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QA1 Shock & Spring Selection Tips

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QA1 Shock & Spring Selection:

I have many people asking me for advice about QA1 shocks & springs for them. At this time, I cannot make recommendations based on installing them on my car, but I do plan to do so. However, I have driven cars with QA1s installed and have also been following the various FerrariChat QA1 threads for several years & have compiled the following based on what people have reported they are using.

The 328s with S/N below 76626, and all the 308s Use the same physical size & length Koni shocks. The 308 GT4s use the same length front shocks as the 308s, however, the 308 GT4s rear shocks are about 1” longer than the 308 shocks, so require either a longer shock, a paperweight, or a 3/8” shock rod extender.

Different 3x8 models had slightly different spring rates & their Konis had different damping & rebound rates as shown in the following table from Ferrari documentation:

DESCRIPTION	MODEL APPLICATION					
	308 GT4		308 GTB		308 GTS	
	Front	Rear	Front	Rear	Front	Rear
Suspension Spring Part No.	113040	108435	113516	113517	113040	113039
Spring Flexibility mm/Kg (LBf / in)	(175) 0.32	(186) 0.30	(200) 0.28	(200) 0.28	(175) 0.32	(186) 0.30
Spring Length unladen	368.5mm (14.50")	367mm (14.44")	341mm (13.43")	376mm (14.80")	368.5mm (14.50")	386 (15.19")
No. of Spring Coils	12.6	12.3	11.5	12.75	12.6	12.85
External Diameter	102.5mm (4.035")	102.5mm (4.035")	102.5mm (4.035")	104mm (4.09")	102.5mm (4.035")	105mm (4.133")
Wire Diameter	12.5mm (.492")	12.5mm (.492")	12.5mm (.492")	13mm (.512")	12.5mm (.492")	13mm (.512")
Replacement Spring Part No.	113054	113055	110784	110871	---	---
Shock Absorber Part No.	110786	104441	110786	110787	110786	110787
Koni Shock Absorber Part No.	82P 1982SP1	82P 1831SP1	82P 1982SP1	82P 1983SP1	82P 1982SP1	82P 1983SP1
Setting Data	45/140	45/150	45/140	45/140	45/140	45/140
Replacement Shock Absorber Part No.	110786	---	110786	110787	110786	---
Replacement Koni Shock Absorber Part No.	82P 1830	82P 1831	82P 1938	82P 1939	82P 1830	82P 1983

QA1 Shock Alternatives:

308/328:

The generally preferred QA1 shocks for 308/328 applications are the single adjustable[1] shocks:

Front: DS402 or HAL-DS402 (formerly HAL-DR4855P) Single Adjustable 14” max height, Poly bushing (2 needed)[2]

Rear: DS502 or HAL-DS502 (formerly HAL-DR5855P) Single Adjustable 17” max height, Poly bushing (2 needed)

If you want dual adjustable[3] shocks, the part numbers are:

Front: DD402 or HAL-DD402 (formerly HAL-DDR4855P) Dual Adjustable 14” max height, Poly bushing(2 needed)[2]

Rear: DD502 or HAL-DD502 (formerly HAL-DDR5855P) Dual Adjustable 17” max height, Poly bushing(2 needed)

308 GT4 Single Adjustable shocks:

Front: DS402 (Same as 308/328) (2 needed)[2]

Rear:

HAL-DS502 with either a paperweight, or with a HAL- 9029-163 Aluminum 1" extension 9/16-18 thread (2 needed)

OR

HAL-DS602 (formerly HAL-DR7855P) Single Adjustable 18.750” max height, Poly bushing (2 needed)[4]

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[1] The single adjustable shock has 1 knob that adjusts both damping & rebound at the same time. It’s simpler to setup the shock, & most people find the settings give a good balance between the two. For street cars with occasional tracking single adjustables are recommended.

[2] You will have to either buy paperweights, or cut out a bit of the inside of the front upper A-frames to clear the QA-1 shock body.

[3] The dual adjustable shock has separate knobs for damping & rebound. It provides a wide range of adjustability, but you really need to know a lot about suspension tuning to take advantage of it. For track only cars seeking the ultimate in track performance dual adjustables are recommended.

