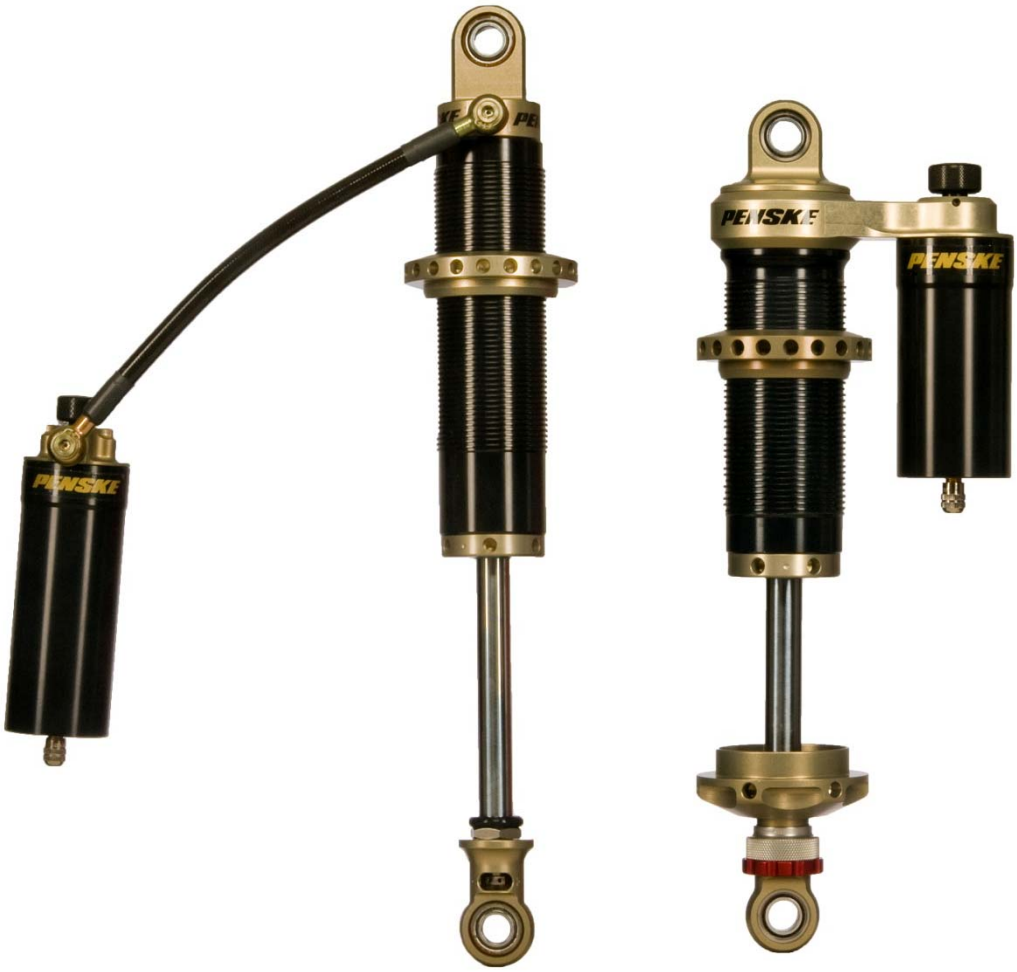
PENSKE
RACING SHOCKS®



PS-8300-DA

Shock, Double-Adjustable Remote & Piggyback

TECHNICAL MANUAL

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Introduction

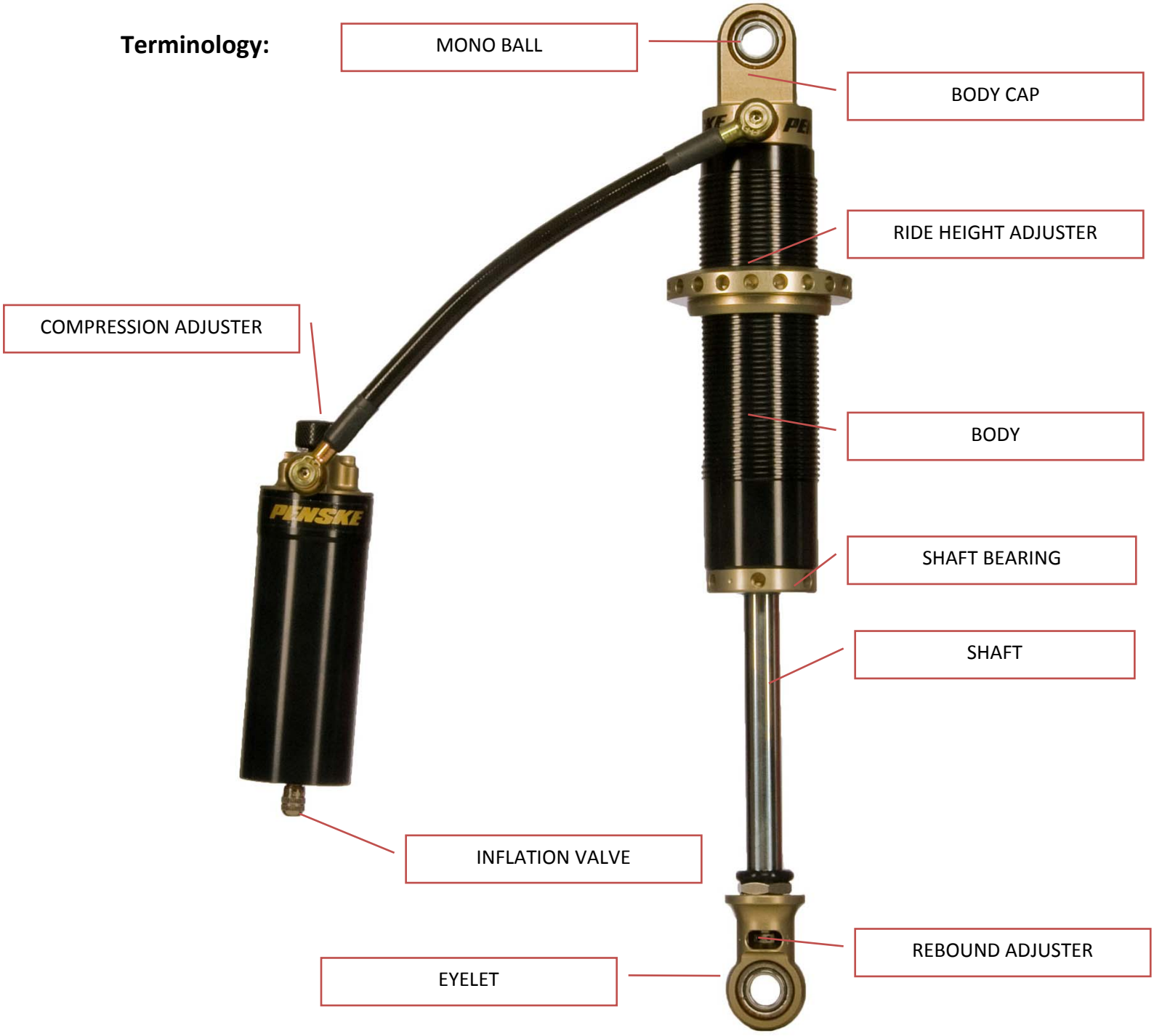
Thank you for your purchase of your new Penske Racing Shocks 8300 series double adjustable shocks!

The 8300 is our latest offering in two way adjustable configuration. This design has superseded our original 8100 design. As you will see in the following pages, major upgrades to performance and reliability have been added to make this the best two way adjustable shock on the market.

All of the fundamental attributes found in any Penske Racing Shock have been incorporated into the 8300 including:

- *Standard Penske 55mm bore size which allows use of wide array of piston types*
- *Low-friction shaft and piston seals*
- *Separate compression and rebound adjustment*
- *Hard anodized, 7000 series aluminum bodies and components for superior durability and performance*
- *Hard-chromed 4130 main shaft for strength, durability, and low breakaway friction*
- *Durable ACME thread body that allows quick adjustment of spring preload (.100" per turn)*
- *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 8300 has been 100% designed, machined, assembled, and tested for quality in the United States.*

Terminology:



Getting Started:

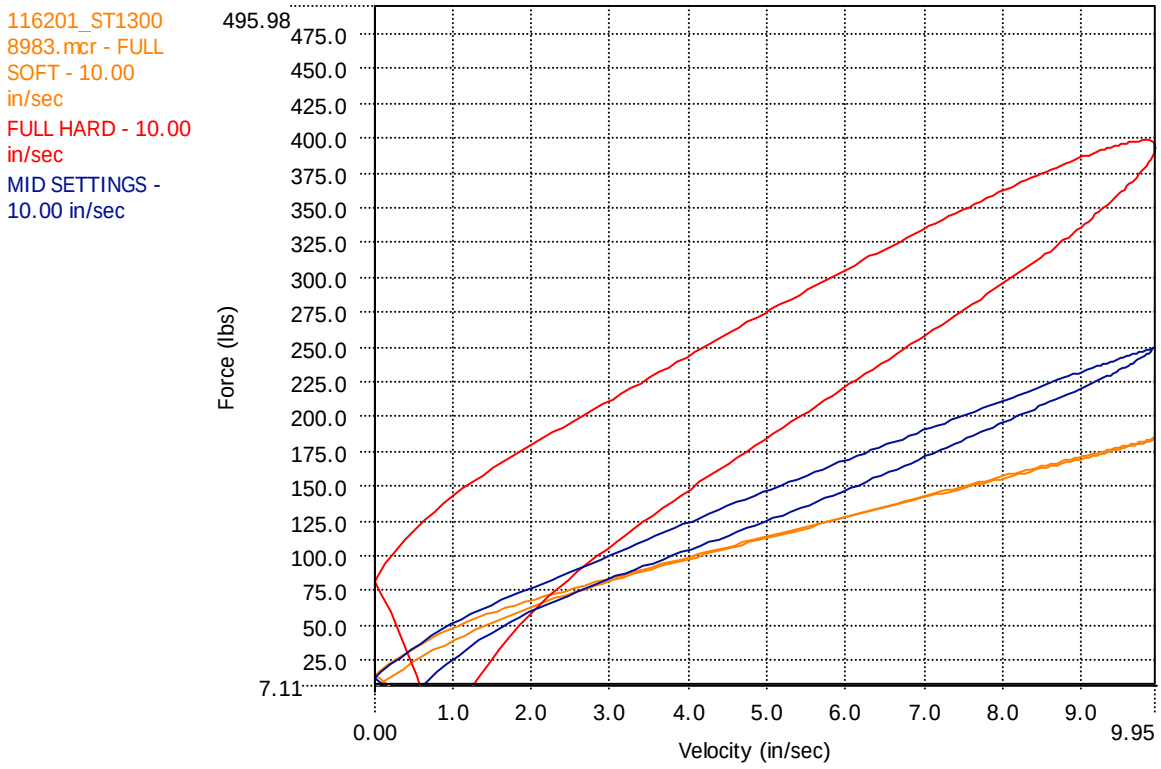
The 8300 series shocks come set from the factory at a pre set adjuster setting ready to bolt on your vehicle. They dyno graph supplied will show you full adjustment range and where they are currently set. We will typically try and set the shocks at a mid setting so you can adjust them either stiffer or softer depending on your feel.

Adjusters:

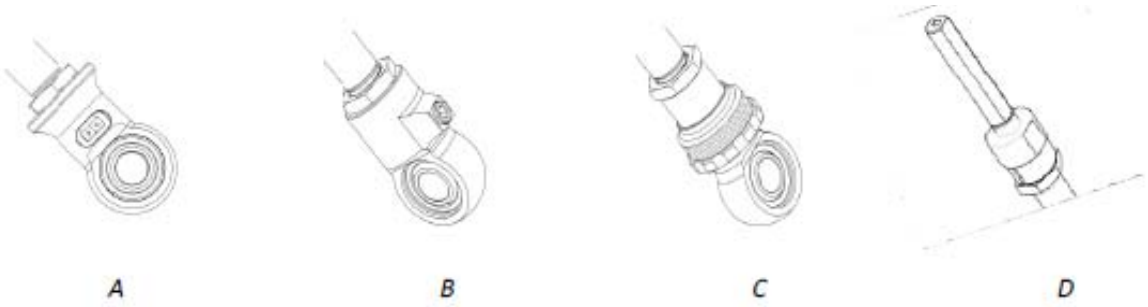
Compression Adjuster- This is the knob that is located on the remote or piggy back canister. This will generally have 20-22 clicks of compression. If instead of a knob, you have a ½" hex head, you will have 20 clicks of compression adjustment. On your dyno sheet, you should see about 175lbs-200lbs of total compression adjustment. On both adjuster types, clockwise is stiffer, counter clockwise is softer.

Knob adjuster side entry/ 20-22 clicks

Hex adjuster top entry / 20 clicks of adjustment



Rebound Adjuster- There are a couple different rebound adjustment knob options, all options have the adjuster mechanism on the eyelet end of the shock. Below are the different options and what they look like and the corresponding # of clicks.



