

# **Full Wall Slide Won't Move Troubleshooting and Repair 2014 Discovery 40F**

## **INTRODUCTION/SUMMARY**

This file documents troubleshooting an inoperative full wall slide on a 2014 40F Discovery. The malfunction occurred during the January 2019 SE DOAI Rally at Lazy Days RV Resort. Several people (Mike Weiher, Kerry Pinkerton, Jim Pinkerton, Rick Blaher, Harry Terrill, Marshall Godwin (remotely)) participated in the process over a period of 4 days during the rally. Mike owns the coach and Rick acted as the scribe. The others combined their knowledge and troubleshooting skills to identify and correct the malfunction's cause. We also had consultation with REV Technical Support during the process. All the full wall system major components were checked and eliminated to arrive at the root cause. A relay was found on the floor under the center dash that had gotten wet and was damaged. The relay was replaced and the problem resolved. The following slides and narrative document the troubleshooting and repair process.

While this was a specific problem, the troubleshooting process involved the entire FW slide system before the root cause was found. The FW system includes 5 motors (1 on each of 2 slide locks; 3 FW motors synchronized to operate the slides), interlocks (relays), electronics (slide controller and slide lock controller) and wiring. I've included some extra pictures and diagrams to help facilitate understanding of the problem and the troubleshooting process. This discussion does NOT address motor synchronization issues.

## PROBLEM

Slide would not extend - slide locks were extended and nothing happened when the extend button was pushed.

## SYMPTOMS

1. The full wall (FW) slide had been previously operated numerous times with expected results. The slide had been retracted (with no indication of a malfunction) for travel to the rally.
2. During set-up at the rally, the slide would not extend. At the time the problem was discovered, slide locks were correctly in the retracted position.
3. Pressing FW extend switch on slide control panel inside the coach had no effect
4. The malfunction symptoms were present, disappeared part way through the troubleshooting process, then reappeared. At one point during trouble shooting, the slide extended and retracted (including lock operation) once normally. When exercised a second time, the locks retracted normally, and the slide went part way out. Then, it stopped and would not move in either direction. Troubleshooting was more difficult, given that the problem appeared to be intermittent.

### Troubleshooting Note

Generally, when troubleshooting electrical, one of the first things that should be checked is input power. We got intermittent results when checking input power, especially at the key and extend/retract switch in the coach. Initially power was present at the key and switch more than it was not. This necessitated a more detailed look at other system components. The input eventually failed long enough for us to isolate the root cause of the malfunction – a damaged interlock relay.

## Detailed Troubleshooting Process Steps (1 of 3)

1. It is useful to have at least a basic understanding of how the system works to facilitate troubleshooting. See 2019 Camp Discovery slides for additional information.
2. Generally, the first step in trouble shooting where electrical connections are involved is to verify power, fuses, relays, and ground connections.
3. We first inspected the full-wall lock assemblies. Neither motor mount was broken. Each motor had 2 connecting wires. There were two more connecting wires on a limit switch on top of the motor assemblies and a 6-pin plug for each motor. Both motors are wired identically. All connections were secure. We did not immediately unplug and re-plug them but did so later in the process with no change in symptoms. (Slide 6)
4. We used a 12V motorcycle battery to jump between the two pins on the lock motors and move the clamps. Reversing the jumper polarity will make the clamp move in the opposite direction. The jumper was used to manually move the clamps to the stowed position, the clamp position necessary for the slide to begin to extend. (Slide 7)
5. The engine was started, slide key lock turned to the unlock position and the extend button pressed. The slide did not move. Had the slide moved, the problem would have been isolated to the slide lock components. Note that the fact that the slide didn't move with the locks manually retracted still does not eliminate the locks as a potential problem. A defective limit switch could cause the malfunction. We agreed, at least for the time being, that the cause was likely something different. (Slide 7)
6. We reviewed available documentation along the way to better understand wiring and connection details. Four reference diagrams are included in this file. Key components are identified where possible.
7. When the RV engine is running and the key switch turned to the "on" position, 13.5V is applied through the key switch to the extend/retract switch on the control panel in the coach. (Reference Diagram 4) We verified that voltage was present at both the key switch and the extend/retract switch. [The source voltage was not present at the key switch later in the process, which created an intermittent problem].

## Detailed Troubleshooting Process Steps (2 of 3)

8. There are two electrical boxes located in the basement ceiling – a PowerGear slide motor controller (Slides 8-9) capable of controlling 4 motors (full wall slide has 3) and an HWH lock controller (Slide 10). The slide controller is the larger of the two and has a 13.5V input at lugs on one side of the box (Slide 9). These are easily accessible and can be tested with a multimeter or DC test light and as a power/ground source for troubleshooting. The input voltage was present at the slide controller.
9. The slide controller has four 40-amp fuses (Slide 9), one for each of 4 motors. Only 3 of those are used, one for each of the 3 full wall slide motors. All the fuses were checked for continuity and were good. We did not check for voltage on each side of each fuse. Performing this latter task is useful to check the integrity of the fuse connections.
10. There is a ¼-amp in-line fuse (slide 11) between the slide controller and the lock controller. That fuse was good.
11. There is a 40-amp fuse that comes off the BCC (Reference Diagrams 3 & 4) and supplies power to a lock relay (Reference Diagrams 2 & 3) located on the basement ceiling near the slide and lock controllers. The 40-amp fuse tested good. The relay plug was cycled on and off a time or two at this point and appeared to be functional.
12. After reviewing wiring diagrams, pins 2 and 3, and then 1 and 2, on the slide controller “Switch” plug (Reference Diagram 1) were jumpered by Kerry. The slide moved both in and out. We retested with the lock motors connected and the locks extended/retracted properly. **This step eliminated the locks, slide controller and lock controller as possible sources of the malfunction.** The slide was checked again using the control panel switch, and it moved out and back in again. Upon extending the slide a 2nd time, it stopped moving about ½ way out and then wouldn’t move in either direction after that. At this point we knew we could manually operate the slide by jumping the correct pins. We extended the slide for livability while we researched the schematics. The pins being jumped are inputs to the PowerGear controller from the HWH lock controller.

