

Installing a New Wiring Harness

By Carlos Cruz

The vast majority of British car owners have experienced electrical problems with their cars. My 1960 Austin Healey 3000 BN7 was no exception. Most owners associate the unexplainable problems to "Gremlins". Being curious about the origin of the word I researched it on www.dictionary.com to see if there is a connection between British automobiles and Gremlins. What I found was truly amazing. A gremlin is defined as:

An imaginary gnome-like creature to whom mechanical problems are attributed.
A maker of mischief.

Word History:

[Perhaps blend of Irish *gruaimín*, bad-tempered little fellow (from Middle Irish *gruaim*, gloom, surliness) and *goblin*.]

Elves, goblins, and trolls seem to be the timeless creations of the distant past, but gremlins were born in the 20th century. In fact, gremlin is first recorded only in the 1920's, as a Royal Air Force term for a low-ranking officer or enlisted man saddled with oppressive assignments. It is said to have been invented by members of the Royal Naval Air Service in World War I, gremlin is used in works written in the 1940's for "an imaginary gnomelike creature who causes difficulties in aircraft." The word seems likely to have been influenced by goblin, but accounts of its origin are various and none are certain. One source calls in Fremlin beer bottles to explain the word; another, the Irish Gaelic word *gruaimín*, "ill-humored little fellow." Whatever the word's origin, it is certain that gremlins have taken on a life of their own.

I have experienced just about every imaginable electrical problem since acquiring my Healey in 1998. My Healey's central nervous system had been cut, spliced, frayed, circumvented and piecemealed during the last 40 years. Troubleshooting problems became an all-weekend ordeal. Replacing the decomposing wiring harness with a new one was definitely in order.

Being somewhat timid with electrical matters I gave serious considerations to hiring someone to install a new one. The estimates I received ranged from 30-to-40 hours with rates from \$60-to-\$110 per hour. That is 10-to-11 times the cost of the new harness. That one was hard to justify to myself let alone my lovely wife (brownie points here guys). My Healey's fate was set. I was going to tackle the job myself. Where to begin?

Being a project manager by profession, some research and planning was in order. Planning and preparation were key throughout the project. There is a lot of truth to the adage "People don't plan to fail, they fail to plan". Discussing the project with other Healey owners on the internet aided in the preparation and planning considerations.

Preparation

With the new harness in hand, it is a good idea to spend some quality time getting to know your new harness before you begin the installation. Study the schematic in the shop manual. It is a good idea to visit a local photocopy shop and enlarge the schematic – it's worth the trip. The other option is to buy a magnifying glass and bottle of aspirin.

Layout the new harness on the floor next to the car. Identify and label each connection point on each section. I used color coded file folder labels folded in half to group each connection point. Using the same color marker, I made an indication on the schematic as a reference point to be used during installation. Take your time and identify each connection point, using the car next to you as a reference. I'm confident the 1.5 - 2 hours of planning here saved at least 10 during the actual install.

With your new harness labeled, plan for two-four days worth of effort. It took me 3-ten hour days in, under and over the car to complete the project, not including the labeling. The project can be worked over several weekends, just make note of the good stopping points mentioned below.

Parts

Sourcing the harness was the easiest place to start. Leveraging the experience and recommendations of other British car owners I contacted British Wiring (708)481-9050. Their quality product is truly complimented by the wealth of information the proprietors have on British wiring. The harness for an early Big Healey comes in eight sections.

The sections include:

- the rear tail light harness
- the main harness which runs under the car
- the engine harness (includes under the dash)
- two pig tail harnesses for the head lamps
- two pig tail harnesses for the horns
- and the stator tube harness

There are other parts that should be ordered when ordering your new harness. Note: You may need to order from more than one supplier. The following is a list of other parts that may be needed for the job.

Bullet connectors. Order both single and double connectors. These are used to connect one harness to another. The old connectors can be re-used if clean and undamaged.

Bullets. The new harness comes with most of the bullets installed, however additional bullet connectors may be required. These come in two styles, solder or solderless. The solder connectors should last longer and require a soldering gun.

Retaining clips. Consider ordering new retaining clips to replace any broken old clips. There are several different sizes used throughout the car. Order accordingly or a handful of each. It's always good to have extras on hand.

Grommets and rubber parts. This is a good time to consider replacing old, dried out grommets. Ones to consider include the license plate lamp, front and rear light assemblies, boot (trunk) wall grommets, large main firewall grommet and the headlamp assembly.

Extra fuses. It is possible the first time you electrify your newly installed harness a short may trip a fuse. Extras should be on hand allowing you to troubleshoot and re-test.

