

Title:	MCC HVAC Upgrades			
Number:	SB_588.4	Release Date:	6/20/2022	
Revision Number:	4	Revision Date:	7/25/2023	
Chassis Type:	Velocity, Impel, Enforcer			
Component Description:	MCC HVAC SYSTEM			
Warranty:	N/A			
Parts:	N/A			
Tools:	N/A			

Subject:

Addressing fault codes and upgrades to the Midwest Climate Control (MCC) HVAC system.

Purpose/Background:

1. When to update MCC HVAC control panel software (programming kit vs updated control panel part #)
2. Allowing temperature control while in defrost mode.
3. Correction to unbalanced air flow out of the evaporator.
4. CZ programming to fix the high and low side pressure readings from flashing in CZ Live Data screen.
5. CZ programming to change HVAC SPN faults from #'s to verbiage.
6. Supply HVAC fault code list for dealer reference

Description:

The MCC HVAC Control Panel has an internal software which allows for the HVAC system to broadcast pressure readings, PWM signals along with faults that are internal to the system. What we have learned of the early software in the control panel, is that it will broadcast these faults to our Command Zone system even when the HVAC system is not active. Therefore, we have worked with the manufacturer of the control panel and have come up with new software to program into the earlier versions to broadcast faults when the system is active.

There are 2 types of fault categories we are looking to eliminate from being displayed:

1. Any time messages.
 - a. LIN communication loss
 - b. Air return sensor out of range
 - c. After coil temp sensor out of range
2. Messages only sent when the AC system is intended to be engaged.
 - a. High and low pressure issues.
 - b. Anti-icing sensor out of range.
 - c. Air conditioner stopped due to issue.

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This will eliminate unnecessary messages and only display the faults that are currently active which will save time on troubleshooting and part replacements. The upgrade also allows the temperature to be controlled in defrost mode. To ensure that the AC system operates correctly and doesn't spray condensation through the vents, an internal baffle needs to be added to the diffuser as part of the air balancing package that also increased fan speed.

Procedure:

If it is determined that the control panel requires the updated software, please start a Technical Incident and you will be advised what below option is best suited for the vehicle.

1. Control panel part number # **63-4753-0002**.
 - a. This panel is the current, production version from HED with 7.10 software installed.
2. Control panel part number # **4231502**.
 - a. This panel is a refurbished part. A previously installed controller that has been updated to the current software 7.10.
3. MCC programming kit part number # **4022115**.
 - a. This allows dealers to program the current control panel on the vehicle with 7.06 software. Dealers can hold on to these programming kits to update other vehicles in their area, if required.
 - b. Dealers will be refunded the cost of the kit when returned to Pierce Aftermarket Product Support.
 - c. If the programming is determined as the best option, the technical team will process the order. When we process the kit, we will send out the programming instructions and software at that time.
4. If vehicle is hardwired (not using multiplex networking) re-pin load manager connector to control panel part number # **63-4753-0002**.

NOTE: Do not re-pin connector if the vehicle matches the table below:

Chassis	Wire Harness Part Number	Description
Velocity	64-3407-H011	Wire Harness, Cab, Inst, Panel
Enforcer	64-3407-H011	Wire Harness, Cab, Inst, Panel

- a. With the correct Mini-Fit Junior pinning tool, re-pin wire 3495 in connector C184 from pin 16 to pin 14.
- b. If the correct Mini-Fit Junior pinning tool is not available:
 - i. Cut wire 3495 at connector C184.
 - ii. Connect wire 3495 to wire 4562 at connector C309.
 - iii. Leave wire 4562 in connector C184 pin 14.
- c. Refer to diagram below:

