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AGM BATTERY REPLACEMENT

Prevost vehicles

DESCRIPTION

On the vehicles affected by this bulletin, replace the batteries by a new set (4) of the same model; perform several verifications on the alternator and charging circuit. Finally, update the multiplex software to the latest version and disable Alternator Management on select vehicles.

MODEL YEAR(S) AND VEHICLES INVOLVED

NOTICE TO SERVICE CENTERS		
Verify vehicle eligibility by checking warranty bulletin status with SAP or via ONLINE WARRANTY SYSTEM available on Service / Warranty tab of Prevost website.		
Model	VIN	Fleet Number
X3-45 Commuter Model Year : 2014 - 2016	The following individual vehicles: 2PCG33495 <u>EC735590</u> , 2PCG33498 <u>EC735602</u> and From 4RKG33497 <u>F9737001</u> up to 4RKG33491 <u>G9737299</u> incl.	From 2490 up to 2789, incl.
This bulletin does not necessarily apply to all the above-mentioned vehicles, some vehicles may have been modified before delivery. The owners of the vehicles affected by this bulletin will be advised by a letter indicating the Vehicle Identification Number (VIN) of each vehicle concerned.		

MATERIAL NEEDED

Order four (4) per vehicle:

Part No.	Description	Qty
SP17-313	Odyssey AGM battery	1

Other parts that may be required for *step 1.1*, depending on vehicle condition:

Part No.	Description	Qty
062490	SLEEVE, HEAT SHRINKING 6-IN LONG	2
564055	TERMINAL, SOCKET (BUSSMAN CONNECTOR)	1
12089679	SEAL, CABLE (BUSSMAN CONNECTOR)	1
563622	BUTT SPLICE/ 22-18 /RED /W/HEAT SHRINK	1
Locally sourced	LIQUID TAPE, BLACK	A/R

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PROCEDURE



DANGER

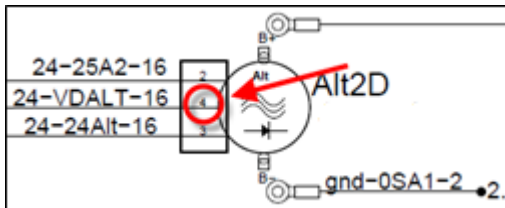
Park vehicle safely, apply parking brake, stop engine. Prior to working on the vehicle, set the ignition switch to the OFF position and trip the main circuit breakers equipped with a trip button. On Commuter type vehicles, set the battery master switch (master cut-out) to the OFF position.

Overview of the procedure steps:

- STEP 1 Alternator Pin #4: 24VD (Direct / Batt) to 24VI (Indirect / Ingition)
- STEP 2. MUX update
- STEP 3. Battery Removal and Replacement
- STEP 4. Alternator verification & Alternator replacement (if required)

1. ALTERNATOR PIN #4: 24VD (Direct / Batt) to 24VI (Indirect / Ingition)

NOTE: this corrective measure may have already been performed on your vehicle



- 1.1 Inside rear electrical compartment (rear junction box), locate VECR module (Figure 1).

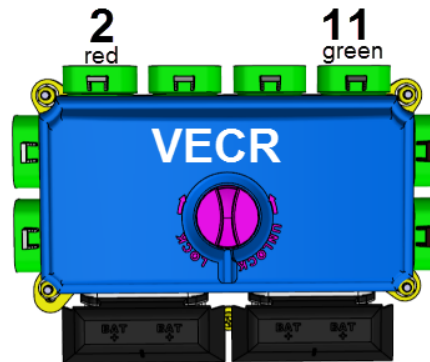


Figure 1: VECR

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- 1.2 Unplug connector no. 11 (green).

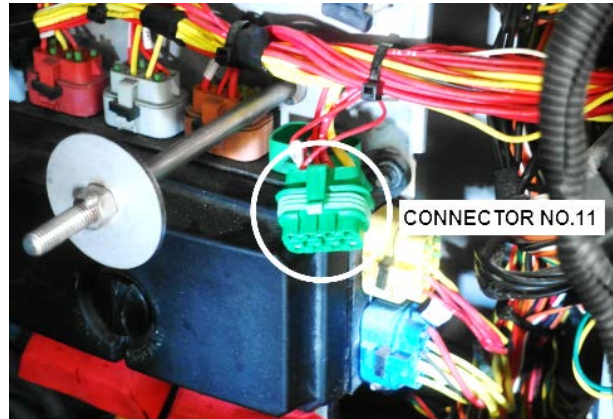


Figure 2

- 1.3 Using an extractor tool or a small flat blade screwdriver, remove wire 24VDALT from cavity H of connector no.11 (Figure 2 to Figure 8).



