

QA1

QA1 MOD™ Series Shock Installation and Quick Tuning Guide



Introduction

Congratulations on your purchase of QA1's double adjustable MOD™ Series shocks with low-speed bleed adjustment! The MOD™ name originates from the modular design that allows the shock to be revalved or reconfigured to fit a variety of force requirements and applications. With nearly limitless adjustability, the MOD™ Series shock allows you to tune for any track condition in multiple types of racing, ultimately increasing traction and performance. In addition, the shock settings can be adjusted to provide a smooth and comfortable ride for street driving.

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MOD™ Series Shock Overview and Operation

The MOD™ Series shock is the first on-the-car revalveable shock. Designed specifically to meet the demands required by today's high performance drag race and handling/pro-touring cars, this shock uses QuickTune™ Technology – modular valve packs that can easily be swapped out. Never before could you change the valving characteristics this much without completely disassembling the shock.

The MOD™ Series shock's unique design uses a 35MM piston to continuously flow oil past the full length of the billet aluminum body for superior cooling of the shock oil. Oil passes through the base of the shock, which triggers an internal poppet valve, on both compression and rebound, to act on the external valving module. Since the QuickTune™ Technology modular valve packs are not submerged in oil inside the shock, the valve packs can be removed from the shock and new valve packs installed without the typical oily mess and loss of oil.

The shock is outfitted with a nitrogen-filled canister to stabilize the oil and prevent cavitation. With the option of a piggyback (attached) or remote (connected by an 18" hose) canister, the ability to mount the body up or down, and the indexable base, the MOD™ Series shock allows for maximum mounting flexibility in nearly any chassis configuration.

The QuickTune™ Technology modular valve packs included with the shocks (identified by the code 400) have a force range from 100 lbs. to 650 lbs. at 10 inches per second. Additional modular valve packs are available in various force ranges to match the needs of any application. QuickTune™ Technology makes it possible to change the shock valving on the car in a matter of minutes without the need to disassemble the entire shock and bleed the shock on reassembly. The external adjustment knobs allow easy and consistent on-the-car compression and rebound adjustment with 24 adjustments per knob.

The MOD™ Series shock also features externally adjustable low-speed bleeds for both compression and rebound for fine-tuning shock performance. The bleed adjusters are located next to the corresponding compression and rebound valve packs and utilize a unique needle and jet assembly to produce consistent changes in the bleed pressure. This bleed adjustment can be thought of as fine-tuning, whereas the high-speed knobs are a coarse adjustment.

The hard anodized with PTFE aluminum threads on the shock body allow for smooth ride height adjustments with the spring adjuster nut. The five-position indexable eyelet on the base of the shock allows the eyelet to be repositioned in 72-degree increments to accommodate mounting needs.

QA1 MOD™ Series shocks are proudly engineered, machined, and assembled in Lakeville, MN, USA.



**Indexable
Five-Position
Eyelet**

Spherical Bearing Mounts



Spring Seat Nut

**Low-Speed Rebound and
Compression Bleed
Adjustments**

**Piggyback or Remote
Canister**

**High Speed Adjusters & QuickTune™
Technology Valve Packs**

Coil-Over Assembly and Installation

The QA1 MOD™ Series shocks are sold as left and right. This is so the shocks can be mounted on the car symmetrically without the canister interfering with other components. With the base of the shock down and the piston rod up, a right-hand shock will have the canister located on the right side of the base. It **DOES NOT** matter which side of the vehicle the shocks are installed on, as they are valved the same from the factory. The shocks can be installed with the body up, body down, or any angle in between.



1. Before starting the installation, check the part number of the shock and the recommended ride height measurement in the chart below compared to the mount-to-mount dimension of the vehicle at ride height. If the shocks are mounted outside of the recommended ride height range, the shocks may be damaged in operation. The shock part number and serial number are etched on the Schrader valve end of the canister.

