PENSKE RACING SHOCKS®

PS-7500-DA (Double Adjustable)

TECHNICAL MANUAL

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Introduction

Thank you for your purchase of your new Penske Racing Shocks 7500-DA!

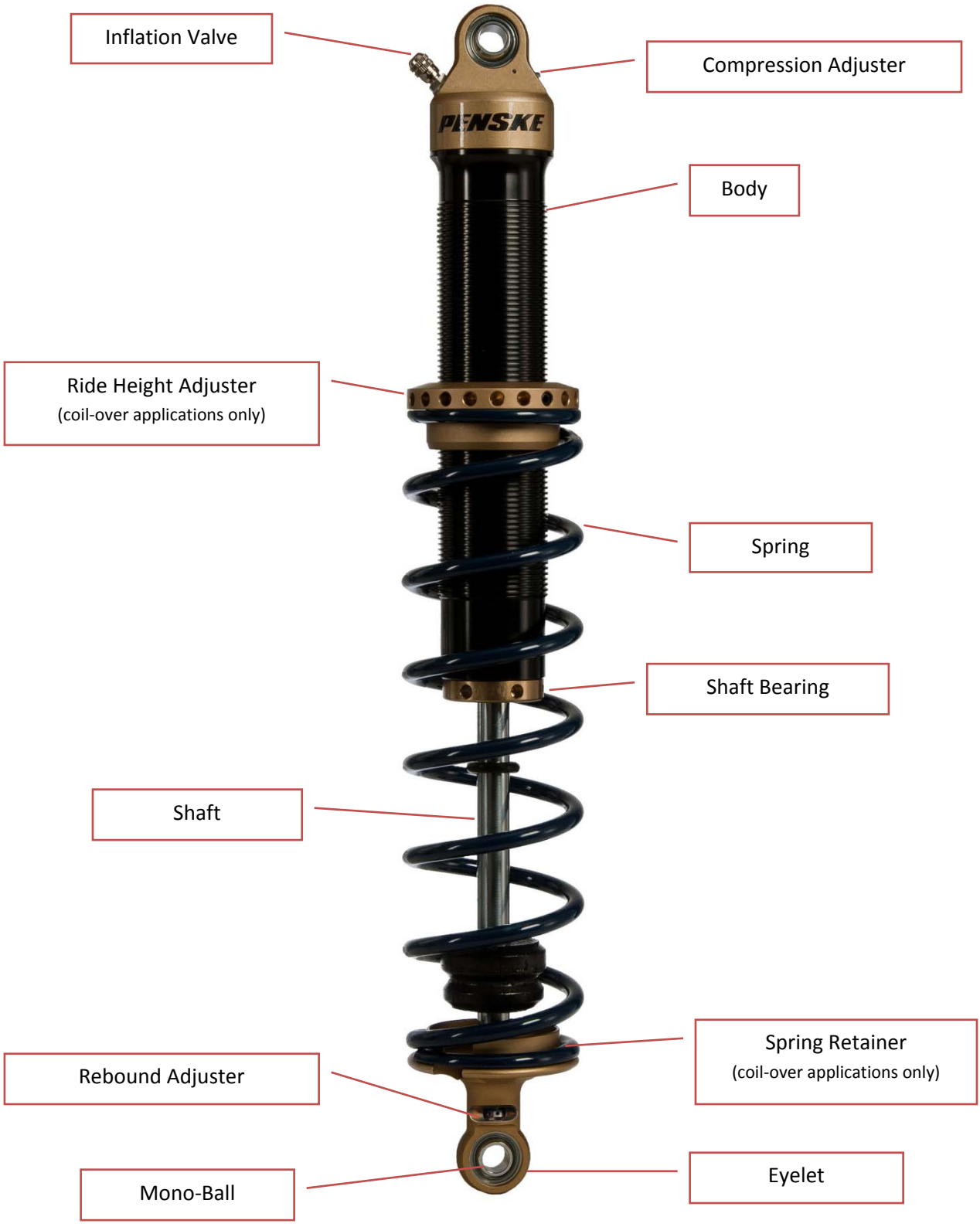
The 7500-DA is the latest addition to our already successful shock line up. This is our most economical multi adjustment shock, yet it still utilizes all of the standard Penske Racing Shocks parts that are known for quality and repeatability.

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 7500 DA 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 7500-DA including:

- *Standard Penske 55mm bore size which allows use of 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 thread body that allows quick adjustment of spring preload (.100" per turn).*
- *Simple, in-line design for lightest weight and ease of installation.*
- *Winning heritage – Penske Racing Shocks continue to help our customers win races and championships in all forms of Motorsport.*
- *Made in U.S.A. – The 7500 has been 100% designed, machined, assembled, and tested for quality in the United States.*

Terminology:



Getting Started:

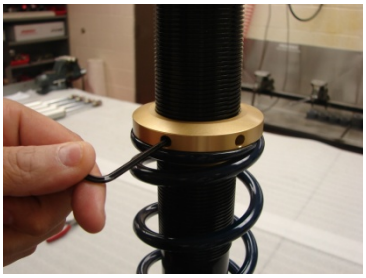
The 7500-DA's are set from the factory at recommended starting settings for your application. They are pressurized and ready to go. The pressure setting is dependent on your application, drag, road race, short track , etc. This will be specified in your build sheet which you should receive with every Penske Shock.