## Detailed Troubleshooting Process Steps (3 of 3)

14. It is noteworthy that the relays involved in the operation of the slide system are common 5-pin relays, easily obtained from local auto parts stores for about \$5.00.
15. Harry Terrill jumpered 13.5V from the slide controller to the green wire(Fleetwood #529) on the Travel lock relay (Reference Diagrams 2 & 3) on the ceiling to energize it. A person inside the coach exercised the extend/retract switch, and the system worked correctly, including with the lock motors reconnected. This verified that the whole slide system was operational, except that it wasn't getting an input trigger to the HWH controller. **The problem was determined to be somewhere between the power source and that relay.**
16. We rechecked power at the key switch on the controller panel and discovered there was no power to the switch. **We determined that there must be an interlock somewhere that we had not found**, and that interlock was blocking power to the slide system. This further verified our conclusion on the previous step.
17. Harry Terrill contacted REV technical support to try to find out where an interlock might be. He learned that there was an Ignition Interlock Relay in the central dash (Slides 15-16). We searched for and found the relay. Mike's coach had an unmitigated leak in that area. The area where they found the relay was wet. They found two relays – one (Engine AC Clutch Relay) was burnt and the other (Travel Lock Relay) corroded (Slide 17). Both relays were replaced. This corrected the problem and the full wall slide now operated properly.

## Visually Inspect motor assembly and connections

We first inspected the full-wall lock assemblies. Neither motor mount was broken. Each motor had 2 connecting wires and there were two connecting wires on a limit switch on top of the motor assemblies and a 6-pin (white) plug. **All were secure.** We did not immediately unplug and re-plug them to remove potential corrosion, but did so later in the process with **no change in symptoms.**



Verify limit switch connections secure

Verify Motor Mount Secure

Verify 2 Motor drive connections secure+-9

## Manual Retraction (Electrical Jumper) of Slide Locks

- ✓ We used a 12V motorcycle battery to jump between the two pins on the lock motors and move the clamps.
- ✓ Reversing the jumper polarity will make the clamp move in the opposite direction.
- ✓ The jumper was used to manually move the clamps to the stowed position – the clamp position necessary for the slide to begin to extend.
- ✓ This step did two things
  1. Allowed us to see if the slide would extend once the clamps were stowed
  2. Verified only that the **motors were both operational** – did not verify controller or limit switch operation.
  3. **Properly stowed** clamps (visually verified) for slide extension

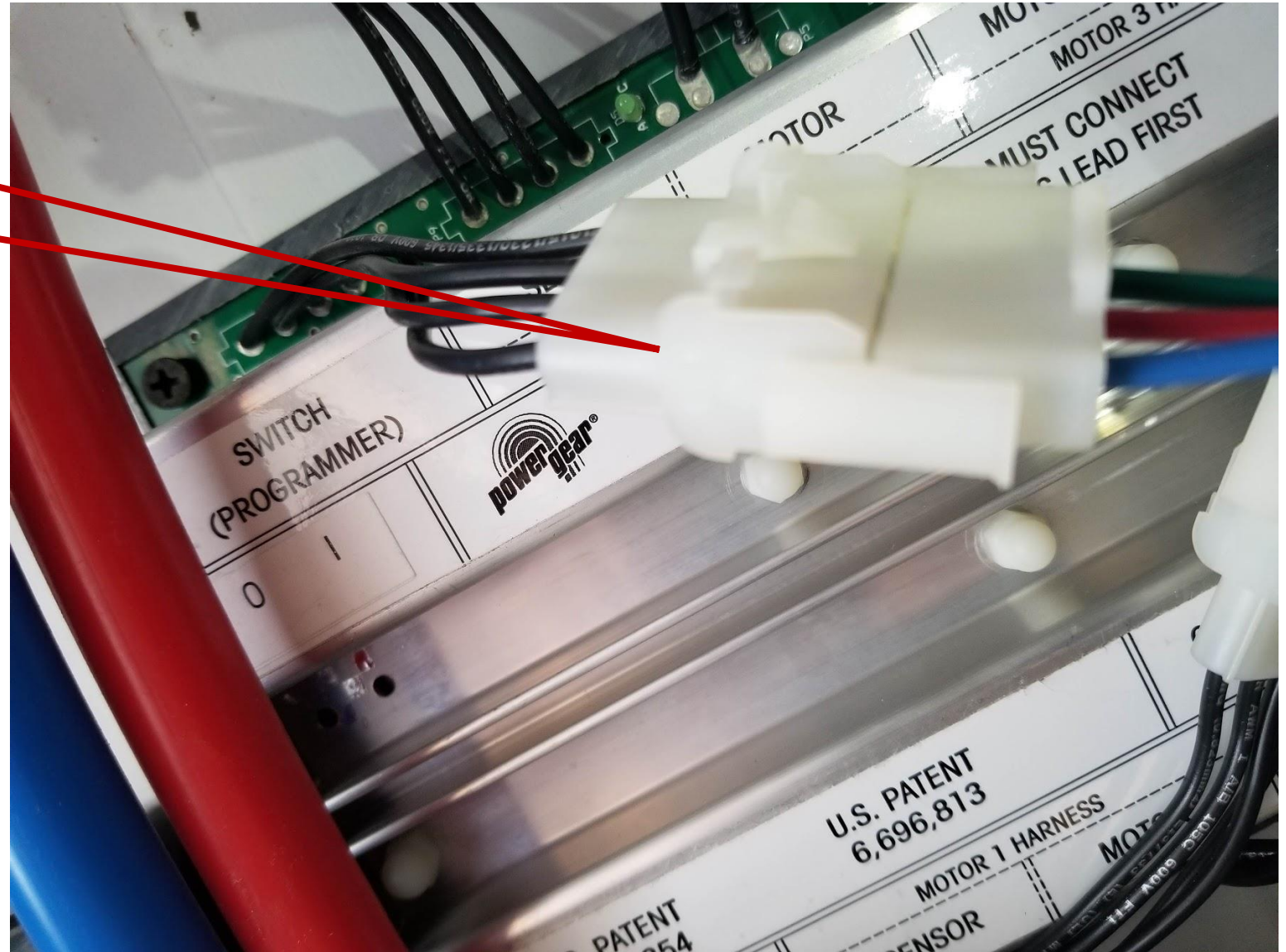
**Slide was tested after locks stowed and did not move. Had the slide moved, the problem would likely have been associated with the slide locks.**



