Installation Manual
GL-1800 - GEN I
2001-UP
Version 2.2

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Introduction

This manual covers installation of the LegUp Landingear system by Chopper Design Services. This system should only be installed by a qualified technician, or those with above average mechanical skills. If you are not SURE that you can perform this installation, please contact us and we will help you find a qualified shop to assist you.

If you have been looking for a system that will keep your feet on the pegs, this is NOT the system for you! On the other hand, if a system that will relieve you of the weight of the bike and help you avoid balance problems as you approach a stop, LegUp is what you need.

Improper installation will void your warranty, so please be very careful!

Thanks for choosing LegUp!
Warranty

Chopper Design Services warrants the LegUp system for a period of one year from date of purchase. This warranty covers replacement parts and/or manufacturer defects. Incidental damages or costs are the responsibility of the purchaser.

Defective parts are to be returned to Chopper Design at the address below. Purchaser must contact Chopper Design to receive a Return Material Authorization, prior to returning defective parts to Chopper Design.

Abuse, improper installation or use, collisions or accidents, are not covered under this warranty. Replacement parts for this type of damage are available through Chopper Design.

Users of the LegUp system agree that Chopper Design is NOT responsible for personal injuries or damage to property arising from the use of the system. While we believe this system to be safe and reliable, the user is advised that use of LegUp is done so at the users’ own risk. Use of the system implies agreement to the above statements. If you can’t agree with the above, Chopper Design and its dealers would be happy to refund your full purchase price, before you use the LegUp System.

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Installation Instructions

The LegUp® system has many components. Please be sure you have them all before starting your installation.

COMPONENTS:

1) Control Switch Box
2) Linear Actuator
3) On-board Computer Module
4) Proximity Sensor
5) Leg Support Stand
6) Leg/Wheel System
7) Hardware Bag
8) Actuator Bracket

If you believe you are missing any parts, please contact Chopper Design at 407-834-5007, and we will rectify the situation.
PREPARE FOR INSTALLATION

Place the motorcycle on an acceptable bike lift. You will need to keep the bike on its wheels for most of the installation, and jack the rear wheel off the lift for some portion of the installation. Make SURE the motorcycle is secure on the lift!

Remove the seat, left saddlebag, rear muffler covers, left passenger floorboard and header covers; they are not needed until the very end of the installation.

The GL1800 has many covers and pieces that need to be removed and/or reinstalled during this installation (like the center stand). While we have worked diligently to make this manual very thorough for the installation of your new LegUp system, we DO NOT cover all of the details on how to remove and reinstall some of these parts. Please consult a service manual or a qualified technician to help with these items, if required!

We are now ready to begin!
INSTALL LEG SUPPORT STAND

LegUp has developed a new, stronger attachment system which attaches to the GL1800® via the bolt holes from the stock center stand, and the bolts that support the exhaust system at the rear. You will need to remove the stock center stand. The two bolts (the one on the right is reverse thread) the spacer, and the center stand will not be re-used, so keep these together and set them aside. Remove the 2 bolts that secure the Catalytic Converter on each side of the bike, and set them aside.

If you haven’t already done so, install the uprights (purple above) to the plate. These uprights bolt to the plate on the top with (4) 3/8” bolts and lock washers. Once this is done, use a helper and gently slide the plate (red above) under the bike. The green plates above will line up with the holes left from the center stand. Find the two washers that have a flat on them, install a 5/16” x 1.75” chrome Allen bolt with chrome washer, through the 90 degree plate, then the washer with the flat, and start this bolt into the holes where the center stand was mounted. These bolts will be smaller than the ones you removed, so they should slide through the holes. Next just start the chrome nylon lock nuts onto the bolts. **Do not** tighten the bolts up all the way!! Just tighten them until the bolts pass through the nylon on the nuts and the plate will still be able to swing on these bolts… Snug is O.K., Tight will make it impossible to line up the plate and tighten all the fasteners.
The next step is to swing the back of the stand up and line up the two uprights with the holes that held the bolts to the catalytic converter. The right upright has a ¾” machined piece built onto it, and the left one is thinner and just bolts straight into the hole. Find 2 longer metric bolts with washers from the hardware bag and start each of the bolts into the holes (use some blue thread locker on these). We want the uprights to be as perfectly vertical as they can be, so set the plate up this way and just snug these two bolts a bit. Now tighten all the fasteners a little at a time, while trying to keep these uprights vertical. There are a total of 10 bolts to tighten/check:

- The (2) bolts holding the uprights
- The (4) 3/8” bolts holding the uprights to the support plate
- The (2) ¼” bolts on the bottom of the plate holding the 90 degree brackets
- The (2) 5/16” bolts and nuts attaching the angle plate to the bike.

