May 8, 2018

Torque Arm Rear Suspension
For ’70-81 Camaro/Firebird

Parts may vary from photo depending on year of vehicle.

Installation Instructions

The following instructions are intended for professional installers and are guidelines only. Speedtech Performance assumes NO responsibility for the installation of any of its products. All products are intended for off road use only and must be installed by qualified professionals only.

Thank you for purchasing your new Speedtech Torque Arm Rear Suspension System. Installing this product will require the removal of your old rear suspension. Take all necessary precautions whenever jacking up your vehicle and use safe and sturdy jack stands to support the vehicle whenever it is off the ground. Be sure to take all other safety precautions required to do the job correctly.
Note: This kit requires approximately 30 minutes of welding time to install the upper rear cross member and rear axle mounted support brackets. If you have opted to use your current rear axle rather than ordering a Speedtech prepped rear axle, you will need to remove the existing leaf spring mounts and have your Torque Arm rear axle brackets installed. A guide for bracket location is included with the brackets. We highly recommend you use a professional shop familiar with welding brackets onto rear axles, one who has an axle jig and/or the ability to straighten the axle tubes should they warp during welding.

The vehicle should be on a level surface before you start.

1. The first step will be to disconnect your brake lines and parking brake cables. Then remove your original drive shaft, shocks, leaf springs, leaf spring pockets, rear axle, pinion snubber and bracket, bump stops and fuel tank.

Front Spring Pocket

2. There are two 3/8” holes that need to be drilled in the pocket. Approximate location is shown below. These holes will be used later in the installation.
3. Using two ½ x 2” sleeves, the ½”x 4.5” bolts, ½” stover nuts and the black aluminum spacer, install the articulink lower trailing arms into the leaf spring pockets with the small sticker indicating D (driver) or P (passenger) at the front. **Do Not** completely tighten the bolts at this time as they use stover lock nuts and you will be removing them again later in the installation. The spacers should be installed towards the outside of the car and grease fittings should point downward. Install the spring pocket and trailing arm assemblies back into the car and snug the bolts.
Pictured below is the final spring pocket and trailing arm assembly. Note that the articulating portion of the trailing arm is towards the front, and the spacer is towards the outside of the car.

Here is the passenger side Articulink NOTE the swivel end mounts to the front. The bend goes towards the inside of the car.
Upper Main Cross Member

The upper main cross member has been designed to accommodate either a car with stock wheel wells or one that has been mini tubbed with the frame rails still in the factory position.

5. Lift the rear X member up and hold it tight to the frame rails, center the X member in the chassis. The rear edge of the X member should be approximately 21” from the original leaf spring shackle mount center line. See diagram below.

There will be an approximate ¼” gap between the X member and the side plates. This is to accommodate variances in the factory assembly. Make sure the X member is centered and tack weld it in place so that it does not move. Now assemble and test fit the entire rear suspension (see below) in order to make sure everything is square and there is no interference between any parts. Do not skip this part, it is vital to be sure all components fit correctly before the X member is fully welded in.
**Rear End Brackets**

**9” Ford**

6A. The pinion mount is a straight bolt-on over the existing pinion support. Remove the five original bolts, position the pinion mount, and reinstall using the new hardware supplied with the mount. **Note:** This bracket is designed to work with the original Ford pinion mount clocking position. Some aftermarket 9” centers have non-Ford clocking. Non-Ford pinion mount clocking **WILL NOT WORK CORRECTLY.** Please verify that your center is correct. If you are not sure, please contact your axle manufacturer before beginning the installation.

The two small lower rear Torque Arm mount tabs must be welded to the housing as per the guidelines supplied with the bracket kit.
'70-81 Camaro Diff Bracket Welding Guide, 9” Ford
Mar 19, 2018

9” and 12 bolt Panhard bar brackets should be parallel to diff mount surface.

Center Torque Arm bracket holes are to be centered in line with the back of the 9” housing face.
Note: 12 bolt tabs are pre-welded to rear bolt-on torque arm mount.

9” and 12 bolt trailing arm brackets should be parallel to diff mount surface.