12V from motorcycle battery to 1 terminal, ground to other. Reverse polarity to reverse lock travel direction

## Full Wall Slide Controller

This plug was disconnected and jumpered to cause the slide to move in and out. See Reference Diagrams 2 & 3

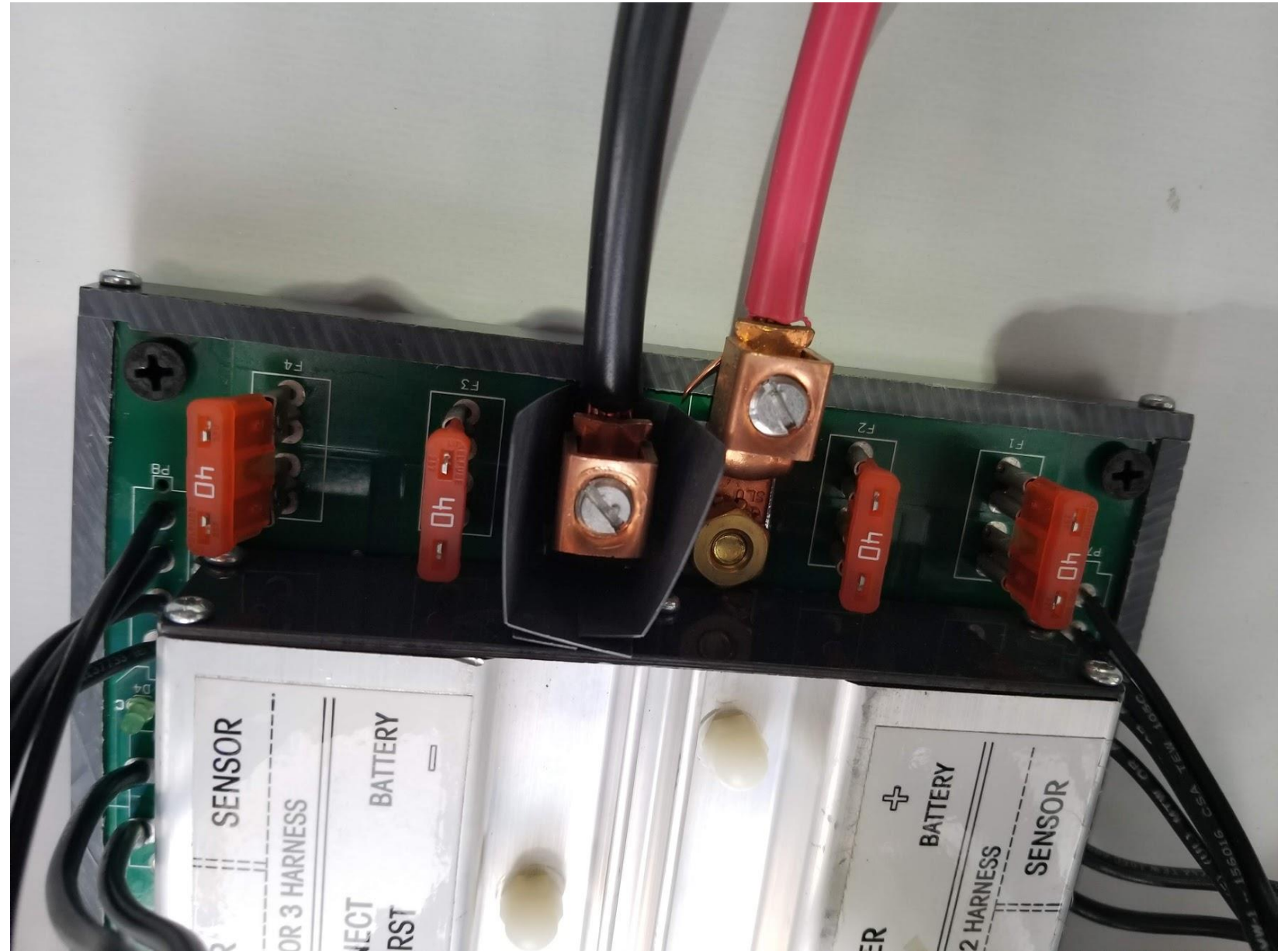




## Full Wall Slide Controller Power Input

The voltage between the black and red wires should be 13.5 volts. Also, this is a place where you can get power to jumper the slide if needed to manually move it in or out.

