



HARLEY TROG INSTALLATION INSTRUCTIONS

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It is critical that you have a safe, clean environment and the proper tools to ensure that your installation is a success. The work area you use must have the ability to secure the motorcycle so that there is no way it can move or fall during the trike installation. Failure to secure the motorcycle could result in physical injury up to and including death. We strongly recommend the Western lift manufactured by Handy Industries. It gives you the ability to lift the motorcycle to a comfortable work level while maintaining a safe and stable environment.

PREPARATION

The front and the mid section of the motorcycle must be secured. We use ratchet nylon tie downs. We attach the ratchet tie downs to the crash bars of the motorcycle on each side and secure to the front of the lift. We also use the tire vise on the front wheel and tire. We then use a hydraulic jack to lift up the rear of the bike and set it down on a frame stand. We have enclosed a picture and a diagram with measurements so you can build one. (Picture 1) You also have the option to purchase the Harley frame stand from Motor Tike for \$75. The frame stand is installed under the frame in front of the rear transmission mount. There is a piece of channel that is part of the Harley frame that connects the two sides of the frame together. This is an excellent reference point for your frame stand installation location.

MOTORCYCLE PARTS REMOVAL PROCEDURE

1. Remove the seat. There is a 1/4" bolt or screw at the rear of the seat. Remove the bolt. Remove the seat and reattach the bolt.
2. Disconnect and remove the battery. If the battery mounts under the side cover, you will need to remove it for later installation.
3. Remove the touring trunk. You will need to disconnect the speaker and light connections. Disconnect the antenna wire. Lift the carpet up and remove the five 1/4" bolts that secure the trunk. (Picture 2) Some have 3 Torx head bolts that thread into the chrome bar.



Note: On Ultra Classic models DO NOT remove chrome rails.

4. Remove the saddlebags and the saddlebag rack. Some later versions use Torx head hardware. It will take a T-40 wrench to remove the hardware.
5. Remove the rear shocks. Be sure that if you unplug the air lines to plug them back in. If you leave them unplugged oil will run out.
6. When removing the rear fender, we will be removing the rear wheel assembly at the same time. You will start by pulling the axle shaft out of the wheel. This will allow you to loosen the wheel enough to remove the belt. Remove the wheel spacers and the rear caliper. Do not disconnect the brake line at this point. Now it is time to unbolt the rear fender. There are five bolts holding the fender on. (Torx 40) Four of these bolts are on the outside of the fender. One is on the inside of the fender in front of the tire by the battery box on the newer bikes. Next you need to unplug the wiring harness to the taillights. After you finish this, your rear wheel and fender will come out at the same time. Cut the wiring harness about 2" from the taillight and remove it from the fender. It is now time to cut the fender for reinstallation later. When cutting the fender, you want to cut it about 3/4" behind the rear mounting bolts. (Masking tape that is 3/4" works great for measurement and alignment. It gives you a good straight line to follow while cutting.) (See Picture 3A & 3B) There is a notch on the front side of the fender to clear the belt. You need to cut it straight across to take the notch out of the fender. Once the ends are cut, you want to sand or file the sharp edges off and then paint the ends to prevent rust. ****Note: The ends will not be seen after completion of the kit. ****
7. You will need to remove the rear floorboards next. A 5/16" Allen wrench will remove the floorboard bolts. There are two chrome plugs that will need to be removed. The swingarm shaft is located behind the two chrome plugs. You will find a 11/16" or 3/4" (wrench size) nuts depending on what year the bike is. We have included an exploded view and instructions to help with the swingarm removal. (See Pictures 4, 5, & 6)
8. Now you are in a position to install your trike conversion. Please take the time to clean and wax your frame and motorcycle components. If this is a new bike, this is a great time to remove all the cosmoline.



TROG SWINGARM INSTALLATION

To install the Trog swingarm assembly you will need to press the factory bushings out of the Harley swingarm. For this procedure you will need use of a press. (Do not hammer out the bushings because it could damage them.)

1. On the 2002 models and up, there is a heim style bushing in them. Take care in pressing these bushings out. Make sure not to press on the swivel part of the bearing. Before pressing out the bearings take a measurement between the bushings in the factory swingarm. This can be used for a reference point when pressing bushings back in. When pressing bushings out, be careful not to damage the washer and dust cover on the inner bushing. The dust cover is a plastic piece and will damage easy. (See Pictures 4, 5, & 6 Disassembly)
2. After pressing out the bearings, it is time to press them into the Trog swingarm. You will press the bushings back in just like they came out. (Place the washer, dust cover, then the bushings.) While pressing the bushings back in, center the bushings up with the swingarm. (Do not press the bushings in too far.)

