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ELECTRONIC SOLENOIDS!
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Magneton TriPac™ Alternator

2016 ERA SHOW IN MEMPHIS!

PLAIN TALK | UP THE CREEK
WITH A MAXED CREDIT CARD

A WORD FROM THE PRESIDENT
2016 Show in Memphis



MEMPHIS
Home of the Blues
Birthplace of Rock'n'Roll

After several months of investigation and planning on the part of the ERA show committee, I am happy to be able to now answer the question that everyone has been asking since our show in Davenport ended several months ago. Where will the next show be?

The 2016 ERA Expo will be held in Memphis, Tennessee, over the weekend of March 18–20, 2016. The exact location of the three-day event is the Holiday Inn Memphis Airport—Conference Center. The entire show will be held under a single roof, including the exhibition, seminars and sleep rooms. This Holiday Inn offers free 24-hour shuttle service to and from the Memphis International Airport, a short five-minute ride away. The hotel also has ample free parking for anyone who plans to drive.



The Holiday Inn Memphis Airport Conference Center

WAI will host a tour of their Global Distribution Center in Southaven, MS, a 10-minute bus ride from the Holiday Inn. The tour will cover the entire 400,000 square foot facility, which includes receiving, validation, testing, packaging, shipping and warranty returns.

Other things to do and see in Memphis include the famous Beale Street Historic District, Graceland, a Bass Pro Shop on the river, which is big enough to attract tour buses and—if you bring children—the famous ducks of the Peabody Hotel.

There will be an exhibition and technical seminars as in previous shows, but plans are to mix up the schedule a bit to include something new that has not been done before. Be sure to mark that date on your calendar now.

Mike Dietrich

NEW ERA MEMBERS

Pigeon River Farm
Clintonville, Wis.

ABOUT THE COVER
This 65 amp orange-regulator Magneton alternator is being sold by Thermo King to replace the Bosch unit.

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PLAIN TALK—UP THE CREEK with a maxed credit card



BY ROB BUKSAR

Like most of you, I lived through the turbulent sixties and early seventies. Many of us are veterans, not only of the time period but also of a very unpopular war. In light of it all, most folks, including myself, were confident that the madness would end, and we would return to peace and prosperity.

Well, Nixon ended the war, opened China and got run out of office, and,yes, we returned to relative peace and prosperity. Our country was still working within many of the controls put in place during FDR's administration. Capitalism still had controls, and we were still the industrial/manufacturing giant on the planet. Because of unlimited commercial opportunity, there was still plenty of everything to go around. If you wanted a job, you could find just about anything you wanted to do and work as much as you wanted. There were far more opportunities than there were folks to fill the positions. The same applied to small business opportunities. Think about it. Many, if not most of us, got our commercial start during those days. We competed in our own market. We learned, grew and prospered. We all operated in a capitalistic free-market system. The economy had enough control to keep the large from devouring or crushing the small. I fondly think of those days as being commercially-just. It wasn't survival of the biggest, best-connected or most-affluent. Success was determined by whether you were willing to work hard enough and whether you were smart enough to earn it—not by an unrestricted supply of offshore goods being sold at competition-eliminating prices!

For the sake of very few, those rules were eliminated or disregarded by a previous administration. Today, all-of-the-above is referred to as the "Good Ole Days", and they are long gone. This isn't an indictment against change. Change will continue, and the future will occur with or without us. This is all about being commercially victimized, robbed and pillaged by big-business concerns who have more money, power and control than most countries. Actually, it's beginning to look like they are our government!

Let me take a short detour, but I'll get back on track in a moment. We now have riots, burning, looting and civil disruptions all over. I'm not suggesting that our society is problem-free and without fault. Yes, we have issues to be addressed, and that will continue, because our country is still a work in progress. I'm suggesting that we are purposefully being distracted "by design" from the real issues which continue to destroy our foundation as a sovereign nation!

This administration talks an awful lot about social justice but never talks about commercial justice. It's really difficult to have social justice when the masses in our country are either unemployed or underemployed. Of course, that's now being used as an argument for raising the minimum wage to $15.00 per hour. All of us old-timers know that the minimum wage jobs primarily were entry-level jobs. Our kids and people just entering our workforce started there. The idea was to better one's self and advance to a greater opportunity. Here's the part of the discussion that's being left out (by design, in my opinion). Millions of opportunities in manufacturing and service are no longer there to advance to! They have been, and continue to be, outsourced overseas where there are no rules, regulations or minimum wage standards. How can anyone move forward when there is a very limited and select amount of opportunities out there? Adults are forced to stay in jobs that their kids should have!

We've learned to do it all right here, and we are regulated accordingly. We can manufacture, fabricate, produce energy, etc. We can do it cleanly and pay a decent wage for doing it. Although this process requires more than "fish heads and rice" to get it done. The problem is that without the governmental controls and regulations on our capitalism, business will always gravitate toward the fish-heads-and-rice countries, because that's the nature of uncontrolled capitalism. Henceforth, we will continue to lose jobs and opportunities, because we don't live in a place that allows its citizens to drink out of and defecate in the same drainage ditch—but that's business, or so I'm told.

The hot issue on the agenda is now the trade authority that our president is asking for. He wants to cement an agreement similar to NAFTA, CAFTA and the favored-nation deal that we have with China. He wants to include Vietnam, Indonesia and about 10 other Asian countries which aren't currently involved. If you take stock of our trade imbalance and national debt, then ask yourself, "How are these current trade deals working for us?"—there is only one answer, they are not!

A handful of CEOs and politicians will continue to amass unimaginable wealth at the expense of our entire country. Remember us talking about the opportunities needed in order to advance from a minimum wage job to a better one? Well, guess what! If this new deal flies, it will eliminate higher paying jobs here, because that's the basic nature of this trade deal. It's to pay a lot less in wages, not the same or more. No matter what kind of "bull" is being shoved down our throats, the new deal will just do more of what the old ones did. It will remove from our shores, opportunities for the folks who live here, and it will send those opportunities overseas, to put folks in other countries to work ... resulting in more offshore goods, higher trade imbalance, more debt, less opportunities and fewer jobs domestically.

There is a bogus TV ad currently being run on most stations, admonishing us to call our congressmen and tell them that we are behind this new presidential trade authority. It clearly states that passing this deal would keep us "number one" in the world as the greatest trader and the biggest economy. Furthermore, it would keep us ahead of the Chinese. What an absolute load of dung!

