Alternator rebuilt

This time we will attempt to rebuilt the alternator of our 33. Although there might not be any obvious signs of wear it is always a nice practice to follow preventive maintenance in order to maximize your car's reliability. Obvious signs of a warn alternator can be noise coming from its bearings or the none obvious ones can be weak battery charge and on many cases the battery check light of the dashboard lights especially when the electrical circuit is on load (heater, lights, rear heated windscreen etc.). The usual procedure to revive your alternator is straightforward; new bearings and voltage regulator brushes will surely give to the alternator double life. What you will need for a rebuilt are the following:

1. New bearings (SKF number 6201 - 6203)
2. New voltage regulator brushes (show your voltage regulator to the auto electric shop in order to get the correct size brushes)
3. Soldering gun
4. Electrical drill
5. Bearing puller
6. 24 mm wrench & 10mm Allen key

It is high time we started our project

These are the new bearings out of their package ...

... and these are the new brushes that will replace the old ones

Using the 24 mm wrench and the 10 mm allen key, remove pulley and fan of the alternator. Do not mix the order of the washers under the nut and fan.

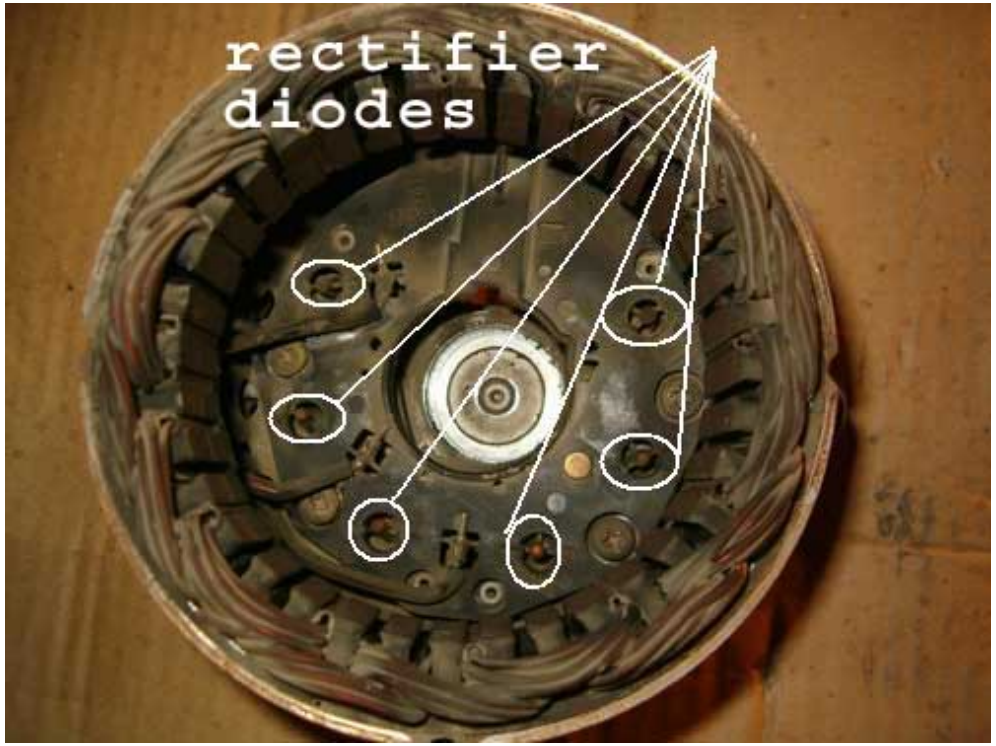
Here is the alternator without pulley and fan. We now need to undo the four bolts on the circumference of the casing. Since these bolts may have never been out, it is pretty likely to ruin their head as they are stuck to the alternator body; do the following trick and you won't miss a single bolt!

Get hold of a carpenter's brace and a cross screwdriver tip. Make sure that the tip perfectly fits to the screw head.

Tighten the brace and using the pliers just unscrew the bolt. It will loosen right away.

Now using the bearing extractor, pull out the front case of the alternator. Just screw in the vertical bolt and the case will slide out of the rotor

Here is the front case extracted. You can see the front bearing (SKF 6203) in the centre and the two bolts keeping the plate attached to the body.



