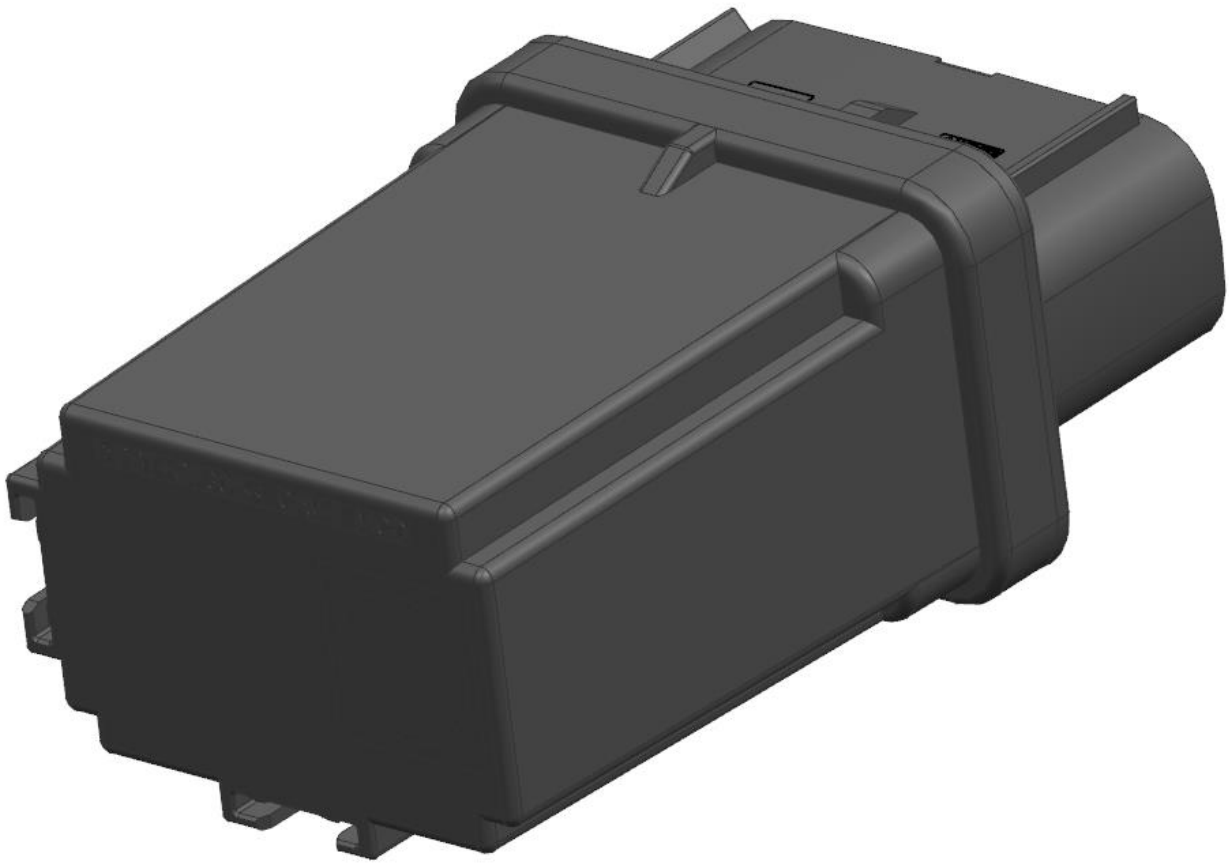
APPLICATION SPECIFICATION

µPDB Module System Application Specification



REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
E1	EC No: **662488** DATE: **04/29/2021**	**µPDB General Market Application Specification**	**1** of **17**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
2003161000AS	**Scott Walker**	**Matthew Young**	**Kushan Vasant**

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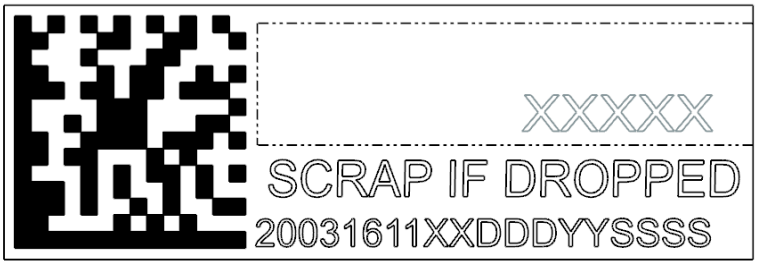
1.0 PRODUCT WARNINGS

1.1 Scrap if Dropped Warning

If the Micro PDB is dropped from any height, it is required to be **scrapped** as per the label warning on the laser marking.

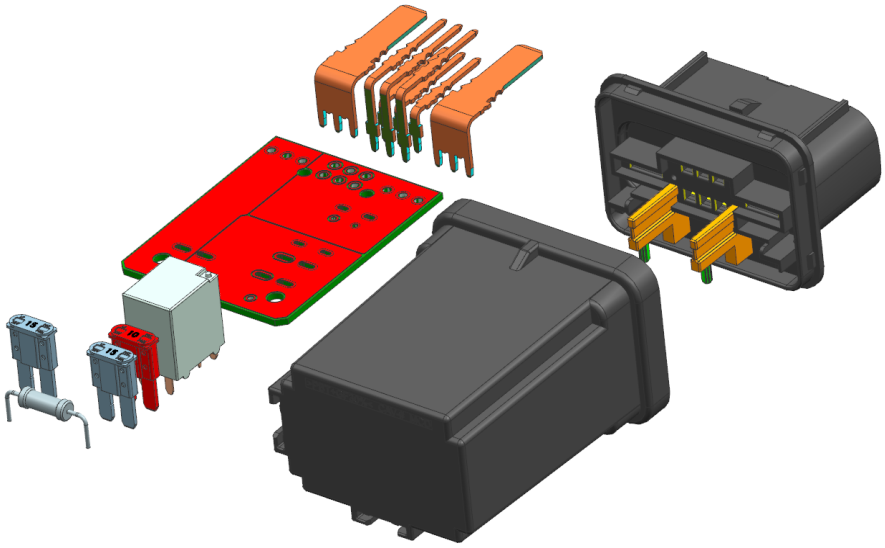


2.0 SCOPE

This Application Specification covers the relay and fuse µPDB modules that utilize the MX150 hybrid (8, 9, 10 way) connector system. Within this document a provided guideline is detailed for connector mating, mounting, and troubleshooting of the µPDB.