A	B	C	D
SWEEP STYLE	*HEX CLICKER*	*KNOB CLICKER*	*SHAFT MOUNT*
20 SWEEPS	*40 clicks*	*80 clicks*	*4 revoloutions*

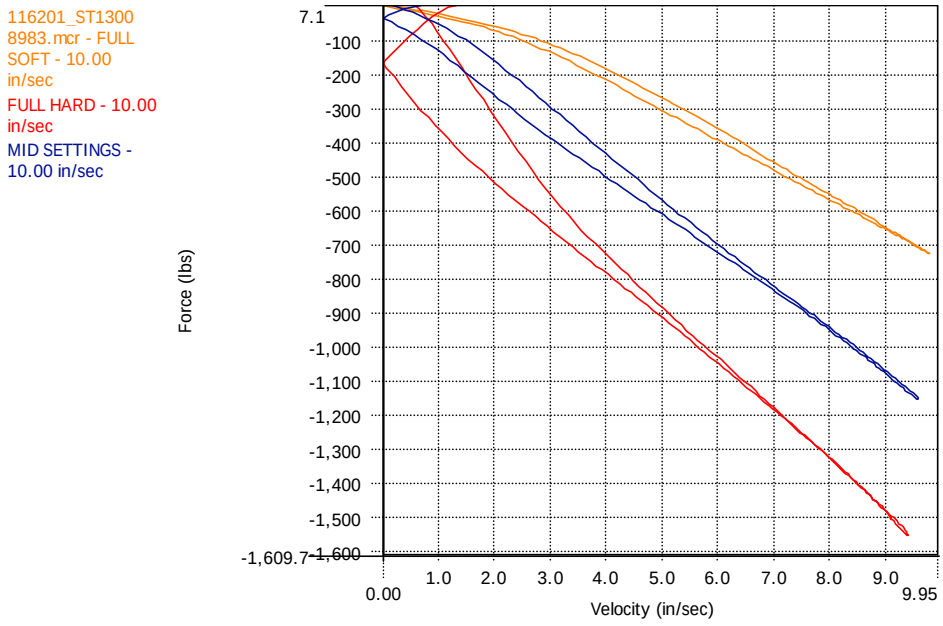
A. **Sweep Style** adjuster is our standard eyelet configuration. 1 sweep means from one side of the window to the other side.

B. **Hex Clicker** is an upgraded adjuster option. This eyelet requires the use of a 5/32 allen wrench to make adjustments

C. **Knob Clicker** this eyelet is our most user friendly, no tools needed. The eyelet is self de-tented, so you have positive clicks when turned by hand

D. **Shaft Mount** requires the use of a 3/32 "T-Handle" allen wrench. Detents can be added to this style adjuster for added cost. Typically this is a simple rotational type adjuster.

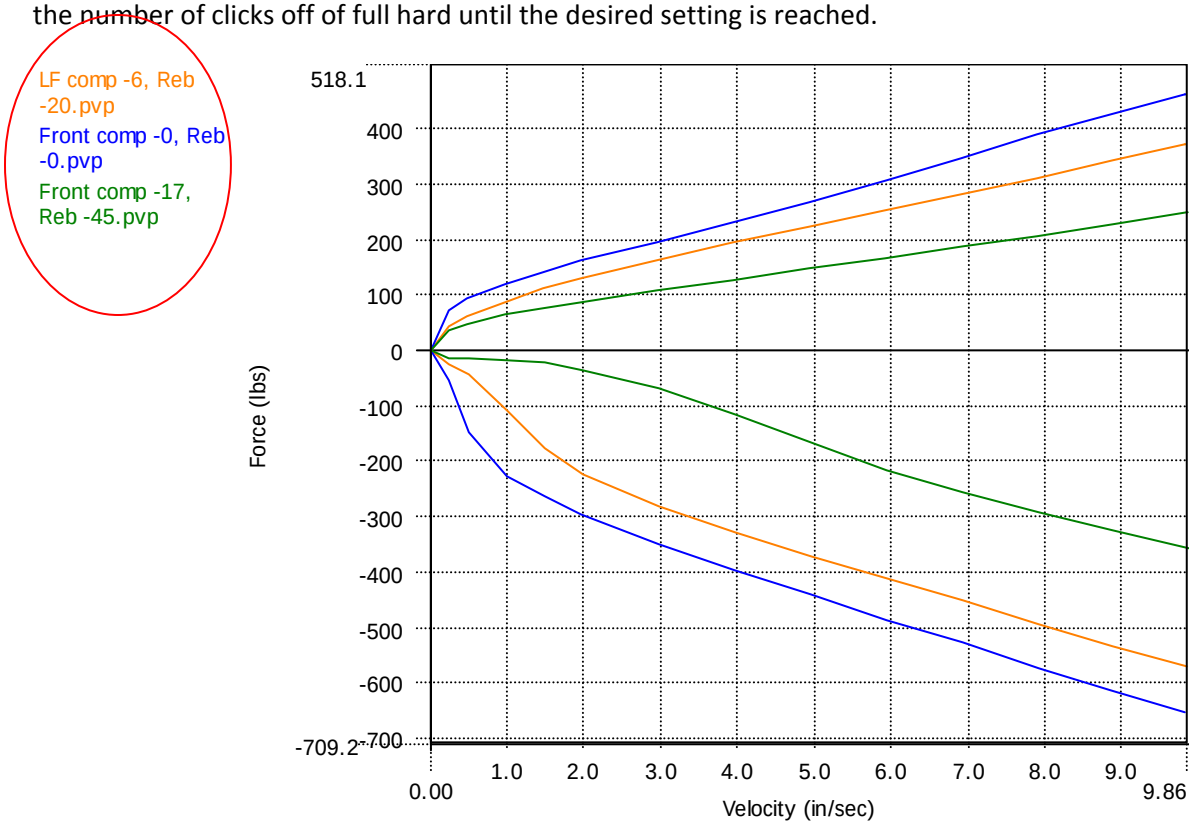
All rebound adjustment options will give you the same adjustment range. The increments may vary from adjuster to adjuster, but full hard and full soft ranges will be the same.



