



## 3 AND 5 LINK INSTALLATION MANUAL

Thank you for your purchase of this Levy Racing quality product. Like all Levy Racing products, this kit is a fully engineered system. It is not a conglomeration of parts that fit a variety of applications. It is a system that is specific in both design and application. For this reason, please read the manual entirely before attempting installation. Check the parts in the box against the parts list and make sure everything is there. Also, be realistic about your mechanical ability and the variety and quality of tools at your disposal. These suspension parts are designed with the utmost integrity in mind for the sake of performance and safety. If they are installed properly they will give many years of continuous service. If these parts are not installed correctly, serious injury or even death can result. If you have any doubts about your ability or your tools, please contact us about our installation services. Above all, work safely. Use the proper tools and wear the appropriate clothing and safety attire. Always use jack stands and **NEVER** work on heavy equipment alone.

### Parts list

Part	# Pieces
1. Front chassis mount	1
2. Rear chassis mount	1
3. Third member mount	1
4. Third member bushings	4
5. Third link	1
6. Watt's link	2
7. Watt's lever	1
8. Lower control arm link	2
9. ½" bushing	8
10. 5/8 bushing	6
11. assorted nuts and bolts	

### Tools

½ drive electric or pneumatic drill  
2 vice clamps of at least 6" radius  
Magnetic protractor  
Die grinder and Rollock sanding wheels.  
Assorted hand tools

### Installation

- 1) Raise the car off the ground and support the frame on jack stands. Raise the rear end from droop back to approximate ride height and support it with jack stands. You will need three jack stands for the rear end. One on each side of the axle and one under the pinion to keep it third member from rolling forward when the upper arms are removed.

- 2) Remove the rear wheels.
- 3) It is easiest to replace the lower control arms with the new Levy Racing units first. This will help locate the rear end while the other pieces are being installed. Remove the lower arms one at a time and replace them with the new units and the supplied spacers. Install the long control arm spacers on the inside of the heim joint at the front of the arm (front meaning front pickup point). Install the second set of long control arm spacers to the outside of the heim joint at the rear of the control arm. This will place the lower arm as parallel to the longitudinal axis of the chassis as possible.
- 4) Remove the existing upper control arms and discard. Remove the rear end cover and discard.
- 5) Install the supplied rear end cover and re-fill the rear end.
- 6) Remove the stock upper control arm bushings from the third member. This is best done with an air hammer and chisel but can be completed with a ball peen hammer. Install the supplied third member bracket using the supplied aluminum bushings and hardware. See figure 1.

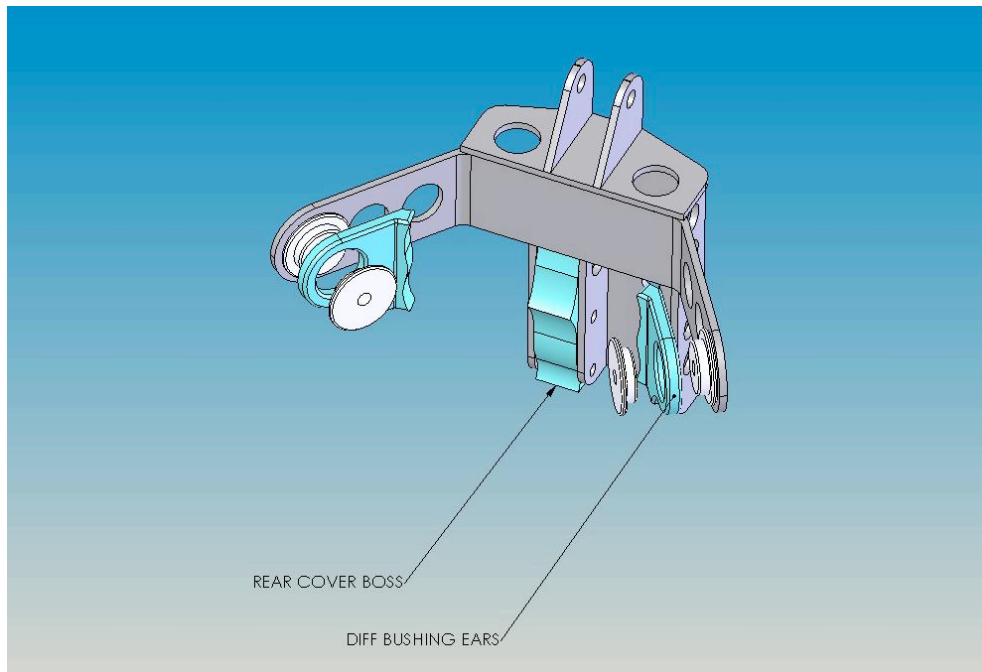


Figure 1.

