



# **Installation Instructions**

*for*

## **C5 / C6 Corvette**

**Independent Rear Suspension (IRS)**

*and*

**Independent Front Suspension (IFS)**

## **Adapter Kits**

**Please note: Although the majority of the photos in this manual are of the rear suspension adapter kit installation, they are pertinent to the front suspension adapter kit as well.**

**Photos that are specific to the front adapter kits are bordered and / or highlighted in yellow.**



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315-683-0022**

**Be sure and check out sections 11-14, on our site, for some helpful tips and adapter dimensions.**

## Corvette Interface Adapters – Installation Instructions

**So you've decided to install a C5 / C6 Corvette IRS or IFS in your project vehicle. Great! – And Thank You for selecting Dobbertin Performance Innovations as a big part of the upgrade!**

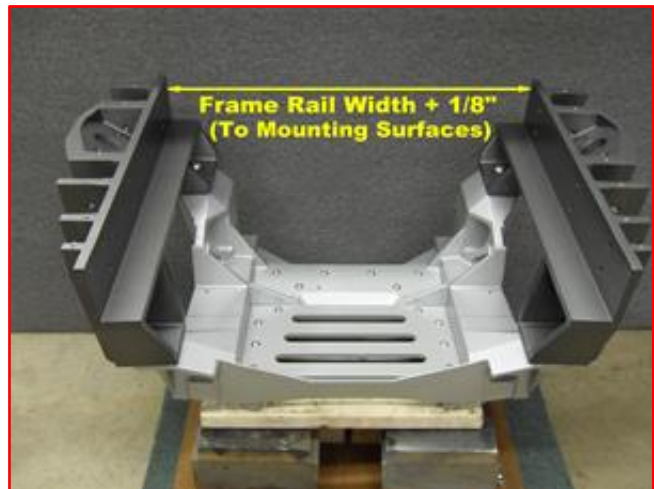
**At this point in the conversion, the frame rails are already tacked in place, but not yet permanently welded.**

### ASSEMBLING THE SUSPENSION MODULE

The adapters need to be mounted on the cradle to take an accurate measurement between their mounting surfaces before the frames are permanently welded in. It's also a good idea to install a wooden 2" x 4" between the rails to keep the correct distance between them, until everything has been permanently welded.

Ideally, the adapters' mounting surfaces should be a total of 1/8" wider than the frame rails. This allows for a snug fit with the 1/16" neoprene pads installed on each side.

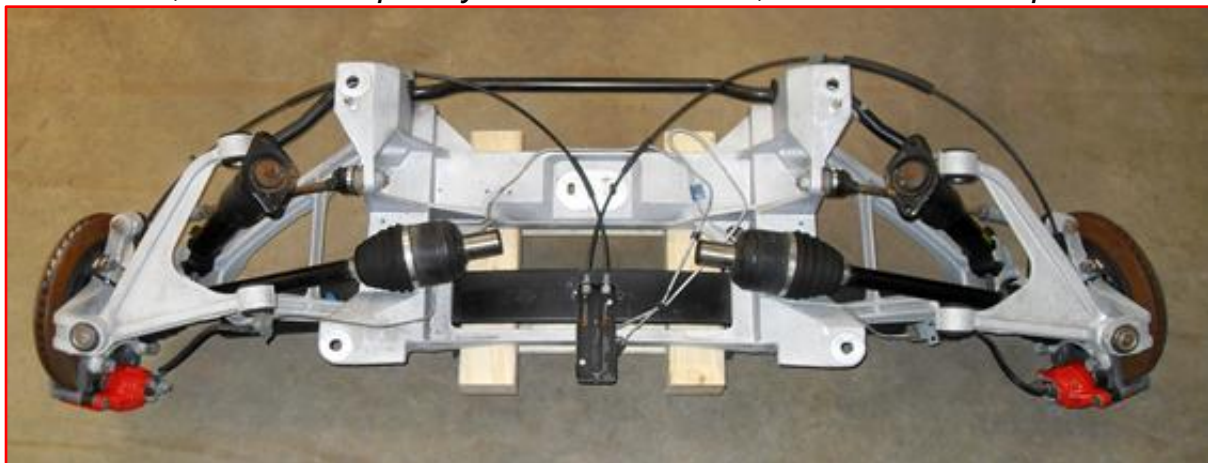
(Please Note: The 1/16" neoprene pads are not necessary if the frame rails are already perfectly parallel and no gap needs to be filled.)