Some basic tools you will need to adjust your new Penske 7500-DA shocks are:

1.) TL-73HSB Pin tool (for sweep style eyelets): to make rebound adjustments.
2.) Allen Key (5/32"): to make compression adjustments.
3.) Inflation Unit (TL-COMPUNIT): to check and adjust pressure in shock.
4.) ¼" punch or pin: to make ride height adjustments to spring perch.
5.) Allen Key (3 mm): to secure ride height adjuster after setting ride height with springs.

TL-73HSB for Rebound Adjustment

TL-COMPUNIT

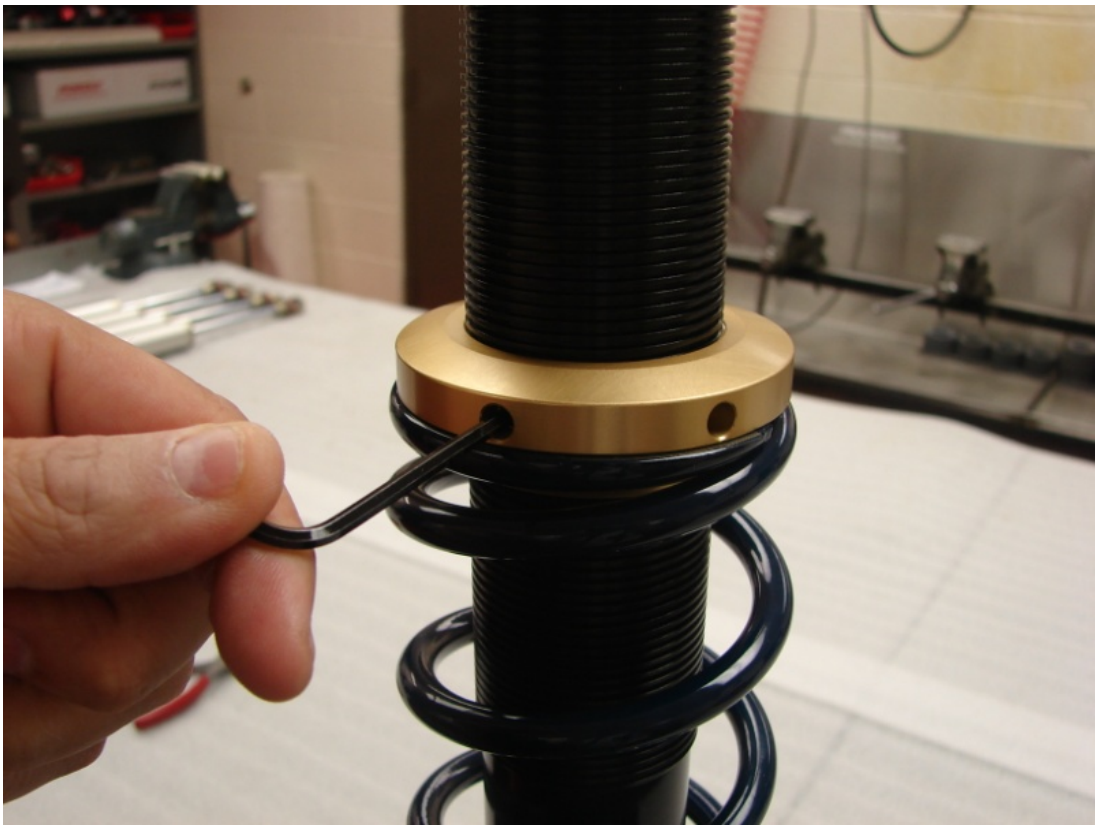


3mm Allen Key to Lock Perch

5/32" Allen Key for Compression Adjustment

To Set Ride Height:

Penske Racing Shocks does not set the spring preload on shocks that include coil-over springs. You must set your ride height AFTER installing the shocks on the car. After your ride height is set, tighten the 2 Allen screws (3mm Allen) in the spring perch to prevent loosening. This does not need to be tightened too much – just nip up to prevent damage to the body threads.



Adjusters:

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

- **Compression Adjuster *(5/32 ALLEN KEY)-*** This is located in the body cap. This allows for **40** different positions of compression adjustment. The range of the adjustment is dependent on what compression stack is used. A typical "B" compressions stack will have about 150 lbs of adjustment range.

