

PENSKE

≡≡≡ RACING SHOCKS. ≡≡≡



PS-8975-DRAG (Double Adjustable)

TECHNICAL MANUAL

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Introduction

Thank you for purchasing Penske Racing Shocks 8975 Series double adjustable shock absorbers.

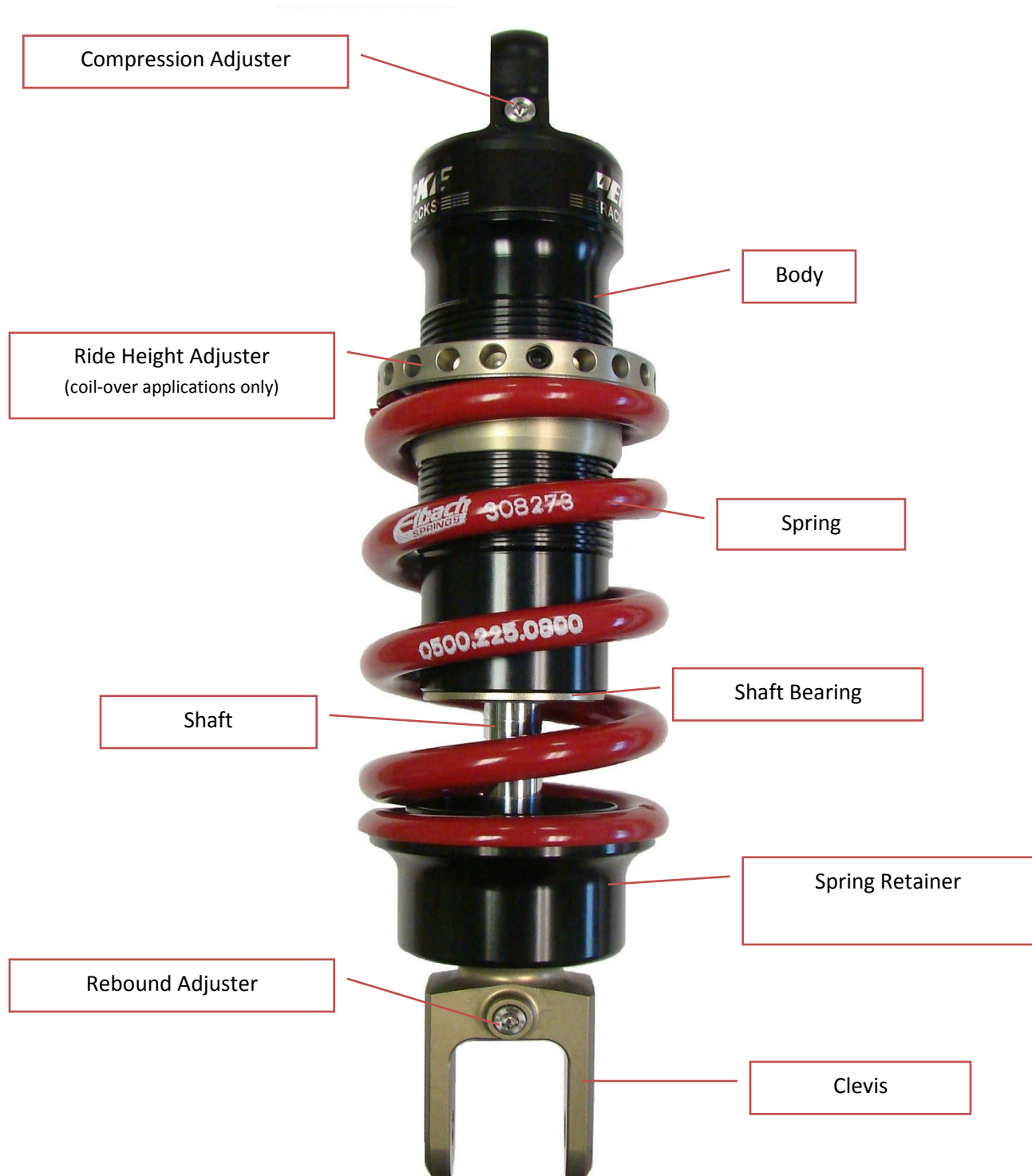
The 8975 Series is the latest addition to Penske Racing Shocks successful product line-up. The most economical multi-adjustment shock, the 8975 Series utilizes standard Penske Racing Shocks parts already known for their quality and repeatability.

Every Penske Racing Shock is 100% hand built and dyno-tested for the best performance and customer satisfaction. We stand by our products and routinely assist customers in getting the best performance from their shocks. The same components in the 8975 Series are used all over the world at the highest forms of Motorsport.

