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BRAKE AND BACK-UP LIGHTS

CIRCUIT DESCRIPTIONS

The brake and back up light circuits are virtually identical for all models, from the TR 250 to the '76 TR6. The only changes are in the physical routing of the wiring. I have included the diagrams for all models, showing these minor changes, but I'll only describe the circuit and trouble shooting procedures for the TR250, as they are the same for the other models as well.

These circuits are about as simple as you can get, consisting of nothing more than a simple SPST switch and two light bulbs each. See **figure 1**, below, for the details of the circuits for a TR250.

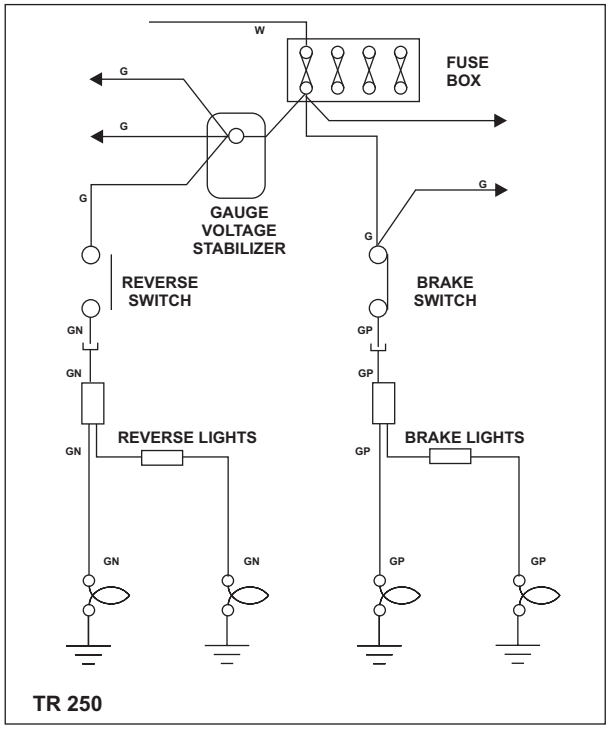

FIGURE 1

The reverse switch is located on the side of the transmission, with the wires coming through a hole in the transmission tunnel. When the transmission is in reverse, one of the shift levers inside the transmission presses on the reverse light switch, causing it to close. With the switch closed, and the ignition key in the on position, current flows from the "green" fuse, through the switch, and then to the backup lamps at the rear of the car.

The brake light circuit in a very similar manner, except the brake switch is mounted on the clutch and brake pedal support assembly, under the dash. There is a peculiarity, though, with the brake switch that might be a little puzzling at first.

The brake switch is a SPST, ***NC*** switch, meaning that the switch is closed when it is out of the car and on the workbench. In operation, when you remove your foot from the brake pedal and the pedal returns to its rest position, it presses against the brake switch and opens it. When you press on the pedal, even lightly, the pedal moves away from the switch and the switch closes. In other words, when you operate the brake, you "un-operate" the switch, causing it to operate the brake lights. Kinda confusing, huh?

Actually, though, there is a good reason for this. You want the brake lights to come on whenever you use your brakes, whether it be lightly, as when slowing down for a turn, or hard, as in a panic stop. If you had the brake pedal operating the switch when it was depressed, it would only operate at the end of its travel, which means it would only operate during a full panic stop. Without a lot of awfully complicated linkages, the switch would not be operated for a gentle stop. If you adjusted the switch to operate at the beginning of travel, the switch would prevent the pedal from traveling further.

TROUBLESHOOTING

As both the brake and the backup lights receive power from the "green" fuse, the first step is to determine if there is power at this fuse. The windshield wipers, windshield washer, turn signals, gauges, and heater fan all receive power from this fuse, so if ***ANY*** of these items work, then you have power at the fuse. If ***NONE*** of these items work, then you need to go to the power distribution chapter and resolve the power issue before proceeding. If you have power, then you can proceed with the troubleshooting steps.

BRAKE LIGHTS

A. Neither of the brake lights work.

Step 1). With a voltmeter or a test lamp, and with the ignition key on, check for voltage on the green wire (or wires) at the brake switch. If you have voltage here, go to step 2. If not, there is a break in the wiring somewhere

between the switch and the fuse. There are no connectors between the brake light switch and the fuse, but there are one or two multi-conductor splices in the green wires on the '74 through '76 TR6 models, as shown in **figures 2** through **5** below.

Step 2). Depress the brake pedal and check for voltage again on the green wire You should have the same voltage as you had in step 1 if you are using a voltmeter, or the test lamp should be equally as bright as in step 1 if you are using a test lamp. If the results of this test are satisfactory, proceed to step 3. If not, you have a break in the wire or a bad connection somewhere between here and the fuse, causing the voltage drop which will have to be corrected.