RECEIVED ON 18 FEB 1964

MOLEX
 MINI-FIT JR
 39-01-2200

C184

LOC	TERM	WIRE	FUNCCD
1	0100	1024N	IND LT I+
2	0100	5093N	+5VUSUPPLY
3	0100	1640N	GND
4	0100	5242N	SHRLE ACT
5	0100	3413N	AC ON SIG
6	0100	3416N	DPST VAL
7	0100	3418N	HEAT VAL
8	0100	4795N	SPARE
9			
10			
11	0100	5241N	CAB TEMP
12	0100	5240N	CAB TEMP
13	0100	5949N	RTD INPUT
14	0100	4562N	SPARE IN
15	0100	5167N	L PSI SIG
16	0100	3945N	LD MAN HT
17	0100	1018N	INST LT
18	0100	3414N	EV BLOW C
19	0100	3417N	HEAT BLOW
20	0100	5255N	AUX LIN

3" 3"

416N SENSE GND
140N GND

0997

3945N
LD MAN HT

C462-b
RESISTOR



SHIP CONNECTED

DEUTSCH
DT04-2P-RT25
W2P

C462-a
LOAD MANAGEMENT



6"

DEUTSCH
DT06-2S-P012
W2S-P012-WEDGE

C309-b

LOC	TERM	WIRE	FUNCCD
1	0715	4562N	SPARE IN
2	0715	1945N	GND
3	0715	3771N	12V DIR
4			

C309-a

LOC	TERM	WIRE	FUNCCD
1	0735	1024N	IND LT I+
2	0735	3945N	LD MAN HT

C309-b

HVAC AUX MODE



DEUTSCH
DT04-4P
W4P

C309-a

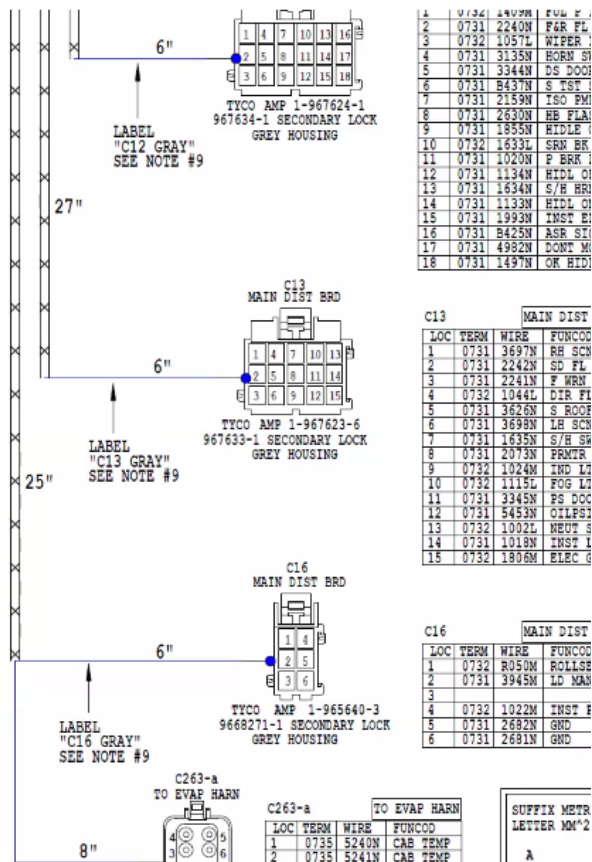
HVAC AUX MODE



6"

SHIP CONNECTED

C309-a
AUX MODE JMFR



A technical drawing showing a perspective view of a mechanical assembly. A rectangular plate with several circular holes is being inserted into a larger, more complex housing. The housing has a series of rectangular slots and a central opening. The plate is shown in a position where it is being slid into the housing, with its edges aligning with the housing's internal features. The drawing is a line drawing with no shading, typical of technical manuals.



