PENSKE RACING SHOCKS

PS-8975-STREET (Double Adjustable)

TECHNICAL MANUAL

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Introduction

Thank you for your purchase of your new Penske Racing Shocks 8975 Double adjustable!

The 8975-STREET Version shock 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.

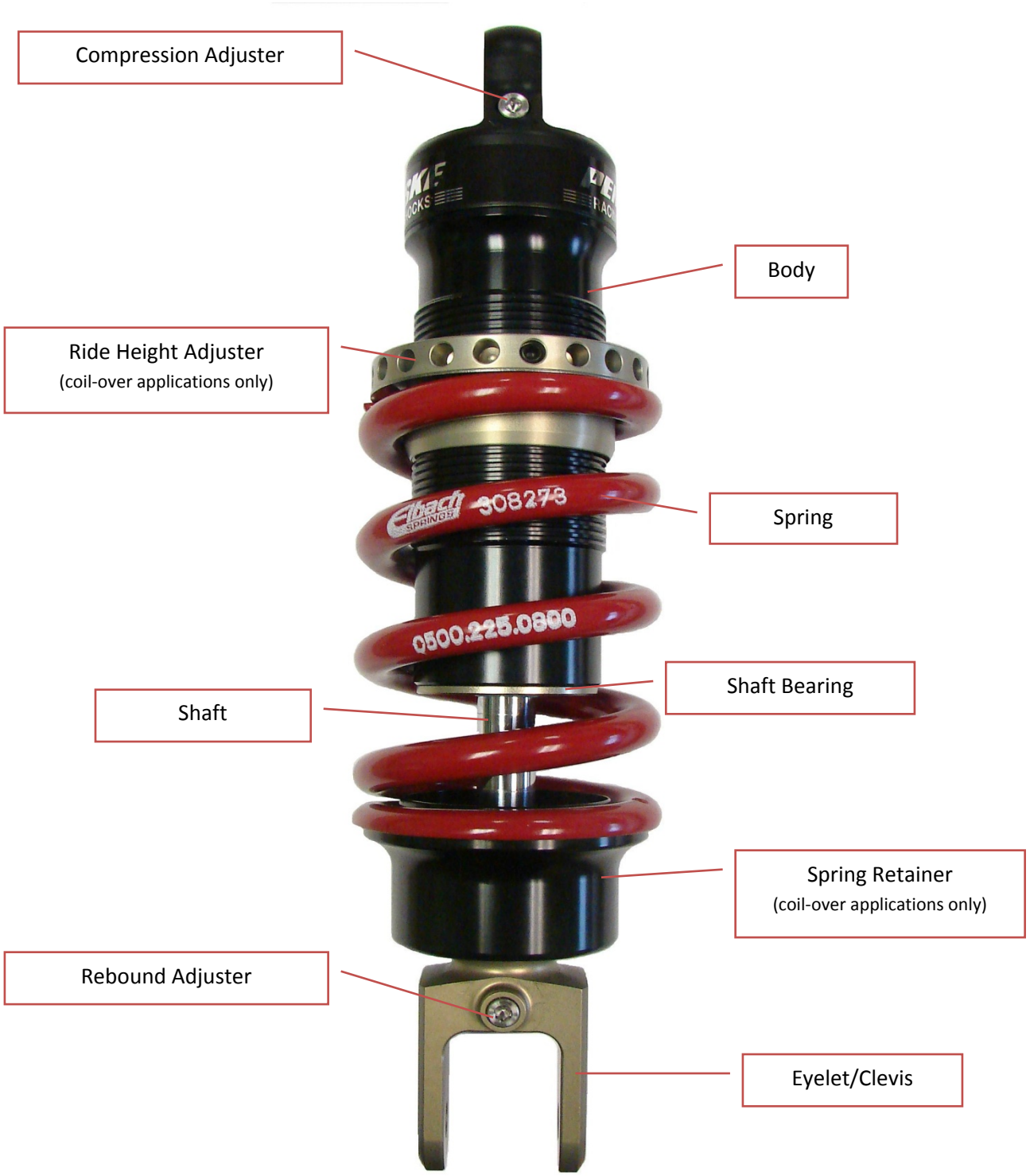
Every Penske Racing Shock is 100% hand built and dyno tested for the best performance and customer satisfaction. We stand by our products and routinely assist customers in getting the best performance from their shocks. The same components in the 8975 are used all over the world at the highest forms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

The 8975 series shocks are set from the factory at recommended starting settings for your application. They are pressurized and ready to go.