**Frames positioned with tack welds.**

**The Adapters on the Cradle.**

The Corvette Interface Adapters can be installed on a bare cradle, such as the one pictured above, or on a completely assembled cradle, such as the one pictured below.



This will be determined by which method you will be using to install the suspension module onto the frame rails. **(This will be discussed in detail in the next Section.)**



**Back (Right side of a stock C5 Rear Corvette Cradle) Front**



**Back (Right side of a stock C5 Front Corvette Cradle) Front**

As you'll notice, the mounting holes in the Corvette cradles are 3/4" in diameter, whereas the holes in the adapters are 1/2" in diameter. **At the rear of the rear adapter as well as at the front of the front adapter have locating pins on each side,** for making sure that the cradle lines up squarely with the stock Corvette frame – as well as with our Corvette Interface Adapters.

To make up the difference in the sizes of the holes, we have supplied four 1/2" x 3/4" ID bushings for the job. Also in the kit are four neoprene fender washers that should be placed over the mounting holes – between the cradle and the adapters. This will take up any differences in the two machined areas, (usually .005" or less.)



**PLEASE NOTE – A QUALITY ANTI-SEIZE COMPOUND MUST BE APPLIED TO THE THREADS BEFORE ANY STAINLESS STEEL HARDWARE IS ASSEMBLED. NOT DOING SO WILL RESULT IN PARTS THAT WILL SIEZE UP AND GALL, WHICH WILL REALLY PISS YOU OFF! TRUST ME ON THIS ONE...**

## **INSTALLING THE ADAPTERS TO THE CRADLE:**

1. Place one neoprene washer over each one of the cradle's four mounting holes.
2. Line up one of the adapters over a pair of the cradle's holes. (There is only one way these can fit properly – and it's pretty obvious.)
3. Starting with one side, put two 12mm washers on two 1/2"-13 x 2-1/4" hex head bolts, included in the IRS kits, and drop them through the adapter and cradle. **(Please Note: The front adapter kit is supplied with two 1/2"-13 x 2-1/4" SHCS bolts and two 1/2"-13 x 3-1/4" SHCS bolts instead of the 1/2"-13 x 2-1/4" hex head bolts.)**
4. Slide the bushings up the bolts from the bottom, and into the cradle's 3/4" holes.
5. Slide a USS washer onto the bolt and follow it with the nut, and **remember the anti-seize if you're using the ESNs (Elastic Stop Nuts.)** (If you have four standard 1/2"-13 nuts, you can use them at this point, instead of the ESNs.)
6. Tighten only enough to bring all of the parts into alignment – so the adapters don't rock back and forth.

## **INSTALLING THE UPPER CONTROL ARMS AND SHOCKS ON THE REAR SUSPENSION ADAPTER KITS:**

1. Jack up the spindles, then raise the control arms over the adapters and slide them in from the top.
2. Select the two 12mm x 1.75 x 100mm hex bolts and two 12mm flat washers for the rear control arm bushings and the two 12mm x 1.75 x 110mm double-end studs, two 12mm x 1.75 ESNs and two 12mm flat washers for the front control arm bushings.
3. Push the 12mm hex bolt all the way through the rear control arm bushing, then tighten it 4-5 turns, which is plenty to keep the control arm in its place.  
**(No need to use any thread coatings on the bolts or studs at this time.)**
4. For the front 12mm stud, push it past the access hole on the second upright and all the way through the front control arm bushing. Then spin on the plated 12mm x 1.75 standard nut (only one of these in the parts bag) so about three of the stud's threads stick out of the end of the nut.
5. Next, spin on the 12mm x 1.75 ESN, and snug them together with two wrenches. Once the threads in the adapter have been reached by the stud, use a wrench on the ESN to turn the stud in about 4-5 turns.