Weld on bracket measurements are the same for 12 bolt and 9”

This dimension will vary according to overall axle width.

Ford 9” Housing Rear View

Measure to pinion center line
Pinion Center Offset 5/8"

Measure to Bracket
2.1"

Weld placement for 9 inch Torque Arm tabs
2.1” Allows .040 Crush and Room for Powder coat
12 bolt tabs are pre-welded to rear torque arm mount which bolts on.
12 Bolt GM

6. The rear mounting ring will be sandwiched between the axle housing and rear housing cover. You will have to clearance some of the casting flash to allow the ring to mount flush. Apply high quality silicone to the housing, set the mounting ring in place, apply silicone and then the cover. Tighten bolts to manufacturer's specs.
Note: Some 2nd gen Camaros will require modification to the back of the driveline tunnel to clear the billet pinion mount. We recommend assembling the suspension and test fitting it in your car. If the additional clearance is required, consult with your fabricator or a reputable shop to perform this modification. This is limited to 12 bolt applications, this is not required for 9" Ford axles.

The supplied billet aluminum pinion clamp must be made to fit the pinion snout. Due to the different variations in housings and castings you will need to grind some of the support castings away until the mount fits perfectly. The diagrams supplied below will show where and how much to grind off. When you have the correct fit for the mount, bolt it together using the hardware supplied with the mount.
Please study these diagrams carefully. You will need to trim your 12 bolt housing to properly fit the pinion mount.

** Be cautious to note where factory pinion bearing oil passage is when grinding!
Shock and Trailing Arm Axle Mounts

7. Using the guidelines supplied with your bracket kit, the trailing arm and pan hard bar mounts need to be welded onto your axle housing. It is very critical that the axle mounting surface is prepped properly and the brackets are aligned correctly and square to the diff as per the instructions. If you have purchased a complete Speed Tech 9” housing then all this will be done for you.

Torque Arm Front Mount

The front cross member for the torque arm is mounted tight to the floor above the body mounts. Provided in the kit are solid body mounts for this location that are 3/16” shorter to ensure that your sub frame remains in the original position. The mounting holes in the cross member are slotted to allow for adjustment of the mount.

8. Support the front of the sub frame on a jack and remove the bolts for the rear sub frame / body mounts. Slip the Torque arm mounting X member in between the floor and the top of the existing body mount. Make sure the X member tabs are pointing forward. Reinstall the bolts.
Installing the Rear End and Torque Arm

Torque Arm Assembly

9. Install the Torque Arm Delrin bushing on the front pin using the 3/8 bolt and lock washer. You may also want to apply blue loctite to the bolt threads.
Assemble the rear pivot busing and 9/16 x 2” sleeve into the Torque Arm rear mount. Attach Torque Arm to the axle housing using the 9/16 x 3 ¼” bolt and 9/16” stover nut.

Attach the torque arm to the pinion mount. Loosely install the ½ x 2” bolts through the dog bone, then through the torque arm and into the mount.
10. Place your housing/ Torque Arm on a jack and raise it up into position. Install the front pivot pin into the front X member. Install the rear trailing arm ends into the brackets on the axle housing using the 12 x 3 ½“ bolts and nuts. Do not tighten completely. Install the shocks without the springs. Install the pan hard bar. Set the axle housing to your approximate ride height location and check and adjust the pinion angle by shimming between the billet mount and the torque arm. Be sure to check drive shaft clearance while doing this.

Note: Pinion angle should be set to between 0-2 degrees from the crank shaft angle, not level to the ground. (If you put a digital degree gauge or inclinometer vertically on the face of the crank pulley and it reads 87 degrees then you should set the pinion at between 87-90 degrees)

Adjust pan hard bar to center the axle. The best way to do this is to hang a plumb bob from the peak of either side rear wheel opening and measure inward to adjacent points on the rear axle. Adjust as necessary.

11. Re check that all components have clearance and that all measurements are correct.
12. Remove shocks and assemble the springs onto the shocks.