3.0 PRODUCT DESCRIPTION

3.1 Module Exploded view



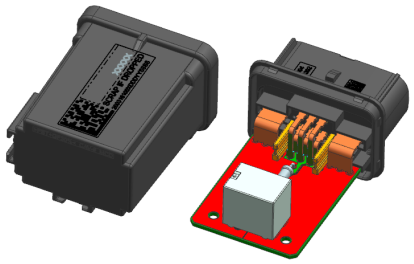
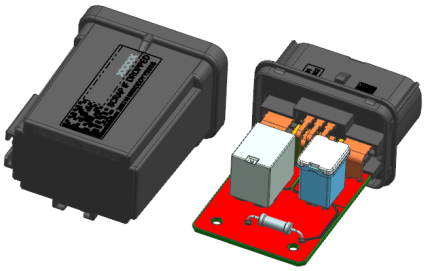
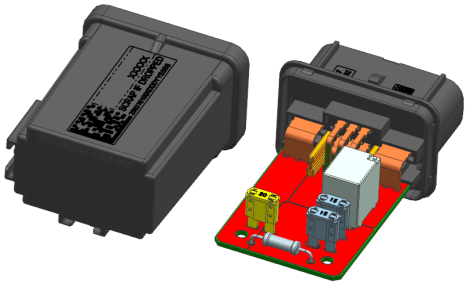
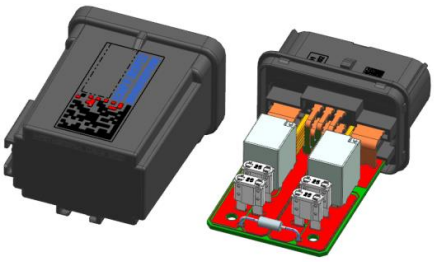
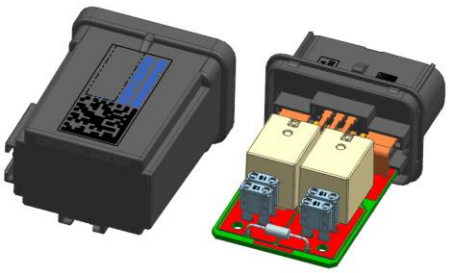
Exploded View of Example Module (Internal Components shown Left to Right: Board Components, PCB, Header Blades, Module Cover, Header Shroud)

3.2 System view

Un-Assembled Module and Connector

Assembled Module and Connector

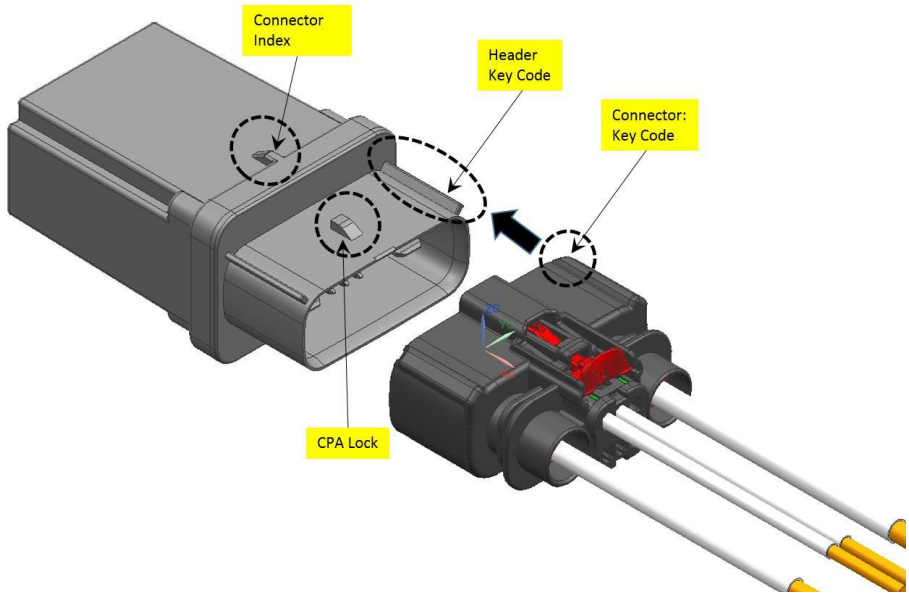
3.3 Product Summary

Part Number	Description	Example Applications	Figure	Page Number
2003161101	1 Relay 1 Resistor	-Cooling Fan -Blower Motor -Headlights -Convertible Car Roof Control		11
2003161102	1 Relay 1 Slow Blow Fuse 1 Resistor	-All Wheel Drive Module -Headlights -Aftermarket Headlights -Front/Rear Defogger -Power Liftgate		12
2003161103	1 Relay 3 Fast Blow Fuses 1 Resistor	-UREA System (Module, Pump Heater, Line Heater) -Wiper Motor (Two Loads) -Tail Lights (Two/Three Loads) -Day Light Running Light (DRL)		13
2003161121	2 Relays 4 Fast Blow Fuses 1 Resistor	-4 CYL Diesel Engine Glow Plugs (Can Combine Multiple Modules for 6 and 8 CYL) -Day Light Running Light (DRL)		14
2003161122	2 Relays 4 Fast Blow Fuses 1 Resistor	-4 CYL Diesel Engine Glow Plugs (Can Combine Multiple Modules for 6 and 8 CYL) -Day Light Running Light (DRL)		15

