

TorqueArm Front Mount Article

There is a propensity among a large percentage of performance enthusiasts to believe the technical claims of new companies with new products. Often this is just hyperbole. Although technically accurate to a degree in theory, some claims can prove sophomoric in reality. Therefore Such technical hype can in the long run prove to be worth no more than spin to sell product. As an example:

What is the best way to attach the front of a torque arm, with an elastomer, or a rigid slider? Let's examine both.

Our Competitor hypes its torque arm for its front mount which is a rigid bearing slider:

Hyped Benefits vs. Reality:

1) Claimed Benefit: Near zero resistance to ride height change.

Reality: This is true. Also true is for over 30 years Griggs has provided certain race teams with TorqueArms with this feature. (Figure 1) The reason for this design is the adjustable lift or load point can be adjusted fore and aft relative to the center of gravity. This can be a useful tool for the knowledgeable chassis tuner when balancing the chassis under power during corner exit in cars with limited front end traction like strut cars. The key is to have enough adjustment to be useful, and know how and when to use it. And there is a detriment of increased Noise and vibration, (NVH), and traction loss due to no drive line cushioning. GR40 cars with SLA don't seem to need this adjustment feature, and the noise limitation and traction increase from the cushion is a huge benefit. Griggs Racing's championship winning development Mustang, "Old Blue" was equipped with a hard slider device for years when it was a strut car. Since its conversion to an SLA, adjustment within the range available had little effect on exit balance. However changing to an elastomer mount increased rear exit traction significantly. (See Item 4 below).

2) Claimed Benefit: Zero resistance to body roll.

Reality: This is only true as long as the axis of the TorqueArm mount is concentric with the roll axis of the car. The roll axis and TorqueArm mount are rarely concentric. The degree of this misalignment at any given time puts a lateral load on the mounting, and a bending moment on the TorqueArm. Quantifying this is difficult for every iteration of roll and ride height. But it is a variable that can result in substantial roll resistance. The real problem is it is non-linear and widely variable with changes in ride height. This can negatively affect consistency of chassis balance.

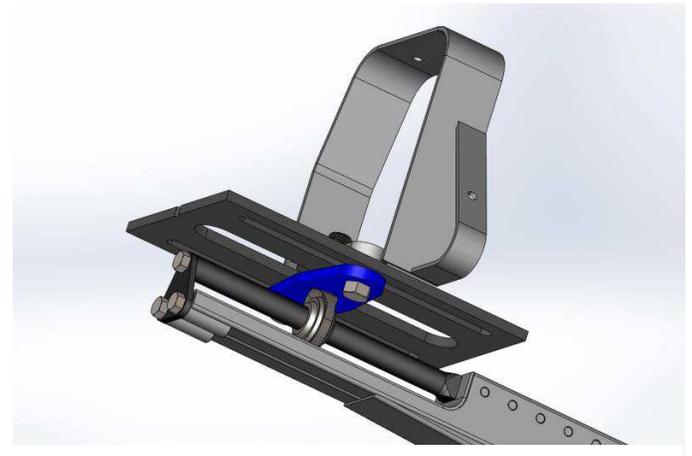


Figure 1: GR40 Adjustable TorqueArm Slider Available since 1998

Griggs Standard Elastomer Forward TorqueArm Mount:

Hyped Detriments by competitor of Griggs Elastomer Mount:

3) Claimed Detriment: Bind in vertical chassis motion reducing traction and causing failure.

Reality: Both the TorqueArm Elastomer Cushion (bushing) on 2005up S197 applications and the urethane snubber mount on all other years of GR40/GR350 TorqueArm applications are designed especially for adequate longitudinal movement with a minimal resistance. We have found that premature failure of a cushion is usually due to excessive heat exposure; either from exhaust leaks or routing, or dyno tuning with inadequate air circulation under the car, or improper installation, such as tightening the mounting bolts with the axle not held at ride height. Unfortunately elastomers can eventually wear out. But, the great majority of our customers that call to replace these parts have well over 100k miles on them, or years of hard track use. Usually other chassis items need attention by that time as well.

4) Claimed Detriment: Inherent Roll Bind.

Reality: The compliance of the Elastomer in all directions is adequate to provide minimal roll resistance within the range of motion achieved in the real world. What small resistance exists is near linear. This load only begins to increase at the limit of the range of motion allowed by the GR40 suspension, which is just over 6 degrees of total roll. Not counting tire compression, total real world suspension roll achieved on track is generally around 3 degrees. This minor roll resistance is NOT noticeable from the driver's seat.

What is noticeable is the improved traction compared to a hard bearing TorqueArm mount when applying power exiting a corner. This traction increase is due to the cushioning effect of the elastomer mount in all standard production GR40 TorqueArms. The cushion will smooth out the 4 power pulses of each cylinder firing per revolution. This reduction of shock from the peak of the firing pulses applies a more constant torque to the tires results in better traction when at the limit of adhesion. High compression or supercharged engines this difference is easy for the sensitive driver to feel and it definitely benefits lap times.

Also noticeable is how little noise is transferred from the rear axle into the car where hard bearing TorqueArm mounts are significantly noisier.

Summary: Griggs Racing has the ability to produce any type of forward mount and we have conceived numerous designs and materials that we have evaluated. We have proven many times to ourselves that a properly designed elastomer as an interface between the forward Torque Arm load point and the vehicle frame is durable and superior to a hard point sliding mount, due to its inherent quieter operation and drive train damping characteristic, while not sacrificing chassis balance. The claimed detriments of our system by our new-to-the-market competitor are false. So for the foreseeable future our Standard GR40 TorqueArms will continue to be constructed with elastomer front mounts of one sort or another.

For more information email engineering@griggsracing.com

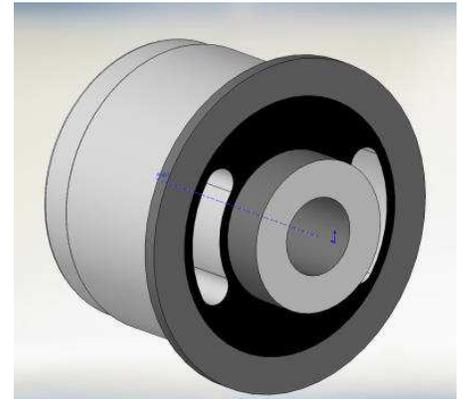


Figure 2: GR40 TA Forward Mount Cushion

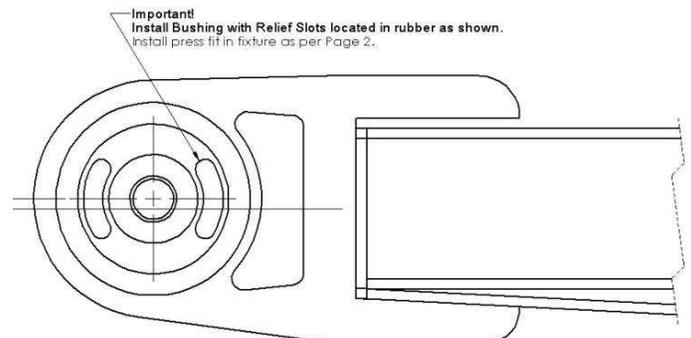


Figure 3: GR40 TA Cushion Mounting Position