AUTO ELECTRIC CORNER — Iskra-Letrika Online & WAI1000 Tester



BY MOHAMMAD SAMII

The use of semi-conductor devices to control a large amount of current at high voltage is the basis of power electronics, which makes the control of large traction/drive motors, cars, trucks and hybrid vehicles possible. In the heart of power electronics lays the Insulated Gate Bipolar Transistor or simply IGBT. These devices have the ability to switch a high amount of current at high voltage and at high speed. This makes them suitable for industrial controls for a variety of high output motors that can drive large machines as well as electric and hybrid cars when used with associated inverters.

For instance, IGBT's in the boost inverter of my 2015 Toyota Prius can handle over 600 volts and at sufficient amps to drive the MG2 (Motor/Generator 2) to get the car rolling or assist the engine if sudden acceleration is needed. All of this is possible because of the IGBT's and their unique capabilities.

My intention here is not to talk about power electronics or hybrid cars (perhaps in a future article or seminar), but I would like to mention that these types of hi-power electronic devices are coming into the field of rotating electrical and are replacing the traditional rectifier diodes that we have been familiar with for decades.

I saw a sample of this in the IAT's (International Automotive Trading) booth at the Big R Show in Las Vegas last October. Obviously Valeo has introduced this new generation rectifier that uses hi-power transistors much like IGBT's in place of the regular familiar diodes. The claim is that they run much cooler and can easly handle the larger currents generated in the newer higher-powered alternators. I believe the plan is to perhaps use these transistorized rectifiers in lower car lines such as VW and Audi before fully utilizing them in the higer-end vehicle applications such as BMW, Mercedes,…etc. (*Figure 1*).

What that means is that those of us who will be in this business into the future will see and work on these units. The fact that more investment in appropriate test equipment and learning new testing procedures will be the next order of the thing, as it has always been when newer technologies and devices appear on the market.

Iskra/Letrika/Mahle Parts and Service info.

The Case/New Holland line of Ag and industrial equipment (as well as many others) are large users of Letrika/Mahle (former Iskra) starters and alternators. The availability of these units through the dealership is sparse and expensive, and their own factory reman units that are usually labeled as CNH (Case New Holland) are very rare. Given the complexity of some of the starters and lack of availability (or very high OE price) of the spare parts, I can see the reason for mediocre availability that even affects the equipment dealers.

Our recent experience with one such starter was with an 11.131.260 Iskra number that I believe fits a 2007 New Holland T8010 tractor or similar machine. There is no breakdown or BOM for this starter on any website of our general industry suppliers, and that's when we discovered that there is indeed some help available.

The company, Letrika/Mahle, still keeps a complete catalog of parts and technical information for the Iskra units that anyone can access. You can simply go to www.letrika.com/katolog (note: katalog with K). Once it opens, it gives you options for 9 different languages. You simply click on GB (Great Britain)…- for English. If you speak Slovenian, German, French, Italian, Spanish, Portuguese, Russian, or Czech, you are also covered…!

Once the next page opens, it offers a list of 6 sections consisting of application, cross-referencing, spare parts, etc., as shown in Figure-2. In Spare Parts you can type in the Iskra number, then detailed unit breakdown will appear with major parts identified by a number (*Figure 3*). Click on the item you need, a window will open and show you the part number. A quick check on your supplier's website or a call can confirm the availability and the price.

The part that we needed was the MSX 164 starter drive (nearly $90). It was our luck that J&N had one at that time. The installation of of the drive was quite challenging. It has one of those with a hidden collar and snap ring combination that the

