

MARZOCCHI

TECHNICAL MANUAL

2004

Contents

p3	-Bomber Technology & Glossary
p5	-Maintenance
p6	-Lubrication
p7	-Torque Specifications
p7	-Fork set up tips
p7	-Break-in
p8	- Spring Pre-load
p8	-Sag
p8	-Coil Spring
p9	-Coil spring chart
p11	-Air Spring
p11	-Air Pump
p12	-Oil Height & Volume
p13	-Oil level chart >01
p14	-Oil level chart 02-03
p15	-Oil level chart 04
p15	-Negative Travel
p16	-Rebound Damping
p16	-Compression Damping
p17	-Damping; how it works?
p18	-Trouble-Shooting

Bomber Technology and Glossary of terms

Open Bath

Open Bath Damping is the heart of our Marzocchi technology. Damping can be described in a multitude of ways but simply put, quality damping means greater rider comfort and control. Marzocchi's technology incorporates 53 years of suspension development where performance is paramount. No one else has our heritage when it comes to suspension development. Our technical philosophy lets our internal design take the guesswork out of complicated and confusing settings. After all, who wants to spend the time and has the skill to constantly be fine tuning their fork according to varying trail conditions. Using our sophisticated Speed Sensitive Valve technology, we've designed our damping systems to automatically provide the right amount of shock absorption. It all relates to how hard and fast you encounter impacts. The slower the fork compresses the less amount of damping is needed. The faster and harder the fork compresses the more damping is required to absorb the force and resist bottoming out. By flowing oil through a series of circuits or valves, damping can be varied automatically, taking the guesswork out of complicated adjustments.

The Open Bath component of our design technology is pure and simple. Oil is the best damping element and that's why it's used throughout the suspension world. Marzocchi's "Open Bath" technology functions in three distinct ways; first the oil is used as a lubricant, secondly it's a coolant, and thirdly oil is a damper.

Marzocchi's "Open Bath" damping technology has trickled down from our motocross division and our experience has taught us that it's the only design that provides superior performance and long-term durability.

Our "Open Bath" system is used in both fork legs, some of our competitors use single sided system where oil is used strictly as a damping fluid (hatch back damping concept). Since suspension forks need to rapidly telescope, moving up and down thousands of times a ride, bushings should be coated in a bath of oil allowing friction free movement.

The only design that truly accomplishes stiction-less performance is Marzocchi's proven "Open Bath" technology. Since oil completely bathes the internal bushings and cartridges all the moving parts glide smoothly, eliminating friction that causes forks to feel harsh and unresponsive. When friction is dramatically reduced or eliminated the life expectancy of internal parts like bushings, seals, and dampers are greatly extended. That's where the center of the legendary Bomber Performance comes from.

Don't settle for anything less than Marzocchi's "Open Bath" technology.

Pos/ Neg Air

Negative air:

The negative air spring valve is located in the center of the left top plug.

The negative air spring is used to help the forks initial movement during compression. It can be used to create a very sensitive ride or one that provides very little "bob".

Positive air:

Positive air spring refers to the air pressure that is in the fork to support the riders weight and allow the fork to extend back to full travel.

This air pressure can be infinitely adjusted using the air valves that are offset from center of the top plug with a shock pump. Be sure to use a pump that can accurately gauge air pressure in the adjustment range.

See the AIR PRESSURE chart, which contains guidelines for tuning the air pressure in the positive air chamber.

Be sure to keep both sized pressurized the same.

The recommendations should be used as a starting point.

Air pressure may need to be adjusted according to riding style, terrain, etc. and may vary slightly between pump brands.

Cryofit

Marzocchi is the only company using an automated process to cryogenically press stanchions into the crown.

We call this assembly "Cryofit." Our robotic machine has been working overtime to give every fork that precise fit by first checking every stanchion for exact tolerances, then dipping it into liquid nitrogen to cool and shrink the tube.

The automated arm then checks the tolerances on the crown and the approved part goes into an oven to soften and expand the material.

The stanchions are now simultaneously pressed into the crown in a jig to ensure parallelism, making the strongest and lightest assembly possible when the parts return to normal temperatures.

It is stronger because we don't have to use bolts or glue and it is lighter because there are no bolts and we can use less material. There is no better way to integrate the stanchions into the crown.

Magnesium Monolite

Restyled and re-engineered for 2003, Marzocchi uses our new Monolite magnesium one piece casting on nearly all of our fork models (29" forks excluded). Marzocchi's magnesium Monolite (Mono for one piece and Lite for, well light) provides confidence inspiring rigidity, razor sharp steering precision, and nimble handling due it's lighter weight design.

Un-sprung weight (the weight of the lower fork component) is reduced allowing the fork to react quicker (compress & rebound) when bumps are encountered.

Our new 2003 Monolite designs are disc-only for the Z.1 line and our Marathon & MX Series incorporate the disc only or brake boss options.

