
Giving Your
Starter Problems
The Brush-Off

MY TALE OF WOE

(and what I did about it)

By XJBikes.com user Tskaz
March, 2014

Has your starter stopped working, but your solenoid goes "click" when you hit the starter button?

Good battery, good solenoid, safety circuits working correctly, but you can bump start it and it takes right off?

That's where I'm at right now. In fact, I bump started it for over a year because sometimes life just gets in the way of the tinkering. Of course, it's my fault because replacing the starter brushes was one of the two things I didn't do when I recommissioned the old girl.

So here it is, March, and I still don't have her out on the road! I can't bump start the XJ650RJ Seca at my ex's house because of all the ice and mud still on the ground. We're about to fix that problem though, with a starter rebuild kit.

The kit I got came with o-rings, bearings, brushes, and brush plate. I only used the two large o-rings and brushes/brush plate because, well, that's all that my starter needed from the kit.

Since I had to pull the starter apart to rebuild it, I decided to do a write up for anyone wondering "Just what in the heck is inside that thing?".

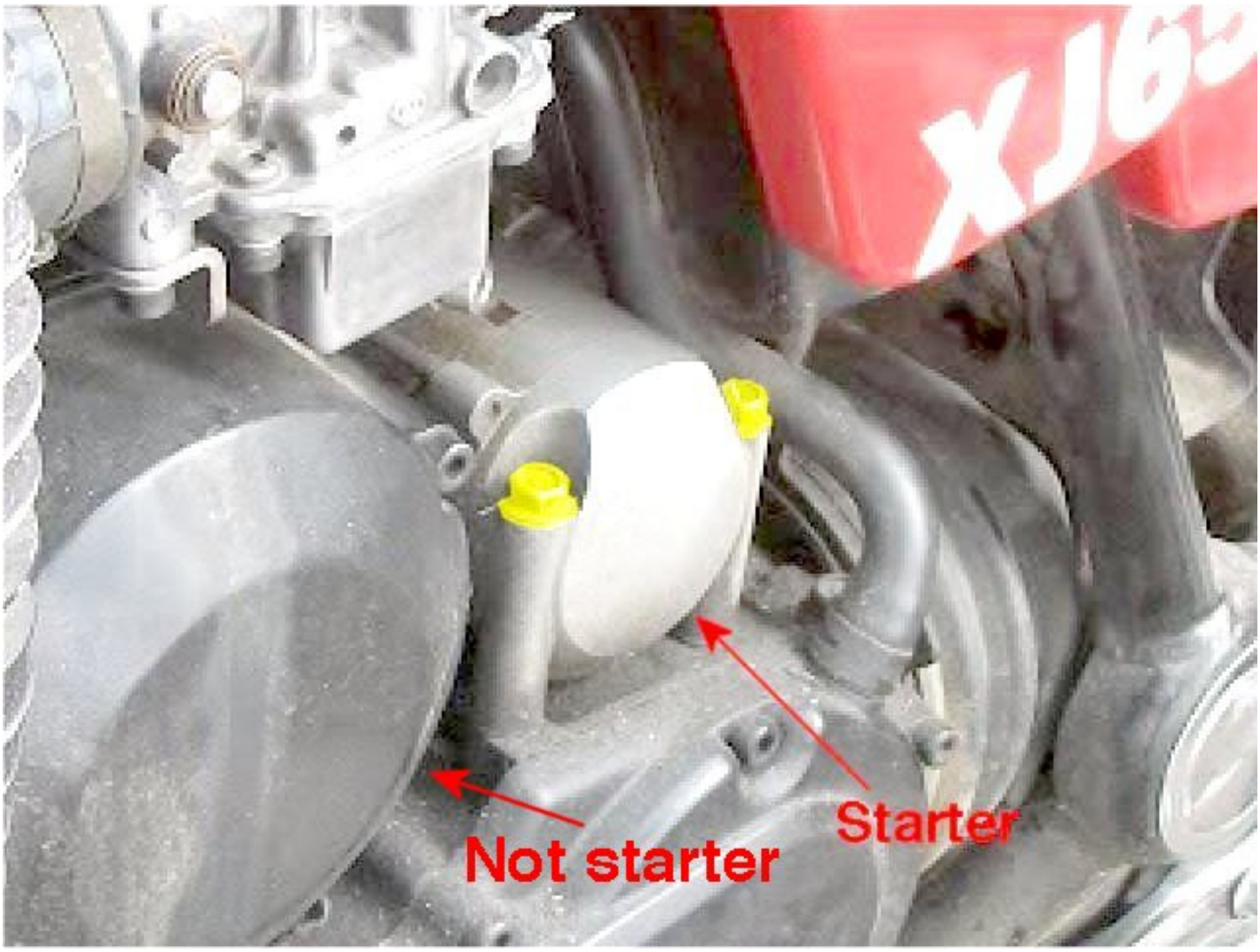
You will need:

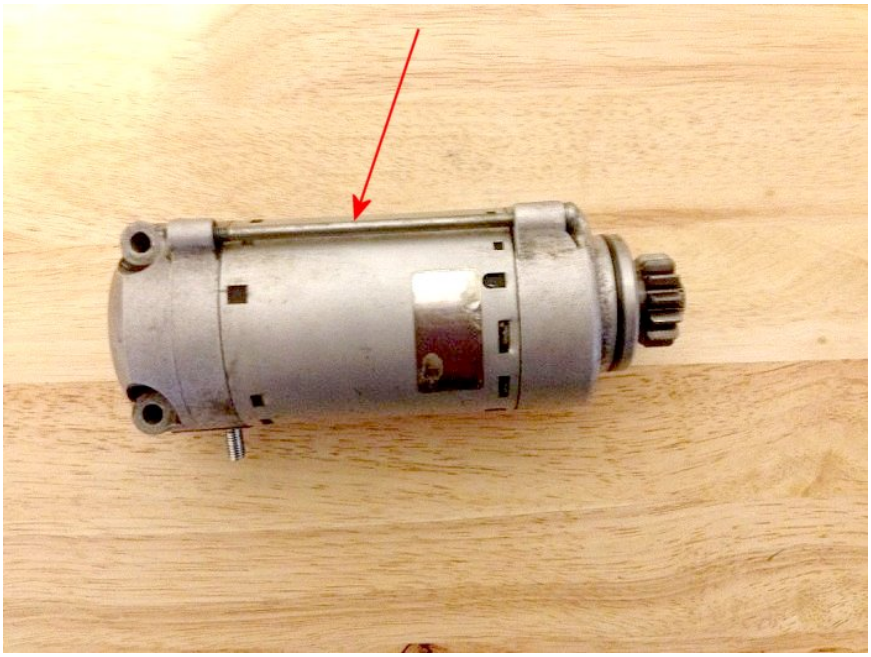
- Brushes set and outer o-rings, or a rebuild kit like I used
- 10mm wrench to remove the starter bolts
- JIS phillips screwdriver or equivalent
- Penetrating oil (if the screwdriver doesn't work right away)
- Locking pliers/vise grips (if neither the screwdriver nor oil work)
- Grease
- Disposable gloves if desired
- Shop towels or equivalent (recommended)
- Metal polish/Glass Paper (P2500 grit, chromium oxide)
- Spray electrical cleaner (Strongly recommended. Bordering on mandatory.)
- Multimeter for testing

About that electrical cleaner… if you do use it, make very sure the stuff you get is **safe for plastics**. DeOxit is good for this. There are some that are **NOT**; we especially don't want to use something aggressive like brake or carb cleaner, as we don't want to run the risk of dissolving the varnish coating/insulation on the armature wiring.

NOTE: we're showing and demonstrating the procedure on an XJ650-XJ900 style starter motor. XJ550, FJ600, XJ600, and XJ1100 starter motors differ in appearance and some minor aspects of design, but the basic procedure is the same.

