



Repairing the Ignition Switch Internals on the Fiat Spider

Article

by

Ken Dickson <kdickson@mirafiori.com>

Revised 12-06 With Switch Diagram by Brad Artigue

Trouble Shooting the Ignition Switch on the Fiat Spider

Additional Pictures of the Ignition Switch:
Chris Courter's article on Ignition Switch Repair [HERE](#)
Photo of rear of switch with color information [HERE](#)

Introduction:

The ignition switch looks complicated, but there are really only five wires involved in the circuit. They are arranged in just two sets. Some model spiders have a warning light that will illuminate when the key is in the ignition. These wires are not part of the switch circuit and can be serviced separately.

Most problems with switches are the result of burnt contacts preventing the connections from being made internally. With simple hand tools and a small drill, you can disassemble the switch and clean the internal contacts and restore the switch to normal operation. Instruction for this procedure is found [HERE](#).

Left Side:

First is the Bl/Bk -Brn-Red

Operation Explanation

- Position 1 (Off) None of the wires are connected
- Position 2 (Run) Brown is connected to black
- Red is not connected
- Position 3 (Start) Brown and Red (starter solenoid) are connected to black

Right Side:

Blk-Pink set

Operation Explanation

- Position 1 (Off) None of the wires are connected
- Position 2 (Run) Pink and Black are connected
- Position 3 (Start) Pink and Black are connected

Summary:

Quite simply when the switch is off, no wires are connected. When the switch is in the Run position Blue/Black is connected to the Brown power lead, and the Pink wire is connected to the Black wire. When the switch is in the Start position the only change is that the Red starter solenoid lead is added to the brown wire connection.

Symptoms of a Bad Switch:

Loss of connectivity will cause intermittent issues like sudden engine dying or lights that won't stay on. Sometimes you can wiggle the wires gently at the back of the switch to get you home if this is the problem.

Spade Connectors:

Some model cars had spade connectors that cause problems. Early models had screw on connectors. Middle year cars had push on connectors. Most later year models had soldered pigtailed to connect the wires to the switch. I highly recommend that if your car has spade connectors(push on), then remove the switch from the column and carefully solder the wires to the back of the switch.

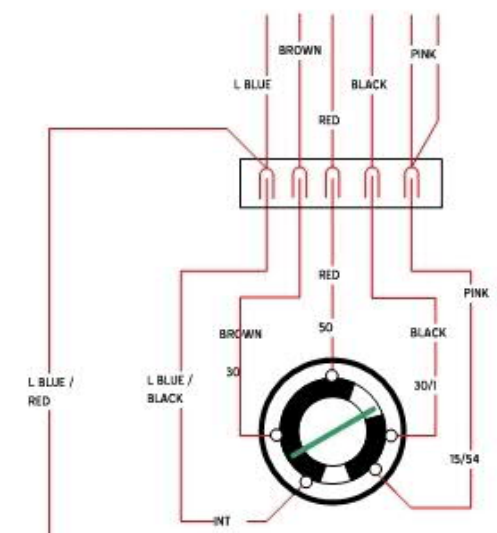
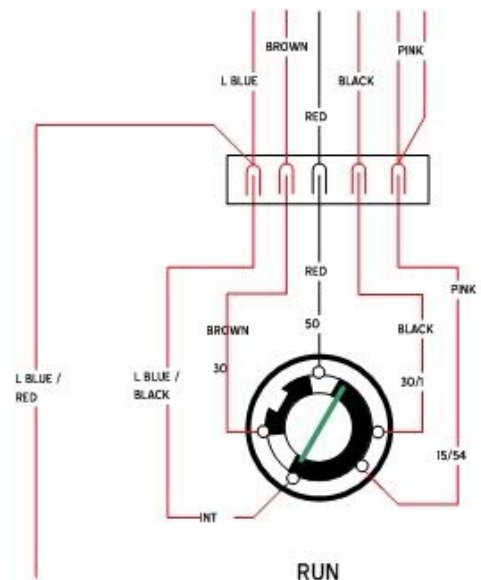
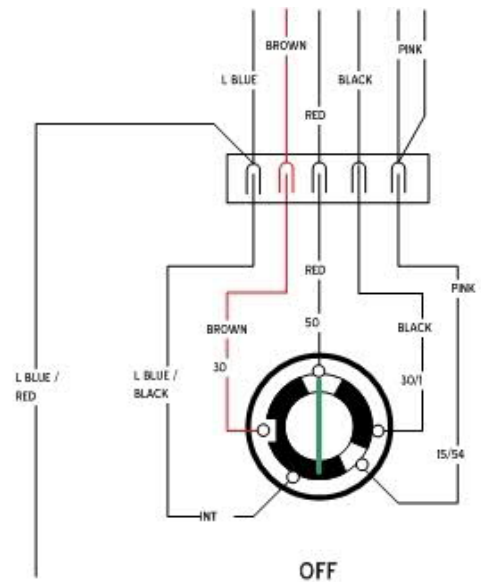
Replacement Switches

Polish replacement switches can be retrofitted, but the new replacement switches are not of the same quality as the OEM versions. OEM Switches are highly sought after by knowledgeable owners. With a little time and patience, it is possible to repair most OEM switches. Instructions for this procedure are [HERE](#).

