

How to Replace a K Model/Sportster Neck Casting

52-72 K & Sportster

By the OSKRG vs.1



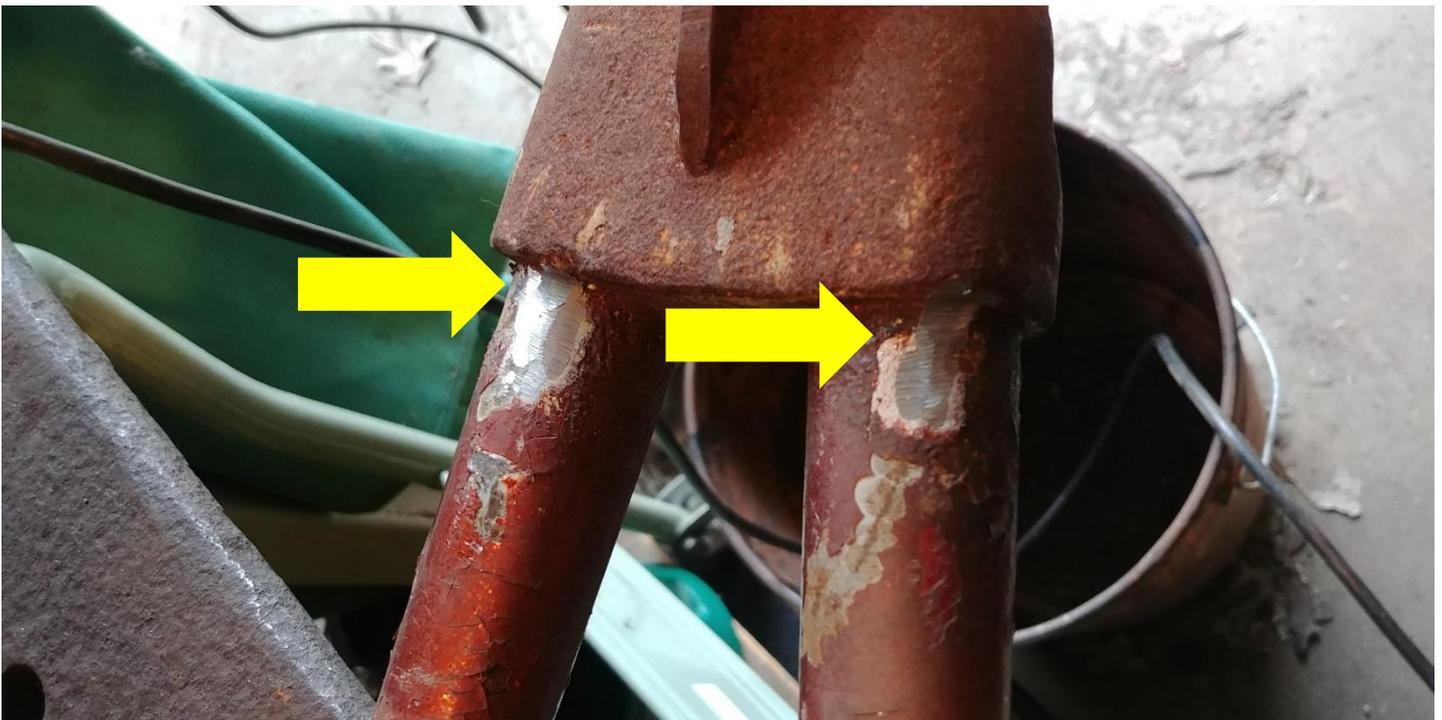
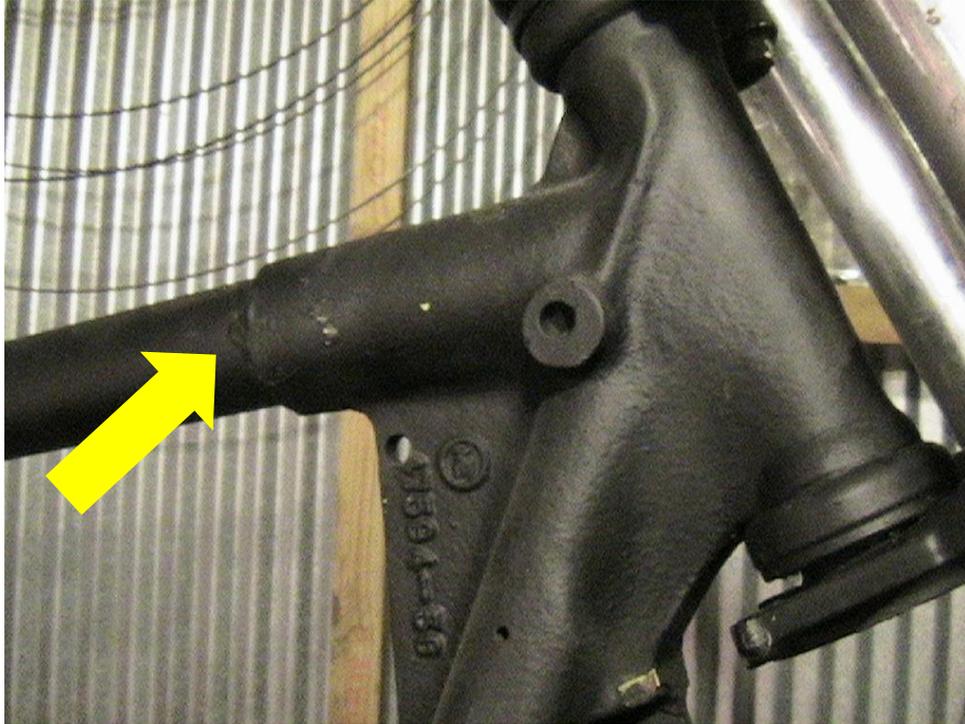
Tools Needed:

- Torch
- Silver Solder
- Welder
- BFH
- Workbench
- Clamps to Secure Frame
- Reamers
- Fixture to Properly Position New Neck Casting
- Turnbuckles
- Nuts and Bolts

Caution needs to be in abundance when applying significant pressure with hydraulics. Things can shift or break with violent force launching metal with deadly force.

Part 1: Neck Casting Removal

Step 1: Grind off as much of the tack welds on the neck to backbone and the neck to downtubes as possible without digging into the base metals on the backbone and downtubes. Since you are replacing the neck, casting grinding into it is fine. You probably have two on the neck and one or two on each downtube.



Step 2: Position the bottle jack base against the seat casting seat brackets. Secure the bottle jack to the top of the backbone with a makeshift bracket. I used a large electrical pipe bracket and some all thread. I set a U bolt between the bottle jack and the backbone as a spacer to get the right angle between the bottle jacks "ram" and the angle iron I used as an extension of the ram. I cut a "V" in the end of the angle iron so that it wouldn't slip off the neck casting. I recommend securing your ram extension, in my case the angle iron (see arrow), to the backbone in some fashion to prevent injury if the jack ram and extension shift under pressure. Tie or bailing wire may work well for this.



Step 3: Pump the bottle jack until significant pressure is applied to the neck casting. Using a torch heat the spot out of the neck casting/backbone union. At some point you may notice the neck casting has moved ever so slightly, at this point while keeping heat on the neck try pumping the bottle jack to separate the backbone from the neck casting.



Step 4: Weld a stout "L" bracket to your welding table skinny enough to fit between the downtubes. Position your frame over the L bracket with the upper portion of the downtubes laying flat on the table. Insert a front motor mount bolt through the frame holes "behind" the L bracket (see arrow).



Step 5: Position the base of the jack against the front of the L bracket. Run the jack ram up against the bottom of the neck casting between the downtubes. Pump the jack until significant pressure is realized against the neck casting. Really heat the spot out of the union between the neck casting and the downtubes. When you notice the ever so slight movement of the neck casting try pumping the jack while keeping heat on the casting. You'll need to move the heat from one side to the other on the neck frequently to keep both sides hot.