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

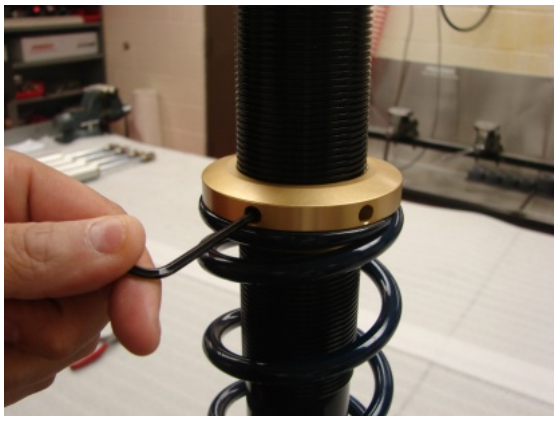
- *Standard Penske 55mm bore size which allows use of wide array of piston types.*
- *Low-friction shaft and piston seals.*
- *Hard anodized, 6000 series aluminum bodies and components for superior durability, performance, and repeatability.*
- *Hard-chromed 4130 main shaft with rolled threads for strength, 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 8975 has been 100% designed, machined, assembled, and tested for quality in the United States.*

Terminology:



To Set Preload:

The adjuster (gold or black with holes) is located on the top of the main spring. The adjuster is threaded and moves up and down the body of the shock compressing or releasing the spring pre-load. You will need a 3mm Allen Key to unlock and lock the adjuster when adjusting preload.



Preload Adjuster Tool: We have supplied you with a preload adjuster tool (steel pin with an angled head). In order to use this tool properly put the smaller angled tip into the hole of the adjuster and grip the longer part of the tool with your hand.

The shock should currently be set to a preload based on the personal information you gave us about your riding. A good baseline setting is .500" (1/2" or 12mm) of preload. What does that mean: If the spring is 5" (127mm) in total length with .500" (12mm) of preload the spring should measure about 4.500" (115mm) compressed.

To adjust the spring Stiffer you would turn the spring down the body (tighter). This motion would be normally from Right to Left (similar motion to tightening most applications). In reverse, to adjust the spring Softer you would turn the spring up the body (looser). This motion would normally be from Left to Right.

Approximately One (1) turn of the spring is equal to .150" (3-4mm) of preload. If your 5" (127mm) spring was set with .500" (12mm) preload and you turned the spring down (Stiffer) two complete turns the total length of the spring should measure 4.300" (110mm). In reverse if you turned the spring up (Softer) two complete turns it should measure 4.700" (119mm).

A tip: Mark the Preload Adjustment Collar with some paint or something so you can tell one complete turn. A sharpie will work too.

Check out our video on “how to change a spring” it will also explain how to set preload:
http://www.youtube.com/watch?v=vxn34K7An3o

Setting the Sag of the Shock

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.

2) Using a tape measure, measure the distance between the axle center line and a convenient location on the rear subframe.

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) Measure the distance between the axle center line and a convenient location on the rear subframe (same locations used in Step 1).

3) Record this measurement as "B". Your Bike:_____

STEP 3

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 tuck position.

3) The third person should then measure the distance between the axle center line and a convenient location on the rear subframe (same locations used in Step 1).

4) Record this measurement as "C". Your Bike:_____

STEP 4

1) Subtract "B" from "A". This number is your static sag or free sag.

Target: 6mm - 12mm Free Sag Your Free Sag:_____

1) Subtract "C" from "A". This number is your rider sag.

Target: 22mm – 35mm Rider Sag Your Rider Sag:_____

Setting the Sag of the Forks

STEP 1

1) Without a rider on the bike, have an assistant lift the front of the motorcycle until the front wheel is off the ground slightly.

2) Using a tape measure, measure the distance between the bottom of the chrome fork tube and the top, the total distance of exposed “chrome” fork tube.

3) Record this measurement as "A". Your Bike:_____

STEP 2

1) One person should hold the rear of the motorcycle, straddling the rear tire.

2) Measure the distance between the bottom of the chrome fork tube and the top, the total distance of exposed “chrome” fork tube. (same locations used in Step 1).

3) Record this measurement as "B". Your Bike:_____

STEP 3

1) One person should hold the rear of the motorcycle, straddling the rear tire.

2) Have the rider, wearing all of their gear, sit on the bike in a tuck position.

3) The third person should then measure the distance between the bottom of the chrome fork tube and the top, the total distance of exposed “chrome” fork tube. (same locations used in Step 1).

4) Record this measurement as "C". Your Bike:_____

STEP 4

1) Subtract "B" from "A". This number is your static sag or free sag.

Target: 15mm - 20mm Free Sag Your Free Sag:_____

1) Subtract "C" from "A". This number is your rider sag.

