

Unidentified (Flying) Objects:

Identify Those Mystery Parts

COLUMN BY NATHAN UNGER

Sometimes perfectly good parts (and whole units) get sent flying into the scrap because nobody can identify them. The following is a collage of ideas on how to identify units and parts that have inadequate identification, hereinafter referred to as Unidentified (Flying) Objects or UFOs.



- If a label is covered with cheap spray paint, lacquer thinner might take the paint off enough so you can guess at the part number. Or maybe you can carefully scrape the paint away. In some cases I found that the label ink was not adhered to the paint. Sometimes even through the paint you can see the number because of the difference in surface thicknesses.

Even on stickers where the ink is rubbed off, put some rubbing alcohol or light oil on the label. Because the surface of the sticker will reflect light differently when moistened, holding the unit up to the light at the right angle will often reveal the part number.

- Do the process of elimination. Knowing the numbering format based on the make, compare the various characters to all the numbers and letters. Older Prestolite starters will usually have three letters, four numbers, and maybe another letter, for example, whereas older Delco starters have seven numbers, the first three of which are usually 110. You would know by its position in the part number whether to expect a letter or a number.

It also helps to recognize the font or character style. A number one might have similarities to a seven depending on what font is being used for the number. A three

might look like an eight. A partial six or a nine might be confused with a zero, unless the zero is cross slashed. If you can see only half of a number, go through the 10 numbers to think which ones it is not. Then try substituting the remaining possibilities when you enter the number in your computer. The supplier's database you are using may not accept all the possibilities, narrowing it down even further. Then compare pictures of the units that are possibilities to see if any are like the unit on your bench.

- Delco dot-punched numbers can be a challenge, but having a list of what all the digits look like in that format can help you eliminate what it's not, then make educated guesses, using a question mark in place of the missing or unclear digits. (More on this question mark idea later.) Here it usually helps to spray some WD40 on it and rub a rag over it a few times to bring out the characters better. Zeros are usually cross slashed here.
- Can you recognize the logos? Also, try to find out what make of engine it's off of. That may be a clue as to what type of starter or alternator it is. If it's a Komatsu excavator for example, then it will more likely use Nikko or Sawafuji, versus Prestolite.
- Familiarize yourself with where on the starter or alternator to look for a part number. Some Valeo and Ford alternators have it on the slip ring end bearing cap. The old 17SI Delco had it on the front surface of the drive end housing. Sawafuji starters may have the part number on the back of the commutator end housing. Mitsubishi starters usually have their number on the flat part in front of the solenoid mount on the drive end.
- It helps narrow your search if you can identify what voltage it runs at. Do some measuring of solenoid amps, shunt coil amps, rotor amps, or generator field amps. Compare these to known units in your shop. If the amperage of your UFO is twice that of your 12V shop unit,

then it is probably a 6V. If it's half as much, it's probably a 24V. Compare copper sizes on armatures. Thicker sizes usually mean a lower rated voltage.

- Look for any stampings or numbers on any parts, then using the part identification, do a "where used" lookup to get you to the different possibilities of starters. For example, older Delco, Prestolite, and Bosch armatures often have numbers stamped in the laminations. Lucas and Ford drive end castings often have numbers cast in.

Sometimes you can identify parts by dimensions or appearance. Chances are if the starter is too rare to be easily identified, there will not be very many similar ones. Once you know what starters your parts will fit, then look at the starter pictures to compare to your UFO.

- I have loaded the following CDs or files onto my hard drive: Transpo; WAI; Wilson Version 2 (I keep this because the new version omits a lot of bill of materials info.); Wilson Version 3 (Has newer units and much improved part number recognition ability. Sometimes I look it up in version 3, then go back to version 2 to get the bill of materials.); Lester Kwikfinder DVD and Web site; RCP; Zen catalog (Downloaded from Web site www.zensa.com.br); CSD catalog (Downloaded from website www.4csd.net. Contact them to set up an account.)

They can also be entered into your start up file so they all open up when you turn your computer on in the morning. Then you can just control+shift+tab or control+tab back and forth quickly.

- When I see a Delco tractor starter and all it has is four numbers hand stamped into the case, I have found that often they are the last four numbers of the Wilson system. I would add 91-01-xxxx for the number and it would come up in the Wilson CD. In the Wilson system, 91 stands for starter, 01 stands

for Delco. The part code system is explained in the front of their parts breakdown catalog.

Zen starter drive Web site has a lookup by drive dimensions. The NRG Web site has a lookup by bushing dimensions at www.nrgauto.com/SpecLookup.asp.

