Table of contents

*Red colored words or bullet points are what I have seen most commonly in the field!

Section 1

Common sense

It is important to consider the history of the bike before diving into issues. If you ride it daily, just purchased the bike or it was handed down from years of sitting, this information is a KEY ingredient to problem solving any issue you face.

Key Words or Terms You Should Know

- **Testing for Battery voltage:** When testing components for power, the reading should read close to what that battery voltage is at in its current state.

- Gr**ound:** This is solid piece of metal (engine, frame, and mounting bolt) that have a direct connection to the battery negative post either with a ground wire or connected to the actual negative post.

- **Continuity:** Don't overthink this term, It simply means a continuous path in or through a wire, switch or circuit. You measure this with the RESISTANCE option on your multi-meter also known as OHMs.
  *One example would be to think of one single 3 foot wire. If you measured the resistance of that wire end to end you should see no more than .2 OHMs of resistance. This proves that your meter is able to measure that wire on one continuous path. If you then were to cut that wire (simulating a break in the wire) than the meter is no longer able to read that original 3 foot wire. This means that there is NO continuity through that wire. If you add rust, wear, harness breaks, water, bad connections, broken or corroded switches, you can experience the same thing.

- **Resistance:** Again, don't over think this term. Resistance is a blockage or loss in current moving through a wire, connection, switch, circuit etc. More resistance means LESS current flow. Less resistance means MORE current flow.
  Every wire has some means of resistance, same with switches, circuits, loads, etc. Certain signal switches may require readings that would be higher than normal.
  * Example, imagine a hose with running water through it. The hose itself is a certain diameter causing a slight resistance. This is because the faucet it is attached to can push water much faster if the hose wasn't connected. Now imagine putting a kink or a knot in the hose, this would cause less flow because of the restriction you added in the path. Now the water has to overcome this obstruction by building up pressure. The result of this built up force when it comes to electricity is heat buildup, melted wires and you guessed it blown fuses!

- **Lean mixture:** When pertaining to air/fuel mixtures, 15 parts air to 1 part fuel (15:1) is pretty much a perfect mix. A lean mixture is when there is too much air for the fuel mix. So anything above 15 parts air is considered lean. This can result in high temperatures in the combustion chamber, outlet ports and exhaust components. This also can be the cause in most backfiring issues.

- **Rich mixture:** Knowing that 15:1 is what's considered to be the best air/fuel mixture, any amount under that 15 parts air can result in a rich mixture or too much fuel in the mix. Although this is a less efficient mixture, it can result in more power and cooler burning throughout the combustion process.

- **Starting fluid:** Yes, I know this isn't a term or phrase but I want to emphasize how useful this single tool is in any "run-

ability” issue. With the proper use of starting fluid you can eliminate a large list of possible problems just by paying attention to how the bike responds by spraying this substance into the airbox.
By using this tool safely, you can figure wither the bike has spark, compression, vacuum leaks, lean or rich mixtures and much more. Here is a link to my video and more info on how it works.

Section 2
Common Problems With Honda's That Will Not Start or Run.

Before you head to your tool box and start busting out tools, start basic.

- Check battery terminals for loose cable contact.

- If loose.. Tighten!
  *Most commonly found under seat or Behind a left or right side cover

- Starter buttons can get sticky or build corrosion internally.

- Try to function the switch while working a rust penetrant or silicon spray behind it multiple times.

*Keep away from harsh brake contact cleaners or carburetor cleaner type sprays when doing this. These harsh chemical cleaners can discolor plastics and make switches work improperly and stiff.

- Rock the kill switch back and forth to free up a bad toggle connection while using the same technique above for starter buttons.

*You can do this with any switch, works great for turn signal toggle switches that get gummy and cause weird turn light issues.

- **Fuel injected** - Do you hear the fuel pump prime?

- Gas level / Gas age / Fuel valve

Pop the gas cap and give the bike a shake. Can you see fuel swashing around?

- Very old gas loses its ability to burn well.
- Double check your that (if carbureted) the fuel valve in the ON

position. Try switching it to reserve In case your gas level is just under the “full on” gas tube inside the tank.

- Check to make sure bike is in neutral with indicator light on if provided.

*If in gear, make sure that your kick stand is fully up and clutch lever is fully pulled in.

- Is it cold? Ensure that your choke system is put to use, fully apply choke on cold start-ups.

*Fuel injected bikes will not have a manual choke system

- If possible, check that the battery voltage is at a minimum of 12.4v and above with the use of a multi-meter.