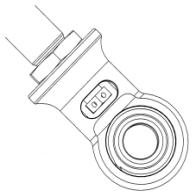
Target: 30mm – 40mm Rider Sag Your Rider Sag:_____

Adjusters:

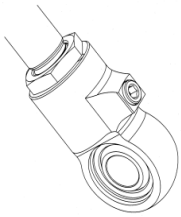
There are 2 external adjustments that can be made while on the bike, Compression and Rebound.

- **Compression Adjuster *(5/32 ALLEN KEY)-*** This is located in the body cap. This allows for **40** different positions of compression adjustment. A typical "B" compressions stack will have about 150 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, you do not need to continue to turn the knob for it to seal.



A



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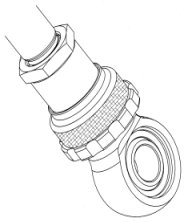


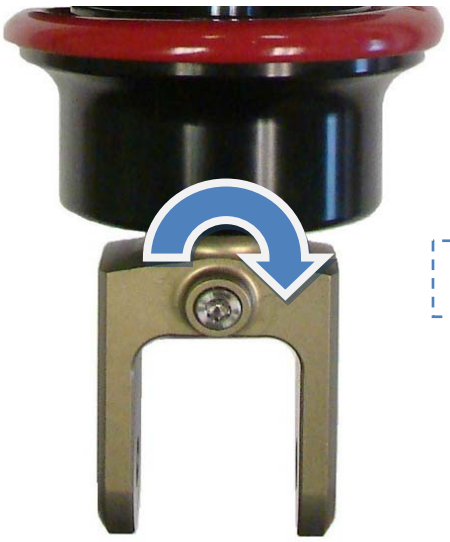
C

- Rebound Adjuster – There are several options for the rebound adjuster. Left pictured is an allen adjuster, right pictured is a sweep style adjuster.

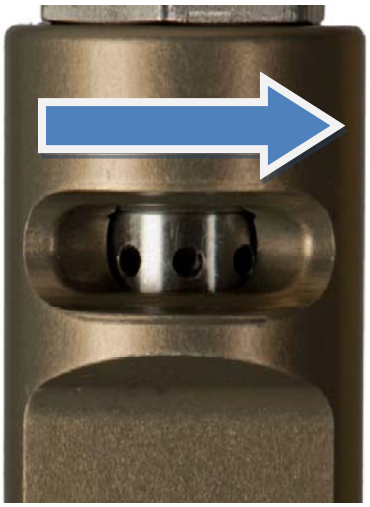
A. Hex Adjuster ***(5/32 ALLEN KEY)*** - **48** "clicks" of adjustment.
Clockwise = stiffer; Counterclockwise = softer.

B. Sweep Adjuster ***(pick or pin)*** - **48** "clicks" of adjustment.
Clockwise = stiffer; Counterclockwise = softer.

C. Knob Adjuster ***(hand operation)*** - **48** "clicks" of adjustment.
Clockwise = stiffer; Counterclockwise = softer.



Clockwise = Stiffer



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 or sweep adjuster 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.

Street Tuning: Symptoms and Suggestions

A. The simplest way to adjust in your suspension is to find a loop approximately 5 miles long where you can create multiple situations, sweeping corners, tight or braking corners, harsh bumps. It is also ideal for you to find a quick or easy stopping place (fuel station, bank, food store) Ride on the factory pre-settings, make changes, evaluate changes and continue and repeat in order to dial in "your" ideal setting.

B. Write down your original or current best setting. Then change only one adjustment at a time. Be patient, go back to your original settings if you get lost.

C. Bring your tools to adjust, also bring a flashlight to see shaft travel of the shock.

Harsh over bumps: If shaft travel is not within 1/8" from bottom (Black) bump rubber:

1. Go softer with compression, 2 to 4 clicks at a time (counter clockwise), if better continue going softer.
2. Reduce rear spring preload (increase sag) -1 turn at a time on spring perch.
3. Change to a softer spring rate.

Harsh over bumps: If shaft travel is clearly into the bottom (Black) bump rubber:

1. Too soft on compression can bring about a harsh feeling by allowing too much shock travel and compressing the bump rubber. Go Stiffer with compression, 2 to 4 clicks at a time (clockwise), if better continue going stiffer.
2. Increase rear spring preload (reduce sag) + 1 turn at a time on spring perch.
3. Change to a stiffer spring rate.

Wallowing exiting corner:

1. Stiffen compression, 2 clicks at a time. (clockwise)
2. Increase rear spring Preload (reduce sag). 1 turn
3. Slow down rebound, 2 clicks at a time (clockwise).
4. Change to a stiffer spring rate.

