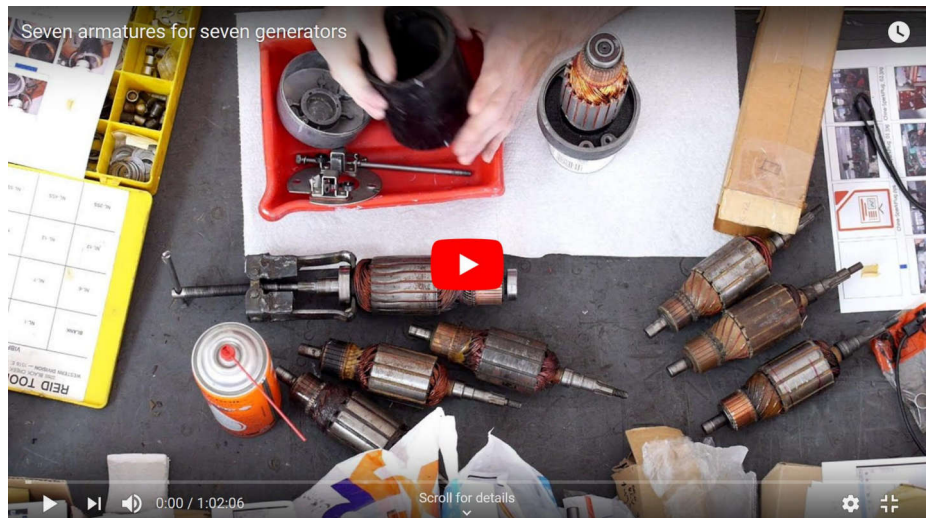


Seven armatures for seven generators

An evaluation of seven armatures for the Harley Model 65A and 65B generators.

The tips and tricks:

1. The OEM Harley armature for the 65B was clearly the best built and designed.
2. There were no other aftermarket armatures for the Model 65B Hitachi.
3. The 20-dollar armature was surprisingly good.
4. The 112-dollar armature was surprisingly bad.
5. Amazon has new production, probably out of Red China.
6. Near-identical armature shipped and sold by Amazon was better-made.
7. Two of the seven are getting returned for defects.
8. Many armatures are old production.



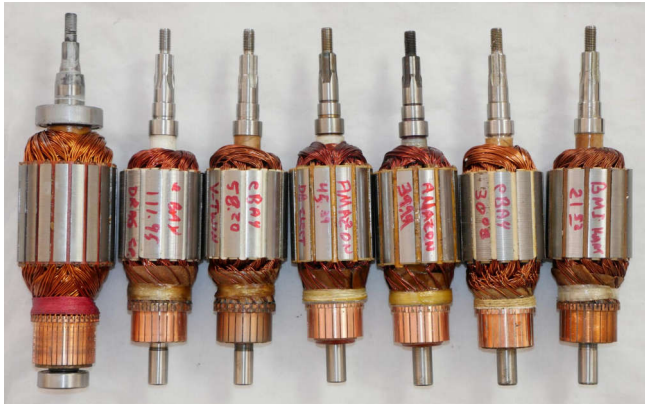
A video shows the evaluation of seven Harley generator armatures. (Click for video.)

After testing 17 generators previously, I decided to do a public service and order seven armatures from different suppliers. This way I can fix the broken generators, as well as learn about what vendors have the better parts.

The OEM (original equipment manufacturer) NOS (new old stock) armature that came with a Harley Davidson label on the box was clearly the best-made armature. It was for the Hitachi Model 65B generator, and was likely made by Hitachi decades ago. These armatures have gotten into the eBay retail channel, though some are sold on eBay by a Harley dealer.

The most expensive armature, at 112 dollars, was defective, proving cost and quality are unrelated, especially on eBay or Amazon. There were two Amazon parts, five eBay ones.

Seven new armatures:



Here are the seven new armatures I ordered on Amazon and eBay. On the far left is the NOS armature for the Hitachi 65B generator. It is significantly larger and puts out 13 Amps vs 10 Amps for the Model 65A. It was used 1982-E84, while the 65A was on Sportsters from 1965 to 1981.

The Hitachi armature was 89 dollars on eBay. To the right is a 112-dollar Drag Specialties eBay armature, defective. Then a 58-dollar V-Twin eBay armature. Next a 45-dollar Amazon armature. Then a 40-dollar Amazon armature, nearly identical. After that a 30-dollar eBay armature. Finally a 22-dollar armature from BMI Kart, a go-cart parts distributor that owns the old Dixie Manufacturing.

The more expensive Amazon armature was shipped and sold by Amazon. It was near-identical to the 40-dollar one, but cleaner, with no defects, and a hardness tester mark on the shaft end. The cheaper one had a splatter on the shaft and has to go back.

The armature direct from BMI Kart is also sold on Amazon and eBay, for a few dollars more. at 22 dollars it's a good deal.

Seven old armatures:



Here are seven old armatures I had laying around the house. The one in the middle came out of the generator I rebuilt recently. Same for the Hitachi armature on the far left. Some have blacked wires, making me think they have suffered over-current. The armature second from the right has unusual construction, with the wires on the drive end bundled up around the periphery, as opposed to just crossing over like the other armatures.



The three armatures on the right might be good electrically, but the shafts where the needle bearings run are damaged. The left one is mild, but you can feel the shaft is worn under-size and it hangs a fingernail. The middle and right ones are clearly damaged beyond repair. Note the Hitachi armature comes with bearings.