- Hitachi and Sawafuji have some similarities in appearance, so if you can't find it under Hitachi, maybe it's Sawafuji instead. Also, some Sawafuji numbers look like Toyota numbers. Hino trucks often have Sawafuji or Nippondenso starters in them.
- Mando, Mitsubishi, Remy-Korea, and some Valeo starters (on Bobcat skid steer machines) have similarities as well. Be careful to count the number of splines on your drive gear, because a similar looking drive gear may have 19 splines instead of 20!
- In your stator catalog, go by inside diameter, outside diameter, thickness, amperage, number of leads, and winding configuration. The thickness and outside diameter can be tricky because some stators have a stepped lamination stack.
- Some regulators will have pin designations on them. Some import alternators have the regulator pin designations right on the label. I use the Transpo or WAI CD a lot because I have a Transpo regulator tester.
- Bearings can be matched up by inside diameter, outside diameter, and thickness. If it's a really rare bearing that you have never seen before but you can identify it, enter it and then select the "where used" lookup to see what alternators it fits, and then go through those to see if any are similar to the one you're working on. I find that the Lester Web site and DVD is good for this too, but their DVD has a better way of helping you identify a part number. Their "narrow the search" function is very useful.
- Solenoids can often be identified by picture in a catalog or CD. I found the Unipoint catalog to have quite a comprehensive coverage of sole-

noids, even though I don't buy much Unipoint stuff. Some Web sites like Zen (for starter drives) and NRG (for bushings—www.nrgauto.com/SpecLookup.asp) have dimensional lookups. You enter the sizes and descriptions, and it will suggest possibilities.

- Lucas numbers often have a letter suffix. If that doesn't work, try typing in the number without the suffix. Or substitute a different letter! Start from A and work down. Last time I checked in the Lester Web site for example, 26352H didn't show up but 26352, 26352A, and 26352B did. They all cross to the same starter.
- It also depends on how the database does the search. Some databases organize things as you type them in (called indexing), and some wait until you have everything entered. The Lester DVD (version 17) organizes things as you type them in, as if it is anticipating your every move. I like that because it shows you numbers above and below the one you are typing in.

Lester's Web site doesn't show this, but it has other features which make it better than the DVD. Plus, it will always be right up-to-date with Lester's research. (A big thank you to Dennis Jacinto for a free trial on Lester's Web site so I could write about this.)

Wilson's new CD is really helpful because it doesn't assume you know what the first nor the last few numbers are, and gives you choices. It also ignores upper or lowercase considerations, and spaces and hyphens. Some databases are extremely fussy that way. On one CD, when I entered a Nikko number and put spaces instead of dashes in between the number groups, it returned a blank, even though all the info I wanted was there.

So try different things if the number doesn't come up right away. It may want periods, hyphens, or spaces. Or maybe even run all the digits together, eliminating

punctuation!

Some Examples

I received a gray market Mitsubishi starter. The part numbers did not cross anywhere. First I disassembled and determined what parts I needed to rebuild it.

Bearings are usually pretty easy to identify with a good set of digital calipers that converts from metric to inches at the touch of a button. If I don't recognize the bearing by its appearance, then I use a bearing chart such as most supplier catalogs will have.

I determined what voltage the starter runs at. If all else fails, I measure the hold or pull current of the solenoid coils and compare to similar solenoids I have in stock. That will usually tell if it's 6, 12, or 24V. That will also help when looking for the correct brushes. (Brushes can be identified by size as well or you can find them once you know what some similar starters are. More on this later.)

I measured the gear. The number of teeth, direction of rotation (chamfer slope direction of the teeth is your clue here), length, diameter, and number of gear splines or drive splines are the main criteria. Increasingly it is becoming important to measure the clutch body diameter as well, like in those Bosch 230 series starters. Armed with that info, I can then scroll through thumbnail pictures in RCP, Lester and WAI. Or type the dimensions into the Zen catalog and it should match a part number in its dimensional lookup function. Once I had the drive gear number, then I did the "where used" search, and then compared the results to my UFO.

The Lester Kwikfinder Web site has a "narrow the search" button. Don't enter anything into the search box, but click on "narrow the search." Select Mitsubishi, then select drive pinion. It will show you a list of thumbnail pictures with dimensions of Mitsubishi drive pinions. Look through them and select the one that matches. Then double click on it, and it takes you to a page of information on that pinion, including what starters it fits.

From there, I could identify the other parts I needed, like in the previous example.

The same thing can be done using armature dimensions, solenoid dimensions, or even brush dimensions.

The armature dimensions of my customer's starter were easily matched to a part number in my OREM or RCP catalog. Dick Vensel of Vensel Enterprises also sells a catalog with rotors, stators, and armatures in it. It gives comprehensive dimensions as well as direction of rotation of rotors that have fans welded to them.

Another gray market Mitsubishi tractor starter had a new challenge. Some of these are common, made for North America, and some are not. This one wasn't. It had a legible part number but it didn't cross in any of my CDs or Web sites I had access to.

Taking it apart, I discovered a part number on the drive clutch. An example is 76171. That number didn't cross either, but in looking at the syntax of Mitsubishi drive clutches, I realized that the number on my UFO clutch was a short form. M357T is a typical preface for that number. Typing in the whole number, I soon found a cross. Doing a "where used" lookup, I soon found a number of other starters that used that clutch. Picking a similar starter based on pictures, I did a bill of materials search. Looking at the pictures and dimensions of the parts of the similar starter, I was able to verify that the parts would fit the UFO I was working on. Problem solved for that one.