See the pictures below for a better look at where the washer goes and how the whole thing is assembled. The uprights may look different than the pictures.
The long stainless steel shaft with the small bolts in the end will slide into the pipe on the support stand. Just set this aside for now.

We now need to clearance the exhaust covers on both sides to make room for these uprights. Use a hacksaw, tin snip or bur, to make the cutouts on each of these covers, and then just slide them back in place to test the fit! The arrows in the picture below show where you need the clearance and what it should look like. Even if LegUp is removed, this extra clearance will never show!

Once you have the clearance, you can reinstall these covers (be careful not to loose the little rubbers that cover the slide-on brackets!)

Once the support stand is installed, we can move onto the installation of the actuator bracket.
ACTUATOR BRACKET

The actuator bracket mounts to the vehicle on bolts we replace. One bolt holds the left saddlebag guard (front bolt of the two holding the guard on), the other holds the front of the left saddlebag support arm. Remove both of these bolts, and thread in the new longer bolts supplied into each of these holes. The extra length of the bolts will support the upper actuator bracket.

If not already done for you, mount the brushed aluminum bracket to the holes in the actuator bracket with the countersunk hole facing toward the fat part of the actuator bracket and tighten these bolts (NOTE: on some of the 05 and up models, not all, we need to use the outside holes, on most the inside. You won’t be able to tell until we line up the actuator).

It would be nearly impossible to snug these bolts after the bracket is installed on the bike. There is quite a bit of pressure on this mount, so make sure these bolts are tight!!

Now we need to slide the bracket between the left side of the rear wheel and the frame (as shown above, arrow points to bolt), onto the two longer bolts we just installed. Put a little blue thread locker into the two nuts supplied and start the nuts by hand, as there is very little room in there for tools. Installed properly, the slanted mount on the bracket will run down-hill toward the front of the bike. Carefully tighten each of the two nuts until the bracket is completely tight!

NOTE: If you have an ‘05 and later bike, this bracket may need to be removed later during actuator alignment, and the aluminum mount moved to the outside holes if the actuator does not line up (see page 13)!
First remove the bolts from the stainless steel rod in preparation for mounting the legs. With help from an assistant, slide the Leg/Wheel Assembly around the rear tire (careful of the finish!), and align the Leg Mounting Points (green) with the slots in the Support Stand. If available a very small amount of ‘Never Seize’ on the shaft is in order here. Then start the stainless steel shaft in from one side through the tube on the support stand, and through the first leg mounting point and its bushing. The fit is tight, so take your time. Carefully work the shaft through the tube and the second leg mounting point. The shaft is inserted properly when it is inserted just past (the shaft is approximately 1/4” shorter than the tube… 1/8” each side) the end of the tube. This distance should be about the same on both sides, but it is not critical as long as both sides are inside the tube. If you need to, you can tap lightly on the shaft (brass drift is preferred here). Once the shaft is in place, use a small amount of blue thread locker and install the (2) chrome bolts and washers on the end of the shaft to finish it off.

Make sure the legs move up and down without any binding!
MOUNT ACTUATOR

We have to mount the actuator to the bracket we installed earlier. You will be inserting a ¼” Allen head shoulder bolt through the aluminum bracket as seen at the right. The small Allen is a bit tricky to install so use some patience here.

The small Allen should get some Blue thread lock on it. Make sure to mount the actuator with the wires and the motor of the actuator, toward the rear of the motorcycle (even though the pictures shows it mounted incorrectly), and the shaft toward the ground as shown.

We now have to attach the lower actuator brackets to the legs for the actuator (if not done already!).

The actuator at right has a 2 piece bracket attached to the legs. This bracket gets the outside piece screwed in, then two small washers (for spacing), then the inside piece is slid onto the bolts and is held on by two locking nuts. You may notice that the lower brackets have some adjustment left to right. We will use this later on if needed.