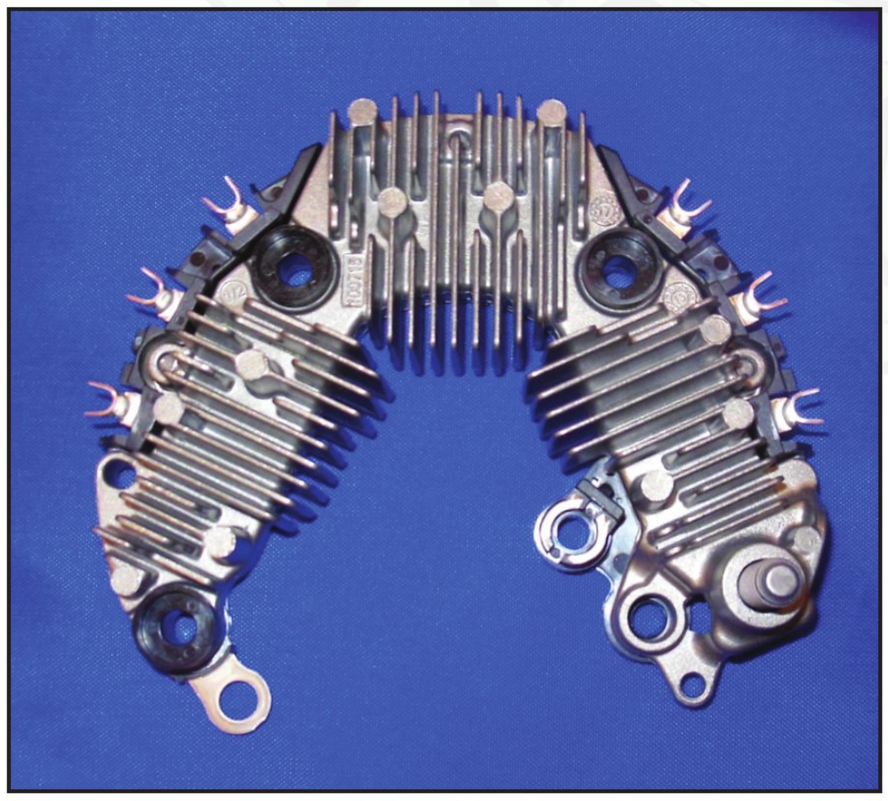


Figure 1 – The New Transistorized Rectifier by Valeo

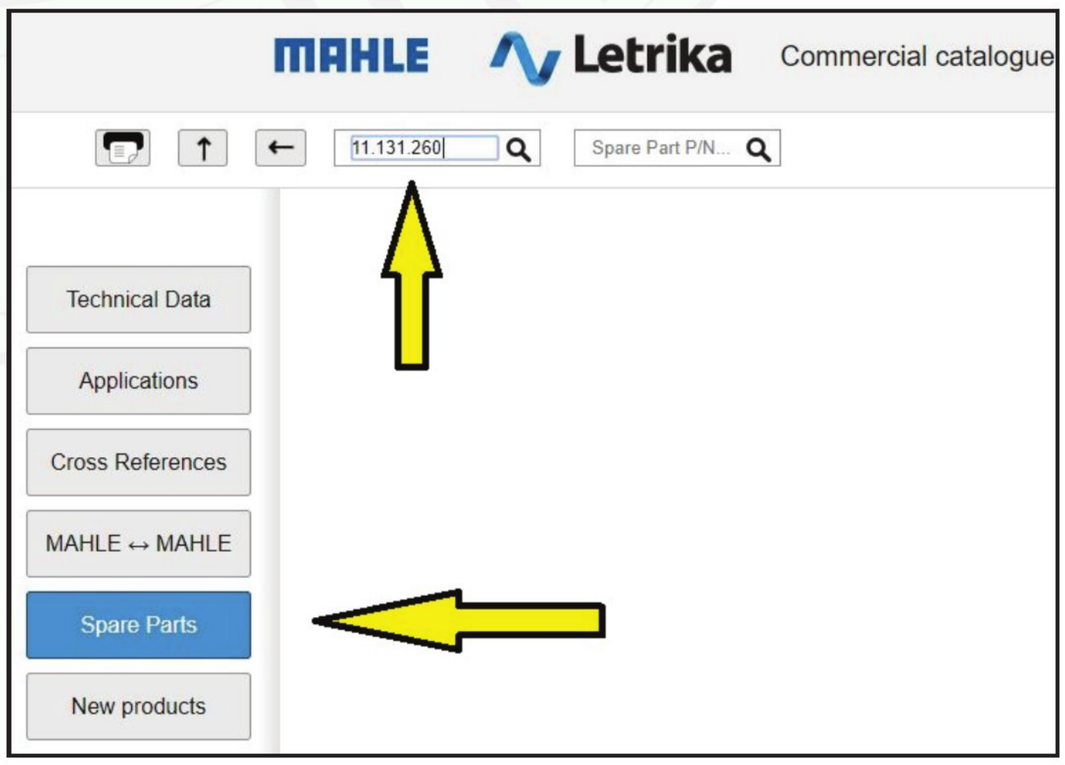


Figure 2 – Select "Spare Parts", then Enter Iskra Number at the Top

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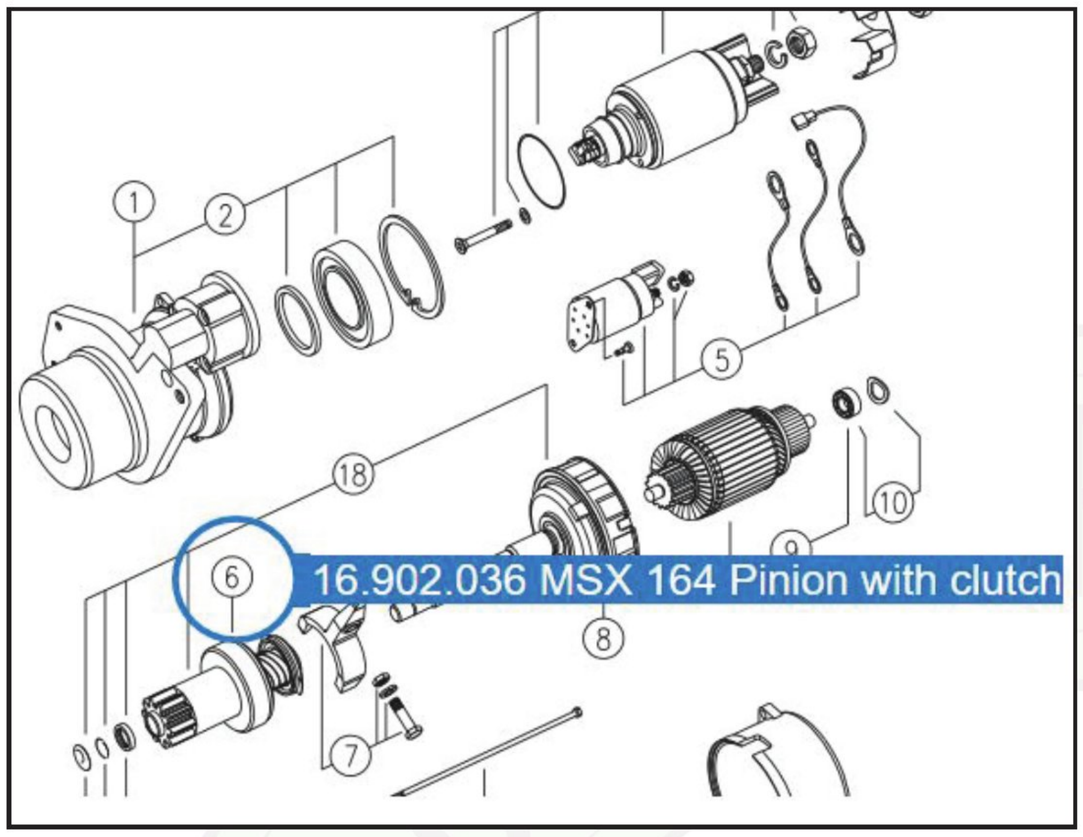


Figure 3 – 11.131.260 Starter Breakdown and the Needed Drive (#6)



Figure 4 – MSX 164 Starter Drive and the Collar and Snap Ring

drive slides over and is difficult to replace. Our Foreman Denny Tuttle who is blessed with patience and skills in biblical proportions neatly replaced the drive (*Figure 4*) and the rest of the starter that looked almost like new was reassembled and delivered. The customer was happy to have his starter back in a day in addition to saving a couple of hundred dollars, as the dealer needed a week with a $550 price tag on the unit.

WAI1000…a First Look…!

I started putting our new WAI1000 combination test box to work and am happy to see that this little gadget that replaces a handful of various test boxes is very user-friendly and very easy to master. The operating instructions are almost unnecessary as working with this tester is very intuitive. All you have to do is connect +B and –B for the power, and the COM wire to the appropriate alternator terminal (COM, Sig, L, RLO…etc.), select one by turning the black knob, then push the knob in once.

Once the alternator start charging, the same black selector knob becomes the voltage selector and turning it can set the desired voltage (Vset). The alternator's output voltage (Vread)



Figure 5 – Testing a Ford-PCM Alternator with WAI1000