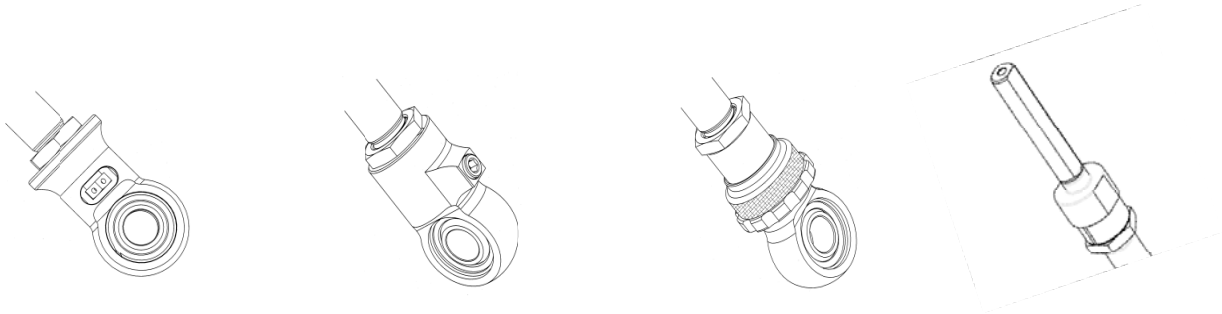
- Rebound Adjuster – There are several options for the rebound adjuster.

  A. Sweep Style (standard) (***PICK OR PIN TOOL)*** - **20** sweeps of adjustment. Rotating the adjuster screw clockwise makes the shock rebound stiffer (slower). Rotating the adjuster screw counterclockwise makes the shock rebound softer (faster). A sweep is one radial movement of a pick or pin engaged in the adjuster the full throw of the window.

  B. Hex Adjuster ***(5/32 ALLEN KEY)*** - **48** "clicks" of adjustment.
  Clockwise = stiffer; Counterclockwise = softer.

  C. Red Knob (***ADJUSTED BY HAND)***- **35** "clicks" of adjustment.
  Clockwise = stiffer; Counterclockwise = softer.

  D. Shaft Mount ***(3/32 ALLEN KEY)*** – **4 ½** "revolutions" of adjustment. We recommend making adjustments using ¼ turns. This is done by inserting a 3/32 Allen Wrench down the center of the shaft mount. Clockwise = stiffer; Counterclockwise = softer.



A *B* *C* *D*

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

To adjust, follow the procedure as follows (if this procedure is not followed in the recommended sequence, the intended settings may not be achieved in practice):

To Set Adjusters:

1.) Turn knob or screw clockwise to full stiff.

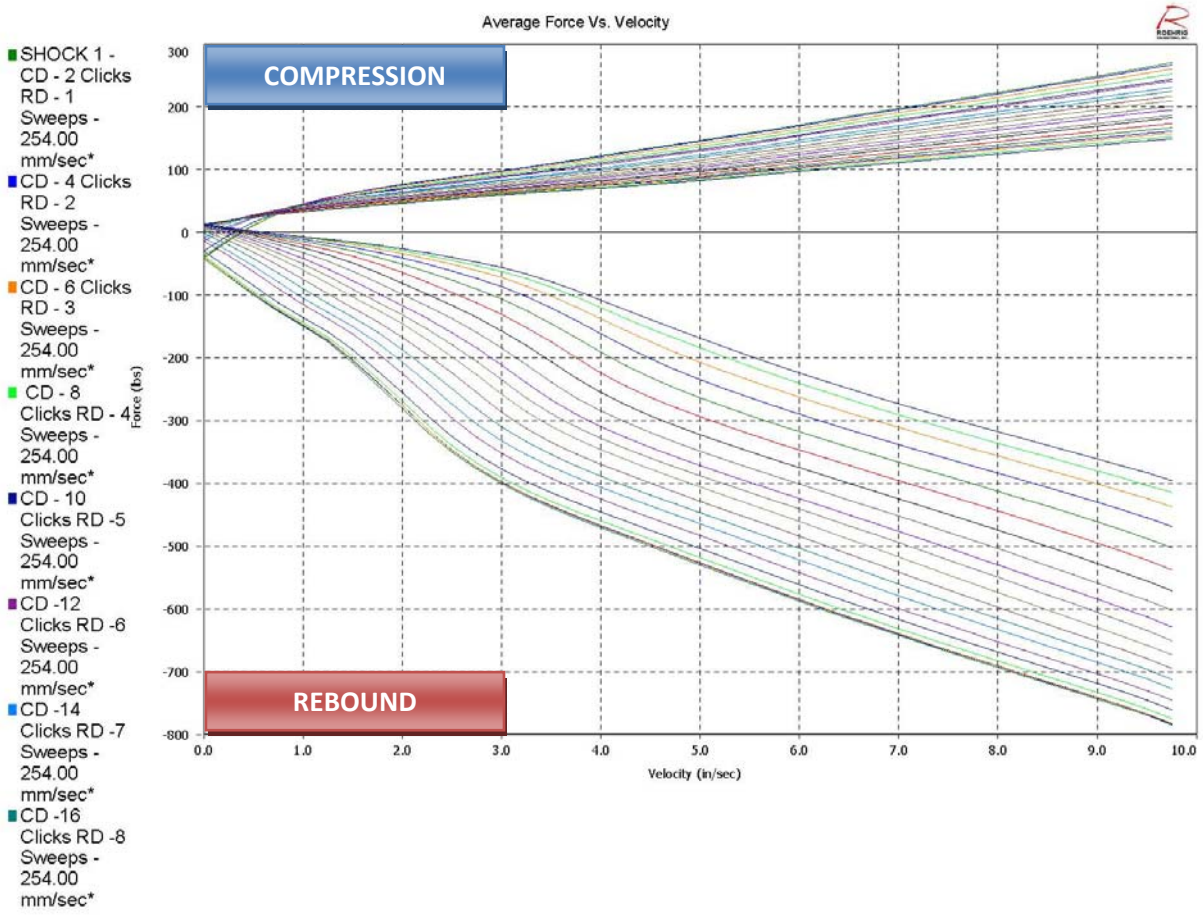
2.) Turn adjuster back "counter clockwise" to desired settings. Typically this is shown as a negative (-) settings. Example: Compression -5 clicks, Rebound -10 clicks/sweeps.