Observations & Comments:

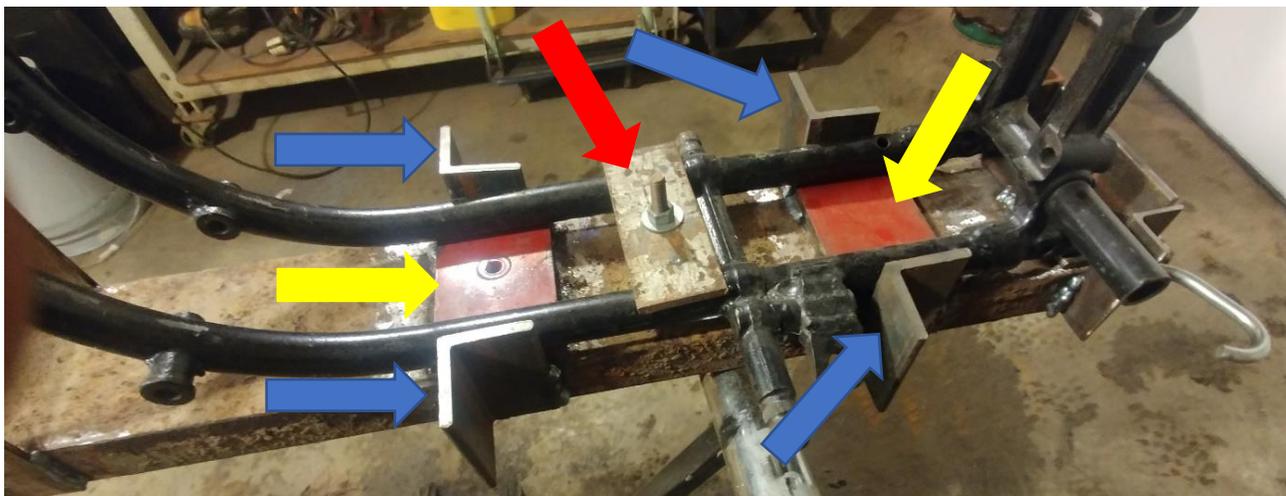
- I need a stronger bottle jack, I felt mine was marginally strong enough.
- You need to put significant heat on the casting.
- **Be concerned with safety. Hydraulic pressures can be significant. If your set up shifts components could move violently causing injury.**
- The parts become really really hot and really hurt when you go brain dead and try picking them up shortly after you separate them. Trust me on this.



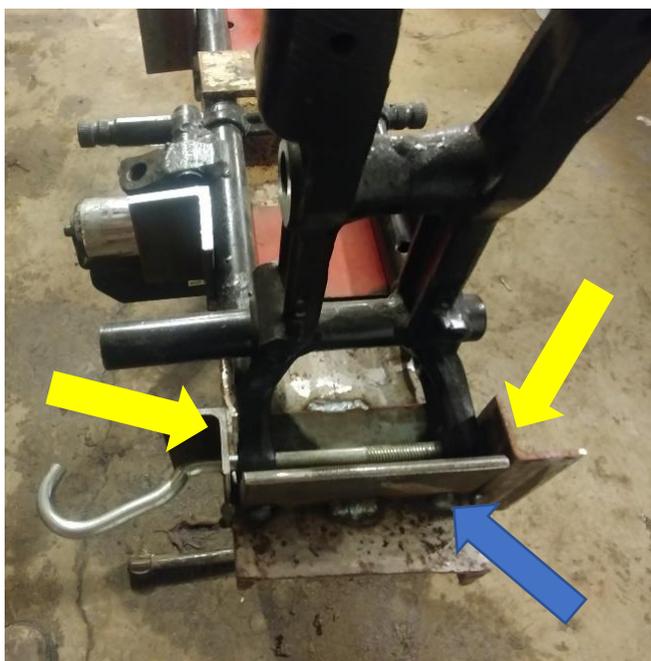
Good Luck!