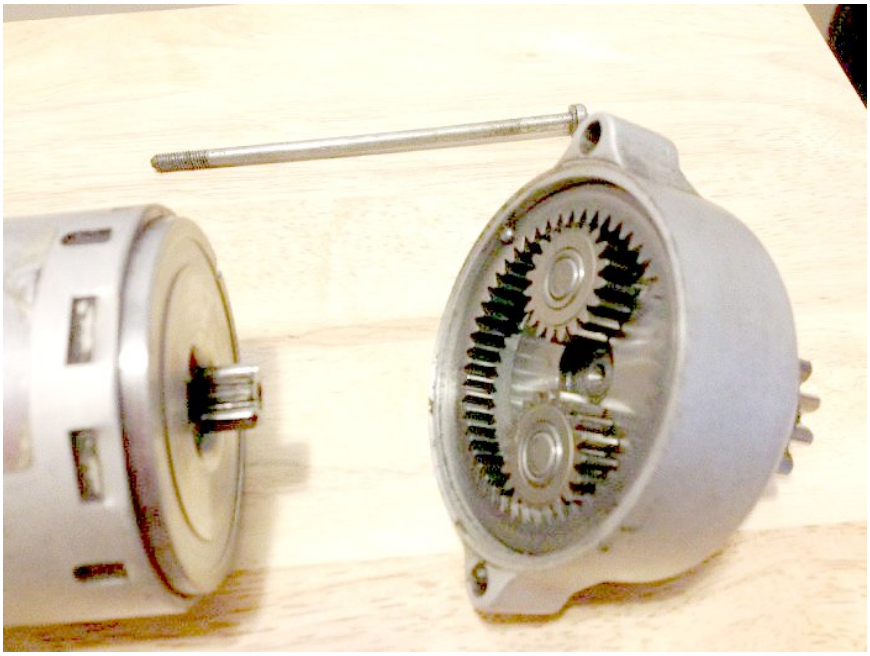
First we start by removing the starter, which is that silver looking thing (it's black on some models) on the left side of the motor with the red arrow pointing at it. All you have to do is remove the bolts (highlighted in yellow) and slide the starter out from the motor. Depending on how long the battery cable is (mine's not very long) you may be able to pull the starter all the way out to access the battery cable terminal located on the side. Disconnect the cable and remove the starter. It's a good idea to put the bolts back into the motor so you remember which one goes into which hole, since they are very different in length. Also so you don't lose them.





This is the starter as it sits on the table. Get ready for a fight.

Grab your philips and remove the two bolts that run almost the entire length of the starter...

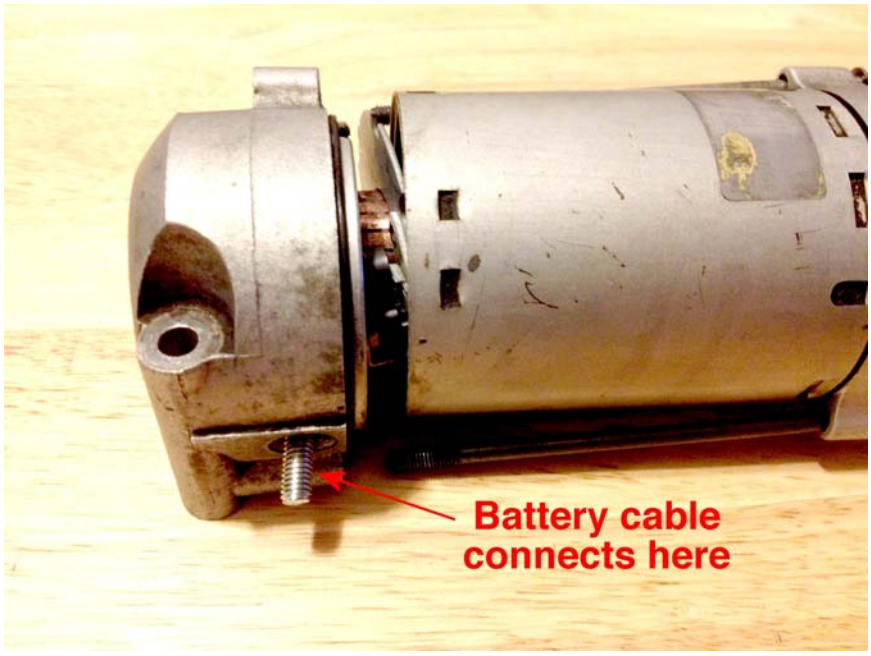


...and then you can remove the reduction gear housing from the stator housing.

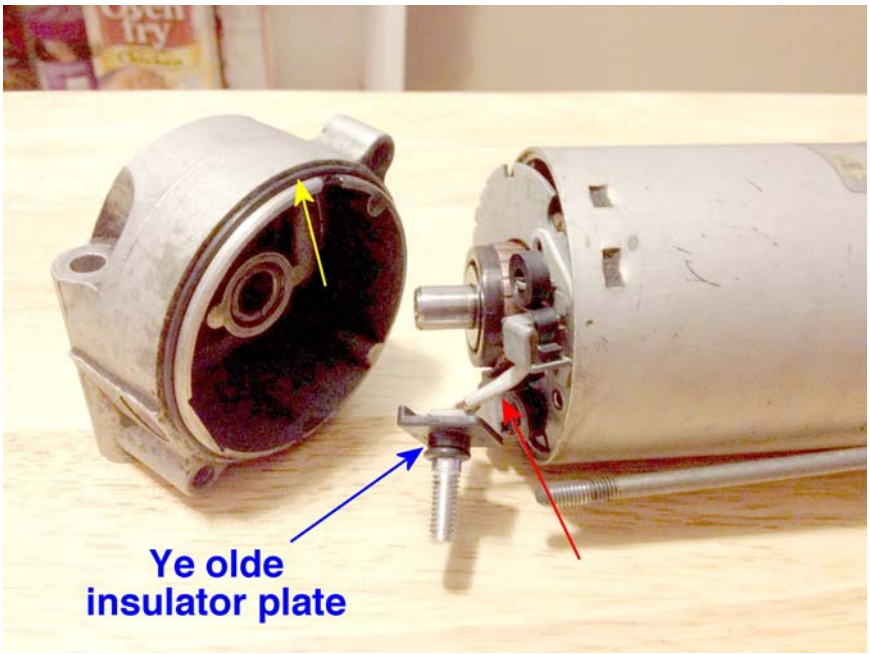
If the bolts come out without too much difficulty, great. If not, penetrating oil can be your friend. Failing that, a set of vise grips can be clamped onto the bolt head and used to break it loose.

Also: later on, we'll illustrate how to align both end housings when reinstalling. It works, but it's not really intuitive.

Something to consider might be, before taking the unit apart, making a little scratch mark across the seam where each end housing meets the body.



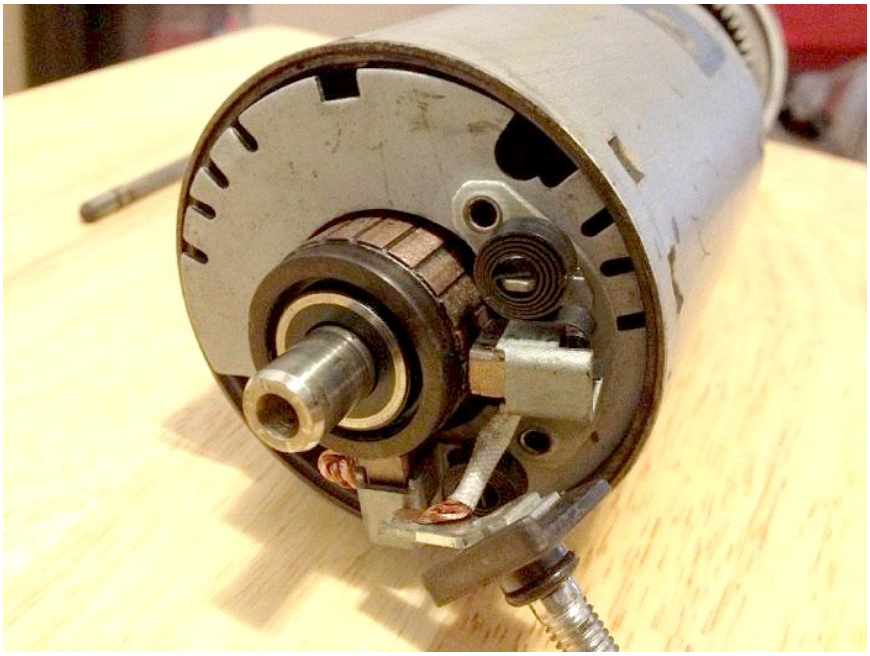
On the opposite end you need to pop off the brush plate cover but first, ESPECIALLY if you are only pulling it apart to check the brush length, you need to press the battery cable bolt through the housing...



...so that you don't break the copper wires connecting the brush to the bolt (red arrow).

