



INSTALLATION INSTRUCTIONS  
TC BROS CHOPPERS  
PART #103-0017 (stock tire width)

WELD ON HARDTAIL KIT FOR ALL 2004-2013 HARLEY DAVIDSON SPORTSTER  
MODELS EXCLUDING XR1200 AND MODELS WITH ANTILOCK BRAKING SYSTEMS (ABS)

*If downloading & printing these instructions online, be sure to set your printer to print "Full Scale"*

**Note:** Please be aware that this procedure may exceed your technical abilities. Please read instructions completely and carefully before attempting installation. This product requires welding and use of power tools to install. All welding should only be performed by an experienced, competent welding professional. This is NOT a project for the first time novice welder. All welding should be done using equipment powered by a 230V power source or larger to allow for sufficient weld penetration. If your welder plugs into a standard U.S. household 115V outlet, it is NOT powerful enough to use for installation. If you are unsure of your abilities, please consult an experienced fabricator.



**WARNING: INSTALL & USE AT YOUR OWN RISK!** Always wear and use all proper safety gear at all times when installing this product. This includes, but is not limited to, proper eye protection, ear protection, proper ventilation, and proper welding safety equipment. We have made every attempt to ensure that these instructions are concise and easy to follow, but if any mistakes are found, or you require additional information, we can be reached M-F from 8:00am-5:00pm EST by calling 419-265-9399 or via email at [sales@tcbroschoppers.com](mailto:sales@tcbroschoppers.com). TC Bros. Choppers LLC assumes no liability for any personal injury or property damage caused by the installation and/or use or misuse of this or any other product.

**Tools required for installation:**

- Motorcycle disassembly tools. Some helpful tools include Hex Key wrenches (aka "Allen Wrenches"), Combination Wrenches, Ratcheting Wrench and Socket set, and Screwdriver set.
- Measuring & Marking Tools including Tape Measure, Square (Machinist or Combination Style), Scribe or fine tipped paint marker, Straight Edge or Level, and Masking tape.
- Steel Frame Cutting Tool. Possible tool includes Hacksaw, Reciprocating saw, Portable Band saw, Air powered grinder or Electric Angle Grinder with proper wheel. Cutting torch is not recommended.
- Grinding tool to finish cuts to square if they are not perfect on the first try. Electric or Air Powered Angle grinder is most commonly used.
- Paint removal tool. Possibilities include a simple strip of 80 grit sandpaper or emery cloth, an angle grinder with wire brush installed, or abrasive blaster. Coarse grinding wheels or sanding discs are not recommended. Remember that you only want to remove the paint around the joint to be welded in order to prevent weld contamination. You do NOT want to be removing steel and reducing the wall thickness of the stock frame tubing as you can severely weaken the structural integrity of your finished connection.
- Motorcycle lift or heavy duty table/workbench. Not required, but makes install much easier.

## 2004-2013 SPORTSTER HARDTAIL INSTALLATION INSTRUCTIONS:

1.) Disassemble motorcycle to the bare frame seen (Figure 1). This includes removing engine from frame. Rigid motor mounts (not included, see TC Bros. #105-0190) are required to replace rubber engine mounts. Failure to use rigid mounts will cause serious problems such as chain slap and exhaust mounting issues. A service manual can be very helpful if you are unsure how to remove a specific component. TC Bros Choppers sells service manuals for Sportsters and these can be purchased on our website [www.tcbros.com](http://www.tcbros.com) or by calling 419-265-9399.

Figure 1



2.) Cut off rear brake master cylinder pivot mount on right lower frame rail (Figure 2). Grind all factory weld material from frame. All weld must be removed for proper hardtail alignment (Figure 3). Master cylinder will be relocated in later steps of install.

Figure 2



Figure 3



3.) Mark for cut on lower seat support frame tubes. Cut point is where tube is welded to rear motor mount casting. Mark tube using scribe or fine tip paint marker at edge of weld. Use masking tape to wrap straight around tube to give a visual identifier to aid in making a straight cut. (See Figure 4)