To Set Adjusters:

All or our adjusters work similar, in that “clockwise” is stiffer or more damping, “counter clockwise” is softer or less damping.

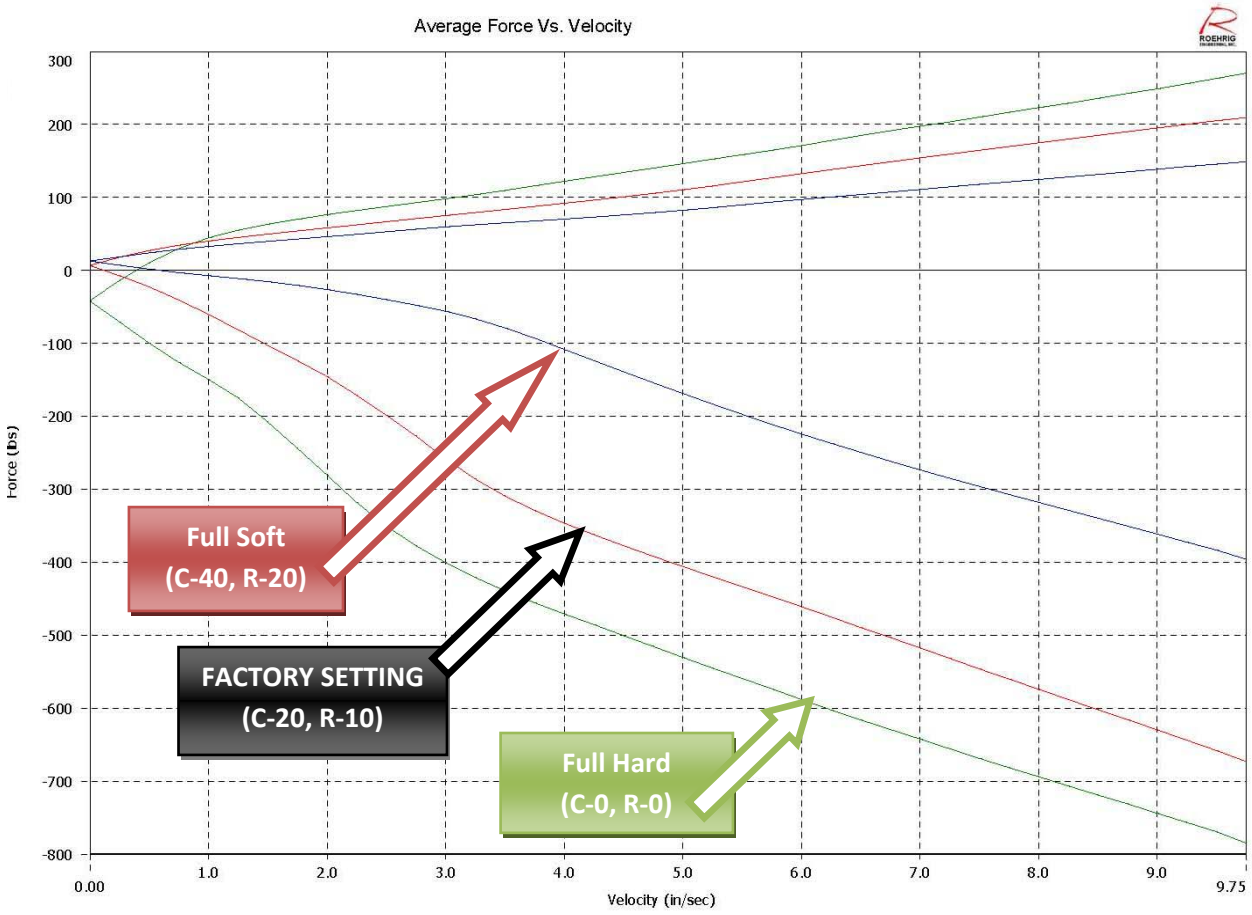
When you receive a dyno sheet, it will display your damping curve in full stiff, full soft, and shipped settings. You will notice the (-) before the setting; this identifies how many clicks **off of** full hard the adjuster was set to achieve this curve. Typically the graph will have a “C” for compression and “R” for rebound before the setting. If it doesn’t as an industry standard, compression is always referred to first, followed by rebound. So to set to specific setting, you would first wind adjuster to full hard, then count the number of clicks off of full hard until the desired setting is reached.