With someone supporting the wheel assembly, raise the legs until the mounting hole in the actuator is aligned with the actuator mount. Install the ¼” – 20 Chrome bolt into this mount, though the actuator, and secure it with the chrome lock nut, supplied (some wiggling may be required!).

NOTE: If the actuator is too short to reach the other mount you may have to lengthen it using the system. Temporarily plug the wiring harness into the bike, attach the 2 hoop connectors to the fuse box (as described on page 18), and follow the directions for ‘Maintenance Mode’ in the ‘Initial System Test’ section below. Using what would be the left button on the switch box, just add a small amount of length to the actuator so you can align the mounts, then turn the bike back off.

At this point you need to make sure that the mounts are in alignment and the actuator is not in any sort of bind! On the next page we have picture of the lower mounts installed properly. As previously mentioned, on some ’05 and later bikes, the actuator may line up to the outside of the lower bracket. If so, remove the actuator, remove the upper actuator bracket, and move the aluminum mount to the outer holes (which are inboard on the bike!).
The switch box should already be mounted to a black mounting plate. The switch box mounts under the left grip and attaches to the left switch housing by a single bolt. Remove the bolt from underneath the left switch housing using a Phillips screwdriver.

Using the bolt provided, slip the bolt through the black plate and spacer, and then thread it into the switch housing. This bolt needs to be snug as when the buttons are pressed, we don’t want the housing to pivot on the bolt (picture below left). Square the box before tightening the bolt. Route the wire down the handlebar and leave it loose near the front forks to be routed under the seat with the proximity sensor wires. Use wire ties to hold the wire to the bar.

**NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE Harness! There is NO Proximity Sensor on a LITE system. Ignore references to the Proximity Sensor & Bracket!**

At this point we need to find the proximity sensor & bracket and get the plug off the end. The wires from this sensor need to be routed from the front left fork area, up toward the handlebar, to join the wires from the switch box (See right picture below). Route the wires under the caliper cover.

Here is the fun part! We use a welding rod, but you may wish to use a coat hanger. Do whatever you have to do to feed the rod from under the forks to come out near the left frame rail (see arrow below). Now you can remove the wires from the plug on the end of the switch box wire, join them with the 3 wires from the proximity sensor, and tape the silver plugs to the rod you just fished through the bike.
Gently pull the rod and wires through the front fairing area until the wires appear (picture below left). Carefully pull on the wires, making sure they move easily. If not, there is a bind, pull the wires and rod back out and start over (Sorry!). Once this works out, carefully remove the tape to expose the silver pins. Route the wires carefully under the metal bracket above the fuel pump to protect the wires (right below). Make sure the wires under the fork have enough room to allow the bars to be turned and that they don’t get caught on anything.

The next step is to reassemble the plugs. Use the diagram at the start of this section for the switch box, and the picture above for the proximity sensor. Be very careful to make sure the wire colors all match those in the mating plug and the diagram. Now onto the rest of the wiring harness!
NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE Harness!

The next step is to route the wiring harness. The harness and the plugs are routed mostly under the seat and left side cover. The most difficult task is taking apart the 12 pin plug on the harness and feeding it into the trunk. The wires will appear inside the small compartment that holds the owners manual. Remove this cover to make it easier to find the wire. Dismantle this plug and tape the silver pins together. Find the grommet where other wires run into the trunk, and insert the 12 wires into this grommet. It may be easier to remove the split grommet, run the wires through the hole and re-install the grommet. Once the wire is in the trunk, carefully reassemble the plug (diagram at end of manual). It can’t be stressed enough that these wires have to be perfect!

Using the provided Velcro, attach the computer box to the bottom of the compartment in the trunk with the plug facing the front of the bike making it easy to attach the plug you just reassembled. Plug the computer into this plug and carefully pull any excess wire out of the trunk, leaving enough wire in the trunk to easily plug and unplug the computer (picture below). Test that the cover goes back on the small compartment. It is likely the owners manual will not fit in there anymore, but if it does, great. You need not worry about heat from the computer or anything like that.
Now that the computer is attached, we can pay attention to the wires under the seat, and the side covers. The proximity sensor is next!

Find the proximity sensor (little yellow square on a bracket with a long thin wire with a three pin plug attached. The sensor and its’ bracket should already be dangling near the left front fork.

