

# 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.

Rev. 2.2

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
- A bad alternator

# 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, high power module, or alternator, you **MUST** disconnect the battery first.



# Hard reset

- You hear this term a lot.
- It means disconnecting the battery and grounding out the positive lead.
- This causes all the modules to reset, or reboot if you prefer.
- It can clear many odd issues.
- It is perfectly safe, provided it is done correctly.

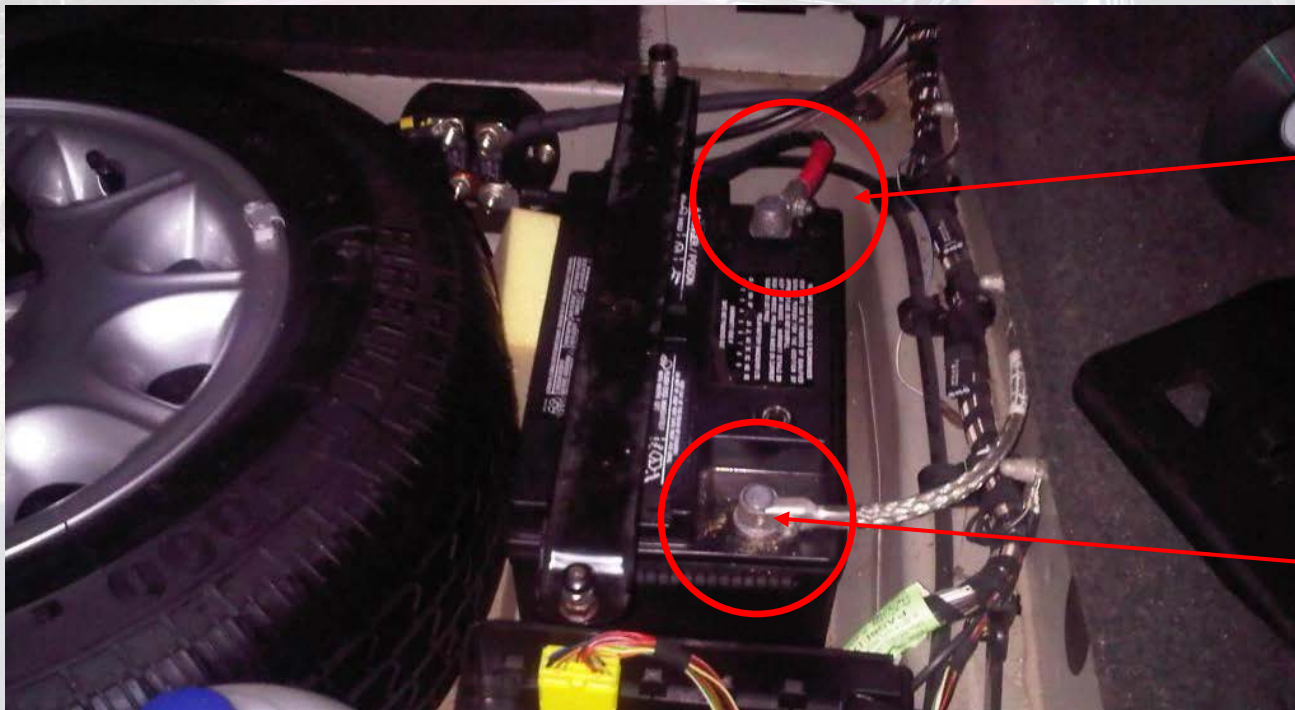
# Hard reset

- The next slide will show the easiest way to do a reset.
- Be sure to follow the instructions carefully.
- Only disconnect the battery clamp of the ground cable.
- DO NOT disconnect the body end of the ground cable.
- Touching the body end of the ground cable to positive will cause a massive short, sparks, flames, battery explosion, plagues of locusts, you name it.
- It's bloody dangerous.



# Hard reset

- Disconnect the negative lead at the battery.
- Hold it to the positive lead for 30 seconds.
- Connect it to the battery again.



Hold here.

Disconnect here.