All of the fundamental attributes found in any Penske Racing Shock have been incorporated into the 8975 Series including:

- *55mm bore size, compatible with a wide array of piston types.*
- *Low-friction shaft and piston seals.*
- *Hard anodized, 6000 series aluminum bodies and components for superior durability, performance, and repeatability.*
- *Hard-chromed 4130 main shaft with rolled threads for strength, durability, and low breakaway friction.*
- *Durable ACME threaded body for quick adjustments to spring preload (.100" per turn).*
- *Simple, in-line design for lightest weight and ease of installation.*
- *Winning heritage – Penske Racing Shocks continue to help customers win races and championships in all forms of Motorsport.*
- *Made in U.S.A. – The 8975 Series has been 100% designed, machined, assembled, and tested for quality in the United States.*

Terminology:



Getting Started:

Shocks are sent from the factory at recommended start settings for the application in which they were ordered - pressurized and ready to go.

Some basic tools needed to adjust the 8975 Series shocks are:

- 1.) Allen Key (3 mm): to secure ride height adjuster after setting ride height with springs.
- 2.) Pre Load Adjuster Tool: to make ride height adjustments to spring perch.
- 3.) Allen Key (5/32"): to make compression/rebound adjustments.



1.) 3mm Allen Key to Lock Perch



2.) Pre Load Adjuster Tool



3.) 5/32" Allen Key for Compression/Rebound Adjustment

To Set Rider Sag:

Shocks will arrive from the factory with $\frac{1}{2}$ " of spring preload. Rider sag must then be set AFTER installing the shock on the bike. After sag is set, tighten the 2 Allen screws (3mm Allen) in the spring perch to prevent loosening. Avoid over-tightening – nip-up gently to avoid damage to the body threads.

STEP 1

1. Without a rider on the bike, have an assistant lift the rear of the motorcycle until the rear wheel is off the ground slightly. One person should hold the front of the motorcycle, straddling the front tire.
2. Measure the distance between the axle centerline and a convenient location on the rear sub frame or tail.
3. Record this measurement as "A". Your Bike: _____

STEP 2

1. One person should hold the front of the motorcycle, straddling the front tire.
2. Have the rider, wearing all of their gear, sit on the bike in a riding position.
3. The third person should then measure the distance between the axle centerline and a convenient location on the rear sub frame (same locations used in Step 1).
4. Record this measurement as "B". Your Bike: _____

STEP 3

1. Subtract "B" from "A". This number is your rider sag. **Target: 12mm-24mm Rider Sag.**



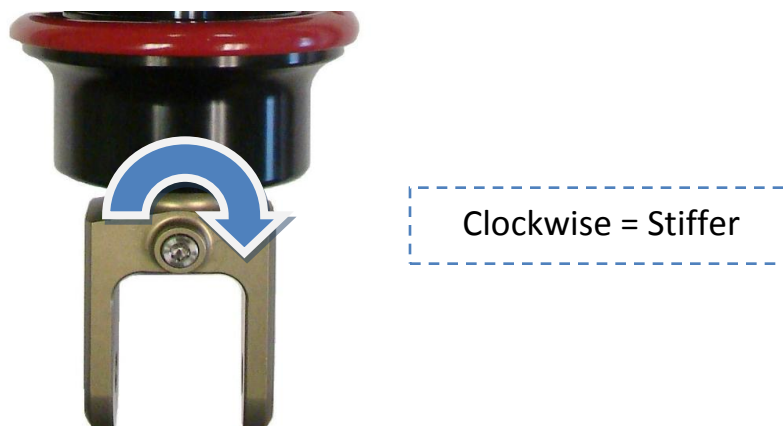
Adjusters:

There are 2 external adjustments that can be made while on the bike.

- **Compression Adjuster (5/32 ALLEN KEY)** - This is located in the body cap and offers **48** different positions of compression adjustment. The range of adjustment depends upon the relative stiffness of the compression stack in use. A typical "B" compressions stack will have about 150 lbs of adjustment range.



- **Rebound Adjuster (5/32 ALLEN KEY)** - This is located in the shaft clevis and offers **48** different positions of rebound adjustment. The range of the adjustment depends upon the relative stiffness of the rebound stack in use. A typical "B" rebound stack will have about 350 lbs of adjustment range.



Do not over-tighten the adjusters. When making adjustments, they will have a positive stop. In order to close off the bleed, it is not necessary to continue to turn the knob for it to seal.

