Converting to Negative Ground

by John Rollins

Recently I installed a modern radio-cassette player in my BJ8. This presented a problem. Try and find a positive ground radio. I'couldn't. Initially I overcame the problem with a voltage inverter. This worked fine, but I was left with other unacceptable problems. With the radio on, the voltage inverter produced a high pitch whine that was quite annoying. With the radio off, the inverter will drain your battery. With the battery off, your nice new radio will lose its memory and the clock will stop.

The solution, I surmised, must lie in converting to negative ground. Quite simple once all the facts are known. However, I could not find all the facts from any one person. Once I put all the pieces together and made the conversion, I thought perhaps other newcomers to the world of Austin-Healeys might appreciate some help.

The worldwide standard (except Britain, prior to 1968) is a negative grounded electrical system. Some Freightliner heavy-duty trucks (even today) use a positive ground. Freightliner says positive ground saves on instrumentation. Others debate on the flow of electrons. For the unknowing, jump-starting a positive-grounded vehicle could be costly and dangerous. For the purist—well, only you and a few wires need know.

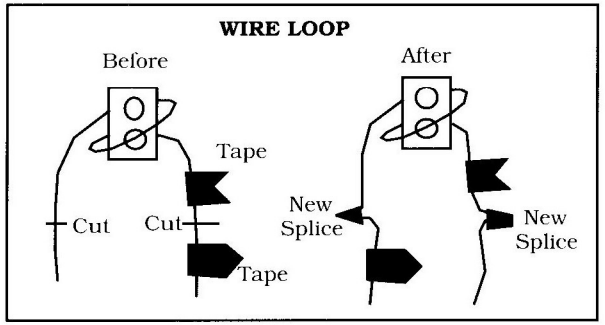
Step 1. You should install a negative ground fuel pump. The newer pumps can be ordered with a negative ground. They hook up exactly the same as the original pumps and the newer ones are much more reliable. Incidentally, for no apparent reason, I had a devil of a time re-installing the new fuel pump. I had little or no room between the ground terminal on the pump and the fuel outlet connection. I thought I would be clever and rotate the pump coil housing. Wrong. There is a cast lug on this housing and this lug must be in the bottom position in order for the fuel pump to work. Why? I do not know. This little bit of trivia cost me two repair manuals and about three hours of harsh words directed across the Atlantic. As with all things mechanical, be patient and persistent. The mind can overcome the wrench.

Step 2. Reverse your battery. Just turn it 180 degrees or reverse the cables. Turning your battery is the best procedure. Put another way, you want the cable running to the starter solenoid connected to the positive post on the battery.

Step 3. You *must* reverse the wires on your ignition coil. The original coils were marked CB (contact breaker) and SW (switch). The newer coils will be marked with a plus sign(+) and a minus sign (-). The SW is negative (minus sign) and the CB is positive (plus sign). There are three wires connected to the coil. You want the single wire (should be white with a black tracer) going from the SW or - terminal on the coil to the distributor. The remaining two wires should be coming out of your main wiring harness. There should be another white wire with a black tracer and a solid white wire. Connect the white wire with black tracer to the SW (-) side of the coil and the solid white wire connected to the CB (+) side of the coil. To say again, connect both white with black tracer wires to the SW (-) side of the coil and the single solid white wire to the CB (+) side of the coil. If these connections are not done properly, you will fry the distributor tension lead wire (the little plastic goodie that mounts on the side of the distributor).

Step 4. If you have a mechanical tachometer, you may skip step 4. If you have an electrical tach, you must read on. The electrical tach must also be converted. First, remove the tach. Carefully pry off the chrome ring and the glass cover. Remove the two screws (on the back) and gently remove the internals. The spade terminal (white or green wire) carries the power. Next to this is the ground connection. Unsolder the wires and possibly the resistor and reverse them and resolder. Reassembly is the reverse of the above procedure. (Sorry, I had to say that just once.)

Step 5. Now for the famous wire loop. When you removed the tach you should have noticed the wire loop, a green wire and two light sockets. The lights and the green wire stay the same. The wires on the wire loop must be cut and reversed. Simply follow the drawing.



Step 6. Turn the key to the on position. The red ignition light should come on. If by chance you did not connect the coil wires corectly, smoke will be wafting from the distributor cap. If this happens, recheck your connections. Assuming there is no smoke, start the car. The red ignition light should go out at about 1000 rpm.

If you do not get a red ignition light, most likely the polarity of the generator did not reverse itself. In most cases, the generator will reverse polarity. If it does not, here is how to help it along. There are two wires connected to the generator, a heavy gauge wire

(should be brown with a yellow tracer) and a light gauge wire (should be brown with a green tracer). Remove the light gauge, or "F" terminal, wire. Now take a length of wire with bare copper showing at both ends. Attach one end to a hot lead (i.e. positive post of the battery or, closer yet, the "A" terminal on the control box which is located on the right hand side of the firewall. Take the other end of the wire and quickly touch the "F" terminal on the generator. Just flick it a couple of times. Look for sparks. That alone should reverse the polarity of your generator.

One final word of caution and encouragement. On occasion, this procedure will push your voltage regulator over the edge and cause it to fail. This did not happen to me, but it could happen. If this occurs, assume that your regulator was weak to begin with and it would have had to be replaced soon in any case. Also, as with all things electrical, be certain that all connections are properly made and tight. A bad connection anywhere will make it appear that all your efforts have been for naught. The above procedure may sound lengthy and difficult. It is not, and can be done in a matter of three or four hours. I believe the effort is well worth the benefits.

Acknowledgement: John Twist, *Sport and GT Market*, December 1983