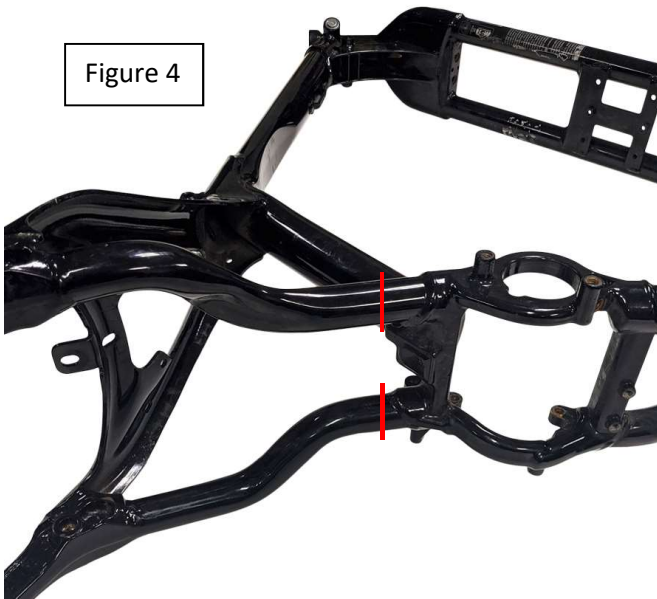


Figure 4

4.) Mark for cut on upper seat stamped plate. Use template included in instructions. Align edge of template with rear fuel tank mounting bung (See Figure 5). Mark using scribe or paint marker. Apply masking tape as described in step 3.

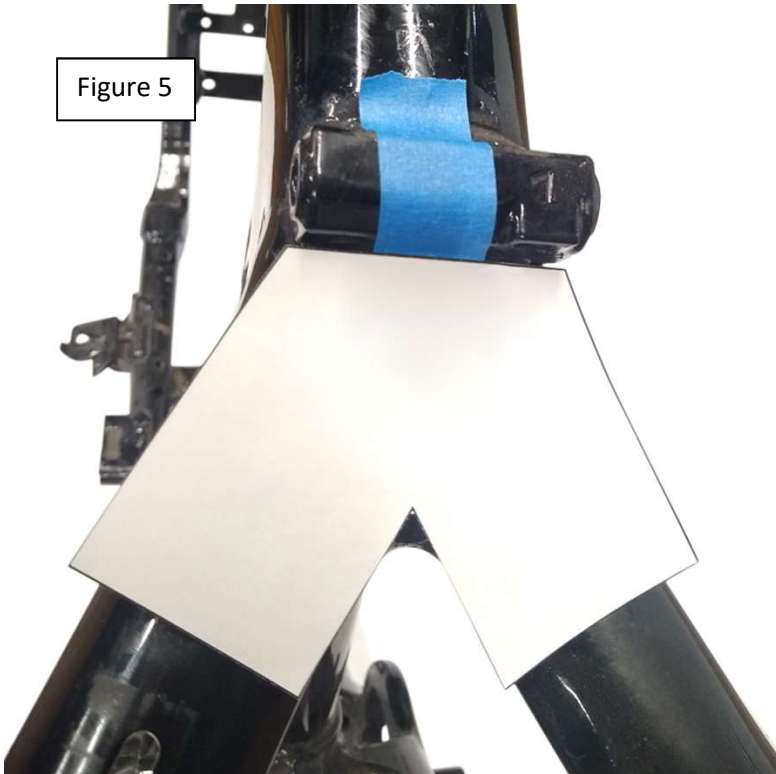
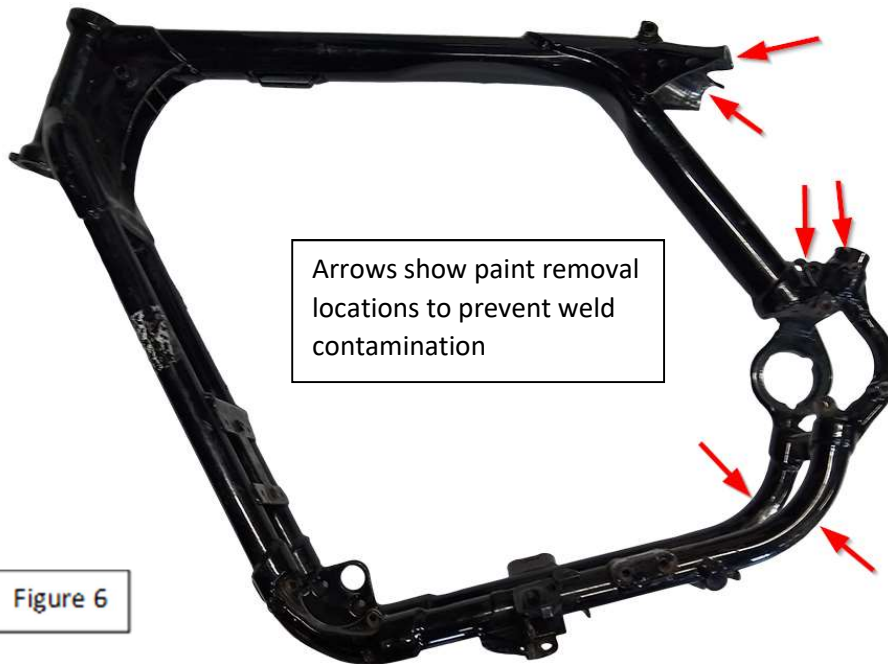


