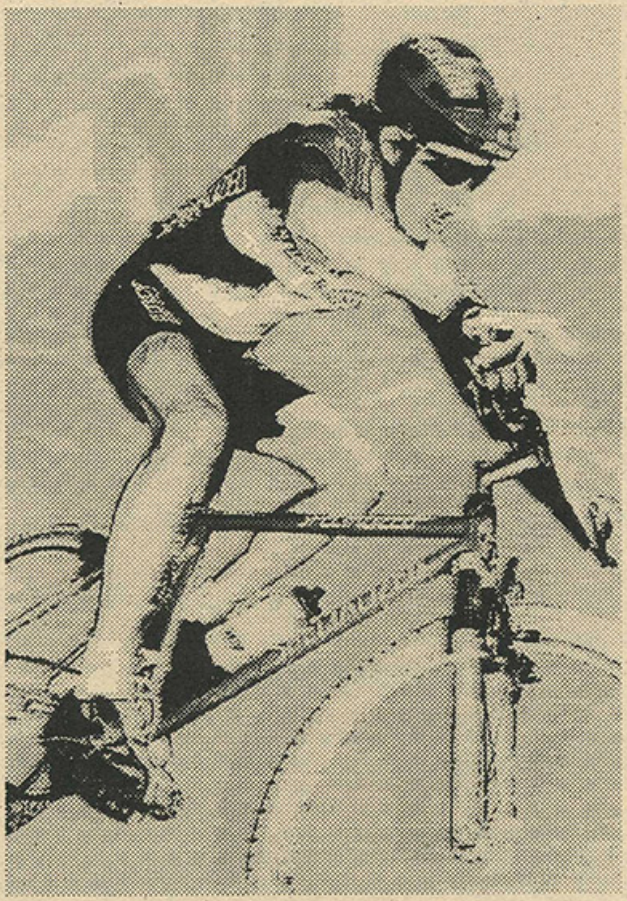
SPECIALIZED

1994 S-WORKS & STUMPJUMPER FSR



Owner's Manual

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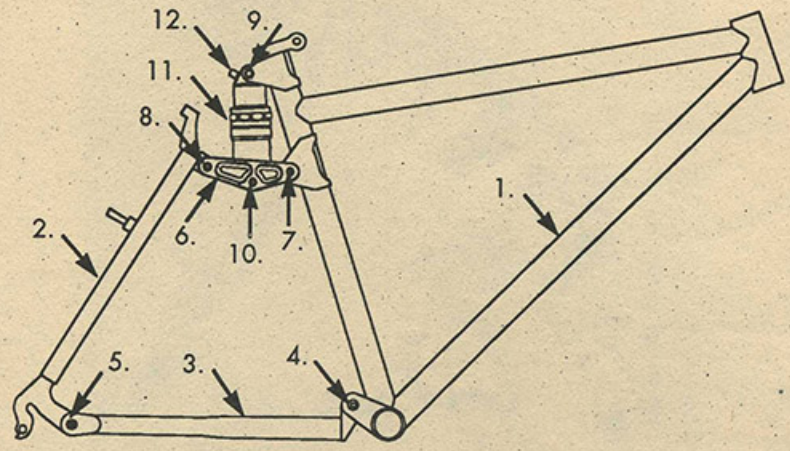

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Specialized Bicycle Components, Inc.®
1994 FSR OWNER'S MANUAL

Congratulations! You've just purchased what we consider to be the best fully-suspended mountain bike available: the Specialized® FSR. The FSR is designed to provide all the benefits of full suspension—great ride quality, comfort, and high performance—without the problems associated with inferior designs.

The FSR's four-bar linkage design is amazingly efficient. A series of optimum pivot locations, ensures that the suspension is completely neutral. That means the length on the drive section of the chain doesn't change as the suspension compresses, so there's no pedal kickback, which wreaks havoc with your pedaling efficiency. It also means that the suspension is unaffected by chain tension, which can cause inferior bikes to bob. One more benefit of the FSR's design is that braking doesn't affect the suspension, so you can brake through stutter bumps without feeling like you're back on board an unsuspended bike.

The bottom line is, with the FSR, you'll find that your pedaling performance isn't compromised, that it works great in all conditions, and that it's not just a downhill bike.