Slow turn-in:

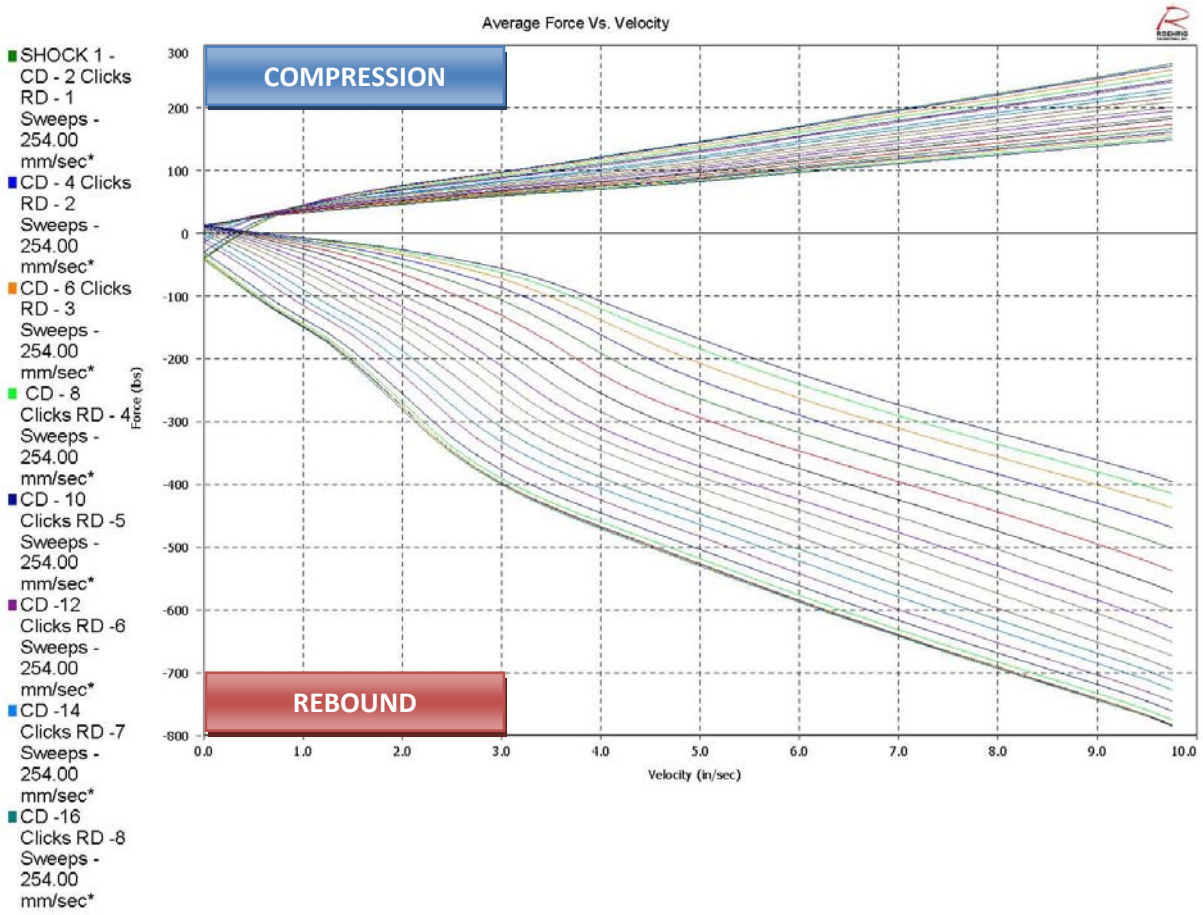
1. Raise fork legs in triple clamps – More fork tube sticking out of top of triple clamps. 3mm-5mm per change
2. Increase rear eyelet length, 1/2 to 1 turn at a time. – If applicable *Cannot exceed 12mm of thread exposed.
3. Soften fork compression
4. Reduce fork Preload (Increase sag)
5. Speed-up rear rebound. Counter Clockwise or (-)

Mid corner push - front:

1. Stiffen rear compression
2. Slow down fork rebound

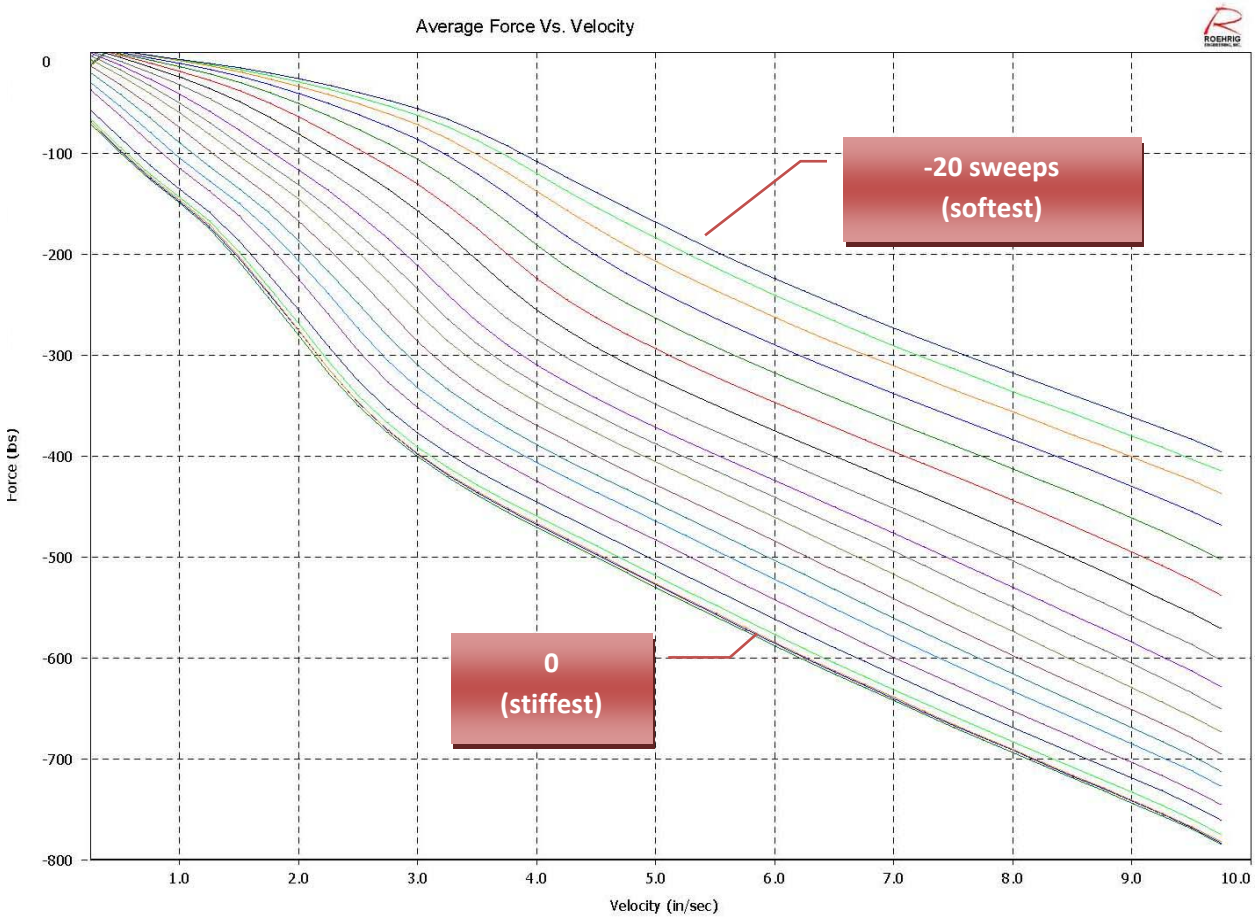
Adjustment Range: COMPLETE GRAPH

The 8975 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.