Step 3). With the pedal still depressed, check for voltage on the green/purple wire at the brake switch. If the voltage or the test lamp illumination is the same as in test 1, proceed to test 4. If not, the, switch is bad and needs to be repaired or replaced.

Step 4). Locate the multiple pin connector which connects the wiring in the rear of the car with the under dash wiring. It is found on the side wall next to the clutch pedal. You may have to use a fine needle to pierce the insulation for this test. With the pedal depressed, check for voltage on the green/purple wire on the side of the connector nearest the rear of the car. The voltage, or lamp brightness, should be the same as for test 1. If so, proceed to step 5. If not, there is a break in the green/purple wire from the switch, or the connector is bad, and repairs will be needed.

Step 5). Proceed to the trunk and, for the TR6 only, remove the plastic panel at the left rear of the trunk. Check for voltage at the green/purple wire at the brake light, again with the pedal depressed. If you have no or low voltage here, there is a break in the wiring between the multi pin connector and this point. Except for the TR250, there are no connectors between these two points, so the only thing to go bad is the wire itself. For the TR250, there is one double bullet connector, located near the lamp assembly, where the wires split for the two sides of the car. This connector will have to be checked as well as the wire for this model. If you have full voltage here, your problem is either in the ground connection or in the light sockets. Repair or replace as needed.

Move over to the right side of the trunk and repeat the test there. For the TR250 only, there is another connector between the two sides which will need to be checked.

B. Only one of the lights work.

If one light works, you know you have power to the left hand light assembly (or connector for the TR250), so there is no need to run tests all the way from the front of the car. The first thing to check is the bulb on the bad side. If the bulb is good, then proceed with step 5 above to resolve this situation.

C. Lights work but are dim.

This is just a lessor case of A, so the same procedure could be followed. However, it might be easier to just trace the wires by hand, looking for bad connections or breaks. If you don't find any by visual examination, then you will have to follow the above procedure.

BACKUP LIGHTS

With only minor differences, the procedure for troubleshooting the back up lights is the same as for the brake lights. To eliminate as much confusion as I can, however, I will repeat them here changing them as needed to reflect the minor differences.

A. Neither of the backup lights work.

Step 1). Locate the green and the green/brown wire where they pass through the transmission tunnel to the backup light switch on the transmission. With a voltmeter or a test lamp, and with the ignition key on, check for voltage on the green wire (or wires) at the connector just before the wires enter the tunnel. If you have voltage here, go to step 2. If not, there is a break in the wiring somewhere between the connector and the fuse, or there is one or more bad connections. The wiring for the backup lights follows a slightly more complicated path than the wiring for the brake lights. Refer to the appropriate diagram below for details. If the brake lights work, you know you have power to the brake light switch, or if the gauges work, you know you have power to the gauge voltage stabilizer, so this will limit you search, as the backup lights get their power from a common terminal on one or the other of these items, depending on the model.

Step 2). Place the transmission in reverse and check for voltage again on the green wire You should have the same voltage as you had in step 1 if you are using a voltmeter, or the test lamp should be equally as bright as in step 1 if you are using a test lamp. If the results of this test are satisfactory, proceed to step 3. If not, you have a bad connection somewhere between here and the fuse, causing the voltage drop which will have to be corrected.

Step 3). With the transmission still in reverse, check for voltage on the green/brown wire at the tunnel connector. If the voltage or the test lamp illumination is the same as in test 1, proceed to test 4. If not, the backup switch is bad or there is a break in the wiring between the tunnel connector and the switch. In this case, you are now going to have to get dirty by crawling under the car and repeating steps 2 and 3, only this time you will be checking at the switch itself, on the side of the transmission top cover.

Step 4). Locate the multiple pin connector which connects the wiring in the rear of the car with the under dash wiring. It is found on the side wall next to the clutch pedal. You

may have to use a fine needle to pierce the insulation for this test. With the transmission in reverse, check for voltage on the green/purple wire on the side of the connector nearest the rear of the car. The voltage, or lamp brightness, should be the same as for test 1. If so, proceed to step 5. If not, there is a break in the green/brown wire from the switch, or the connector is bad, and repairs will be needed.

Step 5). Proceed to the trunk and, for the TR6 only, remove the plastic panel at the left rear of the trunk. Check for voltage at the green/brown wire at the backup light, with the transmission still in reverse. If you have no or low voltage here, there is a break in the wiring between the multi pin connector and this point. Except for the TR250, there are no connectors between these two points, so the only thing to go bad is the wire itself. For the TR250, there is one double bullet connector, located near the lamp assembly, where the wires split for the two sides of the car. This connector will have to be checked as well as the wire for this model. If you have full voltage here, your problem is either in the ground connection or in the light sockets. Repair or replace as needed.