3.) During discussions on handling, if you were to be instructed to "soften rebound by 5 clicks" it would mean to adjust your rebound counterclockwise by 5 clicks or sweeps, depending on your adjuster.

Sweep Style Eyelet Adjuster

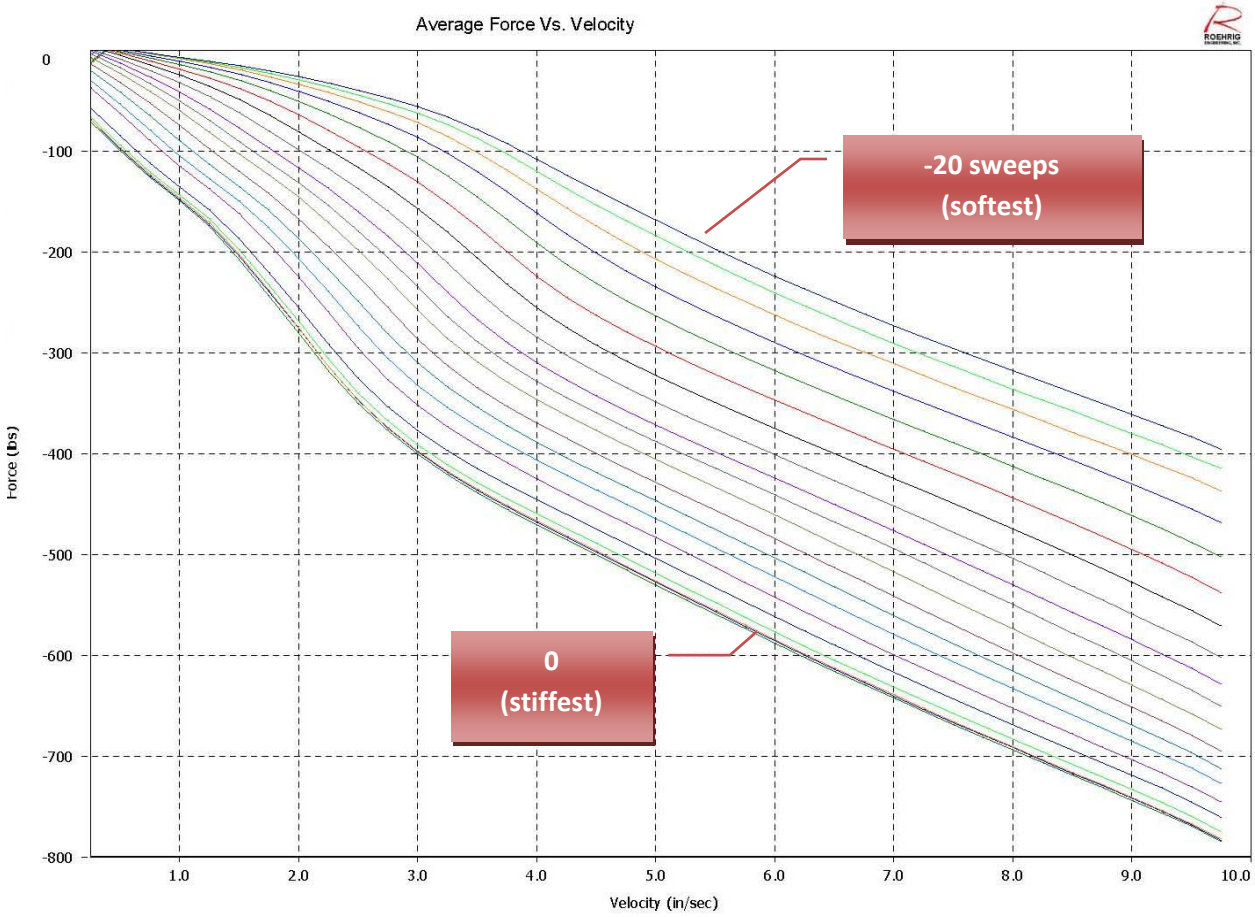
Adjustment Range: COMPLETE GRAPH

The 7500 DA shock has extensive range in both compression and rebound, giving the end user great freedom in making fine adjustments. Your shocks will have dyno graphs sent with them for your reference. Digital copies are available on request.