- 7) Install the third link chassis mount to the center of the chassis cross brace that passes across the chassis above the pinion yoke using the supplied hardware. Do this with the opening for the third link facing towards the back of the car. Measure the cross brace to find the center. Mark the holes using the mount for a template and drill the 4 1/2" holes as required. After drilling, grind off the surface mating area for future welding. Bolt the mount in place using the supplied hardware. This will be welded later. **DO NOT WELD AT THIS TIME.** See figure 2.

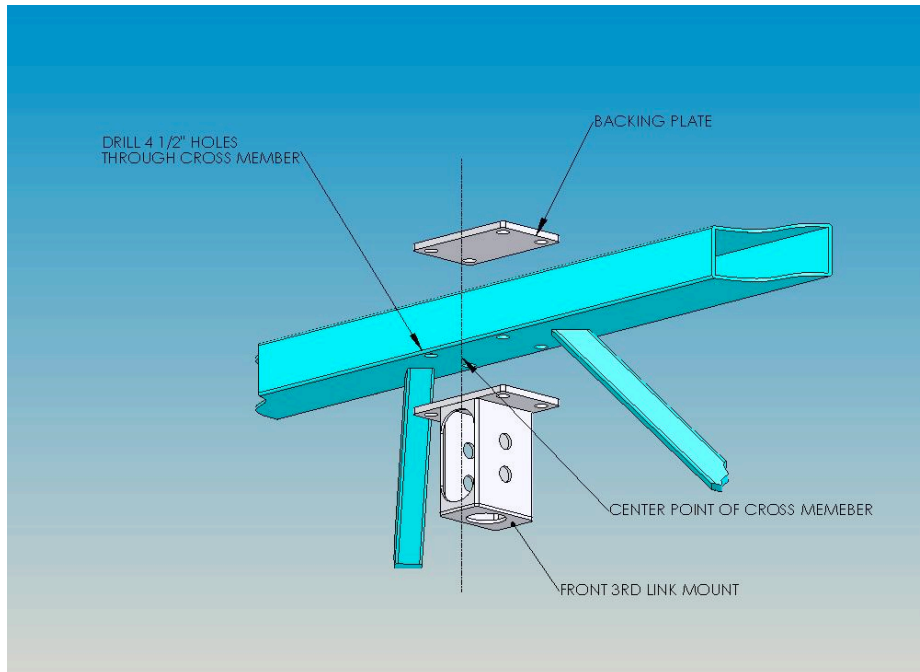


Figure 2.

- 8) Install the third link using the supplied hardware. Install the third link in the bottom hole of the chassis front mount. Placing a magnetic protractor on the top bump pad of the third member, adjust the third link by rotating it so that the pinion angle is 2 degrees negative (facing down toward the front of the car) when measured from the ground. This can be changed later. These measurements are for mock up only. See figure 3.