[4] One user reported a possible issue with DS602s when the car is on jack stands or a lift: Max travel on the passenger side may be an issue depending on particular spring height & spring rate: There is potential for the half shaft to want to sit on the exhaust pipe at full droop.
On his car at full droop the spring collar would sit up against the lower a-arm and limit the travel so the half shaft didn't touch the exhaust. Conceivably others might have to find another way to limit the travel. Under normal operating conditions (the car isn't on jack stands) there are no issues.

Spring Selection:

SPRING RATES:
You cannot directly compare the spring rates used with the OEM Konis to spring rates used with QA1s or other adjustable perch shocks. This is because the stock springs have 2” to 3” more preload (initial compression) than the springs used for adjustable shock installations. In general, to compensate, the springs for adjustable shocks will have spring rates that are at least 50 – 100 lbf/in higher than the stock springs.

Also, In general people have reported that a 50 lbf/in higher spring rate on the front gives better handling with less nose dive than more closely matched or rear biased stock spring rates. The STREET/TRACK and TRACK ONLY categories in the table below are approximate. There is a trend towards selecting the higher 350/300 or 375/325 STREET/TRACK and even the TRACK ONLY spring rates for street use as people learn to tune their corner balancing (wheel weighting) and adjust the shocks. I’ve recently had a few people report being disappointed with the lower two STREET/TRACK spring rate pairings

Here’s what people have reported using for springs to go with QA1 (and similar) coilover shocks:

SPRING RATES lbf/in							
LOCATION	**LENGTH(in)**	**STREET/TRACK**				**TRACK ONLY**	
Front	10”	250	300	350	375	400	450
Rear	12”	225	250	300	325	350	400

FRONT SPRINGS: (FFF is the desired spring rate. – see table.)

a) Eibach 1000.250.0FFF Coil Over Spring, Red Powdercoated, 2.50 in. Diameter, 10 in. Length, FFF lbs./in (2 needed) Silver is also available, add ‘S’ to the
or:
b) 10HTFFF (formerly HAL-10-FFF) QA1 Racing Springs: Coil-Over Spring, FFF lbs./ in. Rate, 10 in. Length, 2.5 in. Diameter, Silver Powdercoated, (2 needed)

REAR SPRINGS: (RRR is the desired spring rate – see below)

a) Eibach 1200.250.0RRR Coil Over Spring, Red Powdercoated, 2.50 in. Diameter, 12 in. Length, RRR lbs./in. (2 needed)
or:
b) 12HTFFF (formerly HAL-12-RRR) QA1 Racing Springs: Coil-Over Spring, RRR lbs./ in. Rate, 12 in. Length, 2.5 in. Diameter, Silver Powdercoated, (2 needed)

NOTES:

- Eibach also lists these coilover springs under ‘off-road’ and ‘race’ applications, but the p/ns are all the same.

- QA1 No longer lists springs with 375 lbf/in spring rate, but Eibach still lists them..
- While I’ve always understood that you can mix different brands on front & rear, so it should be OK to have Eibach front sprints with QA1 springs on the rear. However, There are peple on the web saying keep the front & rear brands the same.

You also should get:

HAL-BC02 Shock Bumpers, Rubber Compression, 1.9 in. O.D., .875 in. Length, (4 needed) - These prevent the shocks from being damaged by hard bottoming out. The bumpers mount on the shock rod. You have to remove the upper eye/spring perch, slip the bumper onto the rod & then reinstall the eye & spring perch & torque the eye again. NOTE: Discard the metal washer that comes with the BCO2, QA1 tech support says it’s not needed with these shocks.

HAL-T114W Coil Over Adjustment Tool, Steel, 2-Spanner Wrenches, Non-Adjustable, Set (1 set needed to adjust the shock ride height & wheel weighting)

HAL-7888-109 Shock Bearing, Coil-Over, Steel, Roller Thrust Bearings and Washers, Kit (2 sets needed). The bearings mount on top of the adjusting ring so that it can turn freely without friction against the spring or the spring turning. Each bearing has 3 parts: Two flat washers, & the rollers mounted in a ring housing. The washers are the bearing races; they go on each side of the roller ring to provide a smooth surface for the rollers to work against. These aren’t absolutely necessary, but make adjusting ride height & wheel weight MUCH easier.