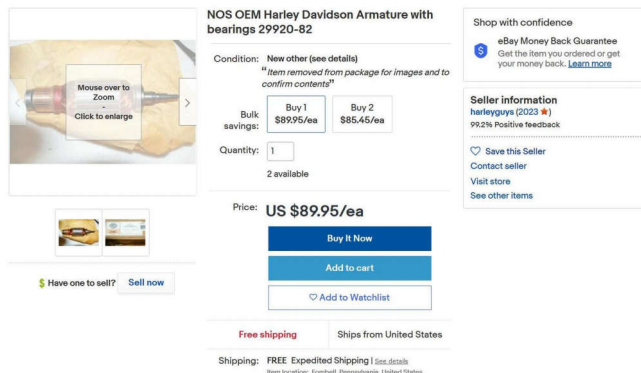
\$89.95 OEM NOS Harley armature



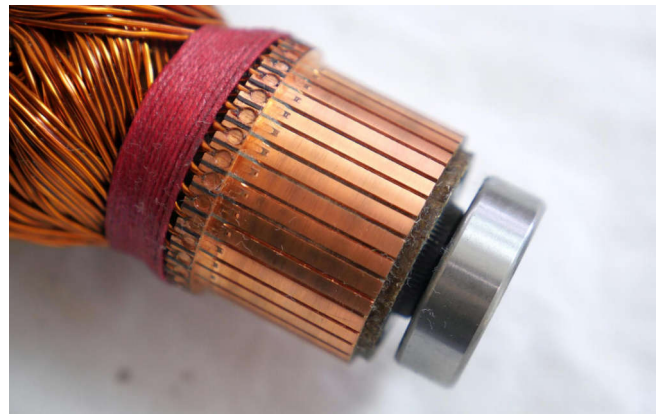
One of my seven Hitachi Model 65B generators was missing a bolt. When I opened it up to make the rebuilding article, I saw that the generator must have come apart at speed. The armature was beat into a spiral shape, with the outer diameter reduced from the pounding on one side. Amazingly, the generator still had output.



I bought the new armature on eBay, from a vendor in Pennsylvania. Since these are so old, many have crept out of Harley dealers and into the retail aftermarket channel.



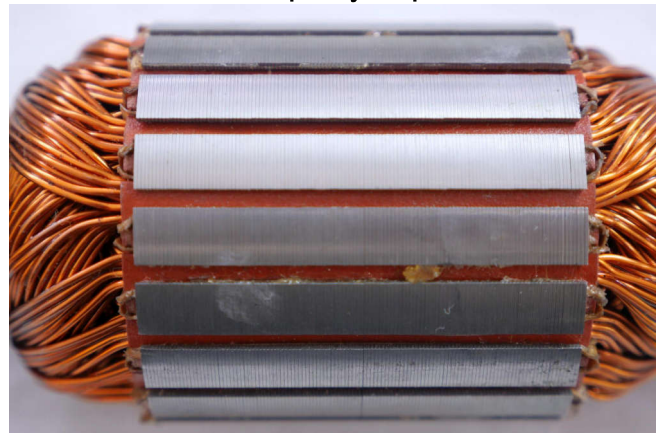
Here is the auction listing. They still have one left if you are interested. Another vendor is the Daytona Harley dealer Robison, not to be confused with the different Robison that designed the Thunderheads aftermarket aluminum heads for Iron Sportsters.



This sets the standard for quality construction. The commutator has even and perfect slots, the wires are held by a red cord winding, and the Hitachi generator gets around that needle bearing problem by having two roller bearings pre-installed on the armature.



Covered with anti-seize, since I took it apart to show you, the quality of the shaft and threads are equally impressive.

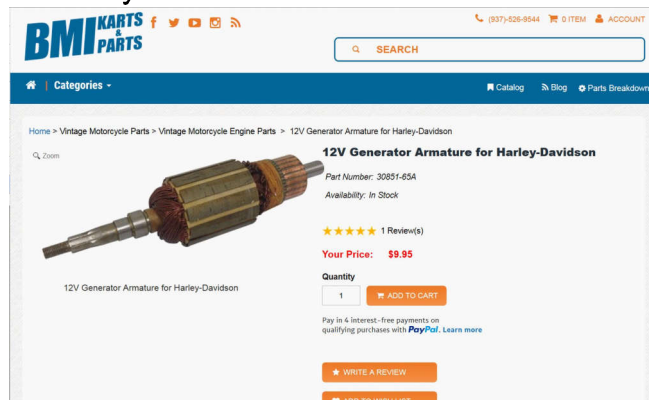


The laminations are perfect, even and straight, and thin enough to reduce eddy currents in the armature.

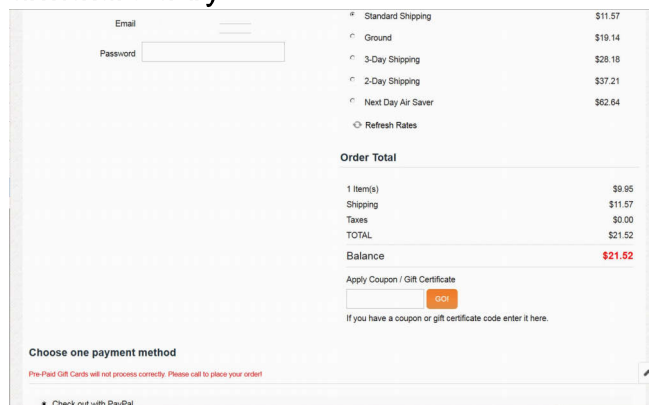
\$21.52 BMI Kart armature



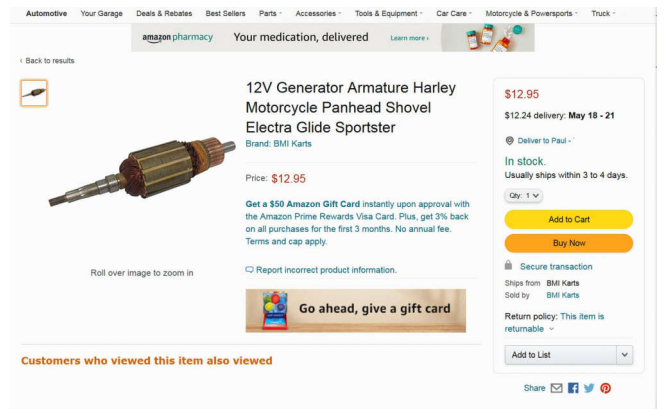
This armature sells for \$9.95 plus shipping that brings it to \$21.52. I ordered it from the BMI Kart website, which lets you pay with PayPal.