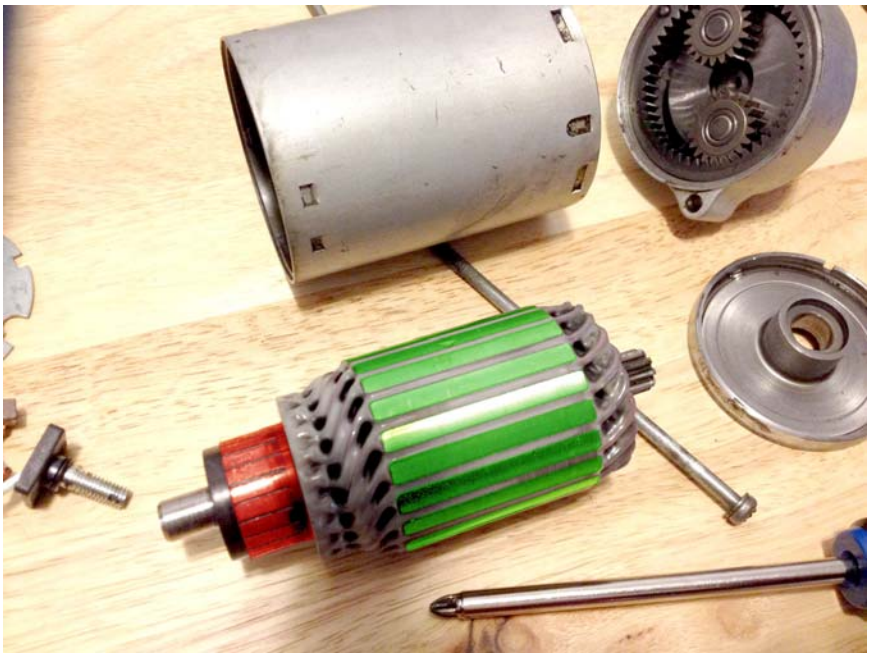
On the other hand, if you are replacing brushes it will come with a new bolt attached, so there's less of a worry.

Note the placement of the o-ring. (yellow arrow) Also, the insulator plate (blue arrow) at the bottom of the bolt you just pushed out; take note of how it sits. It only fits into the housing one way, and it's not always real obvious at first blush.



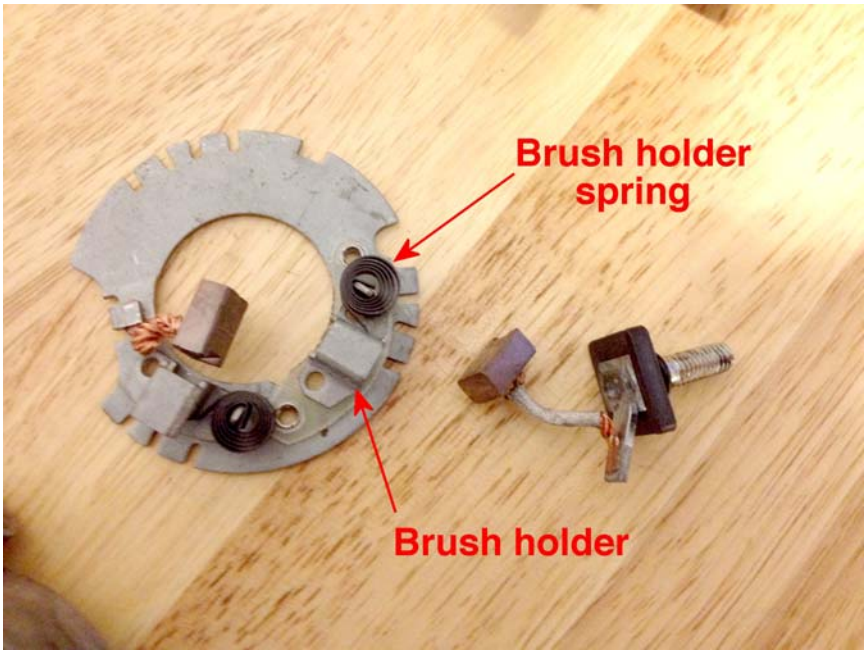
I took the pics for this tutorial after I had done the disassembly/reassembly, so the parts look clean.

The insides of your starter may look slightly more dirty, such as this.



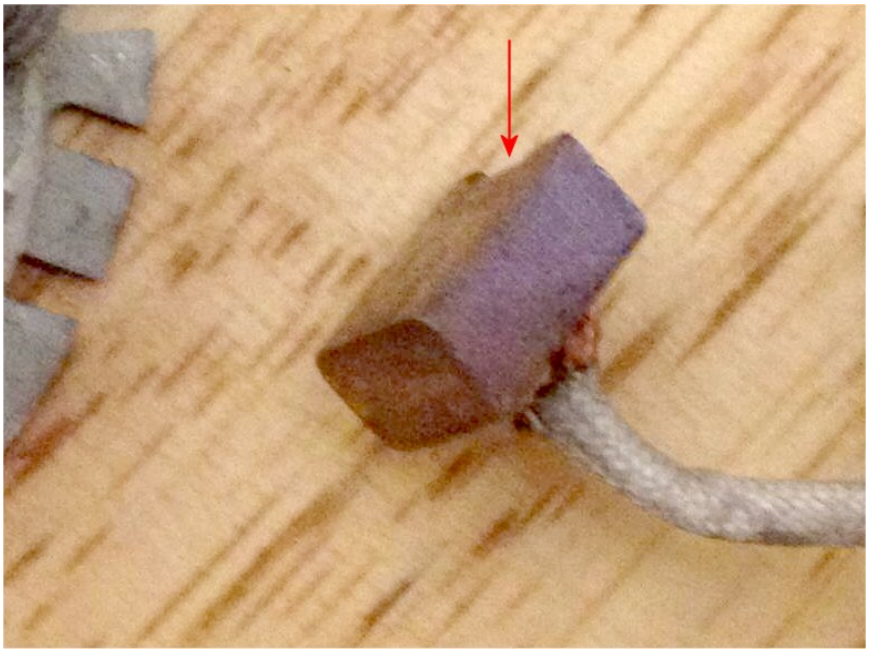
You want the armature (green) and comutator (red) areas to be clean. Use ONLY glass paper or metal polish on the commutator. You don't want to use anything harsher than this so as to not get particles embedded into the copper and cause premature wear of the new brushes.

Testing procedures for this component can be found later on.

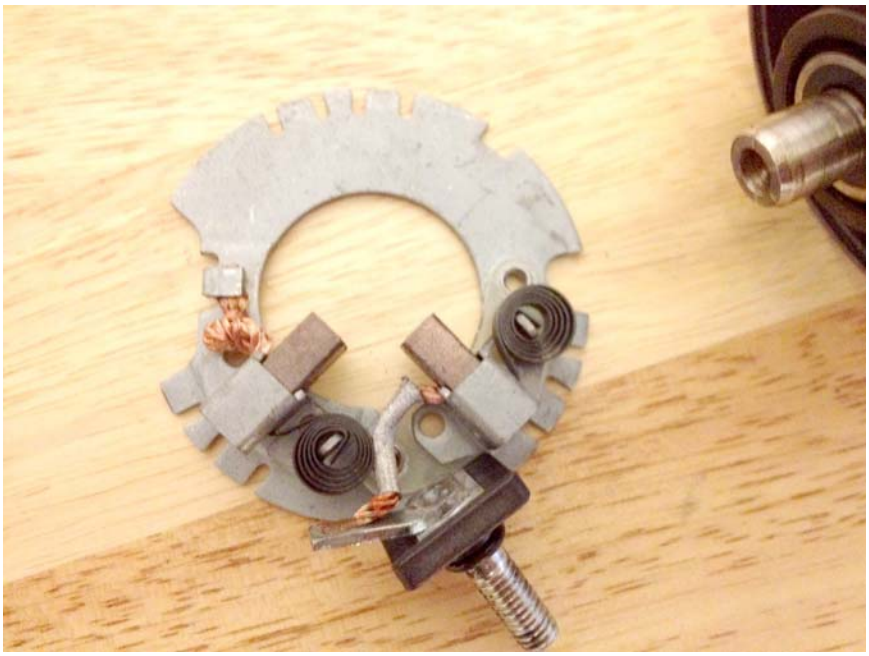


The new brushes need to be installed into the brush holder. If the brushes do not move freely you may need to sand the side or use a screwdriver to spread the holder out to accommodate the brush.