**NOTE: We will mount this bracket in this area later, but making sure you have enough wire to mount it and that the extra slack is pulled to the under seat area!**

Make sure the wire is clear of everything, bearing in mind that you need to leave some slack to allow the suspension to move up and down. Once you are satisfied, plug in the proximity sensor with its’ mating plug.

Next we need to route 2 wires to the left side cover area. The six pin plug, and the wire with 2 hoop connectors on it, needs to find their way into the side cover area. In the picture below, you can see where we want to attach the two hoop connectors (after the cover is removed from the fuse box). Using a Phillips head screwdriver, remove the top screw, and attach the orange wire to this post. The black wire gets attached to the lower post. Notice that the wires can be routed out of the fuse box to the left where there is a relief for each. We strongly recommend that you replace the existing 5Amp fuse (second one down on the left) with a 10 or 15AMP fuse. This fuse only supports the orange wire here and 5 amps is just a bit too light. These connections are only on when the bike is either on or in accessory mode.

The other plug we just worked into this area supports the linear actuator. Look at the picture to the left and find a nice place to put this plug. Then route and wire tie the wires from the actuator up and under the frame rail to meet the other plug. Make sure you leave a bit of slack in this wire to allow the actuator to move.
The only plug left to deal with is the one from the handlebar switches we routed earlier. Plug this plug into the matching plug.

Now would be a great time to carefully move the wires under the seat area around and tie them off so they don’t interfere with anything.

Any extra wire should be wound up and tied off neatly. Please make sure that the wires will not be under any strain and that the seat and the side covers can be reinstalled without any problems.

Now that the entire system is wired, we move onto the Initial System Test.
INITIAL SYSTEM TEST

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Skip this section if you have a LITE System.

Turn your bike to Accessory Mode. This is all the way to the right on the key on the GL1800. The screen on the dash should light up. At this point, have a look at the yellow proximity sensor. The LED Should Not Be Lit. Take a metal object (screwdriver, wrench, etc) and hold it on the flat face of the sensor (it has a circle embossed in it). The LED should light up, and go out when you move the metal away. If not, check all your connections.

Next, press the rightmost pushbutton and hold it for at least 3 seconds. One or both LEDs on the switch panel should light up; we really don’t care which at this point. If this occurs, you are doing well. If both LEDs are flashing (maintenance mode) you can skip the next step which is to press both buttons until both LEDs flash.

Next press both buttons for just an instant! If everything is working, the bottom or yellow LED on the switch box should flash, and the top LED should be out. The next step, and be careful here, is to touch the left button for a split second. The legs should move down just a bit. Touch the right button, and they should move up. With the bike on the lift, you have to be very careful here!

If all of the above has occurred, raise the legs. Press and hold the right button until it stops, and turn the ignition switch off!

The test is now complete. Let’s move on to mounting the Proximity Sensor.
MOUNT PROXIMITY SENSOR

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Skip this section if you have a LITE System.

This step is crucial!! Understand it before starting. The proximity sensor tells the system how fast the bike is traveling. The proximity sensor mounts to the bottom left pinch bolt of the left front fork. Remove this bolt, install it through the bracket and reinstall the bolt semi-tight, so the bracket can be moved if need be (a little Locktite please!). You need to jack up the front wheel or have the bike on the ground so we can spin the front wheel to test the sensor and its placement. Make sure the bike is in neutral.

The sensor will track the rotor bolts on the front wheel as it spins, and is to be mounted 5MM away from the bolts or closer. Look at the picture at the right. Once the bracket is mounted, turn the key to the accessory position, spin the wheel or roll the bike and watch the behavior of the sensor as the bolts pass it.

The LED on the sensor should be off when no bolt is passing the sensor, and the LED should light when a bolt passes by the sensor. Play with this by rotating the wheel back and forth while adjusting the bracket in, out, left or right until the light blinks consistently.

Once you feel you have the right place, tighten the bracket down and slowly rotate the wheel. Every time a bolt passes, the light should get bright when the bolt is nearby and off after it passes.