We know you're excited about building up your new FSR and taking it out for a test cruise. But by taking the time to read through this manual, and learning about how the FSR is designed and can be tuned, you'll be set to get the maximum performance out of your new bike. You'll also learn about the necessary maintenance, which will keep your FSR running great for years to come.

The operation and service of the Future Shock™ Adjustable and FSX forks, which are found on the two FSR models, are covered in separate manuals. Please refer to them to answer front suspension-specific questions, and for additional tuning tips.

You'll also find that the manual is chock-full of warnings. You might consider them severe, or a hassle to read, but they're intended to help prevent serious injury or death, so pay special attention to them. We want you to have as much fun as possible riding your FSR.

⚠ WARNING: If you do not fully understand the product descriptions or service guidelines in this manual, contact your Specialized dealer before using this product.

The FSR is intended for use under normal mountain bike riding conditions. It is not designed for riders who intend to use it for stunt riding, severe jumping, trials, aerial ramp riding, etc.

⚠ WARNING: Be sure you read and understand this manual before riding your new bike. Also refer to the standard Specialized Owner's Manual for non-FSR-related questions. Be sure to store these manuals in a safe place for periodic review.

WARNING: Do not disassemble the FOX shock. The shock should be returned to FOX for tuning or repair.

WARNING: Do not disassemble the FSR, change components, or otherwise modify the frame. Doing so may void the warranty, and result in serious personal injury.

CAUTION: You should take time to feel comfortable with the performance characteristics of the FSR. Suspension improves your comfort and control, but it does not make you a better rider. Suspension may allow you to attain greater speeds, which require increased stopping distance.

SIZING

To retain the geometry of the rear suspension, we did something unique with the frame sizing for the FSR. The 16.5", 18", and 19" frames all use the same seat tube length (19") and standover height, but have a longer top tube dimension for each larger frame size. Here's a quick reference chart, outlining the dimensions between the different frame sizes.

A	B	C	D	E	F	G	H	I	J
16.5"	530 mm	90 mm	430 mm	42 mm	71°	73°	604 mm	728 mm	426 mm
18"	551 mm	90 mm	430 mm	42 mm	71°	73°	625 mm	728 mm	426 mm
19"	563 mm	90 mm	430 mm	42 mm	71°	73°	637 mm	728 mm	426 mm
20"	579 mm	90 mm	430 mm	42 mm	71°	73°	648 mm	740 mm	438 mm
21.5	597 mm	135 mm	430 mm	42 mm	71°	73°	669 mm	778 mm	476 mm

A = Seat Tube Length
B = Top Tube Length
C = Head Tube Length
D = Chainstay Length
E = Fork Offset
F = Head Tube Angle
G = Seat Tube Angle
H = Front Center
I = Standover Height
J = Bottom Bracket Height

ASSEMBLY

WARNING: Improper assembly can result in a loss of control or an unstable condition while riding. At the very least the result can be unsatisfactory product performance, and could also cause serious injury or death. Your authorized Specialized dealer has all the training and tools required to assemble your FSR quickly and correctly.

The FSR is available in two different forms—The S-Works FSR, available as a frameset, which you can build up with either your own components, or with an S-Works Parts kit, which will allow easy assembly of the complete bike. It's also

available as a ready-to-ride Stumpjumper FSR.

For riders building up the FSR themselves, here are the specs for the rest of the components. The headset and seat post are both included with the frameset, but when it comes time for replacement, these specs will come in handy.

Headset: 1 1/8" (34.0 mm/30.0 mm)
Seat Post Diameter: 29.2 mm
Bottom Bracket: 107 mm length, 73 mm BB shell width, English thread
Rear Hub Width: 135 mm

REAR SUSPENSION TUNING

Optimal suspension setup is extremely subjective. It's dependent on many factors, including personal taste, your weight, riding style, and the terrain you ride. That makes it impossible to dictate an exact setup, but we can offer some tips, which are based on lots of experience riding and testing the FSR. There are several factors to consider, including:

- Depending on the ride characteristics you're looking for (from full plush to extremely firm), you can vary the air pressure in the shock. The air pressure affects both the amount of initial sag, and the spring rate. With lower pressure, the spring is softer. With higher pressure, the spring is stiffer.

- The FOX ALPS 4 shock is all new. It's a new air-sprung/oil-damped unit that features light weight, progressive ride quality, custom tunability, low friction, and low pressure (especially compared to other air shocks). Typical pressure is from 140-170 psi, which is easily attainable.