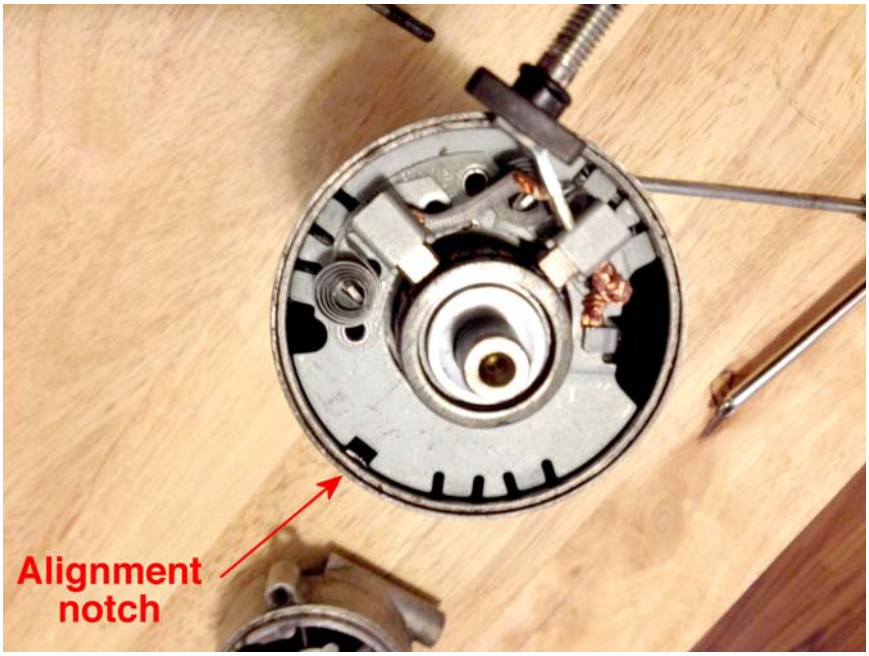
Again, check the testing procedures.



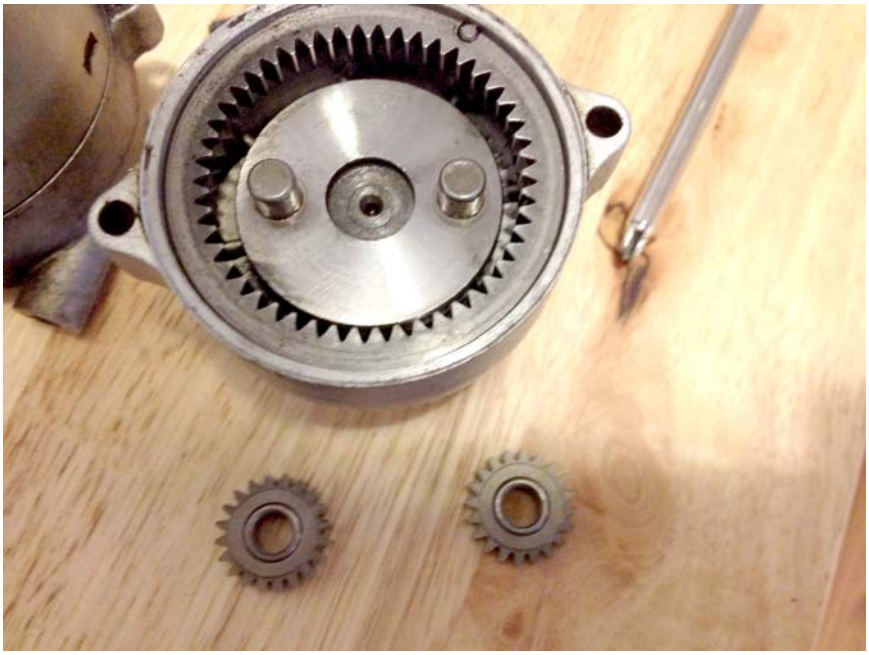
Note the red arrow pointing to the notch for the spring to set in. Make sure this is pointed away from the commutator when assembling.



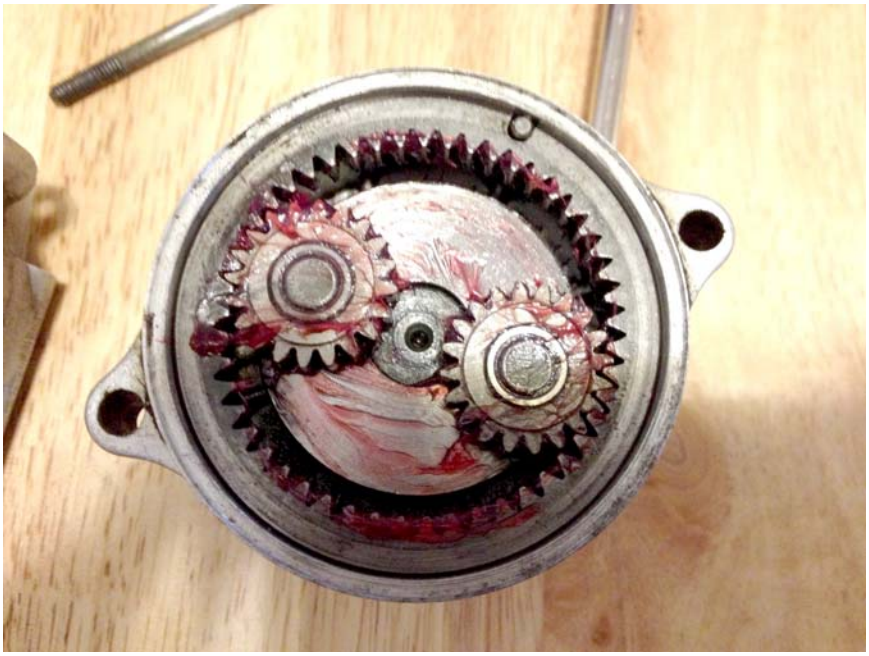
Once installed, also make sure the wires move freely in the area cut out for them. It should now look like this:



When installing the brush holder back into the stator housing, push the brushes into their holders and align the notch on the plate with the raised “peg” on the inside of the stator housing.

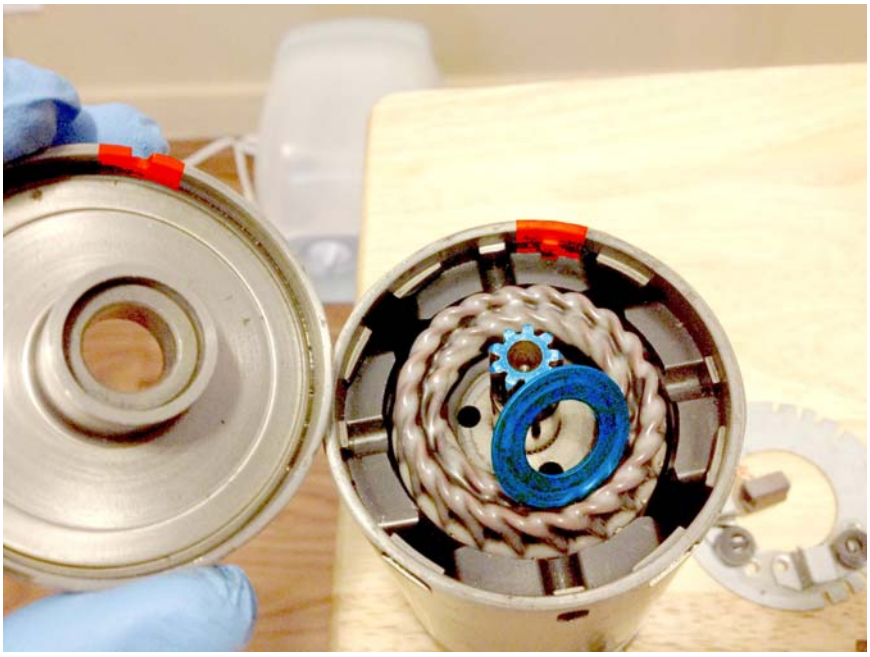


Now on to the reduction gear assembly. Pull out the reduction gears and thoroughly clean the inside and the gears themselves. I recommend nitrile gloves and lots of blue shop towels for this process.