Figure 5

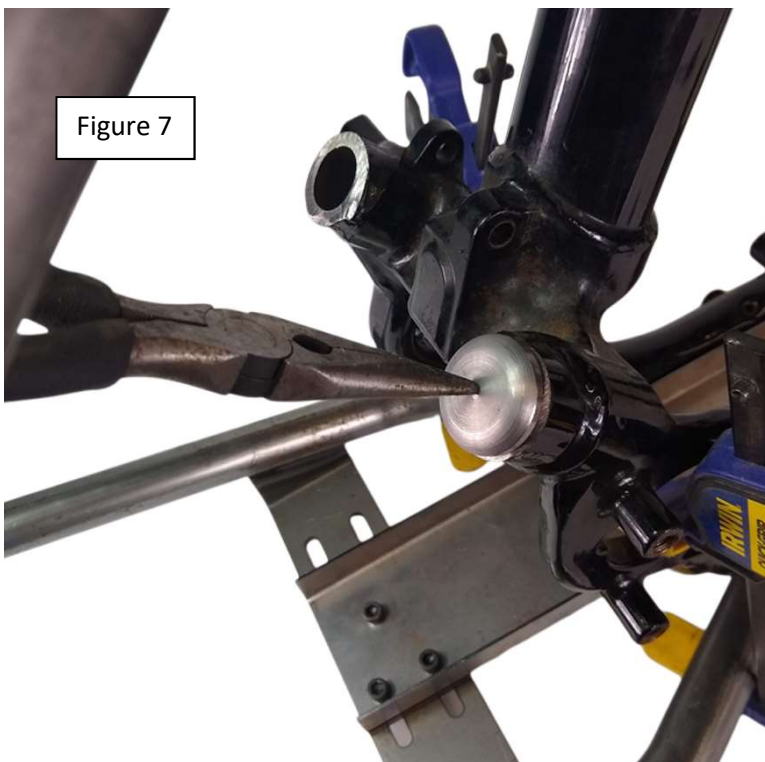
5.) Double check all 4 locations to ensure masking tape is in proper locations. Complete seat support tubes cuts first, being careful to make cut as straight and square as possible. Repeat procedure for both upper seat stamped plate cuts. Hacksaw, Reciprocating Saw, Portable Bandsaw, or Angle Grinder with proper cutting wheel are all effective tools to make the necessary cuts.

6.) Check squareness of cuts using square and correct as necessary using a grinder. Hardtail after frame cut should look like Figure 6 below.



7.) Remove paint around all cut locations, underside of seat stamping, as well as the lower frame rail bends to prevent weld contamination. Sandpaper, wire brush, or abrasive blaster are all effective tools for removing paint. Do not use coarse grinding wheels or sanding disks that may remove significant amounts of steel from tubing, thereby weakening the final welded joint. You only want to remove paint. **WARNING:** Do not skip this step or weld failure can occur.

8.) Tubing caps are provided to cover cut seat tube cuts and provide a finished appearance. Hold in place with tool such as chisel or clamp in place. Weld around entire diameter to secure. (Figure 7)



9.) Install hardtail frame alignment jig (steel u-channel) in stock lower frame cross members using 4 bolts and nuts provided. Make sure that flanges of the channel are facing upward (See Figure 8). Hand tighten so the alignment gauge is snug to cross members.

10.) Place upper hardtail seat tubes under the stamped seat plate and mate the coped areas of lower hardtail tubes to stock lower frame rails. Raise hardtail to align holes in frame alignment fixture and battery tray. Insert bolt into center hole and secure with provided nut. Do not fully tighten nut. Insert bolts into two open holes and secure with nut. Do not fully tighten. (See Figure 8)



Figure 8

11.) Visually align frame alignment fixture with lower frame rails so it is parallel to both. Tighten 4 fasteners to crossmembers. Next tighten 3 fasteners to connecting alignment gauge to battery tray on hardtail.

12.) Verify alignment using passenger footrest lower mounting point on stock frame. Hook tape measure over front of mounting post and measure back to inside radius of hardtail axle plate (See Figure 9 & 10). Measurements should be the same. Approximate Measurement: 18 – 18-1/8 inches. It is critical for alignment that the measurements are the same per side.



Figure 9



Figure 10

13.) Clamp points of contact of the hardtail and stock frame. See Figure 11 & 12. Verify alignment again.