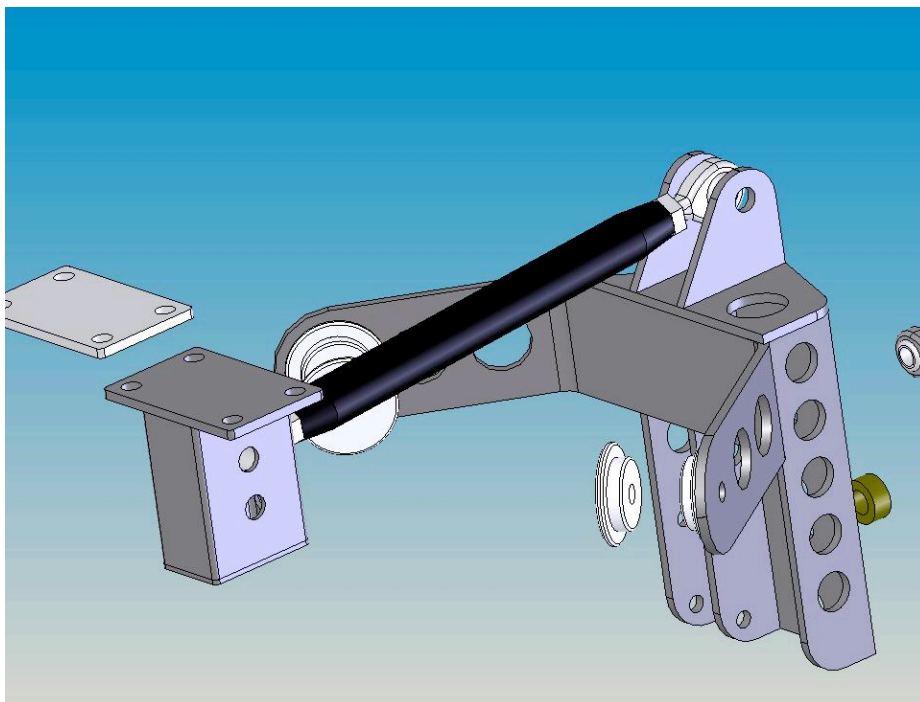


Figure 3.

- 9) Install the Watt's lever onto the third member bracket using the supplied hardware. Place one  $\frac{1}{2}$ " x  $\frac{5}{8}$ " bushing on each side of the lever and fasten with the supplied  $\frac{5}{8}$ " bolt, nut and lock washer. Torque to 50 lb. ft. See figure 4.

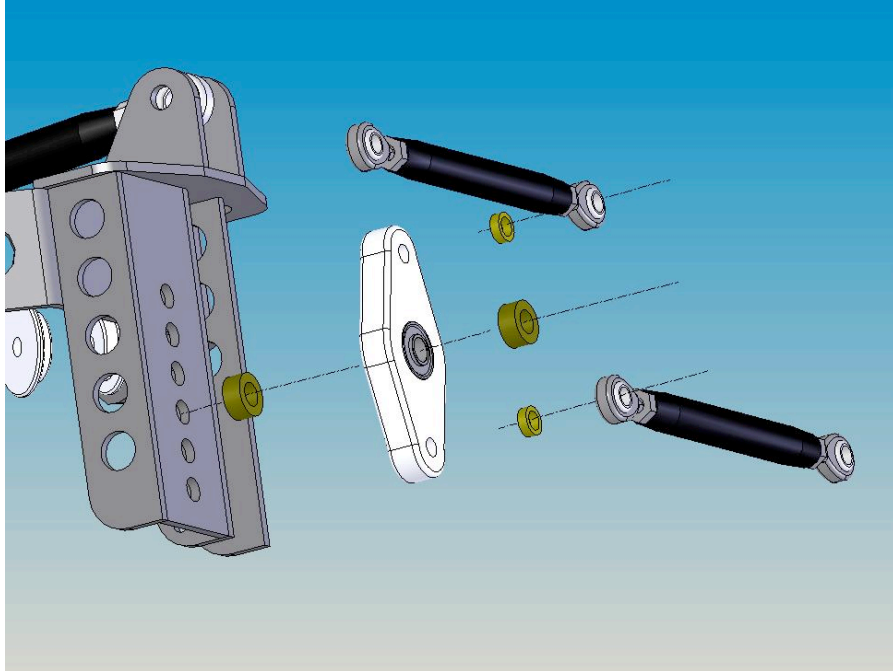


Figure 4.

- 10) Install the two Watt's links onto the lever using the supplied hardware.
- 11) Place the Watt's chassis mount up into the frame behind the rear end and slide it forward until the angled ends mate with the frame members. Clamp in place at these points with vice clamps. Install the two Watt's links into the chassis mount with the supplied hardware so that they are in the holes that make them as parallel to the ground as possible. Viewing the suspension from the bottom, adjust the chassis mount so that the Watt's links are as perpendicular to the chassis as possible and the chassis mount and links are as parallel as possible. These links do not have to be perfectly parallel. This is what the heim joints are for. The most important thing is to get the chassis mount in the chassis as square as possible. See figure 5.