QR20

All hardcore Free Riders & Down Hillers know the difference that a 20mm axle makes on steering precision and Marzocchi has lead the way since the introduction of the QR20 axle system in 1999. 2003 marks the year that the QR20 reaches nirvana perfection in design and function. Lower drop-out is beautifully sculpted for the flap system. Tool-less wheel removal capability when used with the QR skewer.

ECC5

The new Extension Control Cartridge offers on-the-fly adjustment of the rebound damping with a 5-position clicker. Use the fast rebound position for downhill, the 3 middle positions for race start sprints and rough climbing and the fully closed ECC position for steep dirt switchback climbs or Marathon style road climbs.

ETA

The new Extension Travel Adjustment locks down the rebound damping like the standard ECC, but still allows 25 - 30 mm of travel.

HSCV

The High-Speed Compression Valve (HSCV) allows lighter damping for better trail sensitivity but still resists bottoming. It is the best way to provide a controlled damping environment for consistent and perfect damping. The moving valve on the shaft controls rebound and low-speed compression damping. The special valve in the bottom of the cartridge (HSCV), takes the edge of any hard hit to maintain control.

SSV

The Speed Sensitive Valve (SSV) uses 5 valve circuits to control damping rates based on the fork's compression and rebound speed as well as the fork's position in the travel.

SSVF

The latest version of our Speed Sensitive Valve has a new Floating valve and spring design. It incorporates a spring-loaded valve, which is more responsive and uses an external rebound adjuster.

Maintenance

Accomplished by their open bath system, Bomber forks are designed to be nearly maintenance free. However, proper maintenance will need to be performed to maintain peak performance, safety, and longevity of the fork. It is very important to comply with the following guidelines for proper maintenance. Improper or lack of maintenance may result in premature wear and/or failure and can be very dangerous.

Muddy Conditions

	After every ride	Every 10 hours	Every 100 hours	Every 200 hours
Inspect fork for damage and/or wear	●	●	●	●
Clean and grease under dust wipers and/or boots	●	●	●	●
Wipe off on stanchions	●	●	●	●
Check all bolts for proper torque settings		●	●	●
Check air pressure		●	●	●
Thoroughly clean and relube fork			●	●
Thoroughly clean fork and change the oil			●	●

Dry Conditions

	After every ride	Every 10 hours	Every 100 hours	Every 200 hours
Inspect fork for damage and/or wear	●	●	●	●
Clean and grease under dust wipers and/or boots		●	●	●
Wipe off on stanchions		●	●	●
Check all bolts for proper torque settings		●	●	●
Check air pressure		●	●	●
Thoroughly clean fork and change the oil			●	●

Lubrication

Marzocchi only recommends the use of high quality, synthetic fork oil to be used in the Bomber forks. The oil needs to be free of any detergent or 'seal swell' additives and specifically designed for Open Bath cartridge systems. Marzocchi's Factory Fork Oil is a full synthetic blend that fights damping fade due to heat and aeration and exceeds the performance of other suspension fluids in these applications, especially in regard to 'stiction'. All Bomber forks use SAE 7.5 weight oil stock.

In addition, Marzocchi recommends lubricating the stanchions with a silicon spray and greasing the dust seals for peak performance. Silicon spray can be found at any auto parts store or even hardware stores. To grease the dust seals on forks using the Power-Wrap M Arch, the lower legs will need to be taken off. Usually the fork can be turned upside-down and compressed numerous times to drain the oil into the top of the fork. Then the legs can be pulled off without losing any oil and the seals can be cleaned and greased. Be careful when putting the lower leg assembly back on the fork, so that the seal lips are not folded in. For forks using the bolt-on arch, just pry the dust seals up with a small, flat screwdriver and apply the grease on the underside of the dust seal. This can be done with the fork still on the bike, but be careful not to damage the stanchion tubes when removing dust seals. Use only a silicon or a teflon based grease. Lithium based greases may damage the rubber material.

Torque Specifications

Normal maintenance includes checking the torque settings on all of the bolts on the fork. Follow the chart below to set the proper torque for each application.

⚠ WARNING: DO NOT use the fork with any of the bolts removed, including the brake bosses. All of the bolts are structural parts of the fork and removal of any part is dangerous and may cause serious injury.

Bolt Type	Bolt Application Examples	Tightening Torque	
		NM	lb ft
Shrader Valve	Superfly, Xfly, Flylight	Hand Tight +1/16 Turn	
M4 thread diameter	RAC Axle Clamp	4	2.9
M5 thread diameter	97 Arch, Monster Arch, Jr. T & Mr. T Top Crown	9	6.6
M6 thread diameter	98-00 Arch, All single crown Bombers	11	7.5
Footnut	All Bombers	12	8.8
Top Cap	All Bombers	12	8.8
Brake Boss & Replacement Bolt	All Bombers except Inverted Forks and Monster T	15	10.2

FORK SETUP TIPS

Marzocchi offers numerous Bomber forks to correspondent with the different elements of mountain biking. Bombers are setup from the factory for the average rider that will be riding on every terrain possible. This setup may not be suitable for everyone and may need to be modified coordinate with specific needs. Fortunately, Bombers are extremely adjustable and can adapt to any rider, bike and terrain combination possible. Proper setup will insure the best ride possible of any fork and it is necessary to review the following procedures to accurately tune your fork. For best results, follow these instructions in order.