4.0 Procedure

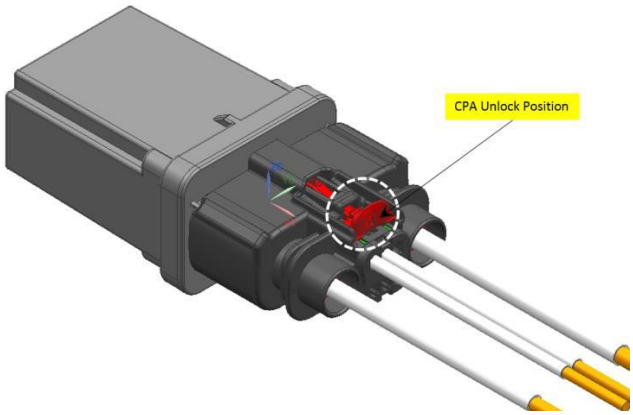
4.1 Connector Mating/Unmating

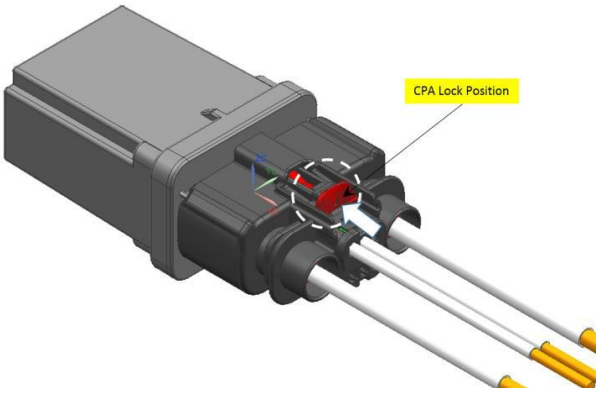
1) Verify the Connector and Header Key Codes



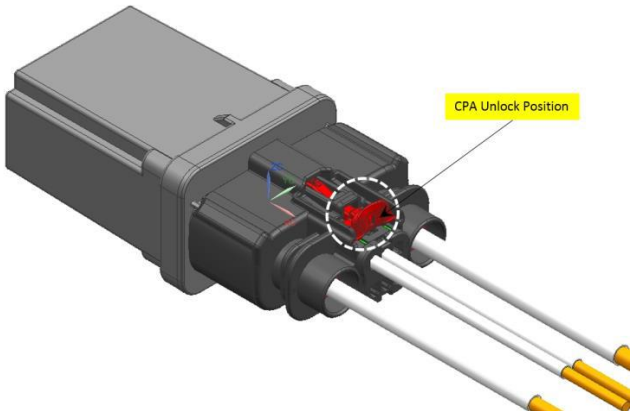
2) Engage connector to header shroud until audible click and lock feeling

3) Push the sliding CPA to the CPA lock position to verify that the connector is locked on the header

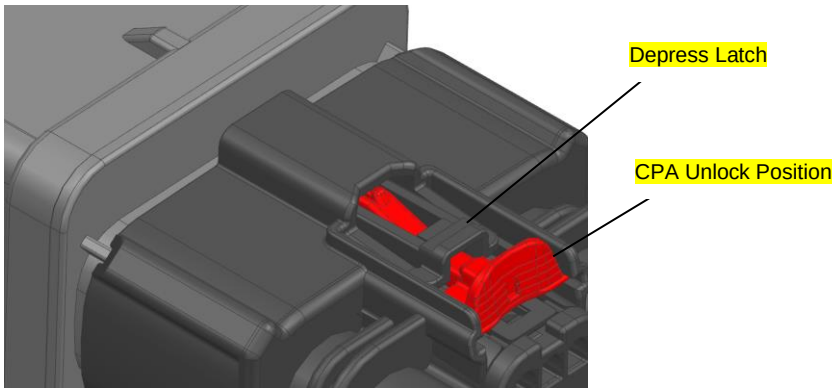




4) To remove the connector from the module, pull the sliding CPA back to the unlocked position



5) Depress the latch on the connector while simultaneously pulling the connector back to remove the module

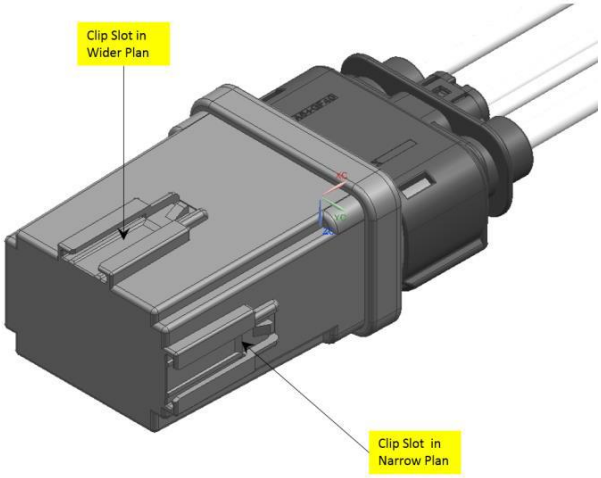


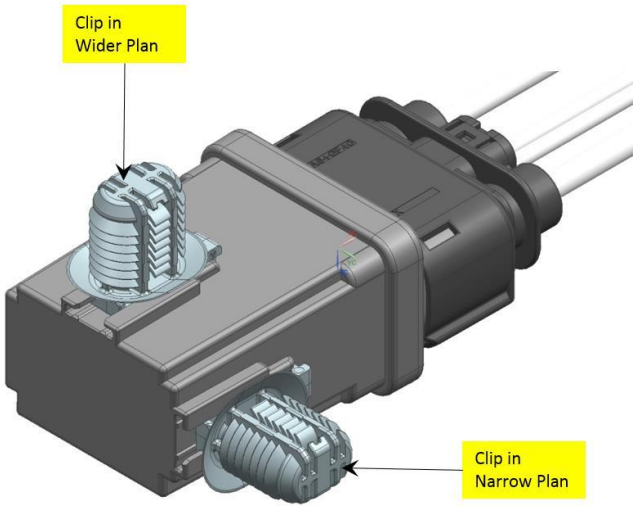
4.2 Mounting Micro-PDB

4.2.1 Mounting by Clip

1) Verify clip slot location: The Micro-PDB has two clip slots which are located in the wider plane and narrow plane of the cover.