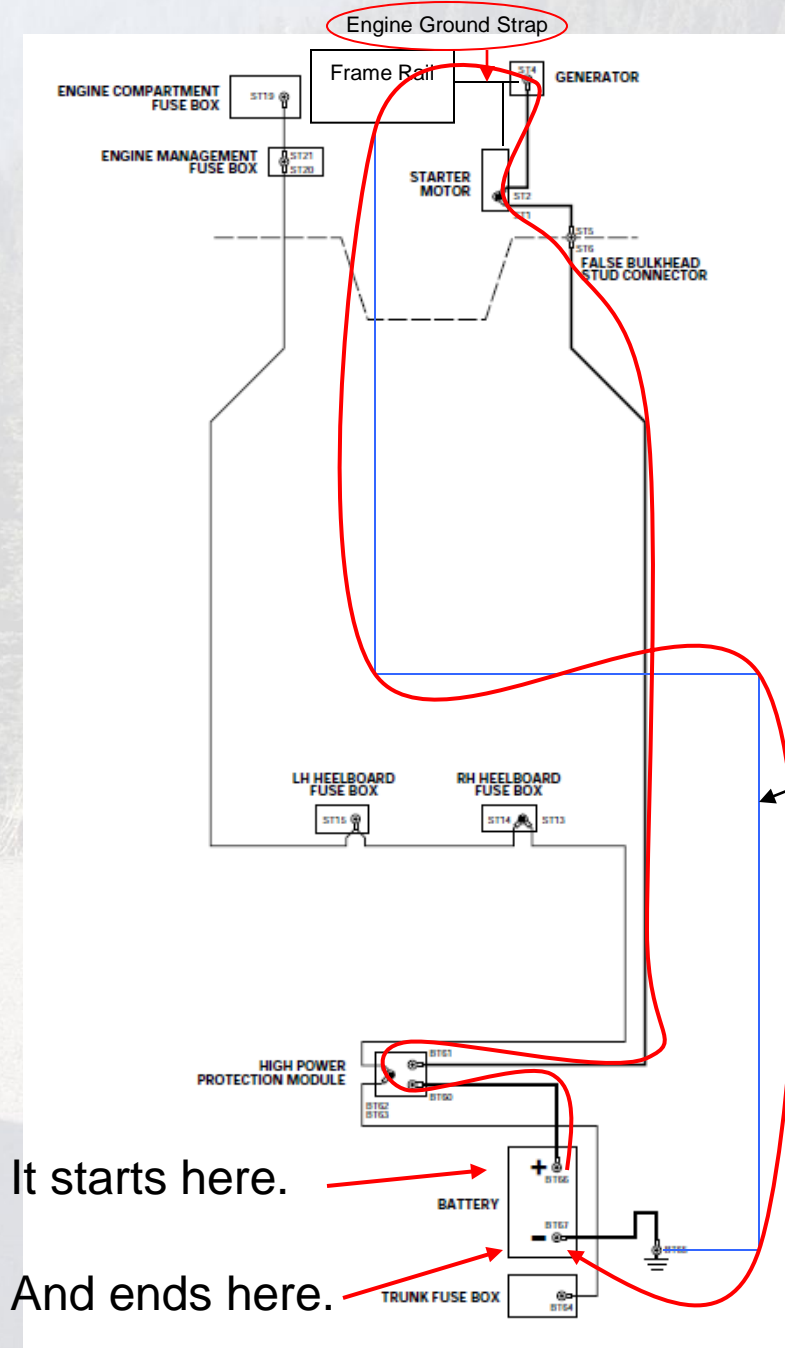
# Hard reset

- If I've made you nervous, the absolute safest method is to disconnect both leads.
- Hold them together for 30 seconds.
- Reconnect them.
- Nothing can go wrong this way.
- Just don't drop your wrench across the battery terminals.



# 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.



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.

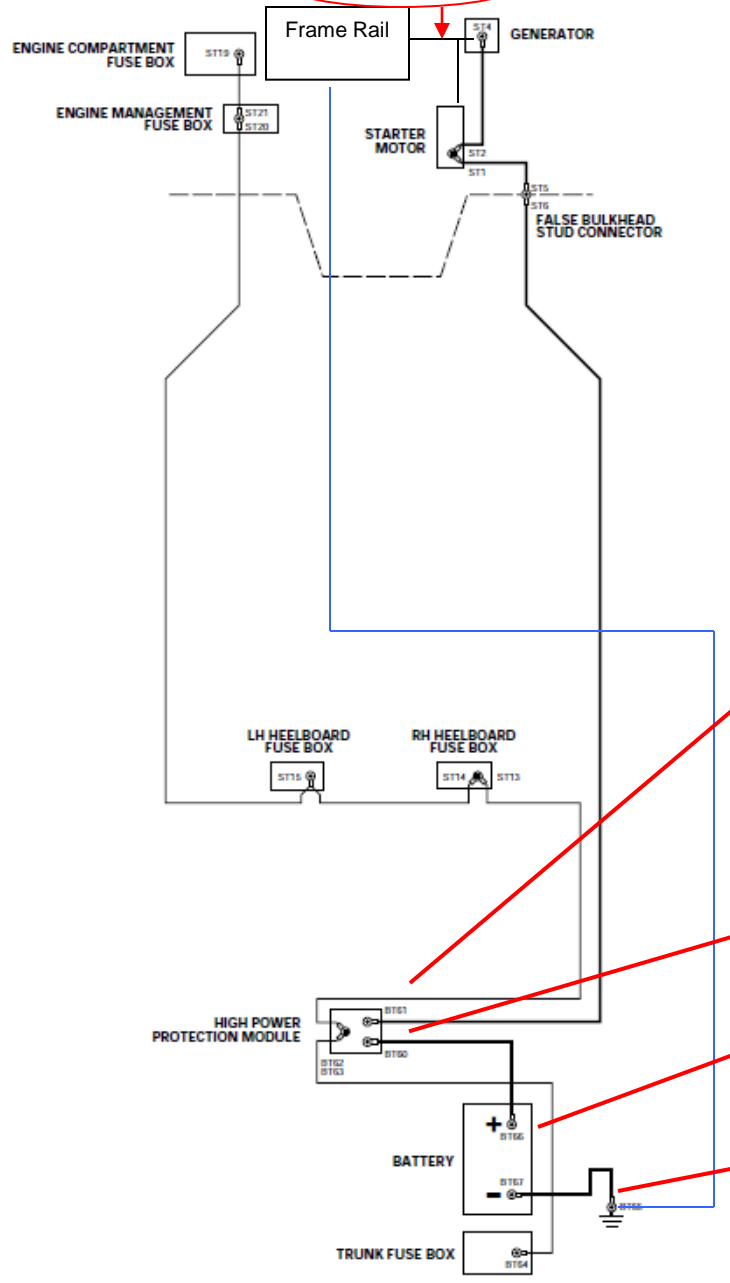
The blue line represents the chassis ground connection between the frame rail and the battery.

