

Benchmarks: We must complete the circuit

COLUMN BY JOEY CLINE

In my article "Doing Business On and Off the Bench" first published in the November edition of the *Electrical Rebuilder's Exchange*, I included a topic subtitled "Testing." In this section I provided information about Automotive Service Excellence (ASE) and how November is one of their testing periods. I also included an official ASE question. The question can be reviewed here in Figure 1. At the end of the article I wrote, "Next month we will look at the correct answer to this question."



The next month rolled around and I had prepared a large article on heavy duty starter drives. Since I had received no feedback or curiosity concerning the ASE test question, I considered it a dead issue. This seems to be where I made a grave mistake. Two months later there were a couple inquiries concerning the ASE question. One inquiry was to know the correct answer to the question and the other inquiry was a little more in-depth. The latter was concerned that the question, as it was presented, may have been altered, making it bogus with no possible answers and not from the ASE database.

This brings us to why I mentioned the ASE question in my article. In September

2008 I received a reminder that the ASE testing session was nearing and that November test dates were set. I was interested in becoming certified, so I proceeded to the ASE Web site for more information. After reading over the testing material, I noticed they were not only involved with automotive, but other divisions as well, such as the school bus division. A very large portion of my rebuilding business pertains to school bus electrical units. As I looked over the school bus PDF study guide on electrical, I came across the question as it appears in the top half of Figure 1. After looking at the question from different viewpoints, I realized that there was a problem. Herein lies my real question. "How do I handle this situation? Do I just ignore the mistake or do I notify ASE?"

Suppose you were driving down the road and your tire blew out and you went sailing over an embankment into a ravine. As you lay in your car unconscious, several people stop and observe your current situation and then get back into their cars and drive off without reporting the accident. I decided that I would e-mail ASE and let them know that indeed there was a problem with the question. Within a few hours of my e-mail I received a reply from Woody Dashiell, executive director of technical programs. "Joey, thanks for pointing out the problem with the sample question. We will make the necessary changes to get it right. Thanks again." From here I went on with life which includes writing articles.