**The rear 12mm hex head bolt.**



**The front 12mm stud with two nuts.**



**The upper shock absorber mount.**



**The shock added to the suspension.**

The shock absorbers can be added next, which will raise the control arms up a bit, and make the suspension module a little easier to handle. (If you use the ESNs, remember to also use the Anti-seize.)

### **INSTALLING THE UPPER CONTROL ARMS AND SHOCKS ON THE FRONT SUSPENSION ADAPTER KITS:**

Put a drop of Loctite thread lock on each of the stainless steel 10mm studs and screw them into the castings within 1/8" of them protruding out of the rear of the casting. The 'blue' non-permanent Loctite will work just fine and will enable the removal of the studs, at a later date, without heating up the casting.



**The eight stainless steel studs.**



**Two studs installed in the casting.**



**With the arms and shocks added, it's time for a quick alignment. The Suspension Modules are now complete!**

## **INSTALLING THE SUSPENSION MODULE**

**Before the final positioning of the axle can be determined, make sure that the wheel alignment is about right. There are several Internet sites that explain how to do a 'quickie' alignment that should get you pretty close.**

*It's important to align an independent rear suspension before positioning it in a vehicle, as sometimes the alignment process can actually change the axle centerline – up to a half an inch in either direction. This is because the spindles might turn slightly during the rear wheel alignment procedure, unlike a vehicle with a solid axle.*

### **There are three Methods to installing the Suspension Module:**

- 1. If you have access to a transmission jack or similar type dolly, you can assemble the entire suspension module together as a unit before you roll it under the vehicle – then jack it up to the frame rails.*
- 2. You can jack up the back of the vehicle, high enough to roll the complete assembly under the rails, then lower the frame rails onto the adapters.*
- 3. If it looks like it might be too much of a hassle to install the complete unit, or it's a one-person installation, the adapters can be mounted to a bare cradle, then rolled under the frame, jacked up and C-clamped to the frame temporarily. Then the remainder of the suspension components can be assembled.*

### **For this example, we'll use Method Two:**

- 1. Jack up the frame and set up a couple jack stands with adequate height to roll the entire suspension module under the frame rails. Make sure to place the stands far enough forward as to not interfere with the suspension.*
- 2. Roll the entire unit under the frame to its approximate final position. Then install the tires and remove the dolly from under the Corvette cradle.*
- 3. Next, lower the frame onto the adapters – just to the point that the adapters are barely touching the frame rails. Don't add the long neoprene pads this time, but keep in mind they are 1/16" thick and very useful in taking up some minor imperfections.*
- 4. Now it's time to take a quick inspection of the adapter's fit.*
- 5. You'll want to make sure that they will mate up to the frame rails without having to force anything.*



**The suspension in position.**



**The tires on and the frame lowered.**

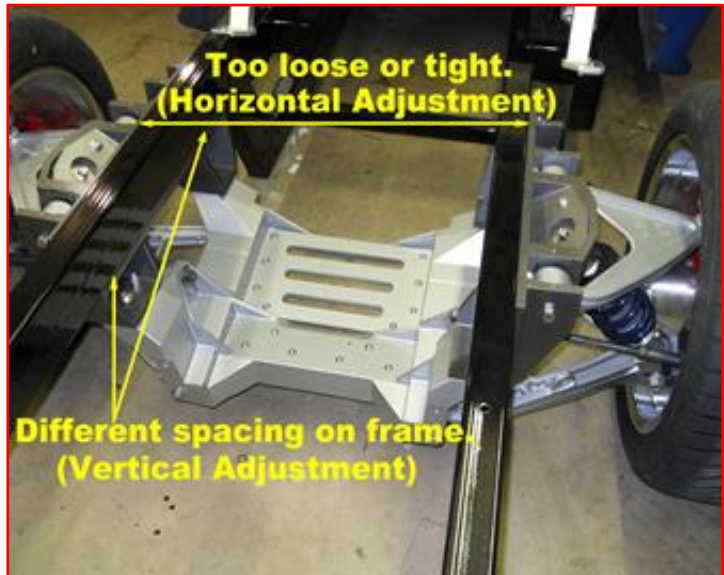
## ADJUSTING THE ADAPTERS

If you find that the adapters are too close together to fit the frame between them, or have a gap between the adapters and the frame, there is a quick fix if the gap is 1/8-inch or less, either way.