QA1 MOD™ Series Shocks				
Shock Part Number	Compressed Length	Extended Length	Recommended Ride Height	Recommended Spring Length (Free Length)
M411xx	10.125"	14"	11.5" - 12.5"	9" / 10"***
M421xx	10.625"	15"	11.625" - 13.5"	10"
M511xx	11.5"	16.875"	14" - 15"	12"
M611xx	12.5"	18.75"	15" - 16.75"	14"
M711xx	12.875"	19.5"	15.375" - 17.5"	14"
M911xx	14.875"	23.625"	17.375" - 21.625"	14"

2. The eyelet on the base of the QA1 MOD™ Series shock can be indexed to suit the application by removing the five (5) 8-32 x 3/8" screws in the eyelet base with a 9/64" hex key. It is recommended that the shock be mocked up in the mounting position before installing the spring to make installation easier. Use blue Loctite and torque the screws to 15 in-lbs.

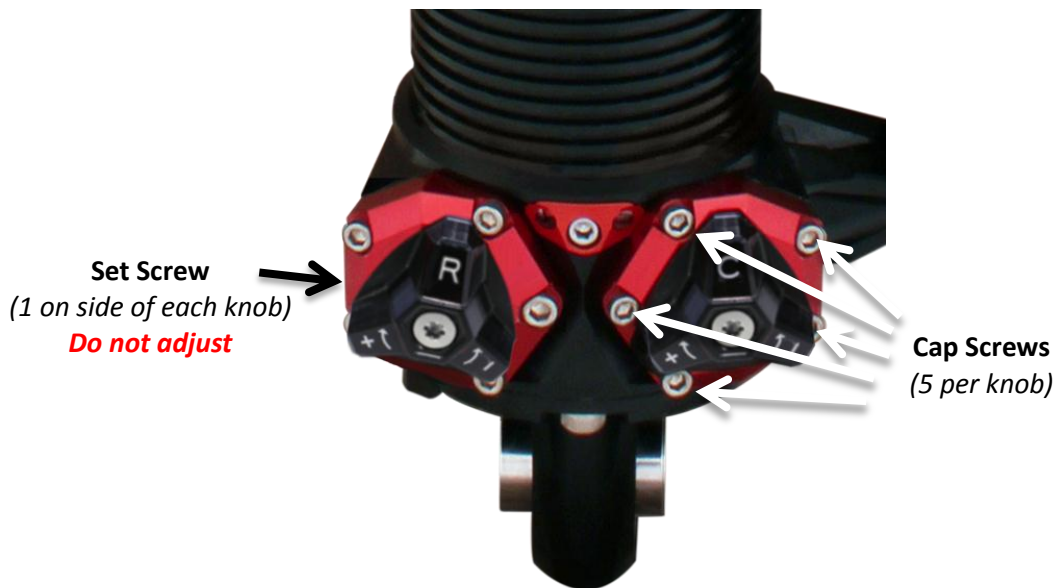
3. If installing a bump stop, loosen the jam nut on the piston rod and remove the eyelet and jam nut. Install the bump stop onto the piston rod, then thread the jam nut onto the piston rod, followed by the eyelet. Lock the jam nut against the eyelet and torque to 20 lb.-ft.
4. Thread the spring seat nut onto the shock body with the spring locator flange (the raised lip on the nut) towards the piston rod. Engine oil should be used for spring seat/shock body thread lubrication.
5. Install the thrust bearing kit on the spring seat nut in the following order: washer, bearing, washer. Apply a light coat of marine grease to the needle bearings to prolong the life of the thrust bearing.
6. Install the coil spring, followed by the spring cap, and snug the spring seat nut towards the spring by hand until it contacts the spring.
7. Install the shock onto the vehicle's mounts and ensure the canister (and hose, if remote canister) do not interfere with any components under the car throughout the full range of suspension and steering travel.
8. If the shocks are equipped with a remote canister: the canister and hose are recommended to be routed at least 6 inches away from exhaust heat sources. Securely mount the canister using P/N 9039-308 Flat Panel Mount or P/N 9039-305 1-1/4" Tube Mount.
9. Set the vehicle down on the ground and measure the center-to-center of the mounting points of the shock to determine initial ride height. You can use the spring adjuster nut to set the ride height within the recommended range for your specific shock and desired stance. See the table on page 4.
10. All ride height adjustments should be made with the vehicle jacked up and the suspension at full droop. Set the compression and rebound knobs and the low-speed bleeds on the softest setting (turned as far counter-clockwise as possible) to prevent the shock force from holding the vehicle up or down. Adjust the ride height by moving the spring nut towards the spring to raise the vehicle. Moving the spring nut away from the spring will lower the vehicle. Please note: Moving the spring nut will not change the spring rate; it will only change the vehicle ride height.
11. Once the ride height is set, tighten the nylon set screw on the spring seat nut in one of the seven (7) threaded holes.