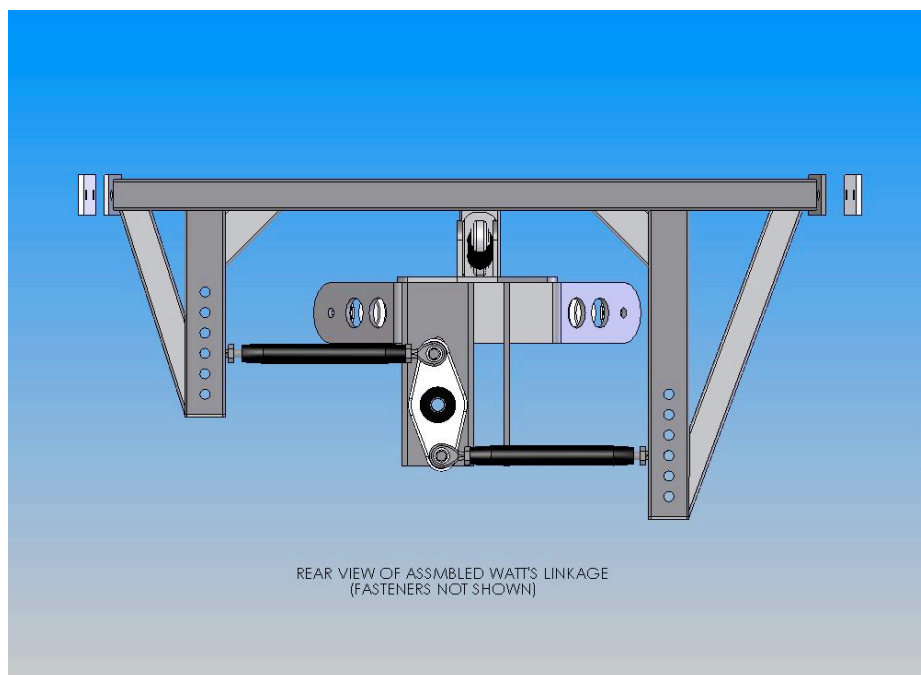


Figure 5.

- 12) Once you have the links and the chassis mount mocked up, mark the chassis mounting holes and remove the chassis mount and links. Drill the chassis mounting holes. Grind of the mating area for future welding. Mount the chassis mount using the supplied hardware. **DO NOT WELD AT THIS TIME.** Re-install the Watt's links with all bushings and hardware.

Figures 6-8 show different views of the assembled suspension.