Day One: The Rear, main and the Engine Bay's Right Side

Get the car up on ramps and stands or a lift. Removing the front and rear wheels makes accessing the internal parts and underside easier. **DISCONNECT THE BATTERY** before you touch any existing electrical components.

The easiest place to start is at the rear, with the tail/brake light harness. Starting here helps build confidence. Work from the right side of the car to the left. Don't worry about making the connections to the light assemblies yet. Cut and remove the old harness one section at a time and just route the new harness using the original as a guide. Take each retaining clip, ground and connection one at a time. Replace or reuse the clips and grommets along the way.

Connect the rear harness to the main harness that runs under the car. Cap or tape off the two long single wires if you don't have a battery cut-off switch. Route and fasten the new harness to the left rail while removing the old harness as you work your way up to the firewall. Drop a line from the bonnet opening to the floor to help fish the harness up the firewall to the topside of the engine bay. There is one clamp between the transmission tunnel and the firewall, which I was unable to access, remove and reapply. (Shhhh! don't tell the concours judges). Pretty straight forward to this point.

The engine harness is big, mean-looking and intimidating. The preparation work done before starting this project will spare your loved-one's ears from any profane language.

Lay out the new harness on top of the engine orientating sides and the transition through the firewall. At this point I took the large collection of wires that route through the firewall and under the dash and wrapped them in aluminum foil to prevent the loom from collecting and grease, oil, dirt, etc... Make sure this clump lines up with the large hole in the firewall.

Take the section that routes along the right-hand side of the firewall and along the right-hand side of the engine bay. Start at the front of the car making the connections and working your way back toward the firewall. Note, you may find the pigtail connection from the coil to the distributor a little short as it was on my new harness. You may have to move things around a bit or replace it with a longer pigtail. Again, cut and remove the old harness one section at a time and just route the new harness using the original as a guide.

When you reach the large aluminum ball, this is a good end to day one! Get yourself a beer and pat yourself on the back.

Day 2: Firewall, the Engine Bay's Left Side and the Front of the Car

OK, get some help on this next piece. Cut the old harness going through the firewall and pull the old harness down and out of the way under the dash. With one person in the car and one under the bonnet, remove the foil and route the large collection of gage wires through the firewall. Take your time, it's a bit awkward but can be accomplished in a few minutes. Once through just let them hang under the dash for now. Thank your help and buy them breakfast.

Back in the engine bay, route the harness along the left-hand side of the firewall and along the left-hand side of the bay. This side of the harness is longer because it also routes along the front of the car connecting the headlamps and driving lights. The routing is also more difficult on this side compared to the other. Take your time, doing one connection at a time. Connect the bay harness to the main harness that you fished up from underneath the car. Once the left-hand side is done route the front of the car, connecting the two horn and two headlamp pigtails. Route the harness to the driving/turn signal lamp assemblies and connect later.

Great time for a couple of beers and call it a good day.

Day 3: Under the Dash and Gages

Re-install the wheels and lower the car off the ramps and stands (or lift). There are at least two different ways to tackle the car's gages. One is to remove each gage pulling the wires through the proper dash openings and connecting them in place of the old wires. The other approach makes for a funny site for bystanders. I took this approach.

Remove the driver's seat, seat frames and steering wheel. Get a nice thick blanket to lay on the floor of the cockpit. Take a nice comfy pillow and stick it up in the driver's side foot well. This is a good time to replace the gage light bulbs with new ones. A good half-day is spent under here - use the facilities accordingly. Now make sure no one is looking, as to not embarrass yourself or your neighbors. Contort your body so that your lying on your back on the floor of your cockpit with your head in the foot well looking up to the underside of the dash and your feet resting on the rear shroud.

Snip off the old harness leaving a couple of inches of the old harness wires at their connection points. Start from your oil/temp gage and work your way toward your left (the car's right). Do not forget the wiper motor. Do one gage at a time and don't forget the grounds. Connect the headlamp dip switch when you are finished with the gages.

Almost there. With that done (don't install your interior yet). Solder the new bullet connectors to the hanging wires near the lamp assemblies and connect.

Where the Rubber Meets the Road

Cross yourself like a good Catholic (if you're not one, it can't hurt). Genuflect in front of the car's grill and say, "I'm not worthy" three times kissing the grill after each chant.

Reconnect the battery. Turn the key and fire "her" up. Check to make sure everything works (excluding OD - remember nothing to sit on). Troubleshoot anything not working. Re-install your interior and take it for a drive. Bring the cell phone just in case. Now test the OD.

All in all, it took about 22 hours to complete the project and a couple of hours to prepare. Good Luck! Contact me via email at hkcruz@earthlink.net with any questions.