Figure 3 : EXTRACTOR DELPHI 12094430

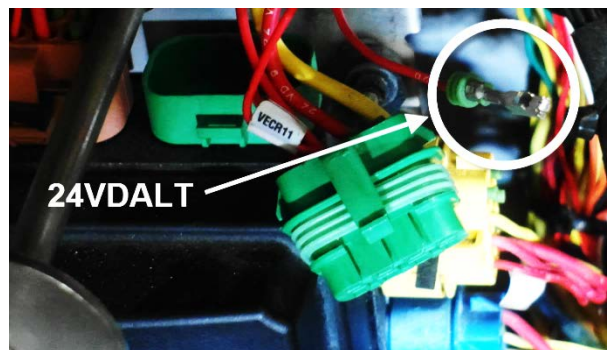


Figure 4

- 1.4 Follow wire 24-VDALT from the VECR down to the point where it splices out in #18 and #16 wires.

- 1.5 Cut the # 18 wire at the splice point. (Figure 5)

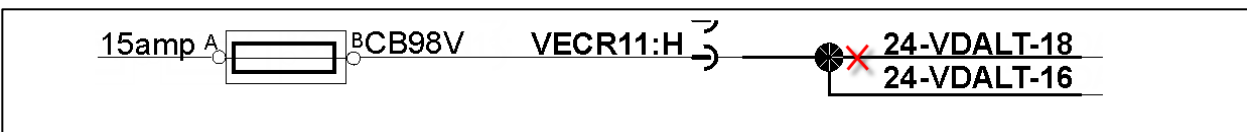


Figure 5: VDALT SPLICE

- 1.6 Extend the #18 wire with 10 in. of #18 wire with a 563622 butt splice. (See Figure 7, Figure 10)

- 1.7 Crimp a new terminal 564055 to the wire and seal 12089679.

Note 2nd crimp on seal. (see Figure 6).

- 1.8 Re-insert VDALT-18 in VECR11:H



Figure 6: Terminal 564055

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- 1.9 Use liquid tape to seal the exposed splice point on VDAULT-16.



Figure 7: Liquid Tape Application

-
- 1.10 Relocate wire 24VDAULT16 to cavity **C** of connector no.2 (red) on the harness. (Figure 8)

*Cavity **C** of connector no.2 should be available. This branch of the circuit will be protected by 10A Circuit breaker CB64 (see Figure 10 below).*

*Should cavity **C** not be available, refer to your vehicle wiring diagram page 5.1 to select another free cavity protected by a 10A or 15A CB (see Figure 8 for reference).*

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IMPORTANT NOTE: If required, extend wire 24VDALT16 using 16 AWG red electrical wire in order to reach connector no.2. Refer to MATERIAL section for optional parts required extend the wire.

Cut and discard existing terminal. Extend wire 24VDALT16 with heat shrinkable butt splice 563622. Place heat shrink sleeve 062490 over soldered joint. Crimp the terminal 564055 to the wire and seal 12089679 (see Figure 6).