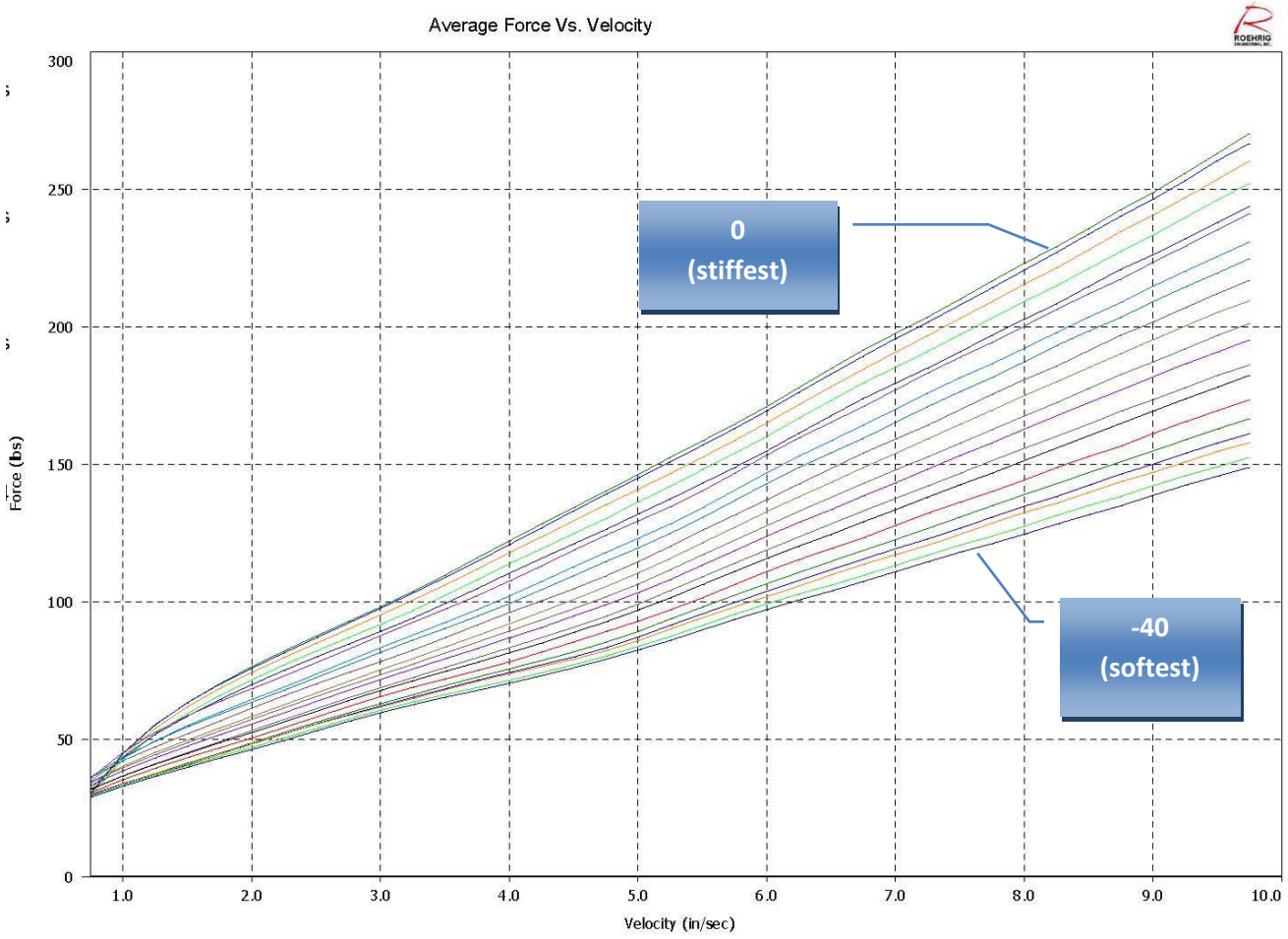
Adjustment Range: REBOUND

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)

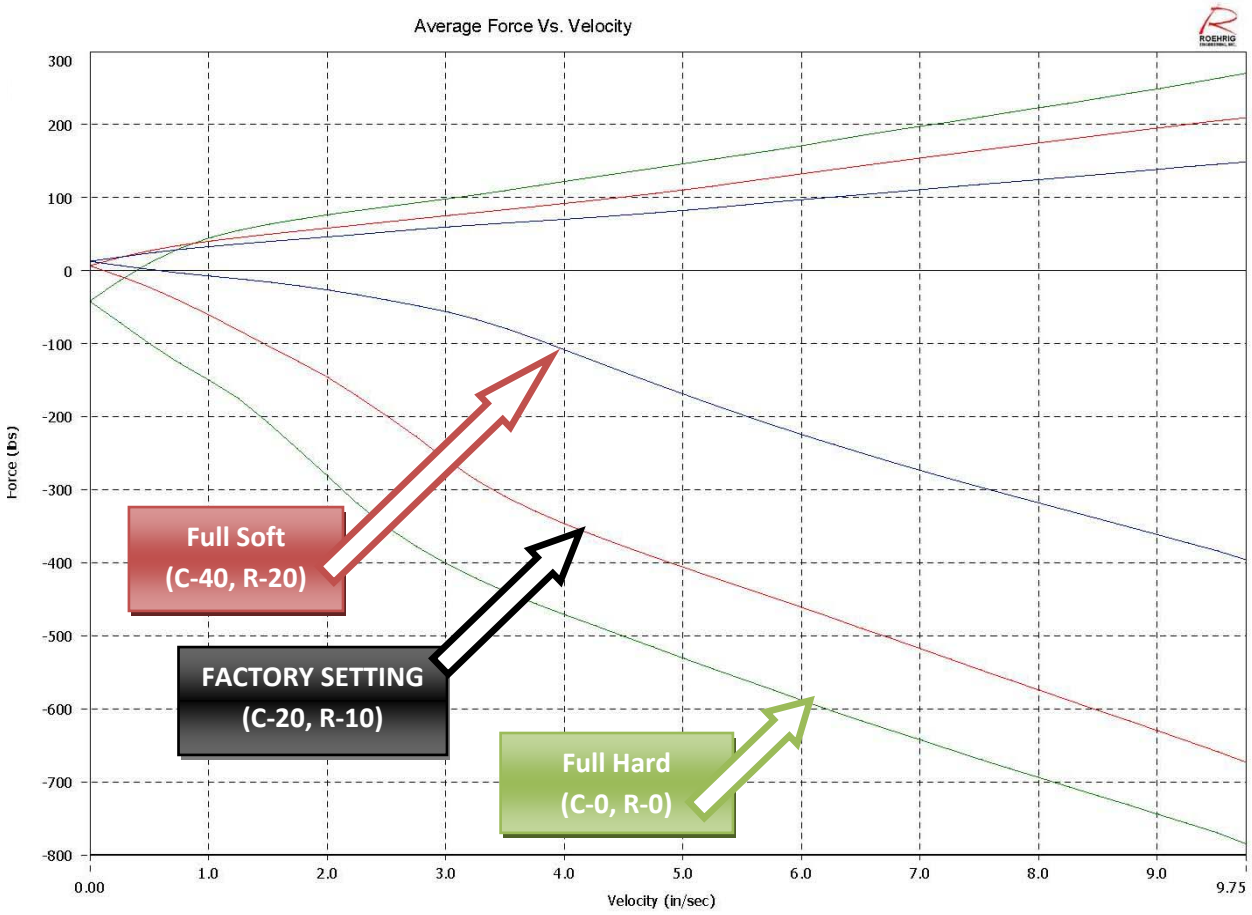
The compression adjuster works differently in that it is affected by displacement of the shaft. The more oil that is displaced the more effective the compression adjuster will be, or the more the rider will feel it. On very small bumps it may take more “clicks” on compression for a rider to feel a difference.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