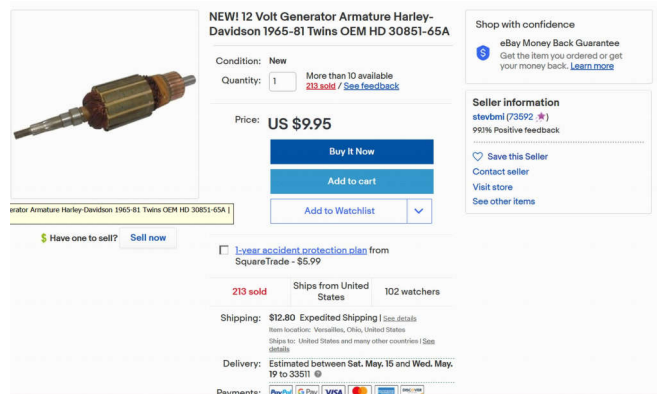
BMI Kart sells to the go-cart market. It also owns or inherited the inventory from the Dixie aftermarket motorcycle company. I remember the Dixie outfit as being pretty reputable, so I gave this ten-dollar armature a try.



The transaction went through fine, and they shipped the armature Priority Mail. I ordered on May 12, got it May 15. The armature was packed very well. It had its own box, that was put inside another cardboard box with shipping paper to prevent shocks or damage.



The same outfit seems to sell on Amazon. Here the price delivered goes up to \$25.19, to cover the billing charges Amazon puts on its vendors.



The armature is also on eBay, with a delivered price of \$22.75, about a dollar more than buying direct.



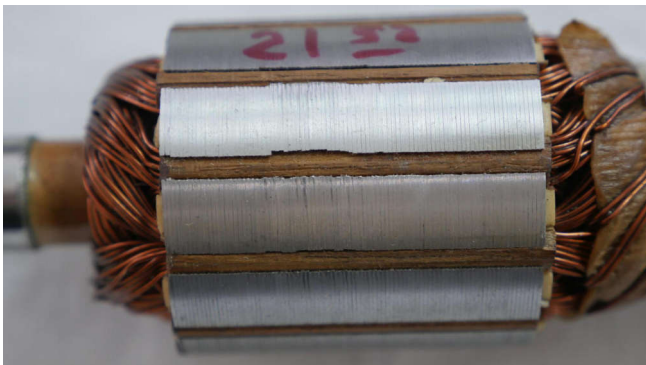
The patina on the copper commutator shows these were sitting in a warehouse for a long time. They might be old Dixie stock that the BMI Kart management decided to liquidate cheaply.



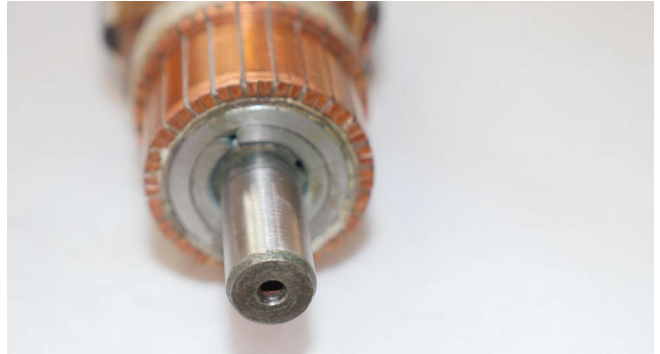
The shaft was bright and looked to be hardened steel. The larger step where the seal runs was smooth with good surface finish.



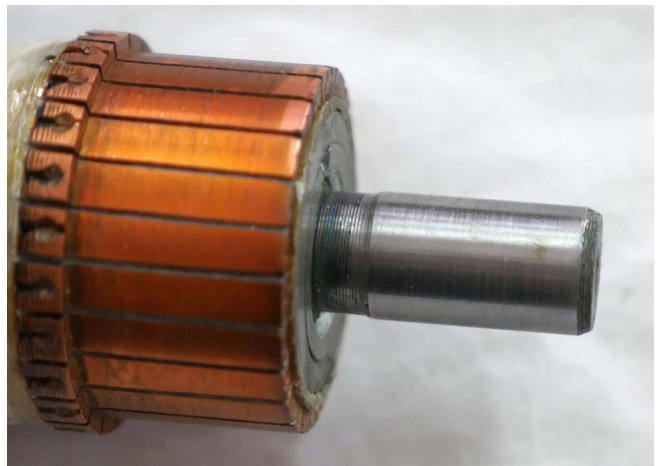
The 7/16-24 thread was cut well and in good shape.



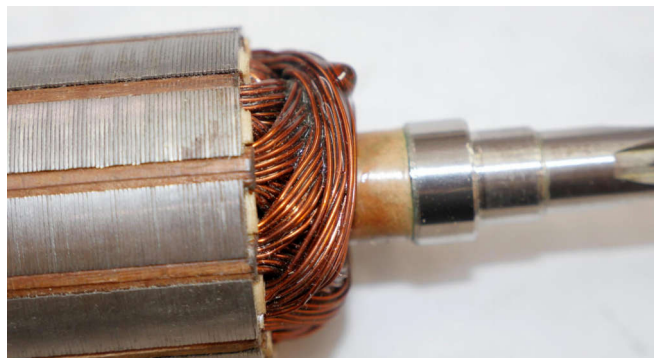
One quality issue was some shifted laminations. The wires in the armature slots do not press directly against the steel laminations. There is a paper separator put in each slot before the winding machine lays in the copper wire. Then an operator slides in plastic or wooden slats that contain and pressurize the wires. Other than this, the laminations were thin and evenly spaced.