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



# Troubleshooting

- Measure the voltage across the battery terminals. You should have approx. 12 volts (engine off) and anywhere from 13.5 to 14.5 (engine running) depending on rpm and electrical load. (You probably don't have that, or you wouldn't be here!)
- My car reads 14.0 here, idling, no A/C, so no cooling fans running.

Positive meter lead here.

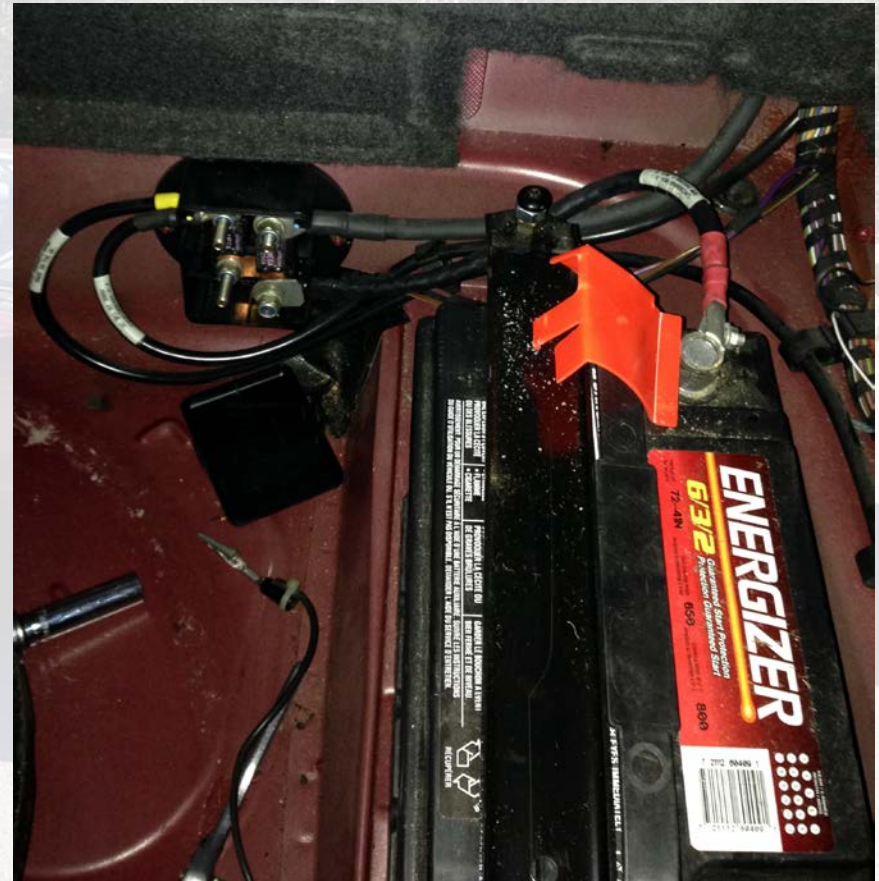
Negative lead here.





# Another problem area.

- The battery cables can be an issue.
- Mine looked perfect, but the positive cable had a 1.0 volt drop across it.
- It felt warm, a bad sign.



# Battery cables

- Testing with a meter revealed the problem was in the crimp at the battery clamp.
- I soldered this connection, problem solved.