If this is not happening, you may need to get the sensor a bit closer to the bolts (5MM is a very small distance!). If you have to move the sensor closer, just loosen the bolt again, and re-adjust the sensor. No matter what you need to do, you MUST make sure that as the wheel turns, the light works as described above! Once you are certain, tighten the bracket down very firmly! Re-check that everything functions properly by spinning the wheel past all 6 rotor bolts and verifying that the LEDS changes as described above. The automatic retraction of the legs as well as their deployment RELIES on this sensor being placed perfectly!

Once satisfied with the mount, make sure the wire running up the fork leg is tied off, clears everything, and can’t get damaged by anything.
FINISHING UP

Now it is time to reinstall all the covers and extra pieces that were removed to allow the installation. Get that saddlebag back on and the rest. Make sure that everything is clear. This would be a great time to double check all the bolts and see to it that none of the wires are in any kind of distress!

Once you are comfortable that everything is correct, get the bike off the lift so you can dial in the actuator, and adjust the wheels.

ACTUATOR ADJUSTMENT (Maintenance Mode)

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Skip this section if you have a LITE System.

Before we teach the computer how high ‘UP’ is and how low ‘DOWN’ is, we need to set the air shocks to their highest position. Realize that the LegUp system will be the sturdiest at the lowest shock position, but will work at any settings. We just want to set things with the bike as high as it will ever get.

Once you have the bike on the ground, turn the ignition to the accessory position and start the LegUp System (hold right button for 3 seconds). The system should enter maintenance mode automatically (Both LEDs Flash), but if it does not, enter maintenance mode manually (Both buttons for 3 seconds). With a helper nearby, straddle the bike, and hold it level. Hit both buttons for an instant to get the system in the “DOWN” setting mode (yellow LED flashing). Straddle the bike so your weight is NOT on the seat, hit and hold the left button until the wheels contact the ground and stop. Make sure that the suspension raises a bit as you do this. If not, the legs are not going down far enough, the bottom actuator mount may need to be moved left or right a bit to get the wheels all the way down (Contact LegUp for assistance if you need help with this). Once these wheels are down as described above, try to put both feet on the floorboards. The bike should be reasonably stable and you should be able to lean a bit in both directions without the bike falling over. The DOWN stop is now set!

Hit both buttons for a moment to get into the “UP” stop mode (top LED blinking).

Carefully use the right button to raise the legs. Have your helper let you know as you approach anything that may come in contact with the wheels or the legs. You also need to make sure the system clears pipes, clamps etc. If you can’t make the clearance to allow the legs to come up all the way, you can set the up stop just below whatever is interfering (if not, you will likely set up
a permanent rattle!) Hit both buttons when complete, and you will be done with these adjustment.

Now press the left button and the legs should lower. Hit it again and the legs should retract. If you are satisfied with these limits, you have successfully installed the LegUp System. Time for a test ride!
TEST RIDE

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Deployment and Retraction of the wheels is COMPLETELY MANUAL if you have a LITE System.

Get the bike to a clear paved mostly level area where you can test ride it. Start the bike, turn on the LegUp system and lower the legs. The first test should be done in a straight line. Put the bike in gear and slowly accelerate. You may notice that the bike tends to want to steer a small amount left or right. This is normal unless it is severe. Once underway, the top LED should flash at around 6 MPH, meaning the legs are retracting. You can lean on one wheel or the other as you leave to reduce any darting the system may be giving you.

Assuming the legs are retracted, you should try to deploy the wheels. As you come to a stop, the Green LED should be on. As you slow down (almost stopped), the Yellow LED should illuminate at the proper speed. Once it does (sometimes hard to see), hit the left button and put your feet down near the ground. The top LED should flash and you should soon feel the wheels deploying underneath you! Make sure you are ready to balance the bike! Uneven ground or lack of familiarity could make the bike want to lean one way or the other. With your feet ready to balance the bike, this should be no big deal. The slower you are going when deploying the wheels, the smoother the transition will be from wheels up to wheels down. Practice these maneuvers until you are comfortable with the wheel adjustments and the system operation.

SEMI-AUTOMATIC DEPLOYMENT: Another way to deploy the legs is to hit the left button while you are running at any speed over 10MPH with the wheels up. The bottom or yellow LED should start to flash. When you slow down to around 8MPH the wheels will start to deploy (see the red/green flash on top LED). Again prepare to put your feet down.