The end of the commutator has steel rings.



The slots in the copper commutator were cut evenly. They were a bit shallow compared to some other armatures I have seen, but the copper would have to wear down a lot before the brushes bottomed out on the insulation material between the slots.

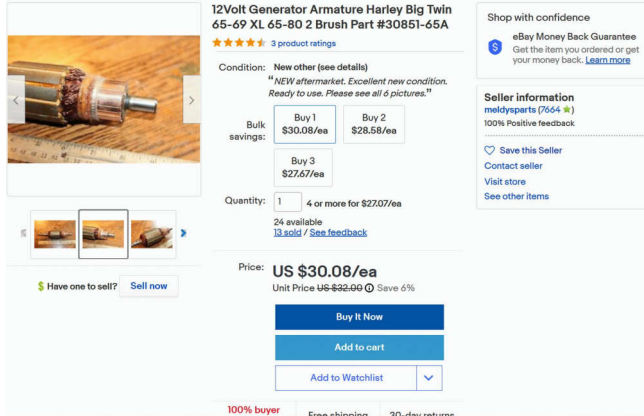


A minor quality problem was a droplet of dried shellac or lacquer on the windings where the armature was dipped to stabilize all the copper wires.

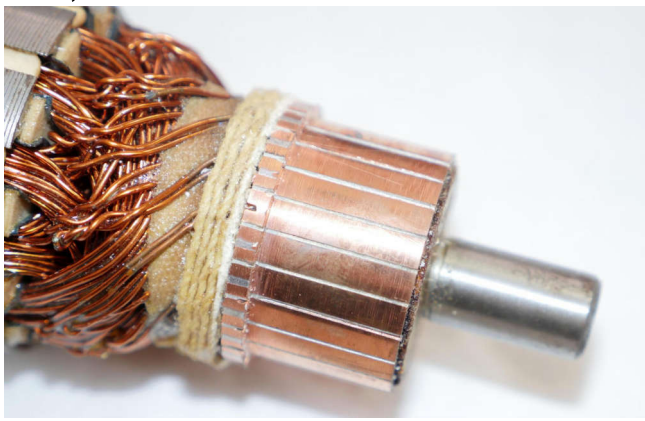
\$30.08 eBay armature



This armature sells for 30 dollars on eBay.



Meldysparts is a mom-and-pop family operation out of Logan Ohio. The armature was packed very well, with Styrofoam blocks to support both ends in its cardboard box. The box was in a Priority Mail pouch. Ordered 5-12-2021, it came 5-14. It came with a washer that fits the shaft, but is not used in factory generators. The brand on the box was Life Line, from Taiwan.



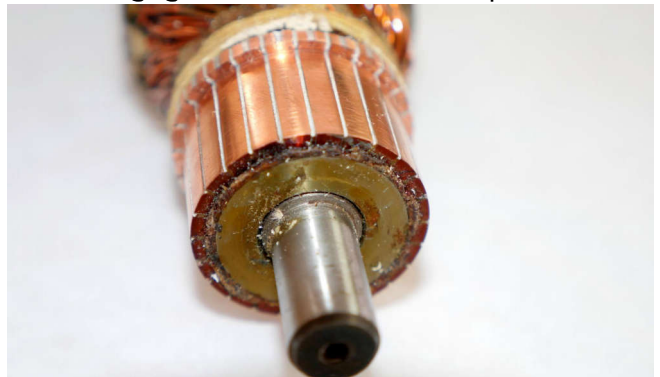
The commutator was smooth with even grooves, though the cuts were a little shallow. The shaft where the needle bearing runs was in good shape. The wires were tied with cord, nicely done.



The threads were dirty, but the shaft was smooth where the seal runs, and looked hardened.



The laminations were even, but there was a tiny bit of damage on one, which would have negligible effect on the output.

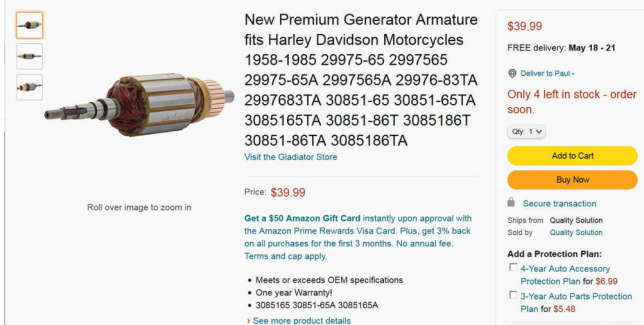


The end of the commutator was finished nicely with a steel washer. Here you can see the slots in the commutator are not cut deeply, but they are very thin, which is a plus. The more area for the copper segments, the better the current will transfer into the brushes. For the price, this armature looks very good, and is a keeper. I really like the smooth segments.

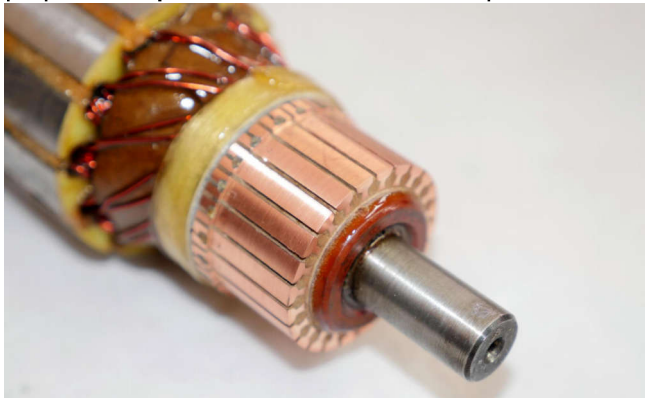
\$39.99 Amazon armature



This armature was \$39.99 on Amazon, no tax was charged me, it ships from Washington State.