Don't take my word for this. "Google" it yourself. We are no longer the world's biggest economy. China is. We don't export the most. China does. The container ship shown in the ad isn't ours going there, it's theirs coming here! Our trade deficit is billions and billions of dollars every month. That means that we buy a whole lot more from offshore companies than we



sell. By the way, the biggest contributor to that trade deficit is Walmart (consumer goods). The problem is so large, that we continue to run out of money. We spend far more than we sell, because we import too many goods and export all of our money and jobs. Of course it's cheaper! It's war! It's by design, and we're losing!

For some reason, the business networks avoid talking about what I'm about to share. As I mentioned earlier, don't believe me, "Google" it yourself if you're in doubt.

- China is the world's biggest energy consumer. It passed the U.S. in 2010.
- China doubled its energy consumption over the past 10 years.
- In the past, the world's dominant energy consumer was, or became, the dominant economic power.
- In 2013, China became the world's biggest energy producer.
- China has 26 nuclear power plants under construction. America has five.
- In 2014, China became the world's biggest importer of agricultural products.
- In 2010, China became the world's largest vehicle market.
- China consumed more cement in the past three years than America did during the entire 20th century.
- In 2014, China became the world's largest gold market.
- In 2007, China became the world's largest gold producer.
- 50% of all metals produced are consumed in China.
- China has more English-speaking people than the United States.
- In 10 years, China will add an additional 35 million people to its population.
- By 2025, China will have ten New York-sized cities.

Folks, we're racing toward a brick wall, and the whole world is paying attention—everyone except us! Many of our economic allies have already jumped off our ship and thrown in with the Chinese. Why not? We sure don't seem to be concerned with our own house and economy.

You want to help out? Be a little pro-active! Call your congressmen and tell them in very clear language that you are against the new trade deal and current trade authority being requested by our president. Furthermore, you support any effort to retrieve any of the industries and jobs that we've already lost overseas. I know this sounds a little impractical, but you tell me which sounds worse—trying to get back some of our basic industries ... or ... continuing to allow big business to outsource more jobs, which leaves us up the creek with maxed out credit cards and no paddle"

God Bless our little industry!

Rob Buksar is the owner of Hoosier Electric Co., Gary, Indiana

ERA

MAGNETON ALTERNATOR
Something new from Thermo King



BY KEN PLOURDE



Figure 1— 65 amp Magneton alternator is being sold by Thermo King to replace the Bosch unit.

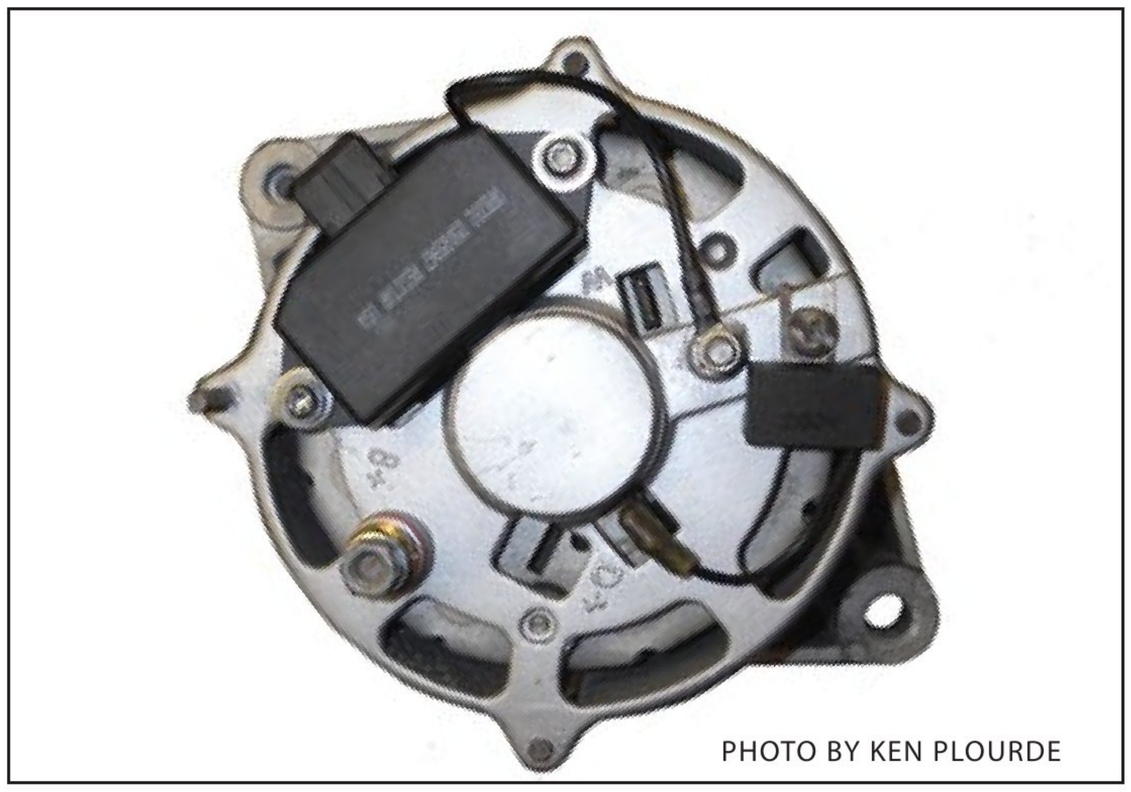


PHOTO BY KEN PLOURDE

Figure 2—65 amp Bosch alternator previously used by Thermo King.

In 2011, Thermo King (TK) changed its alternator manufacturer, dropping Bosch in favor of Magneton, for DC power on their TriPac™ auxiliary power units (APUs). For the last 15 years, APUs have been installed on most new over-the-road trucks to reduce the need for engine idling. Powered by a small and highly efficient diesel engine, an APU provides 12 volts DC, 120 volts AC and powers a compressor for air conditioning and heating. That saves more than 85% on fuel usage, over leaving a truck engine idling. There are several other companies manufacturing APUs for the trucking industry, but TK has dominated this market, as they have with refrigeration units.

A customer recently brought us two 65 amp Magneton alternators for testing (*see Figure 1*). The first one had been sold to him by the local dealership to replace the Bosch alternator on his older model TriPac™ APU. It failed to charge when he installed it. The second alternator was the dealer's replacement for the first alternator. It too was brand new, but it had not yet been installed.