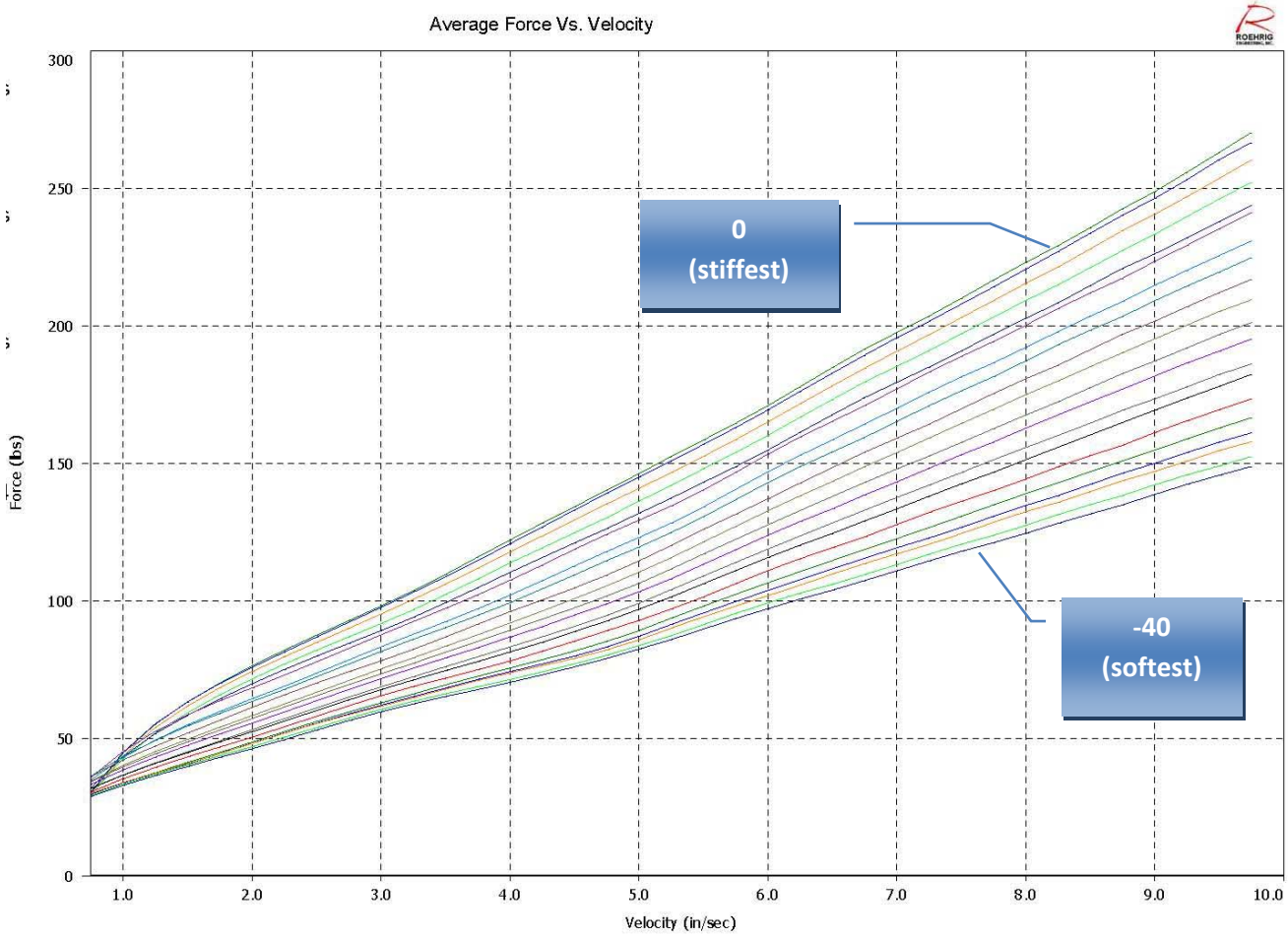
Adjustment Range: REBOUND

The rebound adjustment range is extensive but within the typical tuning window for all chassis and track conditions. The adjuster has 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, there for it has a greater over-all effect to damping.



Adjustment Range: COMPRESSION (40 Clicks)

