

| "DOCUMENT UNCONTROLLED IF PRINTED" |                                  |        |          |         |        |           |
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| DOC #                              | PROCESS NAME                     | PAGE   | REVISION | STATION | BY     | DATE      |
| <b>Recall<br/>16V769</b>           | Engine May Start Without Warning | 1 OF 6 | C        | SER     | C.Ward | 5/24/2017 |

Read process before beginning. If you do not understand any part please contact: Chris Ward, Director of Parts and Warranty at 1-866-953-5555 or by E-mail @ cward@ARBOCSV.com.

Good Mechanics safety practice must be followed on any repairs.

Safety practices should include but not be limited to properly supporting the chassis, axles, blocking tires, and a work area free of clutter.

Repair shops safety rules must be followed and safety equipment used. O.E.M. Battery and Auxiliary Battery MUST be disconnected.

**The purpose of Recall 16V769 is on certain vehicles, the rear run safety switch (lockout) was not wired properly. This allows the vehicle to start with the possibility of a mechanic working on the engine. This could increase the risk of mechanic safety causing injury and/or death.**

**Complaint:** Vehicle can possibly be started from driver compartment with mechanic in engine compartment

**Cause:** Electrical mis-wiring into the power distribution module (PDM)

**Correction:** Re-wire and add a relay to correct the circuit

**Vehicles Affected:** Selected 2016 ARBOC Spirit of Liberty Units

**Labor Operation Code:** **RC057301**

**Verifying Function:**

1. Open the rear engine compartment door
2. Locate the Rear Run Box Switches in the engine compartment



3. The Switch function should be (with Disconnect Switch 'ON'):
- a. Front - Vehicle will only start from the front (driver compartment) - checks to perform:
    - i. With the switch in the Front position (up), start the vehicle from the front. It should work.
    - ii. With the switch in the Front position (up), attempt to engine start the vehicle from the rear. It should NOT work.
  - b. OFF - Vehicle will NOT start from either the front (driver compartment) or the rear (engine compartment) - checks to perform:
    - i. With the switch in the OFF position, attempt to start the vehicle from the front. It should NOT work.
    - ii. With the switch in the OFF position, attempt to ignition start the vehicle from the rear. It should NOT work.
  - c. Rear - Vehicle will only start from the rear (engine compartment) - checks to perform:
    - i. With the switch in the Rear position (down), attempt to start the vehicle from the front. It should NOT work.
    - ii. With the switch in the OFF position (down), attempt to ignition start the vehicle from the rear. It should work.
- 4A. If the unit functions correctly, please submit warranty documentation including notation that NO further changes were required.
  - 4B. If any of the functions of the rear run box are incorrect, please continue to the repair section for re-wiring instructions.

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| <b>Recall<br/>16V769</b>           | Engine May Start Without Warning<br>(4 Relay Assembly) | 2 OF 6 | C        | SER     | C.Ward | 5/24/2017 |

**NOTE: ARBOC HAS BUILT THE REAR RUN BOX HARNESS IN TWO DIFFERENT METHODS. PLEASE REVIEW THE (2) DIFFERENT REPAIRS BELOW TO SEE WHICH APPLIES TO YOUR UNIT.**

## REPAIR #1 - REAR RUN HARNESS WITH 4 RELAYS

**Labor Time Allowance: 15 hours per unit (includes verification review)**

### Tools Required

Heat gun  
Screw gun

### Parts List

- (1) 2003732 - Harness, Rear Run Box Jumper w/Relay
- (1) 1308320 - Harness, Rear Run Box
- (4) 1405424 - Micro Relays
- (1) 505161 - 5 amp Fuse (light)
- (1) 1201497 - 25 amp Fuse (door)
- (2) 616145 - Screw, Cap 1/4 x 1
- (2) 1310479 - Standoff Brackets

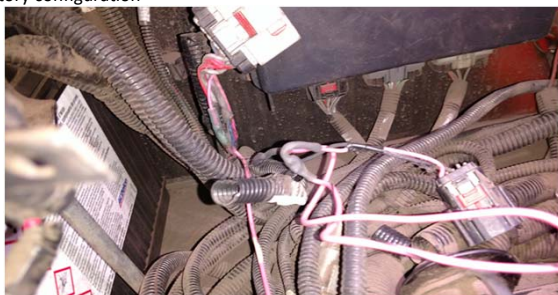
### Repair Instructions:

1. Disconnect batteries
2. Remove/Discard the existing harness
  - 2a. Relay Assembly
    1. Locate relay assembly in the rear of the battery box and remove relays from the blocks
    2. Remove (dismount) from battery box wall



### 2b. FCCC PDM Connections

1. Follow wires from relays back to the black and grey connections on the FCCC PDM Module
2. Find butt splice connections in the pink wires - cut out the butt splice connections to allow the wires to lay back into factory configuration



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#### 2c. Rear Engine Switches

1. Unscrew toggles and pull wire out for easy access
2. Unplug/cut off connections (**keep toggles to be re-used**)
3. At the right side of the battery box, pull harness from switch location (cutting wire ties as needed ) through right side of battery box



#### 2d. Transmission Shift Inhibit Connection

1. Using shop safety procedures, disconnect the transmission shift inhibit connection
2. At the right side of the battery box, pull harness from transmission location (cutting wire ties as needed ) through right side of battery box

#### 2e. Battery Connections

1. Disconnect the 2-position connector which attached to the FCCC battery tap (blue and tan wires)

### 3. Installation of new Rear Run Box Harness (1308320)

#### 3a. FCCC PDM Connections

1. Find the black 2-way connector from the FCCC module that has the pink wire cut from uninstalling the relays.
2. Connect the blunt pink/blk wire from the new harness to the connector side of the pink wire. (crimp and heat shrink butt connection)
3. Connect pink from new harness to the freightliner harness side pink at the black connector.
4. Connect the yellow wire from the new harness to the freightliner harness side pink wire of the grey connector branch.