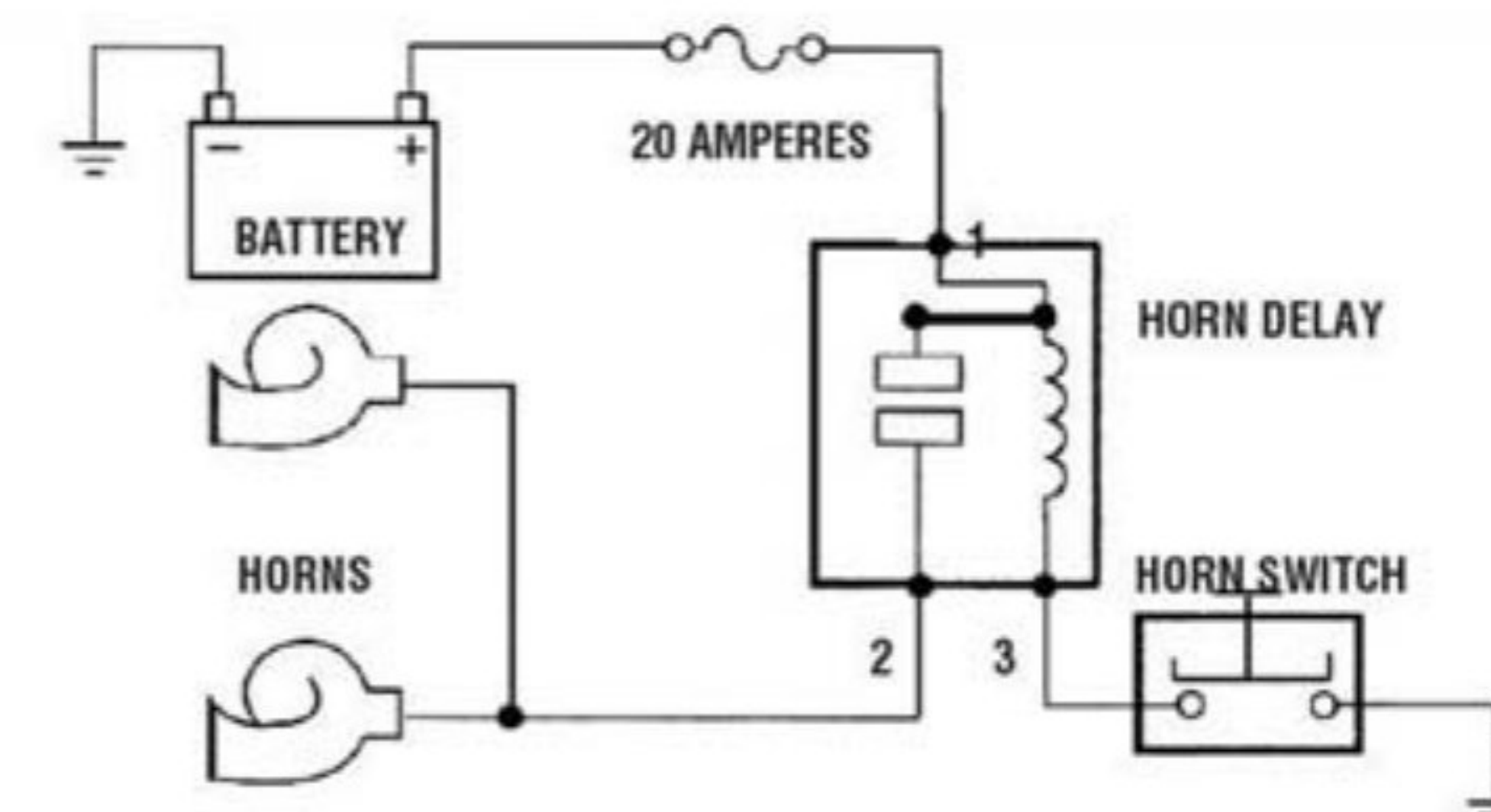
As I was preparing my November

ERE article I decided to include the ASE question, without giving their answer, sort of as a brain teaser. Wow and how, it has become just that! ASE finally made changes to the question (as seen in the bottom half of Figure 1) on their Web site and ERE printed a correction on page two of the February 2009 paper. In my opinion, the corrections that were made by ASE and ERE are only a BAND-AID approach at best and the question is still flawed.

This puts us back at square one and my question for you, "Can you find the problem with the ASE question?" For what it matters, I did send ASE another e-mail detailing the problems with their question and their attempted corrections. I have yet to receive a response.

Clutch vs. solid

In my article last month I came across a situation that left me with no other choice except to manipulate yet another industry warning. Replacing a clutch-type pulley with a solid version has become an interesting topic as of late. It



3. The horns in the circuit shown above only blow when a jumper wire is connected between terminals #1 and #3 of the horn relay. Technician A says that a bad horn relay could be the cause. Technician B says that a ground in the circuit between the horn relay and the horn switch could be the cause. Who is right?
* (A) A only (C) Both A and B
(B) B only (D) Neither A nor B

PAGE 34

ASE SCHOOL BUS STUDY GUIDE

3. The horns in the circuit shown above only blow when a jumper wire is connected between terminals #1 and #2 of the horn relay. Technician A says that a bad horn relay could be the cause. Technician B says that a ground in the circuit between the horn relay and the horn switch could be the cause. Who is right?
* (A) A only (C) Both A and B
(B) B only (D) Neither A nor B

PAGE 34

Figure 1

ASE SCHOOL BUS STUDY GUIDE

is my opinion if the OEMs built it with a clutch-type pulley then it should be rebuilt with a clutch-type pulley and from the original manufacturer if available.

