X308 Charging/Starting Troubleshooting

Created by avt007, aka Rob. Many thanks to Jaguarforums.com for running an excellent site. Any comments, suggestions or complaints should be directed to avt007.

Disclaimer: You are assuming all risks for damage, injury, etc by using this information.

Be very careful when working around running engines.

Use extreme caution when working with live electrical circuits.

This information is provided to try to be helpful to my fellow Jaguar owners, so please don’t blame me for any problems that may arise.

Thanks!

Common Issues/Symptoms

- It won’t charge the battery.
- It cranks slowly.
- It won’t crank at all.
- Multiple faults at once- codes, lights, doors, windows,etc all acting up at once.

X308 Charging/Starting Troubleshooting

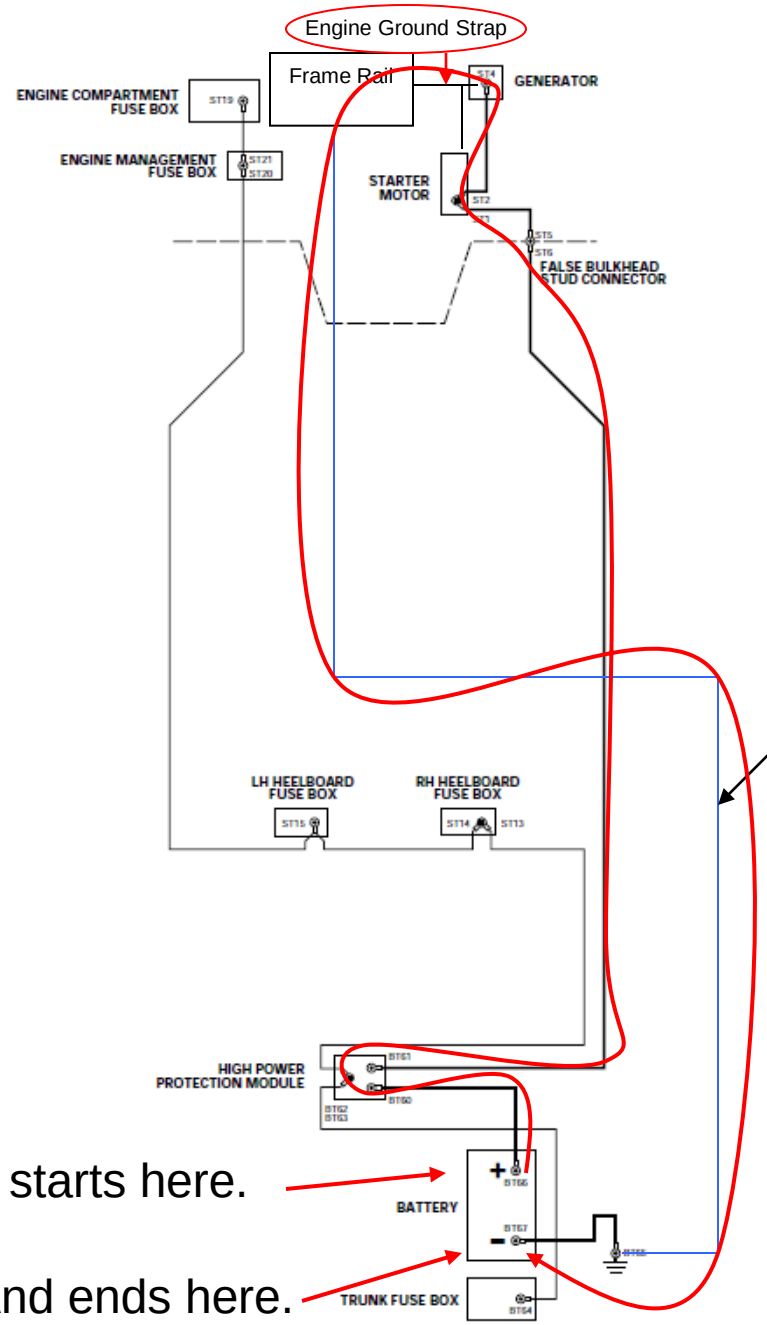
- These problems are usually caused by low voltage.
- Low voltage is caused by;
- An old battery
- Poor power cable connections
- Poor grounds

SAFETY

- When disconnecting the battery, always undo the negative terminal first. This way, if you slip with a wrench or socket, it’s ok if you touch the chassis.
- Then undo the positive terminal if required. A slip here is ok now, since the battery is not connected to the chassis anymore.
- If you are disassembling the false bulkhead connector, starter, or alternator, you MUST disconnect the battery first.