Break-in Period

Some forks may require 5-10 hours of use before the fork fully breaks in. After the bushings, seals, and other parts have matched to each other, the fork will move more smoothly. The tight tolerances make the fork last longer and work better.

Spring Preload

Spring preload can be done with the external adjusters on top of the fork. Preloading the springs will compress them slightly and increase the initial force needed to compress the spring. Bomber forks can use the maximum amount of preload from the adjuster and the fork will still get full travel. Spring preload is used to fine-tune the spring rate to adjust for the proper sag measurement. Minimal spring preload is recommended for better performance and longer working life of the springs, so it is better to change to a stiffer spring rate than to add significant preload (10+ turns.)

Sag

Sag refers to how much the fork compresses when the rider is in the normal riding position. Marzocchi recommends 10-20% of XC travel and 20-30% of DH travel in sag to provide the best overall ride. The easiest way to measure sag is to put a zip tie around the stanchion and then measure how much the fork compresses when the rider is in the normal riding position. Keep in mind that the normal riding position on a DH bike may not be correct on level ground. Refer to the following charts for reference.

Fork Type	Total Travel	Total Sag
XC	70mm	7-15mm
XC	80mm	8-16mm
XC	100mm	20-30mm
FR	120mm	22-36mm
FR	130mm	25-40mm
FR	150mm	30-45mm
DH	150mm	35-53mm
DH	170mm	40-60mm
DH	200mm	47-70mm
DH	300mm	70-106mm

Coil Spring

The spring rate of a coil spring refers to the amount of force needed to compress the springs in the fork. Marzocchi offers several different spring kits to coordinate rider weight and riding conditions. All springs are made from the highest quality chromium silicon (CRSI). They have linear wind except the Pro-Wind springs which are progressively wound (coil wind gets closer together at one end.) Dual Rate kits use two compression springs per side. Put the longer compression spring on the bottom and then put the short spring on top to later ease disassembly. Refer to the following charts to see what factory springs come with each fork and for recommended spring rates based on rider weight.

FORK	TRAVEL	SPRING LENGTH	COLOUR	RIDER WEIGHT	RATE	PART NO.
Z2 97			none	145-180lbs	pro-wind	5141173
Z2 ALLOY 98-99			green	120-155lbs	soft	5141118
Z2 ATOM 98-99	70mm	150mm	yellow	145-180lbs	medium	5141116
Z2 BAM 98			white	180-220lbs	hard	5141117
Z2 LIGHT 98-99			red	210-250lbs	x- hard	5141109
Z4 99						
Z2 BAM 99						
Z2 ATOM 80 00						
Z2 ATOM RACE 01			none	145-180lbs	pro-wind	5141158
Z2 ATOM SPORT 01			yel/ blu	120-155lbs	med dual rate	850658
Z3 BAM 80 00	80mm	165mm	green	145-180lbs	medium	5141184
Z3 M80 00			whi/ blu	145-180lbs	hard dual rate	850659
Z3 SERIES 80 01			red/ blu	180-240lbs	x- hard dual rate	850660
Z4 SERIES 80 01						
Z5 SERIES 80 01						
Z1 97-98-99-00/ QR20						
Z1 DROP OFF 00-01-02						
Z3 LT/ QR20						
Z3.5			none	145-180lbs	pro-wind	5141156
Z3 SERIES 100 01			yellow	120-155lbs	soft	5141112
Z4 SERIES 100 01	100mm	185mm	white	145-180lbs	medium	5141113
JNR T 98	105mm		red	170-205lbs	hard	5141114
MR T 98			green	195-240lbs	x- hard	5141190
RAC COIL						
DIRT JUMP 02						
MXC/R SERIES 02						
Z1 BAM/ CR/ MCR/ QR20						
Z1 DROP OFF 00-01-02			none	145-180lbs	pro-wind	5141155
Z3 QR20 00			yellow	120-155lbs	soft	5141162
JNR T 99-00	130mm	213mm	white	145-180lbs	medium	5141163
MR T 99/ QR20	120mm		red	170-205lbs	hard	5141164
SHIVER SC (non ETA)			green	195-240lbs	x- hard	5141191
DIRT JUMP 02						
		150mm	blue	145-180lbs	stock	5141110
	150mm	185mm	red		dual rate	5141114
SUPER T		150mm	white	120-155lbs	soft	5141117
JNR T 01-02		185mm	yellow		dual rate	5141112
MR T 01		150mm	red	145-180lbs	medium	5141109
		185mm	white		dual rate	5141113
		150mm	blue	170-240lbs	hard	5141110
		185mm	green		dual rate	5141190