Viking Shocks

Upper Mount Bolt & Nut

Spring Cap

1/2" i.d. Shock Bolt Sleeve

*Ridetech Shocks
*Delrin Washer

Coil Spring

Shock Body

*Delrin Washer

Thrust Washers and Bearings

*Single Ring Nut w/ Lock Bolt

Adjusting Nuts

5/8" i.d. Shock Bolt Sleeve

Lower Mount Bolt & Nut

Generally the ideal shock adjustment position would be near center of threads for full up and down travel. Some applications will be different according to desired ride height.
13. Weld in the upper rear X member.

14. Reinstall the shocks.

15. Remove the rear seat. Remove one trailing arm from the rear axle mount and swing it down on the front pivot. Using the two holes in the spring pockets as a guide, drill holes up through the floor. Install two $\frac{3}{8} \times 1 \frac{1}{4}$" bolts through the spring pocket and floor and tighten with the accompanying nuts. 70-81 Camaros will have a gap between the floor and the spring mount cup. Use extra washers here to create a spacer between the cup and the floor for a solid mount. Repeat for other side. Reinstall rear seat.

16. Reinstall all components and tighten all hardware, lubricate all grease fittings and fill rear end with oil.

17. Check all fasteners and axle pinion angle one last time. Hook up the brakes and install the wheels. Lower the car down to check your ride height. Adjust shocks until desired ride height is achieved.

18. It is always a good idea to have the alignment checked by a professional alignment shop when changing suspension parts.
The pan hard bar adjustment includes two heim joints to center the rear end and help wheel fitment. The driver side pan hard bar height adjustment is for adjusting the roll center and needs to be set level at ride height with all the finished weight in the car.

Passenger side pan hard bar adjustment is also for adjusting roll center. For standard setup, adjust the pan hard bar so it is level at ride height with all the finished weight in the car.
Trailing arms can be adjusted by turning them in or out to center the wheels in the wheel well. Trailing arms should be set close to level again at ride height and can be adjusted to any hole position to increase or decrease anti squat. Lowering the rear of the arm increases anti squat, helping to increase traction.
For coil over adjustment, use the threaded nuts on the shock only to fine tune the ride height. The springs are only intended to hold the weight of the car. The shock should have approximately 2” of travel both in compression and extension. You should be able to see 2” of shock shaft when the car is at ride height. If you have to adjust the spring nuts all the way up the shock to raise the vehicle then the springs are too soft for the weight of your car. The adjusting nuts should be approximately in the middle of the adjustment or lower.

For shock dampening adjustment, depending on the shocks you ordered, there are different amounts of adjustment. On all shocks, turning the adjustment knob counter clockwise will soften the ride and clockwise will stiffen the ride. On a single adjustable shock the adjustment affects both the compression (bump) and extension (rebound). Follow the coil over manufacturer’s recommendation on any adjustments.
Pinion angle should be within range at the ride height as stated above. If you feel a drive shaft vibration at speed, you may need to adjust your driveline working angle. We have found this to be at optimum on our ExtReme products between 1.5-2 degrees. Use shims on either the rear pinion mount as seen in the diagram below or at the transmission crossmember until you have the correct angle and any driveline vibrations should go away.

With all finished weight in the car adjust the pinion angle by:

**Option 1.** shimming between the billet pinion mount and the torque arm.

**Option 2.** Raise, Lower or shim, the transmission crossmember mount to achieve the correct working angle. Note- pay attention to the headers' relation to the floor pan. Raising the mount too much could potentially touch the floor pan under load while lowering it may make driveline angles worse or reduce ground clearance. *Be sure to check drive shaft clearance throughout the tunnel for either method.*

![Diagram of driveline angle adjustment](image)

If you do not have access to an angle gauge, most smart phones have a free angle measurement download app. available.

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DIFFERENTIAL CARE, BREAK-IN, and WARRANTY INFORMATION

OIL REQUIREMENTS
For Tru Trac and Wavetrack posi units, use a quality petroleum/mineral based oil. **We do not recommend synthetic oil.** Friction additive/modifier is not required. Do not use any RedLine, Shockproof, Royal Purple or similar gear oils. Specifically any standard 75W 90 or 140 will work just fine.