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 be 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:

Compression Adjuster:

There are a number of different ways to tune a car, with either compression or rebound. Below are a few good starting points for compression.

1. **Entry Under Steer/Push/Tight**-
    a. This typically is a result of too much front compression. Soften compression -5 clicks. Soften the compression until you lose platform in the front of the car, or the front feels under supported, then go back +2 clicks.
    b. Soften rear rebound. Sometimes too much rear rebound will not allow weight to transfer to the front which can cause and under steer condition.
2. **Entry Over Steer/Loose**-
    a. Add rear rebound. You don't want to take grip away from the front if you don't have to. So first work on the end of the car with the grip issue, in this case is the rear. Stiffen rear rebound, if the rear is too soft, it will allow too much weight to transfer to the front too quickly. By slow this, you will keep more weight on the rear, generating more grip, longer into the corner.
3. **Mid Entry Under Steer/Push/Tight**-
    a. First try and determine if the chassis is taking a set, then going into under steer, or if it under steers before taking a set.
        i. If it takes a set, then under steers, add compression to the front. This will support and slow the weight transfer just enough to eliminate or help the condition.
        ii. If the chassis doesn't feel like it is taking a set, or feels like you not into the track, soften the compression, this will make the chassis more compliant, allow weight transfer a little quicker to the front tires and help increase grip.
4. **Mid Entry Over Steer / Loose-**
    a. Determine if it's off throttle or on throttle. If over steer is induced when getting back to throttle, soften rear rebound.
    b. If over steer is coming off throttle, add rear rebound.

5. **Exit Under Steer:**

    a. Add front rebound, try and hold weight on the front tires longer increasing grip.

    b. If it is still over steering, increase rear compression. This will balance out the chassis by taking some grip away from the rear.

6. **Exit Over Steer:**

    a. Reduce rear compression. This will allow quicker weight transfer to the rear tires, creating more grip.

    b. Reduce front rebound. This again will transfer more weight to the rear tires resulting in more grip.

Gas Pressure:

Gas pressure is like spring rate. This is more used for a fine tuning adjustment. 50psi is similar to 5-10lbs of spring rate. Adding more gas pressure is a common adjustment for qualifying, when you need to get your tires to max operating temp very quickly. If you do this, remember to reduce PSI before racing or shortened tire life may result.

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 strut 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 strut for some reason loses its gas charge, the data may show that the velocity of that corner is much reduced. Also, a tell-tale sign of reduced or no gas pressure is that the strut (without a spring) when compressed, will not return to its fully extended position.