Move over to the right side of the trunk and repeat the test there. For the TR250 only, there is another connector between the two sides which will need to be checked.

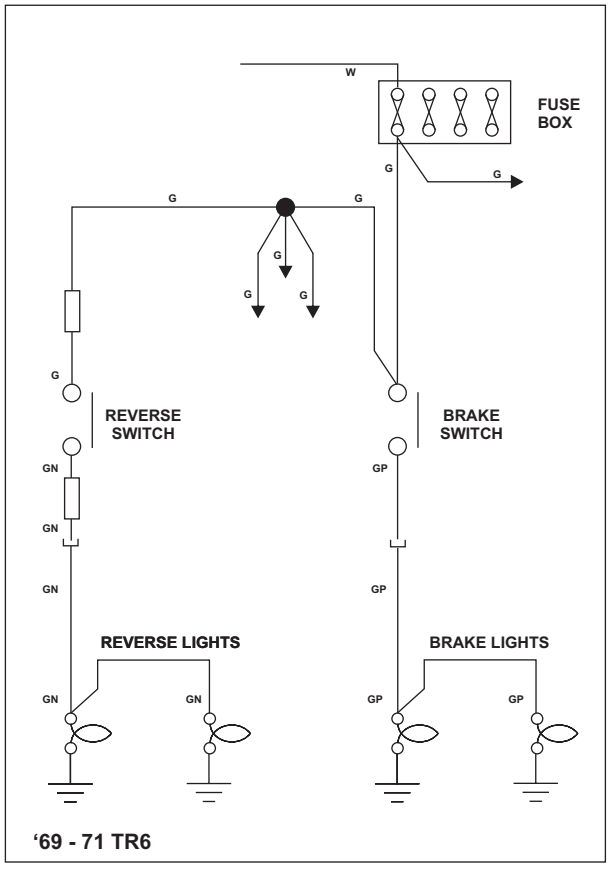

FIGURE 2

B. Only one of the lights work.

If one light works, you know you have power to the left hand light assembly (or connector for the TR250), so there is no need to run tests all the way from the front of the car. The first thing to check is the bulb on the bad side. If the bulb is good, then proceed with step 5 above to resolve this situation.

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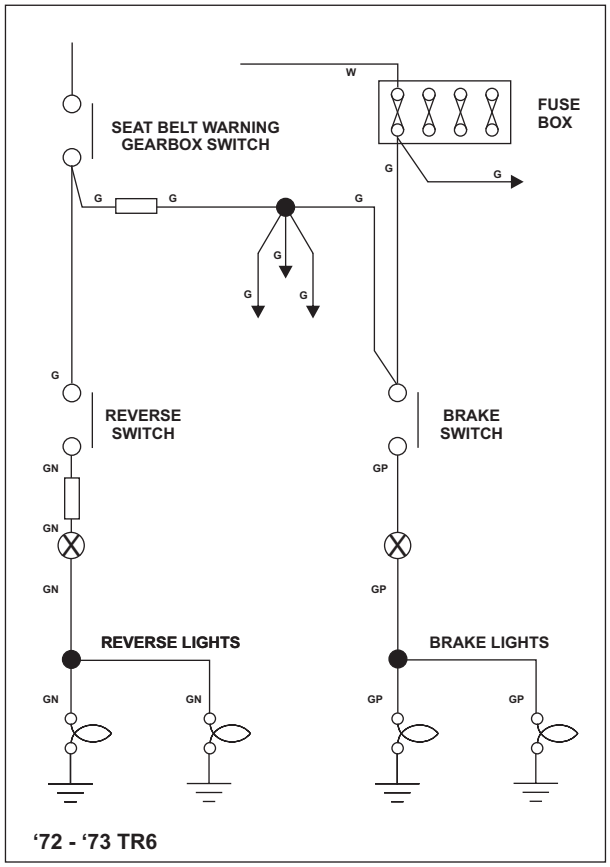