This is the heart of the alternator. You can see the stator in the circumference and the rectifier bridge in the centre. Notice the six diodes (brown color) of the bridge; these actually convert AC to DC for the electrical system.

Back view of the rectifier bridge

These are the cases of the alternator. Here you can see then cleaned with diesel fuel which eats away dirt.

back view

front view (rotor side)

front view (pulley side)

cooling fan cleaned

Now we will remove the bearing from the rotor using the extractor. Do not attempt to remove it by using other means !!! You can easily damage the slips rings and you may need to replace the rotor!

A close -up of the bearing which has lost its grease ... Needless to say that the play of the outer diameter is big enough!

Bearing is half way out ...

... and finally got it out! Both bearings are shot.

Now it is time to flatten and polish the slip rings.

Place the rotor to the drill ...

... and cut long pieces of sandpaper. You can use at this phase 240 grit sandpaper.

Rotate the drill at low speed and place the sandpaper so that it covers the surface of the slip ring.

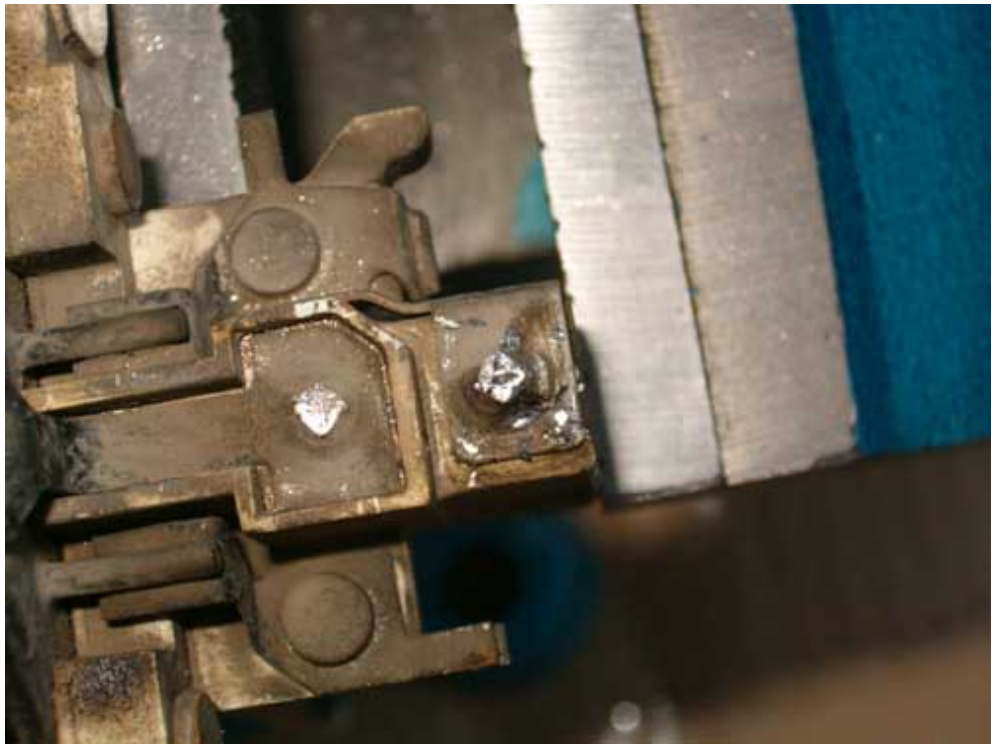
Half of the machining is completed

When you have reached the above state you can actually polish the rings using very fine sandpaper in order to give a shiny view and smooth any roughness created by the 240 grit sandpaper.

Now lets install the rear bearing (SKF 6201).

