

What Do You Do with a 40-Year Old Relay Box? Repair It, Trash It, or Rebuild It

by Jim Albeck

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Happiness is having all the wires going to all the right places with no smoke. Gloom is when the turn signal lights do not function.

Such was the case on my BN2 which I hope will be on the road yet this year. With the meter in hand and adequate clip leads, the process of elimination led me to an ominous box on the left front fenderwell called a DB10 relay box.

Getting the box out of the car requires the aid of a nut holder in the wheelwell, unless you have arms like Meadowlark Lemon. Remember to mark the wires one through eight when removing them as it will aid in the reassembly exercise.

With the box out of the car, on the bench, and with the cover removed, the innards reminded me of an antique wall-hung crank telephone or a 1910 high school science project. After removing all the dirt, rust, and caterpillar cocoons, the relays responded to a little electro-shock therapy from a fully-charged battery. The contacts were cleaned and tweaked per Section N.14 of the A-H Manual to finally give continuity; but the contact resistance was 5 to 10 ohms which is very high and would load the flasher so that it would flash only every seven to ten seconds. The question now in my mind was how long will this piece of junk function and was it worth the day's effort that I now have invested?

Well, upon opening Mr. Moss' book to Lucas Electrical Widgets, I found that a replacement was \$170. That just went against my Scotch nature—that is, I can buy a lot of Scotch for \$170.

Now we have a dilemma. I don't want to use it the way it is, and I don't want to contribute to the Prince of Darkness' fortune, so what do we do?

I decided to rebuild it with modern components, as it would be less pricey than a new one and very reliable. My first choice was to go solid state without electromechanical relays, but laziness and simplicity won out when visiting the electronics store and spotting some small DPDT relays that would fit under the box cover. For \$14 including tax, I was committed. Proceed as follows:

1. Remove cover by prising (English word) off on the short sides.
2. Drill out the 10 rivets from the bottom

side, and remove all parts. Don't throw anything away until the job is complete.

3. There are three insulators, one on the bottom side, and two on the top side. Also there are six insulating washers (small) that are in the metal baseplate between the insulators. (One of my insulators was broken, so I fabricated a new piece—the light colored material in Figure 1.) Save these pieces as they will be reused.

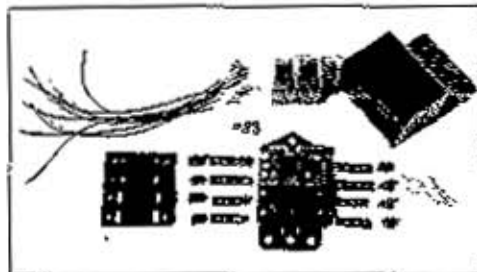


Figure 1: All the parts ready for assembly.

4. The four contact pieces (where the wires from the loom attach) that are designated 1, 2, 5, and 6 are cut off so they are flush with the top insulator when assembled. The insulator acts as a locator for these pieces so they don't short to the baseplate. The four straight contact pieces that go to 3, 4, 7, and 8 have locating pins that interface with the bottom insulator. The pins are inboard on 3 and 7 and outboard on 4 and 8. See the parts ready for assembly in Figure 1.

5. With everything removed, clean up the cover, baseplate, and contact pieces, as they will be dirty and rusty. Paint the cover and baseplate the color of your choice (I used black as it was available).

6. Items you will need from your local electronics supply store or Radio Shack if all else fails:

2-relays, 12VDC, with double pole double throw (DPDT) contacts. Take your baseplate and cover with you as size is important if you want the cover to fit on the finished item.

8-rivets. I used 1/8 diameter pop rivets. Check the length of the rivet as it has to go through the contact piece, insulators, baseplate and the wire terminal.

4 feet of 18 gauge stranded wire. 20 gauge can be used, I had 18 gauge on hand.

