

1997 Cartridge Service Addendum

Judy Fork Models

ROCK SHOX®

Cartridge Service

The Judy cartridge is designed to be fully serviceable. The oil in the cartridge provides the damping for the entire fork and over time will break down. At least once a season, have the cartridge rebuilt (oil change) to maintain optimal performance. When servicing the cartridge, keep in mind that the best performing cartridges have the least amount of air. Cartridge service is easiest with a RockShox cartridge tool kit available from your dealer. The following instructions are written for use with the cartridge service tool kit, but the cartridge can be serviced without these tools.

RockShox forks are designed to be nearly maintenance free. However, as long as moving parts are exposed to the elements, moisture and contamination can reduce performance. To maintain high performance, safety, and long life, periodic maintenance is required. RockShox forks are engineered for easy service to help you keep the fork clean, greased, and performing like new.

NOTE: RockShox recommends replacing both shaft seals and adjuster rod o-ring during every service.

IMPORTANT: Always wear safety glasses when working on RockShox forks.

Maintenance Tools

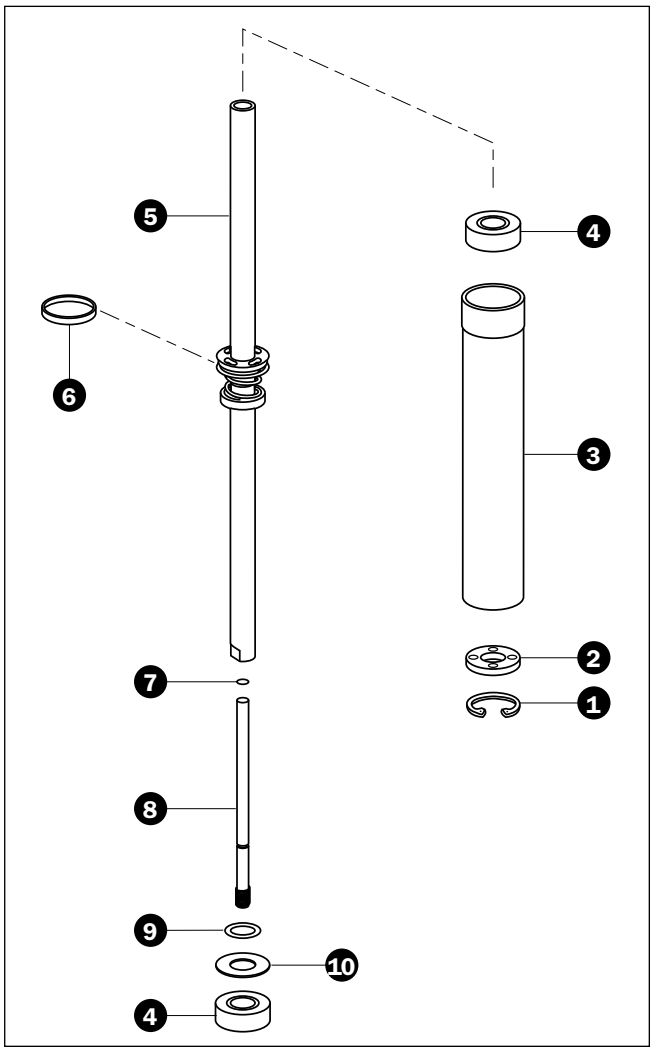
The recommended tools and intervals for maintenance are listed below. Remember, performing maintenance more often is always better and necessary if you ride in extreme conditions.

- 3mm and 8mm hex wrenches
- 8mm open-end wrench
- Small tip internal snap ring pliers
- Plastic face mallet
- 22mm socket (6 point preferred) or wrench
- Ratchet, for socket
- Small straight blade screwdriver
- Long (8" minimum) socket extension, end wrapped with cloth tape

Lubricants and Cleaners:

- Degreaser
- Judy Butter or high quality teflon fortified grease*
- RockShox 5wt or 8wt oil (or fork oil without seal sweller additives)

***Note: For best performance, avoid lithium-based greases. Some lithium greases can become sticky, turn gray and cake up when used to lubricate the bushings. When this happens, smooth fork action is greatly limited, and performance is greatly reduced. If you use lithium grease, check grease quality and condition at each 25-hour service interval to ensure grease is performing properly. If you experience problems, try using another type of lubricant.**



97 Cartridge Internals (see diagram to right)

1	Shaft Guide Retaining Ring	50133
2	Shaft Guide	43089
3	Cartridge Body, 63mm	43175
4	Cartridge Seal (2)	56404
5	Piston Shaft Assembly, 63mm	20864
6*	Piston Glide Ring	51227
7*	Adjuster Rod O-ring	51216
8*	Adjuster Rod	43080
9	Top-out O-ring	51119
10	Seal Washer	52236

* included with piston/shaft assembly (see Small Parts Catalog for other cartridge configurations)