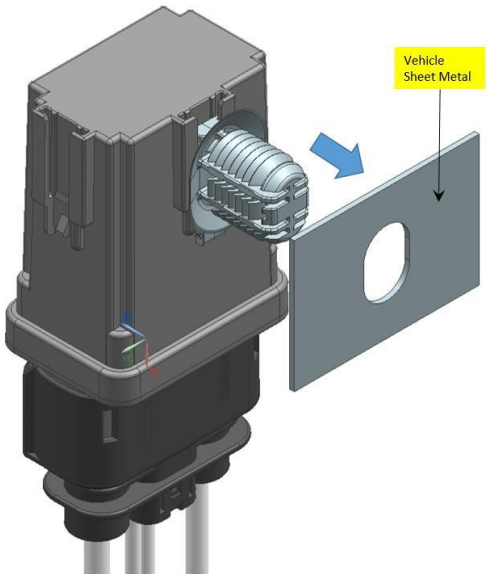
2) Select a clip slot location to fully insert a mounting clip. The mounting clip must be compliant with the USCAR 11.0mm standard clip slot per EWCAP-005-11





3) The mounting clip on the Micro-PDB should be fully inserted into the sheet metal hole that is located within the vehicle.

- Preferred connector orientation: Positioned in the downward orientation
  - Engage Force: ≤45N
  - Clip Slot: EWCAP-005-11



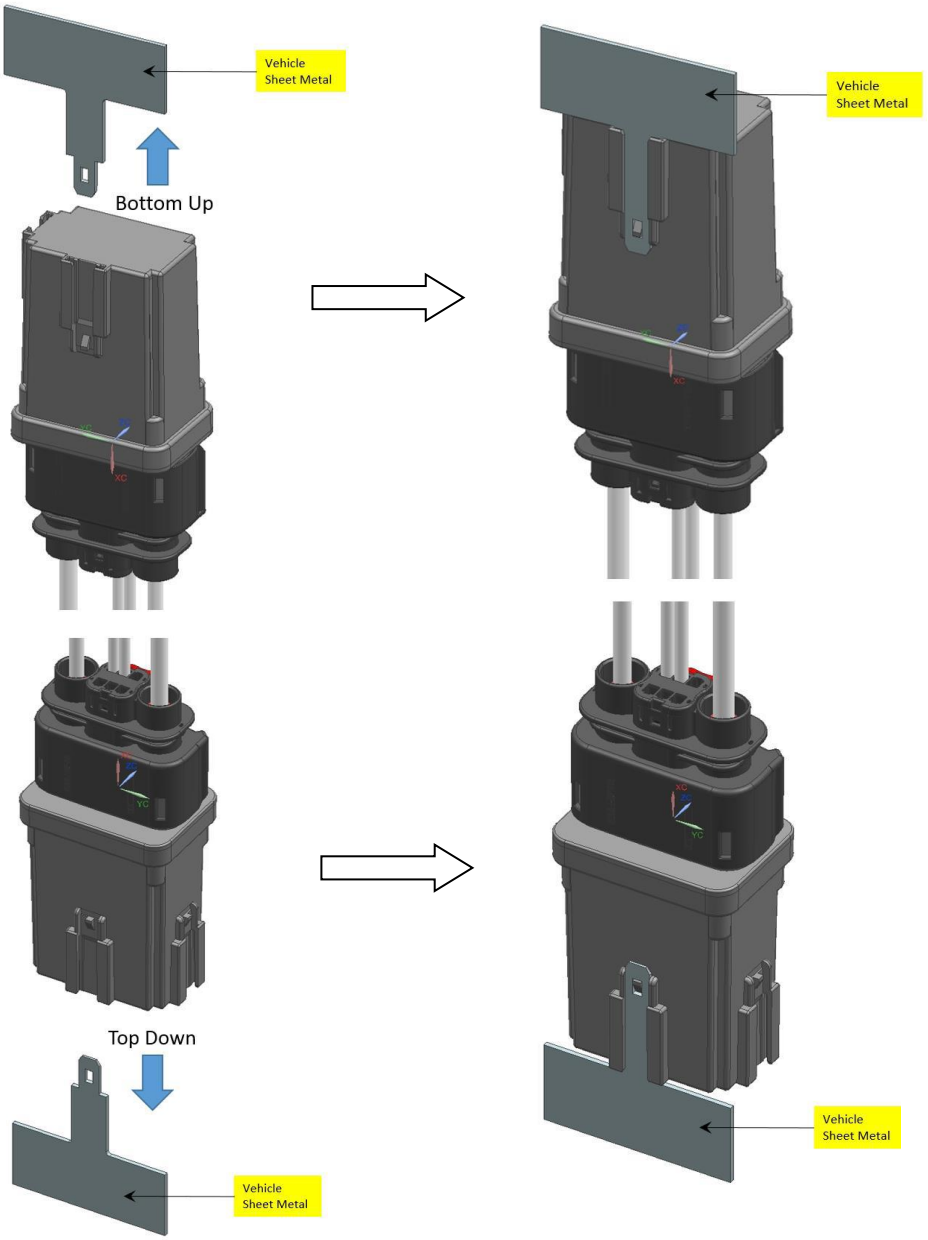
NOTE: Make sure that the clip is fully inserted within the clip slot on the Micro-PDB cover before mounting the Micro-PDB.

4.2.2 Mounting to Sheet Metal/Bracket

1) Applicable to both mounting methods, Top Down or Bottom Up.

2) Select a clip slot location to insert a fully assembled Micro-PDB into the sheet metal or bracket within the vehicle. The sharkfin lock should be fully seated within the bracket hole.