FIGURE 3

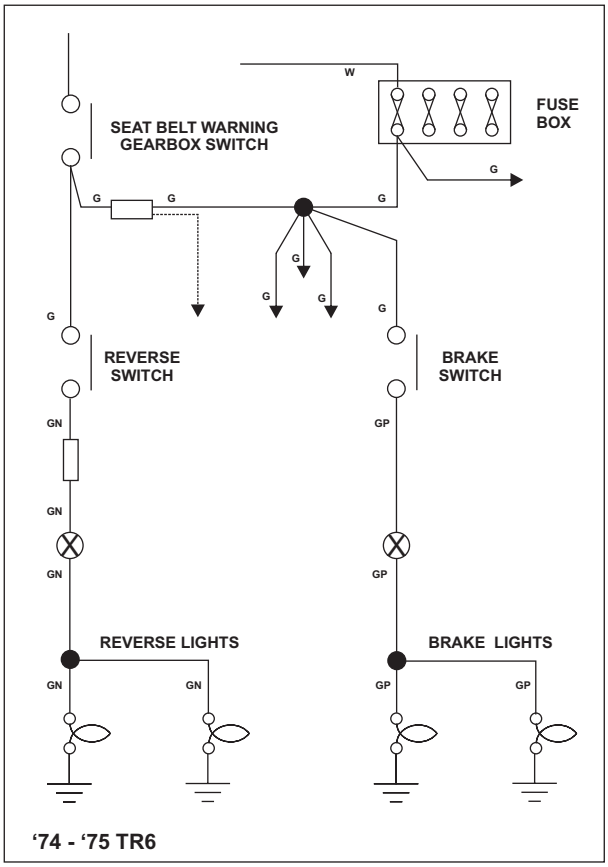


FIGURE 4

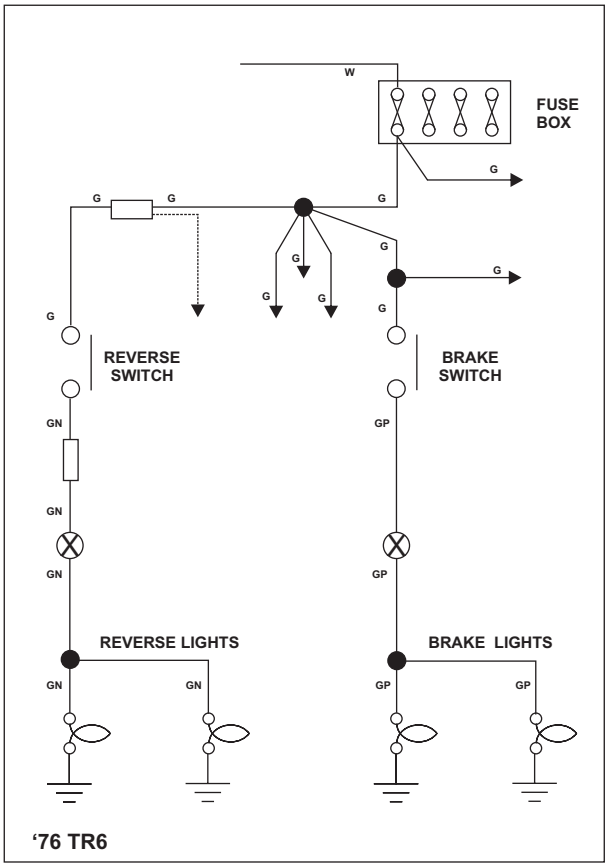
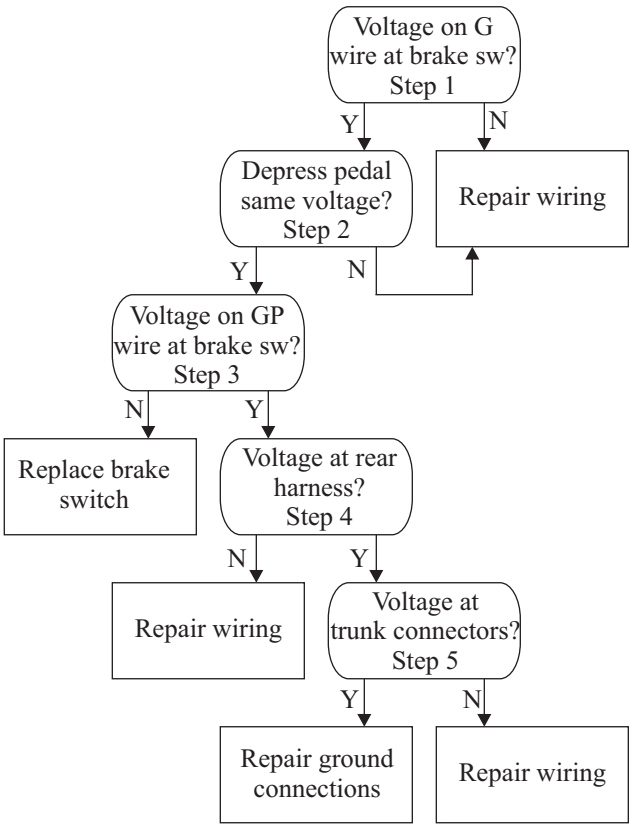


FIGURE 5

TROUBLESHOOTING FLOW DIAGRAMS

BRAKE LIGHTS



REVERSE LIGHTS