First, a little electrical theory.

- In order for an electrical circuit to work, the current has to have a complete circuit, or circle, if you wish.
- It needs to flow from the battery, to the starter for example, then through the ground strap to the frame rail and back to the battery.
- If there are any bad connections anywhere in that circle, you'll have problems.



It starts here.

And ends here.

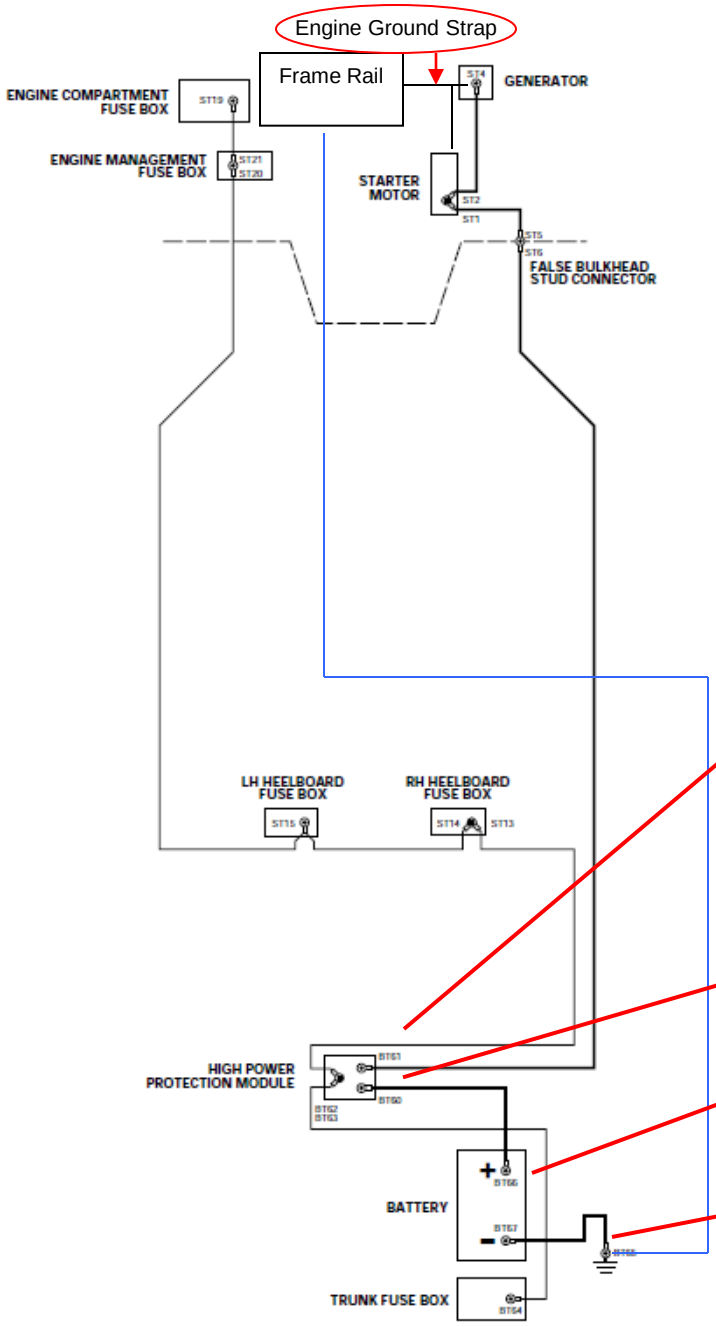
Here's the circle, in red. (Sorry about the poor drawing, but you get the idea).

The weak points are the false bulkhead and the engine ground strap.

The next slides will show pictures of these units.