While we have serviced many of the Bosch alternators used on earlier model TriPacs™ (*see Figure 2*), this Magneton alternator was new to us. The S-L regulator terminals (PIC plug code 360) are identical to those on the Bosch alternator. But this regulator also had an extra terminal that was clearly labeled "F" (*see Figure 3*). The Magneton alternator is easily distinguished from the Bosch by its bright orange regulator.

We tested both of the customer's Magneton alternators on the bench using the S-L plug, and neither one worked. I suspected that "something" had to be connected to the F terminal for it to charge, so I contacted the TK dealer, who also happened to be an occasional customer. It pays to have a good relationship with equipment dealerships. He gladly supplied the applicable TK service bulletins.

After reading TK service bulletin TT610-1, which covers the use of the Magneton alternators on older applications, we managed to get to the root of the problem. If you bench test this alternator, it will not charge unless you ground the F terminal (*see Figure 4*). To make it operate on the APU, the F terminal must

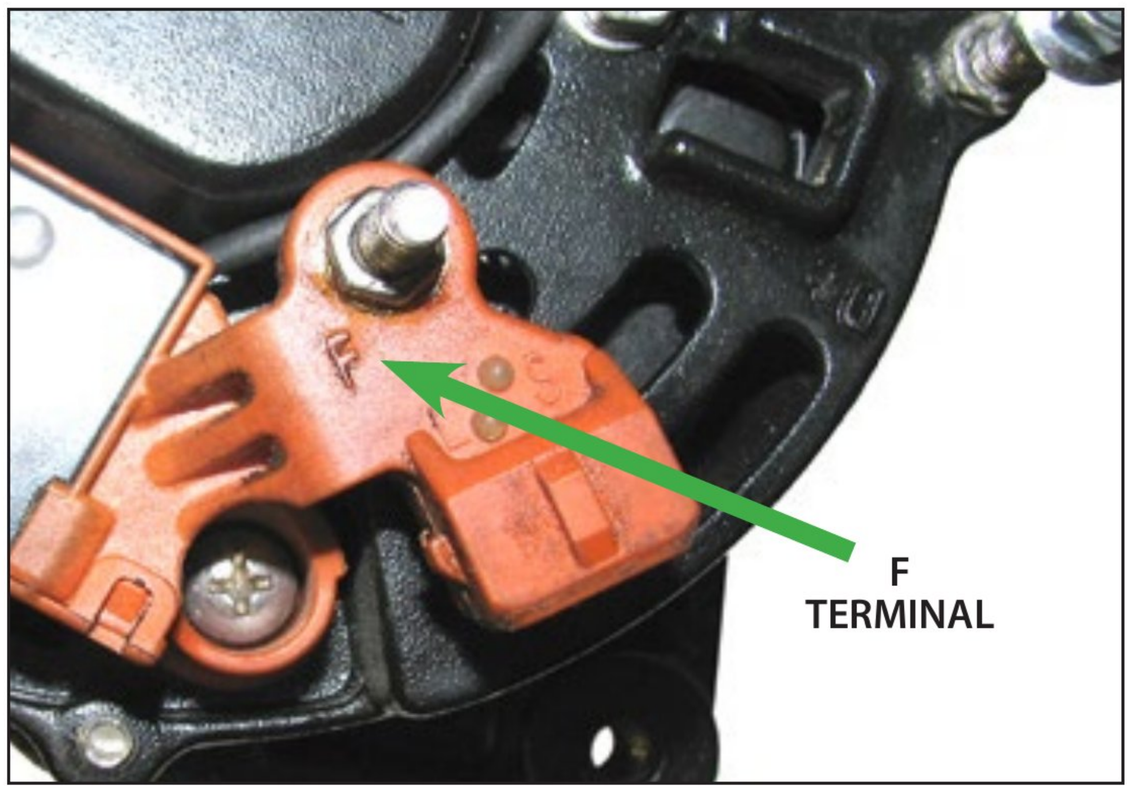


Figure 3—New terminal on Magneton regulator is clearly marked "F".

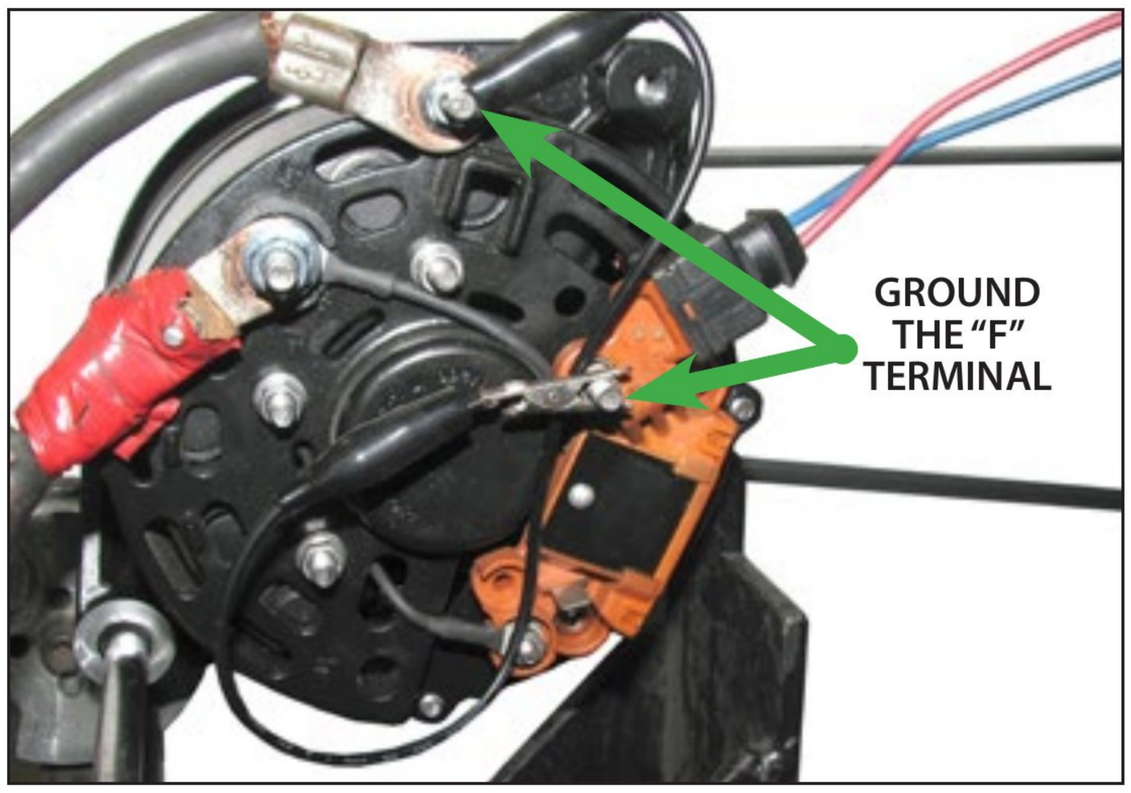


Figure 4—To bench test this alternator you must ground the F terminal.

be grounded with a jumper wire (there is one exception that is explained below). Interestingly, no instructions were provided with either alternator. Who would expect a terminal labeled F to require a ground wire? In the service bulletin, this terminal was referred to repeatedly as F2. I suspect that other rebuilders may run into this same scenario. The voltage set point of the orange Magneton alternator is 14.5 volts.