# Battery cables

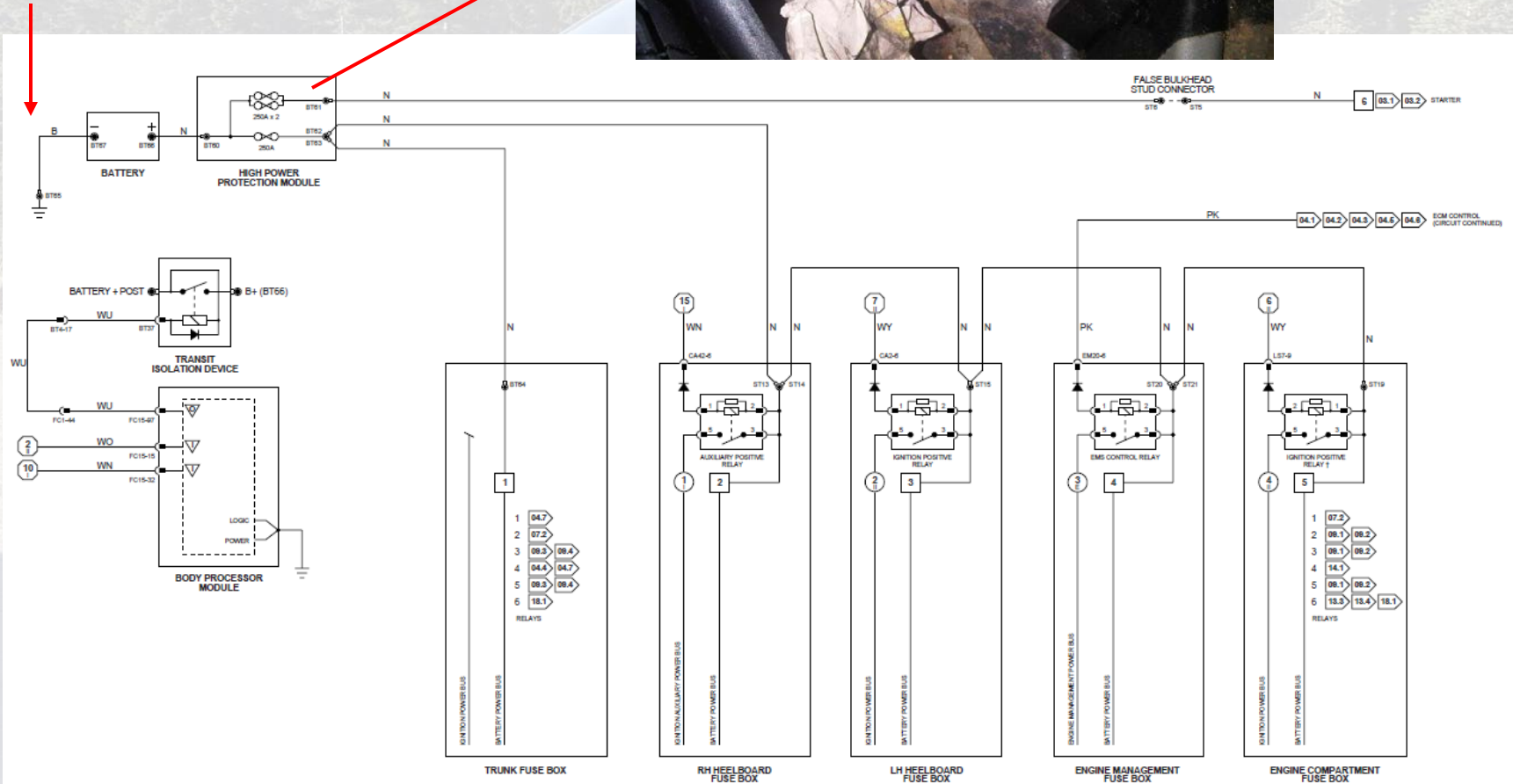
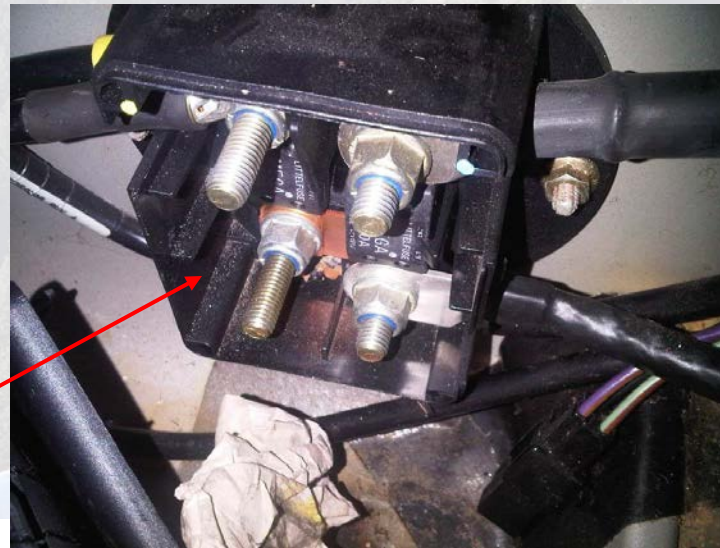
- You could always replace the cable with a generic one, easily found at any parts place.
- Don't forget to check the ground cable as well, other members have had trouble there.
- The electrical circuit is only as good as it's weakest link.
- Don't assume a clean, tight cable is ok!
- Measure everything.

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.