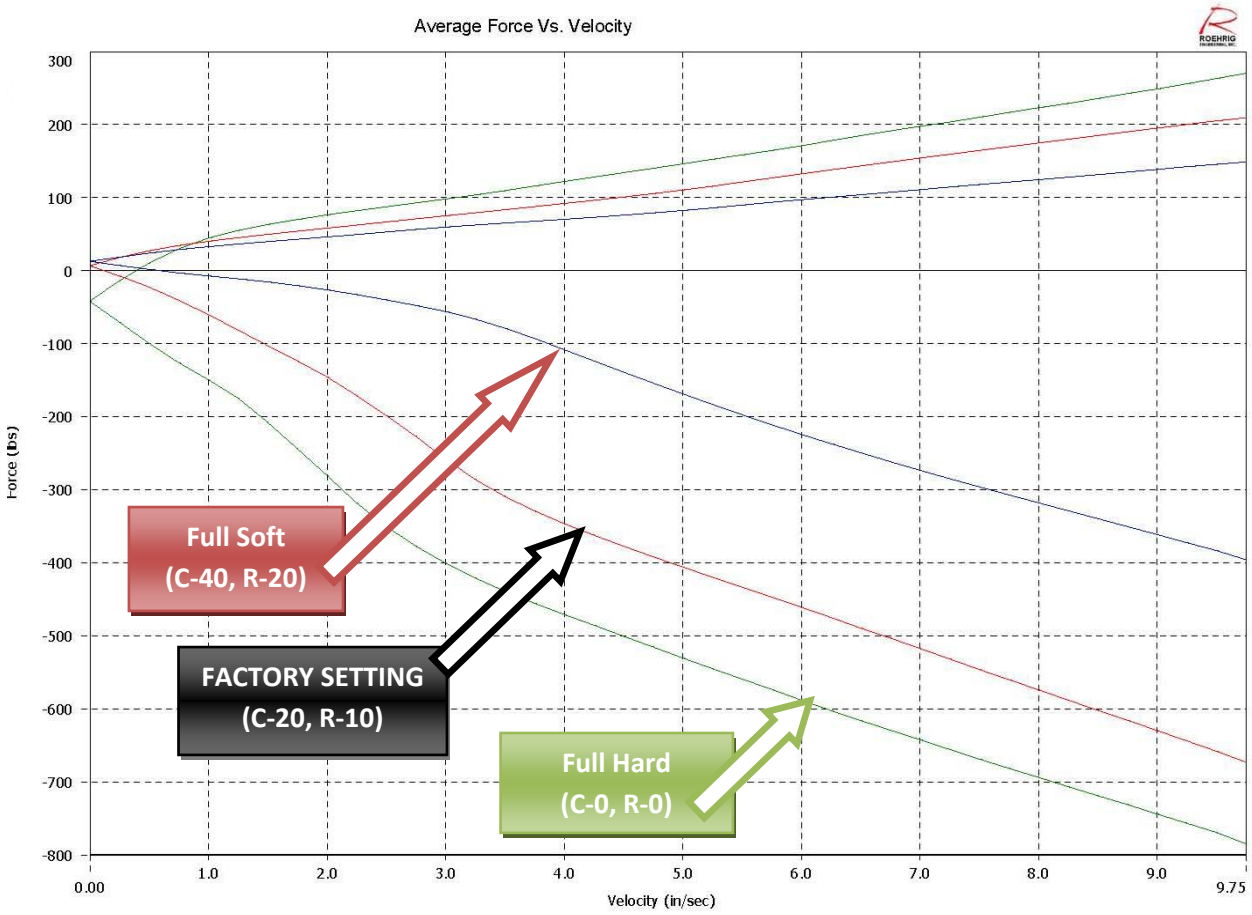
The compression adjuster works differently in that it is affected by displacement of the shaft. The more oil that is displaced the more effective the compression adjuster will be, or the more the driver will feel it. On very small bumps it may take more “clicks” on compression for a driver to feel a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



Factory Settings:

Adjusters:

- Typically from the factory we will set the adjusters in the “mid-range” of the damper. This may be different depending on specific set ups. It will documented on your build sheet and dyno sheet what the start settings should be.
- Gas Pressure- This can vary depending on application. This could range from 50 psi to 200 psi depending on what type of vehicle or type of racing. Again this will be specified on your spec sheet and or dyno sheet.



FACTORY SETTINGS:

COMPRESSION: =-20 / REBOUND: -10 SWEEPS

Track Tuning (GENERAL):

Compression Adjuster:

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

You can also use this adjuster to help in controlling the "platform" of the car, or the body roll. Example- If you are entering a corner and under braking the front of the car is diving to quickly or the weight being transferred from the back to the front is too much, simply close the compression adjuster on the front to slow that weight transfer down.

Rebound Adjuster:

The rebound adjuster is a great tool for tuning body roll. This is a much more driver sensitive adjustment than the compression. If you want to slow the pitch of your car from the back to the front, simply close the rebound off, this will slow the weight transfer.

When you are accelerating off a corner, getting weight transfer to the rear tires is very important for grip or "forward bite" as its reffered to sometime. By softening the front rebound, this will allow for quicker weight transfer to the rear tires, resulting is better rear grip. Be careful though, by allowing to much weight transfer to the rear, you may cause a loss of front grip, resulting in an "under steer" or "tight" condition.

Important!! You can over adjust. Always have a baseline to go back to!!!

Track Tuning (DRAG RACING):

Normal adjustment steps for Drag Racing:

Compression: Adjust 5 clicks at a time. Rebound: Adjust 2 sweeps at time.