Relay Modification:

Now that you understand the "secret" of the switch, you can help the switch to last longer by removing the high current that caused the switch to malfunction in the first place.

All electrical current for the vehicle (with the exception of the starter motor and the alternator charging current) must pass through the ignition switch. With a little thought, you can use two relays to handle the current switching making your precious starter switch last indefinitely. This will be a topic for a future FAQ (or why not write it yourself and submit it to MIRA for publication?).



Repairing the Ignition Switch Internals on the Fiat Spider

Article and Photos

by

Chris Courter cyber104@comcast.net

Revised 12-06

Repairing the internal switch on the Fiat Spider

You may click on the pictures for larger versions

Additional Pictures of the Ignition Switch: (Brad Artigue)

Expalnation of switch positions / wiring colors [Here](#)

Photo of rear of switch with color information [Here](#)

Pictures will open in new window

Tools and Parts List

A Fiat with a messed up
ignition switch.

Soldering gun

1/8" drill bit

5/64" drill bit

Loctite

Qty 4 2 x 20mm machine
screws with nuts. (Were
available at my local Sears
hardware). Other option is
5/64" x 3/4".

Small flat bladed
screwdriver Tweezers
Needle nose pliers
Optional: Dremel tool with
wire brush attachment.

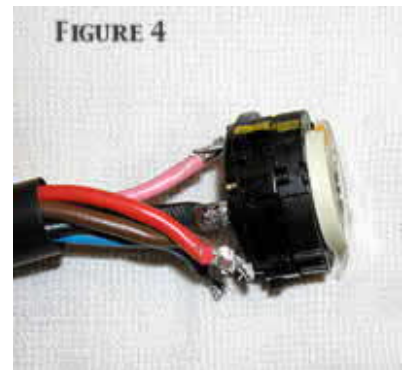
Procedure

I. Remove the ignition switch. Believe it or not this will take you less than 5 minutes. The procedure is described nicely in the factory manual but briefly ...

1. Unplug both connectors connecting the switch to the wiring harness
2. Remove the lower portion of the plastic steering column surround. If you don't do it now, you'll have to later since the column lock will catch on it as you try to remove the switch from the housing.
3. Insert key into the ignition
4. Turn key until it aligns with the arrow stamped into the face of the switch. This will allow the column lock to retract. It also sets things up internally within the switch so that you can push in the mechanism that holds the switch in the housing. See Figure 1.
5. Remove the boot at the back of the switch. Mine was already cut lengthwise and held in place with wire ties so I just removed it. If it is still intact you may be able to simply slide it back.
6. Remove the 2 set screws holding the switch to the housing.
7. At about the 03:00 position on the switch/housing assembly there is a slot. Take a small thin flat bladed screwdriver and push in through the slot. While pushing in with the screwdriver, push the switch from behind. It should slide out easily. If it does not, rotate the key ever so slightly in one direction or the other and try again. See Figure 1.
8. The switch may get 'stuck' after about an inch as you slide it out. Don't panic, it's probably the column lock catching on the metal of the steering column. You can remove the screwdriver from the slot now and use it to gently pry the column lock back the 1/8" that you need.

II. Remove the electricals from the back of the switch.

1. Lay the switch on your workbench and take a look at it from behind. There is a large internal circlip that is holding the electrical contact assembly to the back of the switch.
2. Remove the circlip nothing complicated about this.
3. Remove the contact assembly from the back of the switch by giving a gentle tug on the pigtail. Set the main part of the switch aside. You're done with that.
4. Picture FIGURE 3 shows the circlip laying beside the switch assembly after



the contact assembly has been removed.

5. Picture FIGURE 4 shows the contact assembly.
6. Now, before you go any further, take some sort of marker, paint, whatever and mark the 3 pieces that comprise the contact assembly relative to each other. That way when you put it back together all you have to do is align the marks. You'll see in picture FIGURE 4 that I used some yellow paint.