On the left adapter, the cradle's locating pin hole is round, however on right adapter, the locating pin hole has been slotted, (1/8" right and 1/8" left) to make up for minor frame discrepancies. (This is the same way the Corvette factory frames are made.)

If it becomes necessary to adjust the adapter's width, then the two bushings must be removed from the right side of the cradle to allow for the adapter to be shifted wider or narrower. This will not affect the location of the assembly, as the left side will retain the bushings, which will square the suspension.

**This is the Horizontal Adjustment.**



**Left Adapter with the Round Hole**



**Right Adapter with the Slotted Hole**

Once the Horizontal Adjustment is taken care of, take a look at where the adapter's lower mounting surfaces meet the frame on both sides. Make sure that one side of the adapter is tight against the underside of the frame rail – from front to back.

Now look at the other adapter. If it is off by .040" or more, either at the front or at the rear, it should be corrected. Again, the fix is an easy one. Simply remove the bolt at the adapter base with the gap and slide in the proper amount of stainless steel fender washers necessary to make up the difference. **This is the Vertical Adjustment.**

This discrepancy is usually caused by a slight twist in the cradle or the possibility that the new frame rails are not running perfectly parallel.

The kits are supplied with four fender washers. If you need more than this, and the frame rails are running parallel, take the time to closely inspect the cradle to make sure that there are no cracks in it, due to an accident. The cradles will twist quite a bit before cracking, but it's always better to be safe than sorry.

Before the final position of the suspension can be determined, the wheels/tires have to be mounted, then the bed has to be temporarily installed, (on a pickup) or just step back with an automotive installation, and see exactly where the axle centerline is – in relation to the wheel well openings.

Even if the axle placement looks perfect, take a few minutes to move the entire suspension forward and backward, just a little, to make sure you're satisfied with its final position.

It's always a good idea to have a couple friends help you decide on the exact axle placement. (Then you can blame it on them, if you don't like it later on.)



## **MARKING THE ADAPTER'S LOCATION ON THE FRAME**

1. If you're building a pickup, the bed can now be removed and the frame must be accurately marked for the precise placement of the adapters.
2. We recommend using a center-punch to mark the front two holes in each adapter. However, running a strip of masking tape on the frame against the front and rear edges of the adapters will also work just fine.
3. Once marked, the suspension module can be removed and the frame rails welded in permanently, if it hasn't been done already. (Keep the 2" x 4" between the rails to maintain the correct width during the welding process.)
4. Now that the frame is secure, unbolt the two adapters from the suspension module, (making sure to write down where the fender washers go) and mount the bare adapters back on the frame with C-clamps, using your earlier markings to locate them.
5. With the upper control arms removed, there is easy access to all six mounting holes on each adapter. Again, using a center-punch, make sure that all of the holes are clearly marked, then drill them all – straight through frame.
6. It's also a good idea to drill them a bit larger and install tubes through the frame, so the frame won't be crushed when the hardware is tightened.



**The Adapter with tape and a punch**



## THE FINAL INSTALLATION

### Refer back to “Assembling the Suspension Module” and remember:

1. If it was necessary to add any fender washers to the cradle, for the vertical adjustment, do so at this time – on the proper mounting hole.
2. **Use anti-seize on all stainless steel hardware.**
3. Add the aluminum bushings in all four holes on the cradle, or only in the two on the left, if a horizontal adjustment was necessary.
4. Leave the four adapter to cradle bolts loose enough to allow the adapter to sway from side to side about 1/4-inch each way.
5. Install the control arm hardware again – with only 4-5 turns of the hardware. **(No need to use any thread coatings on the bolts or studs at this time.)**
6. Jack the complete suspension module up to the frame rails. The holes on the frame should line up perfectly with the mounting holes on the adapters.
7. Now it's time to drop in a long neoprene pad on each side – between the frame rails and the adapters.