I don’t care how “NEW” your battery is, it can still be worthless!

Section 3
Motorcycle Does not start or is hard to start (Carbureted)

- Check spark plug for deep black and wet tip (fouling).

***Plug Wet*?**

- *Flooded carburetor, (stuck float, water in gas)*
- *Throttle valve stuck fully open*
- *Dirty air filter, restricted air flow into carburetor throat or air-box*
- *Improperly adjusted pilot screw*
- *If constant fouling try switching to a hotter plug.*
- *On older bikes that use point style systems, you may have a problem there. Check the points for any erratic bright sparking where the gap is on the points. If it is present, this is a sign of the condenser(s) getting ready to go!*

- Check spark plug for spark for a bright and consistent spark

** Place spark plug back inside the plug wire cap and lay the tip of the plug on anything metal (engine/clean frame section or bolt). HOLDING JUST THE RUBBER CAP to keep the plug in place, turn the motor through and inspect for spark. (in-line four engine, check two plugs for cylinder 1&3 coil and 2&4)*

Is the spark quality good or any at all?

- *Faulty spark plug/wire or cap*
- *Loose, disconnected or shorted ignition system wires / coil wires*
- *Faulty pulse pickup, KPS/CMP sensor (all do the same thing)*
- *Faulty Ignition coil*
- *Faulty exciter coil*
- *Faulty kill switch*

- Bad ECU / ECM / ICM / PCM

- Does fuel reach the carburetor?

- Shut OFF fuel valve and locate the carburetors float bowl drain bolt (lowest point of carb). Grab rags and loosen the drain bolt until you see gas flowing either out of the carb or down onto the ground from the drain tube until is stops draining. (Use rags to soak up gas). Close drain bolt and turn fuel back on. If the bike uses a vacuum operated fuel valve (most Honda's do) the bike will need to be turned through for 8-15 seconds for the vacuum to pull on the diaphragm that allows gas to flow. You can then recheck if fuel is getting to the carbs by draining the carburetor float bowl once more.

- Some carbureted V-Twin Honda's are equipped with a fuel pump. You can check if it is indeed pumping by placing your hand or fingers on the pump, and turning the motor through. You should feel a "thud thud" or any sequence of sporadic pulses as it attempts to keep pressure.

- How old is the fuel?
  As gas sits it slowly loses its ability to burn well. So even though gas is making it into the combustion chamber, ethanol has put a choke hold on its chemical ability to burn well. This can cause fouled plugs and clogged carburetors.

  *If the bike has sat for over 3 months try this trick out to help determine what the actual problem may be.

  Has the bike been sitting for months? Check out this Video that shows you exactly how to diagnose a carburetor issue

- Compression and valve train

*If you ride your bike often than this is most likely NOT the problem BUT when it comes to the valve train's tappets, rocker arms, and shims wear, the clearances between certain parts get further and further out of speck and over time will cause slow decrease in performance as well as hard starts.
Is the bike close to or over 24,000 miles? Have you performed a valve adjustment or ever had one done (if applicable)?

- Cylinder compression is checked by attaching a compression gauge into the spark plug hole, applying FULL THROTTLE while turning the motor through until the needle on your compression gauge stops climbing. This will be the compression for that cylinder.

*If it is above 110psi than it is more than likely not a compression problem.

You can pick up a simple compression gauge from your local auto parts store! You may even be able to rent one!

Low Compression?
- *Valve clearance too small*
- *Valve stuck open*
- *Worn cylinder and piston rings*
- *Damaged cylinder head Gasket*
- *Seized valve*
- *Improper valve timing*
- *Faulty decompression cam*

Section 4
Motorcycle Does Not start Hard to start (Fuel injected)

These systems troubleshooting techniques are not too far off from a carbureted unit. Most commonly any PGM-FI system will show DTC read-out codes to help diagnose problems. This would need to be brought to the attention of your local Honda dealer. You can also find DTC readout code definitions and how to retrieve them in the factory Honda service manual that pairs with your bike specifically.

Regardless, thoroughly go through the SECTION 2 before continuing here.

- Fuel pump:
With the kill switch in the run position, turn the key on. Do you hear the fuel pump prime inside of the tank?
No?