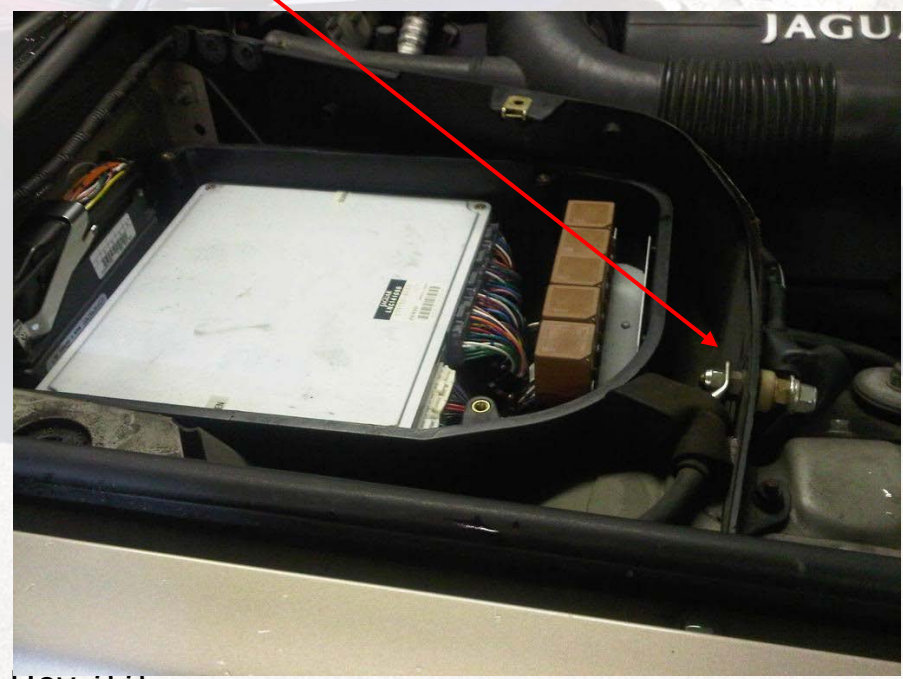
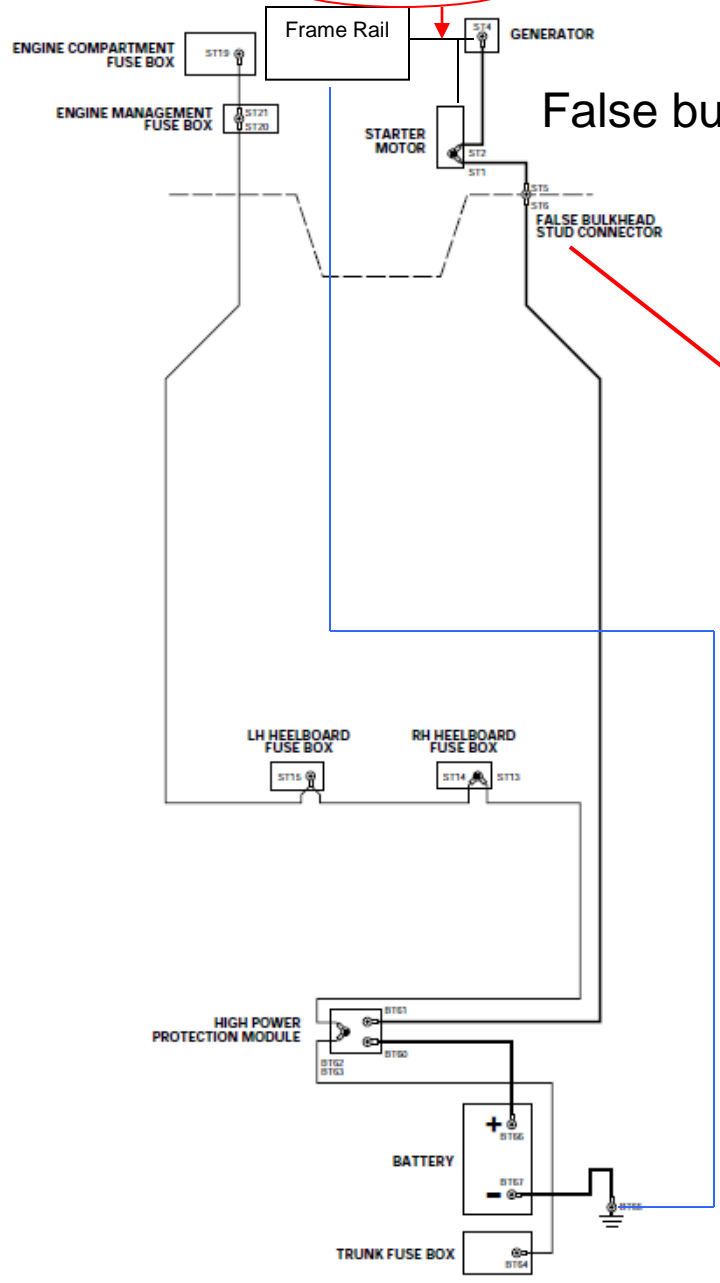
The voltage should be the same at all four. If not, you have a blown fuse, or loose connection.

If the voltage here is ok, move on.

If not, fix the problem.



Engine Ground Strap





# 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

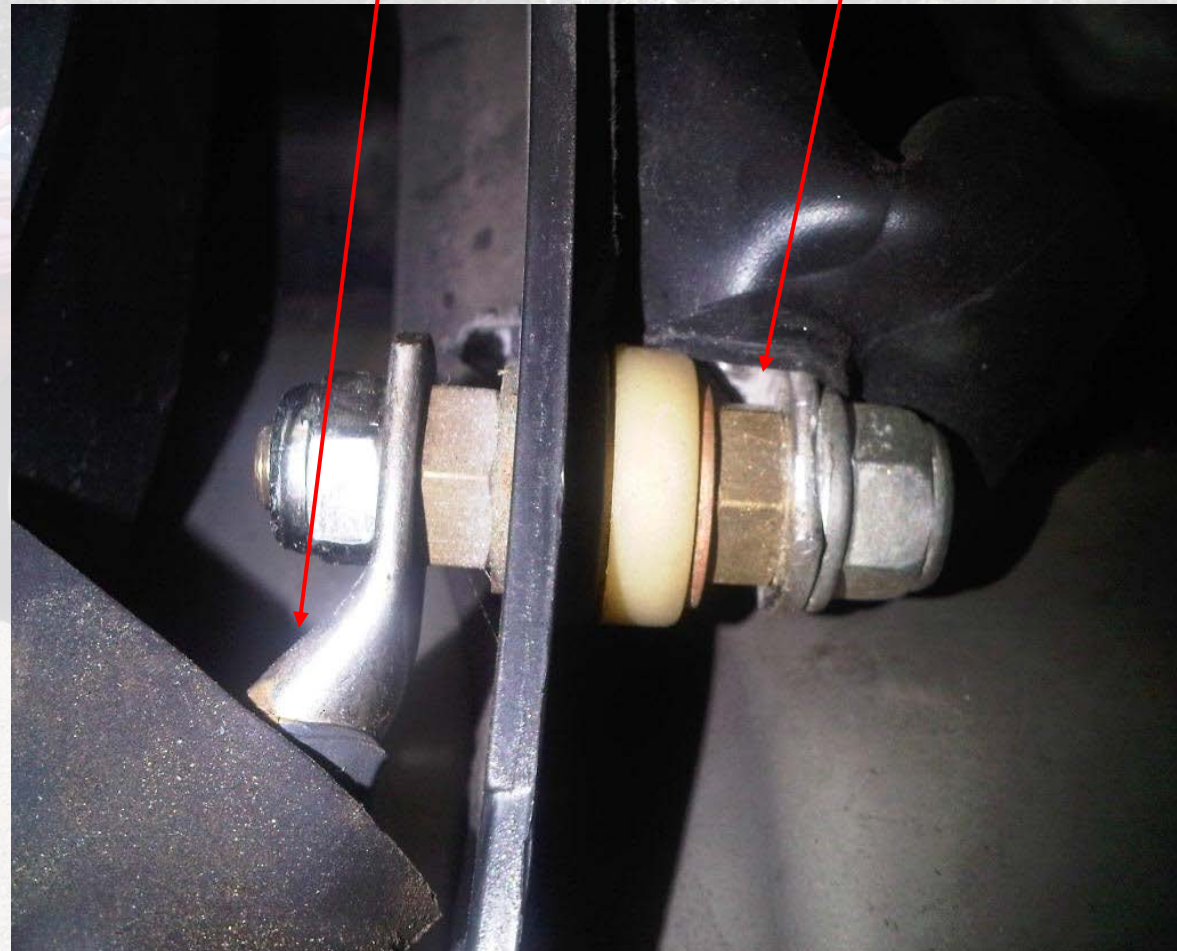
Measure the voltage across the false bulkhead. (With the engine running, if possible).