The blue line represents the chassis ground connection between the frame rail and the battery.

NOTE: All wiring diagrams are from a 98 XJ8. My 98 XJR is the same, and far as I know all X308s are built the same.


Engine Ground Strap
Frame Rail
GENERATOR
ST4
ENGINE COMPARTMENT FUSE BOX
ST19
ENGINE MANAGEMENT FUSE BOX
ST21
ST20
STARTER MOTOR
ST2
ST1
ST5
ST6
FALSE BULKHEAD STUD CONNECTOR
LH HEELBOARD FUSE BOX
ST15
RH HEELBOARD FUSE BOX
ST14
ST13
HIGH POWER PROTECTION MODULE
BT61
BT60
BT62
BT63
BATTERY
BT66
BT67
BT65
TRUNK FUSE BOX
BT64

Troubleshooting

- Measure the voltage across the battery terminals. You should have approx. 12 volts (engine off) and anywhere from 13.0 to 14.5 (engine running) depending on rpm and electrical load. (You probably don't have that, or you wouldn't be here!)

Positive meter lead here.

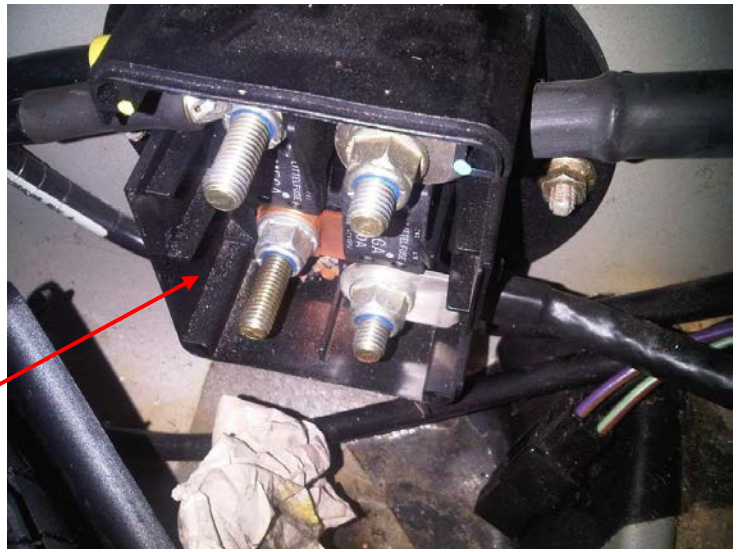
Negative lead here.