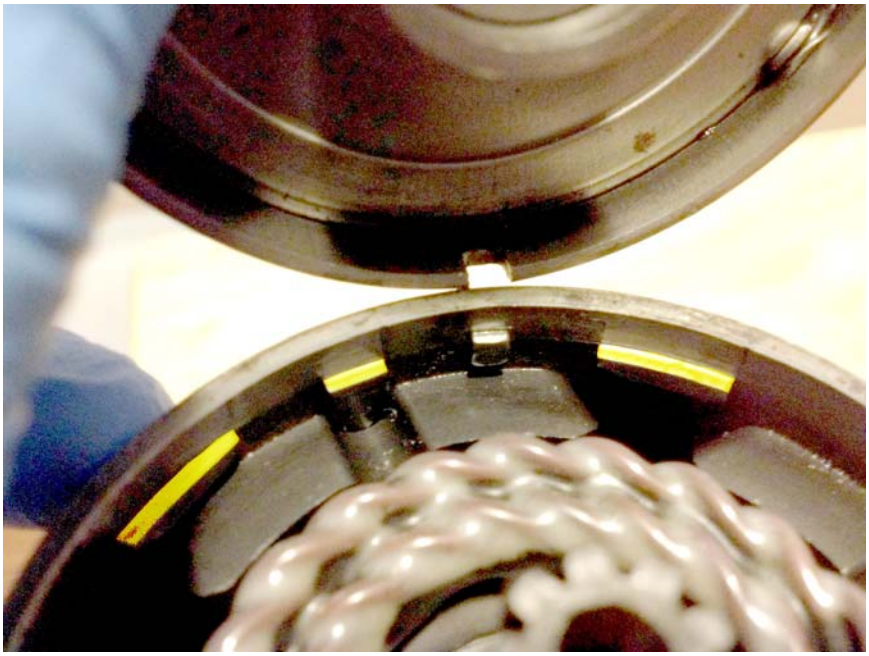


Once cleaned, grease the gears and re-install.

No, that's not a scene from the latest "Saw" movie – it's just red grease. XJ4Ever sells the stuff. Part number **HCP8608**.

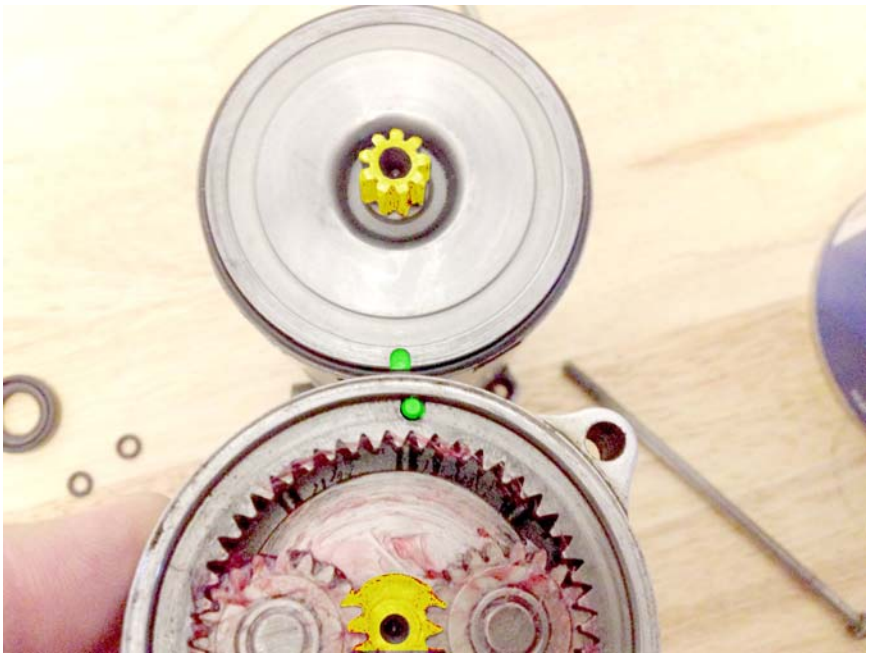


When installing the end plate before installing the reduction gear housing, note the alignment notch (neon red) and ensure to replace the washer (blue).



Close up view of the alignment notch. Note the yellow areas; these are what the end plate sits on. It does **not** sit flush with the outside of the housing.

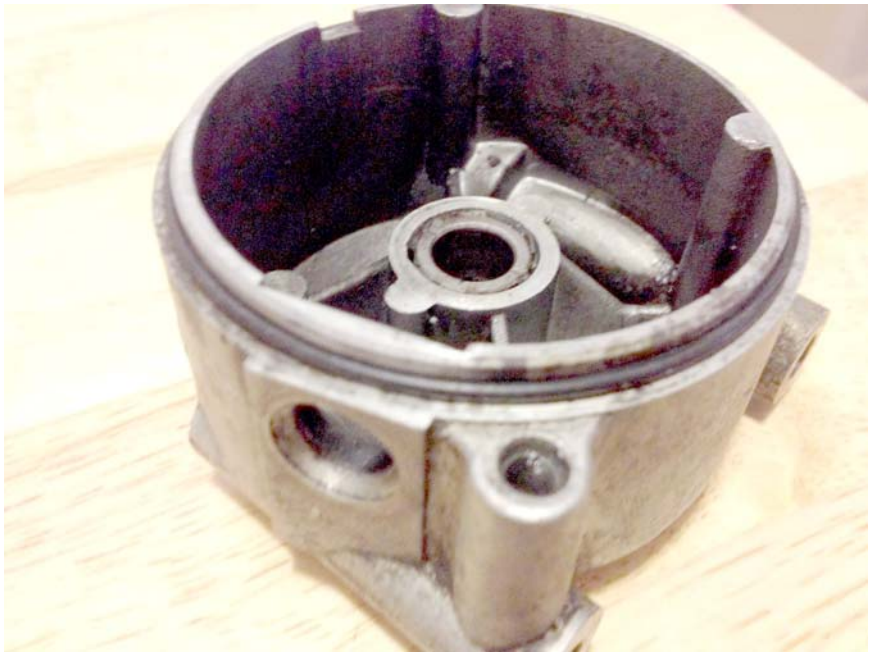
Install the outer o-ring for the reduction gear housing.



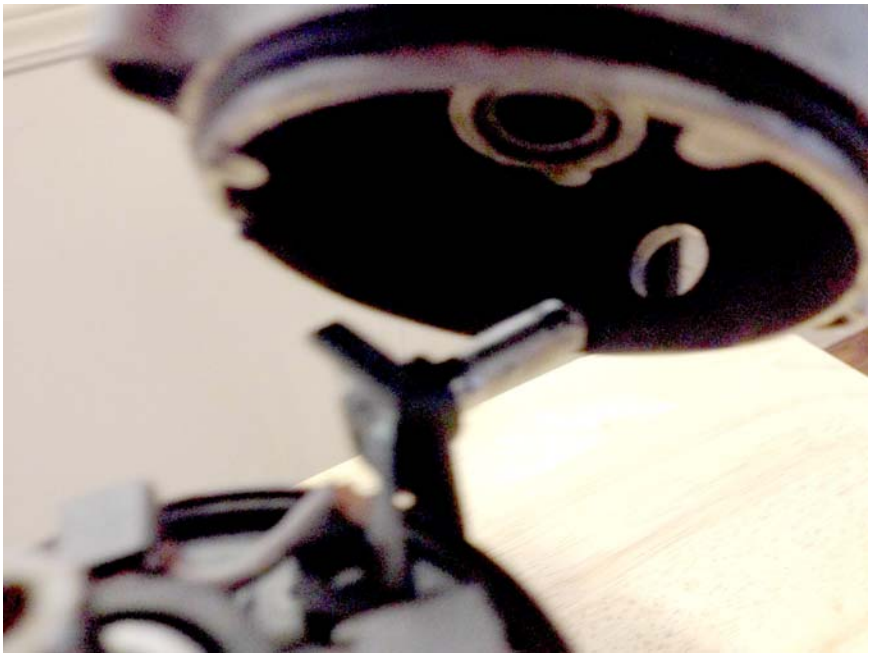
When installing the reduction gear assembly, take note of the alignment notch (green). Setting the armature gear into the reduction gears (yellow) takes a bit of patience to get everything lined up.

This picture shows the housings aligned properly, with the sides fitting flush. You will eventually get to this point...