Figure 6 – Testing a Bosch Alternator with COM/BSS terminal. (Note Tester ID's the Protocol)

can be observed and you can easily manipulate the voltage setting by turning the knob and see the reaction as the output voltage changes, confirming the regulator responds to the command. The (Vset) and (Vread) usually show the same voltage or are within one or two tenths of each other with a light load.

The WAI1000 also has a provision for measuring the feedback (DFM) by providing two separate ports as DFM+ and DFM-, for A or B-circuit regulators, showing the percentage of the field current's pulse-width. As you increase the alternator's load, you see the DFM goes up, showing that the regulator is laboring harder. Figures 5 and 6 shows a Ford-PCM regulator and a Bosch COM regulator (BSS) that were operating by way of the WAI1000.

I am only at the beginning stages of my learning curve and have not had the time or the need to operate all of the alternators that WAI1000 can run, but as I go along further and learn more, I will share my findings with you. Having additional features for firmware update via internet would have been a great feature, but I suppose the price would have gone beyond the range of affordability that the WAI had in mind for most rebuilders.

In closing; I am pleased to see the amount of effort put forward by the ERA Board to make our 2018 Show a great success. What would please me more is to see great participation from the members, and I am hoping to see many of you in Montgomery next April. Until I see you again, keep up the good work.

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