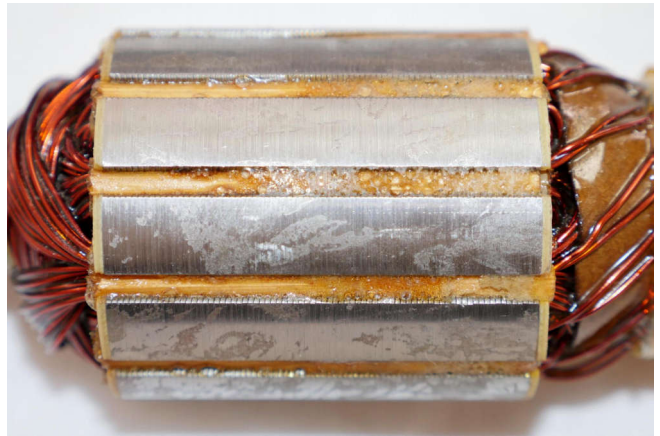
Ordered 5-12, it came 5-17. Boxed with paper wrap, it came in a FedEx pouch.



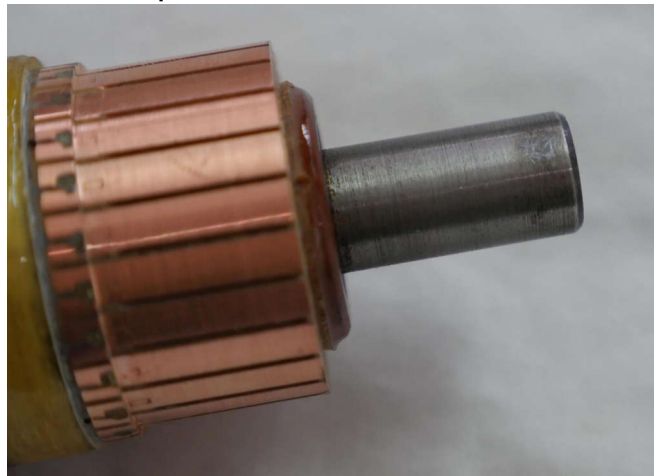
Looks to be modern production, with a red washer on the commutator and deep slots.



The shaft is smooth where the seal runs and the threads are cut cleanly.



The laminations were even and well-made, but there was a sealant or corrosion protection on them.



The commutator is a bit rough compared to others. The shaft had a defect right where the needle bearing runs.

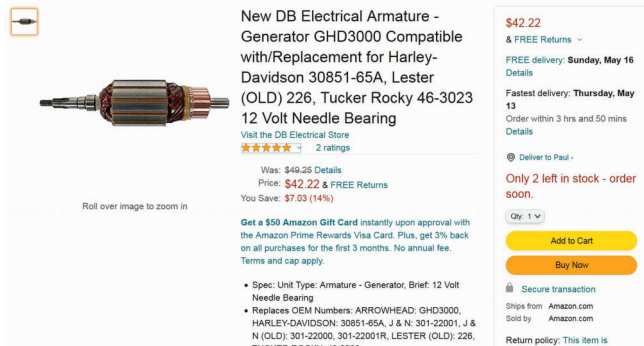


Here is the defect on the shaft, which means this will get returned to the vendor in Kent Washington. Since it was not shipped by Amazon, there will likely be a charge by the vendor to return the item. The next armature, shipped and sold by Amazon, would return free.

\$45.39 (inc tax) Amazon armature



Almost identical to the previous armature, this one is shipped and sold by Amazon.



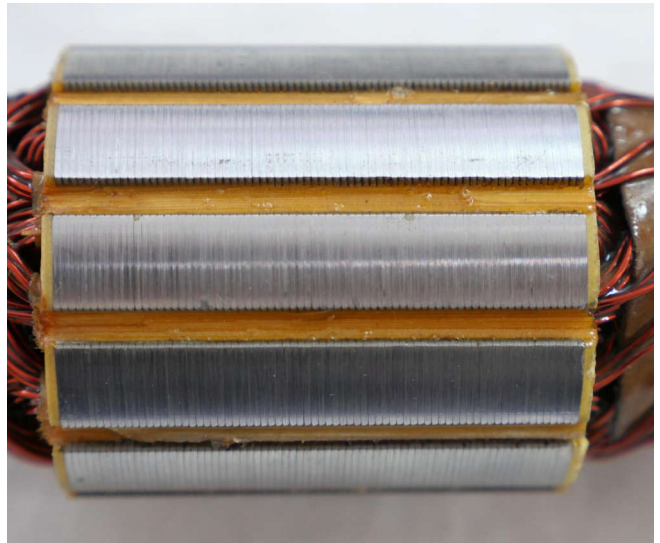
Ordered 5-12, it came 5-17. Box came in an Amazon pouch, minimal packing.



Deep cut slots like the previous, but the shaft looks better and no spatter where the needle bearing will run.



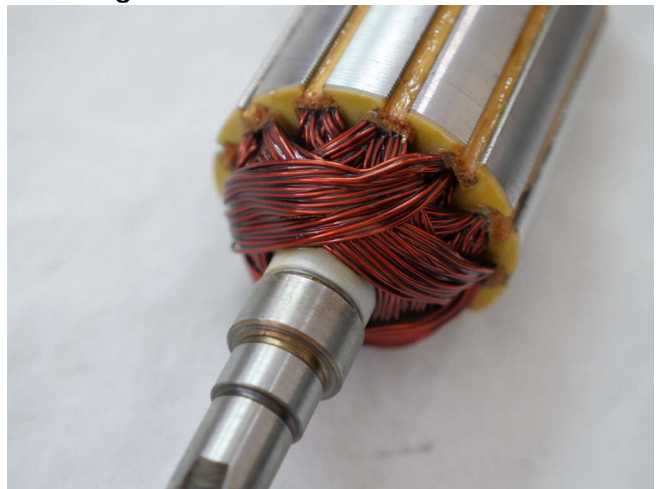
Threads and shaft are clean and smooth.