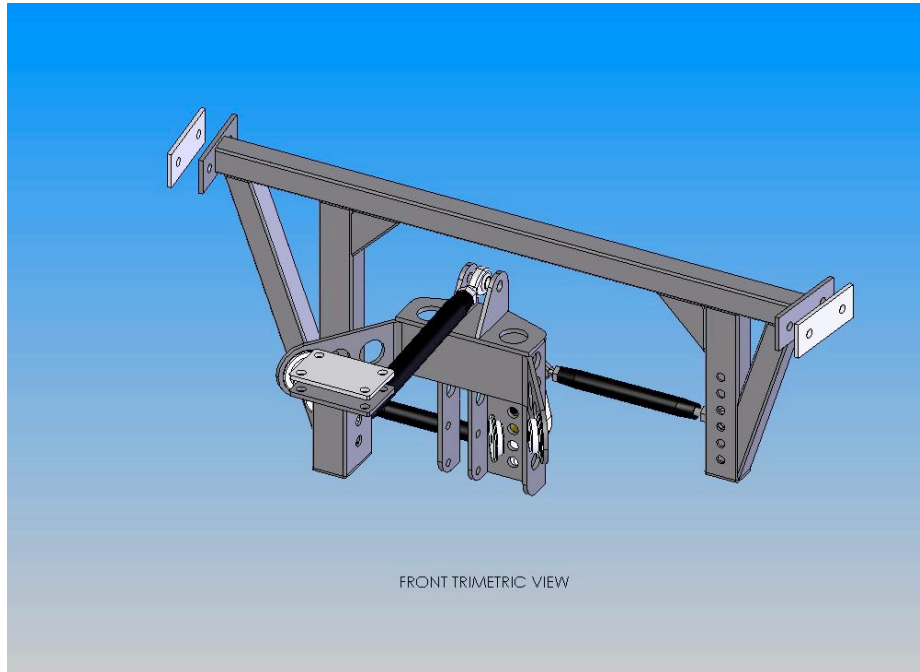


Figure 6.

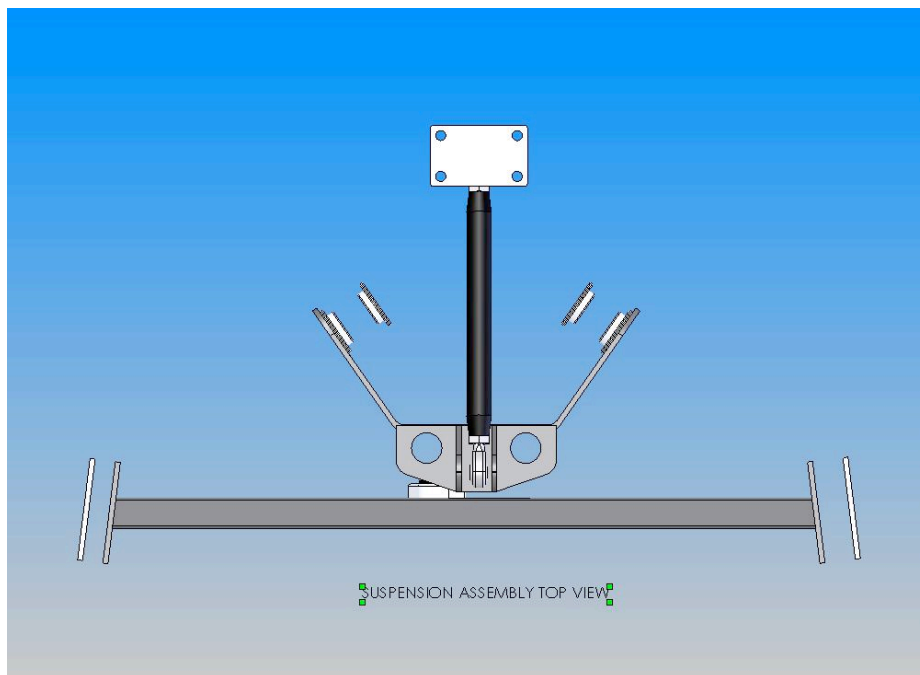


Figure 7.