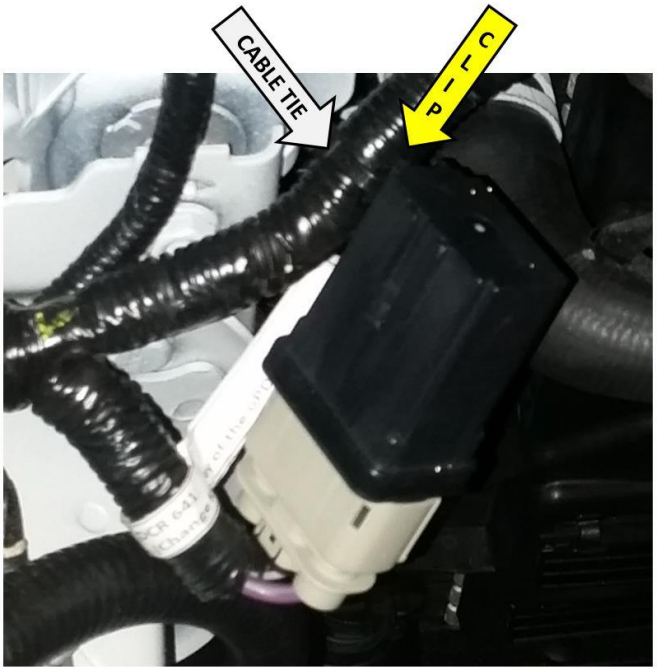
- Preferred connector orientation: Positioned in the downward orientation



4.2.3 Mounting on Wire Harness by Cable Tie Clip

1) Select either clip slot located on the wide or narrow plane of the cover. Insert a cable tie clip that is compliant with the USCAR 11.0mm standard clip slot per EWCAP-005-11.

2) With the cable tie clip fully inserted into the clip slot located on the cover, place the Micro-PDB to be aligned with the center of the wiring harness. Fasten the cable tie around the wire harness until the cable tie is fully fastened. Trim excess cable tie.



4.3 Module Serviceability

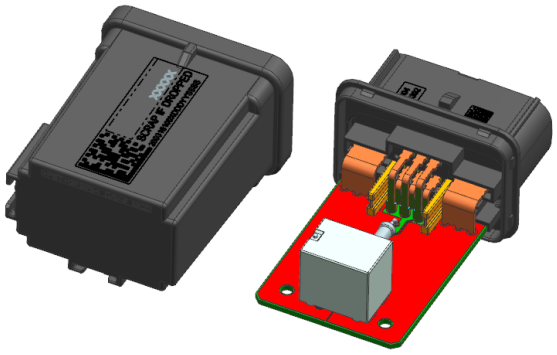
The Micro PDB module utilizes adhesive to permanently seal with the cover. As a result, the module is **not serviceable**.

If the module experiences a failure it is advised to disconnect the module from the connector and replace with a new module. Reference section 3.1 for further instruction for connector mating/unmating.

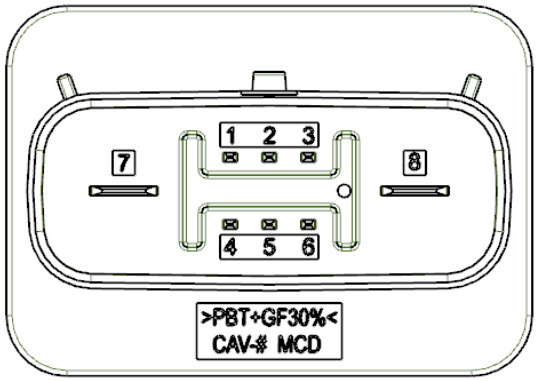
5.0 Trouble Shooting

Un-mate the Micro-PDB from the connector, measure the resistance of the corresponding blades/pins

5.1 **2003161101** (1 Relay, 1 Resistor Module)