### The Final Adjustments – (If necessary):

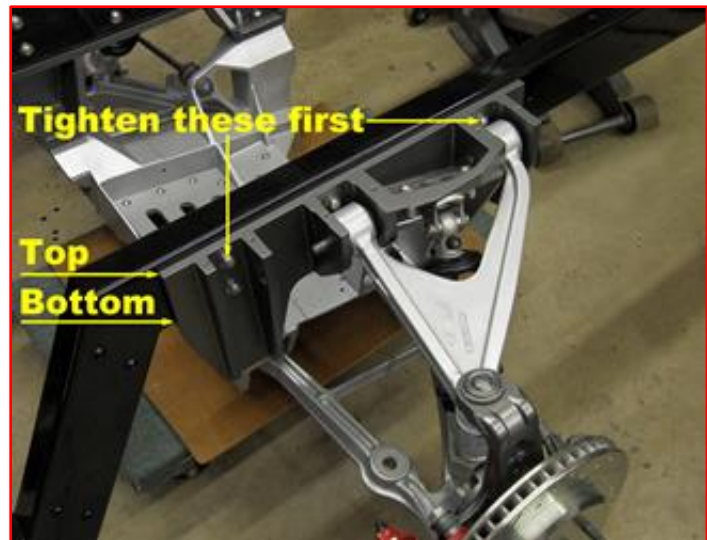
1. With the pads in place, install the two front mounting bolts, (from the adapter side) all the way through the frame rails – on both sides.
2. Now, remove the control arm bolts and move the arms out of the way for the installation of the remaining four adapter mounting bolts on each side.
3. Once all of the adapter to frame bolts are installed, add anti-seize to the threads, install the washers and ESNs.
4. **Begin drawing the adapter to the frame rail by tightening the upper front and upper rear bolts on each adapter first. Since everything has already been assembled earlier, there shouldn't be a problem...**

**Scenario One** – If there is no binding and everything lines up, then proceed with all of the other mounting bolts. There is no need to 'torque' these very tight. (To be technical, I'd classify the proper tightness as very-snug.)

**Scenario Two** – When the adapters and frame rails are drawn together, and the adapters seem to be **tilting inward at the TOP** – back off the bolts and check to see how far they would need to be pushed away from the frame to make the gap equal from top to bottom.

If it's less than 1/8-inch total and you haven't taken advantage of the alignment pin's slot on the right adapter – just drop out the bushings on the right side and slide everything into place. **(As discussed in “Adjusting the Adapters”)**

However, if the bushings have already removed and there is still an uneven gap, then the best way to repair this is to slide in a couple thin pieces of aluminum as shims, next to the neoprene pads. (One of the neoprene pads can be used as a template.)



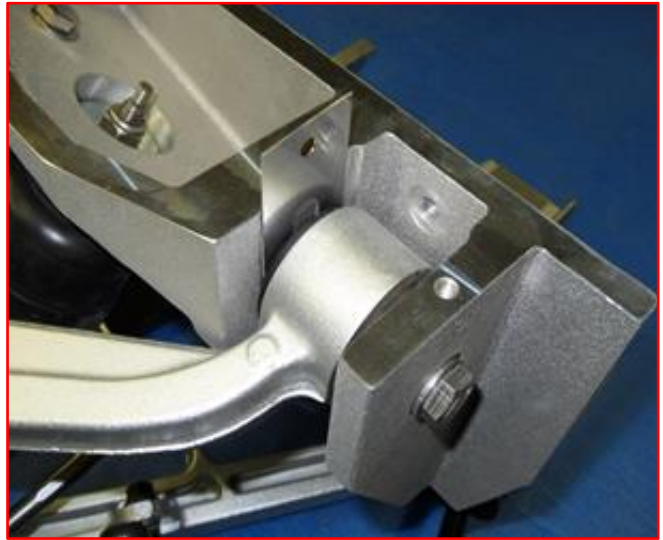
**Scenario Three** – When the adapters and frame rails are drawn together, and the adapters seem to be **binding at the BOTTOM** – (therefore tilting outward at the top) back off the bolts and determine how far they would need to be pushed toward the frame to make the gap equal from top to bottom.