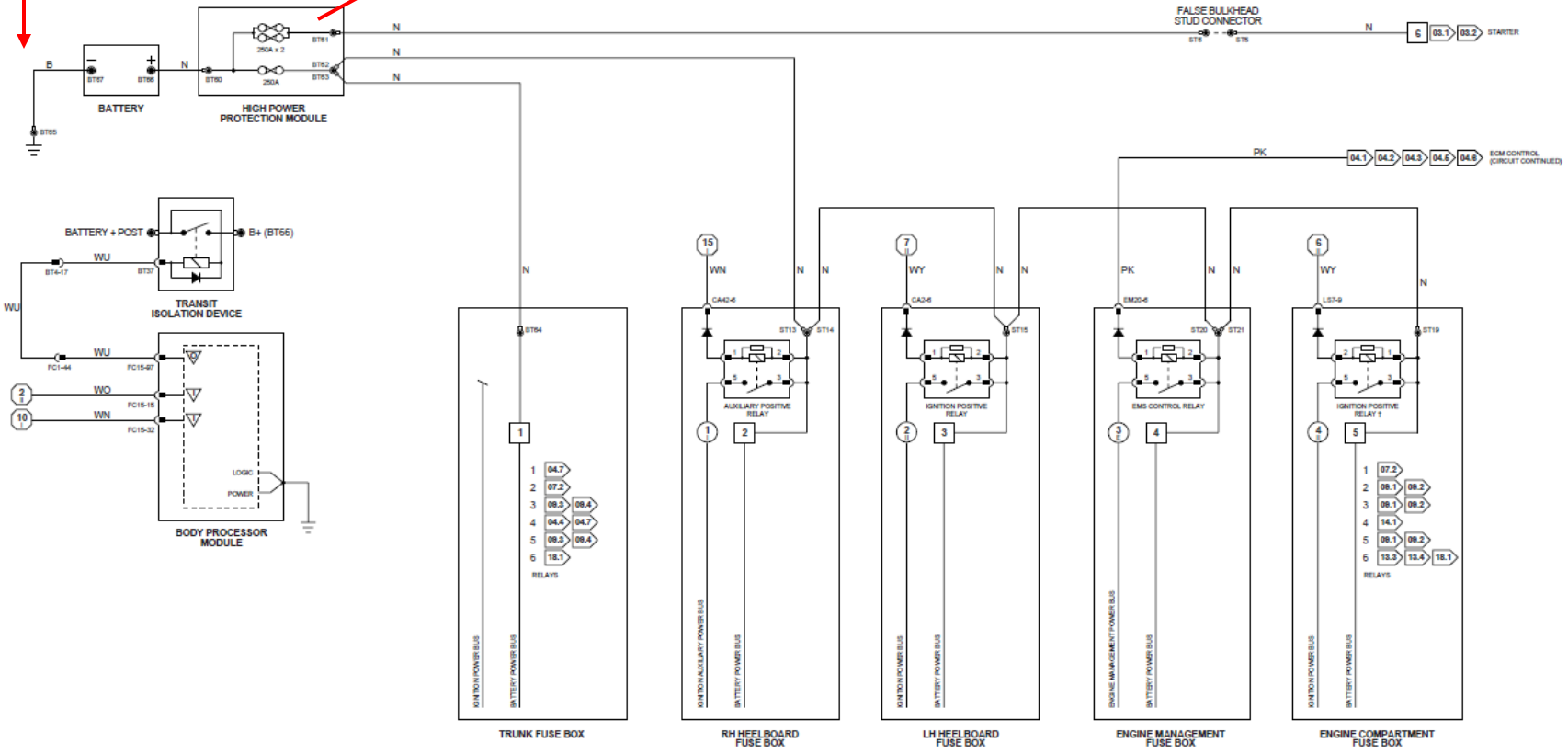
These are the big fuses in the trunk in the High Power Protection module.

Check these with a meter.

Check the cables for tightness.

Check the battery ground cable for a tight clean connection to the chassis. Remove it and sand the surfaces if necessary.