Our solution in this case was to rebuild the original Bosch alternator that had already been removed from the machine. That saved the customer money and made the job more profitable for us at the same time. The TK service bulletins also provided some other good information about the Magneton alternators.

All TriPac™ APU applications, including late model TriPac™ Evolutions, require a CCW fan for cooling (*see Figure 5*). This alternator mounts on the back side of the engine and turns with opposite rotation as a result. This CCW fan is unique to the APU. Other TK applications use similar alternators with CW fans. Those applications also have Magneton replacements with different voltage regulators that have a lower set point of 14.0 volts. Obviously, using the wrong fan will cause overheating with any alternator.

There are three different configurations of the Magneton alternator that can be used on TriPac™ APUs. The one in the first photo is the 65 amp model. There are also two 120 amp configurations. One of them is a single output, while the other one is referred to as dual output. This confused me and will likely confuse other rebuilders who think of "dual output" as having two isolated B+ terminals. Quite plainly, there is only one B+ terminal on any of the Magneton alternators.

In this case, dual output means two amperage capabilities. The single output 120 amp alternator can be used to upgrade the earlier model TriPac™. The dual output 120 amp alternator should not be used in an upgrade, because there are other parts involved in a dual output configuration.

The dual output 120 amp Magneton alternator is part of a factory installed charging system and requires the other parts in order to work properly. An alternator from this application must be replaced with either Thermo-King Part #41-9210 or #41-9925 dual output alternator. These alternators have a field F terminal on

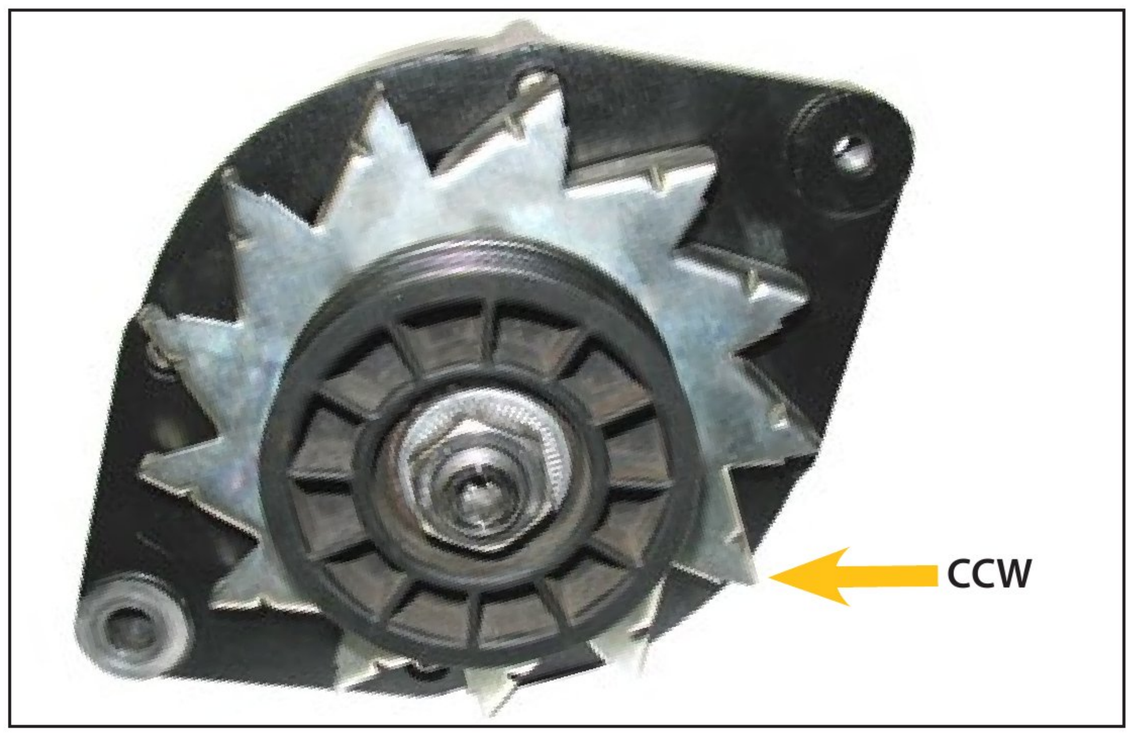


Figure 5—All Thermo King TriPac™ APU alternators must have a CCW fan for proper cooling.

the voltage regulator just like the other units already mentioned. But in this case, the F terminal must be connected to the adaptive alternator relay (AAR) and resistor harness. If it is not connected, the alternator cannot charge. If a single output 120 amp alternator from a truck/trailer application is installed and connected to the AAR harness it will fail prematurely.

The AAR harness includes a relay and a ceramic resistor mounted near the engine air cleaner on the APU's back panel. The harness will attach to the alternator's F terminal. Check for this harness when replacing an alternator on an Evolution model Thermo-King TriPac™ APU.

Units with this application have a high maximum amperage output. However, when the air conditioner compressor clutch is energized, the AAR reduces amperage output by 50% by changing resistance between the F terminal and ground. This is done to control mechanical loads on the APU engine as part of the emissions control system. You should never install a ground jumper wire to the F terminal on the dual output alternator. Doing so will put the APU's emissions out of compliance and could result in fines.

We discovered that the F terminal on all of the orange Magneton regulators is a direct connection to the negative brush. These regulators are B-circuit, controlling on the positive side of the field. Connecting the F terminal to ground simply allows the alternator to operate normally.

But in dual output applications, when the AC compressor is engaged, the relay changes the alternator's field path to ground and runs it through the ceramic resistor. This adds resistance to the field circuit outside of the alternator. That drops the amount of current that can flow through the rotor which reduces magnetic force and maximum output. At the same time, it limits the mechanical load of the alternator on the engine, which in turn keeps the engine's emissions within legal limits.