The 40A fuses are for the motors. Since there are only 3 motors on the full wall slide, the 4<sup>th</sup> fuse is a spare.



## Full Wall lock controller

Don't be fooled by the title on the box. This is the slide LOCK controller and has nothing to do with leveling.

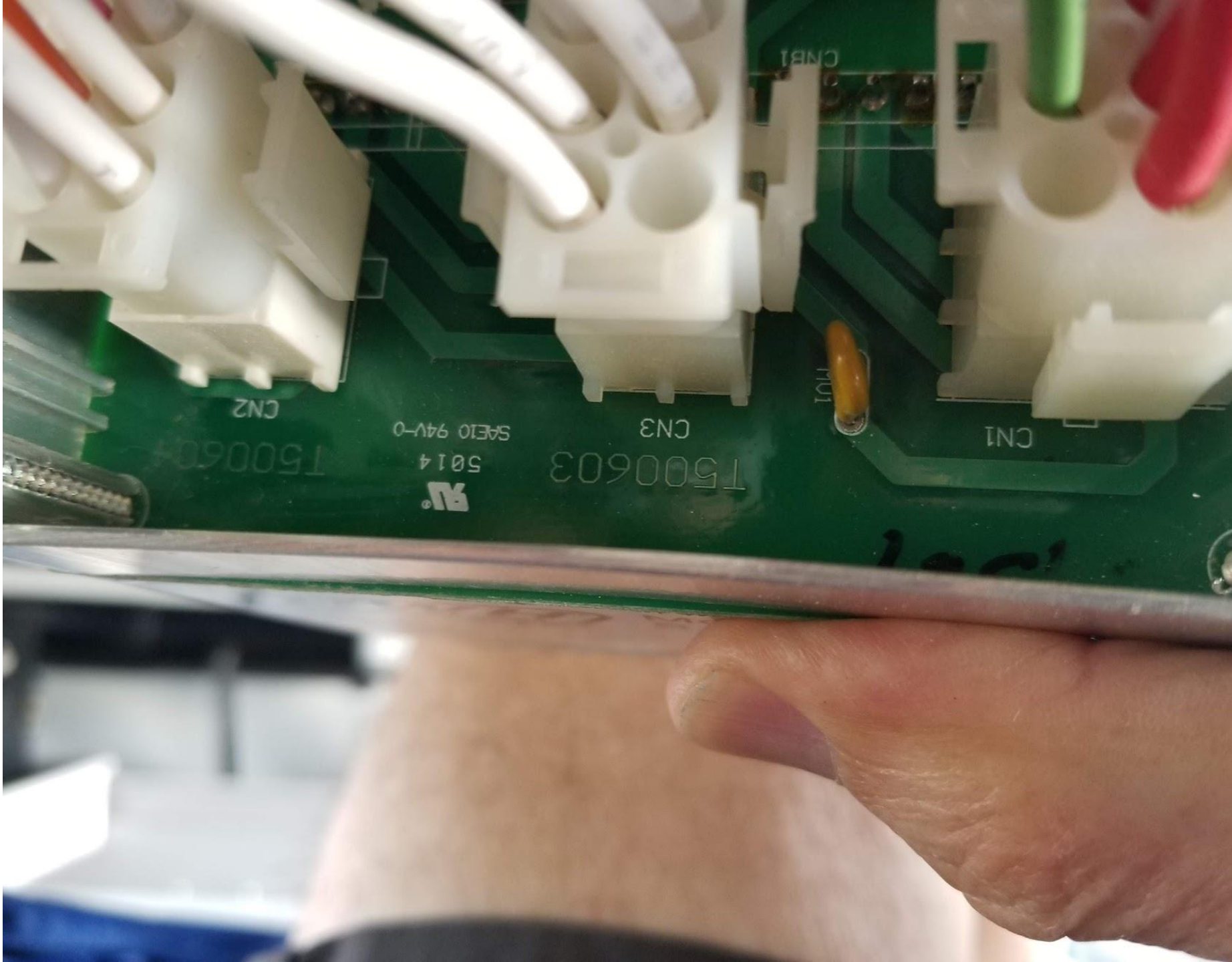




**Quarter Amp Slide lock fuse**

This fuse is in-line between the slide lock controller and the slide controller.