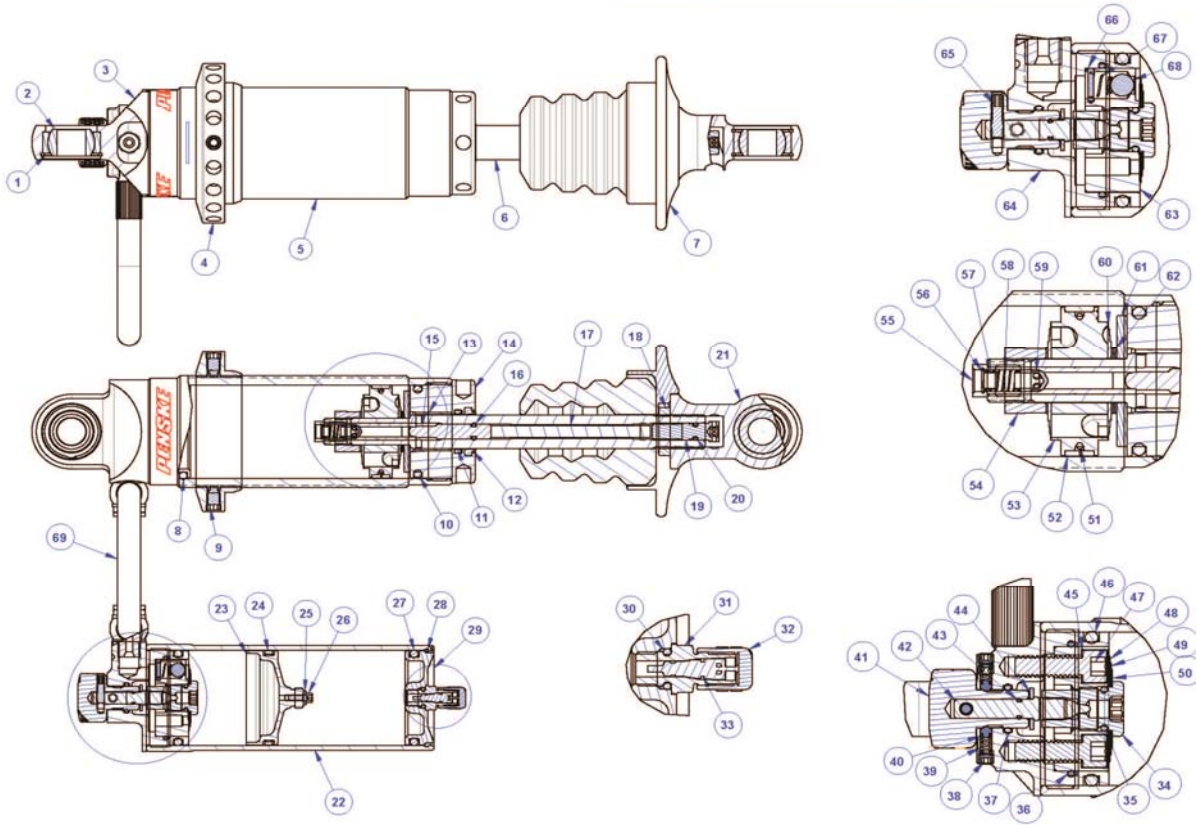
Failure of Shaft to Extend:

If the strut has lost pressure or lost excessive fluid, you may find that the strut shaft does not extend fully when compressed. In some situations, you may need to physically "pull" the shaft out in order for it to reach full extension.