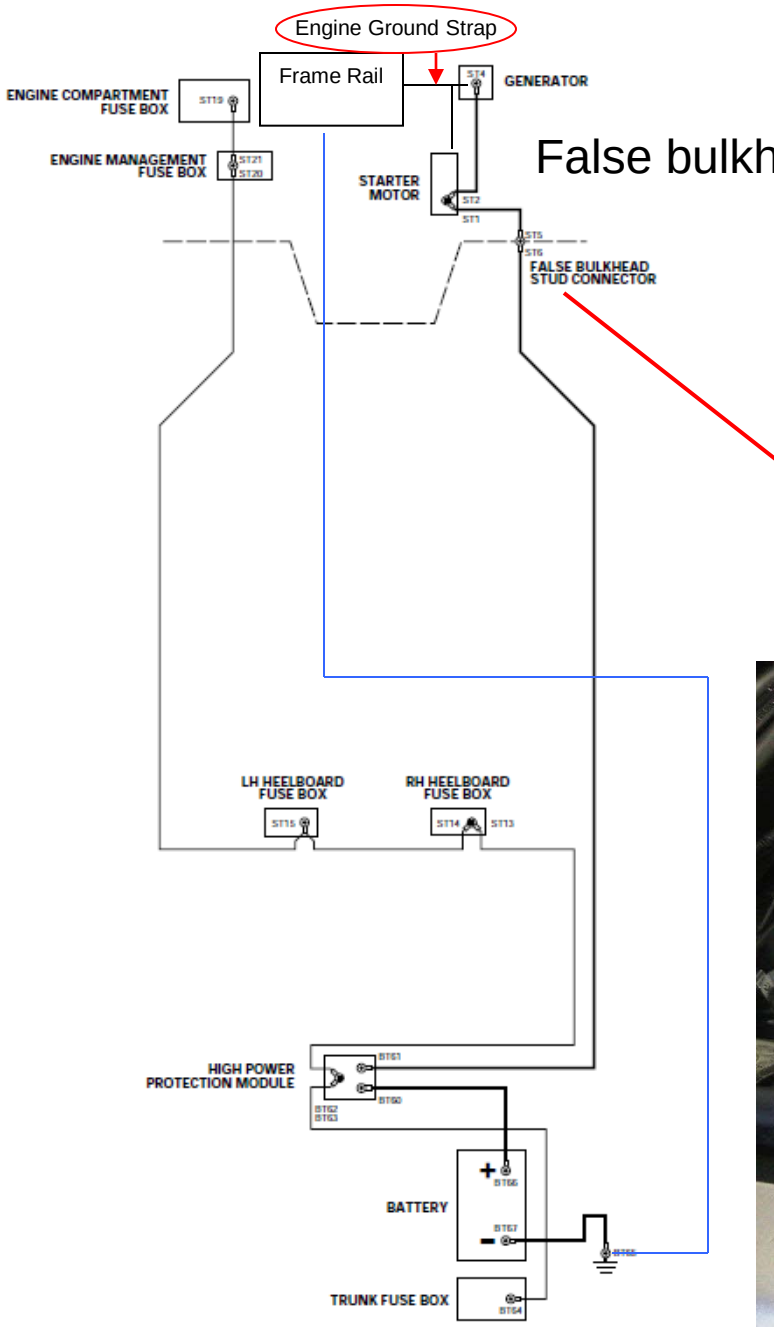
Troubleshooting

Move the positive lead to the Protection Module. Measure at all four studs, again engine running if possible, or at least ignition on.

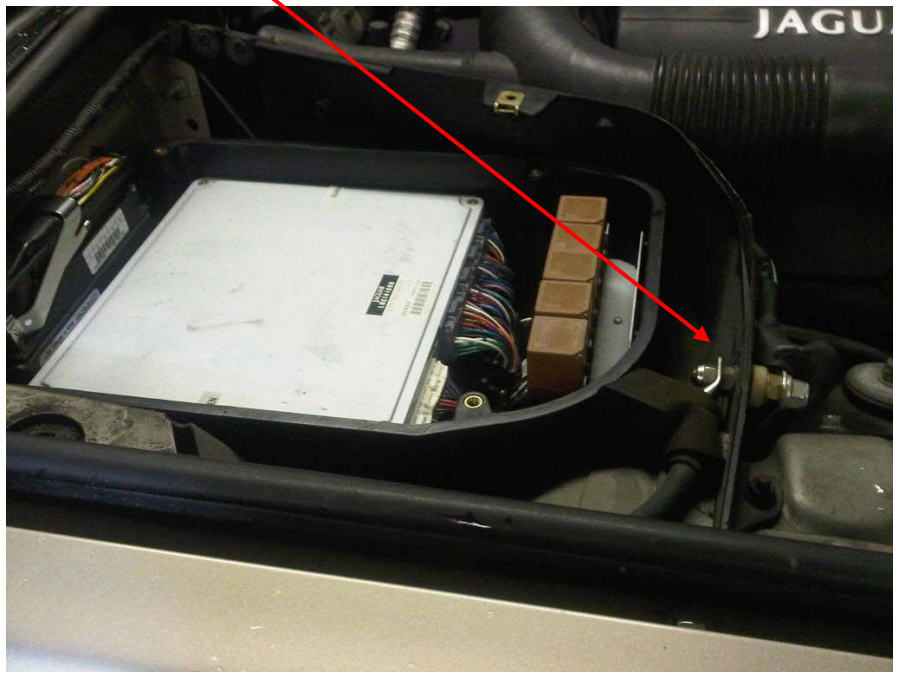
The voltage should be the same at all four. If not, you have a blown fuse, or loose connection.

If the voltage here is ok, move on.

If not, fix the problem.