If it's less than 1/8-inch total and you haven't taken advantage of the alignment pin's slot on the right adapter – just drop out the bushings on the right side and slide everything into place. **(As discussed in Adjusting the Adapters.)**

If the bushings are already removed and there is still no gap, the only way to repair this is to remove the neoprene pads.

### **Installing the upper control arms :**

1. Put a little **Ultra Black Silicone** on the threads of the bolt as well as on the stud's thread that goes into the adapter's aluminum threads.
2. On the nut's side of the stud, apply some **anti-seize**.
3. Put a little **grease** on the non-threaded areas of the bolt and stud.
4. To screw in the studs this time, simply install the 12mm washers and the 12mm ESNs, then use just the ESNs to screw them in.



### **Shimming the control arm bushings**

5. When the control arms are in their final position, there is quite a bit of movement back and forth. This requires that some stainless steel shims be inserted.
6. It doesn't matter if the arms shift forward or backward or remain in the middle. The goal here is to install as many as possible, to minimize the free space, so just use any shim combination that works.
7. With the shims in place, tighten the bolt and stud firmly, but don't over-tighten.

The shims are necessary because when the control arms are installed in a Corvette at the factory, each bushing is sandwiched between two sides of a metal bracket. The factory tightening process randomly shifts the rubber bushings right or left, varying the bushing to bushing widths by almost 1/4-inch, So we designed our adapters with a little extra room and included the shims to take up the difference.

Now its time to install the two cover plates with six bolts per side. Once again, we recommend using a small amount of **Ultra Black Silicone** on the threads.

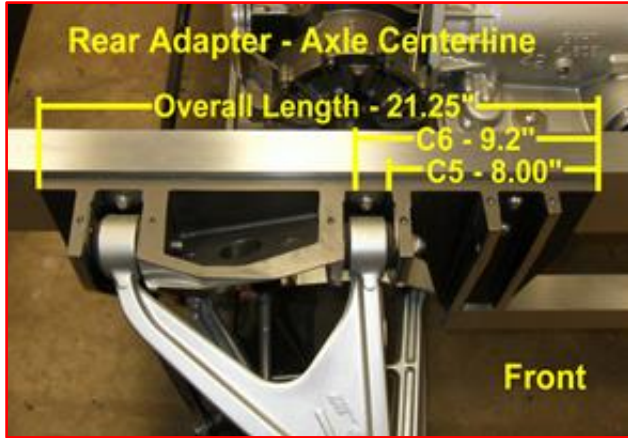


**Thanks again for choosing Dobbertin Performance – Enjoy the Ride!**

# APPENDIX

## Axle Centerlines – Relative to the Castings

Please note: the use of C6 rear control arms will move the Axle Centerline rearward by 1.2". This is how Chevrolet changed the C5's Wheelbase of 104.5" to the C6's Wheelbase of 105.7".



## Outside Frame Rail Dimensions

The rear frame width – outside to outside, with the standard width lower cradle is 31.75".

The front frame width – outside to outside, with the standard width lower cradle is 34.75".

## The WMS (Wheel Mounting Surface) Dimensions

The rear WMS to WMS dimension – with the standard width lower cradle is 66.75".

The front WMS to WMS dimension – with the standard width lower cradle is 65.75".

Please note: WMS to WMS dimensions can vary slightly with different alignment specifications – front and rear.



For more information on Frame Rail and WMS Dimensions, Refer to Section 12 on the Dobbertin Performance website.

**When it comes time to order your coil-over shocks, all you need to do is give Ridetech a call at 812-481-4787 and talk to one of their people. They can help you select the proper spring rate, based on the total weight of your project as well as its front to rear weight distribution.**



**This is the coil-over shock assembly for the our REAR suspension. It has an eyelet and clevis on top and a Corvette C5 style clevis on the bottom.**

**The lower nut and bolt set, are standard Corvette items.**

- |                              |  |
|------------------------------|--|
| 1 - Aluminum mono tube shock | 1 - 5/8"-1/2" bearing spacer kit           |
| 1 - Upper spring seat        | 2 - Delrin washers                         |
| 1 - Lower adjuster nut       | 1 - Upper clevis and plate assembly        |
| 1 - Upper spring seat clip   | 1 - Corvette style bottom mount            |
| 1 - Upper nut and bolt set   | 1 - 7" Tall spring – Rate to be determined |