		165mm	green	120-155lbs	medium	5141184
	170mm	185mm	white			5141113
SUPER T 02		165mm	green	145-185lbs	stock	5141184
JNR T 02		185mm	red		dual rate	5141114
		165mm	green	170-240lbs	hard	5141184
		185mm	green			5141190
		320mm	none	145-180lbs	pro-wind	5141159
MONSTER T	180mm		yellow	120-155lbs	soft	5141165
99-01-02-03-04	200mm		white	145-180lbs	medium	5141166
			red	170-240lbs	hard	5141167
			blue	120-155lbs	soft	5141202
SHIVER DC all years	190mm	334mm	none	145-180lbs	medium stock	5141203
			red	180-220lbs	hard	5141235

FORK	TRAVEL	SPRING LENGTH	COLOUR	RIDER WEIGHT	RATE	PART NO.
MX SERIES 03-04	100mm	185mm	green		soft	5141190
		185mm			hard	5141276/C
MARATHON S COIL	105mm				soft	850346/C
					hard	850345
MARATHON S COIL 04	120mm	213mm	green		soft	5141191
Z1 FR/ DROP OFF	130mm				hard	850342/C
DIRT JUMP 03	105mm		green		soft	5141254
	130mm				soft	5141253
DIRT JUMP 04	100/130/150mm		blue		soft	5141311
JNR T/ SUPER T 03/ 04	170mm				soft	5141264/C
					hard	5141281/C
888R	170/200mm				soft	5141304
					hard	5141305
EXR COIL/ OIL 03					soft	5141258/C
EXR/ MZ COMP	80mm				soft	5141343/C
	100mm				soft	5141346/C

Air Spring

Air spring rate is the amount of air pressure that is in the fork. Marzocchi forks come pressurized for the average rider at about 35psi/3.0bar. Air pressure can be infinitely adjusted using a shock pump to fit rider preference. Be sure to use a pump that can accurately gauge air pressure in the adjustment range.

The following charts contain some basic guidelines for tuning the air pressure in the air sprung forks. Be sure to keep both sides of the fork pressurized the same.

These recommendations should be used as a starting point. Air pressure may need to be adjusted according to riding style, frame design, terrain, and/or personal preferences and may vary between pump brands.

Pressure for Marathon

Pilot Weight	Pos. Air (PSI)	Pos. Air (bar)	Neg. Air (PSI)	Neg. Air (bar)
Less than 55 Kg	26	1.8	80	5.5
55 to 65 Kg	33	2.3	90	6.2
65 to 75 Kg	40	2.8	100	6.8
75 to 85 Kg	44	3	110	7.5
85 to 95 Kg	48	3.3	120	8.2
More than 95 Kg	53	3.7	127	8.7

Pressure for Z1 FR SL

Pilot Weight	Pos. Air (PSI)	Pos. Air (bar)	Neg. Air (PSI)	Neg. Air (bar)
Less than 55 Kg	22	1.5	68	4.6
55 to 65 Kg	28	1.9	76	5.2
65 to 75 Kg	34	2.3	85	5.8
75 to 85 Kg	38	2.6	93	6.4
85 to 95 Kg	41	2.8	102	7
More than 95 Kg	45	3.1	108	7.4

Pressure for MX Comp

Pilot Weight	Pos. Air (PSI)	Pos. Air (bar)
Less than 55 kg	28	1.9
55 to 65 kg	36	2.5
65 to 75 kg	42	2.8
75 to 85 kg	48	3.3
85 to 95 kg	52	3.5
More than 95 kg	56	3.8

Pressure for X-Fly

Pilot Weight	Pos. Air (PSI)	Pos. Air (bar)
Less than 55 kg	24	1.6
55 to 65 kg	31	2.1
65 to 75 kg	38	2.6
75 to 85 kg	42	2.8
85 to 95 kg	46	3.2
More than 95 kg	50	3.4

Air Pump Instruction

Be sure to use only an appropriate shock pump with a specialized shraeder nozzle for best results. The pump needs to be able to accurately measure air pressure in the appropriate PSI range. Marzocchi makes a pump with a 100psi gauge that is specifically designed for our forks. Rear shock pumps with the 300psi gauge will not work well. Keep in mind that most pumps will fill up with air when attached, registering approximately 5-10psi lower air pressure on the gauge. When unthreading the pump, air loss can usually be heard as it empties from the pump. This is air pressure from inside the pump itself, NOT the shock. Re-install the shraeder valve cap before riding to protect the shraeder valve from contamination.

Oil Height & Volume

Oil height can be used to tune the spring rate in the Bomber suspension forks. The height of the oil determines the air volume in the fork and can be adjusted to compress the air as needed. Raising the oil height will create a smaller air chamber, causing the spring rate to become increasingly stiffer as the fork compresses. Decreasing the oil height will create more of a linear spring rate because it does not compress the air as much. Aggressive riders will want to use the maximum oil height to help the fork resist bottoming. Adjusting the oil height is not a substitute for the correct spring rate and should only be used to fine-tune the spring rate. Do not increase the oil height beyond the maximum recommendations or the fork may be damaged during use. Oil height is measured from the top of the stanchions down to the oil, with the stanchions compressed and the springs and preload assemblies taken off of the fork. When changing the oil, be sure to cycle the air out of the fork to insure an accurate measurement. Refer to the following charts for recommended oil heights.