Nice laminations with no sealant like the previous similar armature.



Same red washer but the shaft has a diamond-shaped dimple on the end showing it was hardness tested.

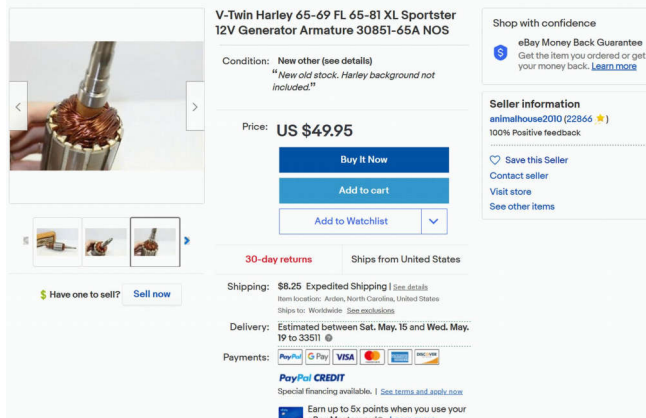


Without the spatter, and sealant, but with the hardness test, this is a keeper. The commutator is rough, but acceptable.

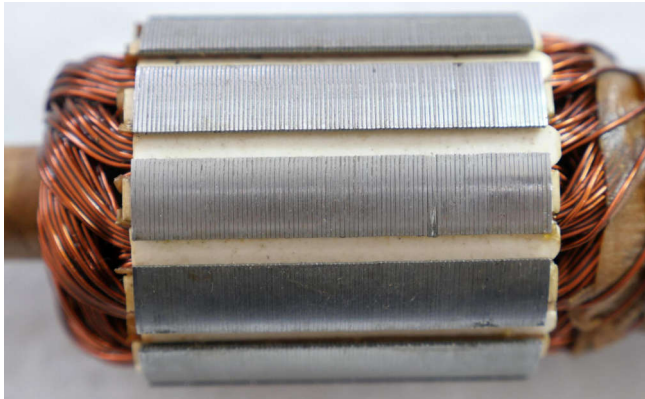
\$58.20 eBay armature



This V-Twin brand armature sells for 58.20 delivered. The seller is affiliated with the Wheels Through Time Museum in North Carolina, good folks.



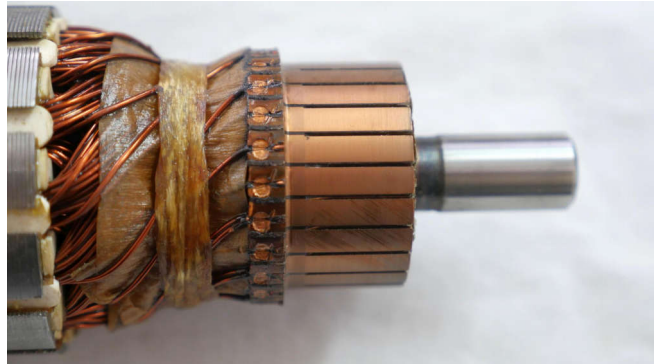
Ordered on 5-11, it came 5-15. The original V-Twin box was slipped into a Priority Mail padded envelope.



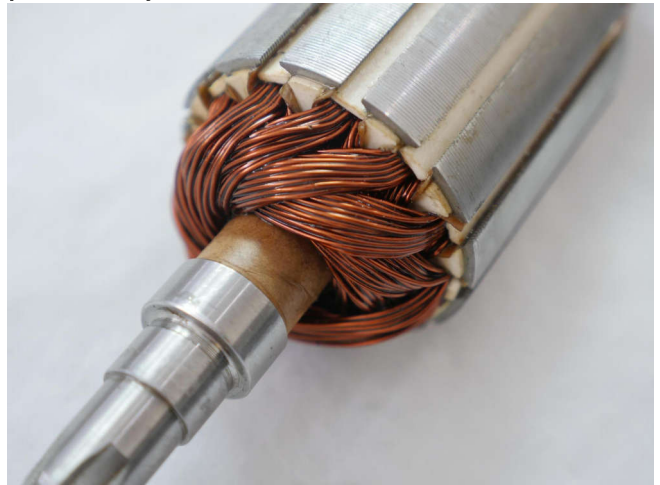
The laminations look thin and well-built. They are very even and not dirty or corroded. The armature was wrapped in ProtekWrap which seems to have done its job. I assume this was made in Taiwan decades ago, as opposed to the Amazon armatures, that look brand new. Overall, I like this best for the smooth commutator and hard shaft, but it is more expensive.



The shaft where the needle bearing runs looks great. This shaft is so bright it looks to have good hardness.



The commutator is cut nicely and is smoother than both Amazon armatures previously. This means less brush wear.

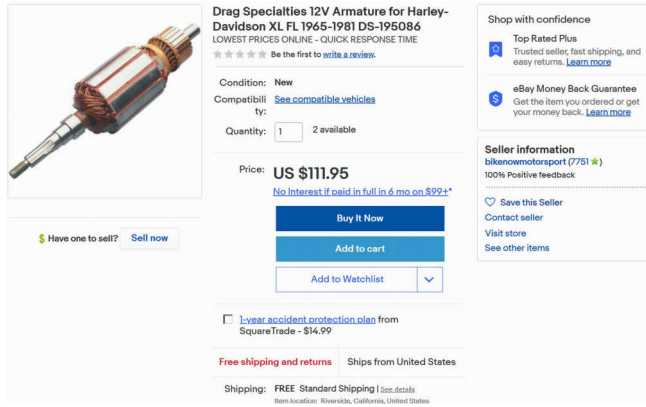


The shaft and threads are beautiful, smooth and clean and so bright I have to think this is a high-harness steel. The windings are nicely done and seem to be well-varnished in place. Another keeper.