NOTE: The bottom LED Should not be LIT if the legs are up over 10MPH! In the event it is, the wheels will deploy instantly if you try to set them as above; this is dangerous! You MUST re-visit the sections on testing the proximity sensor. You should always be aware that this light should NOT be on if you are traveling at speed, and ‘Arming’ the system for deployment should only be attempted if the lower LED is Not Lit! Please see the User Manual for more information on Proximity Sensor Failure!
The next thing to try is to make a turn right after a dead stop with the wheels down. As soon as you start the bike moving, try a left or right turn immediately by leaning into that turn. You may find that you have to nudge the bike a little bit more than usual to get the bike to lean, and you won’t be able to lean as far as you can with the wheels up. Once into the turn, accelerating will raise the wheels. You will hardly notice the wheels coming up unless you see the top LED blinking!

The next thing to try is slow speed maneuvering with the wheels lowered. In a straight line on level ground, you should be able to keep your feet on the floorboards and move the bike forward at very slow speeds (simulate stop and go traffic). I like keeping my feet near the ground during these maneuvers! You can also try small ‘Trike’ turns; keeping the bike upright at slow speed and making turns as you would in a parking lot. Be aware that if you get over the speed that the legs come up, they will!!! Another thing I like to do is donuts. Start out slow, lean the bike left or right, and make circles at very slow speeds (throttle on, rear brake on, clutch slipping… you know like the cops do!). This helps you get familiar with the wheels being on the springs and allowing a lean angle! Practice, practice, practice!! Enjoy your LegUp System!
LEGUP LITE - ADDENDUM

If you have a Lite System, there are a few differences in the wiring compared to our Regular system.

The plugs and their locations don’t change at all! Instead of plugging in the computer to the twelve pin plug, the Relay-Pack gets plugged into this plug. The Relay-Pack will be attached with Velcro as the computer would have been in the same location.

On the LITE system there is no proximity sensor, so ignore the testing and mounting of this sensor, and realize that the three pin plug will be left without a mating connector. We keep this plug in the wiring harness in case you upgrade to a regular system in the future.

Using Your Lite System:

Unlike our Regular System, you don’t turn the LITE system on, or adjust the legs as described in the ‘Maintenance Mode’ section of the manual. When you turn your bike on, the LITE system is ready to go! Press and hold the left button to lower the wheels, press and hold the right button to raise them. No lights will flash; it is up to you to control the system manually!

Please use EXTREME Caution when using the LITE System! Keeping the wheels lowered at speeds over 9MPH can be dangerous. Since the system is manual, please don’t allow its’ operation to distract you from controlling the vehicle!

Upgrading you LITE System:

If you have a LITE System and have chosen to upgrade it to the regular system, there are just a few things you need to do. Unplug the Relay-Pack, and plug the computer in where the Relay-Pack was attached. Run the wire for the proximity bracket and plug it in, test it, and mount it, as described in the ‘MOUNT PROXIMITY SWITCH’ section of this manual.

Once the new pieces are attached and plugged in, refer to ‘ACTUATOR ADJUSTMENT (Maintenance Mode)’, earlier in this manual to set the lower and upper stops for the computer.

That’s all it takes!
There are three different types of actuators with three different wiring configurations. Refer to the notes at the bottom of the pictures above so you can match your actuator with its wiring scheme!

Wiring 2
Wiring 3
HARDWARE LIST

(1) 1/4 - 20 X 1.5” – Actuator Bolt & Nylock - Chrome
(2) 5/16 – 18 X 1.5” - Lower Actuator Mount Bolt - Chrome
(2) 5/16 Cad Washers (lower actuator mount spacer for wide actuators)
(2) M8 X 60mm Head Bolts with Split Washers and Nuts (upper actuator bracket)
(2) M8 X 60mm Head Bolts with Split Washers (uprights to Cat)

(2) 5/16-18 X .75” Cad Bolts with Lock & Flat Washers – (forward ‘l’ brackets)
(4) 3/8 – 16 X 1” Cad Bolts with Lock Washers (uprights)

(2) 5/16” – 18 X 1.75” Chrome Allen Bolts with Nylock (forward mounts)
(2) Fender Washers with flat spot (forward mounts)
(1) 10-32 Allen Head Bolt cut to 1.3” (Handlebar Box)
(1) M5 – Black Allen Bolt cut to 2.95” (Handlebar Mounting Bracket)

Hardware Bag with ties, etc.