QuickTune™ Technology Modular Valve Packs

QA1 offers modular valve pack assemblies to change the shock force range. There are multiple valve pack options to achieve the damping range for your application. The modular valve packs are identified by a laser-engraved 3-digit code on the side of the valve pack.

Changing the QuickTune™ Technology Modular Valve Packs

1. To change the valve pack, first turn the high-speed adjuster knob all the way counterclockwise to full soft, then remove the five (5) cap screws using the supplied 3/32" hex. Do not loosen the set screw located on the side of the modular valve pack, as this is for the detent mechanism.
2. Select desired valve pack and insert into shock base. Note that the shock base has a "C" for compression and "R" for rebound machined into the side. The valve pack knobs are also marked "C" and "R". Make sure the modular valve pack is installed in the correct side so that the knob marking and the body marking match. The modular valve pack must be oriented to line up with the opening in the body.
3. Reinstall the five (5) cap screws and torque them to 5 in-lbs.



Basic Shock Adjustments and Tuning

This section is designed to provide basic starting points for shock tuning adjustments. Keep in mind that the shocks are only part of the suspension system. The suspension design and adjustment, spring rates, sway bar or anti-roll bar rates, and tires are a few of the other variables contributing to the overall suspension system performance.

Compression of a shock is when the two shock mounting points are moving closer together or when the chassis is moving towards the ground. Rebound is when the two shock mounting points are moving further apart or when the chassis is moving away from the ground.

Gas Pressure Adjustment

The QA1 MOD™ Series shock is a low-pressure nitrogen-charged shock. The pressure is factory-set at 60 PSI and should not be changed.

Damping Adjustment

The QA1 MOD™ Series shock allows a wide range of valving adjustment by using both interchangeable QuickTune™ Technology modular valve packs with high-speed adjusters and low-speed bleed adjusters for both compression and rebound. Modular valve packs are available in multiple configurations to change the force range. The high-speed adjusters allow you to adjust the damping within that range and the low-speed bleed adjuster is used for fine-tuning and low-speed control.

High-Speed Adjustment

The knobs on the modular valve packs are for adjusting high-speed valving. The knob with the “C” will be the compression adjuster and the knob with the “R” will be the rebound adjuster. QA1 MOD™ Series shocks have 24 high-speed damping settings per knob with a definitive stop at full soft and full stiff. The knob set fully counterclockwise is the softest setting. Start your adjustments from this point and count the detents while turning clockwise to your desired setting. Turning the adjuster counterclockwise will soften the damping and clockwise will stiffen damping. The shocks will function with the knobs set in the full soft or full stiff position.