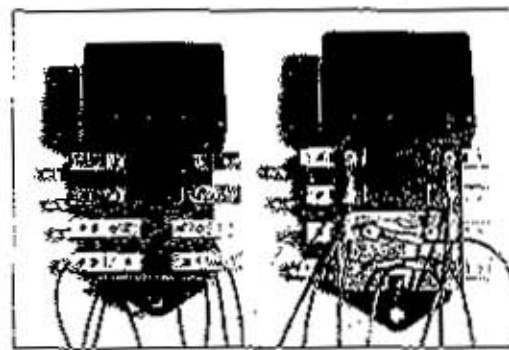
8-1/2 ID wire terminals. Get some extras in case you screw up.

7. I prewired the terminals as shown in Figure 1. I also removed the terminal insulation, as it was difficult to get a clean shot with the rivet; as the insulator wanted to cock the terminal.

8. Replace the insulators (I used contact adhesive to hold them in place), and don't forget to replace the six round washers that go in the larger holes in the baseplate.

9. Locate where the relays will be placed and drill two holes for their mounting studs.

10. Before actually attaching the relays, assemble the wires and contact pieces to the insulated baseplate. I did a trial assembly to see if everything fit before I actually riveted everything in place. I recommend you do the same as you may not have identical relays. See Figure 2, which is the bottom side with the rivets in place and Figure 3 which is the top side sans relays.



Left: Figure 2: Bottom of baseplate, after assembly of contacts and leads. Right: Figure 3: Top of baseplate, after assembly of contacts and leads.

11. Locate and attach the relays to the baseplate.

12. Check all leads with an ohmmeter to see if you have continuity between the free end of the wire and the contact piece. Resistance should be less than 0.4 ohms. Also check each lead to the baseplate to make sure you do not have a short to ground.

13. Wire the relays per the schematic, Figure 4. See Figure 5 which shows the relays wired.

14. With a volt-ohmmeter we can now check to see if you wired it correctly:

(a) You should have continuity from contact 5 to contacts 3 and 7 (brake light circuit).

(b) With clipleads connect the baseplate to ground and contact 4 to a 12 volt power source. The relay should energize

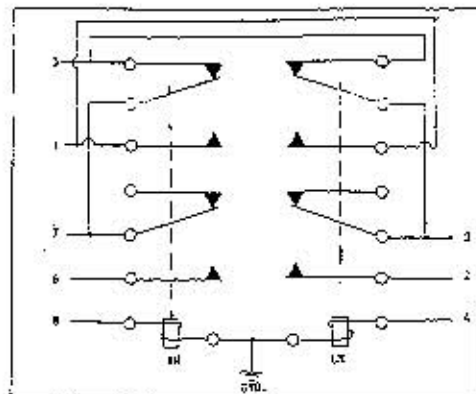


Figure 4: Schematic of how the relays are wired.

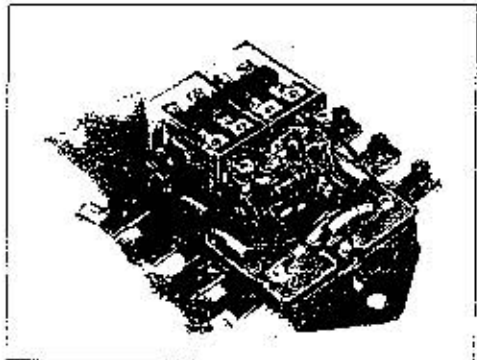


Figure 5: Top view assembly wired. Take your time, it's a tight pack.

and you should have continuity from contact 1 to contacts 2 and 3.