OIL LEVEL
Many differentials are easy to fill with gear oil. However, the 9” Ford design can be difficult to fill completely. The location of the fill plug on the 9” Ford can cause oil to run back out before it is completely full. Most 9” housings hold at least 2 1/2 – 3 quarts of oil and sometimes as much as 5 quarts. It is important to take your time and be sure that the oil has settled into all the crevices and recheck the oil level to be certain that it is completely full before driving the vehicle.

BREAK IN
**ANY OVERLOADING OR OVERHEATING WILL CAUSE THE GEAR OIL TO BREAK DOWN AND THE RING & PINION WILL FAIL.**
All new gear sets require a break-in period to prevent damage from overheating. After driving the first 15 to 20 miles, it is best to stop and let the differential cool before proceeding. Dutchman’s warranty requires at least 500 miles before towing. DMI also requires towing for very short distances (less than 15 miles) and letting the differential cool before continuing during the first 45 towing miles. This may seem unnecessary, but it is very easy to damage the differential by loading it before the gear set is completely broken in. DMI recommends changing the oil after the first 500 miles. This will remove any metal particles or phosphorus coating that has come from the new gear set. The greatest damage results when a new ring & pinion has been run for several miles during the first 500 miles and the oil is very hot. Any heavy use or overloading at this time will cause irreparable damage to the gear set that can be determined by inspection and will not be warranted by DMI.

CLUTCH TYPE “POSICTIONS”
Positraction chatter is normal for limited slip and clutch type positraction differentials. Both rear tires must measure the same circumference in order for the differential to function properly without premature wear. **Limited slip additive or friction modifier for limited slip differentials must be used with the oil to reduce positraction chatter in the event that the oil is changed.**
LOCKERS
Mechanical Locking differentials will bang and clunk during normal operation. Both rear tires must measure the same circumference in order for a locking differential to function properly.

GEAR NOISE
Care is taken to set up each rear gear set with as little gear noise as possible. Aftermarket (non OEM) gears are designed primarily for strength and may be whiney/noisy. This noise is common and typically cannot be eliminated. DO NOT attempt to use synthetic oils hoping to quiet a noisy rear gear set.

SIGNS OF LUBRICATION FAILURE
When a gear runs low on oil, damage is sure to result. The cause of damage is not always obvious. When a differential runs low on oil, the oil volume may not be sufficient to keep the gear cool. Once the oil breaks down from contact with the hot gear, wear occurs very rapidly. Material will wear off the drive side of both the ring & pinion teeth and leave a feather like pattern on both surfaces. A gear that wears from friction due to lack of lubrication and excessive heat seldom experiences a color change from heat because any discoloration is worn off the teeth during each contact. Ring & Pinion gears are heat treated separately so that the pinion, whose teeth make contact more often than the ring gear, is designed to be harder. To accomplish this, the two gears are heat treated separately and a soft gear will not cause both the ring & pinion to wear.

DUTCHMAN AXLE WARRANTY EXCLUSIONS
1. Any damage due to abuse, overloading, or lubrication failure (e.g. oil deterioration, water contamination, low oil level).
2. Any vehicles used off road or for competition.
3. Mini and mid-sized vehicles with tires over 31” tall will not be warranted due to the overloading caused by tall tires.

Most items are not warranted against abuse, overloading, or improper lubrication. All rear axle parts must be returned to DUTCHMAN'S shop freight prepaid for inspection and determination. We do not authorize and will not pay for outside repairs. ANY UNAUTHORIZED OUTSIDE REPAIRS OR MODIFICATIONS VOID THIS WARRANTY. We will not pay for labor, inconvenience, loss of time or revenue, telephone calls, commercial losses, or loss of perishable goods. This is our only warranty expressed or implied. All returned goods must be accompanied by copy of purchase invoice within 30 days and will be charged a 20% service charge for handling.
1. Warranty Information and Terms and Conditions of Sale

1. Effective January, 2008, supersedes all previous policy statements. Policies are subject to change without notice. Speed tech performance Ltd. is not responsible for printing errors.