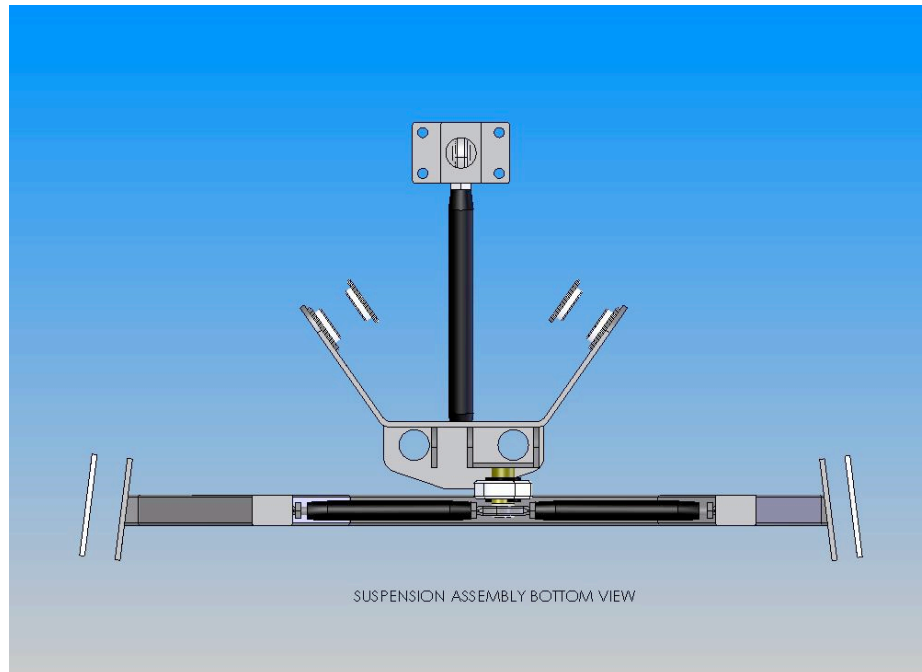


Figure 8.

## Adjustments

Now that the unit is installed, the baseline adjustments can be made. To do this, start with the thrust angle. This is how the rear end sits in the chassis perpendicular to the longitudinal axis. The rear end must be square in the chassis for the car to track correctly. This measurement must be set on a computer alignment rack, such as a Hunter D-111, for the final setting. For now, we just want it close. Make the measurement from the centerline of the axle at the wheel to the closest fixed chassis point, forward of the rear end on each side. Adjust the lower control arms by twisting them until the distances on each side are equal. Do not be concerned if one lower arm is much longer than the other. This is why the arms are adjustable.

Next, replace the rear wheels and set the car on the ground. Set the front and rear ride heights. Then, re-measure the pinion angle as in step 8. Since the rear end is now hard mounted, there will be very little, if any, housing rotation under acceleration. This means the factory spec of -2 to -3 degrees for the pinion angle no longer applies. This adjustment will now be used to minimize drive line vibrations under acceleration. The -2 degrees is just a baseline setting. The final adjustment will be made by you through track/street testing. If the driveline shakes under hard acceleration, adjust the pinion angle up or down by twisting the third link until the shake is minimized or eliminated.

The two adjusting holes on the front chassis mount increase or decrease forward bite (traction) and transition from throttle off to throttle on. This is at the cost of corner entry. The rule of thumb is if you are running an engine with high torque output, use the bottom hole. If you are not, you can take advantage of better handling characteristics by using the top hole. Try both of them out. Only you can decide which is better for you.

With the ride heights set, measure the Watt's links and make sure they are as parallel to the ground as possible. This is where the roll couple between the rear suspension and chassis will be minimized.

At this point all of the pick-up points and mounting points can be welded. Once this is done the suspension can be track tested at speed. Start slowly and build speed as you build confidence. Shake down runs are always potentially dangerous. It is highly recommended that before doing

any serious closed course work, the suspension pick-up points be **securely welded** into place. The rear roll center can be adjusted by moving the Watt's lever up or down. If it is raised to a higher adjustment hole, it will raise the rear roll center. If it is moved to a lower hole it will lower the rear roll center. If the Watt's links are parallel to the ground, the roll couple will be minimized. This is a very important concept to understand. The first thing to do is to move the lever up and down on the differential mount until you find the roll center that gives you the best handling attributes that suit your needs. Make sure when making this adjustment that the other end of the Watt's links are adjusted as well to keep the links parallel to the ground. Once you find the correct window for the roll center height you prefer, you can now experiment with the Watt's link angles themselves. Do this by moving the Watt's links to different holes (up or down) at the chassis end. This will raise and lower the amount of roll couple the suspension has with the chassis through cornering. This will manifest it self in the rear suspension's resistance to body roll. "Wait a minute. Didn't I buy this system to get rid of roll bind?" The answer to that question is yes. But, you have gone one step further with this set up. Now you can use the amount of roll bind that you want as a tuning device to set your car up. Feel like throwing your rear sway bar away? The thing to remember here is to thoroughly test the set-up until you find a balancing act that is right for you. More than anything, this suspension system gives you the adjustability to obtain the handling characteristics that will make you faster. The trick is seat time. There is a wealth of printed material on race car set-up as well as many high performance driving schools available to those who choose to take advantage of them. This rear suspension system should be looked at as yet another weapon in a fast driver's arsenal that will help him make the moat of his skills behind the wheel.

Good Luck and be safe.