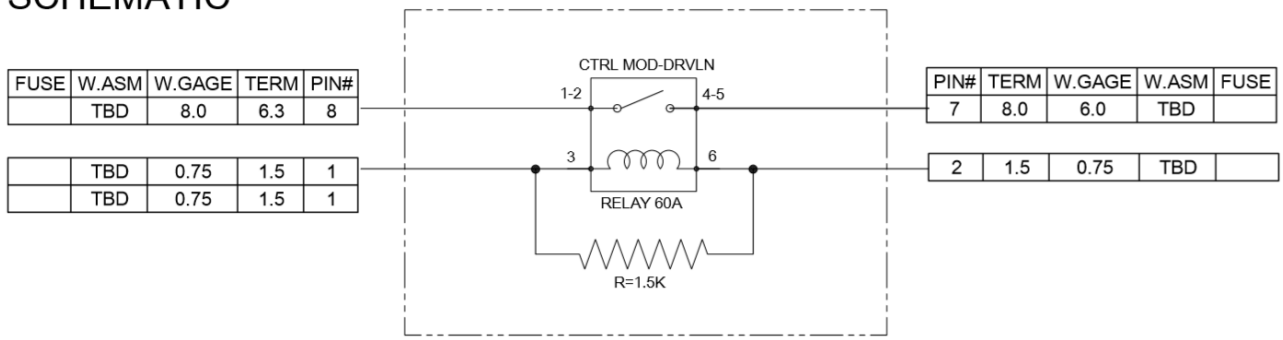


Partial Exploded View of 1 Relay, 1 Resistor Module



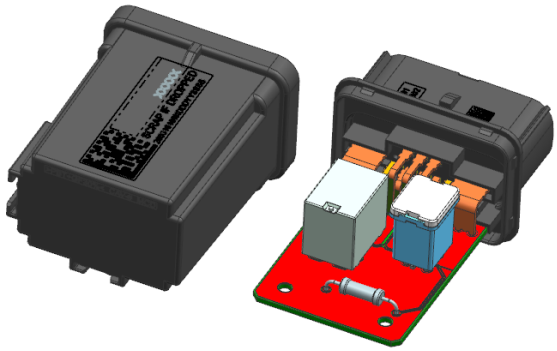
8CKT-Key B

SCHEMATIC

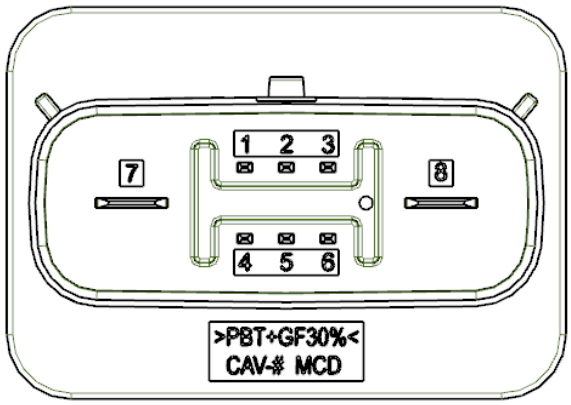


Molex Part Number	Description	Test 1		Test 2			
		Continuity Check (Relay-OFF)		Resistance Check (Relay-ON)			
				Input		Output	
		Circuit Pin No.	Pass Criteria (mΩ)	V1 (VDC)	Circuits Pin No.	Circuit Pin No.	Pass Criteria (mΩ)
2003161101	1 Relay 1 Resistor	Pin 1-2	239Ω - 288Ω	7.3 - 16	Pin 1-2	Pin 7-8	Not to exceed 100 mΩ
		Pin 1-7	Open, Greater than 1MΩ				
		Pin 2-7	Open, Greater than 1MΩ				
		Pin 1-8	Open, Greater than 1MΩ				
		Pin 2-8	Open, Greater than 1MΩ				

5.2 **2003161102** (1 Relay, 1 Slow Blow Fuse, 1 Resistor Module)

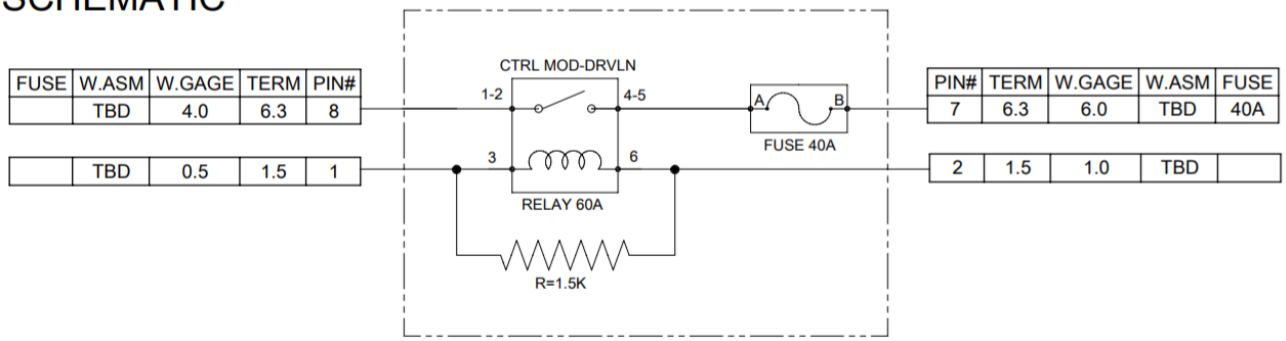


Partial Exploded View of 1 Relay, 1 Slow Blow Fuse, 1 Resistor Module



8CKT-Key A

SCHEMATIC



Molex Part Number	Description	Test 1 Continuity Check (Relay-OFF)		Test 2 Resistance Check (Relay-ON)			
				Input		Output	
		Circuit Pin No.	Pass Criteria (mΩ)	V1 (VDC)	Circuits Pin No.	Circuit Pin No.	Pass Criteria (mΩ)
2003161102	1 Relay 1 Slow Blow Fuse 1 Resistor	Pin 1-2	239Ω - 288Ω	7.3 - 16	Pin 1-2	Pin 7-8	Not to exceed 100 mΩ
		Pin 1-7	Open, Greater than 1MΩ				
		Pin 2-7	Open, Greater than 1MΩ				
		Pin 1-8	Open, Greater than 1MΩ				
		Pin 2-8	Open, Greater than 1MΩ				

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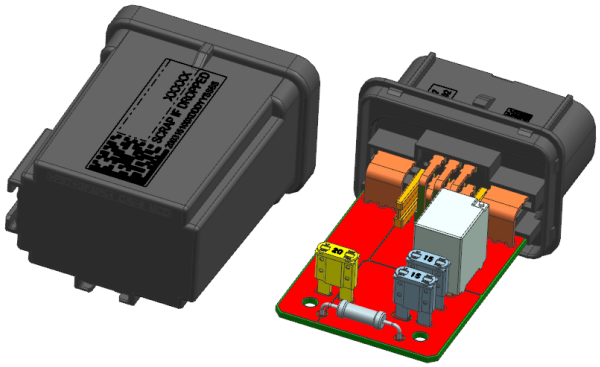
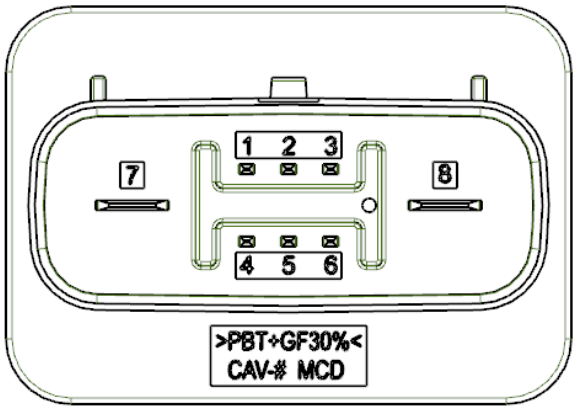
5.3 **2003161103** (1 Relay, 3 Fast Blow Fuses, 1 Resistor Module)