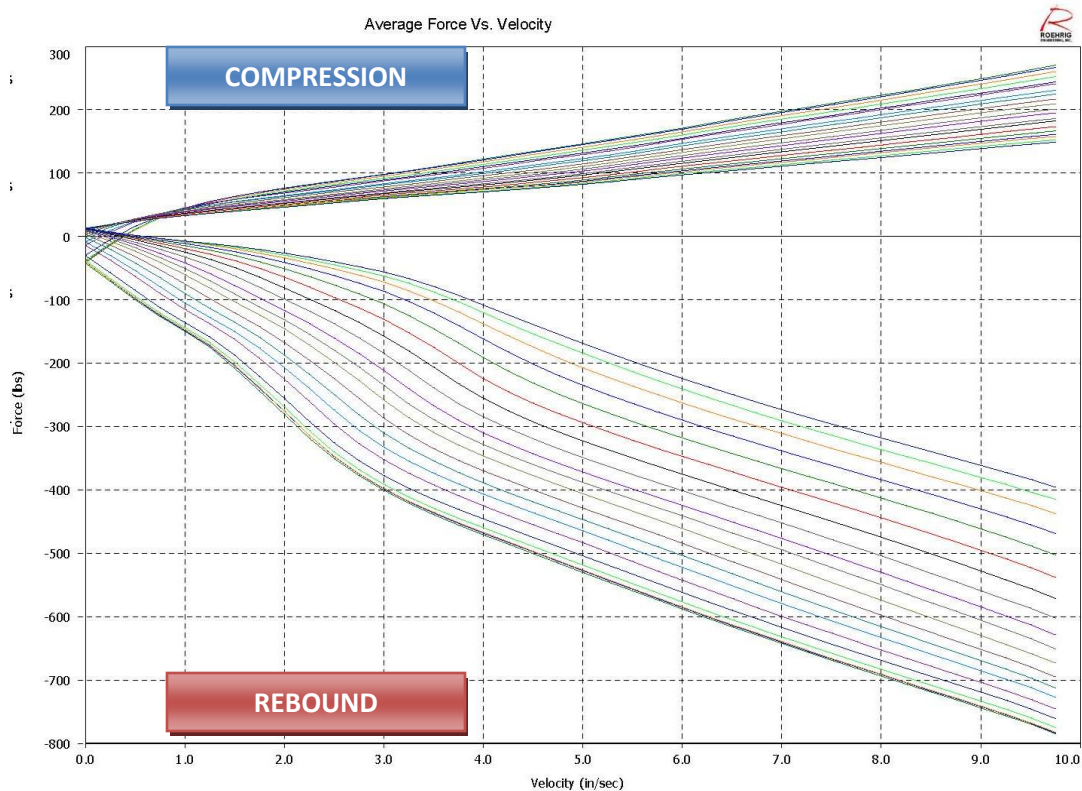
To make adjustments, follow the procedure on the next page (if this procedure is not followed in the recommended sequence, the intended settings may not be achieved).

To Set Adjusters:

- 1.) Turn knob or screw clockwise to full stiff.
- 2.) Turn adjuster back counterclockwise to desired settings. This is typically shown as a negative (-) setting. Example: Compression -5 clicks, Rebound -10 clicks/sweeps.
- 3.) During discussions on handling, if you are instructed to “soften rebound by 5 clicks” that would mean adjust the rebound counterclockwise by 5 “clicks”.