If you are attempting to service a dual output charging system, I strongly advise that you refer to TK service bulletin TT-674 which covers the dual output system on the TriPac™ Evolution. Call Ken Plourde or the ERA tech help line if you need a copy of either TSB.

Ken Plourde is the owner of Guy's Electric Service, Windsor, Conn. 860-528-8174

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ELECTRONIC SOLENOIDS! What's next?

BY NATHAN UNGER  AND BOB THOMAS 

You have no doubt heard of alternators being controlled via pulse width modulation (PWM). Well, now they are making starters that are controlled that way, too.

There is already at least one starter that we are aware of that operates in this manner (*see Figure 1*). It is manufactured by Valeo, #D7ED281 (cross-referenced to Lester #33244 and Mercedes #1661510001). This starter is equipped with a Valeo solenoid, #594463 (cross-referenced to Wagner #W452-24N). This starter fits 1998 and newer 1.4L and 1.6L Mercedes A-Class vehicles. Although the A-Class is not yet sold in the U.S. or Canada, the technology will show up here eventually—if not on the A-Class, then on a different Mercedes model or another brand of vehicle.

Like most starters, this Valeo starter is controlled by its solenoid. Some have called it a "sensing" solenoid. Some describe it as having a "current limiter" in it. Apparently, this solenoid requires a 100% pulse-width-modulated (PWM) signal to activate it.

This Valeo starter is a 12v, 0.8kW, clockwise unit with an 8-tooth gear. Do not confuse this starter with the D7E8, which has the conventional solenoid, Valeo #594447. They look almost exactly the same (*see Figure 2*).

They will both work fine on your normal free-run test, and you will not notice anything different, unless you are monitoring the control current. The trouble comes if you accidentally swap the sensing-type solenoid with the non-sensing type. If this happens, the vehicle's computer simply cannot provide enough current to activate the non-sensing type, so the starter will do nothing at all



Figure 1—A Valeo D7ED281 starter equipped with an electronic solenoid.

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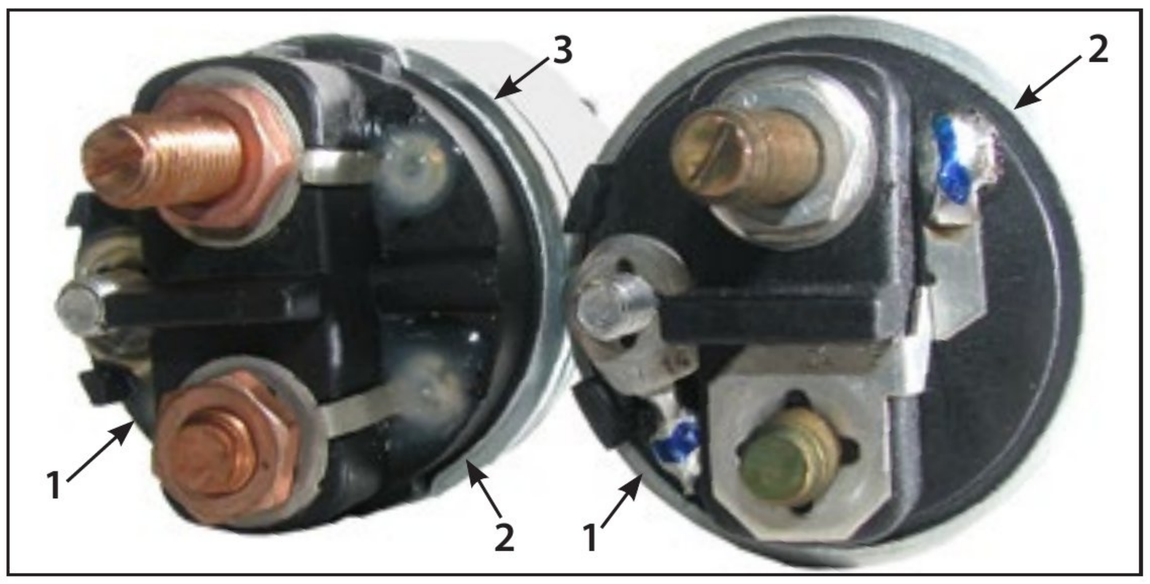


Figure 2—The Valeo electronic solenoid is on the left, and a conventional similar solenoid is on the right.

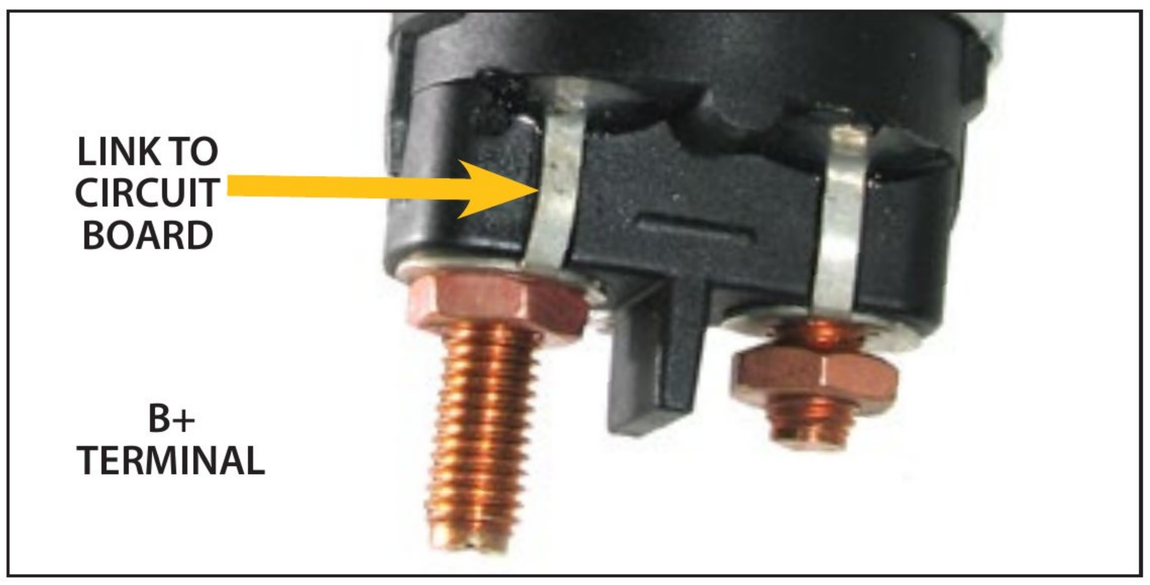


Figure 3—The lead going to the B+ terminal is a sure sign that this is an electronic solenoid.



on the vehicle, even after it bench-tested fine. Removing and replacing this starter is a very lengthy and involved process, so you don't want to do it twice.

