

Low voltage on the low beam Headlamps

August 19, 2006

Thanks to Rod DeGarlais for pointing me in the right direction!

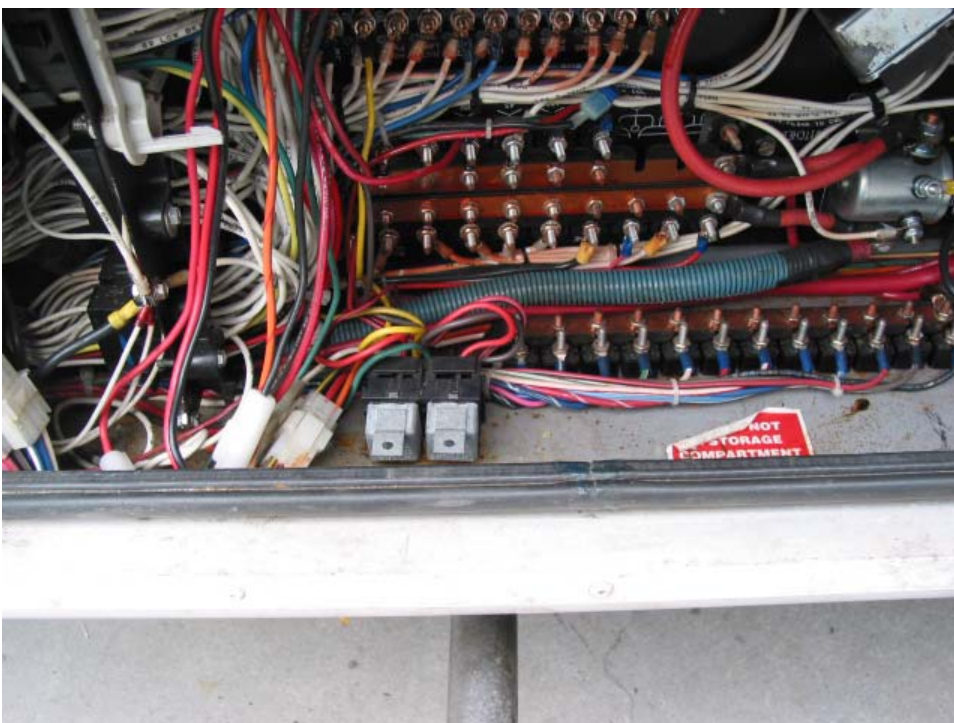
Shortly after driving the Barth for the first time, I noticed that the low beam headlights seemed to be very dim. Without checking I just assumed that these were lamps from the early '90s so I replaced them with Hella H1 and H4 Euro lamps and reflectors.

Not one bit of difference in the low beam output. The high beam really lit up the road but the low beam was totally unacceptable.

Getting out my voltmeter I started to do some checking. With the engine off and 12.6 volts at the hot side of the battery relay in the front electrical compartment, I measured 9.5V volts at terminal #69 "low beam". WOW where does all the voltage go? Moving back upstream toward the battery, I measured 10.3V at terminal #67 "headlamp power" further back to the main low beam headlamp circuit breaker I measured 12.4V volts.

No wonder the low beams were so dim! A little investigation showed that the headlight circuit goes thru an amazing number of connectors and a switch, each contributing to a voltage drop. I posted my findings a while back on the Barthmobile forum and Rod DeGarlais responded that he had inserted a relay in the low beam circuit to eliminate the long voltage path and get near battery volts at the head lamps. He mentioned that he didn't have the instructions handy but was a straight forward, easy job. I noticed that there is a relay for the high beam lamps so Barth must have taken notice that the voltage wasn't satisfactory there, but why they didn't add the second relay for the low beams is a good question. This isn't about bad grounds, just losses that accumulate through many connections and a switch.

On my Barth there are two relays mounted together on the floor of the electrical compartment, one is the high beam relay and the other is the back-up camera lights relay. When switching on the back-up camera (or going into reverse with head lights on, it will turn on high output lamps on the back of the coach for good rear visibility at night.