(c) With the same setup as (b) connect the 12 volt source to contact 8. You should

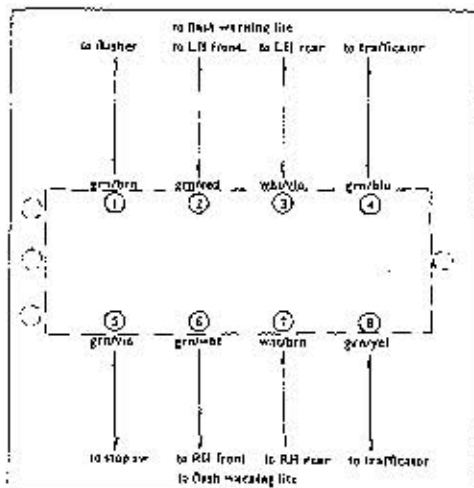


Figure 6: Block diagram of wire colors and where they go.

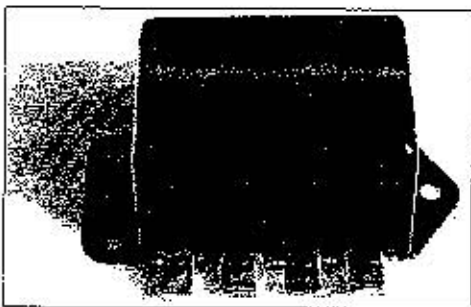


Figure 7: Assembly complete. The concours judge will never now.

now have continuity from contact 1 to contacts 6 and 7.

15. Coat all exposed electrical connec-

tions with a silicon material to prevent oxidation, rust, etc. Do not coat the upper side of the contact pieces where the loom attaches.

16. Replace the cover (Figure 7) and install it in your Healey, ensuring that the baseplate is grounded.

17. With all the wires attached, let's check out the system; if it does not function:

(a) Switching the trafficator you should be able to hear the relays energizing. If not, you are not getting power through the trafficator to contacts 4 or 8. (4=left, 8=right).

(b) If the relays are operating but the lights do not flash, check to see if you have 12 volts at contact 1. If not, check to see if you have 12 volts at the flasher (terminal B). If you do, short out the flasher terminals B & L and operate the trafficator. The lights should illuminate (not flashing) and this means another trip to the autoparts store for a new flasher.

18. If you have problems with one of the lights not flashing, check out the individual lamps by taking a cliplead from the fuseblock (hot side) to each of the contacts on the relay box:

Contact 2 = left front)

3 = left rear

6 = right front

7 = right rear

If all else fails there're hand signals—straight out is left, up is right, and dangling over the door is a tired arm.

Have fun, and Happy Healeying.

100 Radiator Funnel

by Len Cannizzaro

Northeast Region

For those of you who own a 100 BN1 or BN2, you are well aware of how the front-hinged bonnet impedes direct pour-in access to the radiator tank. Well, when it's time to flush your cooling system and add fresh antifreeze, here's a little helper that you can easily make. It is the best funnel I've ever found for the job.

Go to your local market and buy a 2-liter plastic bottle of your favorite soft drink. Note that immediately under the cap is a neck flange designed to aid in carrying the bottle. You may also note that some brands have larger flanges than others. Most are about 1 1/2" in diameter.

When you empty the bottle (save the screw-on cap!), wash it out, dry it, and turn it upside down on a table and measure up 8 1/4" on one side and mark it with a felt Magic Marker. Measure up 5 1/2" on the opposite side and mark. Connect the two spots

with the marker and cut, rounding the high side and the low side. That's it! Insert the funnel in the tank throat with the high side against the bonnet, and you will see that the screw cap end fits snugly into the lower opening and the flange fits perfectly into the upper part and rests flat on the seal ledge. Note that the funnel is very stable and doesn't need to be held while pouring. Also, should your initial pour be a little hasty, the high back side will capture the flow.

Another benefit is that the funnel tail does not reach down into the fluid, so that when you remove it there is no worry about drips. Replace the screw-on cap, store with the open end down, and you have no concern about dirt getting inside the funnel bowl before the next use. While this funnel works particularly well in the 100 models, it will, of course, be helpful on any Healey.

If your state has a bottle deposit fee this tool will probably cost you about a nickel—if not, it's FREE!