There are two different shocks, depending on whether the bike is an S-Works FSR, or the less expensive Stumpjumper FSR. Internally, they're exactly the same. The only difference is the shock shaft itself, which uses gram-shaving aluminum on the S-Works, and steel on the Stumpjumper. You want shock weights? They're 310 g for the Stumpjumper FSR, and 261 g for the S-Works.

- The shock has one inch of travel, which translates to 2.5 inches of travel at the rear wheel.

- The linkage is also progressive (meaning that the further you get into the travel, the more force is required to compress it), except through the last half of the travel, where it gets slightly regressive to compensate for the steepest part of the air shock's progressive curve. This keeps the action of the shock from getting too stiff as it nears full travel.

- Don't be afraid to try softer pressures. Since the design of the Specialized FSR eliminates pedaling inefficiency common to other suspension designs, you can make effective use of sag to provide a softer ride, without affecting pedaling performance. Feel free to experiment. Lots of riders start off with an initial setting that's very firm, and discover later that they prefer a softer setting.

Shock Pressure for Given Rider Weight and Shock Sag

Lbs.(Kg)	140(9.86)	150(10.56)	160(11.27)	170(11.97)	180(12.68)	190(13.38)	200(14.08)	210(14.79)	220(15.49)	230(16.20)
Shock Sag										
Firm	Psi (Atm)									
0.00" (0 mm)	165 (11.6)	172 (12.1)	180 (12.7)	188 (13.2)	196 (13.8)	204 (14.4)	212 (14.9)	220 (15.5)	228 (16.06)	236 (16.6)
0.10"(2.5 mm)	147 (10.4)	154 (10.9)	161 (11.3)	169 (11.9)	176 (12.4)	184 (13.0)	191 (13.5)	199 (14.0)	206 (14.5)	214 (15.1)
Normal										
0.20" (5 mm)	130 (9.2)	137 (9.7)	144 (10.1)	151 (10.6)	158 (11.1)	165 (11.6)	172 (12.1)	179 (12.6)	186 (13.1)	193 (13.6)
0.30" (7.5 mm)	114 (8.0)	120 (8.5)	127 (8.9)	133 (9.4)	140 (9.9)	146 (10.3)	153 (10.8)	159 (11.2)	166 (11.7)	172 (12.1)
Soft										
0.40" (10 mm)	101 (7.1)	107 (7.5)	113 (8.0)	119 (8.4)	125 (8.8)	131 (9.2)	137 (9.7)	143 (10.1)	149 (10.5)	155 (10.9)

The chart above shows suggested air pressure for various combinations of rider weight and sag. Find your recommended pressure from this chart.
Measure your riding weight (lbs. or kg) with all your riding gear on. Find this weight on the top row.
Select the sag you desire, in the far left row, and find the corresponding air pressure.

Charge the shock to the recommended pressure, using a suitable gauge and filler apparatus. (This can either be a high-quality floor pump, a compressed air pressure source that does not exceed 300 P.S.I., or the new Specialized Rear Shock Pump.)

Remember, there's a very small volume of air in the shock, and it can be released VERY quickly. Be EXTREMELY careful about how much air you let out. Even the tiniest release of air can make 5 to 10 P.S.I. difference in pressure.

The best suspension setting is one where the shock uses its full travel over really big bumps. If the system doesn't bottom out occasionally, you're not taking full advantage of all the available travel. Using a zip-tie around the shock shaft can make a good indicator of how much shock travel you're actually using. This works better than trying to feel the suspension bottoming out, since the shock has such a comfortable feeling, even when it bottoms out.

Most riders find that the stock damping characteristics work extremely well, and with air pressure adjustments, they can achieve a perfect setup. In rare cases, riders may find that they want to change the damping characteristics of their shock. This can be done by sending the shock back to FOX to change the valving. Have your Authorized Specialized Dealer remove the shock. Do NOT attempt to disassemble the shock yourself. For more information, call FOX at (408) 269-9200.

CLEANING AND MAINTENANCE

The bushings used at the pivot points of your FSR are all high-quality Oiles bushings. These bushings can be lubed with a grease gun that has a small pointed nozzle (like SunTour's Grease Guard gun) by aligning the grease gun nozzle with the grease port at each point and adding a small amount of lube. The tolerances at each point are very tight, so not much grease is necessary to lube the pivots. Covering the grease ports, after they're cleaned, with a small piece of clear stick-on chainstay protector works well to keep dirt out of the bearing ports.