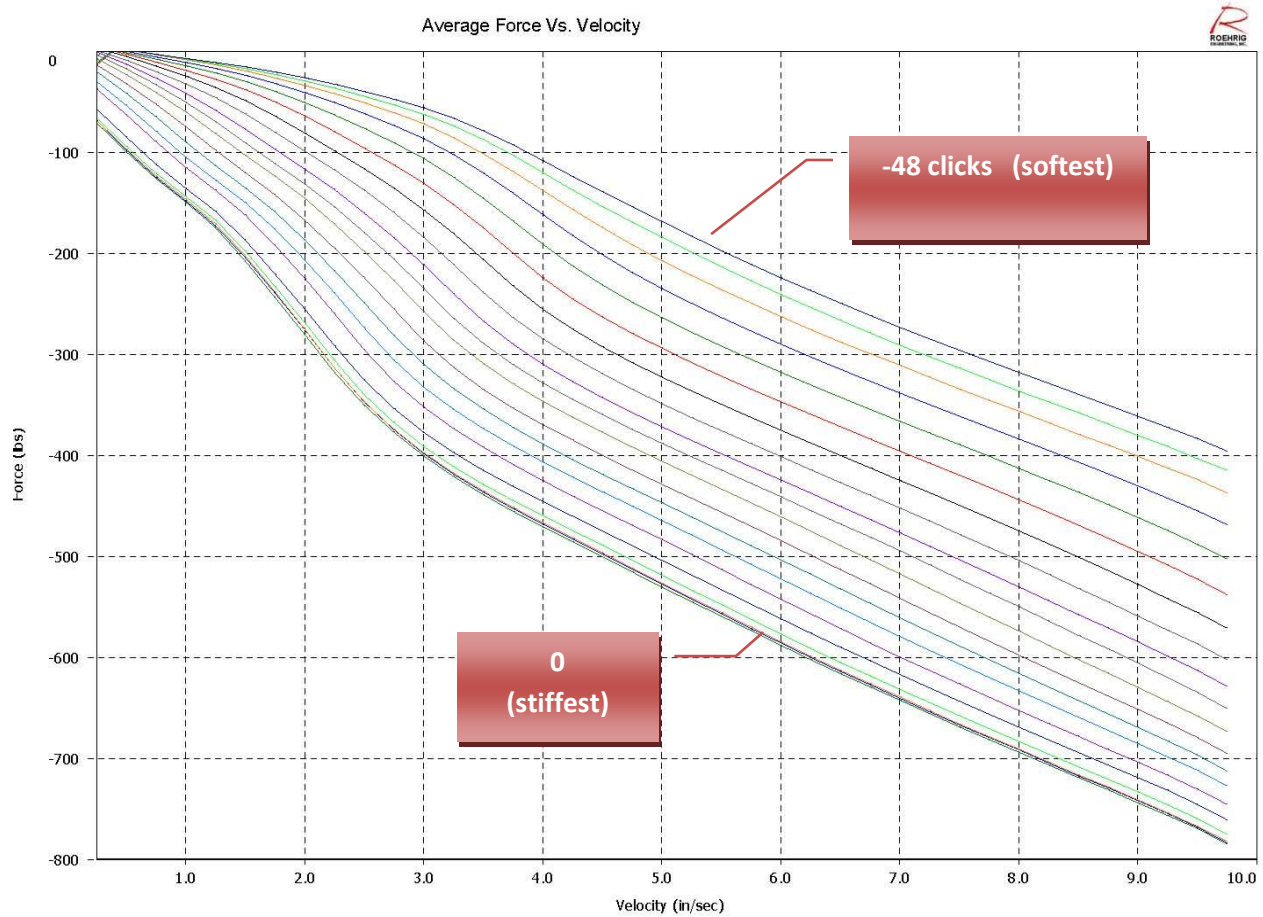
Adjustment Range: COMPLETE GRAPH

The 8975 Series shock has extensive range in both compression and rebound, giving the end user great freedom to make fine adjustments. All shocks arrive from the factory with a dyno graph for reference. Digital copies are also available on request.