Marzocchi also can measure the oil volume in cubic centimeters (cc's.) Oil volume is basically the quantity of oil that is needed in the fork. The '99 Superfly and '00 X-fly's use a unique dual-chamber design that isolates the air spring from the oil bath. It is easiest to measure the oil volume when replacing the oil in these forks. See the following chart for reference.

MY	Fork	55-80 kg	80-90 kg	MY	Fork	55-80kg	80-90kg
	XC51 (sae 7.5w)	35	33	1999	JR T 98-00	100	90
1994	XC600 (sae 20w)	35	33	1999	MONSTER T 98-99-00-01-02	100	90
1996	XCR (sae 20w)	35	33	1999	MR T 99	100	90
1996	XC700 (sae 20w)	35	33	1999	Z-1 ALU 98-99	50	45
1996	DH3 (sae 20w)	35	33	1999	Z-1 BAM 99	55	50
1997	Z-1 97	50	45	1999	Z-1 DROP OFF 99-00	50	45
1997	Z-2 97 COIL	45	40	1999	Z-1 QR20 99	55	50
1998	JR T 98-00	100	90	1999	Z-2 ALU 98-99	45	40
1998	MONSTER T 98-99-00-01-02	100	90	1999	Z-2 ATOM 98-99	45	40
1998	MR T 98	50	45	1999	Z-2 BAM 99	45	40
1998	Z-1 ALU 98-99	50	45	1999	Z-2 X-FLY 99 70 mm	60 cc	50cc
1998	Z-1 BAM 98	50	45	1999	Z-3 LIGHT 98-99	45	40
1998	Z-2 ALU 98-99	45	40	1999	Z-3 LIGHT 99	45	40
1998	Z-2 ATOM 98-99	45	40	1999	Z-3 QR20 99	50	45
1998	Z-2 BAM 98	45	40	1999	Z-4 COIL 99	45	40
1998	Z-3 LIGHT 98-99	45	40	1999	Z-5 COIL 99	40	37

MY	Fork	55-80kg	80-90kg	MY	Fork	55-80 kg	80-90 kg
2000	JR T 98-00	100	90	2001	JR T 01	100	90
2000	MONSTER T 98-99-00-01-02	100	90	2001	MONSTER T 98-99-00-01-02	100	90
2000	MR T QR20 00	100	90	2001	RAC COIL	40	35
2000	SUPER T PRO 00	100	90	2001	SHIVER DC 01-02	80	70
2000	Z-1 CR 110MM 00	50	45	2001	SUPER T PRO 01	100	90
2000	Z-1 CR 130MM 00	55	50	2001	XFLY 100MM 01	45	40
2000	Z-1 DROP OFF 99-00	50	45	2001	XFLY 80MM 01	45	40
2000	Z-1 QR20 110MM 00	50	45	2001	Z-1 DROP OFF 01	50	45
2000	Z-1 QR20 130MM 00	55	50	2001	Z-1 DROP OFF QR20+ 01	50	45
2000	Z-1 X-FLY 100 00	75 cc	85 cc	2001	Z-1 MCR 01	55	50
2000	Z-2 ATOM 80MM 00	45	40	2001	Z-1 MCR QR20+ 01	55	50
2000	Z-2 ATOM RACE 00	45	40	2001	Z-3 SERIES COIL 01	40	40
2000	Z-2 ATOM SPORT 00	45	40	2001	Z-3,5 AIR 100MM 01	45	40
2000	Z-3 BAM 80 MM 00	45	40	2001	Z-4 SERIES AIR 01	40	35
2000	Z-3 FLYLIGHT 100MM 00	45	40	2001	Z-4 SERIES COIL 01	45	40
2000	Z-3 QR20 110MM 00	45	40	2001	Z-5 SERIES AIR 01	40	35
2000	Z-3 QR20 130MM 00	50	45	2001	Z-5 SERIES COIL 01	40	35
2000	Z-3,5 COIL 00	45	40				
2000	Z-4 FLYLIGHT AIR 00	40	35				
2000	Z-5 FLYLIGHT AIR 00	45	40				

MY	Fork	55-80kg	80-90kg	MY	Fork	55-80Kkg	80-90kg
2002	DIRT JUMPER I 110MM 02	55	50	2002	SHIVER DC 01-02	80	70
2002	DIRT JUMPER I 130MM 02	50	45	2002	SHIVER SC	25	20
2002	DIRT JUMPER II 110MM 02	55	50	2002	SUPER T QR20 170 02	95	90
2002	DIRT JUMPER II 80MM 02	30	25	2002	XFLY 100MM 02	45	40
2002	JR T 170 02	95	90	2002	XFLY 80MM	45	40
2002	JR T QR20 150 02	100	90	2002	Z-1 DROP OFF 110-130	65	60
2002	MARATHON S 80-100	ECC 115cc	NEG 30cc	2002	Z-1 DROP OFF QR20 110-130	65	60
2002	MONSTER T 98-99-00-01-02	100	90	2002	Z-1 FREE RIDE 110-130 02	50	45
2002	MXC + ECC AIR 80-100 02	40	35	2002	Z-1 FREE RIDE QR20 110-130	65	60
2002	MXR AIR 80-100 02	45	40	2002	Z-1 WEDGE 110-130 02	60	55
2002	MXR COIL 80-100 02	45	40	2002	Z-2 ATOM RACE 80-100 02	50	45