- Faulty kill switch
  *Test for continuity through switch both ON and OFF
- Bad fuel cut relay
  *replace with a known good one
- Bad fuel pump relay
  *replace with a known good one
- Bad fuel pump
  *see service manual about pump volume output test
- Faulty PGFI system components (harness, injectors, pressure regulator, fuel filter)
    - Contaminated gas (water mixed, really old gas)

- Bank angle sensor

* If they body work was off recently, I have seen people mis-install this fail safe switch. I have also seen them become faulty. See owner's manual for testing or jumping circuit.

Section 5
Starting System Cheatsheet

To keep this simple, let's try to keep just 4 components in mind when diagnosing this system.

1. **Battery** - Supplies the juice to the starter motor to turn the motor through.

2. **Starter Button** - Acts as a flood gate for voltage. Once pressed voltage is allowed to move through solenoid

3. **Starter solenoid** - the final switch before all the voltage hit's the starter

4. **Starter** - the end result of the circuit, transfers electrical energy into something useful and spins the motor through with great force.

Got it? Good.. Let's move on

Battery

- Needs to be above 12.4v to be useable
- Battery terminals must be tight
- Some batteries can read high in voltage but once load tested, show that they are insufficient

Starter button

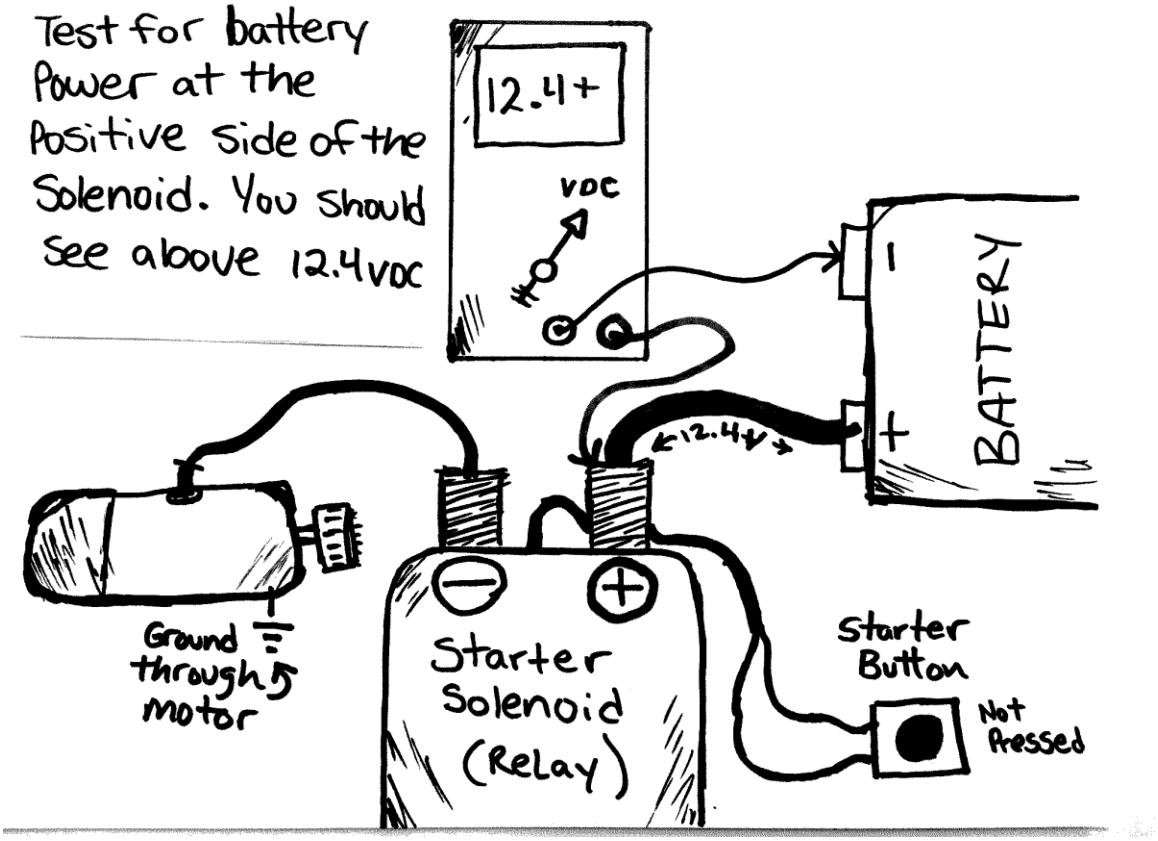
- With multi-meter check resistance through the two wired

switch both pressed and released. You're looking for a different reading between the two.