Measure from the actual cable ends, not the nuts.

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

One meter lead here.

The other lead here.





# 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.

I couldn't get the bolt out of the transmission, because the exhaust is in the way.

I cut the old cable off, and attached the new one to a different bell housing bolt.





# 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 0.2 volts is ok, but anymore than that is a guaranteed indication of a bad engine ground strap connection.

Mine reads 0.04 volts.

I have seen as much as 1 or 2 volts.

That causes poor cranking and poor or no charging.



# Troubleshooting

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). Mine reads 14.1 volts at idle.

Alternators are not easy to get in and out, and they can be pricey, so go through all these checks before going that route.

From my forum experience, (and my two X308s) cable and connection issues are quite common, whereas alternator failures are less likely.

However, alternators do fail, search the forum for threads on rebuilds and replacements.





# 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.





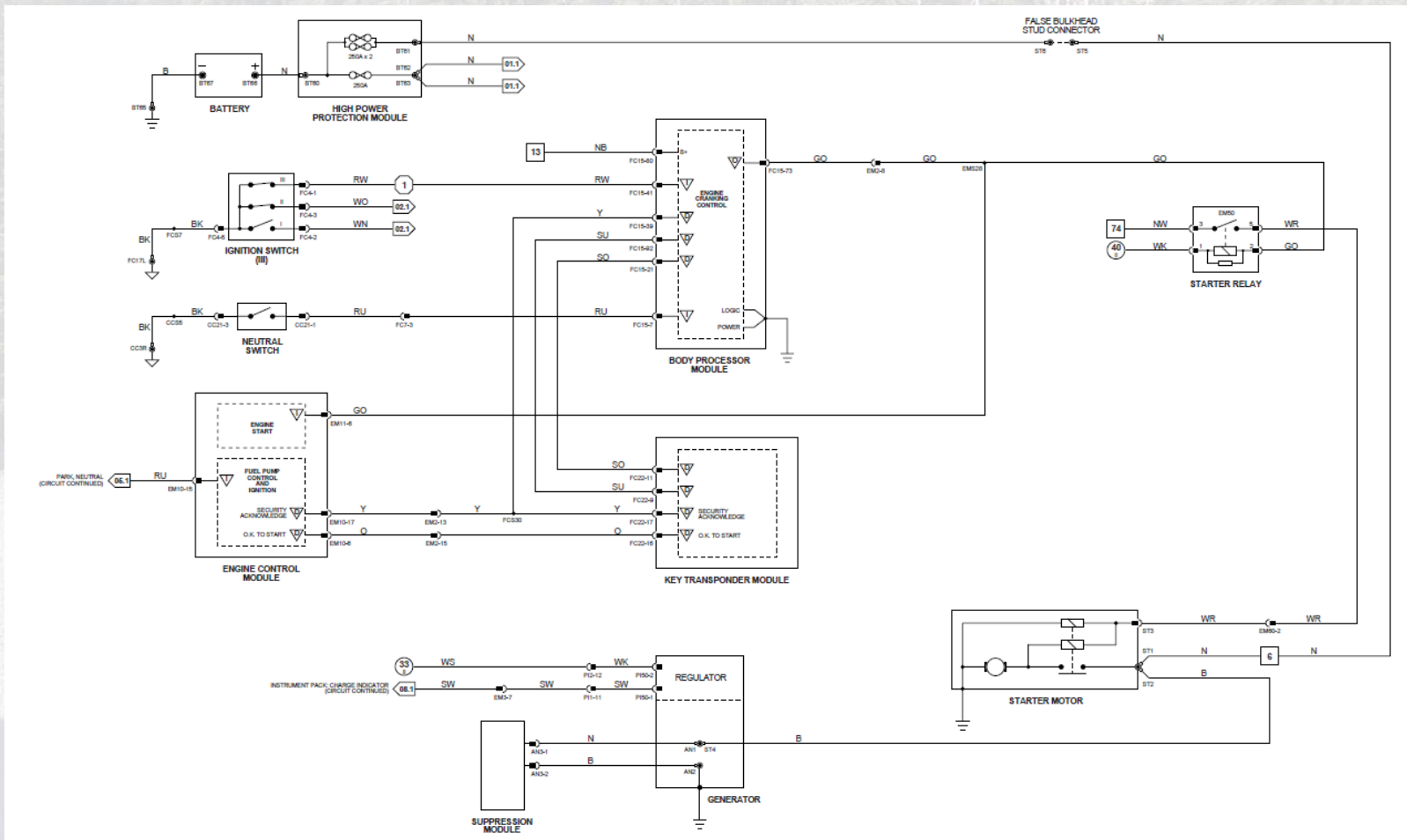
# What if it won't crank at all?