Rebound

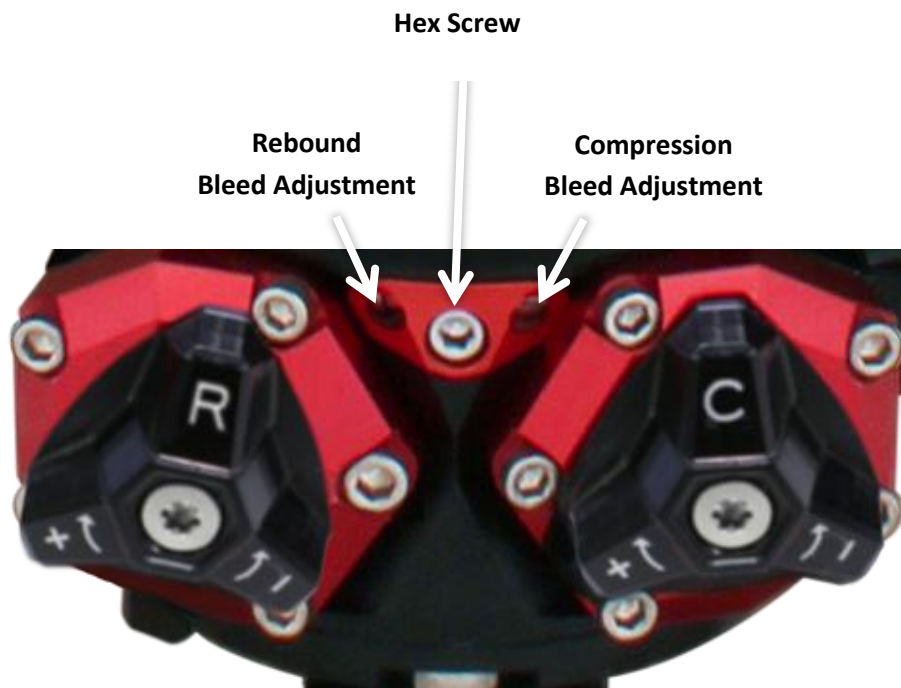
Compression

Low-Speed Bleed Adjustment

There are 3 ½ turns or revolutions of bleed adjustment in the QA1 MOD™ Series shock. The low-speed bleed adjustment requires the included QA1 Bleed Adjust tool (P/N 7791-170) or a 3/32" hex key. Turning the bleed adjustment screws fully clockwise will close off the low-speed bleed ports for stiffer low-speed damping. Turning the bleed adjustment screws counterclockwise will open the bleed adjustment ports and soften the low-speed damping effects of the shocks. Start your adjustments from this point, at the definitive stop at full soft, and count the number of turns while turning clockwise to your desired setting. The bleed screw closest to the Compression knob "C" controls the compression bleed and the bleed screw closest to the Rebound knob "R" controls the rebound bleed. These are used to tune slower chassis movements, which have a large effect on how the car feels to the driver, and to fine-tune off your high-speed adjustments.

Bleed Adjustment

1. Loosen the hex screw between the bleed adjust screws with the bleed adjust tool to unlock the adjustment.
2. Turn the bleed screws to the desired position.
3. Snug the hex screw on the lock plate with the bleed adjust tool to hold the settings.



Base Shock Valving Recommendations

The recommendations below are recommended initial settings. The shocks will need further adjustment for your vehicle to perform at its best.

Turn knob or bleed adjust clockwise from full soft per the suggestions below:

<u>Front shocks</u>	<u>High Speed Adjuster</u>		<u>Low Speed Bleed Adjuster</u>	
	Compression	Rebound	Compression	Rebound
Drag Racing	18-22 Clicks	0-4 Clicks	3 turns	½ turn
Nice Ride & Handling	3-6 Clicks	8-12 Clicks	2 turns	2 turns
Improved Handling	8-12 Clicks	14-20 Clicks	2 turns	3 turns
Aggressive Handling	12-14 Clicks	20-24 Clicks	3 turns	3 ½ turns
<u>Rear shocks</u>	Compression	Rebound	Compression	Rebound
Drag Racing (Stk Susp.)	10-16 Clicks	8-12 Clicks	1 turn	2 ½ turns
Drag Racing (Back Half)	6-10 Clicks	10-16 Clicks	1 turn	2 ½ turns
Nice Ride and Handling	3-6 Clicks	8-12 Clicks	1 turn	2 turns
Improved Handling	8-12 Clicks	14-20 Clicks	2 turns	3 turns
Aggressive Handling	12-14 Clicks	20-24 Clicks	3 ½ turns	3 ½ turns