Your installation process will change as follows:

- 1.) Hand-tighten both rod end retaining nuts fully onto the rod end.
- 2.) Hand-tighten the rod ends fully into the swingarm.

Note: The new NORLOCK washer should be located between the retaining nut and the swingarm end.

- 3.) Turn the rod ends out 2 ½ full revolutions, **6 ½ for 2007** (previously 5 revolutions)
Note: Adjustments may be necessary as you proceed with the installation.

- 4.) As you complete the installation, place **Blue** Loctite 241 on the treads of the rod ends where the retaining nuts will be tightened. Tighten the retaining nuts.

Note: As you tighten the retaining nuts the NORLOCK washers will become engaged.

3. Now it is time to install the Trog swingarm. Take the heim joints on the end of the swingarm and turn them all the way in until they bottom out. Then back them out 2 ½



turns. **6 ½ turns for 2007.** (This is a good place to start from for adjustments.) Now install the Trog swingarm the same as the factory swingarm using the factory rubber biscuits, shafts, and rear floorboard mounts. Make sure the divot pins are lined up properly. (Picture 7) Use the factory hardware to secure. Tighten everything to factory specs. There is a bracket on the top of the swingarm that is used to mount the 3rd link adjustment rod. This adjustment rod will be used to tighten the belt properly during installation. Be sure the link is turned all the way in before attaching this during installation of the trike rearend.

4. Install the Trog frame. The large holes in the frame holds the 1/2" bolt, flat washer or a lock washer, and goes to the upper shock mount hole in the motorcycle frame. On older bikes where the top shock hole is not threaded, a 1/2"x3 bolt is used to hold the fender and the frame. It is held by a nut on the inside of the fender. Using the 4 Torx 40 bolts from the saddlebag bracket (where the rack was joined to the bottom of the fender) attach the trike frame to the chrome bar and install the fender. Use the long Torx 40 bolts in the rear and the short ones in the front. (Picture 8)

INSTALLING THE REAREND

1. Motor Trike provides a pulley on all Harley rear ends. You still need to remove the bolts so you can slide the entire rear end thru the belt. Slide thru belt attach swing arm and reinstall your bolts following the tightening sequence.

5. Re-install all the spacers with the proper hardware: use a 3 sequence tightening procedure. (See review points) (Picture 10 & 11) After the center section is secure, re-attach the brake line to the t-fitting.

***REVIEW POINTS**

1. When installing the bolts to secure the pulley, cross tighten them like you do when you install & tighten the lug nuts on a car wheel. This will be a three sequence tightening procedure; start it, snug it, and final tighten.
2. The belt tightening procedure is just like that of that a stock Harley. Do not over tighten that belt.



6. The third link allows you to level the rearend and tighten the belt at the same time. Belt tension will vary depending on if it is a new or used belt. Start at five $2\frac{1}{2}$ turns on the bottom heim joints. The object is to make the rearend level with the Harley frame. This can be done by leveling the bike before installation or by using a dial protractor to set with the frame then the rearend. (Picture 12) On the flange of the housing, there is a flat vertical spot to reference from. After the Motor Trike rearend is true, and the belt is properly tight. If the rearend is leaning towards the back 1 or 2 degrees, that is okay. Do not let it lean towards the front. It will cause failure to the rubber bushings in the shock.

7. Attach your air bags to the air bag brackets. Put a little air in the bags. They are shipped compressed. They will grow about 4 more inches. Attach the airlines to the bags and plumb the lines to a T-valve. If you have the optional on board air compressor, tie in your lines to the control unit at this time. We will install the air compressor after the body is installed. If you do not have the air compressor, we will install a T-valve fitting in the trunk after the body is installed. It's just a lot easier to install the air bag plumbing before the body is installed. (There are separate and more detailed instructions for the air bags with the air bag kit.) (Picture 13)

ALIGNMENT PROCEDURE

The Harley Trog is belt driven using the stock Harley belt. The belt is incredibly strong provided that the belt is adjusted properly and runs straight and true. You will suffer belt fatigue failure and possible injury and or death if this belt fails. You must adjust this belt properly to insure long-term wear and a safe operating vehicle. After you have your belt adjustment and belt alignment set, measure from the rearend housing to the floorboard bolts. This will give you a guideline to whether you are square. You have plus or minus $1/8''$ variance for each side. (Picture 14)

DIAGONAL FRAME BRACE BARS

It is very important that you use the diagonal frame brace bars supplied in the kit. This will provide additional strength to the factory Harley frame and will stabilize the Trog frame. The fender bracket and frame brace bar will be held on by the same bolt with the motorcycle frame tab (where the saddle bags were mounted). These will bolt on with a $5/16''$ bolt. (Picture 15) The bolt goes through the fender bracket first, then the motorcycle frame tab, and then the long side of the frame brace bar. Next, you have a clip welded on the Trog frame above the air bag brackets to which the frame brace bar will bolt. The slotted hole



goes to the bottom with the bend to the inside. The hardware was attached to the frame when it was shipped.