5. Connect the pink starter crank in wire to the pink wire coming from the grey pdm connector.



#### 3b. Rear Engine Switches

1. Feed the toggle switch connections out the right side of battery box
2. Route wires along back side of battery box to the toggle switch location and secure wires (add ties straps as needed)
3. Connect white/black wire to one side of the 2-position Engine Crank Toggle Switch
4. Connect Front/Off/Rear Toggle Switch
  - a. Connect black/white wire to top or bottom position of 3-way toggle switch
  - b. Connect 20 gauge (small) black wire to top or bottom position of 3-way toggle switch (not used in 'a' above)
  - c. Connect 18 gauge black ground wire to both the center position and remaining wire of the 2-position toggle to make a 3-way splice
5. Find the 3-way connection (2 blue and 1 black wire)
  - a. Cut the black wire from the connector, apply a ring terminal with star washer, and ground to the nearest point

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3c. Transmission Shift Inhibit Connection

1. Feed the transmission shift inhibit connection out the right side of battery box to transmission location
2. Plug in the transmission shift inhibit connection and secure wires (add tie straps as-needed)

3d. Battery Connections

1. Locate the 2-position connector (blue and tan wires) and plug into the FCCC connection for battery power

4. Re-connect batteries

5. Turn Disconnect Switch to 'ON' position

6. Complete the verification of the functions (above) to ensure it is operating correctly

7. Submit documentation for warranty claim including notation of required repairs

## REPAIR #2 - REAR RUN HARNESS WITH POWER DISTRIBUTION

**Labor Time Allowance: 3 hours per unit (includes verification review)**

**Tools Required**

Heat gun  
Screw gun

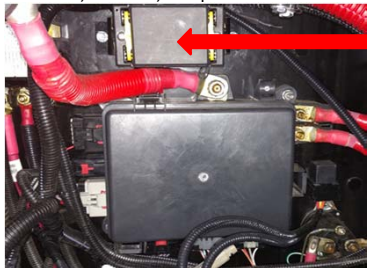
**Parts List**

(1) 2003732 - Harness, Rear Run Box Jumper w/Relay

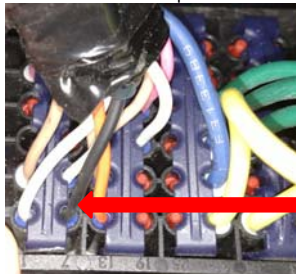
**Repair Instructions:**

1. Disconnect batteries

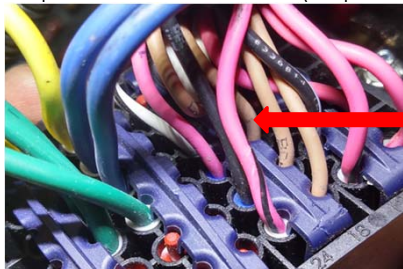
2. Locate, unscrew, and pull out the Power Distribution Module (PDM) from the rear wall of battery compartment box



3. Locate the Black Wire (Bay 7 of PDM - next to white wire), cut away from block to allow room for splice point, and create a 3-way splice to the new Black wire in the Jumper Harness with butt connector (crimp and heat shrink)



4. Locate the Tan Wire (Bay 18 of PDM - 3rd wire up), cut away from block to allow room for splice point, and create a 3-way splice to the Red wire in the Jumper Harness with butt connector (crimp and heat shrink)



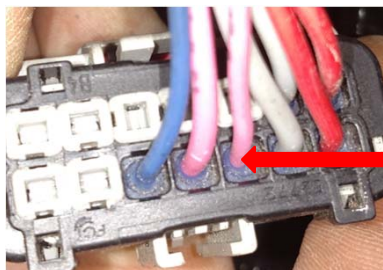
5. Re-secure PDM

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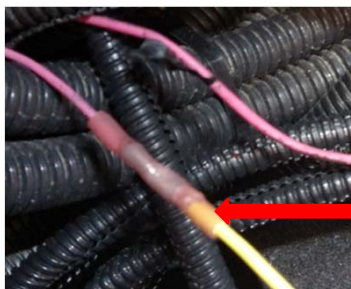
6. Unplug Grey plug from the bottom left side of the compartment



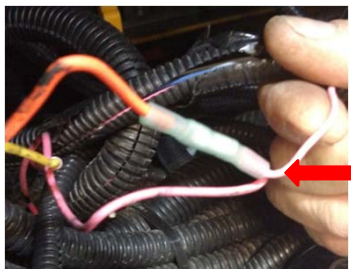
7. At the Grey Plug, locate smaller pink wire in the plug, follow the wire to a butt connection in the sheathing, and cut out the butt connector section



8. Connect the Yellow wire in the Jumper Harness to the Pink Wire on the 'Harness' side with butt connector (crimp and heat shrink)



9. Connect the Orange wire in the Jumper Harness to the (2) Pink Wires that remain on the 'Plug' side with butt connector (crimp and heat shrink)



10. Re-connect Grey plug

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11. Mount relay on the back wall

11a. Re-Mount Run Box Module



12. Re-connect batteries

13. Complete the verification of the functions (above) to ensure it is operating correctly (Disconnect Switch in the 'ON' position)

14. Submit documentation for warranty claim including notation of required repairs