Factory Settings:

Adjusters:

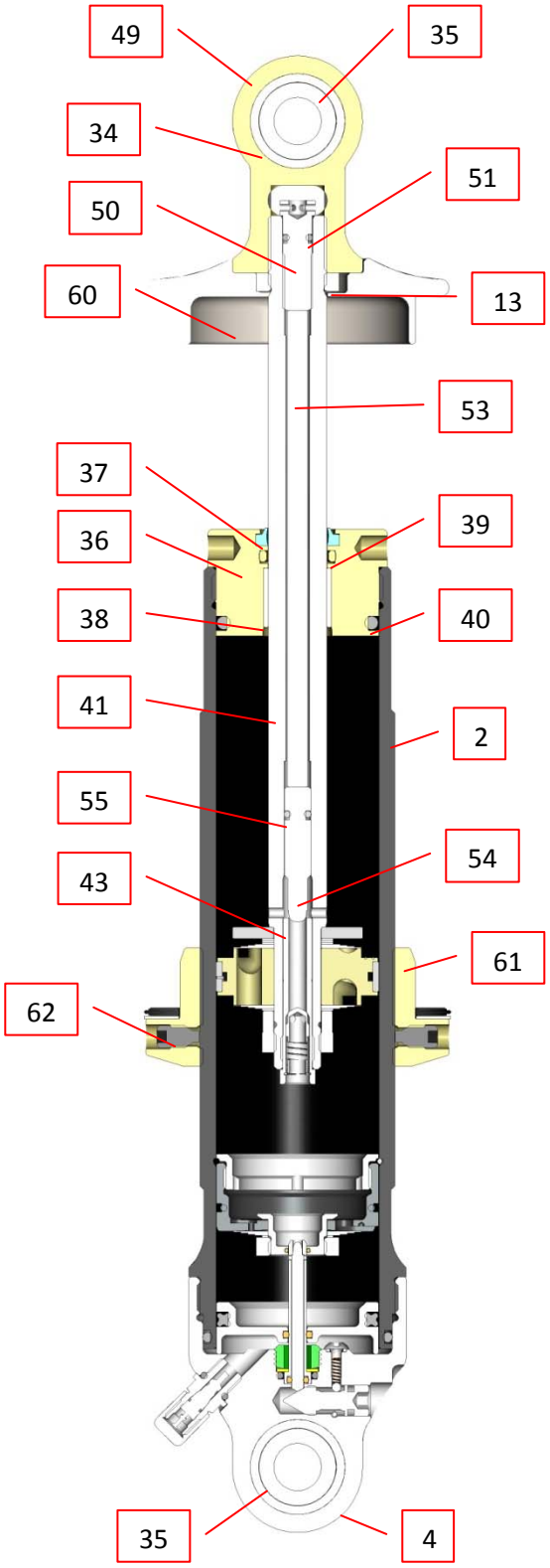
- Typically from the factory we will set the adjusters in the “mid-range” of the damper. This may be different depending on specific set ups. It will documented on your build sheet and dyno sheet what the start settings should be.
- Gas Pressure- This can vary depending on application. This could range 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.