EXHAUST

The Harley Davidson twin has an unbalanced sound to its motor that is a cornerstone to its success. The disadvantage of this motor design is the vibration that accompanies it. It is critical that the exhaust system has give or flexibility so that the motor can move without the exhaust restricting it. That is why we use their exhaust mounts off the saddlebag frame to mount the mufflers. We supply you with adaptor pipes to drop the exhaust below the rearend. You will need to trim your exhaust pipes about 1" to insure that the muffler length is equal. Note: You can always remove more. You cannot add. (Pictures 16, 17, & 18)

BRAKES

Crimp the rear brake line with vise grips before you unhook it from the rear brake caliper. This will keep you from leaking brake fluid. We supply you with an aluminum junction block that is designed for the Harley banjo fitting and our rubber brake line. You will attach the Harley brake line that comes off the master cylinder to this block. We will then attach the rubber brake line that is attached to the Motor Trike rearend to the junction block. Mount the junction block on the side of the rearend link plate. (Picture 19) Bleed the brakes at this time and remember to bleed the fittings on the junction block to remove all the air.

In your kit you will receive a wiring harness that will plug directly into the stock harness of the bike. It will have four connections; they will be separated into left and right sides (they are marked). You will notice the connectors are 4 and 3 prong. The 4 prong being the one that will have the turn signal application. The 3 prong being only brake and run. You will also notice a green wire and a black wire tied into the harness. This is for the license plate light. Simply drill a hole in the bottom of the trunk toward the front lip and connect the wires to your light (green is ground, black is hot). Also you will find a 3 prong plug up top where your harness plugs into the stock bikes plug. This is for your load equalizer and plugs it in.

You should receive 5 plugs with your kit to fit this harness. 2) 4 prong 2) 3 prong 1) load equalizer. They will connect as follows: Black = Running



Green = Ground

Red = Brake

White = Turn

ELECTRIC

There are many keys to a successful trike installation. One key to a happy and trouble free long term relationship with your trike is a clean and professional wiring job. This will give you years of trouble free service. It is critical that you follow the wiring diagram that we have included. It is also critical that you check and recheck this before you install the body. We urge you to solder your connections and use shrink tubing to insure trouble free service. (Picture 20)

Now the tires are ready to be mounted. Once this is done, remove the center stand and jack and lower the trike. Set your belt tension now. Add your forth link. Now is the time to loctite all of your jam nuts.

FOURTH LINK ASSEMBLY BRACE INSTRUCTIONS

You are going to be adding a piece to the rearend suspension. To gain access to the rearend, you will need to remove the rear tires. The rearend of the trike will need to be lifted up and supported with jack stands under the left and right side of the trike frame.

The front wheel needs to be secured to insure no movement both sideways, or up and down.

Next step is to pull the rear tires off the trike for better access to the area where you will be working.

You will need to loosen the jam nuts on the belt tension bar.

Next, back off on the belt tension bar so there is no tension on it. This will allow you to remove the 1/2" bolt on the swingarm side of the tension bar.

Remove the nut and bolt at this time.



Next install the new longer $\frac{1}{2}$ "X $2\frac{3}{4}$ " bolt we have supplied with the brace. The bolt should be installed with the threads protruding through the right side of the two tabs and heim on the swing arm.

The front of the fourth link brace will mount on the outside of the two tabs. The tension bar will remain in its original location.

(NOTE): *you need to pre-fit the fourth link brace before final installation.*

The back section of the fourth link will mount on the axle housing. There are two attachment plates on the back section of the brace that have slots. These slots are provided so you can adjust the belt without removing the fourth link brace.

The two attachment plates will bolt in the second set of holes on the housing plates from the top using the two $\frac{1}{2}$ "X $1\frac{1}{4}$ " bolts supplied in the kit.

Next adjust the heim on the fourth link brace where the housing plate holes are in the center of the slotted holes on the brace.