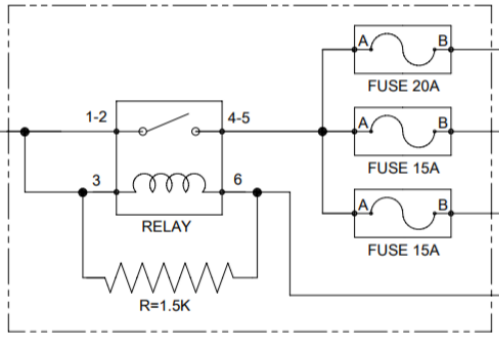
Partial Exploded View of 1 Relay, 3 Fast Blow Fuses, 1 Resistor Module



8CKT-Key C

SCHEMATIC

FUSE	W.ASM	W.GAGE	TERM	PIN#
	TBD	6.0	6.3	7

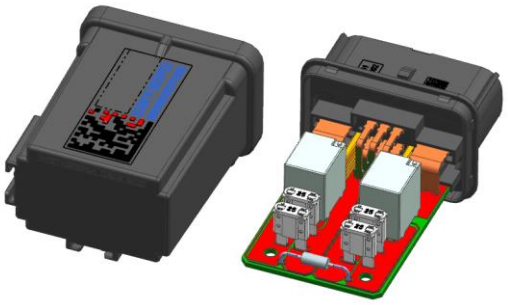


PIN#	TERM	W.GAGE	W.ASM	FUSE
8	6.3	3.0	TBD	20A
2	1.5	1.5	TBD	15A
3	1.5	1.5	TBD	15A
1	1.5	0.35	TBD	

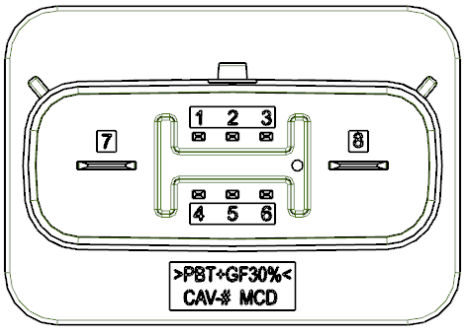
Molex Part Number	Description	Test 1 Continuity Check (Relay-OFF)		Test 2 Resistance Check (Relay-ON)			
				Input		Output	
		Circuit Pin No.	Pass Criteria (mΩ)	V1 (VDC)	Circuits Pin No.	Circuit Pin No.	Pass Criteria (mΩ)
2003161103	1 Relay 3 Fast Blow Fuses 1 Resistor	Pin 7-1	185Ω - 230Ω	7.3 - 16	Pin 7-1	Pin 7-8	Not to exceed 100 mΩ
		Pin 7-2	Open, Greater than 1MΩ			Pin 7-2	Not to exceed 100 mΩ
		Pin 7-3	Open, Greater than 1MΩ			Pin 7-3	Not to exceed 100 mΩ
		Pin 7-8	Open, Greater than 1MΩ				
		Pin 1-2	Open, Greater than 1MΩ				
		Pin 1-3	Open, Greater than 1MΩ				
		Pin 1-8	Open, Greater than 1MΩ				

APPLICATION SPECIFICATION

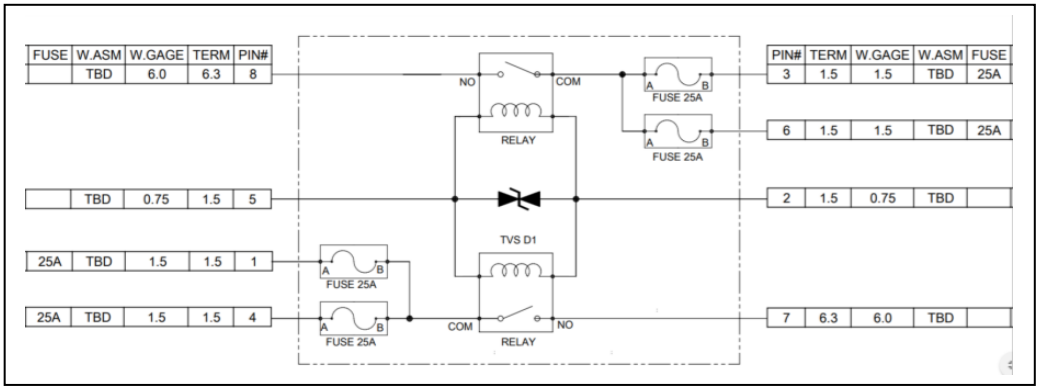
5.4 **2003161121** (2 Relays, 4 Fast Blow Fuses, 1 Resistor Module)



Partial Exploded View of 2 Relays, 4 Fast Blow Fuses, 1 Resistor Module



8CKT-Key A



Molex Part Number	Description	Test 1 Continuity Check (Relay-OFF)		Test 2 Resistance Check (Relay-ON)			
				Input		Output	
		Circuit Pin No.	Pass Criteria (mΩ)	V1 (VDC)	Circuits Pin No.	Circuit Pin No.	Pass Criteria (mΩ)
2003161121	2 Relays 4 Fast Blow Fuses 1 Resistor	Pin 2-5	185Ω - 230Ω	7.3 - 16	Pin 2-5	Pin 7-1	Not to exceed 100 mΩ
		Pin 7-All	Open, Greater than 1MΩ			Pin 7-4	Not to exceed 100 mΩ
		Pin 8-All	Open, Greater than 1MΩ			Pin 8-3	Not to exceed 100 mΩ
		Pin 1-4	Less than 1Ω			Pin 8-6	Not to exceed 100 mΩ
		Pin 3-6	Less than 1Ω				
		Pin 1-2/3/5/6	Open, Greater than 1MΩ				
		Pin 4-2/3/5/6	Open, Greater than 1MΩ				
		Pin 3-2/5	Open, Greater than 1MΩ				
		Pin 6-2/5	Open, Greater than 1MΩ				