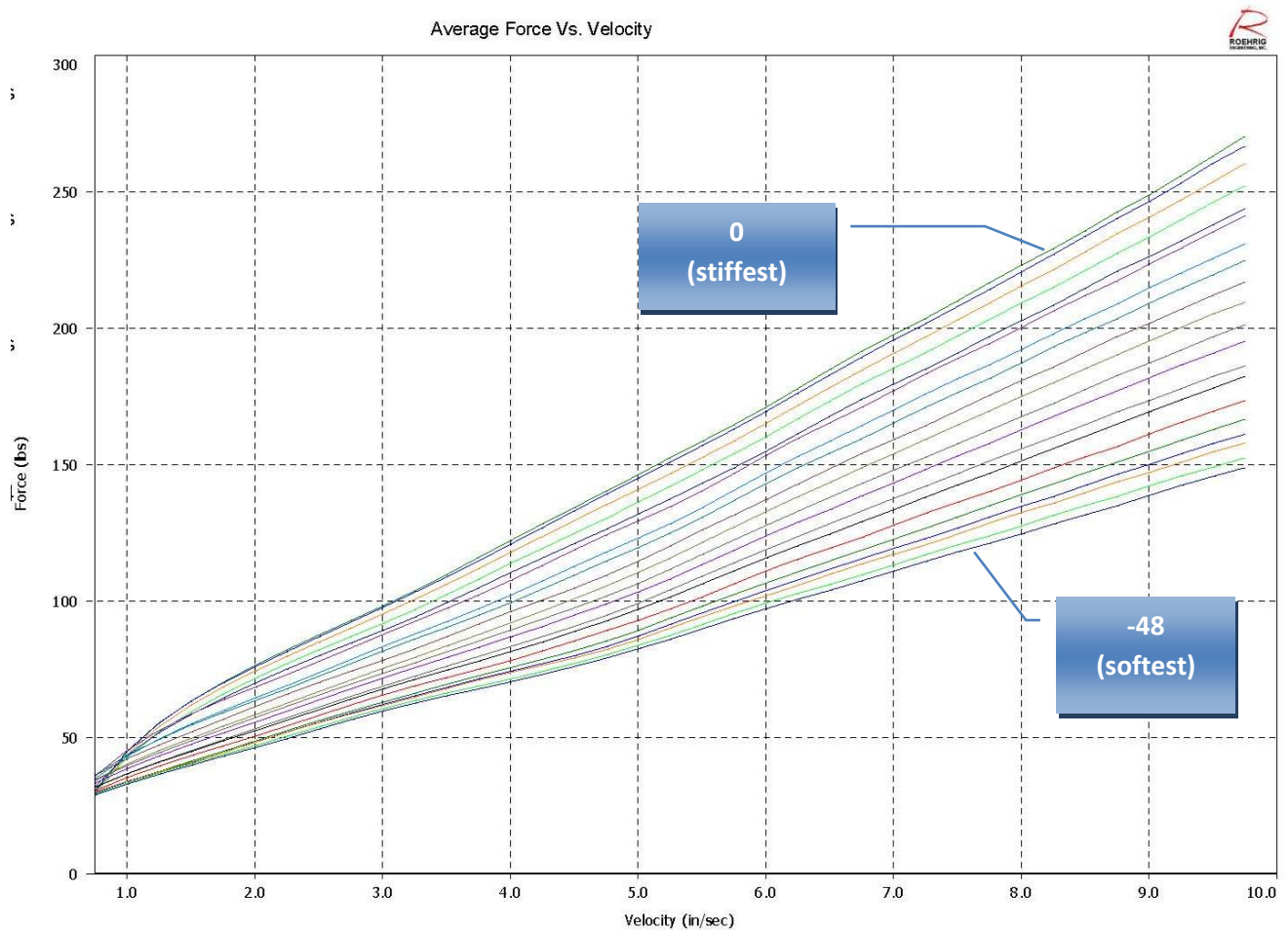
Adjustment Range: REBOUND

The rebound adjustment range is extensive, accommodating many bike and track conditions. The adjuster is most effect in the **0-10 in/sec** velocity range of the shock. This is because the rebound adjuster is a direct bypass to the main piston and shim configuration; therefore it has a greater overall effect on damping.



Adjustment Range: COMPRESSION (48 Clicks)

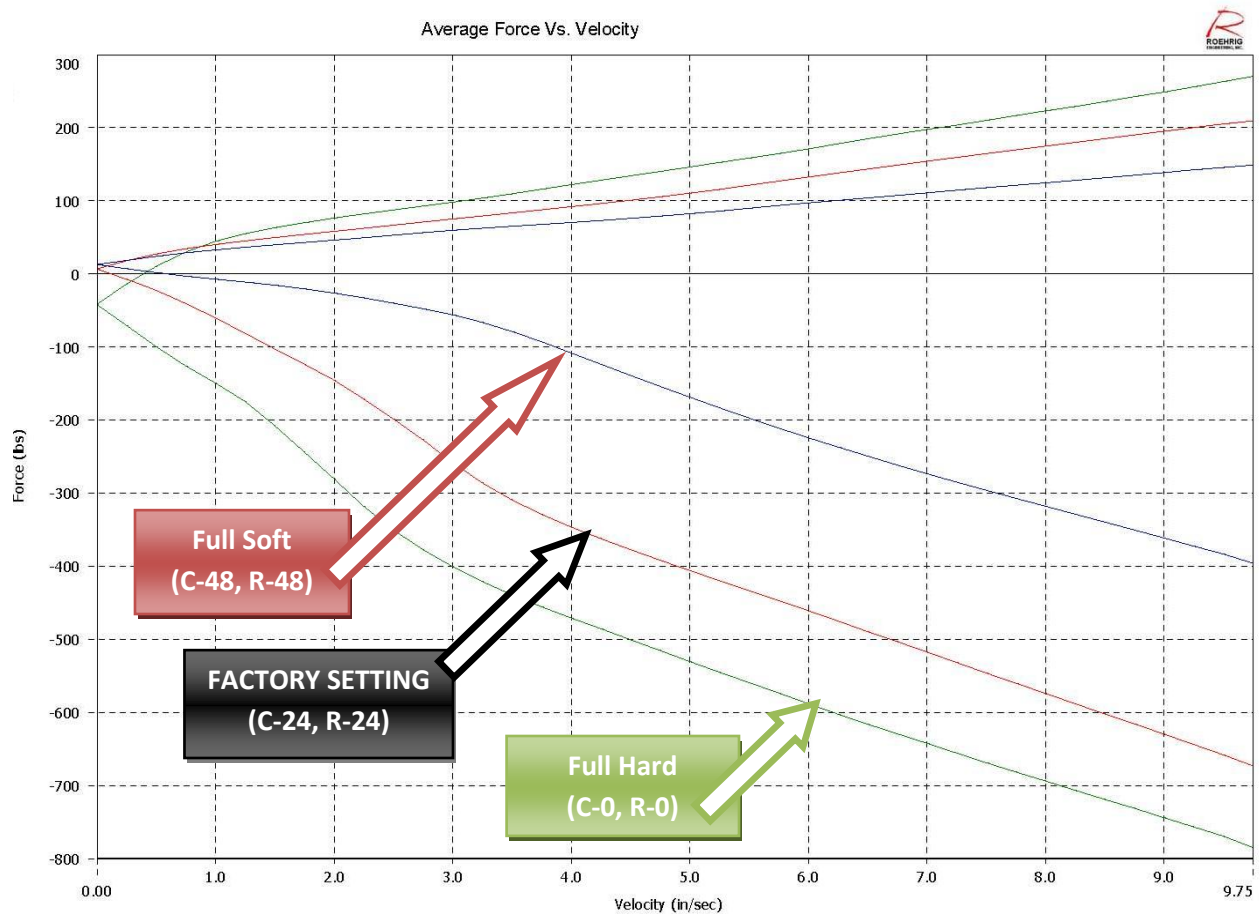
The compression adjuster works differently in that it is affected by displacement of the shaft. The more oil that is displaced, the more effective the compression adjuster will be, or the more the rider will feel it. On very small bumps, it may take more “clicks” on compression for a rider to feel a difference, where on rebound it may only be 1 or 2 clicks to notice a difference.