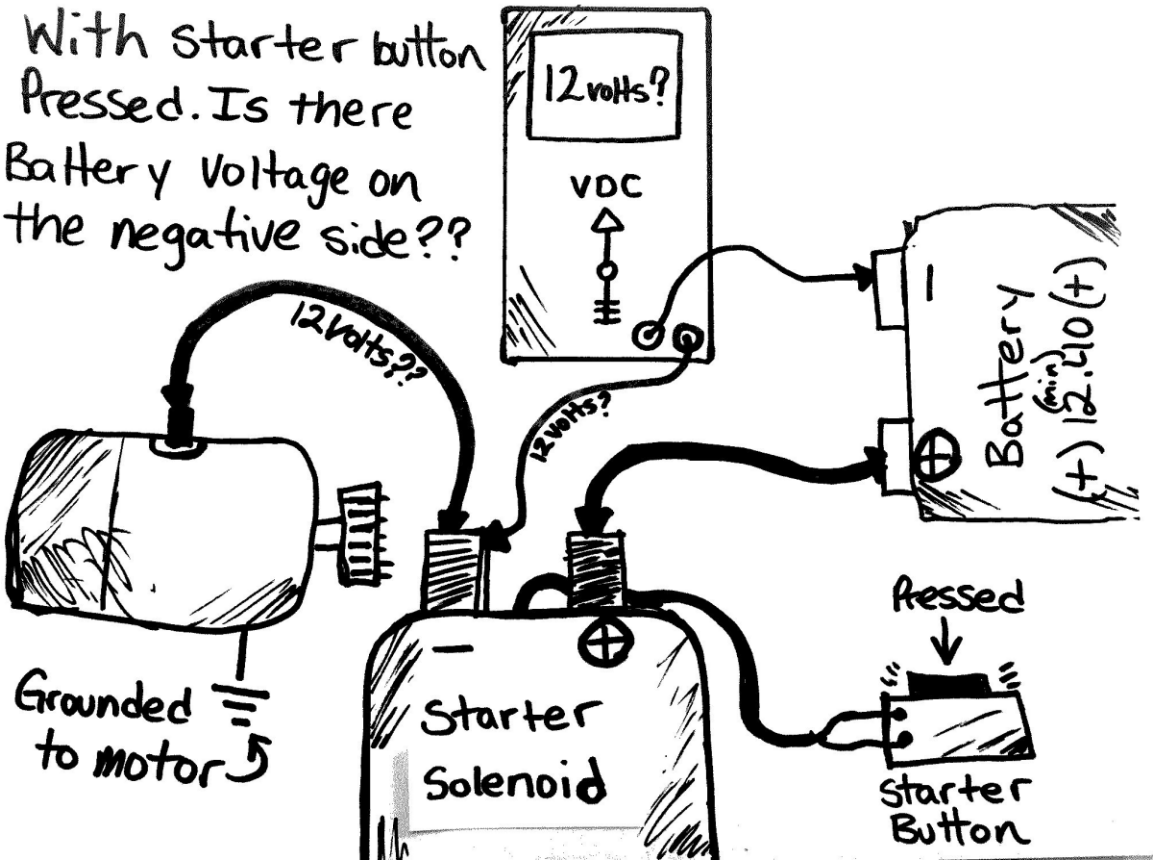
- One way will give you and actual resistance reading
- One way will give you and OPEN or OL or no reading at all.

Starter Solenoid

- Test for battery voltage on the positive side of starter solenoid/relay (commonly a red wire straight from battery)
  -Good? Move on.
  -Not good? Check wire for heavy resistance or bad connection



- Test for battery voltage on the negative side of solenoid (black wire, goes straight to starter) WITH STARTER BUTTON PRESSED IN.
  -Battery voltage? Move on.
  -No battery voltage or a big voltage drop? Check wiring from starter button to solenoid, if fine than replace starter solenoid.



