

## ADVANCED TECH

### HHI WELD-ON RAKE KIT

Use this excellent kit to get the total rake you need to run a 23", 26", or 30" front wheel

by Buck Lovell

Installing a 23", 26", or 30" front wheel on any bagger used to be a daunting task that only custom motorcycle builders like Paul Yaffe (Paul Yaffe Originals), Jerry Covington (Covingtons Cycle City), and a few others are able to pull off. These builders have been altering the neck rake of their show-winning custom baggers for years using proprietary procedures they developed. But that's not the case anymore. Hawg Halts Inc. (HHI) now offers a weld-on neck rake section for Harley-Davidson FLH motorcycles that greatly simplifies this process. All HHI kits, when installed as per the included comprehensive instruction booklet, alter the frame's neck to accommodate these large front wheels while retaining the correct steering head geometry (rake and trail). The result is a frame that's as strong as the original and provides the correct geometry for full suspension travel and proper handling at both low and high speeds. Basically you'll have no wheel flop or wobble and the motorcycle will sit level using 12" rear shocks same as used on the FLHX models. Plus, you can install these kits with the motor still in the frame, as long as it's well protected during the welding and painting process.

HHI's weld-on frame neck sections add seven degrees of rake on the 23" kit and nine degrees of frame rake on the 26" and 30" kit. In case you're wondering, the stock frame's rake is 26 degrees. Using one of these kits extends the neck 1-1/2" forward and 1" up on both the 30" and 26" kits. The 23" kit extends the neck 1/2" forward. Needless to say, expert welding skills are still required to attach one of these neck sections. However, HHI has greatly reduced the process of replacing the neck section and keeping it perfectly aligned to the frame, which is the part of the upgrade that most beginners screwed up.

To complete the project and establish correct CHASSIS geometry for installing a 23", 26", or 30" wheel, you must also install raked triple trees, which HHI also sells separately. The stock triple trees have a rake of 4 degrees on 2008-earlier models and 3 degrees on 2009-later. HHI uses a 7 deg triple tree for the 23" wheel kit, the 26" kit uses a 9 degree tree and the 30" wheel kit uses a 12 degree raked tree. To put all this another way, the total resultant rake when using a HHI frame neck section and raked triple trees is 40 degrees for a 23" wheel, 44 degrees for a 26" wheel, and 47 degrees for a 30" wheel. Of course, a major change in frame/tree rake also means longer fork tubes are needed. The stock fork tubes will still work with the 23" kit. However, extended fork tubes are required for the 26" and 30" kits. NOTE – proper handling thru correct rake and trail cannot be achieved by using a raked triple tree alone.

To simplify this process even further, HHI offers complete Neck Rake Builders kits. These kits include the correct frame neck section, raked triple trees, and fork tube extensions/inserts for the size wheel you want to run. We used a 26" Neck Rake Builders kit (#NRBK-5-09+1/\$1,190) for our installation, as you'll see in the accompanying photos and captions. Our thanks to ???????? for doing this installation for us and the police department of Sundance, Wyoming, and Deluxe Harley-Davidson for the 2011 ex-police bagger we used.

## SOURCES

Hawg Halters Inc.  
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[www.hawghalters.com](http://www.hawghalters.com)

## Tools & Materials

Basic hand tools  
Body filler  
Body filler tools  
Welder

Hand Grinder  
Digital protractor  
1-2-3 blocks (two sets)  
Machinists jacks (four)  
Angle iron (two pieces)  
C-clamps (four)  
Steel round stock  
Electric drill  
Spray gun  
Air compressor  
Sandpaper  
Masking tape  
Metal scribing tool  
Metal ruler  
Black paint  
Primer coat  
Sawzall

1. After stripping the equipment from the frame that would hamper the installation of the Hawg Halters kit, drape a protective cloth over the motor and the rest of the bike to keep it clean, and protect it from damage while cutting and welding on the neck area.
2. Position the frame on four machinist jacks on the lift you intend to use during this installation and ensure the lift is perfectly level using a digital angle meter.
3. Adjust the machinist jacks so the digital meter reads 26 degrees (the stock rake) when mounted on the neck as the stock reference point. A neck alignment reference tool (threaded round stock), which extends down past the lift's deck, is also bolted into the neck.
4. Two lengths of angle iron are then bolted to the lift deck, positioned on either side of the round stock reference tool leaving about 0.100" of clearance on each side. These pieces stay in place during the entire installation to show if the new HHI neck unit is positioned correctly.

5. After bolting the steel templates included in the HHI kit to the stock neck, scribe the neck on both sides for guidance and reference when cutting the stock neck off.
6. Apply tape along the scribed lines to provide a more visible reference.
7. After removing the round stock reference tool from the stock frame neck, cut the neck off using the scribed lines/tape lines for guidance.
8. Once the stock neck is off, use a grinder to remove all the factory paint from the frame area that's going to be welded. Do the same for the HHI raked neck component that will be welded to the frame.
9. The HHI raked neck component must also have three large holes drilled into it on each side. These holes are not for bolts; they are for additional weld points, which will add strength to the neck component installation.
10. Both neck bearing races, which are included in the HHI kit, can now be installed into their cups in the raked neck component.
11. The HHI neck component can now be fitted onto the frame. The fit is snug, so you'll need to use a rubber mallet to tap the component into the correct position.
12. The round stock alignment tool can now be reinstalled into the HHI neck component, so the installer can see if it lines up with the middle of the two piece of angle iron previously clamped to the lift. If not, adjust the neck component as needed.
13. Using the digital angle gauge, ensure that the kit's 35-degree neck specification is present. Since the vertical alignment is perfect and the neck rake is correct, it's time to start welding.
14. After the certified professional welder first tack-welded the neck component in place, he welded a bit on the left, then moved to the right side. He alternates sides seven times to ensure the neck wouldn't be pulled out of position by the welding.

15. After the welding is completed, remove the alignment tool. Once the neck area has cooled for at least 24 hours, body filler is applied. When the body filler has cured, sand it smooth in preparation for priming and painting.

16. Here's the finished product; stronger than the original. This kit is such a clean setup, the frame looks like it came from the factory this way.

17. High-load capacity bearing grease is being applied to the neck bearing races prior to installing the HHI triple tree assembly.

18. The HHI lower triple tree is then installed upward through the neck post bearings. Be sure to use anti-seize at the base of the neck post when installing into the lower tree.

19. The HHI top triple clamp is then installed over the threaded neck post. Again apply anti-seize to all 3 threaded holes in the upper triple tree.

20. The stock fork legs can now be installed into the HHI triple trees. The top portion of the fork leg is threaded and must be spun into the top triple clamp. The needed thread adapters are included in the HHI kit.

21. With some blue Loctite on its threads, the HHI top nut threads onto the neck post and is tightened to 25 ft-lbs. using a 1 1/2" socket.

22. Here's the finished frame and front end. The HHI kit results in a total of 44 degrees of chassis rake with a trail measurement of 6 1/2" similar to the stock spec, which ensures safe and easy handling at both low and high speeds. A 26" wheel is required with this kit to maintain the level stance of the bike.