Parts Diagram-

ITEM NO.	PART NO.	DESCRIPTION
*	AS-76RESCAP	RESERVOIR CAP ASSEMBLY (ITEMS 27 - 33)
*	AS-76SB	SHAFT BEARING ASSEMBLY (ITEMS 10 - 14)
*	AS-83SIDE-BJ	HOUSING ASSEMBLY (ITEMS 34 -50, 63 - 68)
1	RR-16	RETAINING RING, 1.025 SPIROLOC, STAINLESS
2	MO-8T	MONOBALL, .500 ID X 1.00" OD
	MO-15T	MONOBALL, 15MM ID X 1.00" OD
3	BC-830	BODYCAP, 8300 0
	BC-8390	BODYCAP, 8300 90
4	RH-83225	RIDE HEIGHT, 8300 2.25
	RH-83250	RIDE HEIGHT, 8300 2.50
5	BD-83___	BODY, 8300 C/O 10"- 24"ALUMINUM
6	SH-___	SHAFT, ADJ 10"- 24"
7	SR-81225	SPRING RETAINER, 8100 2.25
	SR-81250	SPRING RETAINER, 8100 2.50
8	OR-2221-B	O-RING, 2-221 BUNA 70 DURO
9	SC-M6M8-S	SCREW,SHCS M6 X 8MM STEEL W/NYLON
10	OR-2221-B	O-RING, 2-221 BUNA 70 DURO
11	OR-2114-V	O-RING, 2-114 VITON 75 DURO
12	SL-09	SHAFT WIPER, .625 POLY (BLUE)
13	BU-10DU10	BUSHING, DU .625 X .625
14	SB-765	SHAFT BEARING, 8760
15	NE-76	NEEDLE, 8760
16	OR-2007-B	O-RING, 2-007 BUNA 70 DURO
17	MR-ROD	METERING ROD
18	NT-04J	JAM NUT, .625 X 18
19	RS-81	REBOUND SCREW, ADJ SHAFT
20	OR-2008-B	O-RING, 2-008 BUNA 70 DURO
21	EY-81160	EYELET, 8100 1.60 SWEEP 0°
	EY-81160NH	EYELET, 8100 1.60 SWEEP NO HOLE
	EY-811690	EYELET, 8100 1.60 SWEEP 90°
	EY-81200	EYELET, 8100 2.00 SWEEP 0°
	EY-81230	EYELET, 8100 2.30 SWEEP 0°
22	RB-76_	RESERVOIR BODY, (4" - 7")
23	PI-76	PISTON, 8760 RESERVOIR
24	OR-4222-B	QUAD RING,4-222 BUNA 70 DURO
25	SC-18	SCREW, SHCS 4-40 X1/4
26	SL-87	SEAL, DOWTY
27	OR-2222-B	O-RING, 2-222 BUNA 70 DURO
28	RR-06	WIRE RING, .0625 WIRE DIAM. X 1.900
29	CP-76	CAP, RESERVOIR PORT O-RING

ITEM NO.	PART NO.	DESCRIPTION
30	OR-2010-B	O-RING, 2-010 BUNA 70 DURO
31	IU-20-A	AIR VALVE, PORT O-RING, ALUM.
32	IU-06	VALVE CAP, HIGH TEMPERATURE
33	IU-04	VALVE CORE, 2000 PSI
34	JT-83LS	JET, 8300 CD ADJUSTER
35	OR-2012-B	O-RING, 2-012 BUNA 70 DURO
36	OR-2028-B	O-RING, 2-028 BUNA 70 DURO
37	OR-2013-B	O-RING, 2-013 BUNA 70 DURO
38	SC-08	SCREW, SOCKET SET8/32 X 1/8
39	SP-14	SPRING, (A109)
40	BA-125-ST	BALL, 1/8 STEEL
41	KN- 83LS	KNOB, 8300 CD ADJUSTER
42	SC-83LS	SCREW, 8300 CD ADJUSTER
43	OR-4MMX1MM-B	O-RING, 4 MM X1 MM BUNA
44	VW-83CD	WASHER, 8300 CD ADJUSTER
45	VW-01-C	CRUSH WASHER, .25 ID. COPPER
46	OR-2222-B	O-RING, 2-222 BUNA 70 DURO
47	SC-06	SCREW, 1/2-20 X 3/4
48	VW-120012	WASHER, 1.200 X .012 X .500 VALVE
49	VW-105012	WASHER, 1.050 X .012 X .500 VALVE
50	VW-90012	WASHER, .900 X .012 X .500 VALVE
51	OR-2028-B	O-RING, 2-028 BUNA 70 DURO
52	PB-55	PISTON BAND, 55MM
53	PI-____	PISTON
54	NT-02R	RING NUT, .500 X 20, . 440 LONG
55	JT-RDHSNG	JET, RD STRAIGHT THRU
	JT-76RD	JET, REBOUND (ITEMS 55 - 59)
56	RR-05	RETAINING RING, .250 INTERNAL
57	JT-76HAT	JET, TOP HAT
58	SP-15	SPRING, (FF71)
59	JT-76POP	JET, POPPET
60	VS-__	VALVE STACK, (AA-F)
61	VW-99	TOP OUT PLATE, 1.375 X .500
62	VW-75020	WASHER, .750 X .020 X .500 VALVE
63	PI-83CD	PISTON, 8300 CD ADJUSTER
64	HG-83SIDE	HOUSING, 8300 SIDE, BANJO
65	SC-91	SCREW, SOCKET SET 6-32 X .500"
66	DO-06	DOWEL PIN, 1/16 X 3/8
67	SP-10	SPRING, (TA2086)
68	BA-250-ST	BALL, 1/4 STEEL
69	HO-83__-SW	HOSE, 8300 (6"-36"), SWIVEL HEAD



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