MY	Fork	55-80kg	80-90kg	MY	Fork	55-80kg	80-90kg
2003	Dirt Jumper 1 Ø32 c.110	60	55	2003	MX COMP COIL c.105	55	45
2003	Dirt Jumper 1 Ø32 c.130	60	55	2003	MX COMP COIL c.85	50	45
2003	Dirt Jumper 1 MQR20 110	60	55	2003	MX COMP+ETA 29"	40	35
2003	Dirt Jumper 1 MQR20 130	60	55	2003	MX COMP+ETA c.105	50	45
2003	Dirt Jumper 2 Ø32 c.110	60	55	2003	MX COMP+ETA c.85	50	45
2003	Dirt Jumper 2 Ø32 c.130	60	55	2003	MX PRO AIR c.105 SSVF	50	45
2003	Dirt Jumper 2 MQR20 Ø32 c.110	60	55	2003	MX PRO AIR c.85 SSVF	50	45
2003	Dirt Jumper 2 MQR20 Ø32 c.130	60	55	2003	MX PRO COIL c.105 SSVF	55	50
2003	Dirt Jumper 3 Ø32 c.110	60	55	2003	MX PRO COIL c.85 SSVF	50	45
2003	Dirt Jumper 3 Ø32 c.130	60	55	2003	MX PRO+ETA 29" c.75	35	30
2003	Dirt Jumper 3 MQR20 110	60	55	2003	MX PRO+ETA c.105	50	45
2003	Dirt Jumper 3 MQR20 130	60	55	2003	MX PRO+ETA c.85	50	45
2003	Jr. T MQR20 c.170	110	105	2003	Shiver D.C. Ø35 USD	80	75
2003	Jr. T c.170	110	105	2003	Shiver S.C. Ø30 USD	40	35
2003	Marathon S COIL c.105	60	55	2003	Super Monster OE c.300	140	135
2003	Marathon S COIL c.85	60	55	2003	Super T MQR20+ c.170	80	75
2003	Marathon SL 29"	ECC 150cc	NEG 35cc	2003	Z1 Drop Off c.130	60	55
2003	Marathon SL+ECC c.105	ECC 150cc	NEG 35cc	2003	Z1 Drop Off MQR20 c.130	60	55
2003	Marathon SL+ECC c.85	ECC 150cc	NEG 35cc	2003	Z1 FR MQR20 Ø32 c.110	60	55
2003	Monster T OE c.200	120	115	2003	Z1 FR MQR20 Ø32 c.130	60	55
2003	Monster T2 OE c.175	160	155	2003	Z1 FR Ø32 c.110	60	55
2003	Monster T2 OE c.200	160	155	2003	Z1 FR Ø32 c.130	60	55
2003	MX Comp 29" coil c.75	40	35	2003	Z1 FR SL MQR20+ECC Ø32 c.130	ECC 165cc	NEG 50cc
2003	MX COMP AIR c.105	50	45	2003	Z1 FR SL+ECC Ø32 c.130	ECC 165cc	NEG 50cc
2003	MX COMP AIR c.85	50	45	2003	Z150 FR QR20 150mm	75	70

MY	Fork	55-80kg	80-90kg	MY	Fork	55-80kg	80-90kg
2004	Marathon SL 85mm	ECC 150cc	NEG 35cc	2004	Super T Pro QR20	80	75
2004	Marathon SL 105mm	ECC 150cc	NEG 35cc	2004	Jnr T QR20	110	105
2004	Marathon S 105mm	60	55	2004	Jnr T	110	105
2004	Marathon S 120mm	60	55	2004	MX Pro ETA 120mm	60	55
2004	Z150 FR QR20	75	70	2004	MX Pro ETA 105mm	55	50
2004	Z1 FR Pro QR20	60	55	2004	MX Comp ETA 120mm	60	55
2004	Z1 FR SL	ECC 165cc	NEG 50cc	2004	MX Comp ETA 105mm	55	50
2004	Z1 FR	60	55	2004	MX Comp Coil 105mm	55	50
2004	Z1 Drop OFF 1	60	55	2004	MX Comp Air 105mm	50	45
2004	Z1 Wedge	50	45	2004	MX Comp Air 85mm	50	45
2004	Dirt Jumper 1 QR20	60	55	2004	Drop Off Triple 155mm	245cc	
2004	Dirt Jumper 2	60	55	2004	Drop Off Comp 130 & 110mm	155cc	
2004	Dirt Jumper 3	60	55	2004	EXR Supra 120/ 105/ 85mm	125cc	
2004	Shiver SC 100mm	40	35	2004	EXR Pro Air 120/ 105/ 85mm	130cc	
2004	Shiver DC	80	75	2004	EXR Pro Coil 120/ 105/ 85mm	125cc	
2004	Super Monster T	140	135	2004	EXR Pro AirCoil 100mm	125cc	
2004	888R 200mm	210cc		2004	EXR Comp 100/ 80mm 2004	150cc right leg	
2004	888R 170mm	210cc					