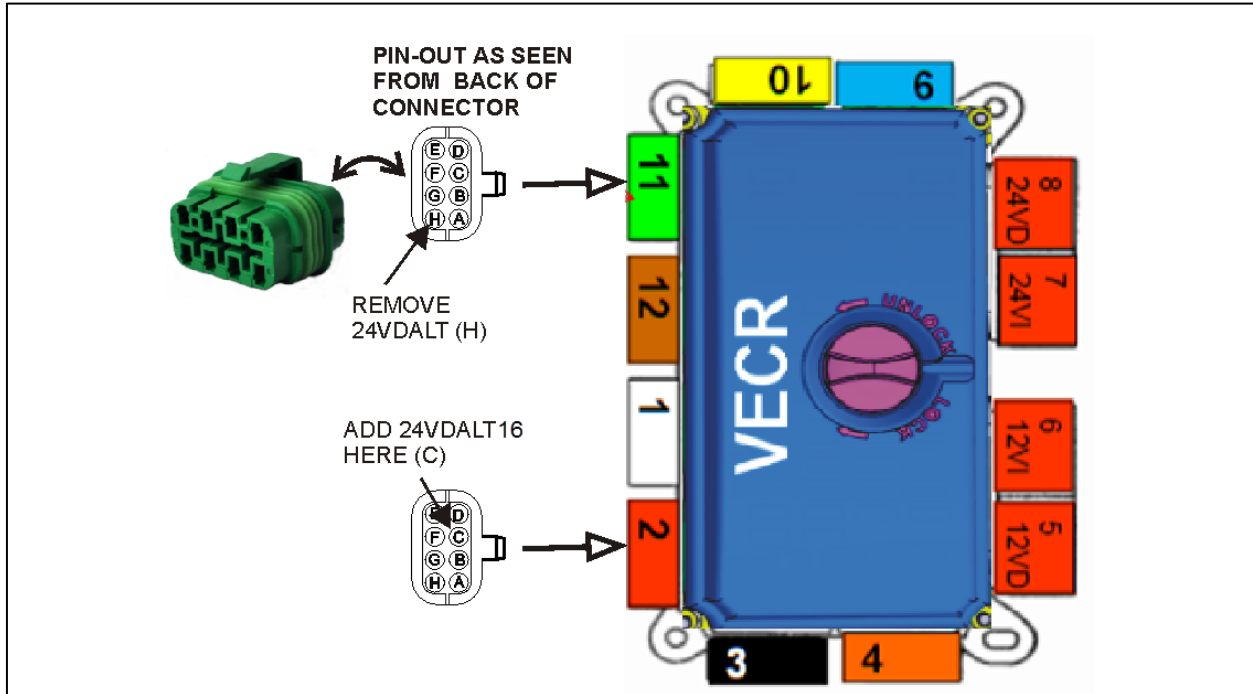
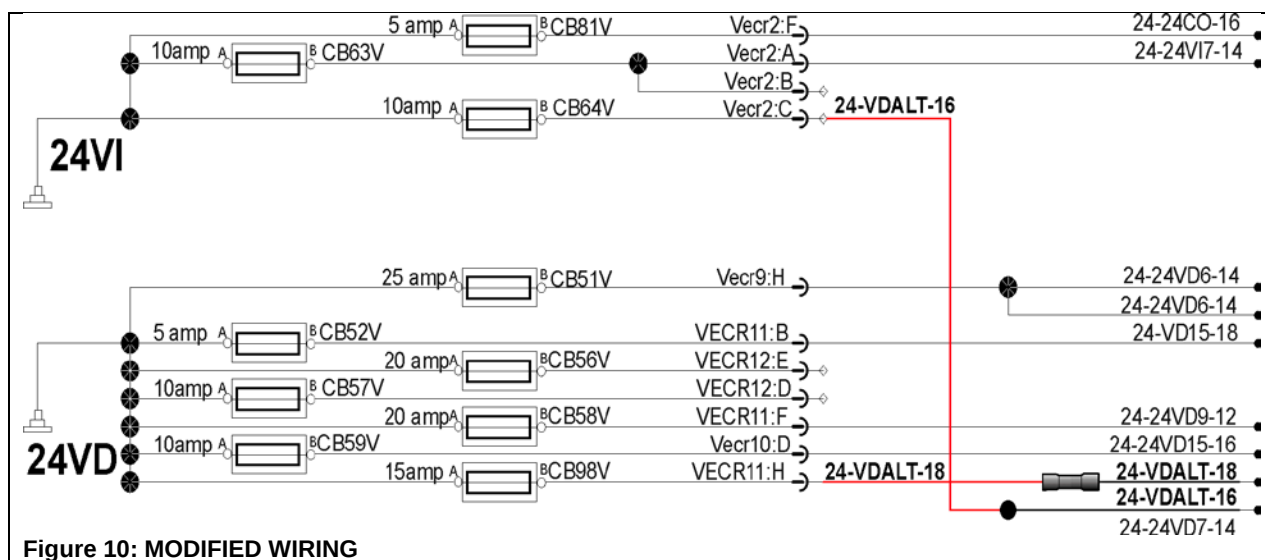


Figure 8: 24VDALT16 wire relocation



Figure 9: Connector Cavity Seal

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2. MULTIPLEX SOFTWARE (MUX) UPDATE

SPECIAL TOOLS

A laptop with VPG software installed and interface cable is required.

- 2.1 Set the battery master switch (master cut-out) to the ON position.
- 2.2 Follow "Alternator Management Parameter" Special instruction below.

Special Instruction: Alternator Management Parameter (200 selected vehicles)

STOP! *Check with the service manager if this vehicle needs the parameter disabled.*

- If vehicle is excluded, skip this step.
- If vehicle is confirmed, set **ALTMGM** parameter to "NO" in VPG.