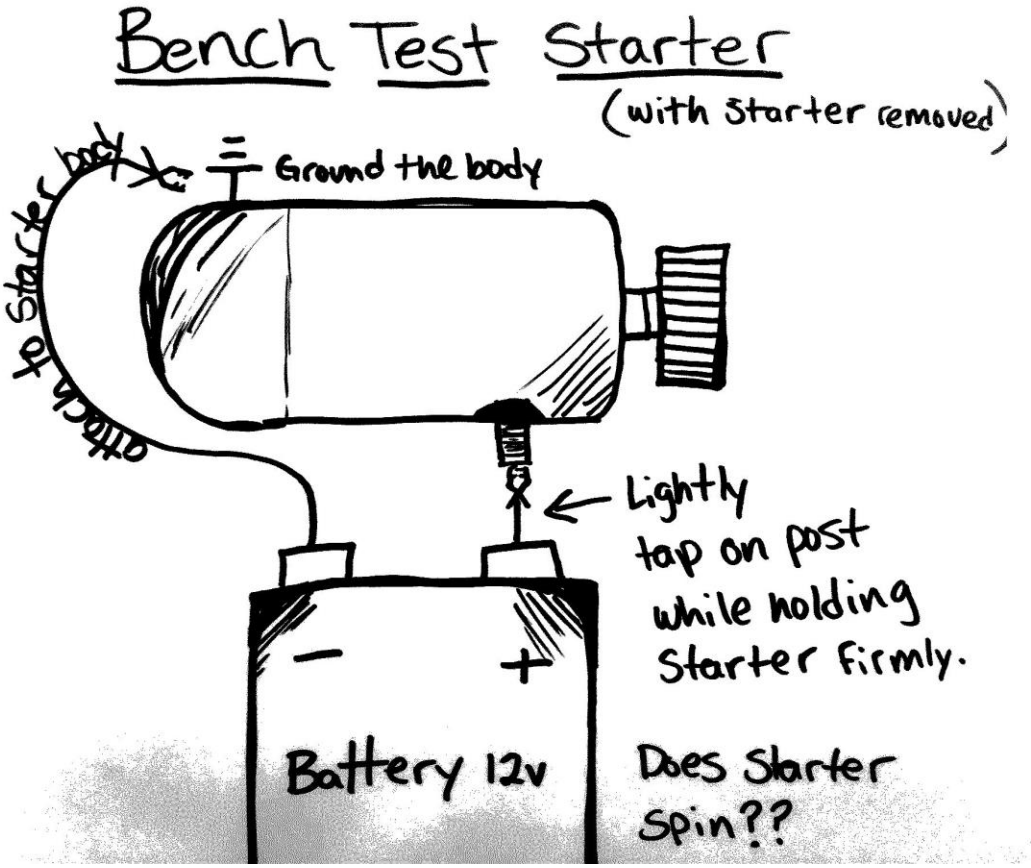
*Quick tip for testing starters: Using a pair of cheap pliers you can jump the starter solenoid by laying both ends of the plier's arms on both solenoid terminals at the same time. This will cause sparking momentarily but will force voltage to the starter. This method will either turn the motor over or do nothing at all. This then tells you that the problem is before the starter and

most commonly the solenoid. Try not to do this over and over and over again as it can cause heat buildup in the solenoid or starter wiring.

Starter

- If you have voltage to the negative side of the starter solenoid in the previous test you can move your test lead to the starter motor's cable found directly on the starter motor and perform the same test. IF battery voltage is present, than the issue is in the starter.
  *The only other issue you could have is that either the bike is equipped with other safety switches such as a side stand switch, neutral switch, or engine kill switch. These switches may or may not be integrated into your starting circuit but it all depends on manufacture specs.

- Bench test the starter, by removing it from the engine and grabbing a spare battery and jumper cables. Here is an image to help show you how to connect your wires.



**What's the Worst case scenario if everything checks out?*

Your motor is full of water, gas or oil and it is hydro-locked or something mechanical inside of the motor has come apart, bent, or exploded.

- Best thing to do then is to turn it through by hand with the spark plugs removed.

Section 6
Charging System Cheatsheet

I really don't want to go into a crazy amount of explanation for this system because it will take away from the quick testing techniques you can remember now.
Below I have some video links to tutorials I have made to help you better understand on from visual perspective.

Testing if the bike is charging

- With a multi-meter, set the meter to read VDC and place the red lead on the positive side of the battery. Place the meters black lead on the negative side of the battery. Run the bike and let it idle. Than bring the engines RPM's up to around 3,000 RPM. You should see that the voltage has increased on your meter no more than 14.8volts. This means that your system is In fact charging!

- If you notice that the more RPM's you give the bike the higher the voltage reads and starts climbing into the 15v-17v range than you need to replace you Regulator/Rectifier.
  *Bikes after the 70's use a combined REG/REC unit you will need to replace the entire unit.
  This means that your system is In fact charging!

  If you're looking to dive deeper into understanding charging systems for your bike, I have an awesome post that explains everything! You can check that out HERE

Stator testing
- **How to test a stator**

Regulator/ Rectifier Testing
- **Part 1**
- **Part 2**