Like any bushings, the bushings on the FSR don't last forever, and may need to be replaced periodically. The frequency of replacement is dependent on factors such as the environment you ride in, and how aggressively the bike's ridden. If you start to feel excessive play in the rear end of the bike, you should return the bike to your Authorized Specialized Dealer for service. To check this, hold the seatpost, and move the rear axle from side-to-side. If there's more than 3 mm of free play, you should have the bike checked by your Specialized Dealer.

AFTER WET OR MUDDY RIDING, clean and dry the bike thoroughly, but DO NOT spray high pressure directly at the pivots. This could force mud and crud into the pivots, which could decrease their lifespan.

NOTICE: Your Specialized bike should be inspected by your dealer at least once a year. Use good judgement; if you're using the bike frequently or in muddy conditions, more frequent inspections may be required.

Warning: Should your FSR need maintenance beyond routine cleaning, take it to an Authorized Specialized Dealer for servicing. The bike should also be inspected if you have crashed or suspect that it's damaged in any way. Take it to your Authorized Specialized Dealer for inspection.

TORQUE SPECS

The bolts used throughout the rear end of the FSR are high-quality Grade 8.8 bolts with locking nuts designed to keep the bolts tight. If you need to re-torque these bolts, the specs are:

	Size Bolt	Allen Key	Torque
Bottom Bracket Pivot	8 mm	6 mm	200 inch lbs. (23 Nm)
All Other Pivots And Shock Bolts	6 mm	5 mm	104 inch lbs. (12 Nm)

Be SURE to check the torque before each ride.

The Specialized Warranty

Specialized Bicycle Components ("Specialized") makes the following Limited Warranty:

One Year Limited Warranty on Complete Bicycles

Specialized warrants to the original owner that this new Specialized bicycle shall be free of defective materials and workmanship for a period of one year from the date of the original purchase provided the bicycle is purchased in the United States and operated under normal conditions and use. During this one-year warranty period, Specialized shall repair or replace, at its sole option, all parts that are found by Specialized to be defective and subject to this limited warranty. The original owner shall pay all labor charges connected with the repair or replacement of the bicycle frame.

Lifetime Limited Warranty on Bicycle Frame

Specialized further warrants to the original owner that the frame of this new Specialized bicycle shall be free of defective materials or workmanship during the lifetime of the original owner. During this lifetime warranty period, Specialized shall repair or replace, at its sole option, the bicycle frame if Specialized determines the frame is defective and subject to this limited warranty. The original owner shall pay all labor charges connected with the repair or replacement of the bicycle frame.

General Provisions

This Limited Warranty is made only to the original owner of this new Specialized bicycle, and it shall remain in force only as long as the original owner retains ownership of the Specialized bicycle. This Limited Warranty is not transferable.

In order to obtain service under this Limited Warranty, the original owner must deliver the Specialized bicycle to an authorized Specialized dealer, together with the Specialized warranty card and the bill-of-sale or other dated proof-of-purchase document identifying the Specialized bicycle by frame number.

This Limited Warranty does not apply to normal wear or tear, nor to defects, malfunctions or failures that result from the abuse, neglect, improper maintenance, alteration, modification, accident, or misuse (including, without limitation, bicycle racing, bicycle motocross, stunt bicycling or similar activities) of the Specialized bicycle.

This Limited Warranty is the only express or limited warranty applicable to Specialized bicycles. Any implied warranties, including warranties of merchantability and fitness for a particular purpose, shall be limited in scope and duration in accordance with this limited warranty. Specialized shall not be responsible for any direct, incidental, consequential or exemplary damages suffered by any party. The foregoing statements of warranty are exclusive and in lieu of all other remedies.

This Limited Warranty gives you specific legal rights; you may also have other legal rights which vary from state to state. Some states do not allow limitations on the duration of implied warranties, or the limitation or exclusion of incidental or consequential damages; therefore, the limitations and exclusions set forth in this Limited Warranty may not apply to you.

The Limited Warranty set forth herein may not be extended, enlarged or otherwise modified by any Specialized dealer, agent or employee, and Specialized does not assume any liability or make any warranty except as stated in this Limited Warranty.