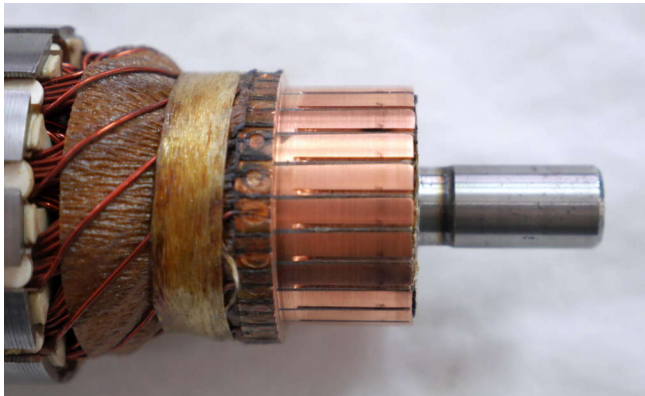
\$111.95 eBay armature



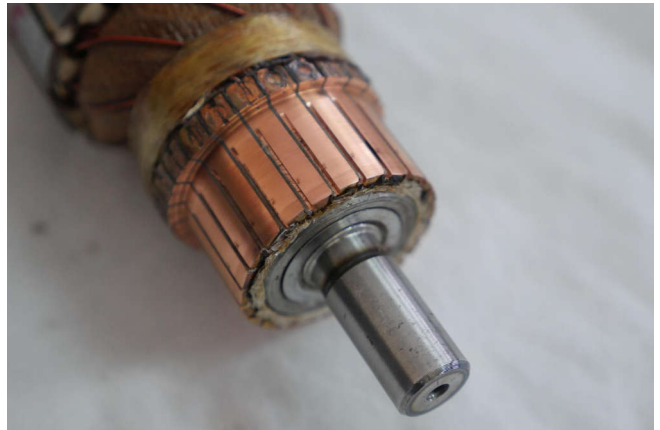
This Drag Specialties armature came from a vendor in Riverside California.



Ordered 5-11, it came 5-17 UPS Ground.



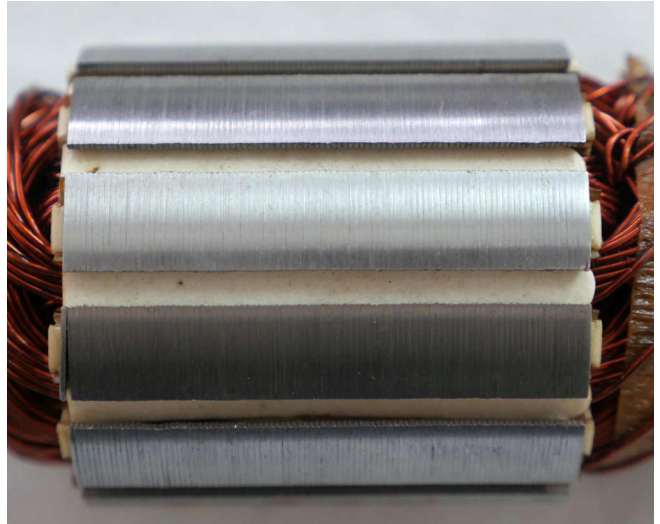
The armature is defective. You can see the slots cut for the commutator segments are in the copper, not the insulation. This means the insulation left will hold the brushes off and the generator will soon lose output. You could cut down the insulation by hand, if you were careful. This is a shame, since otherwise, the quality of this armature is very similar to the the quality of the V-Twin armature shown previously. The commutator segments are nice and smooth, meaning long brush life. The vendor was excellent about the return, free label for USPS.



The shaft where the needle bearing runs looks perfect and hardened. You can see the construction is very similar to V-Twin.



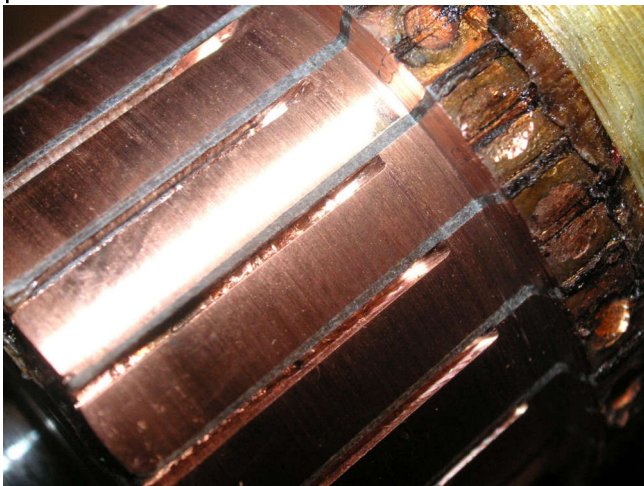
The seal surface is smooth. This armature does use a white plastic insulator unlike the paper one on the V-Twin armature.



The laminations are thin, clean, and perfect. It's a tragedy those commutator segments are cut wrong.



A view of the drive end of the armature shows the uniformity and quality of the windings. Drag Specialties usually has high quality due to their coming from the racing world where every bit of performance matters.



Another view of the mis-cut commutator segments. It is likely this might have been a hand operation in the old days, and some employee at the factory just didn't care or was not trained. The contrast of that ugly commutator with that beautiful hardened shaft is pretty hard to take. All that matters is that you now know what to look for in any armatures you buy. I do like that Amazon armature since it is new construction, but the V-Twin has a nice smooth commutator, and the BMI Kart is dang good for the price.