Factory Settings:

Adjusters:

- Typically, adjusters will be set in the “midrange” of the damper when arriving from the factory. This may be different depending on specific set ups. Precise settings will be documented on the build sheet and/or dyno sheet.
- Gas Pressure - This can vary from 50 psi to 200 psi, depending on the application and setup. Generally, higher compression damping will necessitate higher gas pressure. This will also be specified on the build sheet and/or dyno sheet.



FACTORY SETTINGS:

COMPRESSION: -24 / REBOUND: -24

Track Tuning (GENERAL):

Compression Adjuster:

This adjuster is typically used when looking to improve the bike over bumps. If the bike is hitting a certain bump that is causing it to “unload” the tire, simply soften the compression adjustment. This will allow the shock to absorb the bump, keeping the bike more stable and making it more controllable.

Closing the compression will slow the weight transfer of the bike.

Rebound Adjuster:

The rebound adjuster is a great tool for tuning and is a more rider-sensitive adjustment than compression damping. To slow how quickly the bike is pitching forward, simply close off the rebound. This will delay weight transfer, keeping the back planted longer.

Important!! It is possible to over-adjust. Always have a baseline to go back to!!!

Normal Adjustment Steps for Drag Racing:

Compression: Adjust 4-5 clicks at a time.

Rebound: Adjust 2-4 clicks at a time.

To Increase Bite:

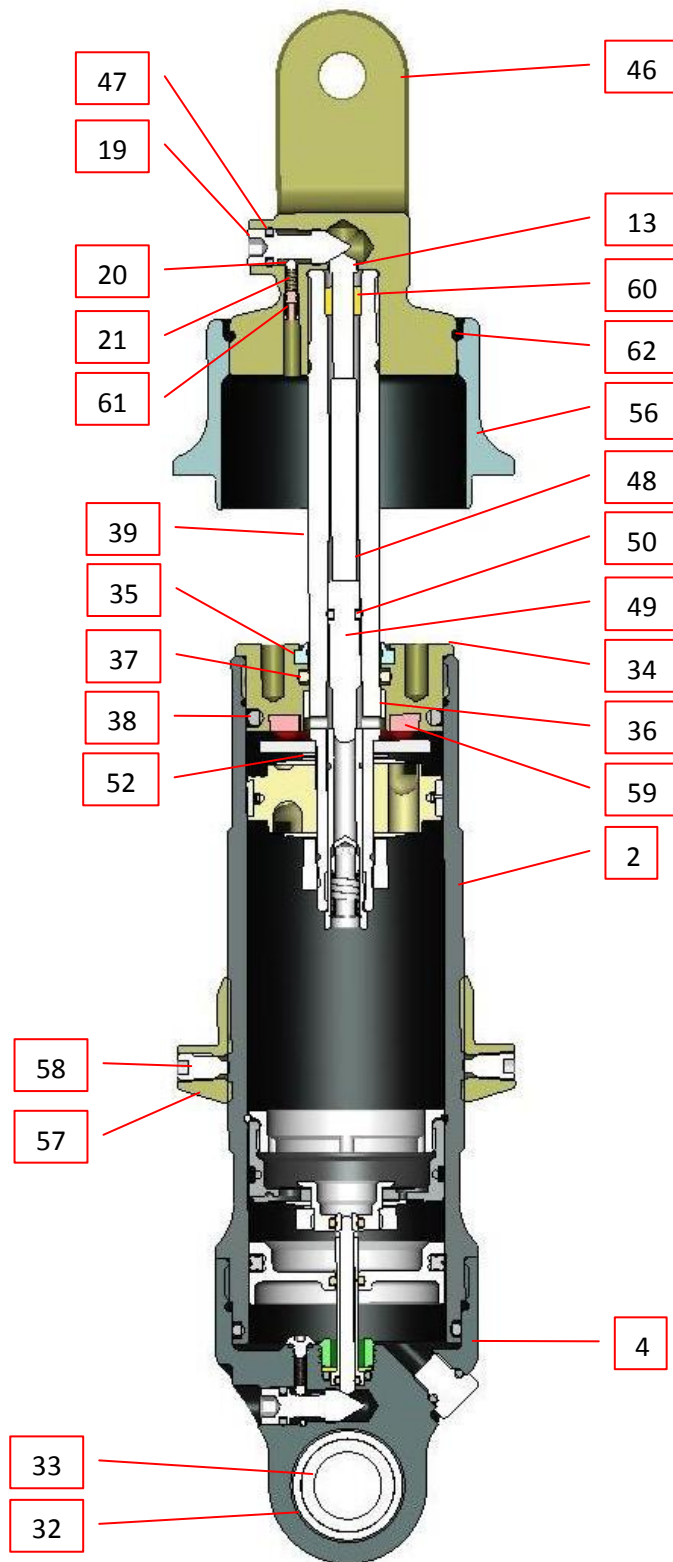
Soften compression or stiffen rebound. Example: Hot and greasy track / bald spots on starting line.