This brings me to a recent problem I have encountered. A previous customer of mine brought in the alternator from his 2001 Plymouth Prowler. He told me that he would like to have it tested because he was getting low voltage at the battery. As I picked the unit up by the clutch-type pulley, I noticed it turned both ways without turning the rotor on the inside. I showed him the problem and explained

how the design is supposed to work. Since this is becoming a recurrence in my shop, I left a defective pulley and a new clutch-type pulley close to the counter to help explain how this fairly new technology works. The customer agreed to research and find a replacement clutch-type pulley for his alternator.

Before we go further, let's look at clutch-type pulleys. You may have noticed that I have been referring to a clutch-type pulley. The reason for this is because there is more than one type of clutch pulley. Although they may be similar, they have different working principles. In today's industry we have the standard clutch pulley and the Isolator Decoupler Pulley (IDP). The standard clutch pulley works very similar to the way a starter drive works. The IDP works in a similar way except contains a tension spring that absorbs energy. Clutch-type pulleys are becoming very popular with the automobile manufacturers and are installed on a lot of late model automobiles. As I researched the clutch pulley I needed (which was an IDP), I could find nothing but dead ends. I made a daring attempt to contact my local dealership to see if they had or could get one. I was told that the pulley part no. 5264913AA had been superseded by a new part number which turned out to be the complete alternator at a cost of \$382.

My last resort was to contact Al Steadman who works for the company that made the pulley I was looking for, Litens Automotive. He let me know they did not make a replacement pulley for this

application because it was not very popular. There were only a total of 4,578 Prowlers made in 2001 to 2002. Al said that I could use a solid pulley for this application. He said what? Isn't this like the no-no that we have been told not to do? Here is how he could suggest this type of fix: Referring to Figure 2, you will notice that the Prowler engine does not contain an automatic belt tensioner. By using a clutch-type pulley, the automobile manufacturers are able to use a tensioner that uses less tension on the belt resulting in longer belt life, less vehicle noise, and less vibrations with the switching of electrical loads. Also, by applying less tension on other accessory drive components (bearings), their life is extended too.

Using a solid pulley to replace a clutch pulley on applications that utilize a tensioner can have damaging effects to the tensioner due to the extra cycling. Since the Prowler engine does not use a tensioner, using a solid pulley becomes a viable option. In this application I used a Ford 3G pulley, reference no. 24-2257 and a nut kit no. 470-48003 from J&N to replace the clutch-type pulley.

Oops! Take it back apart

The Ford 4G alternator—you either have to love them or hate them. When Ford discontinued the 2G IAR and introduced the 3G, I thought things were looking up. Just to remind those that might have forgotten, all too soon the 2G was a pain in the neck because of the BBS harness design and the early inability of the aftermarket to reproduce a rectifier that could hold up. Don't get me wrong, the

4G alternator, from an electrical standpoint, is right there with the best of its counterparts.

The drawback of rebuilding the 4G is how all the components stack together during assembly and disassembly. For instance, if the rotor shaft is stuck in the DE bearing during disassembly, there is a great chance a part might get damaged before the unit is apart. To make matters worse, the stator has a press-like fit into the DE housing. Now there is another twist to the 4G alternator as shown in Figure 3. For whatever reason, it seems that on the later units a rotor spacer is now needed. So, after all that work to stack those parts back together and the unit is locked up and won't turn, you might want to start turning the shop upside down looking for the spacer that fell off during disassembly.

Final answer

There is no way I'm going to end this article without going back to the ASE question. Referring to Figure 1, you will notice that the horns have no ground path to complete the circuit. Therefore the question as it is presented, even in the corrected version, has no possible answers. I leave you with this, ASE makes questions to certify people, you make electrical units and if one of your units goes bad don't you have to fix it?

