

A Project for an Afternoon

by Neil Maken

REPAIRING REAR STOP LIGHTS

It's one of those things that you cannot see, so you really don't know if your brake lights are working. Let's start by having you get a helper to stand behind the car while you step on the brakes. If both brake lights (on newer cars or on cars with a second light assembly added aftermarket) work, you are finished. Take a break.

But, if neither, or just one of the brake lights work, there is a project ahead of you. It's not a big job or a bad job. It just means playing detective and running around with your multimeter.

Very simply the brake light(s) consist of a 'hot' wire running from the wiring terminal or fuse box to the stop light at the back of the car. The wire is interrupted somewhere in the system with a switch activated by stepping on the brake pedal. Cars with mechanical brakes generally have a switch at or near the brake pedal; cars with hydraulic brakes have a pressure activated switch in the hydraulic brake fluid line. When the brake pedal is depressed the pressure in the line closes the switch completing the circuit. With mechanical brakes, the movement of the pedal generally moves a lever closing the switch and completing the circuit.

Let's start with the simplest things first. Remove the lens(es) at the rear of the car and check the bulbs. Clean the base of all corrosion using a wire 'toothbrush.' Clean the center terminals at the



With a multimeter, test the bulb for continuity.

base of the bulbs as well. Once clean, use the ohmmeter or continuity setting on the multimeter to test the bulb. There should be '0' resistance between the base terminals and the base. If you get resistance of '1', it is an indication that the filament is broken or that something else in the bulb is bad. Replace it. That might solve your problems. If the bulbs test okay, clean the sockets with a small piece of sandpaper or 1/2" round wire brush. Get a helper to step on the brake pedal while you check the socket with the multimeter (set the meter for the correct voltage - 6-volt or 12-volt). One terminal should be connected to the socket housing while the other probe is touched to the center terminal. You should get full battery voltage. If so, replace the bulb, try the brakes again and then button everything up.

If you do not get battery voltage, you have to begin to check the entire brake wire system. Start with the fuse (the owner's manual will advise if the brake line is fused and where the fuse is). Use the meter to check that both sides of the fuse have battery voltage. If one end has voltage and the other end doesn't, chances are that the fuse is burned out. Replace it.



The brake switch may be under the toeboard.

Locate the brake switch (it may be under the toeboard on an early car, or possibly at the base of the brake pedal) and on a newer car with hydraulic brakes try toward the rear of the car, near the rear axle in the brake line. Or it may be mounted on or near

the master cylinder. Either type of switch will have two wires connected to it. The wires may be connected with a screw or may be a pressure-fit over the switch terminals.



The switch in an hydraulic brake system will be somewhere in the hydraulic line.

Ground one end of the multimeter against a clean, good ground on the frame of the car, use the second probe to check both wires (with your foot off the brake pedal). One wire should be 'hot' - battery voltage. The other terminal should give a '0' voltage reading.

Next use the wire toothbrush and clean the terminals on the switch and the wires where they connect to the switch. Clean to a bright shine. Use the multimeter on 'ohms' or 'continuity'. Test the switch by touching each terminal of the switch with a probe while a friend steps on the pedal. If the switch is operating, you will get a '0' reading. When the pedal is released the reading should revert to '1'.

At this point you have tested that the voltage is getting through the fuse, to the switch and through the switch to the wire leading to the stop light at the rear of the car. If the brake lights still do not work, and you know that the bulb is good, connections at the bulb are clean, and that voltage is getting to the second side of the switch, it has to be the wiring.

Test the socket to be sure that you have a good, uninterrupted ground. Use a long piece of wire (test the wire to be sure that there are no breaks internally). Connect one end to the wire (at the brake switch) that goes to the rear of the car. Using the 'ohm' or continuity meter, test the continuity between the end of the jumper wire and the center terminal of the socket. You should get a '0' reading. If not, start disassembling the taillight assembly in order to check the connections.

Often car manufacturers used a spring-loaded pin that fits into a female receptacle. Sometimes the corrosion on the pin does not allow the pin to extend by itself; it sticks in the 'in' position. Clean the corrosion, spray WD-40 or a silicone spray into the pin in order to free it up. Reconnect the pin/receptacle, and test the continuity of the wire again.

If you still do not get continuity, you will have to go through the wiring. Chances are there is an internally broken wire, the wire may be rubbing against the frame or body, or it may be shorting out from abraded insulation (often, if the fuse was blown, this is the reason).

It is a simple circuit. Often the reason that it doesn't work is nothing more than corrosion, but at worst, it could be a broken wire, a defective brake switch or a disconnected wire.

S.K.

INCREASING YOUR VISIBILITY AT NIGHT

Perhaps I've mentioned this before: one night I was driving a 1926 car, completely original, including the dim taillight. I was stopped at a traffic light, looked in my rearview mirror and saw a pair of headlights barreling down on me. He was coming too fast, and I had no place to go (there was a car stopped ahead of me). At the last moment he saw my taillight, or perhaps the bulk of the car, but he stopped in time.

After that I replaced both the taillight bulb and the brake light bulb with a Halogen bulbs - a considerably brighter bulb - though still 6-volts. Contact Hirsch Automotive for a selection of Halogen bulbs which are direct replacements for your bulbs.

I also made an auxilliary light bar which I can hang from the rear bumper on night trips. It is merely a strip of aluminum with three or four small 6-volt trailer lights attached to it and wired in series. An alligator clip provides the ground, while another small alligator clip connects to a pigtail that I tapped off the taillight wire.



The increased number of bulbs makes the rear end of the car much more visible at night.

The same light bar can be used on any of my cars, as long as provision is made to supply a 'hot' line near the back of the car. The ground is easy.

Optionally, 12-volt bulbs can be inserted in the sockets, and a spare 12-volt battery stored in the trunk at the rear of the car. The 12-volt will provide much brighter lights without making any alterations to the car.

Editor