Negative Travel

Positive travel refers to how much the fork can compress from the un-weighted resting position. Therefore, negative travel refers to the ability of the fork to extend past the un-weighted resting position. As the fork and wheel rebound after impact or while dropping off a ledge, the fork extends past its normal resting position and compresses the negative/top-out spring, giving it more positive travel. Negative travel increases the overall travel of the fork without making the fork longer. All of the Bomber forks have negative travel that allows the fork to top-out smoothly and keep the wheel in constant contact with the terrain while adding to the legendary 'plushness.' Negative travel combined with the recommended amount of sag will insure the smoothest ride possible.

Rebound Damping

Rebound damping controls the rate in which the fork is able to extend. All of the Bomber forks have adjustable rebound damping. Rebound damping should be set fairly fast, but without causing a sudden, harsh force back to the rider. This will allow the fork to comfortably extend to full travel as soon as possible after impact.

It is a good idea to get a feel for how the different rebound adjustments affect the fork. On forks that have external adjusters, try turning the adjuster all the way counter-clockwise to the fastest rebound setting and then quickly compress and release the suspension several times. Next test the fork with the adjuster turned all the way clockwise and then somewhere in between. This will demonstrate the differences between damping settings.

Forks using the **SSV Non-Adjustable System** can change their rebound damping with oil viscosities. Stock oil is 7.5 weight, so changing to a lighter oil (Example: 5 wt.) will increase the rebound speed. Heavier riders using stiffer springs may want to adjust their rebound speed with a heavier weight oil. Be sure only to use a high quality motorcycle fork oil like Marzocchi's Factory Fork Oil.

Forks that have the **SSV Internally Adjustable System** can adjust the damping via an internal adjuster through the stanchions. When looking down into the stanchions, turn the adjuster clockwise to slow the damping and counter-clockwise to speed it up. Forks that use the **SSV Externally Adjustable System** have the convenience of an external rebound adjuster. When looking at the adjuster (fork will be upside-down), turn the adjuster clockwise to slow the damping speed and turn the adjuster counter-clockwise to increase the damping speed. Use a 2.5mm hex wrench to turn the adjuster on the '99 Superfly and the '00 X-fly's.

Forks that use the **HSCV Cartridge System** benefit from an external damping adjuster located in the center of the colored spring preload knob. The small rebound knob has a screwdriver slot to aid with adjustment. Turning the adjuster clockwise will slow the rebound speed and therefore turning the adjuster counter-clockwise will speed up rebound.

Compression Damping

Compression damping is the oil flow resistance felt when compressing the fork. Compression damping is categorized in two ways: low speed compression and high-speed compression. Low speed compression refers to when the fork is compressed slowly and gradually, for example during rolling impacts and rounded bumps. High-speed compression refers to the resistance felt during multiple, hard impacts and square-edged bumps. The Bomber's SSV system automatically adjusts damping depending on direction change and rate of travel. Therefore, Bombers can be set-up very plush and supple and yet still resist bottoming.

It is better to be conservative while setting the compression damping because the spring offers resistance to compression as well. Too much compression damping creates a harsh ride because the suspension cannot compress rapidly enough to absorb large impacts. Compression damping is not a substitute for proper spring rate and should not be adjusted until the fork has the proper spring set-up for the rider.

Marzocchi has introduced the new adjustable compression cartridges in selected 2000 models. Use the external adjuster located in the middle of the spring preload knob to change the compression damping. Turning the adjuster clockwise will increase the compression damping and therefore slow the compression speed of the fork. Consequently, turning the adjuster counter-clockwise will speed up the compression damping.

Forks that do not have an external compression adjuster can modify their compression damping by changing the oil viscosity. Although most riders will be happy with the stock compression settings, some riders may prefer a different weight oil to coordinate with rider weight and/or spring setup. Keep in mind that changing the oil viscosity will change the entire damping range and will affect rebound as well.

Damping; How It Works?