- 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.



# Inertia Switch

If you have some power to some parts of the car but not all, check this out.

If your inertia switch is tripped, you will lose all power to the Engine fuse box and LH Heelboard fuse box. Here's a description from a fellow member:

“still wont start, Just a click coming from somewhere on the right side in the dash or under the hood. I cant tell.

When I turn the key on I get multiple fault codes.

system check

transmission fault

electrical fault

suspension fault

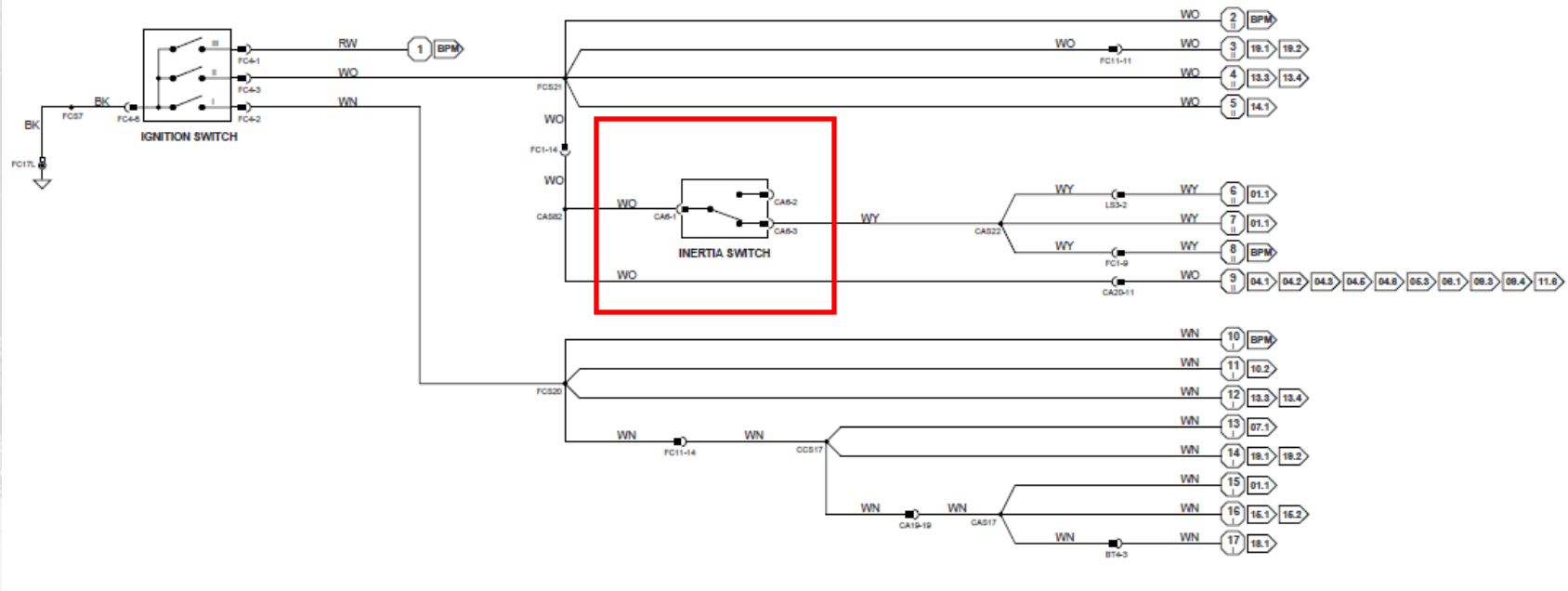
fail safe engine mode

incorrect part fitted

in that order, I turn ignition and nothing but the faint click somewhere in front right side.