Part 2: New Neck Casting Installation

Step 1: My first step was to make a fixture to position and secure the frame and allow for the proper positioning of the replacement neck casting. I built the fixture around a known good frame with no issues. A 4 & ½' length of 5" "C" channel was used. The yellow arrows point to the 3/8th plates I welded to the C channel to raise the frame. Without raising the frame it would not sit flat on the downtubes. The footpeg support casting running from left to right and the kickstand spring attachment point on the bottom of the downtubes would be in the way. The red arrow points to the hold down plate used to rigidly secure the frame. The blue arrows point to the 4 side plates I secured to the C channel that extend above the channel and the frame lower downtubes. This worked out very well. The frame snugly with no slop just fits between the side plates, gentle tapping with a soft mallet was needed to lower the frame onto the channel.



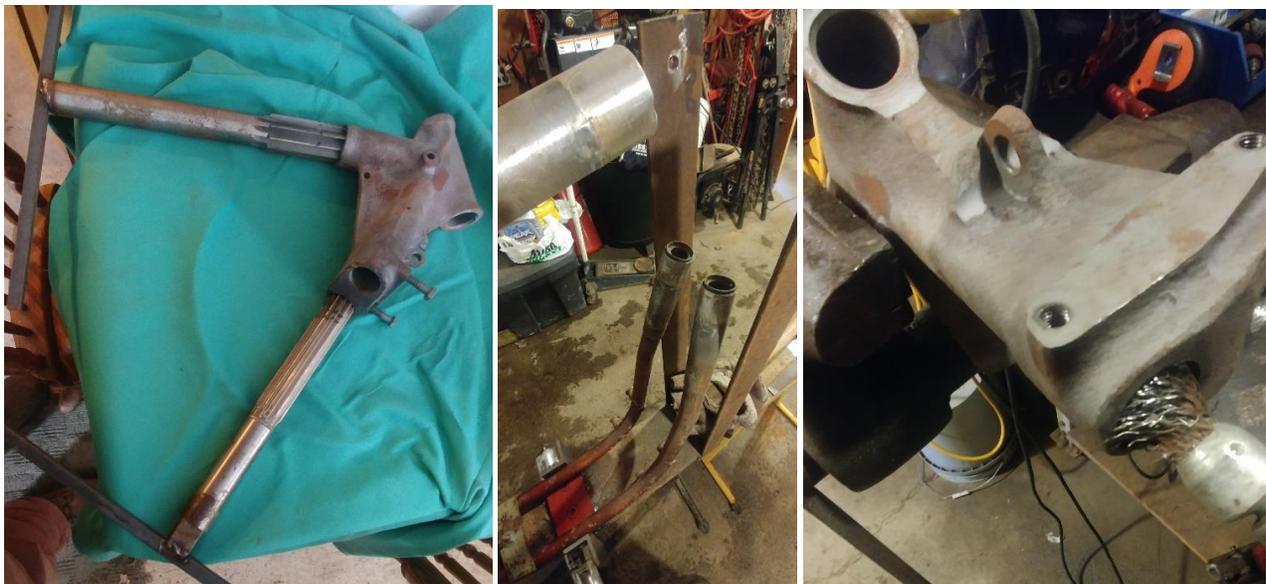
The yellow arrows point out 2 side plates welded to the channel and drilled to allow the placement of a bolt or steel dowel through the bottom back hole of the "Tomahawk". This will consistently position the frame from front to back. The blue arrow points out a plate I installed to help position the frame front to back but soon realized it is unnecessary.