**This is the coil-over shock assembly for the our FRONT suspension. It has an eyelet and clevis on top and a Ridetech universal trunnion on the bottom.**

- |                              |  |
|------------------------------|--|
| 1 - Aluminum mono tube shock | 1 - 5/8"-1/2" bearing spacer kit           |
| 1 - Upper spring seat        | 2 - Delrin washers                         |
| 1 - Lower adjuster nut       | 1 - Upper clevis                           |
| 1 - Upper spring seat clip   | 1 - Trunnion style bottom mount            |
| 1 - Upper nut and bolt set   | 1 - 8" Tall spring – Rate to be determined |

# **DOBBERTIN PERFORMANCE – ADAPTER KIT COMPONENTS**

## **FRONT KIT**

### **CAST ALUMINUM ADAPTERS**

- 1 – LH A356 Aluminum Heat Treated Casting  
– Complete With Machining
- 1 – RH A356 Aluminum Heat Treated Casting  
– Complete With Machining

### **BILLET ALUMINUM COVER PLATES**

- 1 – LH 6061-T6 Billet Aluminum Cover Plate –  
Complete With Machining
- 1 – RH 6061-T6 Billet Aluminum Cover Plate –  
Complete With Machining

### **ADAPTER TO CRADLE HARDWARE**

- 2 – 1/2" x 3-1/4" Socket Head Cap Screws
- 2 – 1/2" x 2-1/4" Socket Head Cap Screws
- 4 – 12mm Flat Washers
- 4 – 1/2" x 2" Fender Washers
- 4 – 1/2" x 2" Neoprene Fender Washers
- 4 – 1/2" ID x 3/4" OD Aluminum Bushings
- 4 – 1/2" USS Flat Washers
- 4 – 1/2" Elastic Stop Nuts

### **ADAPTER TO FRAME HARDWARE**

- 10 – 3/8" x 3-1/2" Hex Head Bolts
- 2 – 3/8" x 2-3/4" Hex Head Bolts
- 22 – 10mm Flat Washers
- 10 – 3/8" Elastic Stop Nuts

### **ADAPTER TO UPPER A-ARM HARDWARE**

- 8 – 10mm x 60mm Socket Head Set Screws
- 8 – 10mm Flat Washers
- 8 – 10mm Elastic Stop Nuts

### **UPPER SHOCK ABSORBER HARDWARE**

- 2 – 3/8" X 1-3/4" SHCSs
- 2 – 10mm Flat Washers
- 2 – 3/8" AN Washers
- 2 – 3/8" Elastic Stop Nuts

### **ALUMINUM COVER PLATE HARDWARE**

- 12 – 1/4"-20 x 7/8" Button Head Cap Screws
- 12 – 1/4" Mil Spec AN Flat Washers

### **NEOPRENE SPACERS**

- 2 – .063" x 3.500" x 24.50" Spacers

### **SPARE WASHERS**

- 4 – 1/4" Mil Spec AN Flat Washers
- 2 – 10mm Flat Washers
- 2 – 12mm Flat Washers
- 2 – 1/2" USS Flat Washers

## **REAR KIT**

### **CAST ALUMINUM ADAPTERS**

- 1 – LH A356 Aluminum Heat Treated Casting  
– Complete With Machining
- 1 – RH A356 Aluminum Heat Treated Casting  
– Complete With Machining

### **BILLET ALUMINUM COVER PLATES**

- 1 – LH 6061-T6 Billet Aluminum Cover Plate –  
Complete With Machining
- 1 – RH 6061-T6 Billet Aluminum Cover Plate –  
Complete With Machining

### **ADAPTER TO CRADLE HARDWARE**

- 4 – 1/2"-13 x 2-1/4" Hex Head Bolts
- 4 – 12mm Flat Washers
- 4 – 1/2" x 2" Fender Washers
- 4 – 1/2" x 2" Neoprene Fender Washers
- 4 – 1/2" ID x 3/4" OD Aluminum Bushings
- 4 – 1/2" USS Flat Washers
- 4 – 1/2" Elastic Stop Nuts