**Full Wall Lock Controller**  
Close up connectors CN1,  
CN2, CN3 for Reference

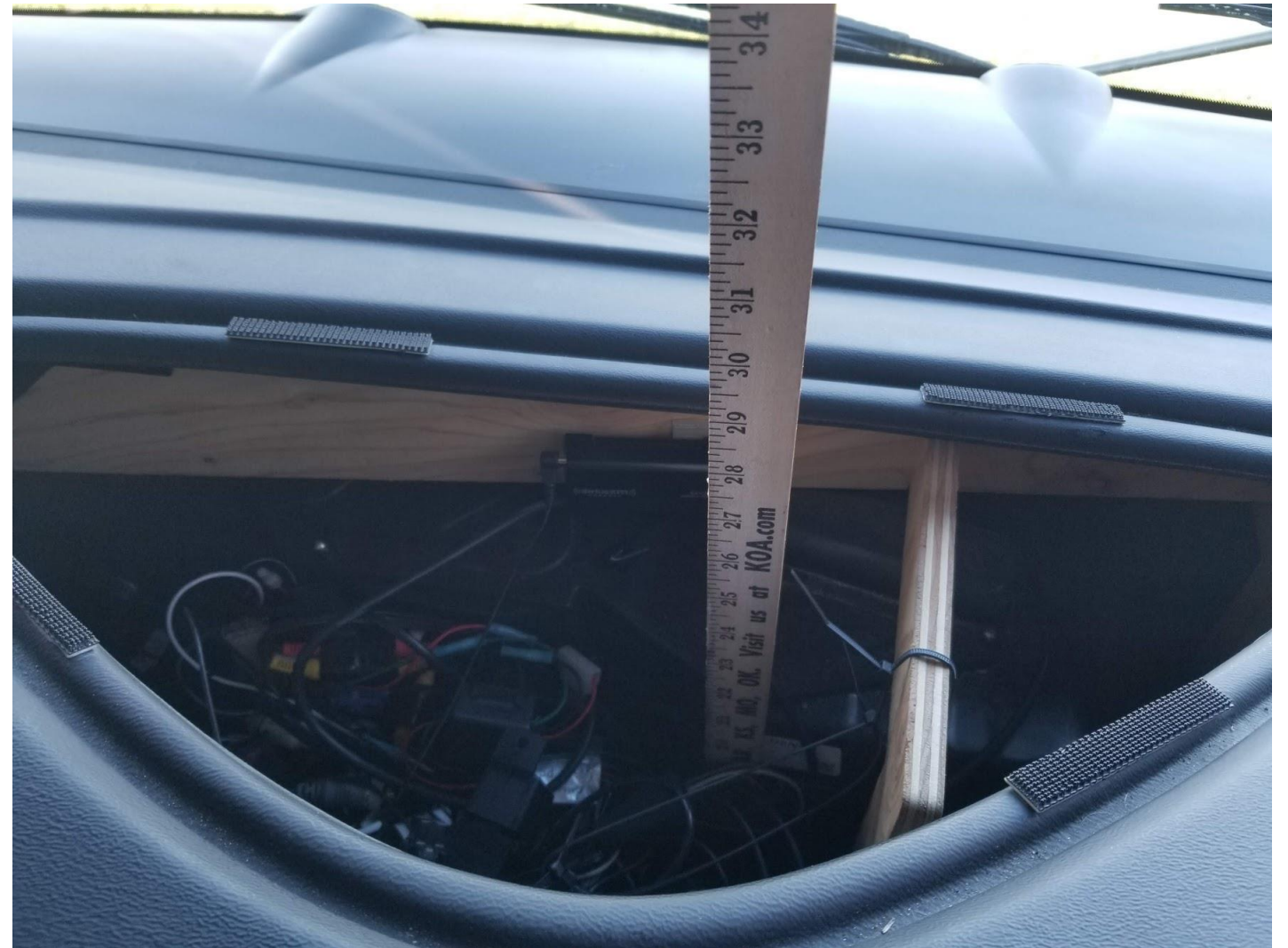


**Full Wall Lock  
Controller  
Connectors. For  
Reference**



### **Yardstick distance to floor under dash.**

The floor at the dash is about 30 inches from the top. The two faulty relays were near the floor. The floor was wet due to a persistent leak.



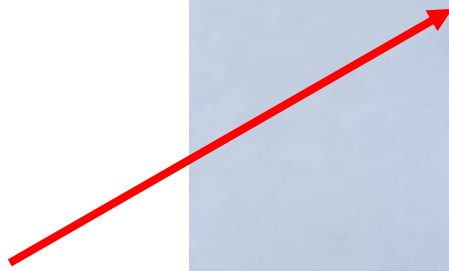
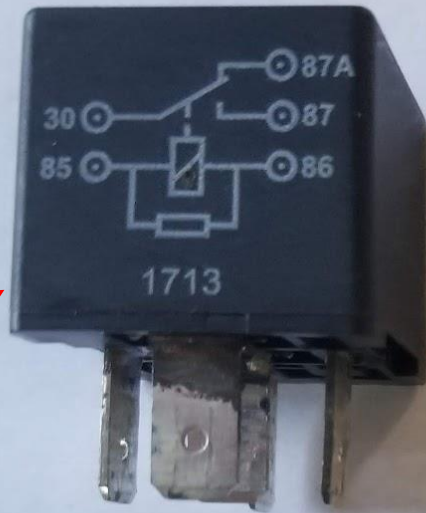
Looking down from the dash acces at the top of the dash