MCC HVAC Fault Codes:

LIN MODULE COMM LOSS	Amber	519169	31	0xC3	There are no LIN modules connected to HVAC dash panel.
LIN MODULE COMM	Amber	519169	31	0xFE	There are no LIN modules connected to the HVAC dash panel.
HIGH SIDE PRESS SENS ISSUE	Amber	519170	31	0xFE	The high side (discharge) pressure transducer is reading a value out of normal operation range.
HVAC HIGH PRESS SENS ISSUE	Amber	519170	31	0xC3	The high side (discharge) pressure transducer is reading a value out of normal operation range.
HVAC LOW PRESS SENS ISSUE	Amber	519171	31	0xC3	The low side (suction) pressure transducer is reading a value out of normal operation range.
HVAC LOW PRESS SENS ISSUE	Amber	519171	31	0xFE	The low side (suction) pressure transducer is reading a value out of normal operation range.
CAB TEMP SENSOR OUT OF RANGE	Amber	519172	31	0xC3	The cab air temperature sensor is reading a value out of the normal operation range.
CAB TEMP SENSOR OUT OF RANGE	Amber	519172	31	0xFE	The cab air temperature sensor is reading a value out of the normal operation range.
AFTER COIL TEMP SNSR OUT RANGE	Amber	519173	31	0xC3	The overhead after coil temperature sensor is reading a value out of the normal operation range.
AFTER COIL TEMP SNSR OUT RANGE	Amber	519173	31	0xFE	The overhead after coil temperature sensor is reading a value out of the normal operation range.
ANTI ICE SENSER OUT OF RANGE	Amber	519174	31	0xC3	The air condition anti-icing temperature sensor is reading a value out of the normal operation range.
ANTI ICE SENSER OUT OF RANGE	Amber	519174	31	0xFE	The air condition anti-icing temperature sensor is reading a value out of the normal operation range.
EO HIGH SIDE PRESS TRANS ISSUE	Amber	519175	31	0xFE	The engine off high side (discharge) pressure transducer is reading a value out of normal operation range.
HVAC LOW PRESS SENS ISSUE	Amber	519176	31	0xC3	The engine off low side (suction) pressure transducer is reading a value out of normal operation range.

Troubleshooting Common Issues:

1. Engine Off High/Low Side Pressure Transducer Issue Faults and HVAC High/Low Pressure Sensor Issue Faults
 - a. Are codes present with system off?
 - i. Yes - update software in control panel or order new panel as stated in above procedure.
 - ii. No - go to step B.
 - b. Unplug transducers and see if AC turns on.
 - c. If system activates, then recover refrigerant.
 - d. Charge refrigerant to appropriate charge in table below:

ENFORCER / SABER FR (MCC system introduced Jan 1,2021)

Description	Comp	Oil Type	Oil to add	Oil Charge	Refrigerant Charge***	Smart Cart Dial
All Cabs Overhead A/C (All Engines except X15)	QP-21	PAG 46	4.0 oz	11.00	4 lb 0 oz	4.00
All Cabs Overhead A/C (X15 Engine only)	QP-31		None	17.9	4 lb 0 oz	4.00

VELOCITY / IMPEL (MCC system introduced Jan 1, 2021)**VELOCITY FR / IMPEL FR**

Description	Comp	Oil Type	Oil to add	Oil Charge	Refrigerant Charge***	Smart Cart Dial
Overhead A/C units Pumpers	QP-21	PAG 46	5.0 oz	12.6	4 lb 8 oz	4.5
	QP-31		None	17.9		
Overhead A/C units Aerials	QP-21	PAG 46	5.0 oz	12.6	4 lb 12 oz	4.75
	QP-31		None	17.9		

- e. After the vehicle is properly charged, do codes go away?
 - i. Yes - no other checks are needed.
 - ii. No - replace transducers (if only a high side fault-replace just high side transducer)
- f. Last step is to look at charge written on the data placard to ensure it shows the correct refrigerant charge.
- g. Order data tag if incorrect charge is on data placard.