In studying the photo of the two solenoids, we see that the regular non-sensing type solenoid on the right has two visible soldered tabs. One is connected to the motor stud, and the other one is connected to the 50-terminal (also called the S-terminal). This is exactly what we have come to expect to see on a solenoid. However, the sensing-type solenoid on the left has a soldered tab on the B+ stud, too. So there are three visible soldered tabs in all. The B+ tab (*see Figure 3*) is what powers this solenoid. This is what will identfy it if you encounter one of these.

We cut one of these solenoids apart and found more surprises than answers inside (*see Figure 4*). There are five connections to the circuit board. It is grounded to a 4.3mm laminated steel plate that may be there to channel the magnetic lines of strength and enhance their effect on the plunger. Or it could be there to shield the electronics from the coil's magnetic field. To the right is the connection to the 50-switch terminal. On the left of ground is the circuit's motor connection. The coil is connected to the two wires at the bottom in the photo. The one on the left is B+, always hot and ready for a start command. The one on the right is the control side of the coil, which is grounded through one of the large transistors when activated.

The driver transistors are N-channel trenchMOS logic level

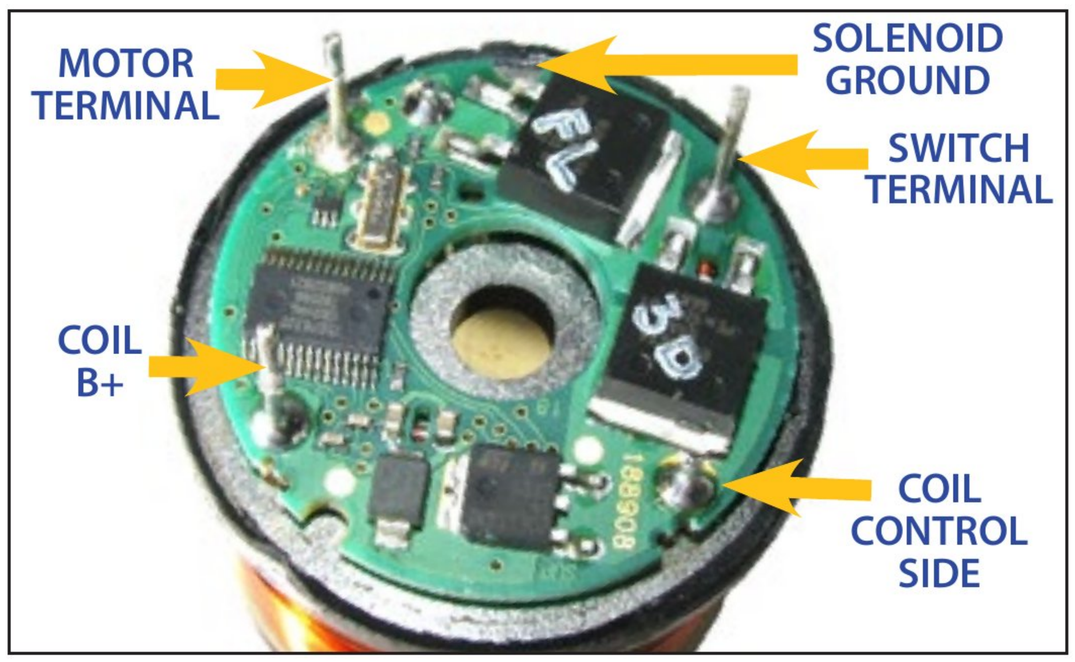


Figure 4—Once the circuit board was removed, we identified the five connections that are needed to make it operate.

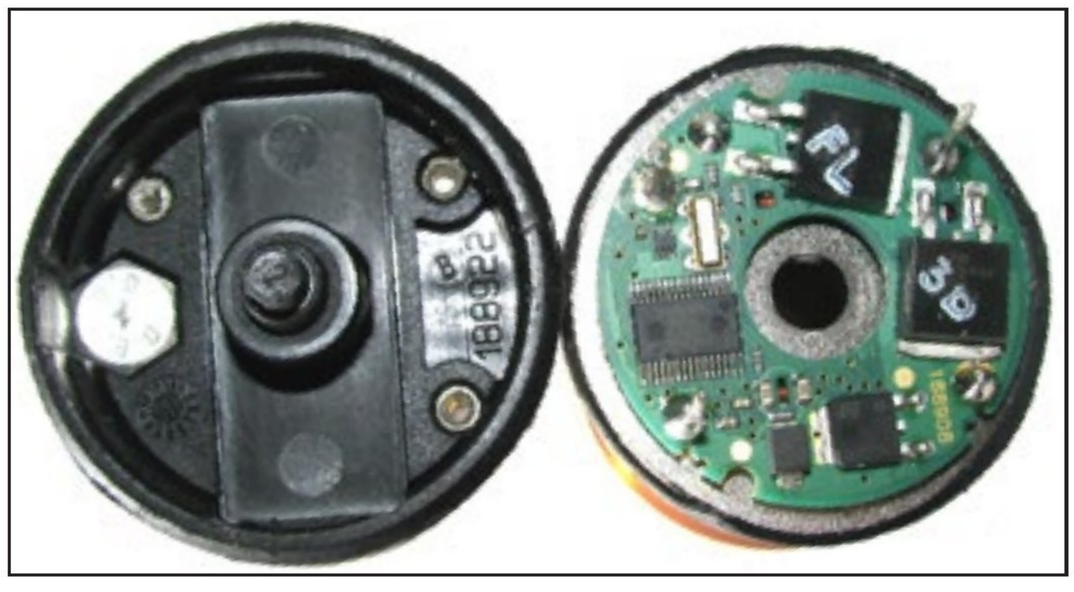


Figure 5—Note that the contacts and spring are totally enclosed in the cap, possibly to prevent contamination of the circuit board.



Figure 6—This solenoid uses a single coil. We can only speculate how it works but suspect that the mosfet transistors play a part.

FETs, rated for a peak current of 266 amps, repetitive avalanche and high temperature (175 degrees C). The integral kickback diode of the mosfet is also rated for 226 amps peak! They are designed for automotive and general purpose power switching in 12V or 24V applications.

The contacts are sealed into a cavity within the cap to prevent contamination of the circuit board (*see Figure 5*).