Figure 11

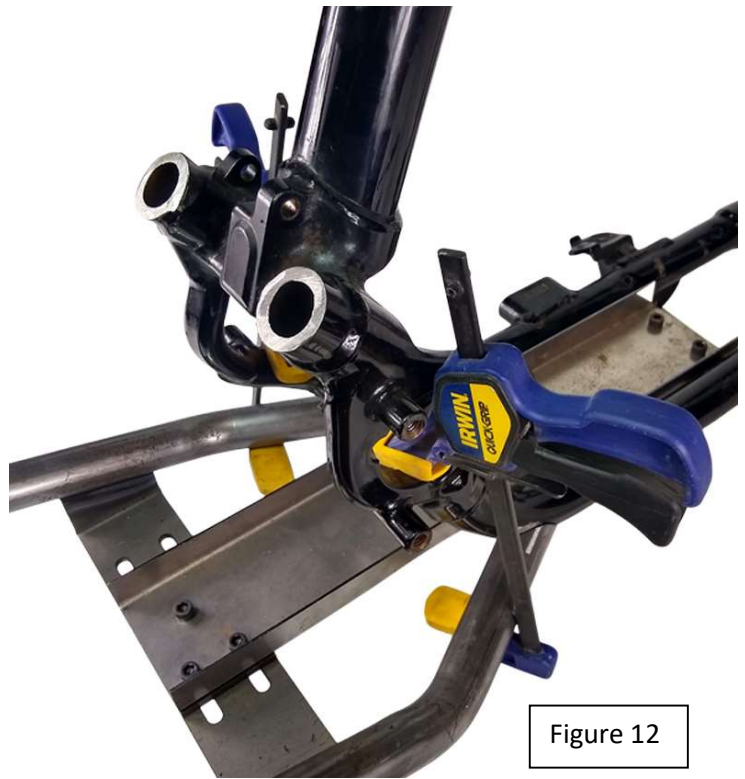


Figure 12

14.) Once alignment is verified after clamping, it is time to weld the hardtail to your stock frame. Start by first tack welding the upper hardtail tubes to the underside seat stamped plate, then both tack both lower tubes of the hardtail to the stock frame tubes. Then continue welding as much of each joint as possible with alignment jig installed.

15.) After completing as much of the welding as can be done with the alignment jig installed, allow your welds to fully cool, and then remove alignment jig from the frame. You can now finish all welds 100% around each joint.

16.) You may have noticed that the upper seat cross-member tube of our hardtail is only tack welded into place. This was intentionally done like this to allow you to move it if needed for your final seat placement. There are so many size variations of seats, that we really cannot weld it in one place and have it fit everything. **This tube MUST BE FULLY WELDED into place before use.** To prevent the frame rails of the hardtail from warping inward when welding the seat cross member tube into place, you need to place something in between the axle plates of the hardtail to apply a “spreading” force against the insides of the axle plates. We include a piece of ½” threaded rod as well as two ½” nuts and two ½” flat washers just for that reason. First you need to assemble them as shown and make sure the threaded rod is pushed to the front of the axle slot. (Figure 13) Then you will actually need to spread the hardtail approximately ½” wider than it is at finished width so that it will spring back to proper finished width after welding. Proper finished width after welding is 10 ½” (267mm) in between axle plates. That means that you need to spread the hardtail to 11” (279mm) in between axle plates before welding the seat cross member tube to allow the material to “spring back” to proper finished width previously mentioned. If for some reason your hardtail ends up being narrower than proper finished width after you fully weld your seat cross member tube into place, there is no need to worry because you can use the supplied threaded rod and hardware to spread your hardtail far enough to effectively straighten it so that it returns to proper finished width once the “spreader” has been removed. Once you have fully welded the seat cross member tube into place, and you have confirmed that your hardtail is at proper finished width between axle plates, **installation of the hardtail is complete!**



Figure 13

## NOTES REGARDING REASSEMBLY OF YOUR SPORTSTER AFTER HARDTAIL IS INSTALLED

### 103-0017 Weld-on Hardtail (Stock Width Wheel/Tire):

- 1.) Harley used 3 different axle diameters (3/4", 1", and 25mm) and 2 different rear rotor diameters (11.5" and 10.25") from 2004-2013. 2004 models came with a 3/4" diameter axle, 2005-2007 models are 1", and 2008-newer are 25mm. This Hardtail is designed to use your stock axle, wheel, wheel spacers, and brake components if you have an 11.5" rear brake rotor. The 2004 models require a 3/4" axle adapter kit #104-0107 (not included).
- 2.) 2011-2013 Harley Davidson Sportster models, came with a smaller diameter (approx. 10.25") rear rotor. If your Sportster has the smaller rotor, you will have convert to a brake caliper bracket from a 2008-2010 model Sportster (25mm axle, 11.5" diameter rotor) and use the corresponding 11.5" rotor. The OEM Harley Davidson part numbers are as follow:  
Rear Brake Caliper Bracket - 42835-08  
Rear Wheel Spacer – 41730-08