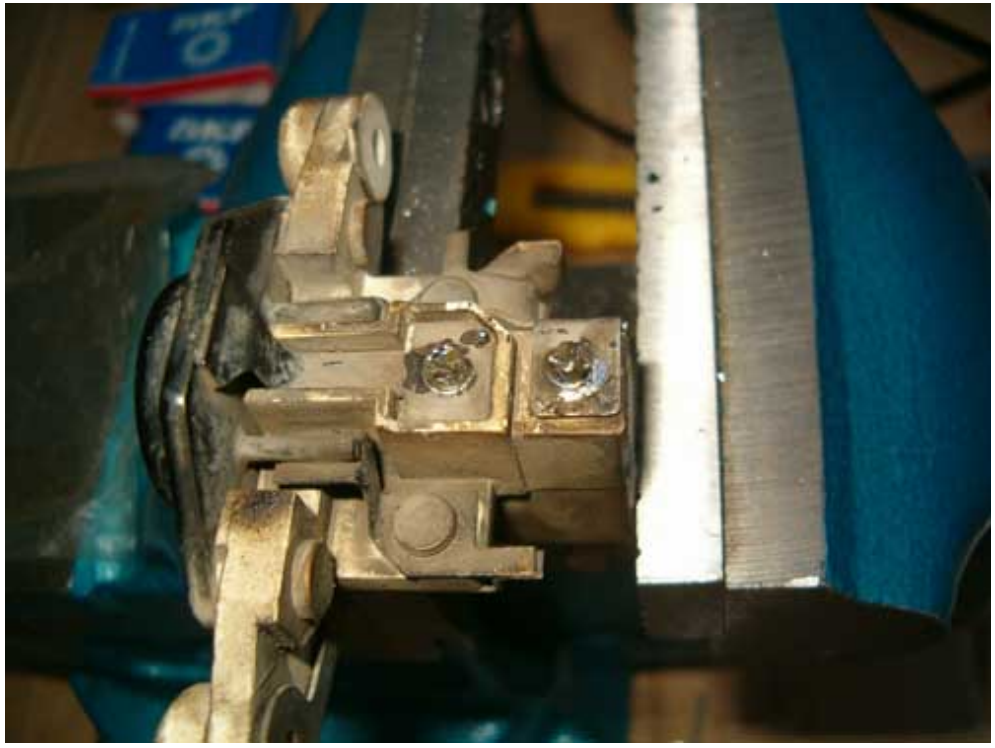
Here is a critical part. Find a socket exactly the size of the bearing inner ring. Place the socket on top and with a hammer punch it steadily making sure to have the bearing sitting vertical to the axis of the rotor. Do not use another way for this installation as hitting the bearing anywhere except its inner ring, it will definitely destroy the inner balls and both rings (inner and outer).

It is now time to replace the regulator brushes. Place the regulator in the vice and with a metal saw, cut the ends of the brushes extruding. It is then much easier to unsolder the brushes.



A close-up of the extruded brush end cut away

Install the new brush along with the retaining spring and solder the brush wire to the body of the regulator



Here you see both brushes replaced and the remaining wire ends cut out. We are now ready to proceed assembling the alternator.

The case, pulley and fan have been painted with high temperature silver enamel paint

Let's now install the front bearing (SKF 6203). Just install it on its place; no need to hit or press it in.

Then install the support plate along with its screws and fully tighten them.

This is the rectifier bridge and the visible portion of it painted in red. We have masked everything out with newspaper sheets and paper tape.

ready to start assembly

Bolt in the four screws fixing rectifier bridge to case ...

... and press in the rotor to the case.

install front cover and with a socket punch in the washer as seen in the photo. Also install and bolt in the four long screws that actually keep the cases and rectifier bridge together.

install washer ...

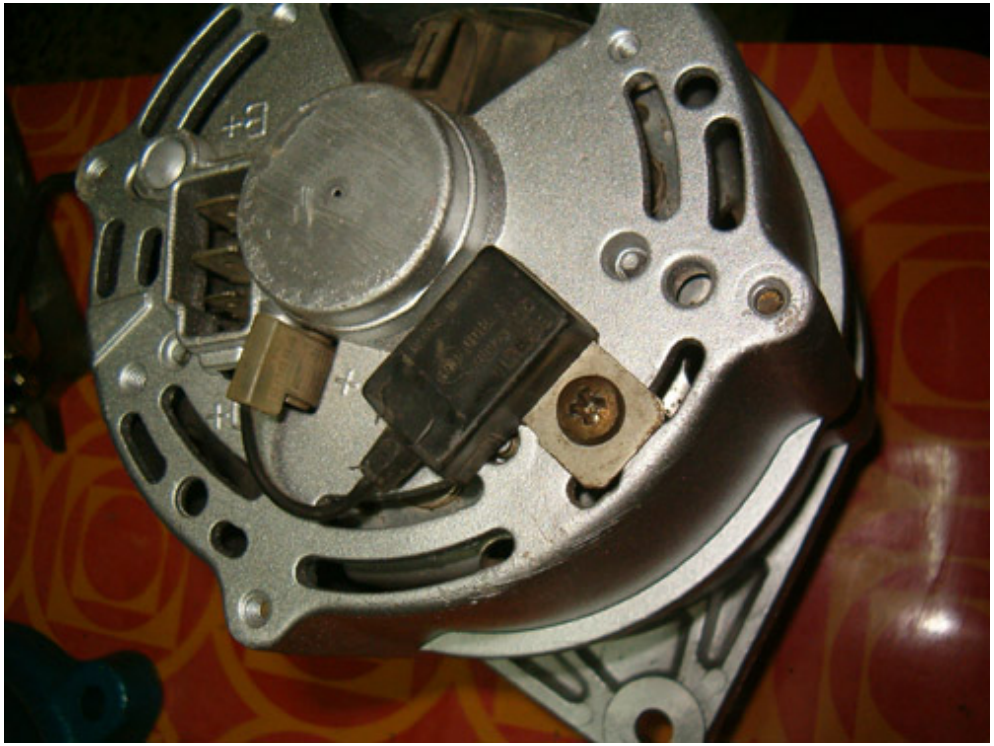
... then larger washer on top ...