To Increase Bite:

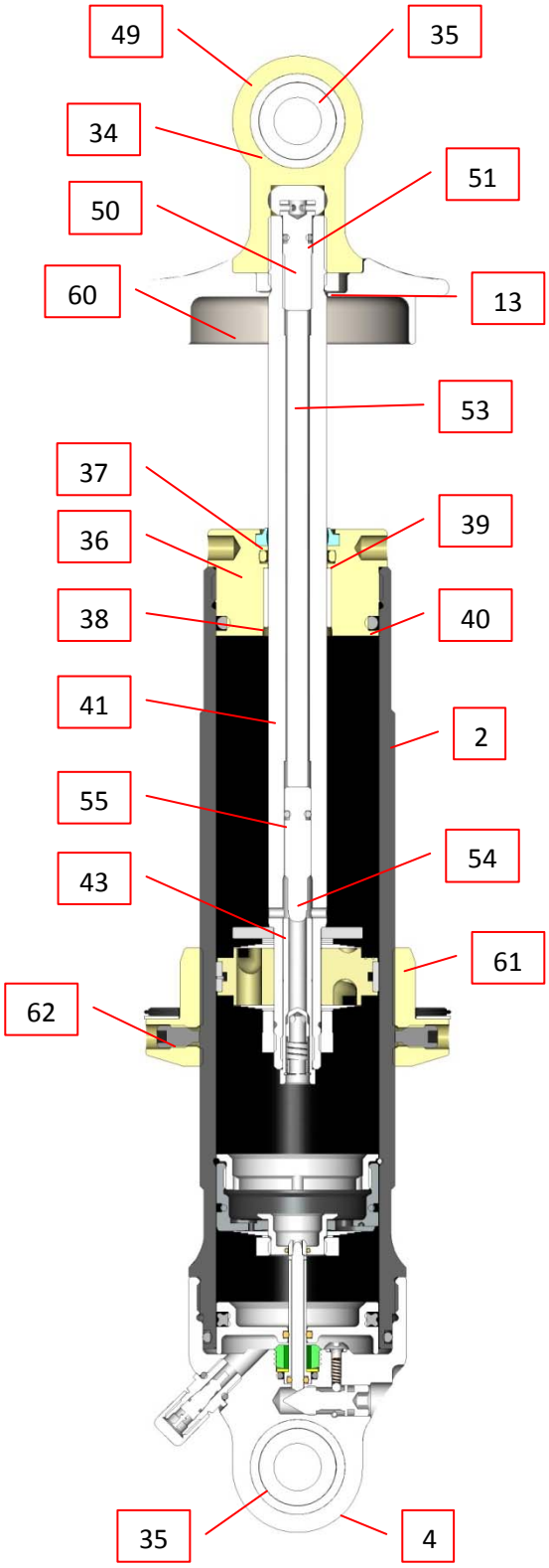
Soften compression or stiffen rebound. Example: hot and greasy track / bald spots on starting line.

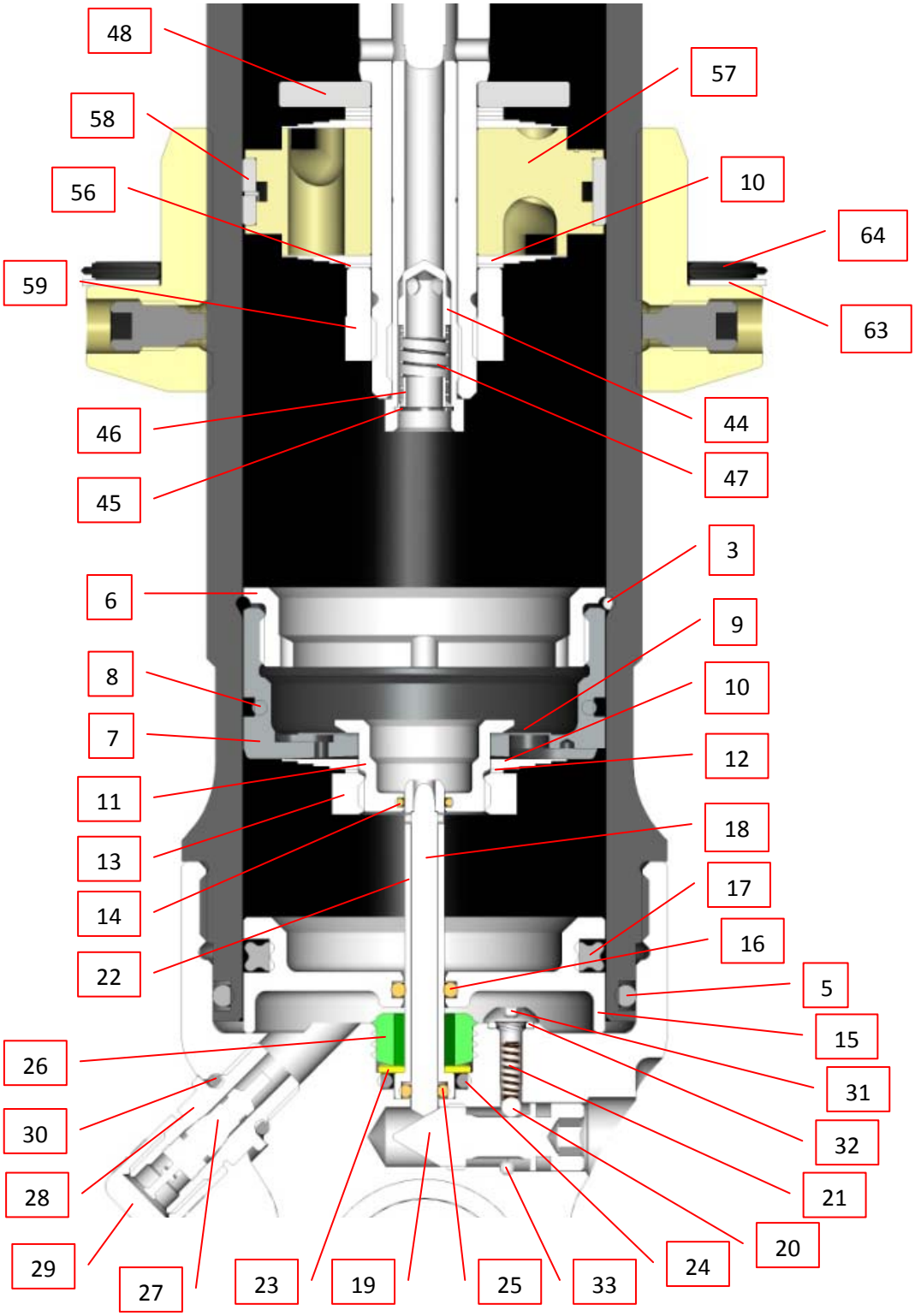
To Decrease Bite:

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 eyelet: As each chassis and track is different, we recommend consulting a Penske technician for help with the setting of timers and other air bleed-off mechanisms.

Assembly:

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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	NT-04J	JAM NUT, .625 X 18
14	OR-5MMX1MM-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-04	VALVE CORE, 2000 PSI
28	IU-22-S	AIR VALVE, PORT O-RING, S.S.
29	IU-06	VALVE CAP, HIGH TEMPERATURE
30	OR-2010-B	O-RING, BUNA, 70 DUROMETER
31	SC-75	SCREW, BUTTON HEAD 6/32 X 1/8"
32	OR-3.5MMX1MM	O-RING, VITON
33	DO-18	ROLL PIN, 1/16 X 1/2
34	RR-16	RET RING, 1.025 SPIROLOC, STAINLESS
35	MO-8T	MONOBALL, .500 ID X 1.00 OD
36	SB-765	SHAFT BEARING, 8760
37	SL-09	SHAFT WIPER, .625 POLY (BLUE)
38	BU-10DU10	BUSHING, DU .625 X .625

39	OR-2114-V	O-RING, VITON, 75 DUROMETER
40	OR-2221-B	O-RING, BUNA, 70 DUROMETER
41	SH-75AX	SHAFT, 7500 ADJ
43	JT-RDHSNG	JET, RD STRAIGHT THRU
44	JT-76POP	JET, POPPET
45	RR-05	RETAINING RING, .250 INTERNAL
46	JT-76HAT	JET, TOP HAT
47	SP-15	SPRING
48	VW-99	TOP OUT PLATE, 1.375 X .500
49	EY-75XXXX	EYELET, 7500
50	RS-81	REBOUND SCREW, ADJ SHAFT
51	OR-2008-B	O-RING, BUNA, 70 DUR0METER
53	MR-ROD	METERING ROD
54	NE-76	NEEDLE, 8760
55	OR-2007-B	O-RING, BUNA, 70 DUROMETER
56	VW-75020	WASHER, .750 X .020 X .500 VALVE
57	PI-XX005	PISTON, 55MM
58	PB-55	PISTON BAND, 55MM
59	NT-02R	RING NUT, .500 X 20, .440 LONG
60	SR-75XXXX	SPRING RETAINER, 7500 FLAT
61	RH-83XXX	RIDE HEIGHT, 8300
62	SC-M6M8-N	SCREW, GRUB M6 X 8MM NYLON

Warnings:

Penske Racing Shocks never recommends running lower than **50 psi** in our 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 driver feel.

We also do not recommend using pressure higher than 300 psi. This could result in stress fractures in main mounting components which may lead to seal or other failures.

Always check with Penske Racing Shocks technicians on recommended pressures for your 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 which serves the purpose to allow a small amount of fluid to be wicked onto the shaft when the shock operates. If you see excessive amount of fluid that may "pool" on the top of the shaft bearing, you may have a seal problem. Contact your Penske representative at once.

Loss of Gas Pressure:

If the shock for some reason loses its gas charge, a tell-tale sign of reduced or no gas pressure is that the shock (without a spring) when compressed, will not return to its fully extended position, or gradually gets much slower when reaching full extension.

Penske Shocks recommends checking gas pressure before each race. Gas pressure has become a fine-tuning option; we supply gauges to properly check gas pressure.

Technical Support:

8:30 AM – 5:00 PM (EST)

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