False bulkhead



False bulkhead

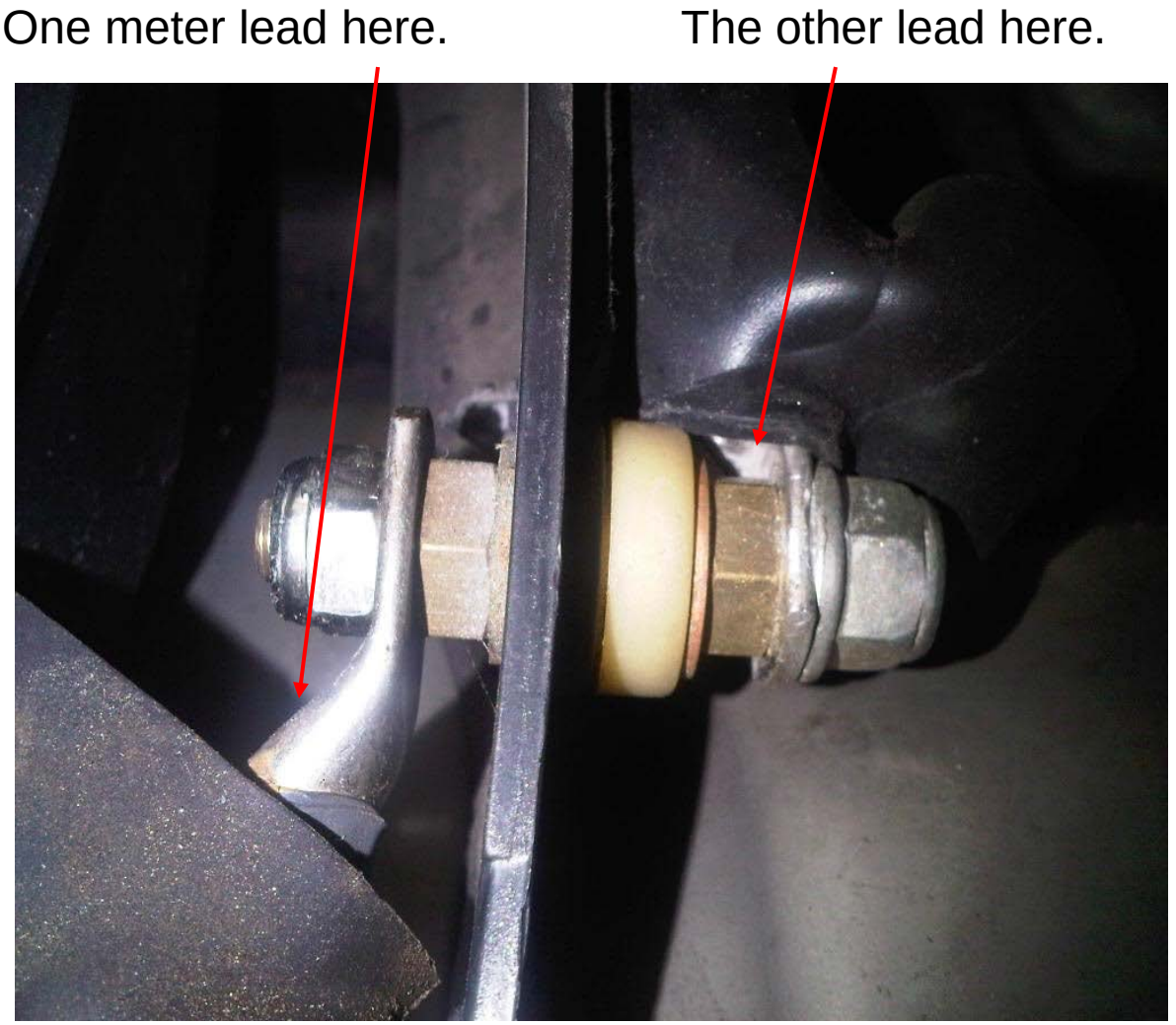
- These are poorly designed at best.
- Check for loose nuts, melting, and burnt cable lugs.
- Often you can clean up all the parts and reassemble it and it will be ok.
- DISCONNECT THE BATTERY FIRST!

Troubleshooting

Measure the voltage across the false bulkhead. (With the engine running, if possible).

Measure from the actual cable ends, not the nuts.