... and cooling fan.

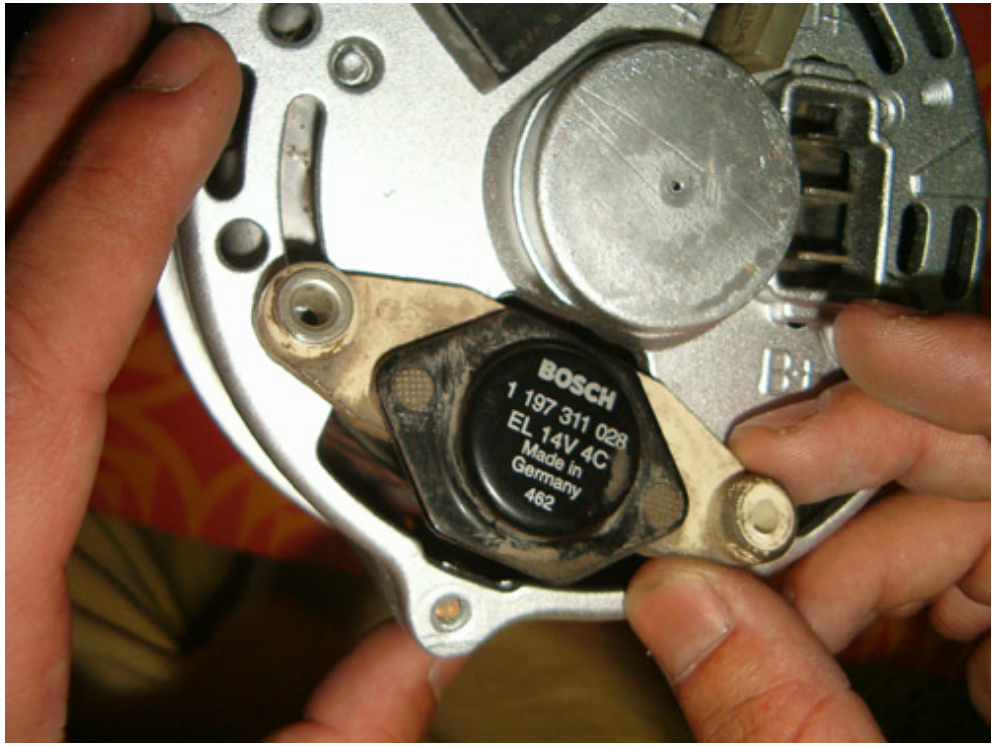
Then install semi-pulleys ...

... and finally the two washers and securing nut.

Now fully tighten the nut (24 mm key) with the help of a 10mm allen key



Proceed installing the capacitor which has as purpose to absorb high frequency electrical waves created by current generation. Without this device you could hear in your radio player high pitched sounds which would otherwise escape from the electrical system.



Finally install voltage regulator.

Alternator is now ready for installation to the car. We measured the output of it on idle and it was almost 14 V; on 2,500 rpms it reached 14.3 V. For sure the alternator will last double years as this was a ground - up restoration. Well done!

1991 Alfa 33 1.4 IE

Athens - Greece