Unlike a conventional solenoid with separate pull-in and hold-in coils, this solenoid has a single coil. It is wound with 10 gauge wire with a resistance of just 2/10ths of an ohm (*see Figure 6*). That translates to a 60 amp draw when powered with 12 volts, which we confirmed by passing current through it.

Mercedes has never been a company that shared anything, let alone technology. But because of this coil's amperage draw, we feel that the current to the coil during cranking is never constant. In all likelihood, it is probably cycled with longer on-times during pull-in until the contacts close. At that point, the on-times are reduced to meet the needs. The mosfets are more than capable of doing that.

Interestingly, the same Mercedes A-Class cars have been sold in New Zealand with Bosch starters using identical technology. We were able to obtain our sample solenoid from Rick Wagner of Wagner Alternators and Supplies in Southern California, the west coast distributor for Valeo in the U.S. He confirmed that they carry this solenoid in stock, because they were getting calls for it—before we inquired. The A-Class Mercedes has been sold in Mexico for a number of years.

Why would Mercedes go to all of this trouble to activate a starter motor? This is speculation of course, but the electronic solenoid makes possible any of the following things:

- No auxiliary relay coil to create spikes on the control wire, nor relay contacts to wear out or get fouled
- More compact design
- Less copper use, reduced "control" wire size, and fewer connections exposed to the elements or to vibration damage (this solenoid was very well sealed)
- Better solenoid supply voltage than if it were supplied by the ignition switch
- Incorporates all the "smart start" features into the existing software instead of having a separate module
- When solenoid contacts get worn or in low voltage conditions, typically the pull-in coil will be active longer



than it should. This extra current loading has been known to burn out ignition switches. In this new design, the solenoid gets its power from the B+, so it cannot overload the ignition switch. If there is a hesitation, click-no-start, or any other fault, it could inhibit the starter so the engine management system would send a fault code.

- The engine management system could also tell if the cranking RPM is too slow from the crank sensor and send a fault code.
- It could even have an on-board thermal sensor inside the solenoid that would detect if the coil is getting hot.
- Prevent low voltage cranking
- Prevent overheating due to excessive cranking, by having a timing algorithm that limits crank time, and also allows for adequate cooling in between, incorporating information from the engine temperature sensors
- Prevent run-on of starter due to operator error by inhibiting the starter as soon as the engine fires
- Reduce the operator error of cranking too long, not long enough, or not consistently
- Inhibit accidental engagement when engine is already running (anti-restart)
- Prevent over-run due to faulty ignition switch or other sensors/relays
- It is ready for a remote-start controller option, without adding another relay.
- If the contacts ever get welded together, (causing the starter to keep running), the engine could be disabled, and the solenoid coil and plungers be pulsed to attempt release. This could, in some cases, prevent starter failure, increasing overall reliability of the vehicle.
- Inhibit activation and engagement in the event of ring gear rock-back or vehicle rolling backwards in gear.
- It could check if the brakes are applied with the clutch engaged.
- Because it supplies the coil current through the B+, it is possible to design the pull-in current to be great enough to make it capable of "soft start", similar to what the 39MTs do.
- Respond to start request only after computer has polled the applicable sensors
- It could prevent gear milling if the starter is ever not engaged while spinning

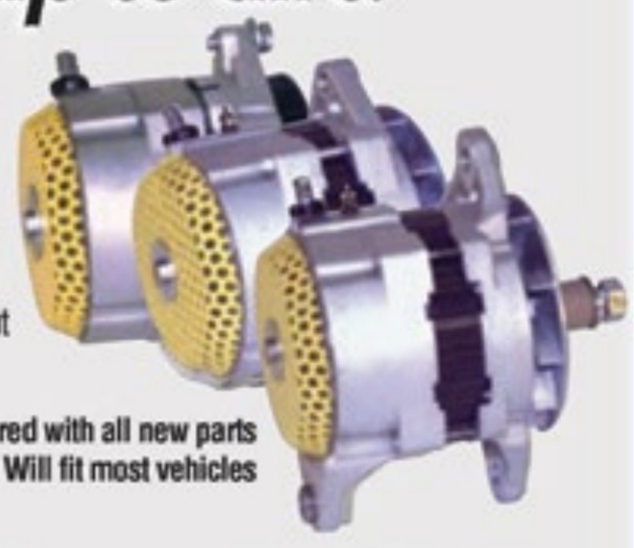
Nathan Unger is the owner of ASI Rebuilders, Abbotsford, British Columbia, Canada.

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BY ERA STAFF

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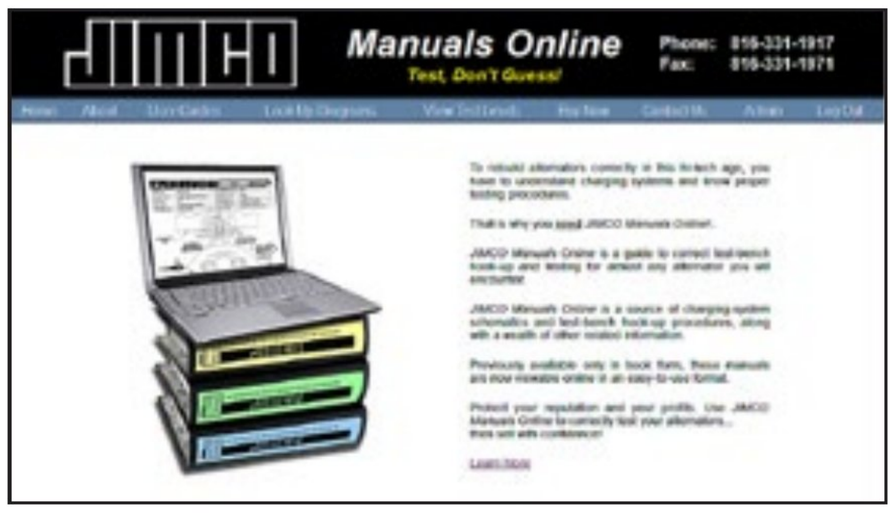
This will put you on the JIMCO site and log you in. If you have time to explore, there's a lot of good information here to read about charging systems. If you are looking for a particular alternator, left-click on "Look Up Diagrams" in the center of the blue menu bar across the top of the page.

This will take you to the diagram index page. The best way to find what you need is to select the generator or alternator manufacturer for the unit you want. Clicking on a manufacturer will take you to the diagrams for that brand where they arranged by series. The JIMCO line drawings and descriptions are exceptional in detail and make it easy to find exactly the unit you need.