The needles bearing that runs on the end of the armature shaft is very short. On the left is the factory 9064 bearing. Middle is a Custom Chrome (CCI) bearing with an O-ring, part number 26-363. It must be used in certain aftermarket end bells with no separate seal. It will fit factory generators despite being a bit longer. Right is a longer bearing that also fits and supports more of the shaft.



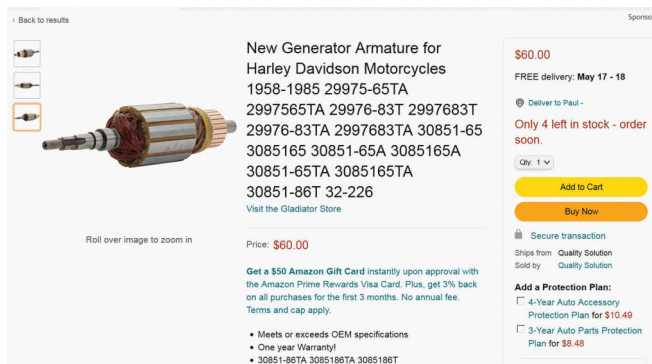
The factory needle bearing.



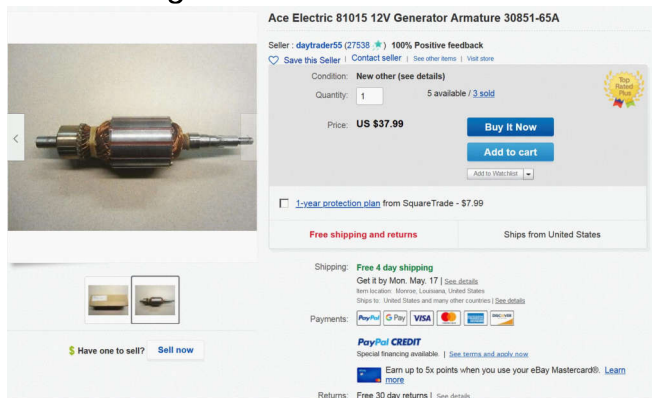
The CCI needle bearing.



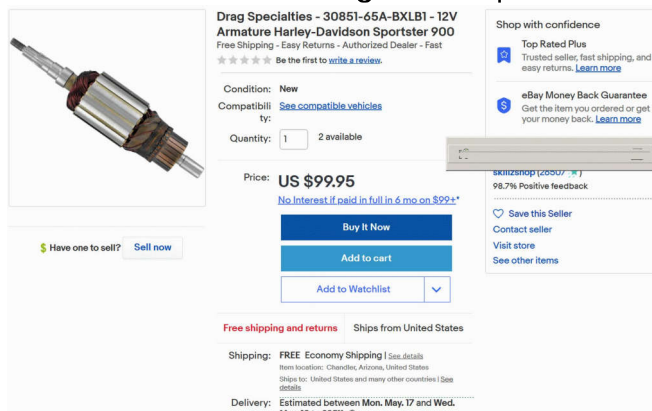
Finer needles in the long bearing.



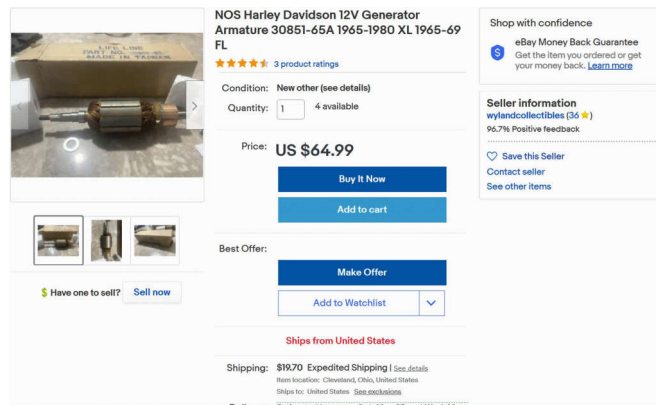
The same outfit as the \$39.99 armature had this listing for 60 bucks. It has now been changed to 40 bucks.



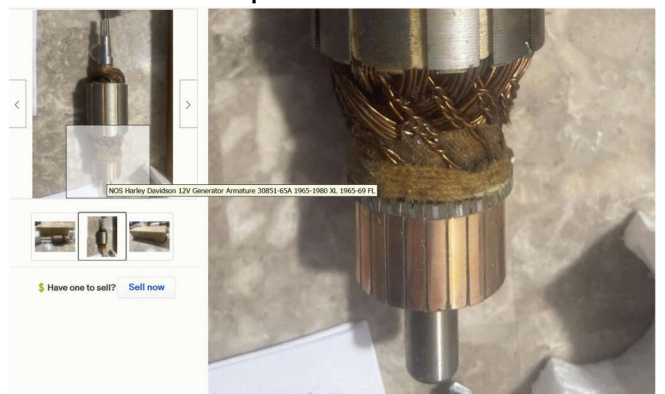
The box label says "Accel, which was a very high quality parts distributor back in the day. Problem is the shaft and commutator looked rough in the picture.



The dark commutator shows this to be old stock from a warehouse somewhere. It is now sold. I thought the price was high. After seeing the BMI Kart armature, I would hesitate to pay 100 bucks. I could probably call BMI up and get five armatures for the same hundred dollars.



Same as the 30-dollar armature I bought, but asking \$63.99, and now priced at \$49.99. The second auction where the armature was re-priced a few days after I looked at it and passed.



The expanded picture from the same auction. The commutator looks very rough. Thing is, the 30-dollar commutator I did buy looks pretty good. I am glad I passed on this one.

I was astonished that the 20-dollar armature compared favorably with the 60-dollar armature. I was disappointed that the most expensive armature was defective. Price does not mean quality, but don't blame the vendors, they are just trying to get a markup over what they paid.

The 45-dollar Amazon armature was modern manufacturing, but the commutator was a little rough. I think my favorites are the V-Twin overall, and the BMI Kart for price. Your mileage may vary.