There seem to be a lot of gray market cars, tractors, and equipment coming into North America. Sometimes when you can't get anywhere with your own collection of information, try tapping into someone else's...

You might want to give a call to H.C. Cargo for European and Japanese alternator and starter parts. They can supply an amazing variety of oddball parts at very reasonable prices. John Jervelund at Brantford Starter in Ontario got me started with them.

From Antique to ATV

An antique starter arrived at my door. To identify it, I searched for a tag, a stamping, or any clues such as logos. The customer could not give me any application info because it was from an engine that had been swapped over

to his machine. I disassembled it and found a number on the armature. Taking this number, I entered it into my Wilson CD, clicked on the "where used" button and came up with five possible options.

I looked at pictures of each, selected the most likely one, and then went to the bill of materials. From there, I went to my supplier CD like WAI or Lester which showed pictures of components, compared the drive and solenoid to make sure I had the right parts, and then ordered the parts I needed. I really like the backwards reference feature of databases. This used to be a lot more difficult when we had to do everything from the books.

And speaking of books, I bought a Lester catalog 20 years ago that covers vehicles back to the 1920s. I have not found some of this information anywhere else, and that's why it's not wise to discard the really old catalogs. It's neat to be able to help someone when they ask for something antique.

ATV starters can be a challenge to identify. I have downloads from the EMS Web site (www.electricmotor.svc.com/downloads.html) which lists a very comprehensive selection of these units. Also check the Web site at Stockers (stockers.com/productsLB.htm).

I recommend that you collect a number of different CDs, downloads, and Web sites. Nobody has all the units covered, it seems. IAT has a great downloadable catalog of European units. Wagner Alternators and Supplies has a Web site which includes a parts crossover feature.

Jack Isom at IMI helped me out with a Chinese tractor starter one time. He took certain critical dimensions from me, then manufactured a drive end housing to fit on a Nippondenso gear reduction starter with the correct gear. It worked great!

Another thing I have done with the WAI CD and certain others is to use the question mark (?) in place of a character where one is missing on the label, or an asterisk (*) in place of a group of characters.

For example if I want to look at all the starter drives made by Mitsubishi, I would look up the product code guide in the WAI parts book. A 54 represents

drives, and 83 represents Mitsubishi, so anything that follows would be a Mitsubishi drive. Based on that, enter 54-83*. This would then find the Mitsubishi drives, some of which would be pinions. Another way to do this is to select unit family, and then choose Mitsubishi starters. When the page loads, click on the top title of that column to sort, and then scroll down to the section where the drives are. Tab through them until you find one that looks right. Click on it, and it will call up a page on that part with dimensions, etc.

A couple of months ago, a company sent me an alternator from a 2005 Ford F250 5.4L pickup truck. It looked like a 3G 130A (sort of) but the part numbers did not cross in any interchange I tried. The usually helpful guys at the Ford dealership said that they did not sell and could not identify just the regulator for that alternator, and that the nearest alternator was a day away, and the customer was hoping to get it that same day.

The regulator, number VP4L2U-10316AA, looked similar to an F 794 in Transpo, the common 3G regulator, which I stock. Using the ERA forum (www.electricalrebuilders.org), I put in a request to find out if anyone had vehicle diagrams for that truck.

Apparently the good folks over at Automotive Parts Remanufacturers Association have a service called AutoElectricPro.com where you pay an annual subscription fee, and it will give you any electrical diagram you want.

A quick call to Mohammad Samii confirmed that the regulator did not connect to the data bus. This meant that it was not one of those Pulse Width Modulated (A, sig, FR) types. We put in the F794, and everything worked great.

With marine units I usually go to the ARCO catalog (you can download it) and look through pictures until I find a match. This also goes for those little tilt/trim pumps, etc.

I have an old IPM field coil catalog. I often found that the last four numbers of the IPM code coincide with the last four of the Wilson code. So if I find the right picture, pole shoe sizes, voltage, and rotation, it converts easily over to Wilson. For example, 2A-4769 converts

to Wilson 55-01-4769. You need to know the IPM code and Wilson code to compare them. For example, the Delco represents the “A” in IPM and the -01- in Wilson. If you can get one, Wilson also had a CD out a few years ago called “Coil finder.” It had pictures and cross references galore.

If anyone out there has other CDs or programs that they like, e-mail me (nate unger@shaw.ca). I consider information searching to be like digging for treasure. I even collect catalogs or CDs from suppliers I don’t actually buy from because they may have information that can help me in my searches. The programs that I use may not be the ones you will like. It has a lot to do with what you are used to.

The point to remember is that your present information sources probably have a lot more than you think they do even though at first attempt they might return a blank.

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