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ABRASIVE CLEANING MEDIA
More options are available



BY BOB THOMAS

Traditionally, the rebuilding industry has used steel shot media almost exclusively for cleaning parts in airless shot blasters. While other forms of abrasive media have been developed and brought to the market in the last 15 to 20 years, rebuilders have been reluctant to try them. Feeling comfortable with what "has worked" for decades, and failing to look at new alternatives, is not always what is best for your business in the long run.

Steel Media

The major benefit of using steel media is that it can be very aggressive. Nothing will strip a part down to bare metal faster than steel grit, but it also will remove a thin layer of any part's surface and leave a dull finish in the process. Parts no longer look new when they have been cleaned with steel grit. Steel shot, on the other hand, is less aggressive and leaves a smooth shiny surface. Some rebuilders mix the two media and find the right ratio to produce the best results for them. Shot is basically round, while grit is made up of square or rectangular flakes.

There are several downsides to using steel shot or grit in a machine that is made of steel. Even though the machine's cabinet and internal parts are constructed of hardened steel, shot or grit can still wear it out from the inside. If the cabinet has a rubber liner, even that will wear over time. Shot and grit will also wear the basket, the wear plates and the inside walls of the cabinet itself. Another downside is that steel dust is highly combustible. I have run into some people over the years who were not aware of this. Those who were aware had usually learned it the hard way. If you doubt that steel dust will burn, try lighting a very small amount outside in a safe area, and be very careful doing it. Under the right conditions, it can explode.

Steel media, being aggressive, will always remove some metal from the surface of the parts you are cleaning. Aluminum parts are the most impacted, but steel parts are affected, too. This may not be a problem in most cases, but machined surfaces will be visibly reduced. Part numbers that have been stamped into housings may be diminished or erased altogether if subjected to steel media blasting. Steel media also wears itself out faster than the other alternatives. Because of the greater mass it carries, the steel particles pulverize themselves much faster than softer metals. That, in turn, produces more of the combustible steel dust. I used steel media in several different blasters for more than 20 years.

Aluminum Media

Aluminum shot has been available for several decades, but it has never been embraced by our industry. It is less aggressive than steel shot and generally requires longer cycle times than a steel media. This is because aluminum is much lighter than steel, therefore it carries less mass to the impact. The lower weight also means that you get more volume of product per pound. All media is sold by the pound. So by volume, aluminum is not much more expensive than steel. Aluminum also puts less of



a mechanical load on the motor running your blaster. You will use less electricity running a blaster using aluminum media. In my machine, amperage consumption dropped about 60% when I made the switch from steel media to aluminum.

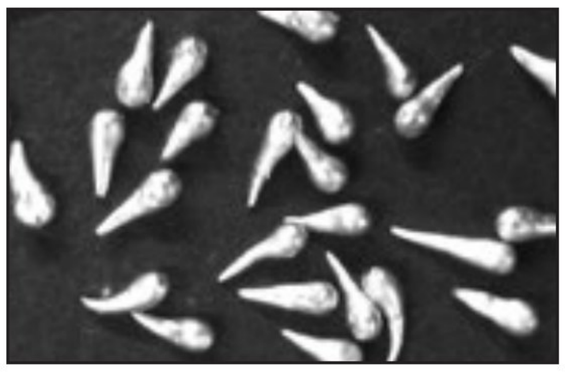
Aluminum media lasts longer than steel, for two reasons. First, it brings less mass to the impact, and it is softer than steel. It will deform rather than pulverize itself on impact. Aluminum media will last many times longer than steel, making it much more economical to use in the long run. The major complaint I have heard from rebuilders who did not like aluminum media is that it was not aggressive enough and required longer cycle times to clean parts.

I used an aluminum alloy shot in two different machines for more than 10 years. The first machine was actually worn out when I made the switch. It allowed me to get another 10 years of usage out of that old blaster. For me, the longer cycle times were well worth the savings of repairing or replacing the machine.

Zinc Media

Zinc shot is a relatively new option. So before writing this, I decided to try it out in my AR Industries bench-top blaster. This required removing the aluminum media from the machine and replacing it with cast zinc alloy, supplied courtesy of Tom Fee at Transmet Corporation. They also offer a pure zinc shot, but Tom recommended the alloy, which is a little harder and more aggressive.

The zinc alloy has a weight that is similar to steel but a hardness that is closer to that of the aluminum alloy. This allows the zinc media to impact with the weight of steel without removing surface material. Zinc cleans better and lasts considerably longer than aluminum. It is more expensive than aluminum, especially by volume, but when you consider its durability, its cleaning power and the reduced cycle times, zinc media is a viable option that can save money and cleaning time over the long term.



Zinc shot's distinctive tear-drop shape is created during the manufacturing process as molten material is flung from a spinning wheel.

What surprised me the most was how much more quickly it cleaned rusted and painted cast iron housings to bare metal, without removing any surface material. It did a better job cleaning aluminum alternator housings, too. It is worth noting that although you could mix medias, steel with aluminum or aluminum with zinc, it is not recommended. The only way to get the full benefit from the new material is to remove all of the old media from the machine. Mixing media is a shortcut not worth taking.

Finding the best solution for you and your equipment is going to require a trial and error experience on your part, but the rewards of discovering a better solution to your cleaning challenges will more than make up for it, assuming you do your homework first.

Special thanks to Transmet for providing enough ZA4 alloy zinc shot to test for this article

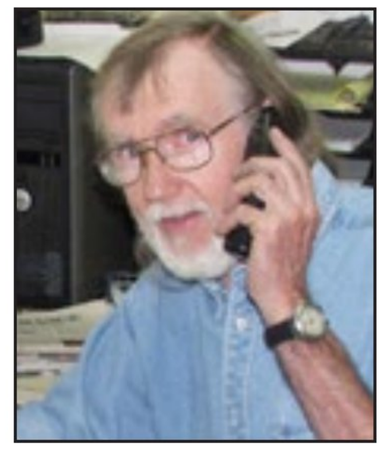
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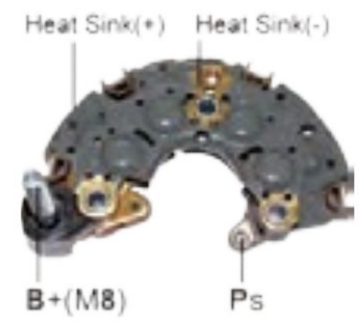
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