Drag Racing Tuning

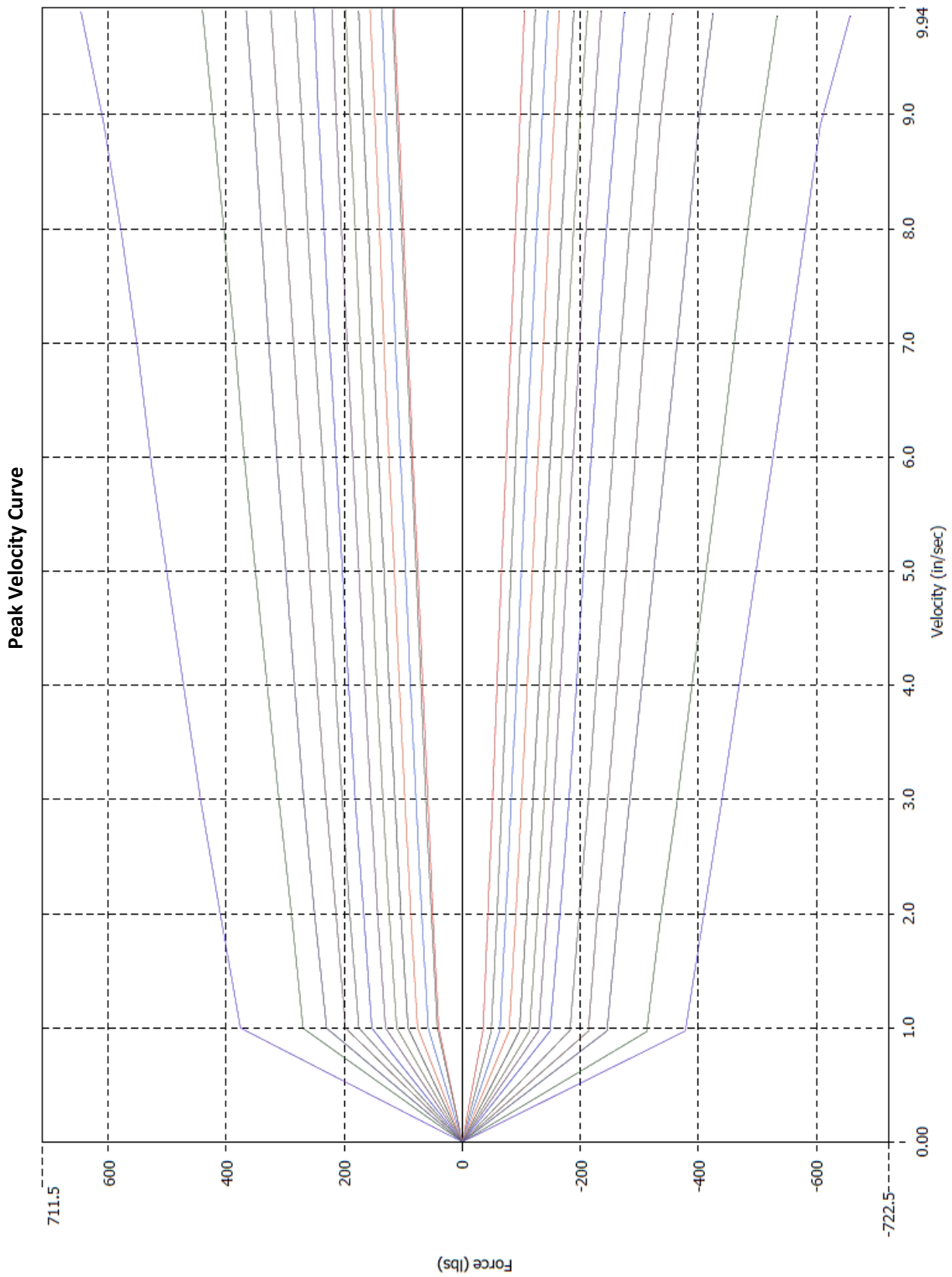
Excessive front-end rise	Stiffen front rebound
Too little front-end rise	Soften front rebound
Front-end bounce after launch	Soften front compression, stiffen front rebound
Rear of vehicle squats	Stiffen rear compression
Rear tires unload about 60 ft. mark	Stiffen front compression
Too much separation in rear	Stiffen rear rebound
Tires hook and unload at starting line	Stiffen rear compression
Tire shake	Stiffen rear rebound
Immediate loss of traction	Stiffen front rebound, soften rear compression and rebound