Damaged Relays

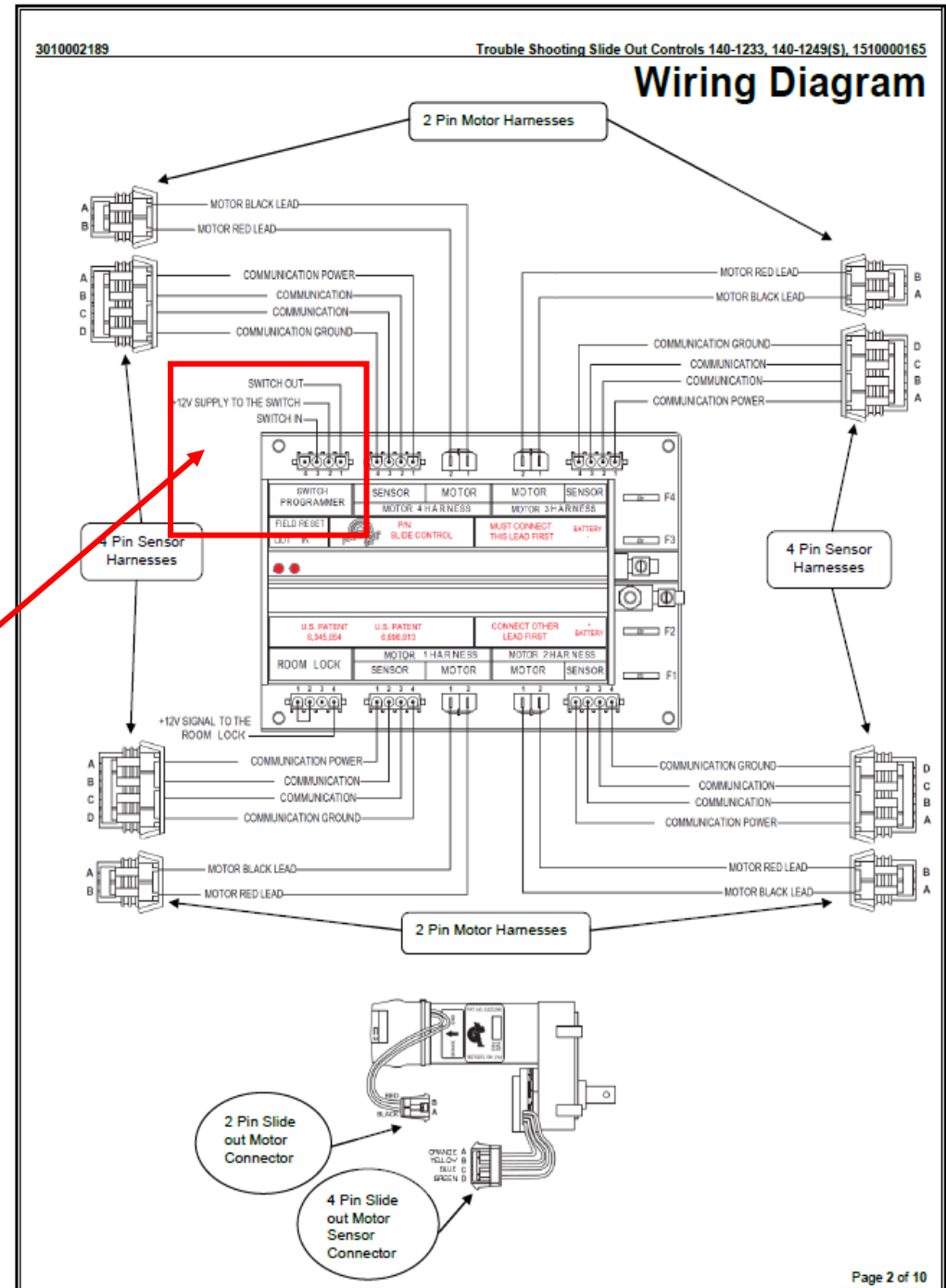
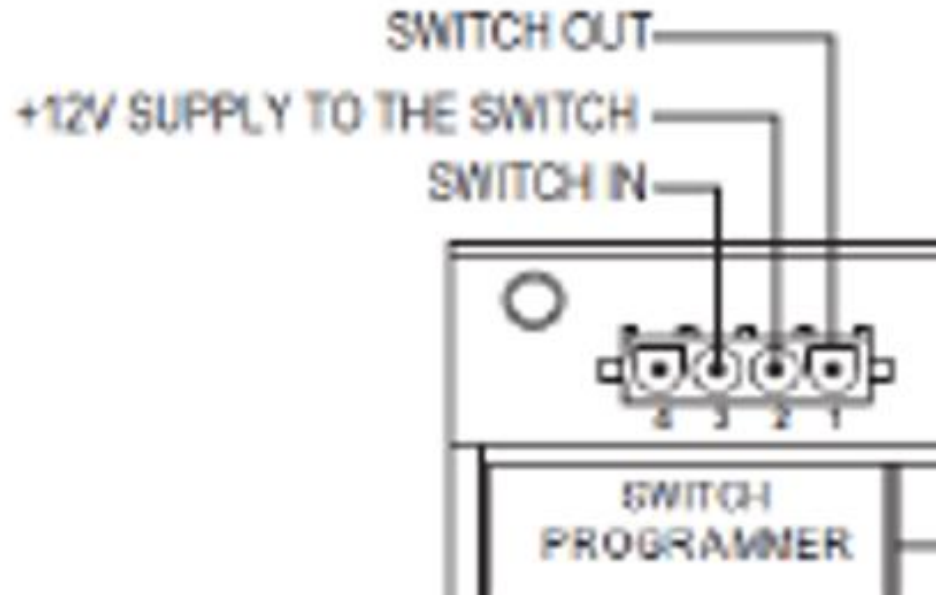
Slide Lock Relay