After that is completed, you can mount the front of the fourth link brace to the swingarm. Use the $\frac{1}{2}$ " flat fender washer and nylock nut, and then tighten the $\frac{1}{2}$ "X $2\frac{3}{4}$ " bolt. **DO NOT TIGHTEN THE $1\frac{3}{4}$ " BOLTS UNTIL THE BELT IS PROPERLY ADJUSTED.**

The rear attachment plate on the left side mounts on the right side of the housing plate.

The right side attachment plate mounts on the right side of the outer plate with the nylock nut in between the two plates on the right side.

Now it's time to retighten your belt with the tension bar. Also LOCTITE and retighten your jam nuts on the tension bar.

Now tighten all the remaining bolts and jam nuts on the fourth link brace.

(Always remember that when you adjust the belt with this brace, you must loosen the two rear mounting bolts on the fourth link before the rear axle will move.)

THE BODY



1. Now you are ready to place the body on. If you can, use a helper or friend to help place the body on. Now that the trike is resting on the suspension, it is time to set the body on. Once the body is set on the frame, it is time to measure the body to insure it is square on the trike. We start by measuring from the ground or rack (if you have one) to the bottom side of the front of the fender. The measurement should be 12 1/2" to 12 3/4". Jack stands will be helpful to hold the front fenders of the body up in position. The body should be 4 1/2 " to 4 3/4 " from the tire to the front edge of the fender. You will need to use a 2 foot level to use as a straight edge. Place the level on the outside of the tire up to the fender. You will place your finger up beside the fender on the level for a temporary gauge, then hold it, then gauge the other side to make sure you are the same on both sides. (See Picture 21, 22, & 23) Double check your dimension and proceed. Reach behind the fender and drill your front fender brackets. An angle drill works real well for this process. Bolt the front brackets using 1/4" a screw with chrome caps. Next you will pull your measurement from the ground or the rack to the top center of the wheel opening. This measurement should be 25" to 25 1/4" with the weight still on the suspension. Shimming may be necessary. Now it is time to drill from the bottom of the trike frame to the inside of the trunk. Bolt your body down and your body is secure.
2. Your taillights should be installed next. Remove the rear wheels and tires from the trike. This will allow you to reach in behind the wheel well to do the wiring and mounting of the lights. The lights should be mounted in the center of the fender and should run vertical with the body. If you have the Tombstone lights, use the rubber gasket for the template to drill your holes. The lights should be 10 1/2 " from the bottom of the fender to the bottom of the light. (See Picture 24) Before you bolt your lights on, make sure the ground wire is connected to the light bolts. After this step is done, connect the running light wire and brake light wire. Solder and shrink-wrap your connection for a nice clean look. Attach the wire harness to the inside (trunk side) of the fender well and zip tie it to the trike frame. **Use the appropriate plugs.** If you are installing the new LED lights they will be 10" even from bottom of fender and they will still be 5" from trunk just like the standard tombstone. See Picture # 24
3. The bumper needs to be mounted next. Take masking tape and place it on the back of the body in the general area that the bumper will be attached. Center the bumper on the body and mark around the two pins at the top of the bumper. You need to drill 5/16" holes in the center of where you made the mark. Put 5/16" bolts in the two pins and loctite them. **Align your slots on bottom of bumper tabs and** bolt them up using the two-center body mount bolts to secure the bumper. (Picture 25 & 26).



4. **If your body is a gel coat unit**, you are ready to bolt hinges on the door and body. **If your body is painted, then the door will already be installed.** The T-handles are to be mounted next. Mount the handles to the door and leave the latches loose. Now is a good time to put your trunk seal in. The seal will mount around the trunk opening. The gasket is stick on. When putting on the gasket, leave about half of the bubble stick out of the offset of the body. Start at the center of the bottom lip. Make sure you have a good seal around the top corners. Now you may adjust the latches on the T-handles so it will close and seal properly. T-handles will latch to the top.
5. Place the seat back on the bike. If you have an aftermarket seat handle, you may need to trim the body neck for clearance so it will not rub.
6. Now, you might want to check the brake adjustment. If it is okay, put the rear wheel and tires back on the trike. Put about 35 psi of air in the air bags and check for leaks. Take the spanner wrench that came with the shocks and apply two clicks to start with. You may need to soften or stiffen your ride depending on your preference.

Air Bag Pressure - We suggest you run 30-35 psi with one passenger and 40-45 psi with two people.

Tire Pressure - Your front tire should have 42 psi and your rear tires should have 18-24 psi.

If you have any further questions, please call us.