**NOTE: All axle size and brake combinations are summarized in the table at the bottom of this page.**

- 3.) This hardtail kit is designed for non-ABS (antilock braking system) models only. This should not be an issue considering Harley did not offer ABS options on the Sportster until the 2014 model year.
- 4.) Rubber engine mount will need to be replaced with rigid engine mount kit (see TC Bros. #105-0190). **WARNING:** Failure to convert to solid engine mounts will result in serious drive chain tensioning problems (chain slap, etc.).
- 5.) See following parts diagram attachment for all that is included with the kit, as well as the sequence that the hardware is designed to be installed.
- 6.) This hardtail is designed to be used with a chain drive conversion only. For a conversion sprocket kit, see TC Bros. #111-0023 (chrome) or #111-0043 (black). These, as well as several styles/finishes of 530 chains, can be purchased from our web site [www.tcbros.com](http://www.tcbros.com).
- 7.) The Hardtail uses a 2004-10 style rear brake caliper (11.5" diameter rotor). The 2004-2010 style caliper brackets have a large cast portion that wrapped around the stock swingarm. It serves no purpose in a hardtail frame, and we recommend to remove this for the cleanest look. An angle grinder makes quick work of this task. Figure 14 is the caliper bracket with the swingarm tabs removed flush to the bracket.
- 8.) There are brake anchor hardware components included in the kit to allow easy installation of these model year calipers. There is also a full sized template included to assist with installation of the 2004-2010 caliper. The most common method to install the 2004-2010 caliper is to drill and tap a 3/8-16 hole in the stock caliper bracket to attach the supplied brake anchor hardware. This requires a 5/16" diameter drill bit and a 3/8-16 UNC Tap (not included). Refer to supplied full sized template on page 15 to determine hole location. There are heim joint rod ends included that thread into one another to form an anchor rod for the caliper bracket. The rod prevents the caliper from rotating and is attached from the left side anchor tab (already welded to hardtail) to the caliper bracket itself using the supplied hardware. Always apply medium strength thread locker (Blue Loctite #243 or equivalent) to all threaded hardware during final assembly.
- 9.) It is very important to check for proper chain alignment with a straight edge before use! Both the front and rear sprockets faces must be aligned flush with one another or serious injury/property damage can occur while riding. The most common alignment issues are caused by improper wheel spacer orientation during assembly and/or uneven adjustment of the chain tensioners located on the axle plates.

Model Year	Axle Size	Rear Brake Bracket Required (HD #)	Caliper required
2004	3/4"	Stock Caliper Bracket Modified (HD 42835-04)	Stock Caliper
2005-2007	1"	Stock Caliper Bracket Modified (HD 42835-05)	Stock Caliper
2008-2010	25mm	Stock Caliper Bracket Modified (HD 42835-08)	Stock Caliper
2011-2013	25mm	2008-2010 Stock Caliper Bracket Modified (HD42835-08)	Stock Caliper