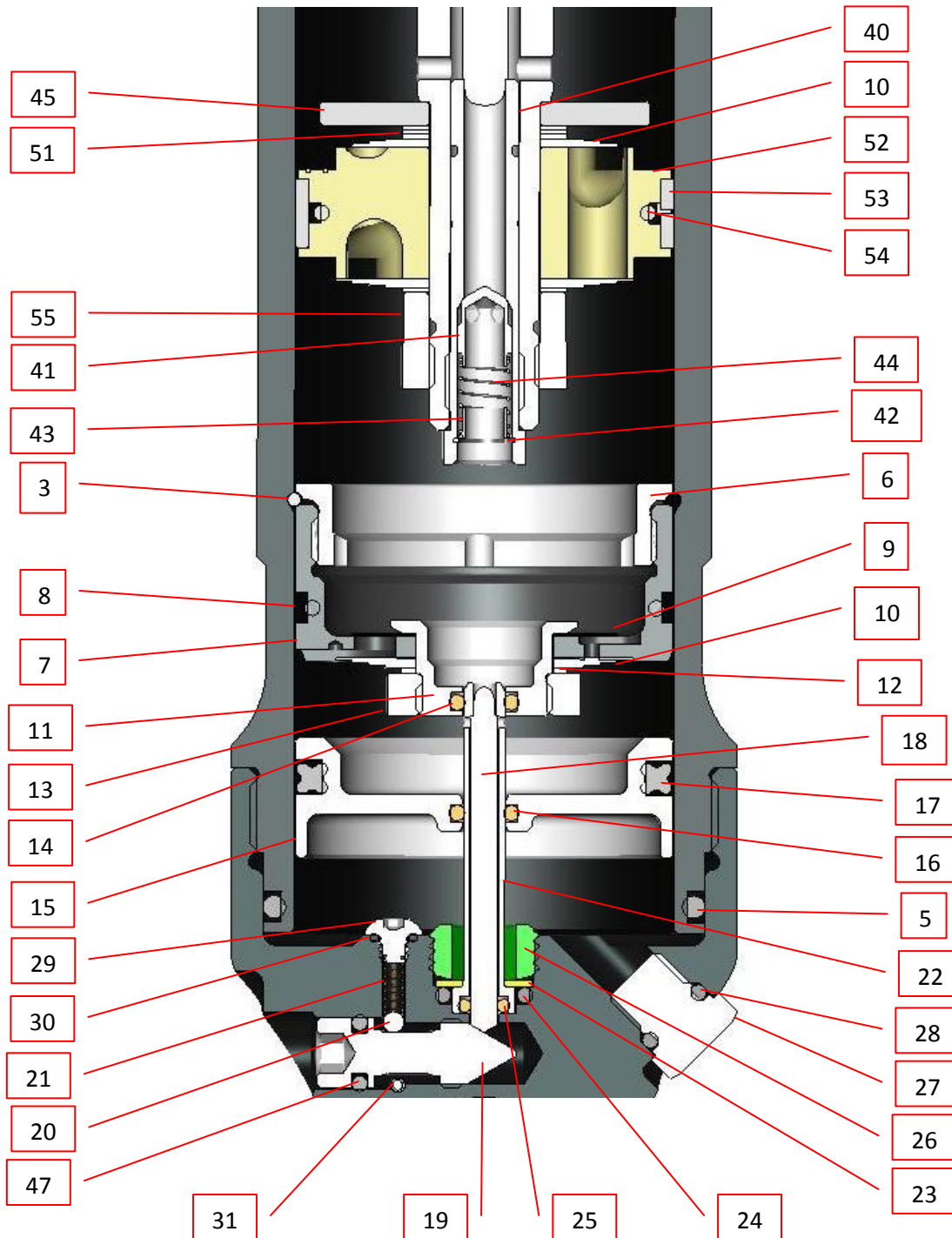
To Decrease Bite:

Stiffen compression or soften rebound. Example: Track conditions are at their best / starting line is covered with good rubber.

When using a pneumatic (air) bleed-off option: As each bike and track is different, it is recommended to consult a Penske Racing Shocks technician for help with the setting of timers and other air bleed-off mechanisms.