Updated capacity Data Tags P/N

CS-TAG5-0825	A/C CHARGING OVERLAY	4 lb 0 oz	11.0 CHARGE
CS-TAG5-0826	A/C CHARGING OVERLAY	4 lb 0 oz	17.9 CHARGE
CS-TAG5-0827	A/C CHARGING OVERLAY	4 lb 8 oz	12.6 CHARGE
CS-TAG5-0828	A/C CHARGING OVERLAY	4 lb 8 oz	17.9 CHARGE
CS-TAG5-0829	A/C CHARGING OVERLAY	4 lb 12 oz	12.6 CHARGE
CS-TAG5-0830	A/C CHARGING OVERLAY	4 lb 12 oz	17.9 CHARGE

2. Anti-Ice and After Coil Temp Sensor Out of Range Faults

- a. Are codes present with system off?
 - i. Yes-update software in control panel or order new panel as stated in above procedure.
 - ii. No-go to step B
- b. Inspect sensor and sensor wiring (pins 11 and 12 out of LIN Module and common ground from pin 4 of 4 place connector for evaporator)
- c. If sensors and connections look good, please start technical incident with Pierce technical team to be advised on part replacement.

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3. Flashing pressure readings in Command Zone display
 - a. Flashing high and low side pressure values have been reported while monitoring the readings in the live data page on the Command Zone Display
 - b. Flashing values can cause the AC system to not activate.
 - i. Start technical incident to have CZ programming completed to correct values from flashing.
4. MCC HVAC fault codes display as SPN numbers.
 - a. Fault codes that are broadcasted from the control panel to the Command Zone display can show as SPN and FMI numbers.
 - b. We would like to have these programmed, so it is correct to come up as verbiage to help assist our customers and dealers when diagnosing.
 - i. Start technical incident to have Command Zone programming completed.
5. AC System Does Not Activate
 - a. Are there fault codes present?
 - i. YES
 1. See above if they are related to issue 1 or 2.
 2. If they are Lin module comm loss or temp sensor faults, please start a technical incident for assistance.
 - ii. NO
 1. Refer to chassis AC print and verify control panel has a good IGN source (12 VDC) at pin 1, 5-volt reference on pin 2 and a good ground on pin 3.
 - a. Repair if not present
 2. Inspect AC on signal out of control to ensure it has 12 VDC going to Evaporator (ckt 3413, pin 5 of controller to pin 2 of 6-place connector on evaporator)
 - a. If not present out of controller, please start technical incident.
 3. Check to ensure 3413 is present at the thermostat module inside the evaporator. If this is present the thermostat module will then send out a signal on ckt 1395 to the binary high-low pressure switch
 - a. If 12 VDC are present on ckt 3413 "AC on Signal" to the thermostat module, but no voltage on ckt 1395 "comp clutch" then it is likely there is not enough load to indicate that the thermostat module does not have an open circuit.
 - b. If 12 VDC are not present, then please start a technical incident. The thermostat will most likely have to be replaced with one that has a resistor built in to supply a large enough load or a module with the open circuit check removed.
 4. Pressure switch will close and allow the signal to go to the compressor on/off relay.

6. Digital Temperature Displayed in Wrong Format

- a. Temperature can be displayed in Fahrenheit or in Celsius
 - i. To change one from the other, press the center AC button quickly 6 times and wait 10-15 seconds for it to change.
 - ii. It might be required to wait and press the AC button one more time for it to change over.



AC Button

7. Evaporator Fans Slow Down or Will Not Run

- a. Ensure faults are not active and not in a load manage state.
- b. Mechanical siren cable needs to be ran back and connected to the battery. It can be connected direct or switched battery. We just need to eliminate it from the passenger side cab distribution as it requires such a high amp draw at start up and operation.
- c. If condition continues after siren cable reroute, then wires (ckts 1397 and 1398) for the evaporator need to have the wire size increased to 8 awg. This will be run from the evaporator fan fuses in the cab roof distribution all the way to the evaporator fans.

8. Low Air Flow out of the Rear Vents

- a. If there is a significant notice in decreased air flow in the rear of the evaporator compared to the front, we need to inspect and cover the recessed compartment where the LIN Module is mounted.
- b. Creating a fab part to mount over the compartment has significantly increased the air flow in the rear.

Reference Print 401455

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