Figure 14



Grind Swingarm Tabs Flush 3 Places

Figure 15

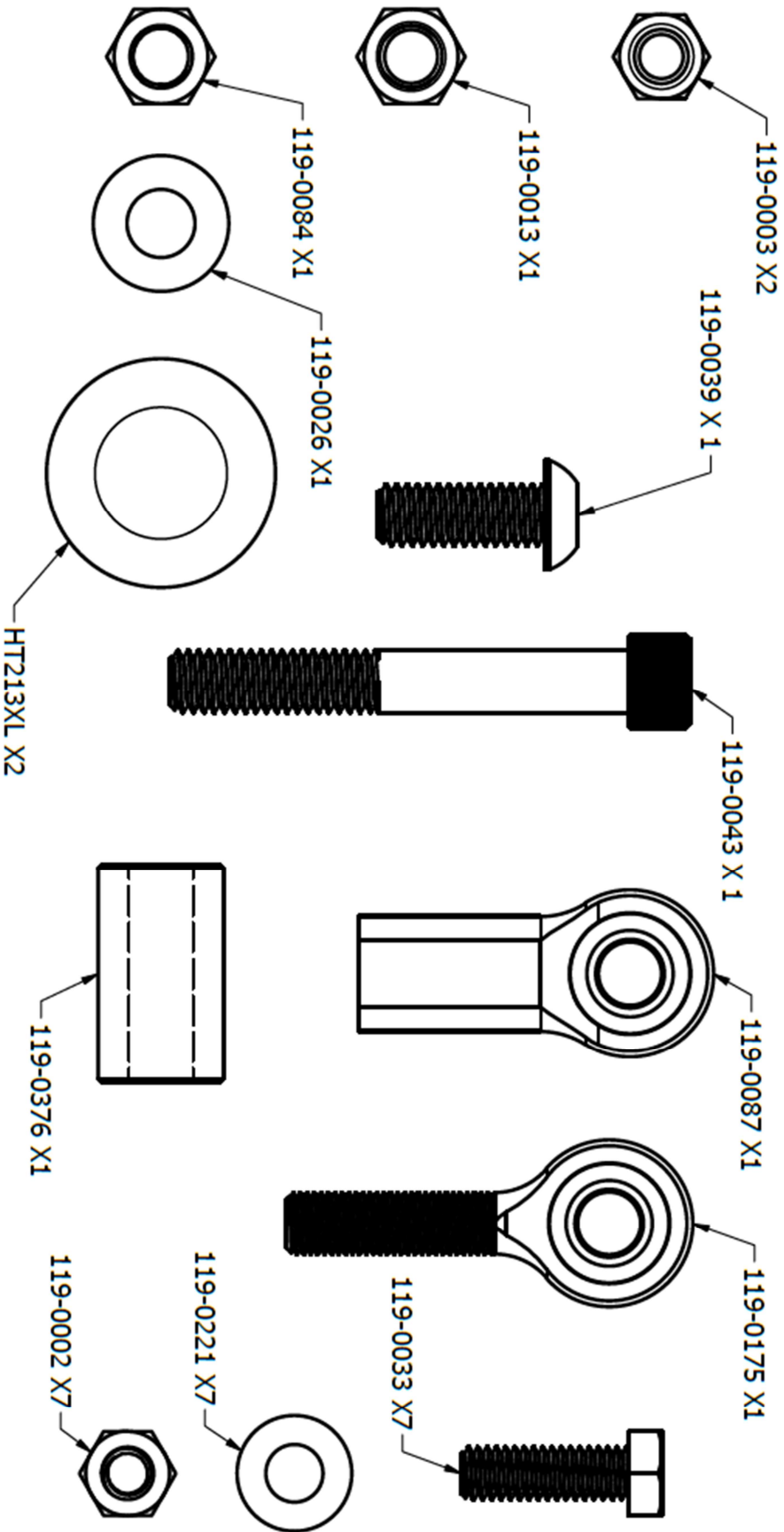


Use paper template from page 15 to locate position for 3/8-16 threaded hole. Center punch, drill through using 5/16" diameter drill bit, and tap using 3/8-16 UNC tap (not included).



PART #103-0017

WELD ON HARDTAIL KIT 2004 - 2013 SPORTSTER  
MOUNTING HARDWARE CHART (FULL SIZE)



NOTE: HARDTAIL AXLE PLATE SPREADER HARDWARE NOT SHOWN





PART #103-0017  
WELD ON HARDTAIL KIT  
2004 - 2013 SPORTSTER  
(Stock Tire Width)

HARTAIL PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	7	119-0002	5/16-18 HEX NUT
2	2	119-0003	5/16-18 NYLOCK NUT
3	1	119-0013	3/8-16 NYLOCK NUT
4	2	119-0015	1/2-13 HEX NUT
5	1	119-0026	3/8 SAE WASHER
6	2	119-0029	1/2" WASHER
7	7	119-0033	5/16-18x1" HEX BOLT
8	1	119-0039	3/8-16x1 SS BUTTON HEAD
9	1	119-0043	3/8-16 , SHCS SS, 2-3/4" LG
10	1	119-0084	3/8-24 HEX JAM NUT
11	1	119-0087	3/8-24 FEMALE HEIM JOINT
12	1	119-0175	3/8-24 MALE HEIM JOINT
13	1	119-0178	1/2-13 x 15" THREADED ROD
14	7	119-0221	5/16" SAE WASHER
15	1	119-0376	SPACER, AL, 3/4" OD X .382" ID X 1-5/16 LG
16	2	HT213XL	TUBING CAP
17	2	HT217XL	1"/ 25mm TAKEUPS
18	1	HT219XL	ALIGNMENT GAUGE
19	1	NOT INCLUDED	REAR CALIPER BRACKET - MODIFIED
20	1	NOT INCLUDED	SPACER, WHEEL BEARING, SPROCKET SIDE
21	1	NOT INCLUDED	SPACER, DISC SIDE
22	1	NOT INCLUDED	FLANGE NUT 3/4-10
23	1	NOT INCLUDED	WASHER, LEFT SIDE, REAR AXLE
24	1	NOT INCLUDED	1" AXLE 2005-2007, 25mm AXLE 2008-PRESENT
25	1	NOT INCLUDED	BRAKE CALIPER, 2004-13
26	1	WM204XL	2004 -2013 SPORTSTER WELD ON HARDTAIL