III. Un-solder the connections

1. First off, MAKE A DIAGRAM OF WHERE ALL OF THE WIRES ARE CONNECTED!
2. Now it's time to remove the 'pigtail' wiring from the spade terminals on the back of the contact assembly. This is a critical operation. A light-duty hobbyist's soldering 'iron' will not work very well. I suggest a Weller or similar medium-heavy duty soldering gun.
3. The most critical part of this operation is that you get as much of the solder off of the spade terminals as possible. Your success in this area will pay off later as you try to remove the spade terminals from the assembly.

IV. Disassemble contact assembly Now the FUN BEGINS!

1. Ever so carefully take a drill with a 1/8" bit and begin drilling out the crimped part of the rivet at the center of the white plastic rotating disk. Be very careful not to go too deep. You're only trying to cut the crimp off with the drill bit tip so that you can press the rivet out later.
 2. Once the rivet is cut, set the assembly so that it is resting on the spade terminals and take a small screwdriver and carefully pry the disk off of the main assembly. In FIGURE 5 you can see the disk and its washer removed.
 3. Behind the disk are 3 spring loaded pins. The ramps on the back side of the disc act on these pins to 'make' or 'break' the electrical contacts. Carefully lift these pins out with a pair of tweezers. Refer to FIGURE 11. Note: This picture was taken at the time of reassembly, that is why you see screws instead of rivets holding the assembly together.
 4. Now take your drill bit and cut out the rivets holding the 2 black disks together in the same way that you did in step 4.1
 5. Once the rivets are removed, working around the perimeter, carefully pry the 2 black disks apart a little at a time.
 6. Once the disks are separated you will see something similar to FIGURE 8. Note that the top set of contacts in this picture are already partially disassembled.
 7. Now, let's see how good you were at removing all of the solder from the spade terminals on the back of the assembly.
 8. From behind, using your tool of choice, push a spade terminal back thru the assembly. They are tight, but they WILL slide out. Be VERY careful to maintain the 90 degree bend of the contact assembly (opposite end from the spade terminal).
 9. Now remove the brass contact assembly and the 2 small springs underneath.
 10. Repeat this process for all spade terminals.
- When you're all done, you should have something that looks like FIGURE 7.
11. Now, break out the Dremel tool and clean up all of the contact points with a wire brush attachment if you have one. Otherwise use some other form of very fine abrasive. Be VERY careful to only clean up the burned areas. Remove as little material as possible.
 12. Once everything is cleaned up, remove the rivets from the assembly completely (if you haven't done so already). You are going to replace them with screws.



V. Reassemble the contact assembly

1. Using a 5/64" drill bit enlarge the 3 holes around the perimeter of the 2 black contact assembly disks. You are doing this because the screws that you are going to put back in there are slightly larger than the original rivets. There is NO NEED to enlarge the center hole that secures the white plastic rotating disk; it is large enough already.

2. Now carefully reassemble the contact assembly. This will require PATIENCE J
It is easiest to work on one contact set at a time.
3. Drop the 2 little springs that the brass contact rides on into place.
4. Lay the brass contact on top with the contact points pointing up towards you
(away from the springs).
5. Now, carefully push the spade terminals for that contact back through the black plastic disk and push them all the way down until they make contact with the brass piece.
FIGURE 8 shows the contact reassembly partially complete. Be careful that the springs under the brass contacts don't fall over.
6. Once you have all of the springs, contacts and spade terminals back in place,
use your alignment marks to put the 2 black disks back together.
7. Before completing the next steps please take note that nuts that you will use
will interfere with the internal circlip when you try to reinstall the contact assembly
into the main switch. This is shown in FIGURE 12. My solution was to cut the
circlip in a couple of pieces and use the nuts as 'stop' points for the circlip. This is
not my preferred solution but it worked. If I had to do it again I would grind one
side of the nut flat BEFORE I reassembled. I would grind it almost to the point of
cutting into the threaded hole at the center of the nut. Then the ring would be able
to slip past the nut and into its groove. If this works, shoot me an email and I'll update
this document.
8. Hold the 2 black disks together and insert a 2x20mm machine screw (or 5/64" x 34")
and a nut (with Loctite) in each perimeter hole to hold everything together. Make
sure to orient the screws as shown in FIGURE 10.
9. Now trim the excess thread from the rear of the assembly using a pair of wire cutters.
10. Next, put the spring loaded pins back in place
11. Next place the white plastic rotating disk back into position and slip a screw through it.
Orient the screw as shown Figure 12. On the spade terminal side of the contact put a
drop of Loctite on the screw and install the nut.
12. Solder the wires back onto the contact assembly.
Place the contact assembly back into the ignition switch, taking note that it will only fit
in 1 direction.
13. Reinstall the internal circlip
14. Reinstall the ignition switch in the car and YOU'RE done!