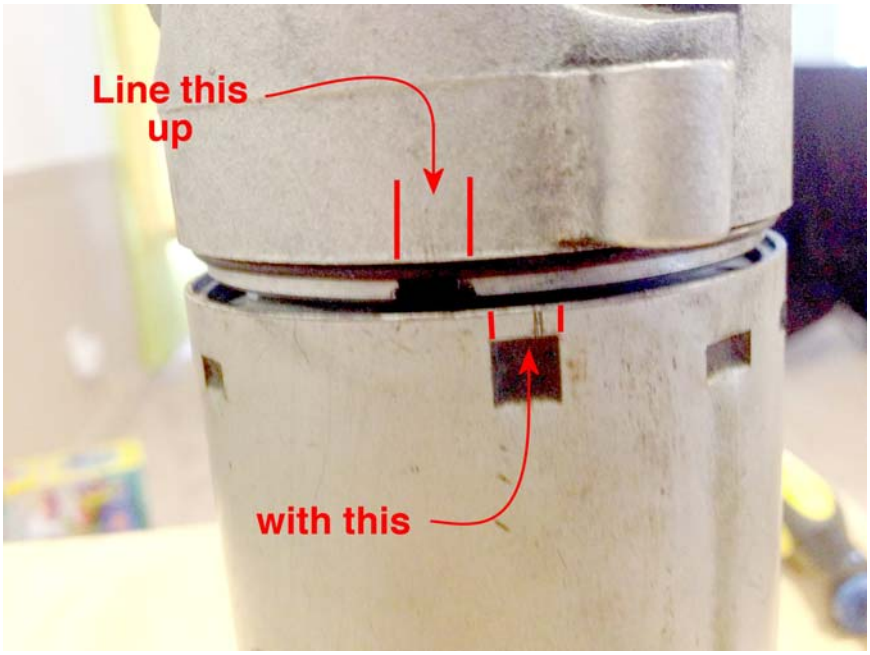
…but probably not without having to try a couple of times when you get off alignment as in this photo.



Then back to the brush end to install the other outer o-ring.



Get ready to slide the cable bolt through the housing as you install the brush end cover, but take a good look at the insulator plate first. If it's cracked and/or missing bits, you run the risk of grounding the starter out. If that happens, the starter won't spin, nor will you be able to bump-start the bike.



Align the notches (side view shown) as you press the entire assembly together. You can see here that the cap isn't (yet) aligned properly; when we suggested earlier that you make a mark on the housings, this is where that mark would come in real handy right about now.

Then it's just a matter of installing the two long screws to complete the assembly and installing the starter back on the bike.

When reinstalling the battery cable, don't forget to put the o-ring and plastic bushings back on as well. Notice I did **NOT** say metal washers. Again, we're trying to avoid grounding out the starter. If you need the bushings, look for **HCP6375** in the parts list.

Thus endeth my (almost) 18 month bump starting ritual.

TESTING PROCEDURES

As far as checking your starter motor, the only tests that you can do are on the commutator (the segmented "snout" of the entire armature) and the brushes, and are as follows:

a) If the surface is commutator is dirty, clean it with 800-grit or finer sandpaper or crocus cloth. Make sure that any dust generated by this process is completely removed.

b) The mica insulation on the armature... in between each of the raised "segments"... should be:

- 0.8mm (.03") below the level of adjoining segments on XJ550 and FJ600 starter motors.
- 0.6mm (.025") below the level of adjoining segments on all XJ650, XJ700, XJ750, and XJ900 starter motors.

If the depth of this mica insulation below the level of the segments is less than the specifications given above, you should scrape away the insulation until that depth is reached (a hacksaw blade or similar tool can be shaped to fit), or take the armature to an electrical service shop to have them undercut the mica to the appropriate depth.

c) Check the raised segments for continuity between each individual segment and each and every other segment. There should be continuity.

d) Check for continuity between every segment (assuming the test in "c" above has already been performed) and the shaft of the armature. There should not be continuity.

e) Check the resistance of the internal coil windings of the armature. You do this via measuring the resistance across every two adjoining segments. It should be:

- 0.012 ohms +/- 6% at 70-degrees F. for all XJ550 and FJ600 starter motors.
- 0.014 ohms +/- 6% at 70-degrees F. for all XJ650, XJ700, XJ750, and XJ900 starter motors.

f) Measure the outside diameter of the segments. The minimum acceptable diameter is 27.00mm.

If any of the above tests (c-f) fails, then the armature is bad and needs to be replaced.

g) Measure the length of the brushes. The minimum acceptable length is:

- 5.00mm for all XJ550 starter motors.
- 8.50mm for all XJ650, XJ700, XJ750, and XJ900 starter motors.

h) Check for continuity between each brush and the brush plate. There should be continuity.

i) Check for continuity between each brush and its terminal bolt. There should be continuity.

j) Check the condition of the shaft end bushings or bearings in the case. If they are worn, then they need to be replaced.

k) Check the condition of the ring and planetary gears. If they are worn or chipped, then they need to be replaced.

The only other procedure that is mentioned in the factory manual is to check the condition of the brush springs, and you are supposed to do that by comparing them to new ones... which is kind of hard to do. The springs should be considered serviceable if they snap the brushes firmly back into position when released from tension. The exact specification is:

- 550 +/- 50 grams (18.5 +/- 1.5 ounces) of pressure, measured via the use of a spring gauge, for all XJ550 and FJ600 starter motors.

- 800 +/- 150 grams (28.22 +/- 5.29 ounces) of pressure, measured via the use of a spring gauge, for all XJ650, XJ700, XJ750, and XJ900 starter motors.

Also, be very careful when re-assembling a starter motor. There is an alignment notch in the brush plate that must be aligned with the case properly, as well as alignment notches on the outside of the main case to the end caps. Failure to install the brushes and brush plate in their proper orientation can cause the starter motor to not work at all, or to even spin backwards! The correct rotation of the starter motor is counter-clockwise, looking at the butt-end of the motor (as it is installed on the engine); or, clockwise if you're looking the starter drive gear dead in its eye...

Finally, always be sure to use a premium, high-temperature grease to lubricate the internal gears and bearings, and do not attempt to clean the armature via the use of strong solvent sprays (brake cleaner, carb cleaner, etc.) as the solvents may break down the insulation on the coil windings, causing an internal short.

PARTS LISTING

Complete Starter Motors:

HCP4155 Aftermarket rebuilt/re-wound STARTER MOTOR fits all XJ550 and FJ600 models. This unit has the silver finish and is correct only for XJ550 models, but will fit both. A $50.00 core charge applies to this item, and a re-usable, same-model rotor must be returned for the core charge to be refunded. **NOTE**: "re-usable" means it is complete and has not been physically damaged in any way, in particular the end caps and case, and all of the gears cannot be damaged or chewed up in any way.

HCP20068 OEM original, brand new STARTER MOTOR fits all FJ600 models.

HCP20435 Aftermarket rebuilt/re-wound STARTER MOTOR fits all XJ550 and FJ600 models. This unit has a black finish and is correct only for FJ600 models, but will fit both. A $50.00 core charge applies to this item, and a re-usable, same-model rotor must be returned for the core charge to be refunded. **NOTE**: "re-usable" means it is complete and has not been physically damaged in any way, in particular the end caps and case, and all of the gears cannot be damaged or chewed up in any way.

HCP19794 Aftermarket rebuilt/re-wound STARTER MOTOR fits all XJ600 Seca II models. A $50.00 core charge applies to this item, and a re-usable, same-model rotor must be returned for the core charge to be refunded. **NOTE**: "re-usable" means it is complete and has not been physically damaged in any way, in particular the end caps and case, and all of the gears cannot be damaged or chewed up in any way.

HCP476 OEM original, brand new STARTER MOTOR fits all XJ650, XJ700, XJ750, and XJ900 models. Natural finish on the case, which is not correct for models that used a black-painted starter motor: XJ650 Midnight Maxim, XJ650 Turbo, XJ650RJ Seca, XJ700 all except N/NC models, XJ750 Midnight Maxim, 1983 XJ750 Seca, and XJ900 N/FN and F models.

HCP4156 Aftermarket rebuilt/re-wound STARTER MOTOR fits all XJ650, XJ700, XJ750, and XJ900 models. Features the correct bright silver finish on the case. And although this motor will fit properly, it is not correct for the following models which used a black-painted starter motor: XJ650 Midnight Maxim, XJ650 Turbo, XJ650RJ Seca, XJ700 all except N/NC models, XJ750 Midnight Maxim, 1983 XJ750 Seca, and XJ900 N/FN and F models. A $50.00 core charge applies to this item, and a re-usable, same-model rotor must be returned for the core charge to be refunded. **NOTE**: "re-usable" means it is complete and has not been physically damaged in any way, in particular the end caps and case, and all of the gears cannot be damaged or chewed up in any way.

