #3	B	407
DAP #4	Bulkhead, FMM side	23	DAP #4	D	407

Pin 21 –
Black/White
wire



Pin 23 –
Black/White
wire

Pin B –
Black/White
wire



Pin D –
Black/white
wire

4-pin intermediate DAP harness
connector end view

Bulkhead harness connector end view – FMM side

Resistance between zero and 1 ohms?

Yes

↳ Contact Hexagon Agility® Technical Support.

No

↳ Repair open / high resistance in chassis harness **5V Low-Reference** circuit. Refer to *DSM.0036 Harness and Wire Repair Manual*.
↳ After repair is complete, **proceed to Reassembly and Validation**.

Reassembly and Validation

After completing all repairs, always perform the following steps to confirm the issue is fixed:

1. Reconnect all connectors and verify connections are secure.
2. Reattach any enclosure covers and close any fuel system doors.
3. Clear fault codes using Cummins® INSITE™ tool.
4. Run vehicle until it reaches normal operating temperature. *Refer to OEM instructions.*
5. If fault is cleared, return vehicle to duty.

If fault is not cleared, contact Hexagon Agility® Technical Support.

Hexagon Agility® Customer Care and Technical Services

Fuel system warranty or non-warranty product support may be obtained by calling or emailing Hexagon Agility® Customer Care and Technical Services (CCTS).

Please provide **your name, phone number, email address, and complete vehicle information: VIN, year, make, model, mileage, unit number vehicle owner, and current vehicle location.** A service advisor will contact you to arrange vehicle repair or ship a part.

833-4-HEX-CARE

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