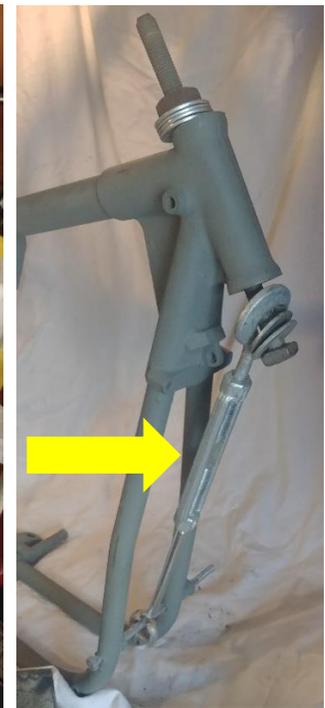
I purchased an 8' precision (very straight) one inch steel rod. I had a set of neck cups machined to just accept the rod. This tight tolerance created problems. When the cups were tapped into place in the neck casting, the rod was very difficult to insert. I eventually had to ever so slightly ream the cups in place to allow the rod to pass. I drilled out a large nut to a 1" ID to just fit over the end of the rod. With the good frame secured to the fixture and the rod inserted through the cups and extended to the C channel, I placed the nut over the end of the rod and welded it to the C channel. I cut the 8' rod into two 4 foot pieces. One of the pieces I used as an instrument for aligning the new neck (did not want to do anything with it to distort its' straightness), the other I used as a tool to "torque" the neck casting ever so slightly to the left or right to achieve proper alignment.



Step 2: You will want to clean your components that are going to mate and get silver soldered. For the backbone and the downtubes emery works well. The new neck may need to fit onto the backbone or the downtube more or less than the original neck did. Be sure to grind smooth any part of the tack welds that might remain on the backbone or downtubes and interfere with fitment. The new casting will have to be cleaned up as well. It most likely will have the remains of silver solder from its' last use. The neck casting backbone hole takes a 1 & ½" reaming tool. The neck casting downtube holes (late 55K and on with the downtube "doublers") takes a 1.2" reaming tool. I then wire brushed the neck casting holes.



Step3: Get the new neck casting started. Force it over the downtubes and backbone. There is no secret or anything hi-tech about this, do what you must to mussel it into a starting position. Once started I used ½” turnbuckles to draw the casting into place. You will want to buy the longer ends to go with your Home Depot or Menards ½” turnbuckle. The ends that come stock will not give you the reach you need. I felt the ½” turnbuckle was marginally adequate. The turnbuckle to draw the casting onto the backbone was connected to the seat casting seat mount with a bolt through the casting and the turnbuckle. How you connect to the neck casting is a function of your creativity. I used a large steel ring that was laying around the shop. My set up to draw the neck casting onto the downtubes was a little more elaborate. I would remove the 4’ rod from the neck casting and replace it with a ¾” bolt. The bolt head would protrude from the bottom of the neck and large washers with a nut would secure the bolt to the top of the neck casting. The lower end of this turnbuckle can be pinned with a bolt going through the upper front motor mount downtube holes. You will need to work one turnbuckle then the other and then check alignment with the precision 4” rod. You will probably have to repeat this step several times to get the neck alignment right.



Step 4: This step is about fine tuning the alignment. We need to have a conversation at this point about Harleys quality control tolerances. Did you ever wonder why the front motor mount plate mounting holes were elongated? How about #4 from the Service manual saying keep track of how many shim washers the top motor mount uses? Both provide tolerance for variances in the frame construction.



SPORTSTER

gasoline lines (1, 2 and 2A) and remove bolts securing gasoline tank. Tank can then be removed from motorcycle.

Remove the following parts from right side of motorcycle.

2. Remove air cleaner assembly (3) including back plate.
3. Disconnect throttle and choke control at carburetor (4 and 22).
4. Remove top engine support bolt located at point (5). Be sure to note the number of shim washers

SECTION 3A
Engine - General

between cylinder head bracket and frame lug; these will have to be refitted when installing the engine.