- 2.3 Generate the program for this specific VIN.
- 2.4 Reprogram to the latest revision (P20)

3. BATTERY REMOVAL AND REPLACEMENT

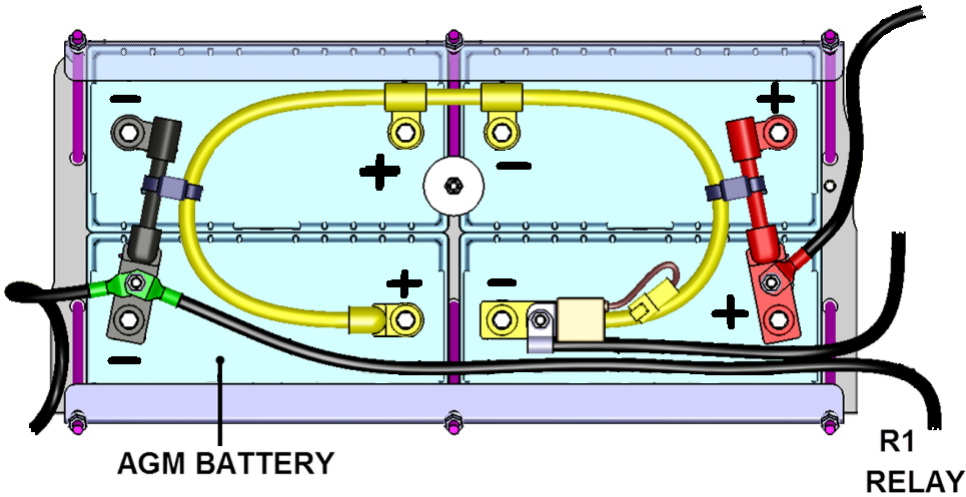


Figure 11: BATTERY CONNECTIONS



WARNING

24VD battery cable to R1 main battery relay (Figure 11) is still powered after battery master switch is set at the off position.

The batteries are located in the battery compartment on the R.H. side of the engine compartment and are accessible from the engine compartment curb-side door.

- 3.1 Set the battery master switch (master cut-out) to the OFF position
- 3.2 Remove the battery compartment protective covers by pulling the rod on the spring latch to release and lift cover. Starting with (1) then (2) (Figure 12).

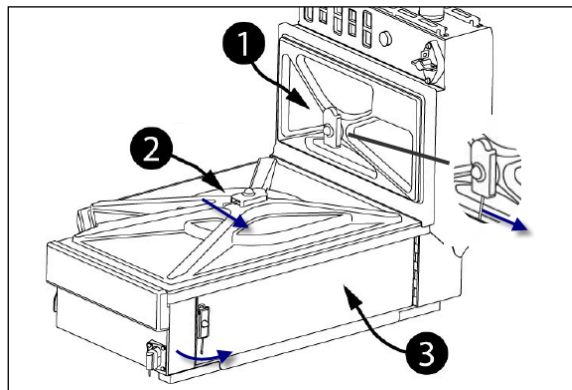


Figure 12: BATTERY PROTECTIVE COVERS

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- 3.3 Lateral access panel (3) is hinged. Release it by pulling on the spring rod and swing open (Figure 12 & Figure 13).

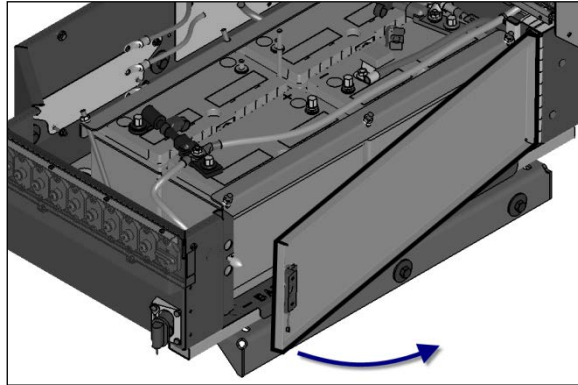


Figure 13 LATERAL ACCESS PANEL



DANGER

To prevent possible electric shocks or sparking, the battery master switch should be in the "off" position before disconnecting cables from the batteries.

- 3.4 Unscrew battery holding bracket nuts (6) and remove clamps (2) (Figure 14).