Notice the two relays (silver colored) Left is high beam right is camera back-up lamp

I like to keep things sanitary so I thought the cleanest way to do this would be to replace the back-up lamp relay with another relay and use the existing relay for the low beam headlights. This way both headlight relays (one for high and one for low) are mounted together in the same location.

I purchased a Pico relay socket part # 5653C for the camera back-up light relay.

Camera relay replacement:

Removed the original red relay wire from terminal "B4".

Crimped a ring terminal to the red wire from the replacement relay socket, secure to terminal "B4"

Removed the original brown relay wire from terminal "Spare A"

Crimped a ring terminal to the yellow wire from the replacement relay socket, secure to terminal "Spare A"

Removed the original red/blk stripe relay wire from terminal "22B backup"

Crimped a ring terminal to the blue wire from the replacement relay socket, secure to terminal "22B backup".

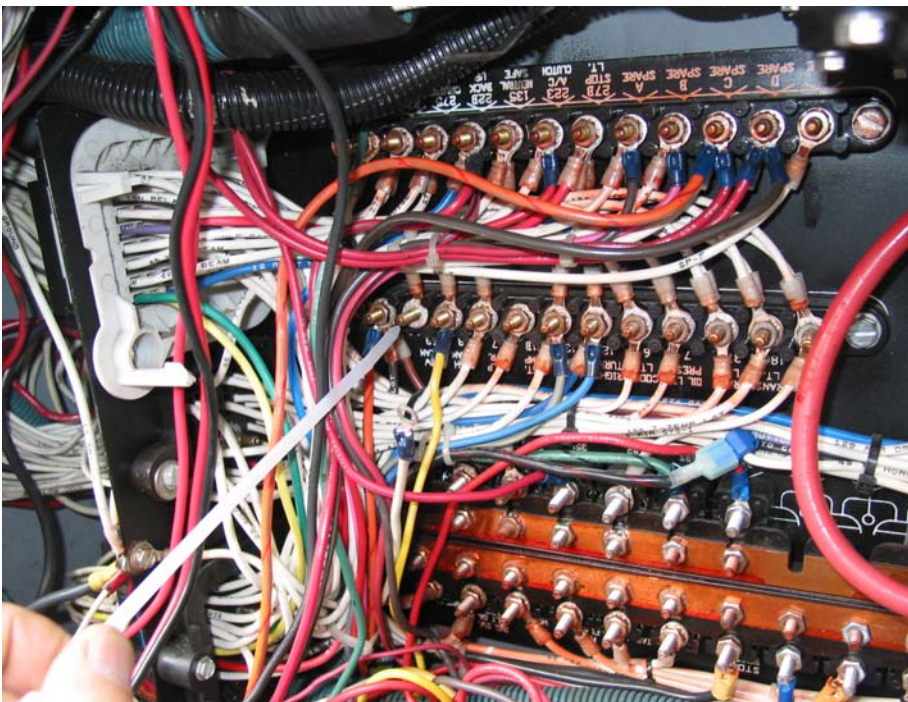
The green wire from the replacement relay was then secured to the ground strip on the lower left of the electrical cabinet. Do not remove the original relay green wire from the ground connection.

That completes the relay replacement for the camera back-up lights and frees up the original relay to be used for the low beam headlight circuit.

Connecting the relay into the low beam headlight circuit:

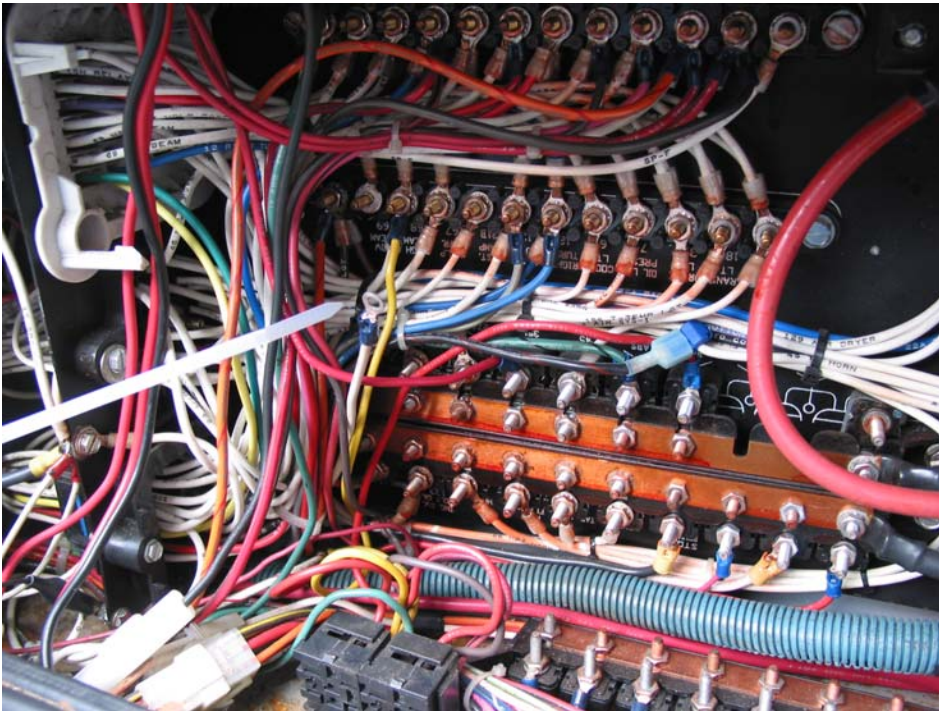
For clarity I will mention "relay", this is the one that has been disconnected from the camera back-up system and is now free to use for the low beam circuit. Colors of the wires should be followed.

Remove the "low beam #69" wire from terminal # 69 low beam". Make sure it is the wire that goes to the headlights not to the large white connector which comes from the steering column! On my coach it was the wire that exited downward from the terminal block.



Terminal #69

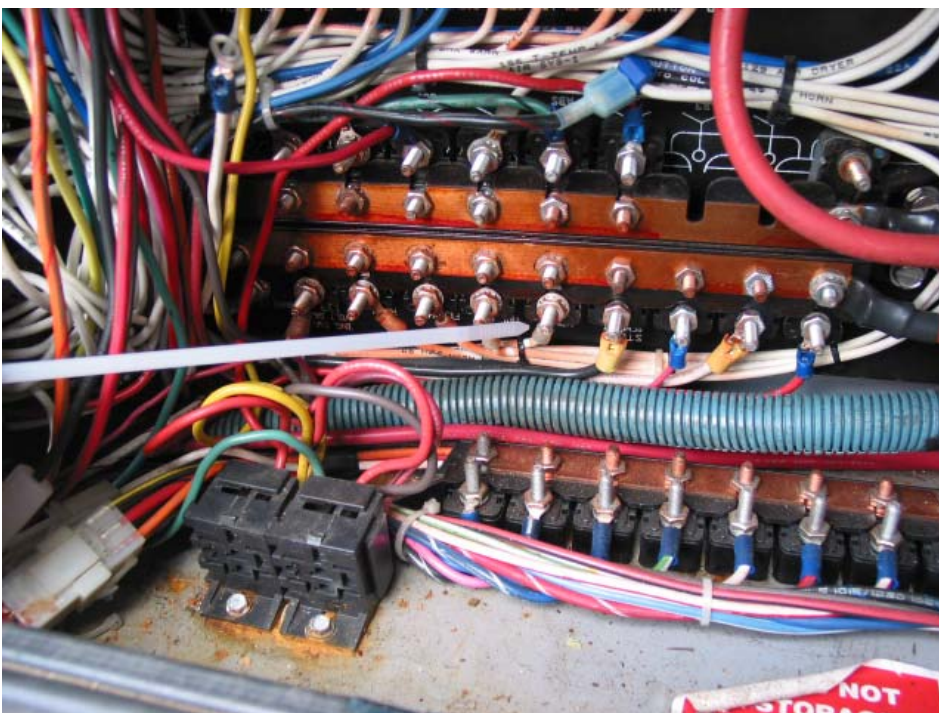
Locate the brown wire from the relay, cut the ring terminal off this wire and also cut the ring terminal off the “69 low beam” wire removed in the previous step, either solder or crimp connect these two wires together, insulate and tuck out of the way.