Any voltage difference indicates a poor connection. Clean or replace as required.



Engine Ground Strap

This lives under the right hand side of the car, by the exhaust and transmission.

As you can see, mine is green with corrosion.

Cleaning the connections at the engine and frame rail helped, but in the end I replaced it with another cable.

I recommend removing the paint from the frame rail, and cleaning up the engine with sandpaper to endure a good connection.

I had this cable in my toolbox, so I used it, and it works great.

You can always buy the Jag part if you want, but any auto parts place will have these generic ones.

Troubleshooting

Measure from the engine (a handy spot is the throttle body, as shown here) to the shock tower, with the engine running.

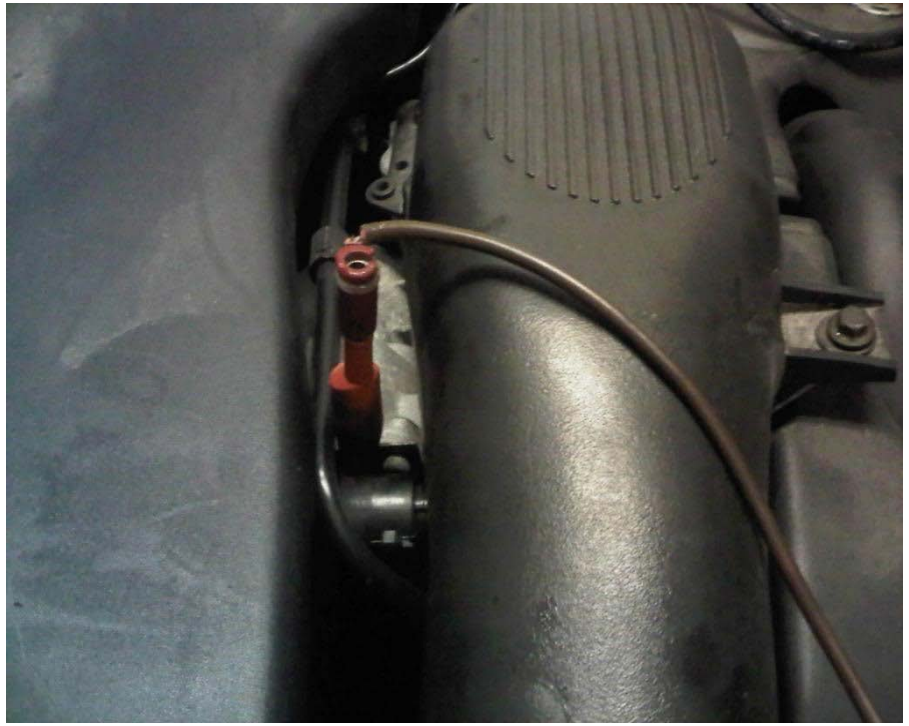
A reading of 0.1 to 0.3 volts is ok, but anymore than that is a guaranteed indication of a bad engine ground strap connection.

I have seen as much as 1 or 2 volts.

That causes poor cranking and poor or no charging.

Measure from this same point to the false bulkhead lead. This is the voltage your alternator is putting out. It should be 13.5 to 14.5 volts (engine running).

From my forum experience, (and my two X308s) alternator failures are unusual, whereas cables and connection issues are quite common.



More cables

Alternator connection

Starter connection (other end of the same cable)

Troubleshooting

- At this point, you're under the car (please be careful about supporting it properly).
- Check the starter and alternator for tight connections where the cables attach.
- Again, disconnect the battery, these cables are live even when the car is turned off.