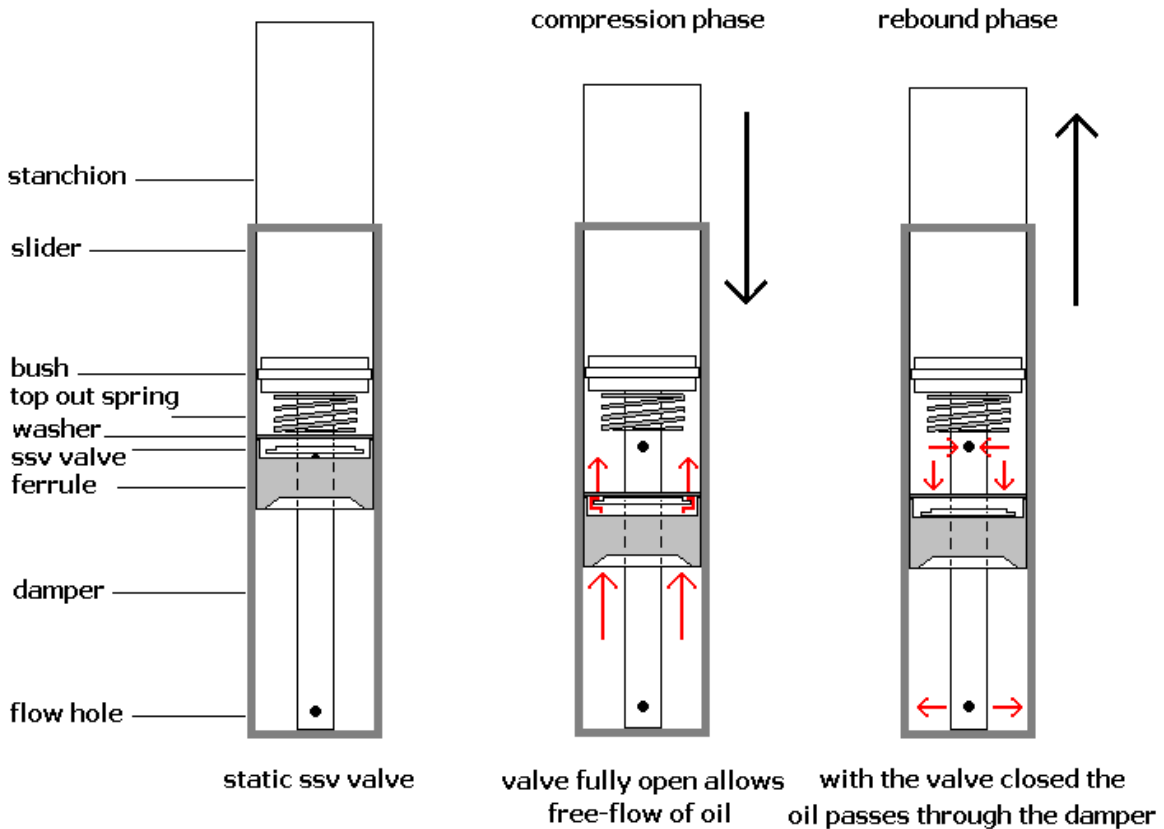
SSV

The SSV valve is captivated in the base of the stanchion and is pushed through the oil by the only moving component, the stanchion.

Under compression the passing of the valve through the oil pushes the valve up against the internally castellated washer, leaving a clear path for the oil to flow and the least resistance.

Under extension the oil flow is reversed, the valve is pushed against the ferrule blocking the main oil pathway and crating resistance. The oil can now only pass through the flow holes on the damper shaft giving a controlled rate of rebound.

For SSVF, the valve has a closing spring, so when the fork changes direction from compression to extension the valve snaps shut giving a more positive transitional phase.



Trouble Shooting Tips

The following chart will help pinpoint any problems that may occur while setting up your Marzocchi suspension fork. Keep in mind that some problems may be due to one or more cause and that setup should be done in the order as it appears in this book.

Problem	Diagnosis	Solution
Fork has too much sag	Spring rate too soft	Add preload; Change to stiffer spring rate
Fork bottoms too easily; Needs more than max. preload	Spring rate too soft or fork oil too low	Check oil height-refer to oil height chart; Get stiffer springs/increase air pressure-refer to spring/air pressure chart
Fork bottoms too easily but has recommended sag	Not enough compression damping	Change to a higher viscosity oil. Stock oil is 7.5 wt.; Increase compression damping
Fork does not get full travel	Spring rate too stiff; Oil height too high	Check oil height-refer to oil height chart; Get stiffer springs/decrease air pressure-refer to spring/air pressure chart
Fork extends too quickly; Harsh top-out after impacts	Not enough rebound damping	Increase rebound damping-refer to rebound damping chart
Front wheel wants to tuck under while cornering	Too much rebound damping; Spring rate too soft	Decrease rebound damping-refer to rebound damping chart; Increase spring rate-refer to spring rate chart
Fork 'packs up' or stays down in travel during multiple impacts	Too much rebound damping	Decrease rebound damping-refer to rebound damping chart
Knocking sound during rebound, but no harsh top-out	Too much rebound damping	Decrease rebound damping-refer to rebound damping chart
Oil ring on stanchions	Seals are contaminated	Completely take fork apart to be cleaned and serviced
Heavy amount of oil on stanchions; Oil dripping down leg	Seals are damaged	Replace all seals; Inspect stanchions for damage
Fork is sticky; Fork does not perform as new	Oil is contaminated; Fork needs to be serviced	Completely take fork apart to be cleaned and serviced

**Solent UK Ltd T/A WindWave
Units D2 & D3 Heritage Business Park
Heritage Way, Gosport
Hampshire
PO12 4BG**

**Phone (023) 92 521912 Fax (023) 92 522625
Warranty & Service (023) 92 526882
Technical Support (023) 92 505322**

www.windwave.co.uk
tech@windwave.co.uk
warranty@windwave.co.uk