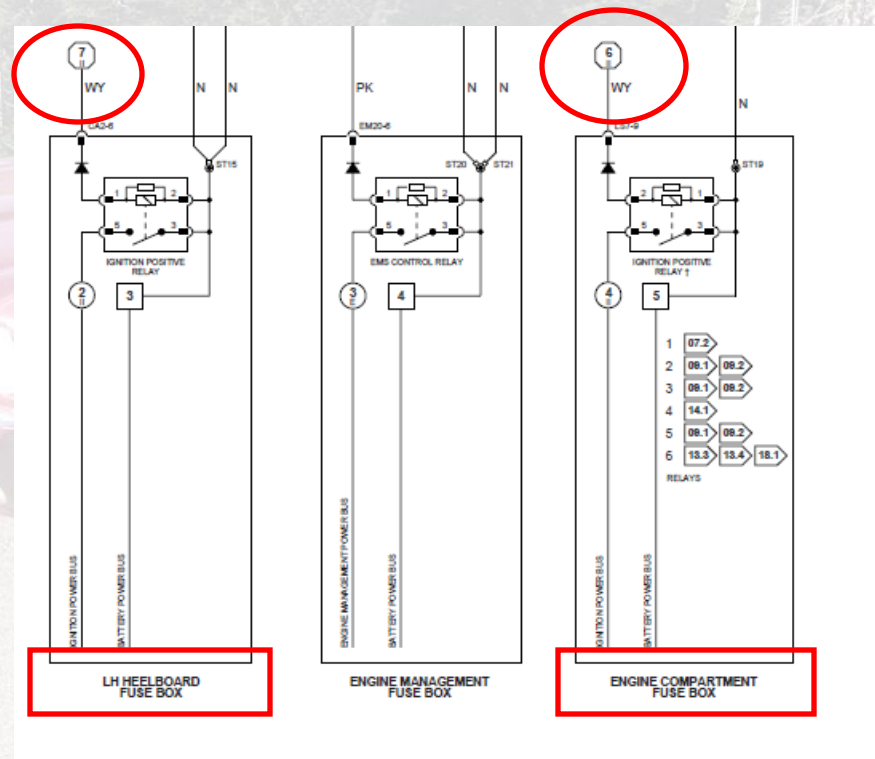
# Inertia Switch



This switch opens the grounds for two relays, coming up in a couple slides.

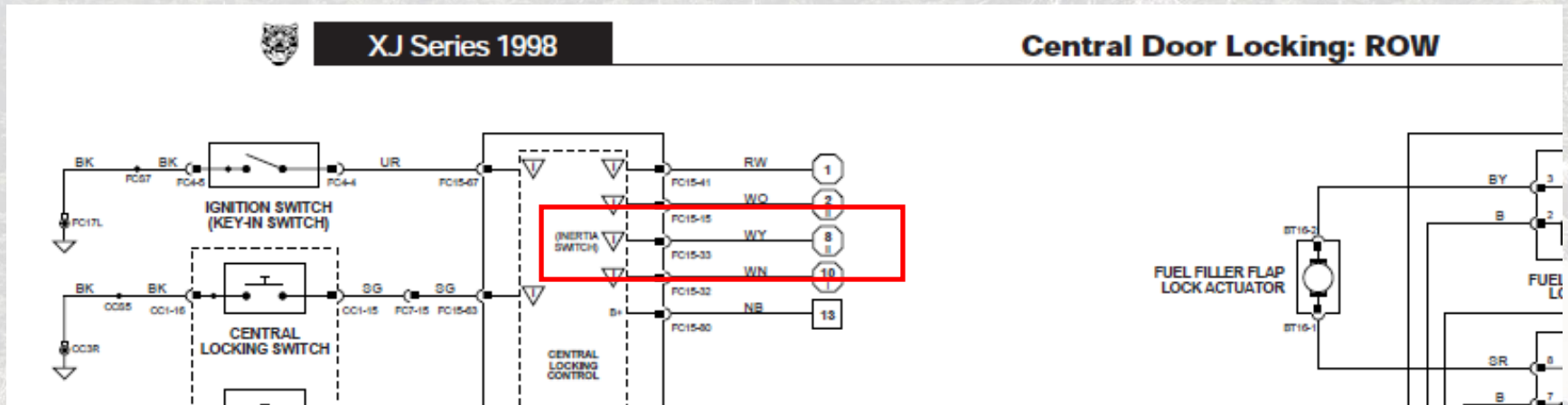
# Inertia Switch

The switch removes these two grounds, causing the relays to not work.





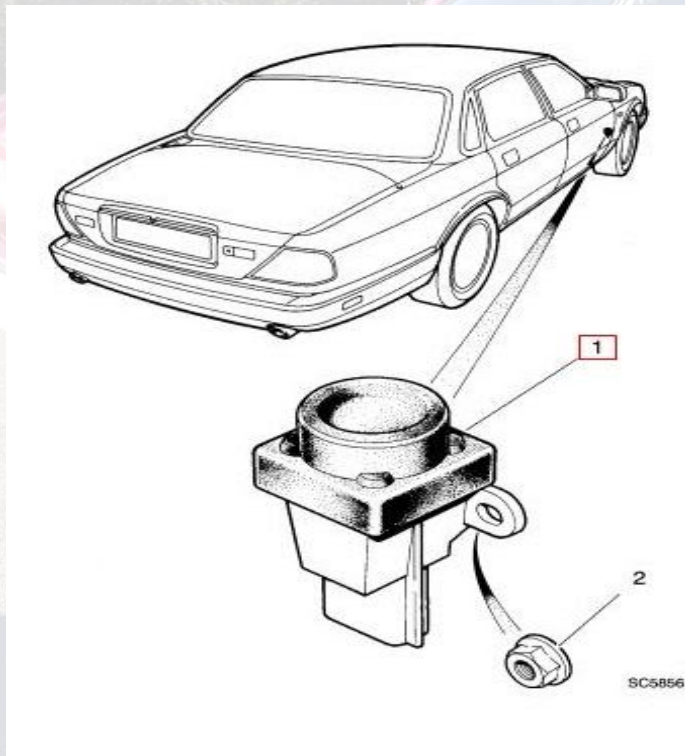
# Inertia Switch, BPM input.



It also removes a ground from the Body Processor Module, apparently affecting the door locks, windows, and sunroof.

# Inertia switch location. Press the rubber button to reset.

Here is the location of the switch, credit due to Jim Lombardi for his tireless pdf work. It's down in the passenger footwell, RH side.



### The New Jaguar EPC

0 Item(s) Subtotal : \$0 Search

XJ Series (From (V)812317 to (V)F59525)/ENGINE

INERTIA SWITCH

No		Description
1	+	Inertia switch
	+	RH
		LNA6520BA
2	+	Nyloc nut



# 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!