HCP477 OEM original, brand new STARTER MOTOR fits all XJ650, XJ700, XJ750, and XJ900 models. Black finish on the case, which is correct for these models: XJ650 Midnight Maxim, XJ650 Turbo, XJ650RJ Seca, XJ700 all except N/NC models, XJ750 Midnight Maxim, 1983 XJ750 Seca, XJ750RL, and XJ900RK and RL models

HCP4156BLK Aftermarket rebuilt/re-wound STARTER MOTOR fits all XJ650, XJ700, XJ750, and XJ900 models. Black finish on the case, which is correct for these models: XJ650 Midnight Maxim, XJ650 Turbo, XJ650RJ Seca, XJ700 all except N/NC models, XJ750 Midnight Maxim, 1983 XJ750 Seca, XJ750RL, and XJ900RK and RL models. A $35.00 core charge applies to this item, and a re-usable, same-model rotor must be returned for the core charge to be refunded. **NOTE**: "re-usable" means it is complete and has not been physically damaged in any way, in particular the end caps and case, and all of the gears cannot be damaged or chewed up in any way.

HCP4157 Aftermarket rebuilt/re-wound STARTER MOTOR fits all XJ1100 models. Natural finish on the case. A $35.00 core charge applies to this item, and a re-usable, same-model rotor must be returned for the core charge to be refunded. **NOTE**: "re-usable" means it is complete and has not been physically damaged in any way, in particular the end caps and case, and all of the gears cannot be damaged or chewed up in any way.

An assortment or original OEM and aftermarket starter motor rebuild parts are available -- BRUSHES, O-RINGS, GASKETS, ETC. See the complete list of items available below.

The secret life of starter motors is revealed here, which may assist you in visualizing what the rebuild process will involve:

http://www.youtube.com/watch?v=n6Gq6XWvdp4

Starter Motor Rebuild Parts:

XJ550, FJ600, and XJ600 Seca II models:

HCP4020 Aftermarket starter motor BRUSH SET, fits all XJ550 and FJ600 models. Set of two brushes, either positive or negative. Order two sets to do one starter.

HCP485 OEM starter motor BRUSH AND PLATE SET, fits all XJ550 and FJ600 models. Complete set of four brushes with the mounting plate. **NOTE**: brushes and plate may differ in appearance from original but are designed to work properly in original starter motors.

HCP4160 Aftermarket starter motor BRUSH AND PLATE SET, fits all XJ550 and FJ600 models. Complete set of four brushes with the mounting plate. **NOTE**: brushes and plate may differ in appearance from original but are designed to work properly in original starter motors.

HCP18273 Aftermarket starter motor COMPLETE REBUILD KIT, fits all XJ550 and FJ600 models. Complete set of four brushes with the mounting plate, nose o-ring, end cap gaskets, bearing and oil seal, bushing, collars, positive post stud insulator and washers. All the items necessary to do a complete starter motor overhaul. **NOTE**: brushes and plate may differ in appearance from original but are designed to work properly in original starter motors.

HCP19800 Aftermarket starter motor COMPLETE REBUILD KIT, fits all XJ600 Seca II models. Complete set of two brushes with the mounting plate, nose o-ring, end cap gaskets, bearing and oil seal, bushing, collars, positive post stud insulator and washers. All the items necessary to do a complete starter motor overhaul. **NOTE**: brushes and plate may differ in appearance from original but are designed to work properly in original starter motors.

HCP2321 Aftermarket starter motor snout-to-engine case O-RING, fits all XJ550 and FJ600 models. It's a good idea to replace this o-ring whenever the starter motor is removed from the engine before re-installation.

HCP4845 OEM starter motor END GEAR CIRCLIP, fits all XJ550 and FJ600 models. Use 1 per starter.

HCP2568 OEM starter motor positive brush lead stud INNER NUT, fits all XJ550 and FJ600 models, not the same in appearance as original but will work properly. This flanged nut secures the positive brush stud to the motor case.

HCP315 OEM starter motor positive brush lead stud LOCK WASHER, fits all XJ550 and FJ600 models, not the same in appearance as original but will work properly.

HCP916 Aftermarket zinc-plated alloy steel with a natural finish, starter motor positive brush lead stud LOCK WASHER, fits all XJ550 and FJ600 models.

HCP319 Aftermarket 18-8 stainless steel starter motor positive brush lead stud LOCK WASHER, fits all XJ550 and FJ600 models.

HCP321 Aftermarket black oxide-coated alloy steel starter motor positive brush lead stud LOCK WASHER, fits all XJ550 and FJ600 models.

HCP2176 OEM starter motor positive brush lead stud OUTER NUT, fits all XJ550 and FJ600 models, not the same in appearance as original but will work properly. This nut secures the starter motor power cable to the positive brush lead wire stud.

HCP2563 OEM starter motor MAIN CASE GASKET, fits all XJ550 and FJ600 models. Use 2 per starter.

HCP15399 Aftermarket starter motor CASE BOLT, cinches the end caps together to the center case. Fits all XJ550 and FJ600 models. This allen-drive, socket head cap screw replaces the original phillips-drive, panhead screw, and is made from a bright-finish 18-8 stainless steel material. Use with the HCP319 lockwasher below. Use 2 per starter.

HCP15330 Aftermarket starter motor CASE BOLT, cinches the end caps together to the center case. Fits all XJ550 and FJ600 models. This allen-drive, socket head cap screw replaces the original phillips-drive, panhead screw, and is made from a black-oxide coated alloy steel material. Use with the HCP321 lockwasher below. Use 2 per starter.

HCP319 Aftermarket starter motor case bolt LOCK WASHER, 18-8 stainless steel. Use with the HCP15399 case bolt above.

HCP321 Aftermarket starter motor case bolt LOCK WASHER, black-oxide coated steel. Use with the HCP15330 case bolt above.

HCP3197 OEM starter motor mounting FLANGE BOLT, to attach the starter motor end case to the engine. Fits all XJ550 and FJ600 models. Use 2 per starter.

HCP21306 Aftermarket starter motor mounting FLANGE BOLT, to attach the starter motor end case to the engine. Fits all XJ550 and FJ600 models. Use 2 per starter.

XJ650, XJ700, XJ750, and XJ900RK models:

HCP486 Aftermarket starter motor BRUSH HOLDER, fits all XJ650, XJ700, XJ750, and all XJ900 models. Use one per starter, does not include the brushes.

HCP480 OEM starter motor POSITIVE BRUSH, fits all XJ650, XJ700, XJ750, and all XJ900 models.

HCP482 OEM starter motor NEGATIVE BRUSH, fits all XJ650, XJ700, XJ750, and all XJ900 models.

HCP4158 Aftermarket starter motor BRUSH SET, fits all XJ650, XJ700, XJ750, and all XJ900 models. Order one set to do one starter.

HCP4159 Aftermarket starter motor BRUSH AND PLATE SET, fits all XJ650, XJ700, XJ750, and all XJ900 models. Complete set of two brushes with the mounting plate. **NOTE**: brushes and plate may differ in appearance from original but are designed to work properly in original starter motors.

HCP18274 Aftermarket starter motor COMPLETE REBUILD KIT, fits all XJ650, XJ700, XJ750, and all XJ900 models. Complete set of two brushes with the mounting plate, nose o-ring, case o-rings (2), drive gear bearing and oil seal, end cap bronze bushing, planetary gear collars (2), positive post stud insulators and hardware. All the items necessary to do a complete starter motor overhaul. **NOTE**: brushes and plate may differ in appearance from original but are designed to work properly in original starter motors.

HCP6375 Aftermarket starter motor positive brush wiring lead STUD BUSHINGS SET, fits all XJ650, XJ700, XJ750, and all XJ900 models. Complete set of two plastic bushings that insulate the positive brush stud where it goes through the starter case. One set does one starter. **NOTE**: bushings may differ in appearance from original but are designed to work properly in original starter motors. These bushings are already included in the HCP4159 Brush and Plate Set listed above.

HCP3072 OEM starter motor END GEAR CIRCLIP, fits all XJ650, XJ700, XJ750, and all XJ900RK, RL, N/FN, and F models. Use 1 per starter.

HCP4976 OEM starter motor armature shaft SPACER WASHER, fits all XJ650, XJ700, XJ750, and all XJ900RK, RL, N/FN, and F models. Use 1 per starter. This ultra-thin shim “washer” fits on the armature at brush-plate end of the shaft. The larger, thicker washer that fits onto the armature shaft at the “gear end” of the shaft is different and is not currently available.

HCP2568 OEM starter motor positive brush lead stud INNER NUT, fits all XJ650, XJ700, XJ750, and all XJ900 models. This flanged nut secures the positive brush stud to the motor case.