2. Speedtech Performance USA LLC. does not endorse, nor recommend modification of vehicles for use on public highways, since warranty or government regulations may be violated. As an express condition of sale of any performance part, the buyer acknowledges and agrees to use the performance parts for the modification of vehicles in sanctioned OFF-ROAD competitive events and show purposes only. Customers should exercise their discretion on matters with regards to the purchase and installation of these products.

3. Speedtech Performance USA LLC. does not ensure the legal use of these products. We do not guarantee the fitment of these products for anything other than there intended application nor do we assume any responsibilities what so ever for the misuse or losses incurred by the use of any of these components. While every effort is made to provide technical information and assistance, we have no control over owner installation, modification, and unusual stress that performance parts are subject to.

4. The customer acknowledges that Speedtech Performance USA LLC. and its employees are not responsible for any mechanical failures due to the use of parts sold, supplied or installed not for their intended application. Speedtech Performance USA LLC. will not be held liable for any damages which are incurred directly or indirectly on the vehicles or operators or passengers of the vehicle.

5. Please consult your sales agent and/or technician prior to purchase of any of Speedtech Performance USA LLC products to ensure proper fit. The buyer assumes all responsibilities for determining the suitability of the product. All aftermarket products should always be installed by professionals only.

2. How to File a Warranty Claim:

1. Speed tech Performance Ltd. Warrants its products against materials and workmanship failure for the term of 12 months (1 year) from the date of purchase and only up to the amount paid with proof of purchase.

2. Seller’s liability shall be limited to repairing or replacing, at its option, any defective product which is returned, freight prepaid to Seller, according to the Merchandise Return Procedure set forth in Section 3-B below. Buyer shall bear all responsibility for shipping charges and risk of loss or damage during transit to Seller. Products which have been subjected to abuse, misuse, alteration, neglect or unauthorized repair or installation, as determined solely by Seller, are not covered by this warranty. Any alterations, addition, improvements or attachments to the product(s) not authorized in writing by the Seller shall be deemed to be a waiver of this warranty by Buyer and shall render this warranty null and void. Seller shall return repaired or replaced product(s) to Buyer, at its expense via regular ground service in the U.S. Shipping charges by all other methods and to all other destinations shall be borne by Buyer.

3. As per section 3-B below, all shipments MUST be prepaid, include the original invoice and show the RGA on the outside of the package, otherwise it will be refused. Please include a brief explanation letter in order to expedite the warranty analysis process.

This Warranty DOES NOT Cover:
- Removal, installation, shipment and insurance costs
- Improper installation or maintenance
- Alterations on the original design or unauthorized repairs.
- Normal wear and tear
- Misuse or abuse, negligence
- Damage to related components
- Costs incurred due to down time of vehicle

3. Merchandise General Return Procedure:

A. If you purchased your Speedtech Performance USA LLC product from us or from an authorized dealer, you are covered by the terms of our general product return policy. All claims however, must be submitted directly to Speedtech Performance USA LLC. The answer to ALL of the following questions should be YES before contacting our Customer Service Department.

1. Is the part appropriate to your application?
2. Did you carefully and thoroughly read the instructions provided along with the part?
3. Do you have the proof of purchase?
4. Are you the original purchaser?
5. Is the part unmodified and clean?
6. Is the return date within 3 months from the purchase date?
7. Is the reason for return a legitimate product defect?

If all answers are yes, please do the following:

B. Call our customer service representatives at 1-435-628-4300.

- Provide the invoice number, date of purchase and reason for return
- You will be assigned a Returned Goods Authorization Number (RGA) valid for 30 days. The package you return must show the RGA on the outside of the package, include a copy of the original invoice and be shipped prepaid to our facility. The part has to be in its original packaging materials and be in a resellable condition. For parts presenting signs of installation and/or use, only warranty claims will be accepted.
- Ship to seller, freight pre-paid and insured for replacement cost in original packaging.
- Replacement or repair decision will be made when merchandise is received by seller. No advance replacement is available.
- A Restocking fee may be applied.

All warranties implied by law are limited in duration of this warranty. You have specific rights that may vary from state to state or Province to Province. By purchasing any of the products that are manufactured by speed tech performance you agree to any and all of the above terms and conditions. Copyright © Speedtech Performance USA LLC