\*MODEL YEAR 2011 - 2013 WILL NEED TO PURCHASE BRAKE CALIPER, CALIPER MOUNT AND BRAKE SIDE AXLE SPACER FROM 2008-2010 MODEL YEAR WITH 25mm AXLE.

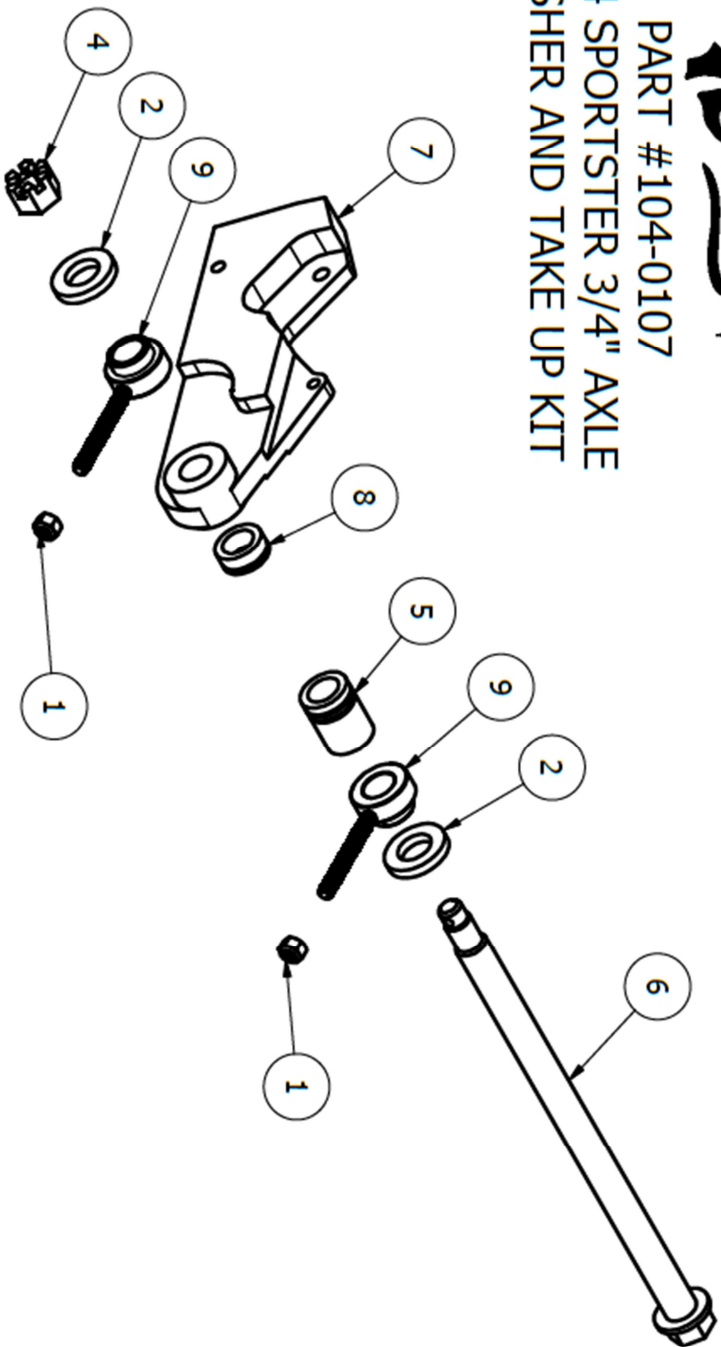
\*HARDTAIL IS DESIGNED FOR CONVENTIONAL BRAKES AND 10.5" BRAKE ROTOR.

\*NOT COMPATIBLE WITH STOCK ABS PARTS.