QA1 Shock Adapter Bushing 4-wheel set from Unobtainium Supply Co. - Adapts the QA1 ¾” poly eye thru-hole to the Ferrari 12mm mounting bolts. Also provides correct length & resistance to avoid breaking the shock mounting ears when the thru-bolt is torqued down.

The QA1 poly bushings's width varies quite a bit. The shim washer combination in this kit was selected to cover the full range of poly bushing widths:
The kit comes with 2 each of the two shim washer thicknesses: thin (0.030") & thick (0.060)"/bushing. Start with a thick washer on each side of the poly bushing & install the retaining rings. It's OK if the poly is compressed slightly, but there should be no side to side play. Add one or both of the thin shim washers as needed to eliminate side play.

Very infrequently people have reported only needing to use a thin & thick washer.

BTW, hold onto any unused shims. If you ever have to replace a poly bushing with the 2-piece 'repair' bushing you may need them.

Paper Weight, Stretched Eye – get 2 from Unobtainium Supply Co.
See this Fchat thread: http://www.ferrarichat.com/forum/showthread.php?t=142079

QA1 Web site: https://www.qa1.net/tech-center/street-performance-racing-faqs

The QA1 web site has catalogs & documents with a substantial amount of useful technical details.

Eibach Web Site: Eibach Coil-Over Springs

Go here for more information about Eibach springs:

Here are some of the more useful QA1 installation related FerrariChat threads:

Group Buy: QA1 Coil-over Shock Bushings:
http://ferrarichat.com/forum/showthread.php?p=137227182

Installing QA-1s
http://www.ferrarichat.com/forum/showthread.php?t=100632

GROUP BUY: Extended Length Shock Eye Paper Weights
http://www.ferrarichat.com/forum/showthread.php?t=142079

QA1 Front shocks with NO A-arm modification!
http://www.ferrarichat.com/forum/showthread.php?t=134442

Ferrari 3x8 Suspension Upgrades:

308 Suspension Springs/Shocks
http://www.ferrarichat.com/forum/showthread.php?t=11974

Suspension and Brake Upgrade Time
http://www.ferrarichat.com/forum/showthread.php?t=39712

suspension recommendations
http://www.ferrarichat.com/forum/showthread.php?t=2388

Aftermarket Spring Rates for a 308
http://www.ferrarichat.com/discus/messages/256120/261228.html

QA1 shocks for the 328- info/wisdom sought
http://ferrarichat.com/forum/showthread.php?t=204283

308GT4 Threads:
QA-1's on GT4 - Slightly worried
http://www.ferrarichat.com/forum/showthread.php?t=157432

QA-1's on GT4
http://www.ferrarichat.com/forum/showthread.php?t=191813

1st drive after Suspension Rebuild
http://www.ferrarichat.com/forum/showthread.php?t=195212

GT/4 rear ride height
http://www.ferrarichat.com/forum/showthread.php?t=165768

WARNING, WARNING:
Read the following QA1 shock eye Installation procedure to avoid risk of a serious accident after installing QA1s or other shocks with removable eyes.

QA1 EYE INSTALLATION PROCEDURE

By Birdman

In conversations with QA1 tech support, they made it clear that ***the following steps are necessary for safe reinstallation of eyes on QA1 shocks:***

You will need:

- Small tube of RED (maximum strength) Loctite thread lock
- Lacquer thinner or spray brake cleaner

PROCEDURE:

1. Remove the lock nut from the end of the shock shaft.

2. Thoroughly clean the eye, jam nut, & shaft threads, then degrease the threads, nut, & bottom of the eye with aerosol brake cleaner or other solvent & let it evaporate for a few minutes to ensure there's no cleaner left on the parts.

3. Screw the jam nut down on the shaft as far as it will go (just finger tight).

4. Apply red Loctite to the shaft threads from the jam nut to the shaft's end, also apply it to the bottom of the eye where the jam nut will press against it.

5. Quickly screw the eye down onto the shaft until the shaft bottoms out inside the eye, or the eye bottoms out on the jam nut. If available, clamp the shaft between blocks of wood, or aluminum & tighten the eye down firmly onto the shaft.

6. Use something round like a steel rod, piece of round pipe, pry bar, big-ass screwdriver, etc. inside the eye to hold it while you tighten the jam nut up firmly against the bottom of the eye.