Engine AC Clutch Relay

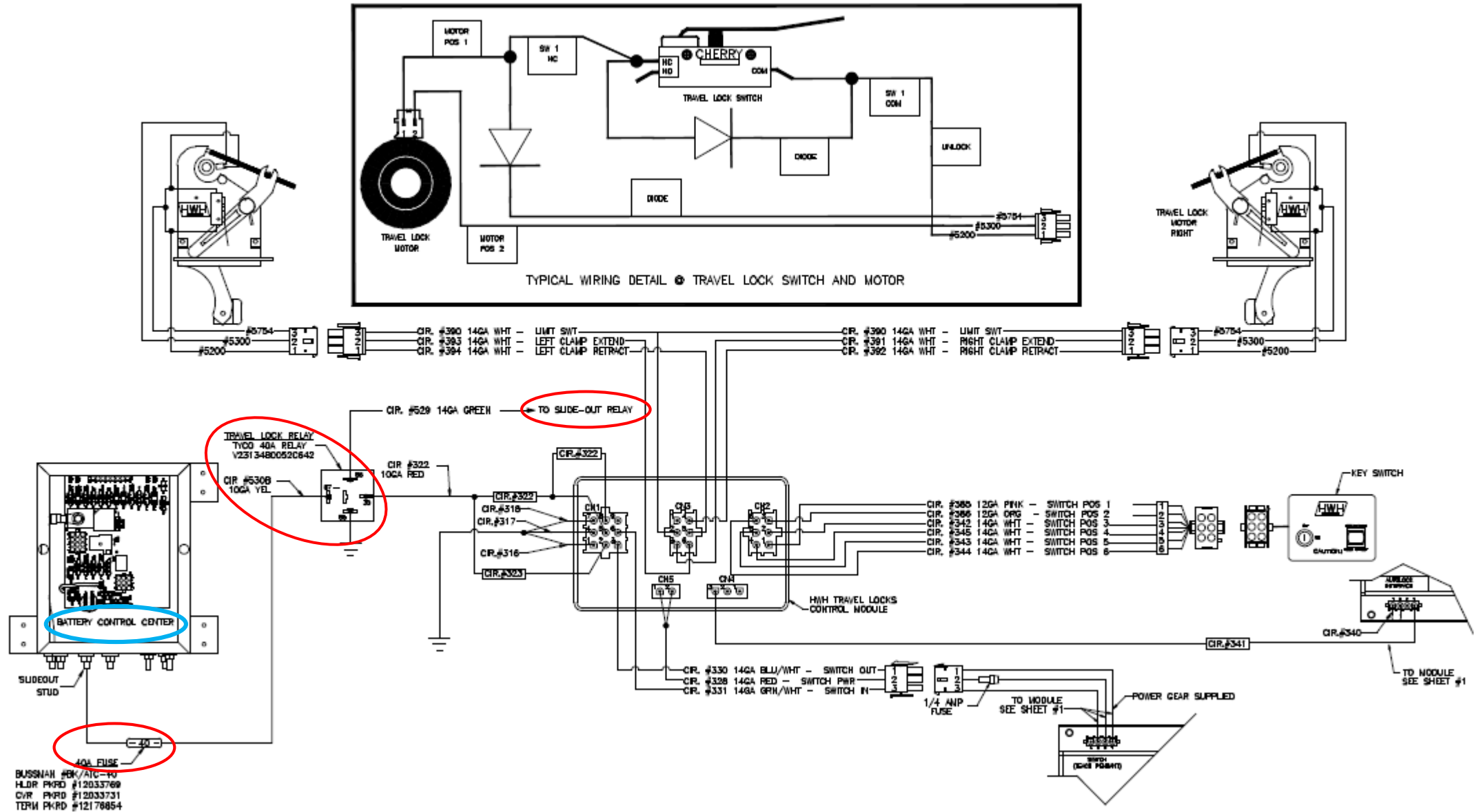




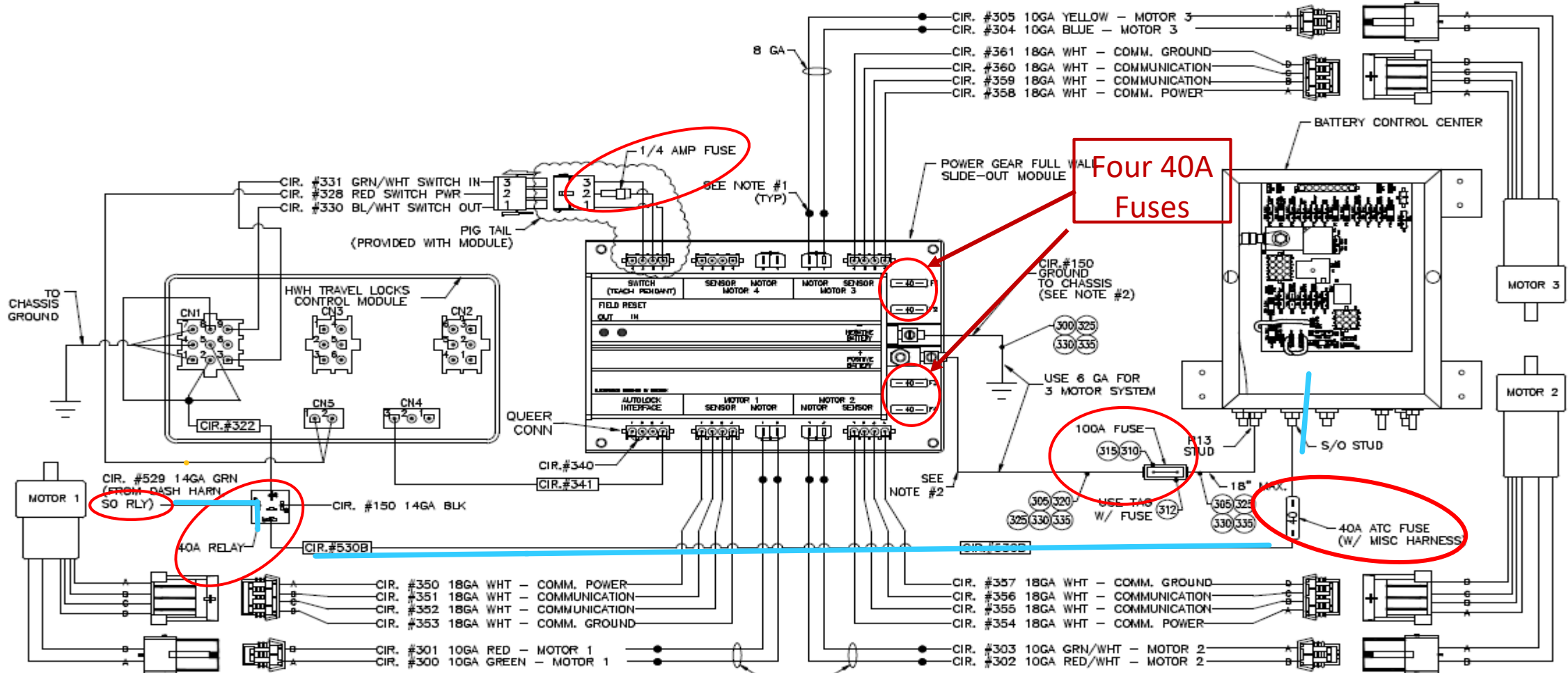
Reference Diagram 1



## Reference Diagram 2

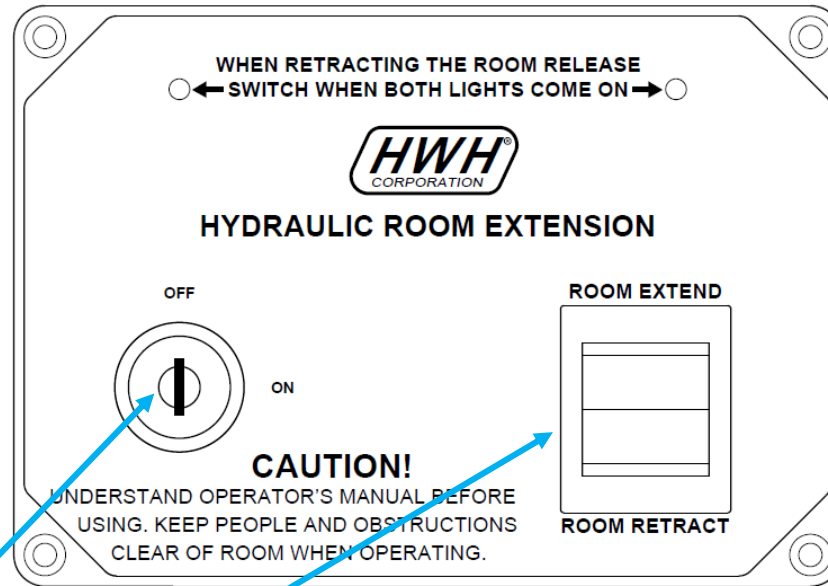


# Reference Diagram 3

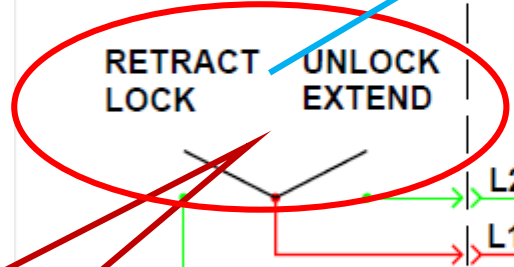


- NOTES:
1. USE #8 GA WIRE, DOWNSIZED TO #10 GA WIRE (6" OR LESS TO CONNECTORS).
  2. TO BE ROUTED WITH R/S MISC HARNESS.

# Reference Diagram 4



13.5V supplied through key switch to slide switch when key is turned on.



If you measure 13.5V here, you know also that the key switch is closed. If no voltage, neither slide nor locks will work.

