



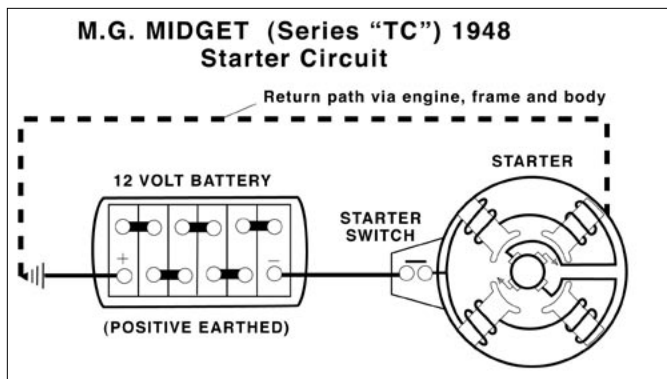
TClinic

TC STARTER ELECTRICAL CIRCUIT by David Edgar, TCMG

Let's begin with the all important electrical path. Note the description here is based on an original TC with Positive Battery Ground. If you have switched to Negative Ground, just reverse the terminology. If you are not sure what you have, look at your battery. One battery cable comes off the battery terminal and bolts to the inside of the battery box. This is your ground cable and which terminal it connects to determines your ground.

THE ELECTRICAL PATH

Now the original TC had the negative battery terminal connected to a cable that went down through the bottom of the battery box, then out through the scuttle and attached to a bolt on the starter switch which is on the end of the starter. When you pull the starter cable, a large switch is activated and heavy contacts continue the electrical path to the actual starter windings. The return path for the electrons is through the metal starter housing, which is bolted to the engine, which is bolted to the transmission, which has (or should have) a heavy braided cable that connects to the TC's frame. From the frame the path is through the bolts which hold the body to the frame and then back to the battery via the ground cable that is bolted to the body. Lots of connections here and remember, this is the simplest electrical system on the TC. So what can go wrong here?



TROUBLESHOOTING

We want a nice path for the electrons to flow through. The electrons will gladly do work (turning the starter) to balance out the battery, but bad cable connections can cut the number of electrons getting to the starter. Ensure that the battery clamps themselves look clean and more importantly the surfaces between the cable and terminals are clean. You have to unclamp the terminals to inspect. Disconnect the GROUND cable first for safety and reconnect last. You usually don't get corrosion there

but look anyway. Check to see if that end is tight. Look for rusty or loose bolts holding the starter on the block. Check strap and connections from transmission to body. Also check for loose or rusty bolt on ground strap to body.

One TC owner asked why his choke cable would smoke when he tried starting his TC. A missing or bad connection at the transmission ground strap was the answer. Electrons couldn't get back through the strap so took the choke cable back as a short circuit. The choke cable wasn't designed to carry electrons. It can handle the load of the lights, horn and such but the starter really takes a lot of electrons to crank over the engine. All those electrons have to get back to the battery and to get back via the choke cable they really have to work at it (heating the choke cable up enough to burn off the lubrication in there).

There is a rubber grommet where the battery cable goes through the battery box and another where it goes through the scuttle. In addition the cable is coated with insulation. This keeps all those electrons contained so they can't leak out and short out to the body. Replacing worn out battery cables and grommets is cheap insurance.

Other sources of starter circuit problems are in the starter motor windings and brushes. Insulation can burn off the windings causing a short. Grinding your starter for long periods of time can cause the starter to overheat and cause insulation damage so watch how long you crank. Brushes can wear out but are fairly easy to replace. Contacts inside the starter switch can wear. A starter uses lots of electrons and it is hard for them to all stop instantly when you release the starter switch. Just as the contacts open up a few electrons try to keep going and jump the gap. A small spark occurs when this happens and eventually all those little sparks wear away at the contacts. You can replace the switch as a whole unit but you can also build up the contact plates. When I restored my switch 30 years ago I just filed the contacts so they were flat (but thinner). I then soldered copper sheet on the contacts to build them back up and they are still going strong.

Remember the first time you looked at the maze of wires, especially behind the facia panel or by the voltage regulator? Well it won't be quite as daunting if we can isolate the different parts of the system. On the back side of this sheet is the complete TC wiring diagram with everything except for the starter circuit greyed out so you can see how it is incorporated into the whole system.

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M.G. MIDGET (Series "TC") 1948 Starter Circuit