Street Tuning

Excessive Body Roll	Stiffen front and rear rebound
Excessive Front-End Dive	Stiffen front compression
Excessive Rear-End Squat	Stiffen rear compression
Too Firm Front	Soften front compression and rebound equally
Too Firm Rear	Soften rear compression and rebound equally
Doesn't Weight Transfer under Acceleration	Soften front rebound and rear compression
Doesn't Weight Transfer under Braking	Soften rear rebound and front compression

Handling Tuning

Corner Entry	
Oversteer	<ul style="list-style-type: none"> • Stiffen rear rebound • Stiffen front compression
Understeer	<ul style="list-style-type: none"> • Soften front compression • Soften rear rebound
Mid-Corner	
Oversteer	<ul style="list-style-type: none"> • Stiffen rear rebound if rear suspension is unstable or has excessive body roll • Soften rear rebound if rear tires chatter and don't have enough lateral grip
Understeer	<ul style="list-style-type: none"> • Stiffen front rebound if front suspension is unstable or has excessive body roll
Corner Exit	
Oversteer	<ul style="list-style-type: none"> • Soften rear compression, stiffen rear rebound, and soften front rebound
Understeer	<ul style="list-style-type: none"> • Stiffen front rebound and rear compression



Dyno Graph shows every two clicks on the high-speed adjusters from full soft to full stiff and the low-speed adjusters on full stiff. Standard valve packs (400) shown.

Accessories

Spanner Wrench

Spanner wrench P/N T121W is unique for the MOD™ Series shock, as it allows you to slide the tool horizontally into the spanner nut ports from multiple angles, allowing easy adjustments in tight spaces.

P/N T121W.

Bleed Adjust Tool

The included 90-degree hex (3/32) bleed adjust tool allows you to tune the low-speed bleed adjustment in confined spaces and easily track the turns of the bleed adjustment screws.

P/N 7791-170.

Thrust Bearings

The included thrust bearings allow easy adjustments on the spring adjuster nut and prevent the spring from binding through travel. Replacement thrust bearing kits are sold as a pair to fit two shocks.

P/N 7888-109.

Remote Canister Mounting Brackets

These mounting brackets allow you to securely mount the remote canister to a flat surface or 1 ¼" tube.

Flat Panel Mount P/N 9039-308

1 ¼" Tube Mount P/N 9039-305

QuickTune™ Technology Tuning Kit

Modular valve packs are available in a tuning kit which will allow for multiple configurations to set damping force range in the MOD™ Series Shock.



Extended Eyelet

This eyelet will extend the compressed and extended lengths of the shock by 1" and move the spring cap away from the mounting point for added clearance.

1" Extended Eyelet P/N 9036-229

Extended Shock Eyelet – Base

This base will extend the compressed and extended lengths of the shock by ½" and move the shock body away from the mounting point for added clearance.

1/2" Extended Base P/N 9036-230

Bearing Mounted T-bar Conversions

Designed to convert one eyelet to a T-bar for stock mounting applications.

3" T-Bar kit (2.115" - 2.625" bolt spacing) P/N BAR305K

3.5" T-Bar kit (2.125" - 2.875" bolt spacing) P/N BAR355K

5" T-Bar kit (3.33" - 4.05" bolt spacing) P/N BAR505K

Replacement Bearing Kits

Replacement bearing kits include 2 bearings and 4 snap rings to replace bearings on one shock.

1/2" ID Bearing Kit, 1" Wide P/N COM8T-102PK

5/8" ID Bearing Kit, 1" Wide P/N SIB10T-102PK

1/8" Wide Bearing Spacer Kit P/N SLV107

Bump Stops

Bump stops can be used to limit suspension travel and prevent bottoming out. Bump stops can also help prevent shock damage in the event the shocks are bottomed out during use.

3" Tall (*can be shortened to desired length*) P/N BC01

0.875" Tall P/N BC02

1.25" Tall P/N 9032-117