TC BROS CHOPPERS LLC  
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**PART #104-0107  
2004 SPORTSTER 3/4" AXLE  
WASHER AND TAKE UP KIT**



**PARTS LIST**

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	119-0003	5/16-18 NYLOCK NUT
2	2	119-0375	3/4 WASHER OVERSIZED ZINC PLATED
4	1	NOT INCLUDED	3/4 CASTLE NUT
5	1	NOT INCLUDED	SPACER, WHEEL BEARING, SPROCKET SIDE
6	1	NOT INCLUDED	3/4" AXLE 2004
7	1	NOT INCLUDED	2004 REAR CALIPER BRACKET, 3/4 AXLE"- MODIFIED
8	1	NOT INCLUDED	SPACER, DISC SIDE
9	2	HT218XL	3/4" TAKEUP

\*DO NOT USE 3/4" STOCK HD WASHER ON CASTLE NUT SIDE WITH 103-0017 HARDTAIL

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### #104-0027

TC Bros Holey Battery Box for YTX14AH or 12N14 Series Batteries  
(Use on #103-0008 stock width sportster hardtail)



### #105-0132

TC Bros 5 inch Round Pill Style Oil Tank  
(Use with #105-133 heavy duty oil tank mounting kit)

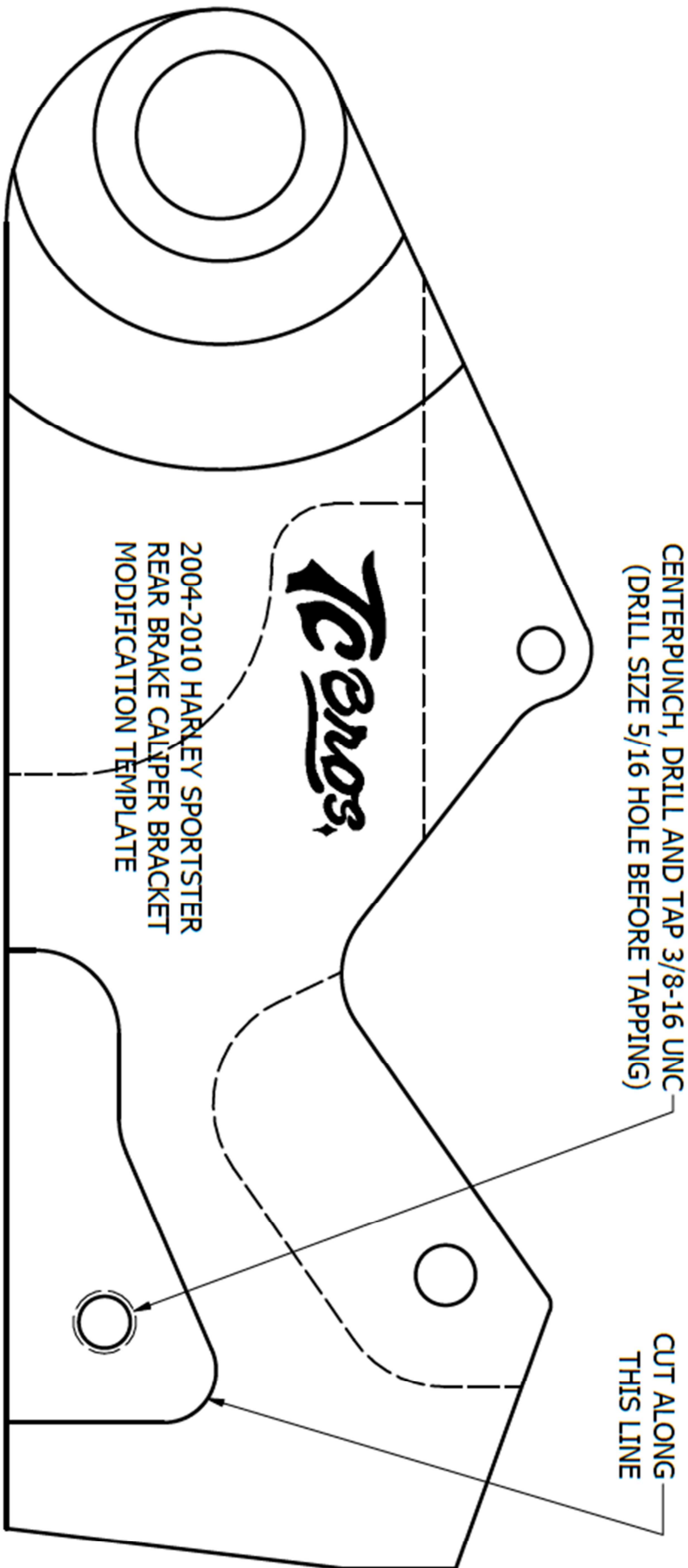


### #105-0191

Heavy duty oil tank mounting kit.



#105-0136 TC Bros. 6.25" Spun Fender (works great with stock 130mm tires)





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