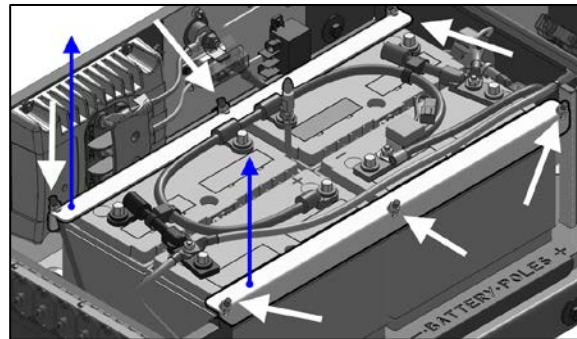


Figure 14: BATTERY HOLDING BRACKET REMOVAL

NOTE

The ground (negative) cables should always be disconnected first and replaced last.

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- 3.5 Loosen negative terminal with the 4/0 cable only, using a 14mm socket and a wrench (figure 5).

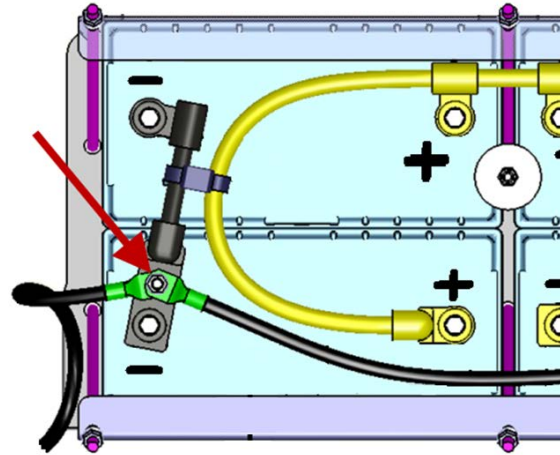


FIGURE 15: 4/0 NEGATIVE CABLE TERMINAL

- 3.6 Remove the 4/0 negative cable only (Figure 16)

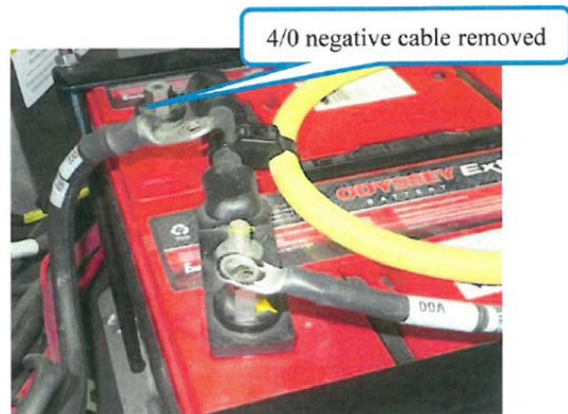


Figure 16: 4/0 CABLE REMOVAL

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- 3.7 Leave the 2/0 negative cable and hand tighten the terminal nut in place (Figure 17)



Figure 17: REPLACE 2/0 CABLE

- 3.8 Loosen the (8) battery connection nuts using 14mm socket and wrench (Figure 18).

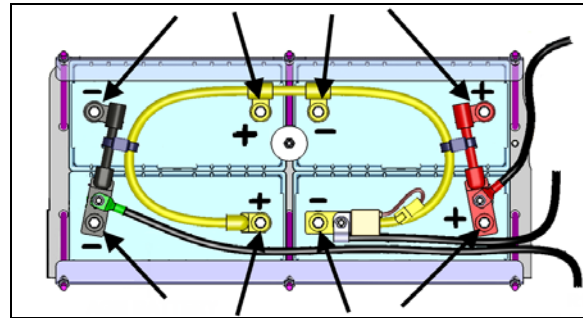


Figure 18: CONNECTIONS REMOVAL

- 3.9 Lift the battery cable assembly (including cables with their attached terminals) and secure up and out of the way using a wire tie (Figure 19).



Figure 19: SECURE UP CABLES

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- 3.10 Follow locally approved safe procedure for handling batteries (use lift table).

NOTE

Before reinstalling the cables, ensure that the contact surfaces are clean.

If the surfaces are dirty or show signs of corrosion, clean them using appropriate means.

If cables are significantly corroded or otherwise damaged, they should be replaced.

- 3.11 Lower the battery cable assembly and re-connect the (8) battery connections, the negative cables shall be the last reconnected cables.
- 3.12 Torque the battery connections to **180 lb-in** using a 14mm socket and a torque wrench. Apply torque seal mark.