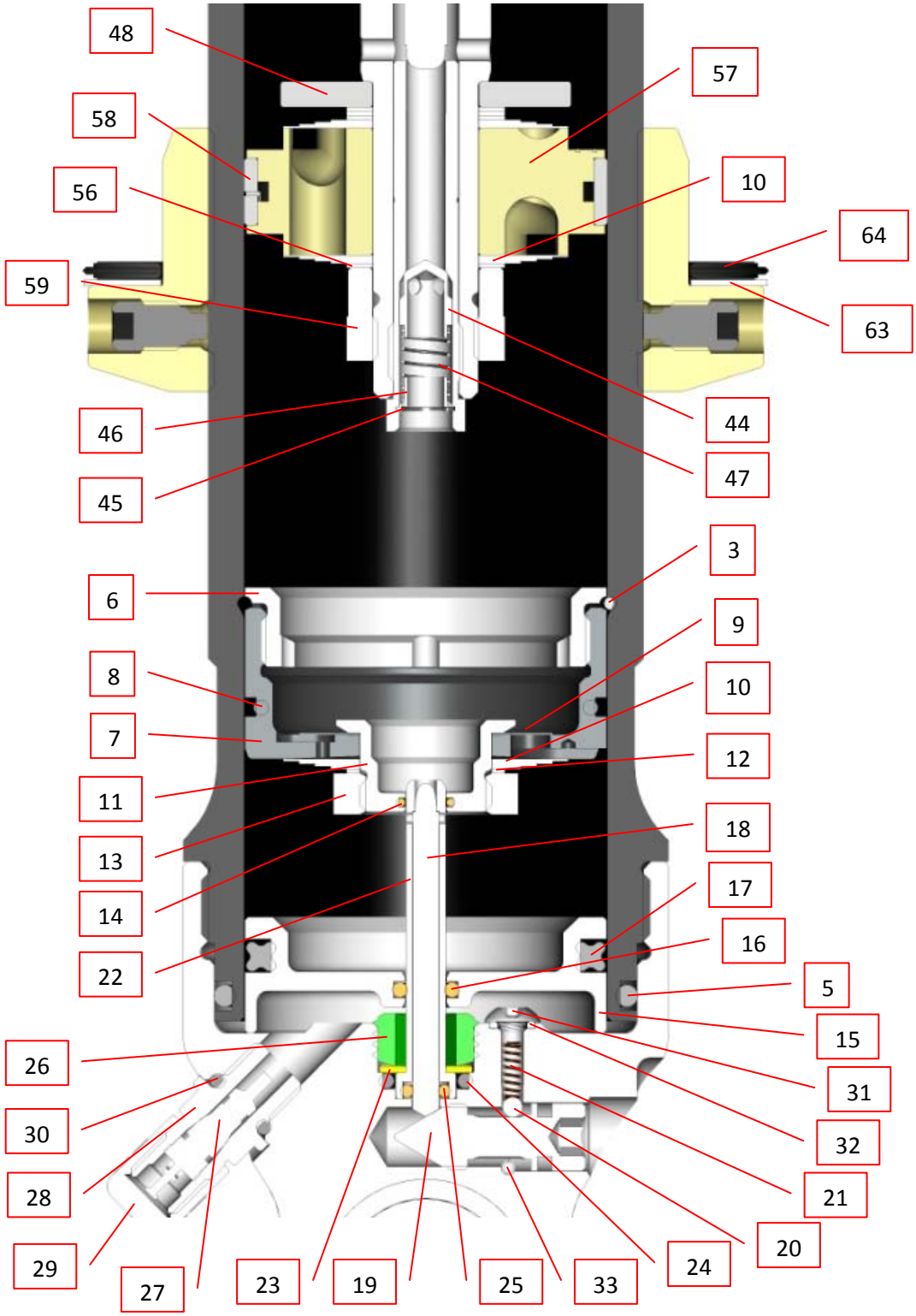


FACTORY SETTINGS:

COMPRESSION: =-25 / REBOUND: -25 SWEEPS/CLICKS

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 rider 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. If you have experienced a loss of gas pressure, contact your Penske representative at once.

Technical Support:

8:30 AM – 5:00 PM (EST)

Penske Racing Shocks – Technical Center
150 Franklin Street
Reading, PA 19602
United States

610.375.6180

Penske Racing Shocks Midwest
12666 U.S. Route 12
Brooklyn, MI 49230
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Apparel and Accessories:

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