HCP315 OEM starter motor positive brush lead stud LOCK WASHER, fits all XJ650, XJ700, XJ750, and XJ900 models.

HCP916 Aftermarket zinc-plated alloy steel with a natural finish, motor positive brush lead stud LOCK WASHER, fits all XJ650, XJ700, XJ750, and XJ900 models.

HCP319 Aftermarket 18-8 stainless steel motor positive brush lead stud LOCK WASHER, fits all XJ650, XJ700, XJ750, and XJ900 models.

HCP321 Aftermarket black oxide-coated alloy steel motor positive brush lead stud LOCK WASHER, fits all XJ650, XJ700, XJ750, and XJ900 models.

HCP2176 OEM starter motor positive cable-to-brush-stud OUTER NUT, fits all XJ650, XJ700, XJ750, and all XJ900 models. This nut secures the starter motor power cable to the positive brush lead wire stud.

HCP479 OEM starter motor snout-to-engine case O-RING, fits all XJ650, XJ700, XJ750, and all XJ900RK, RL, N/FN, and F models. It's a good idea to replace this o-ring whenever the starter motor is removed from the engine before re-installation.

HCP2320 Aftermarket starter motor snout-to-engine case O-RING, fits all XJ650, XJ700, XJ750, and all XJ900RK, RL, N/FN, and F models. It's a good idea to replace this o-ring whenever the starter motor is removed from the engine before re-installation.

HCP2564 OEM starter motor END CAP O-RING, fits all XJ650, XJ700, XJ750, and all XJ900RK, RL, N/FN, and F models. Use 2 per starter.

HCP18663 Aftermarket starter motor END CAP O-RING, fits all XJ650, XJ700, XJ750, and all XJ900RK, RL, N/FN, and F models. Use 2 per starter.

HCP3079 OEM starter motor CASE BOLT, cinches the end caps together to the center case. Fits all XJ650, XJ700, XJ750, and all XJ900 N, FN, and F models. Use 2 per starter. Bright plated. Some models used black finished bolts.

HCP15324 Aftermarket starter motor CASE BOLT, cinches the end caps together to the center case. Fits all XJ650, XJ700, XJ750, and all XJ900 N, FN, and F models. This allen-drive, socket head cap screw replaces the original phillips-drive, panhead screw, and is made from a black-oxide coated alloy steel material. Use with the HCP321 lockwasher below. Use 2 per starter.

HCP59 Aftermarket starter motor case bolt LOCK WASHER, black-oxide coated steel. Use with the HCP15324 case bolt above.

HCP3080 OEM starter motor-to-engine case SHORT BOLT, to attach the starter motor outer end to the engine case boss, rear position. Fits all XJ650, XJ700, XJ750, and XJ900RK and RL models. Use 1 per starter. Black, flanged hex-head bolt. Some models used natural finished bolts.

HCP14280 Aftermarket starter motor-to-engine case SHORT BOLT, to attach the starter motor outer end to the engine case boss, rear position. Fits all XJ650, XJ700, XJ750, and XJ900RK and RL models. Use 1 per starter. 18-8 stainless steel, bright finish, hex-head bolt. Note that the original bolt has a flanged head, which is not present on this replacement bolt, so you will need to use one of the washers listed below with this bolt.

HCP14281 Aftermarket starter motor-to-engine case SHORT BOLT, to attach the starter motor outer end to the engine case boss, rear position. Fits all XJ650, XJ700, XJ750, and XJ900RK and RL models. Use 1 per starter. 18-8 stainless steel, bright finish, allen-drive bolt matches the style of the side cover bolts. Note that the original bolt has a flanged head, which is not present on this replacement bolt, so you will need to use one of the washers listed below with this bolt.

HCP14282 Aftermarket starter motor-to-engine case SHORT BOLT, to attach the starter motor outer end to the engine case boss, rear position. Fits all XJ650, XJ700, XJ750, and XJ900RK and RL models. Use 1 per starter. Black-oxide coated alloy steel, allen-drive bolt matches the style of the side cover bolts. Note that the original bolt has a flanged head, which is not present on this replacement bolt, so you will need to use one of the washers listed below with this bolt.

HCP14287 Aftermarket starter motor-to-engine case LONG BOLT, to attach the starter motor outer end to the engine case boss, forward position. Fits all XJ650, XJ700, XJ750, and XJ900RK and RL models. Use 1 per starter. 18-8 stainless steel, bright finish, hex-head bolt. Note that the original bolt has a flanged head, which is not present on this replacement bolt, so you will need to use one of the washers listed below with this bolt.

HCP14288 Aftermarket starter motor-to-engine case LONG BOLT, to attach the starter motor outer end to the engine case boss, forward position. Fits all XJ650, XJ700, XJ750, and XJ900RK and RL models. Use 1 per starter. 18-8 stainless steel, bright finish, allen-drive bolt matches the style of the side cover bolts. Note that the original bolt has a flanged head, which is not present on this replacement bolt, so you will need to use one of the washers listed below with this bolt.

HCP14289 Aftermarket starter motor-to-engine case LONG BOLT, to attach the starter motor outer end to the engine case boss, forward position. Fits all XJ650, XJ700, XJ750, and XJ900RK and RL models. Use 1 per starter. Black-oxide coated alloy steel, allen-drive bolt matches the style of the side cover bolts. Note that the original bolt has a flanged head, which is not present on this replacement bolt, so you will need to use one of the washers listed below with this bolt.

HCP6642 Aftermarket starter motor-to-engine case mounting bolt FLAT WASHER, required for use with any of the aftermarket mounting bolts listed above. Zinc-plated steel. Use 1 per long or short aftermarket bolts.

HCP14283 Aftermarket starter motor-to-engine case mounting bolt FLAT WASHER, required for use with any of the aftermarket mounting bolts listed above. 18-8 stainless steel. Use 1 per long or short aftermarket bolts.

HCP14284 Aftermarket starter motor-to-engine case mounting bolt FLAT WASHER, required for use with any of the aftermarket mounting bolts listed above. Black-oxide coated hardened alloy steel. Use 1 per long or short aftermarket bolts.

HCP14285 Aftermarket starter motor-to-engine case mounting bolt FLAT WASHER, required for use with any of the aftermarket mounting bolts listed above. Black-oxide coated hardened stainless steel. Use 1 per long or short aftermarket bolts.

XJ1100 models:

HCP481 OEM starter motor POSITIVE BRUSH, fits all XJ1100 models.

HCP483 OEM starter motor NEGATIVE BRUSH, fits all XJ1100 models.

HCP4908 Aftermarket starter motor BRUSH SET, fits all XJ1100 models. Order one set to do one starter.

HCP18275 Aftermarket starter motor COMPLETE REBUILD KIT, fits all XJ1100 and XS1100 models. Complete set of four brushes with the mounting plate, brush springs, nose o-ring, end cap o-ring, case gasket, bearing and oil seals, bushing, collars, positive post stud insulator and washers. All the items necessary to do a complete starter motor overhaul. **NOTE**: brushes and plate may differ in appearance from original but are designed to work properly in original starter motors.

HCP2566 OEM starter motor snout-to-engine case O-RING, fits all XJ1100 models. It's a good idea to replace this o-ring whenever the starter motor is removed from the engine before re-installation.

HCP6841 Aftermarket starter motor END CAP O-RING, fits all XJ1100 models. Use 1 per starter.

HCP3077 OEM starter motor case LONG BOLT, cinches the end caps together to the center case. Fits all XJ1100 models. Use 2 per starter.

HCP3701 OEM starter motor cover mounting BOLT, use 2 on all XJ1100 models. Originals were bright plated, these replacements feature a dark phosphate plating.

HCP13157 Aftermarket starter motor cover mounting BOLT, use 2. Bright plated hex-head 18/8 stainless steel bolt is correct for all for all XJ1100 models.

HCP2533 OEM starter motor cover mounting BOLT, use 1 on all XJ1100 models.

HCP2173 OEM starter motor cover mounting bolt FLAT WASHER, use a total of 3 on all XJ1100 models.

Starter Motor ID Decals:

HCP15132 Aftermarket starter motor case ID DECAL, black foil decal with the brushed silver 4K0-81800-50 wording. This decal is used on all models that have black-painted starter motors. Used on the XJ650, XJ700, XJ750, and XJ900 models.

HCP15189 Aftermarket starter motor case ID DECAL, black foil decal with the brushed silver 4H7-81800-50 wording. This decal is used on all models that have silver-painted starter motors. Used on the XJ650, XJ700, XJ750, and XJ900 models.