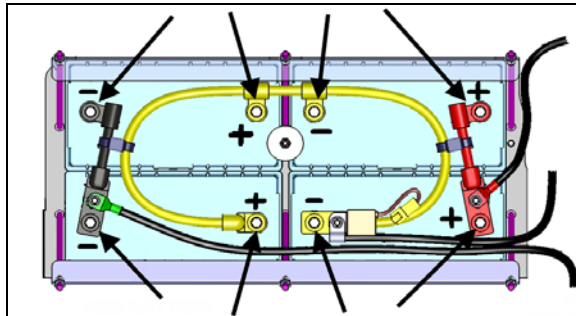


Figure 20: CABLES RECONNECTION

- 3.13 To properly reassemble the negative battery cables, loosen the terminal nut holding the negative 2/0 cable in place and remove. Seat the negative 4/0 cable (on the bottom) and then place the negative 2/0 cable (on top).



Figure 21: 2/0 CABLE REMOVAL FOR 4/0 RECONNECTION

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- 3.14 Torque the negative terminal nut to **170 lb-in** using a 14mm socket and a torque wrench. Apply torque seal mark.

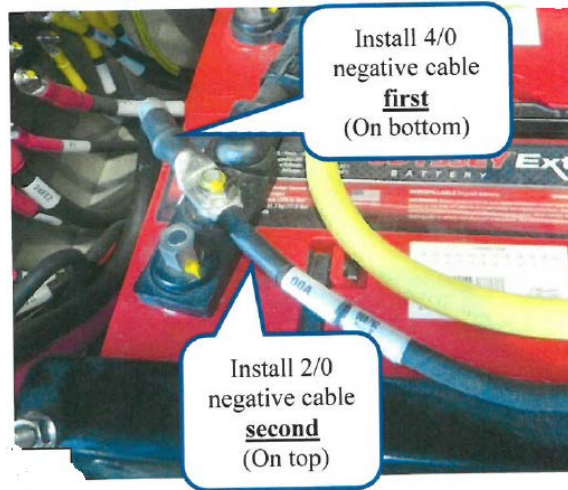


Figure 22: 4/0 AND 2/0 NEGATIVE TERMINALS RECONNECTION

- 3.15 Re-install the battery holding brackets (2).
- 3.16 Torque holding bracket nuts (6) between **45 to 55 lb-in**. Apply torque seal mark.

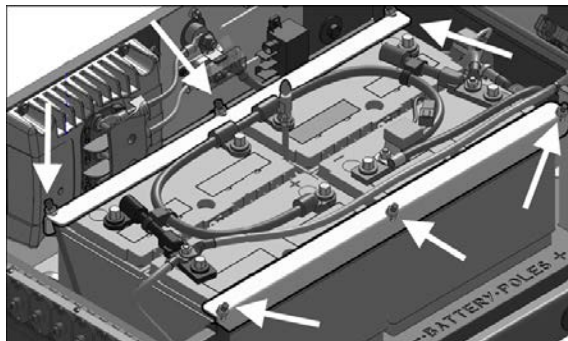


Figure 23: HOLDING BRACKETS RE-INSTALLATION

- 3.17 Close the lateral access panel.

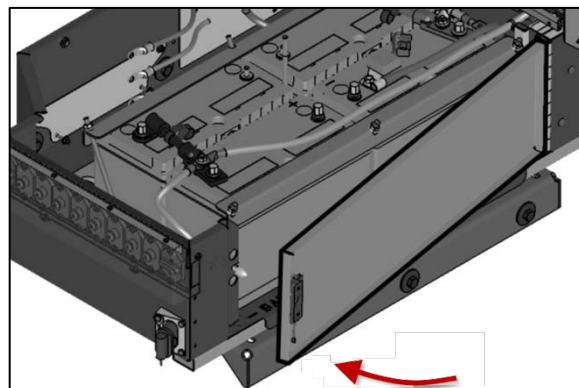


Figure 24

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- 3.18 Install the battery protective cover (number 2, Figure 25)

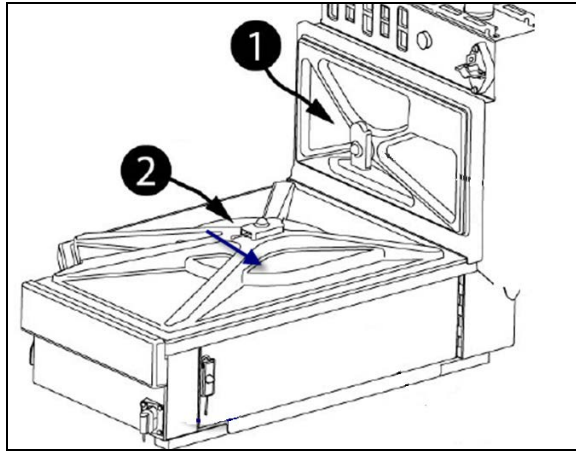


Figure 25: Battery & Electrical Box Covers



CAUTION

Replace only with AGM type batteries of the same specification and capacity.
Prime system is programmed for the charging capacity of the batteries installed.
Installing a higher capacity battery will affect the battery life as the system will not fully charge the batteries, which is detrimental to battery performance.