Wire to headlights

Locate the red/blk wire from the relay and connect to terminal “69 low beam”.

Locate the red wire from the relay and connect to “#46 head lamp breaker” there is another wire there and leave it in place.

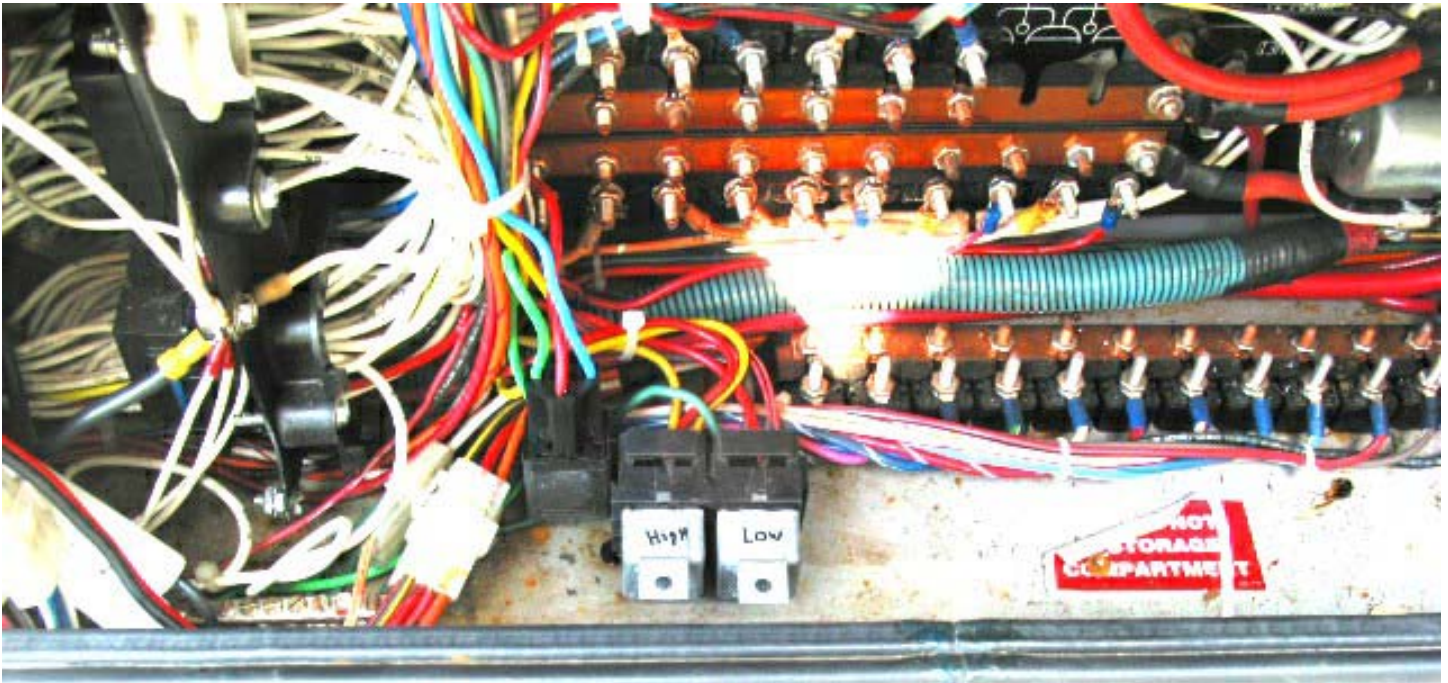


Low beam headlight power circuit breaker

The green wire of the relay should already been grounded so this will not change.

This completes the addition of a relay to the low beam headlight circuit. Test by turning on the headlights, observe the headlights and insure that both low and high beams work. On low beam there should be nearly full battery voltage at terminal #69 and no voltage at terminal #68. On high beam, there should be near battery voltages at terminal #68 and no voltage at terminal #69.

If all checks out, dress up the harness and tie down anything that may have been loosened during this process.



Notice the new camera back-up relay just to the left of the headlight relays.

Enjoy the night ride with brilliance!