Assembly:





Parts List:

KEY	PART NUMBER	DESCRIPTION
2	BD-75XCO	BODY, 7500 C/O
3	RR-06	WIRE RING, .0625 WIRE DIAMETER X 1.900"
4	BC-75TV-DA	BODY CAP, 7500 DOUBLE ADJUSTABLE
5	OR-2133-B	O-RING, BUNA, 70 DUROMETER
6	CO-75HV	COLLAR, 7500 SERIES HEAD VALVE
7	PI-75HV-3PORT	PISTON, 7500 SERIES HV 3 PORT
8	OR-2029-B	O-RING, BUNA, 70 DUROMETER
9	VW-120004-625	WASHER, 1.200 X .004 X .625 VALVE
10	VS	VALVE STACK, COMPRESSION AND REBOUND
11	SC-75HV-DA	SCREW, 7500 DA HEAD VALVE
12	VW-75020-625	WASHER, .750 X .020 X .625 VALVE
13	MR_73	METERING ROD, 7300
14	OR-2008-V	O-RING, 5 MM X 1 MM, VITON
15	PI-75-DA	PISTON, 7500 DOUBLE ADJ FLOATING
16	OR-2008-V	O-RING, VITON, 70 DUROMETER, BROWN
17	OR-4221-B	QUAD RING, BUNA, 70 DUROMETER
18	NE-75X-DA	NEEDLE, 7500 DOUBLE ADJUSTABLE
19	RS-73	REBOUND SCREW, 7300 HEX
20	BA-093-ST	BALL, 3/32 STEEL
21	SP-36	SPRING
22	FT-75X-DA	FITTING, 7500 DOUBLE ADJUSTABLE
23	VW-75-DA	WASHER, 7500 DOUBLE ADJUSTABLE
24	OR-2011-B	O-RING, BUNA, 70 DUROMETER
25	OR-3MM X 1.5MM-V	O RING, 3MM X 1.5MM, VITON
26	SC-75-DA	SCREW, 7500 DA HOL-LOCK SOCK 500-20
27	IU-75NV	INFLATION SEAL SCREW
28	OR-2010-B	O-RING, BUNA, 70 DUROMETER
29	SC-75	SCREW, BUTTON HEAD 6/32 X 1/8"
30	OR-3.5MMX1MM	O-RING, VITON
31	DO-18	ROLL PIN, 1/16 X 1/2
32	RR-16	RET RING, 1.025 SPIROLOC, STAINLESS
33	MO-8T	MONOBALL, .500 ID X 1.00 OD
34	SB-89	SHAFT BEARING, 8900
35	SL-09	SHAFT WIPER, .625 POLY (BLUE)
36	BU-10DU04	BUSHING, DU .625 X .250
37	OR-2114-V	O-RING, VITON, 75 DUROMETER
38	OR-2221-B	O-RING, BUNA, 70 DUROMETER

39	SH-75AX	SHAFT, 7500 ADJ
40	JT-RDHSNG	JET, RD STRAIGHT THRU
41	JT-76POP	JET, POPPET
42	RR-05	RETAINING RING, .250 INTERNAL
43	JT-76HAT	JET, TOP HAT
44	SP-15	SPRING
45	VW-99	TOP OUT PLATE, 1.375 X .500
46	CL-5450CL-H	CLEVIS
47	OR-2009-B	O-RING, BUNA, 70 DUROMETER
48	MR-ROD	METERING ROD
49	NE-76	NEEDLE, 8760
50	OR-2007-B	O-RING, BUNA, 70 DUROMETER
51	VW-75020	WASHER, .750 X .020 X .500 VALVE
52	PI-XX005	PISTON, 55MM
53	PB-55	PISTON BAND, 55MM
54	OR-2028-B	O-RING, BUNA, 70 DUROMETER
55	NT-02R	RING NUT, .500 X 20, .440 LONG
56	SR-8975-WR	SPRING RETAINER, 2.25"
57	RH-83XXX	RIDE HEIGHT, 8300
58	SC-M6M8-N	SCREW, GRUB M6 X 8MM NYLON
59	BR-37	BUMP RUBBER
60	BU-04-BZ	BUSHING
61	SC-30	GRUB SCREW
62	RR-5206	RETAINING RING



Warnings:

It is not recommended to run lower than **50 psi** in Penske Racing Shocks Motorcycle shocks, depending on piston and shims being used. Lack of nitrogen pressure could result in cavitation which can result in loss of immediate damping and rider feel.

It is also not recommended to run more than 300 psi. This could result in stress fractures in main mounting components, which could result in failure of shock.

Always check with a Penske Racing Shocks technician on recommended pressures for a specific application and use.

Troubleshooting:

Signs of Fluid:

If the area around the shaft bearing and shaft exhibits a small amount of moisture, this is normal. In order to reduce friction in the system, seal squeezes are slightly relaxed to allow a small amount of fluid to be wicked onto the shaft when the shock operates. If an excessive amount of fluid that may “pool” on the top of the shaft bearing is noticeable, there may be a seal problem. Contact a Penske Racing Shocks representative at once.

Loss of Gas Pressure:

An obvious sign of reduced or no gas pressure is when the shock (without a spring) will not return to its fully extended position after being compressed, or it gradually becomes much slower when reaching full extension.

It is recommended that gas pressure be checked before each race. Gauges to properly check gas pressure are available at Penske Racing Shocks, as well as at authorized dealers and distributors.

Technical Support:

8:30 AM – 5:00 PM (EST)

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