CAUTION

On battery replacement, confirm all protective covers are properly fitted and secured. This will protect battery terminals and circuit breaker bus bars against mist, dust and corrosion.



CAUTION

Ensure that connections are not reversed when reinstalling batteries, since damage to electrical system components will result.

4. ALTERNATOR CHECK AND REPLACEMENT (if required)

4.1 Set the battery master switch (master cut-out) to the ON position

4.2 Alternator control circuit verification: Check Voltage at indicated pins of A49.J1, fill Table 1 below.

Table 1: Voltage Measurement

TEST	A49 PIN 8	A49 PIN 9	A49 PIN 15	A49 PIN 16	NOT OK	OK
Ignition key OFF	_____ V	_____ V	_____ V	_____ V		
Ignition ON engine not running	_____ V	_____ V	_____ V	_____ V		
Engine running	_____ V	_____ V	_____ V	_____ V		

- With Key **OFF**:
All values should be around 0V
- With Key **ON**:
PIN 8 and 9 should be around 1.2 V
PIN 15 = 24V Bat.
(Figure 26)
- With **Engine running**:
All values should be above 28V.

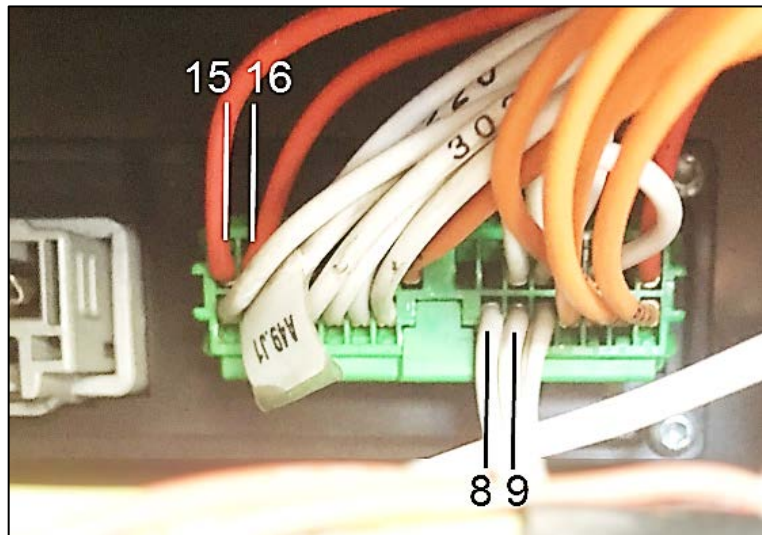


Figure 26: A49. J1

4.3 To validate alternator performance check we need to generate maximum electrical load on the system.

4.3.1 Have engine running on fast idle, park brake applied.

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- 4.3.2 With HVAC passenger on, disconnect Hi-side Pressure transducer to get full condenser speed.



Figure 27: Disconnect Hi-side pressure transducer

- 4.3.3 Disconnect evaporator speed 1 white wire on evaporator fan motor to get full evaporator speed.

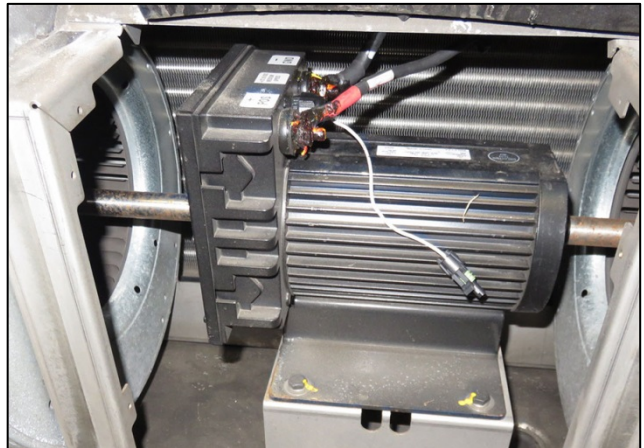


Figure 28

- 4.3.4 Turn on all exterior and interior lights.

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4.3.5 Fill in Table 2 below with the following measured values:

- Amperage on main alternator cable alongside the engine (Figure 29).
- Amperage at jumper cable between alternator 1 and 2 (Figure 30)

Note: Remove any additional wiring harness attached to this jumper cable by cutting cable ties. (Arrow, Figure 30) This will allow clamping only the jumper cable and getting a proper measure of amperage.