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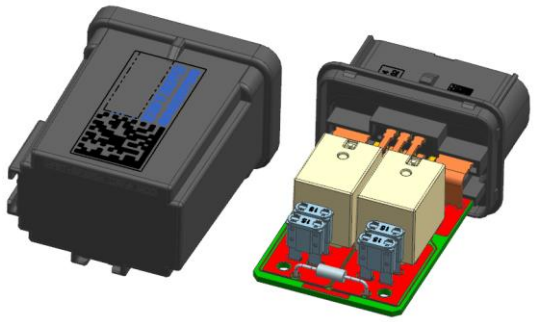
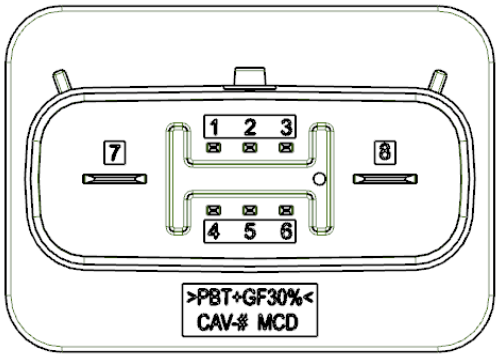
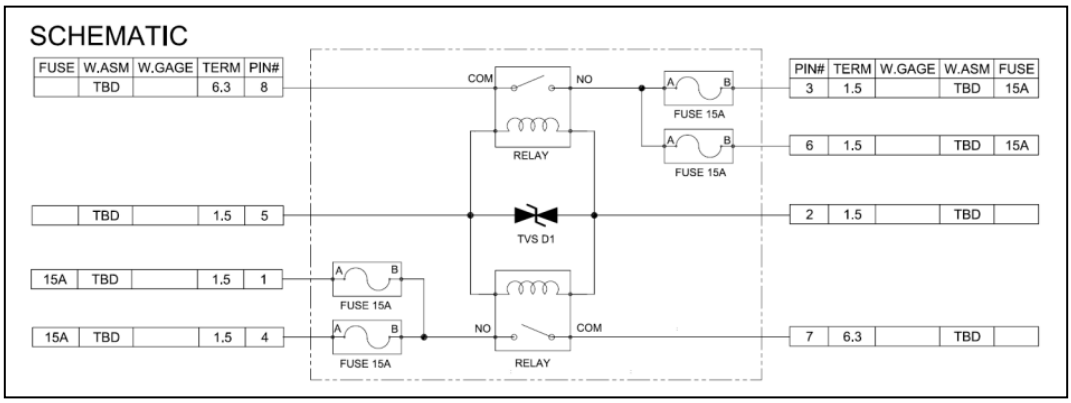
5.5 **2003161122** (2 Relays, 4 Fast Blow Fuses, 1 Resistor Module)



Partial Exploded View of 2 Relays, 4 Fast Blow Fuses, 1 Resistor Module



8CKT-Key B



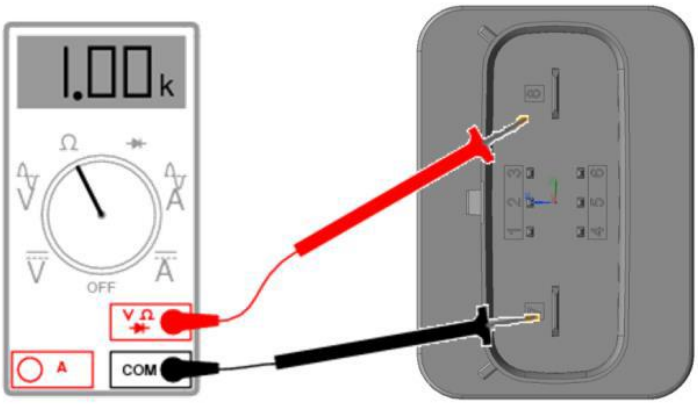
Molex Part Number	Description	Test 1 Continuity Check (Relay-OFF)		Test 2 Resistance Check (Relay-ON)			
				Input		Output	
		Circuit Pin No.	Pass Criteria (mΩ)	V1 (VDC)	Circuits Pin No.	Circuit Pin No.	Pass Criteria (mΩ)
2003161122	2 Relays 4 Fast Blow Fuses 1 Resistor	Pin 2-5	185Ω - 230Ω	7.3 - 16	Pin 2-5	Pin 7-1	Not to exceed 100 mΩ
		Pin 7-All	Open, Greater than 1MΩ			Pin 7-4	Not to exceed 100 mΩ
		Pin 8-All	Open, Greater than 1MΩ			Pin 8-3	Not to exceed 100 mΩ
		Pin 1-4	Less than 1Ω			Pin 8-6	Not to exceed 100 mΩ
		Pin 3-6	Less than 1Ω				
		Pin 1-2/3/5/6	Open, Greater than 1MΩ				
		Pin 4-2/3/5/6	Open, Greater than 1MΩ				
		Pin 3-2/5	Open, Greater than 1MΩ				

5.6 **Test 1** Continuity Check (Relay-OFF)

1) Continuity check: Measure resistance pin to pin. See corresponding table per each module
2) Reference criteria resistance. See corresponding table per each module

5.7 **Test 2** Resistance Check (Relay-ON)

1) Relay ON: Apply V1 to specified pins listed in the reference tables above
2) Measure the resistance from pin to pin
3) Refer criteria resistance
4) If the standard criteria is not met, replacement of the Micro-PDB is necessary



6.0 Traceability

Traceability Laser Marking:

- 2D Data Matrix Code (2D DMC)
  - Marking and reading standard: Data Matrix (ECC200)
  - 14mm x 14mm Size
  - Information to be encoded:
    - PPPP = Last Four Digits of Molex Part Number
    - YY = Year
    - DDD = Day of the Year
    - SSSS = Incremental Serial Number
- Human Readable Code (HRC)
  - 10 Digits Molex Part Number
  - 5 Digits Julian Manufacturing Date (DDDYY)
  - 4 Digits Incremental Serial Number