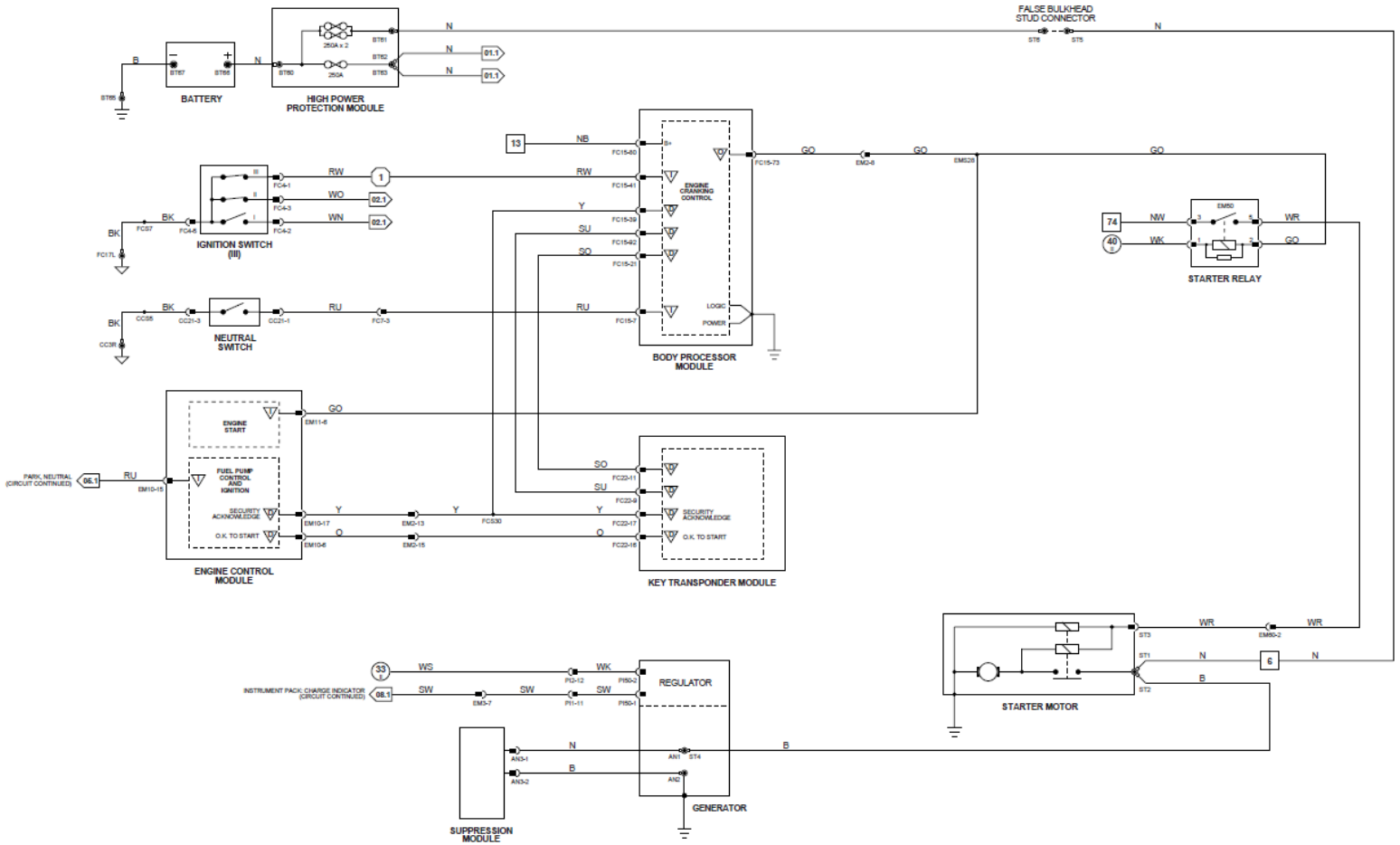
What if it won’t crank at all?

- Pull the plastic cover off by the firewall, so you have access to the RH exhaust manifold.
- Connect jumper cables to the manifold as shown.
- Connect the other end to the shock tower, as shown on the next slide.
- I used both the red and black cables, but one should work.

What if it won’t crank at all?

- If it cranks and runs now, your engine ground strap is completely useless and needs replacing.
- If you are away from home, you can drive it like this, just stow the cables carefully under the hood.
- I did this to get home, a 50 km trip.

Here’s another good diagram.



Summary

- Get a meter (any cheap one will do) and try these ideas before spending any money.
- If these steps don’t help, get your battery tested. Many Jag owners have had their problems solved by a new battery.
- If you store your Jag, buy a battery maintainer like those made by CTEK.
- Good luck!