Joey Cline is the owner of Alternator Starter Resource in Lenoir, N.C. He can be reached at (828) 754-8208 or via

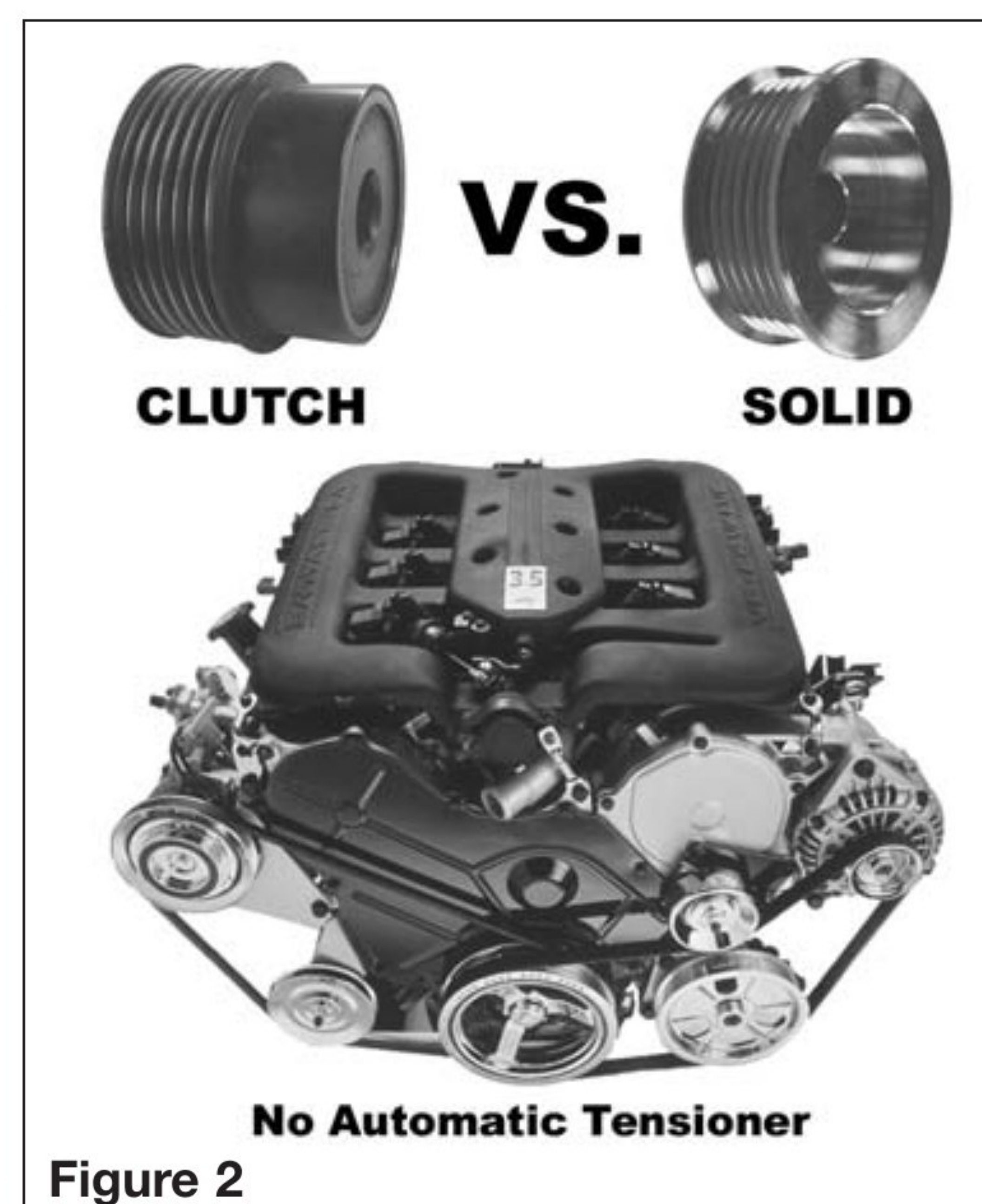


Figure 2

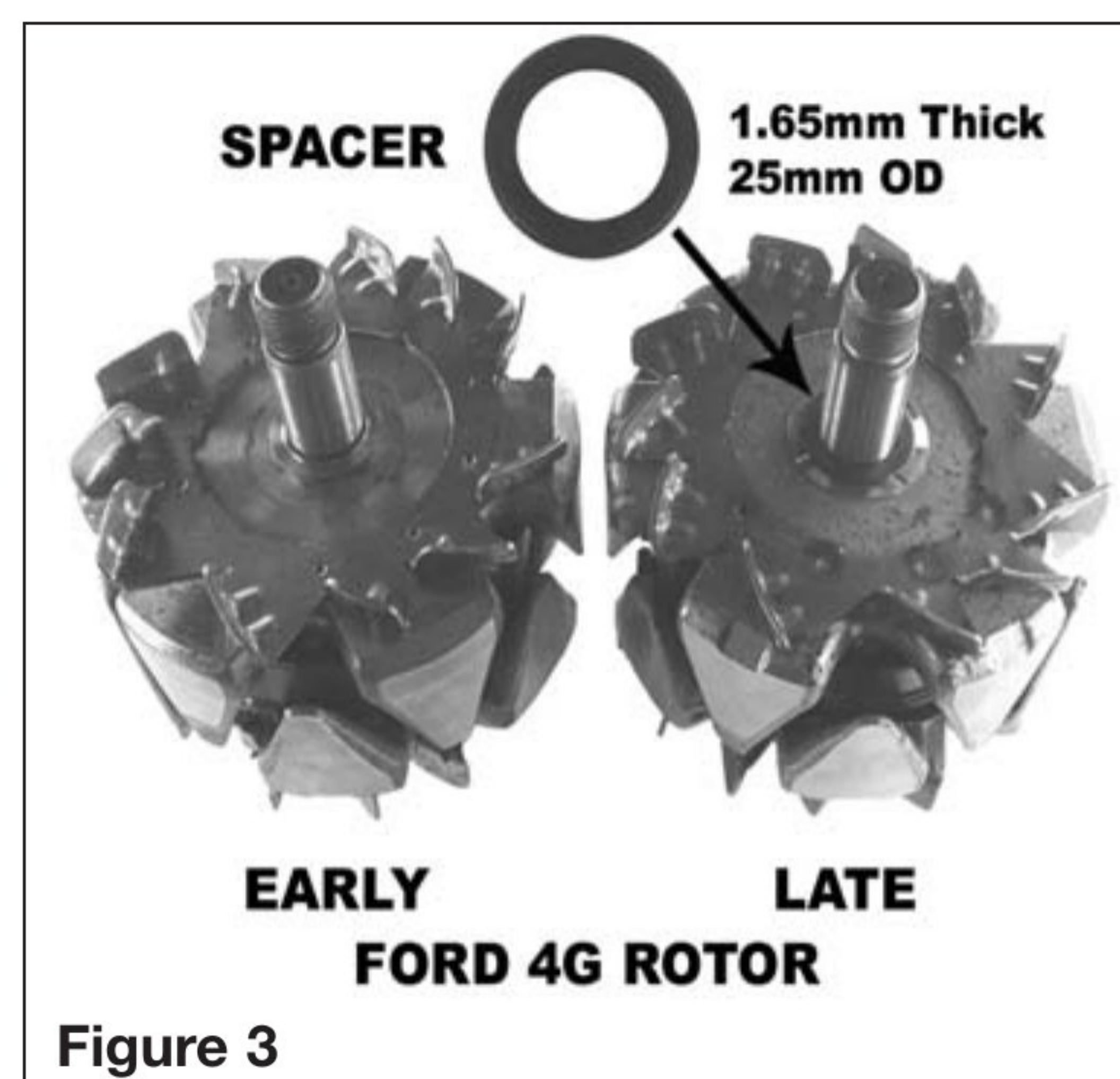


Figure 3

e-mail at asrjdcline@bellsouth.net.

ERE