5. Loosen exhaust pipe port clamps (6). Remove two muffler clamps and free exhaust system from motorcycle.
6. Disconnect spark control wire from circuit breaker or magneto (1964 and earlier XLH and 1965 XLCH).
7. Remove generator and horn mounting screw (1964 and earlier XLH).
8. Remove starter crank clamp bolt (9) and with a screwdriver pry crank from shaft. Press down on

I have built two different fixtures for frame repair. The original one was not intended for neck casting replacement but rather for rear downtube, seat tabs etc... The second was for this project, neck casting replacement. I never understood on the original fixture why sometimes it didn't line up well with the seat casting gas tank mount boss and the gas tank mount holes in the neck casting. What I realized after building this fixture for neck casting replacement incorporating positioning brackets for the front gas tank mounting holes in the neck casting, is that this is somewhat of a variable. What I believed HD did was align the frame casting from blueprint dimensions. Some holes were predrilled before assembly like the seat casting plunger hold down plate threaded holes and the front seat tab holes. This makes sense since the seat bracket was of certain dimensions and it attached to two points on the same casting. What was not consistent is the relative position of the neck casting gas tank mount holes and the location of the seat casting gas tank through hole mount. Because of tolerance variances between the neck casting position relative to the seat casting, I believe the seat casting gas tank mount hole was drilled after the frame was assembled. Examine the two shown below to see how much of a difference there could be.



In addition if you look at a gas tank, its' front mount holes are also elongated to allow for variations in mounting hole positions.

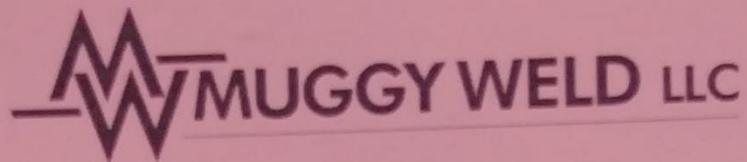


Step 5: Once you are satisfied with the alignment of the new neck casting, tack weld it into place. I would put the tachs in the same spots they were originally. I also would practice my tachs on a scrape piece of steel first. Arrows indicate tach welds.



Step 6: You will now need to silver solder your replacement downtube. I have been using “MuggyWeld” silver solder, it seems to work well. I would recommend looking at the MuggyWeld website on how to use their rod first rather than after you try using it. I also used the flux they sell.





SSF-6 Instructions

1. Prepare metal using sand paper, emory cloth, wire brush, Dremel tool, steel wool, a sander, or a wire wheel.
2. After cleaning metal, preheat generally to 350° F. Heat the joint area to 800° F.
3. Melt off some flux and allow it to flow throughout the joint.
4. Add alloy while heating the deposit and the parent metal until the deposit has completely flattened and flowed out.

SSF-6 Tips

- Clean base metal before soldering.
- Never heat metal bright red, as this can impede the flow of SSF-6.
- The key to any brazing or soldering with a torch is a fair amount of preheating of the adjacent work area. Broadly preheating beforehand reduces the surrounding metal from pulling heat away from the targeted area. This will always ensure a better result.
- Allow the flux to work momentarily before adding the rod.
- Flow out each drop of rod before depositing more.
- If the rod balls up, the base metal is too cold-- back the brazing rod up and heat the base metal in a broad fashion.
- A flat braze will result in the best seal and bond.
- Almost any torch can be used, including: propane, MAPP gas, natural gas and air, straight acetylene, or oxy-acetylene. The cheap brass tips do not work well in most cases. On thin metal or small parts, propane or MAPP gas works fine. Use an oxy-acetylene with heavy gauge metals.
- To build up, use slightly less heat when depositing rod. The bridge small gaps and holes, apply some rod around the hole or gap then use less heat to bridge the desired area. More heat will make the rod flow thinner and it can fall through.
- If the rod is in place and you want more flow, add more flux.
- After brazing, let the part air cool naturally to achieve the highest strength.
- Warm water and a wire brush will remove any remaining flux.