### **ADAPTER TO FRAME HARDWARE**

- 12 – 3/8"-16 x 3-1/2" Hex Head Bolts
- 24 – 10mm Flat Washers
- 12 – 3/8"-16 Elastic Stop Nuts

### **ADAPTER TO UPPER A-ARM HARDWARE**

- 2 – 12mm x 1.75 x 100mm Hex Head Bolts
- 2 – 12mm x 1.75 X 105mm Double-End Studs
- 2 – 12mm Elastic Stop Nuts
- 4 – 12mm Flat Washers

### **UPPER SHOCK ABSORBER HARDWARE**

- 4 – 3/8"-16 x 3-1/2" Hex Head Bolts
- 8 – 10mm Flat Washers

### **ALUMINUM COVER PLATE HARDWARE**

- 12 – 1/4"-20 x 7/8" Button Head Cap Screws
- 12 – 1/4" Mil Spec AN Flat Washers

### **A-ARM ADJUSTMENT SHIMS**

- 8 – .017" 4 – .023" 4 – .033" Thick Shims

### **NEOPRENE SPACERS**

- 2 – .063" x 3.500" x 21.25" Spacers

### **SPARE WASHERS & JAM NUT**

- 4 – 1/4" Mil Spec AN Flat Washers
- 2 – 10mm Flat Washers
- 2 – 12mm Flat Washers
- 2 – 1/2" USS Flat Washers
- 1 – 12mm x 1.75 Nut (For Installing Studs)

***Any questions, please call me (Rick) at: 315-683-0022***

***or***

***Email me at: Rick@DobbertinPerformance.com***

## ***Dobbertin Performance Innovations – Limited One-Year Warranty***

This Limited One-Year Warranty is given to the original purchaser (the 'Buyer') of this Dobbertin Performance Innovations product.  
The Warranty is non-transferable.

### **What is covered:**

Dobbertin Performance warrants that the product will be free from defects in workmanship and materials under normal use and service for one year from the date of purchase.

The date of purchase must be verified by a sales receipt, canceled check or other acceptable payment record.

### **What is not covered:**

Damages caused by shipping, product misuse, misapplication, improper installation or maintenance, or damages resulting from accidents or contact with on-road or off-road hazards.

Labor costs to remove and install the products or component parts

The costs incurred in shipping the product to and from Dobbertin Performance.

Any incidental, accidental or consequential damages to the buyer. (This may not apply in your state.)

### **Claims Procedure:**

Contact Dobbertin Performance at 315-683-0022 within one year of the purchase to report a possible warranty claim.

The buyer is responsible for the shipping of the product to Dobbertin Performance for inspection of the claim before an exchange or refund is approved.

In the event a Warranty defect is discovered, Dobbertin Performance will repair or replace the product, or return the purchase and return shipping costs to the Buyer, in an amount which will be determined by Dobbertin Performance.

## ***Dobbertin Performance Innovations – Product Return Policy***

We at Dobbertin Performance Innovations want all of our customers to be happy with their purchases.

If you are not satisfied with one of our products within 30 days of your purchase, you may return it for a full refund – minus the shipping costs. (The purchaser is responsible for the original shipping costs, as well as the return shipping costs.)

All returns must be complete and returned in their original shipping container and packing material – or equivalent.

We will not accept any return product that appears to have been used or installed, unless there is a valid warranty issue.

We will not accept any returned product that, in our opinion was used, installed, handled, packaged, or shipped improperly by the customer and it will not be eligible for exchange, refund or warranty.

The cost of any missing parts will be deducted from your refund.

Parts returned past 30-days will be subject to a 15% restocking fee.

No returned parts will be accepted after 60 days from the purchase date.

There is a 15% exchange fee for any custom-made, narrowed cradle for a different width cradle, providing it has not been installed or altered in any way. This exchange applies for 60-days from the time of the original purchase.

Any questions or to begin a return, please contact Dobbertin Performance directly at 315-683-0022.

***Thank You***