- 24V Battery voltage



Figure 29: Main alternator cable suggested ammeter clamp position alongside engine.

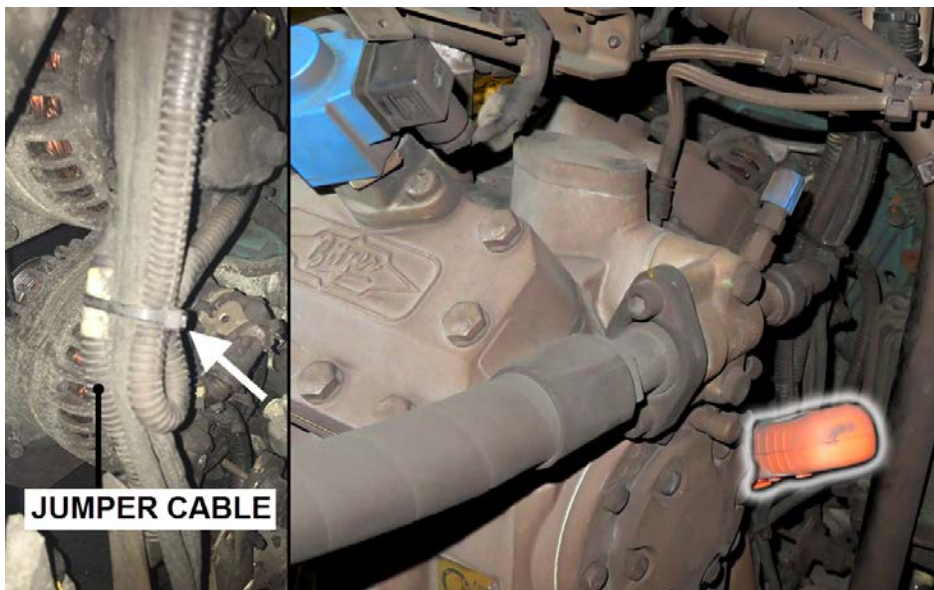


Figure 30: Jumper cable ammeter clamp position

Table 2 :Amperage Measurement

Item	Measured Value	Expected value	NOT OK	OK
Main Alternator Cable	_____A	150A to 180A		
Jumper between ALT#1 & 2	_____A	20A to 110A		
24V battery voltage	_____V	28V		

Note: One alternator may deliver more current. As long as the total load is higher than max capacity of one alternator (110 A for 120 A alternator) (140 A for 150 A alternator), if both deliver current this test is successful. If voltage drops below 28V or one alternator does not deliver current, check alternators further.

- 4.4 With key OFF and Emergency cut out switch ON, read voltage at A49 pin 15 and pin 16. If voltage is present, this is an alternator with an internal short circuit. (Figure 26)
- 4.5 Replace shorted alternator per bulletin MI16-17E and report problem on warranty claim
- 4.6 Reinstall removed cable ties.
- 4.7 Install the electrical box protective cover (number 1, Figure 31)

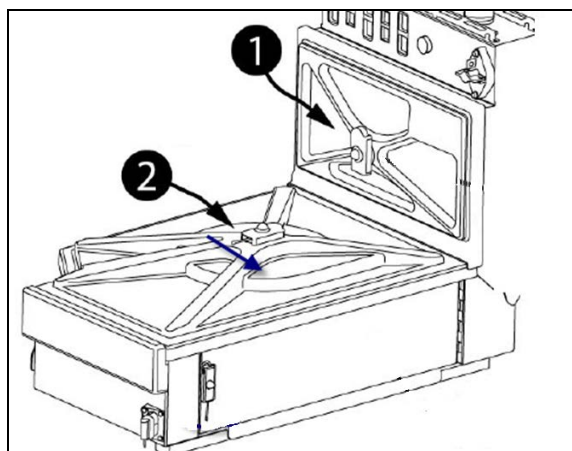


Figure 31: Battery & Electrical Box Covers

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PARTS / WASTE DISPOSAL

Coordinate with Northeast Battery for pick-up of scrap batteries.

Discard waste according to applicable environmental regulations (Municipal/State[Prov.]/ Federal)

ESTIMATED TIME

The time required to perform this special bulletin is approximately two hours (2h).

OTHER

VBC Bulletin	N/A
Fail Code	06.11
Defect Code	49
Syst. Cond	B
Causal Part	565904

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