Cartridge Disassembly


Fig. 1

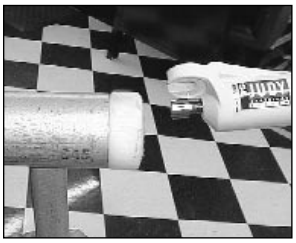

Fig. 2


Fig. 3


Fig. 4


Fig. 5


Fig. 6

1. Mount the bike in a stand, disconnect the front brake cable, and remove the front wheel. (The brakes do not need to be removed. Avoid disassembling brakes unless absolutely necessary.).
2. Pull red external damping adjustment knob from left shaft bolt of Judy SL with a downward twisting motion. (The external adjuster is press fit in the shaft bolt.) (See Fig. 1)
3. Partially loosen shaft bolts with a 6 or 8mm hex wrench, tap bolts firmly with a mallet breaking shafts free from lower tube, and remove bolts completely. (See Fig. 2)
4. Slide off one-piece lower tube assembly. (See Fig. 3) Remove fork boots.
5. Clean upper tubes and inspect for wear and/or damage (nicks, scratches, or dings).
6. Clean fork boots and slide onto uppers, and clean internals of lower tubes, and double seal.
7. Remove the snap rings at the bottom of the upper tubes with small tip internal snap ring pliers. (see Fig. 4)
8. Pull the cartridge assembly free from the left upper tube. Note orientation of parts, top to bottom: shaft-end plate, cartridge, cartridge washer (very important), wave washer, and snap ring. The shaft-end plate on the top of the cartridge shaft may remain in the upper tubes. Remove the spring stack assembly as described in owner's manual and tap the plate out the bottom of the tube with the long socket extension. (For DH, repeat this procedure on right leg to remove rebound damping cartridge.)
9. Pull the neutral shaft assembly free from the right lower tube. Note orientation of parts, top to bottom: shaft end plate, upper shaft guide with o-ring, pressed-on washer, top-out bumper, lower shaft guide, and snap ring. (See Fig. 6) The shaft-end plate and upper shaft guide on the top of the neutral shaft may remain in the upper tube. Remove the spring stack assembly as described in owner's manual. Tap the plate and guide out the bottom of the tube with the long socket extension.
10. Slide off the plastic cartridge washer. Hold the cartridge over an oil receptacle with the exposed seal end down and tap the top damper shaft end with a mallet, firmly holding the cartridge body, to press the lower seal out of the cartridge body. (See Fig. 7) Once the seal is exposed, drain the oil from the cartridge into the oil container. If the seal is difficult to remove you may need to support cartridge body in fixture tool.
3. Pull the damper shaft free of the cartridge body. Inspect the damper shaft for nicks or scratches that may cause oil leakage. Replace assembly as needed.
4. Inspect the inside bore of the cartridge body for scoring or scratches that may cause oil leakage. Replace cartridge body as needed.
5. For adjustable compression cartridges, unscrew the adjuster rod completely with a 3mm hex wrench and remove from the damper shaft. (See Fig. 8)

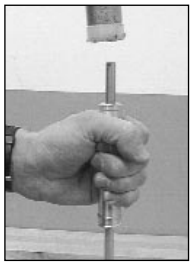
CAUTION: Remove the adjuster rod gently to avoid damaging the adjuster rod o-ring on the threads of the shaft when removing.

6. Clean the following parts with a lint-free rag: damper shaft, seal, and cartridge body.
7. Remove top snap ring and plastic shaft guide washer from cartridge body to remove upper seal out of cartridge body.

WARNING: Use extreme care not to damage the cartridge bore.

8. Inspect glide ring for nicks and scratches, making certain it shuttles freely on the piston. Replace as needed.
9. Remove and inspect adjuster rod o-ring for cuts and damage. Grease liberally prior to installation onto adjuster rod.

NOTE: RockShox recommends replacing adjuster rod o-ring during every service.


Fig. 7

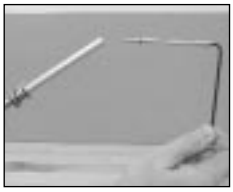

Fig. 8


Fig. 9


Fig. 10


Fig. 11

Cartridge Assembly

1. Install snap ring, sharp outside edge up, and plastic shaft guide washer into upper end of cartridge body.
2. Lightly coat inside of cartridge body with RockShox oil. Apply grease to upper cartridge seal inside and out. Slide seal, pocket side down, onto upper seal installation tool. Press the seal into seal bore of cartridge until fully seated. (See Fig. 9) Remove upper seal installation tool.
3. Invert (turn upside down) cartridge body, and insert greased shaft guide tool into cartridge body and seal. (See Fig. 10) Place assembly into cartridge body fixture. (See Fig. 11) Fill cartridge 1/2 full with RockShox oil (5wt stock, 8wt optional). Apply oil to piston glide ring and carefully insert piston shaft assembly, internal threaded shaft end up, into cartridge, mating shaft end with


Fig. 12

shaft guide tool. Then push piston shaft assembly through the upper seal forcing shaft guide tool out of upper seal.

4. Remove shaft guide tool by lifting entire cartridge body fixture. Take care not to spill any oil.
5. Push piston shaft assembly into cartridge body until it stops. Add more oil until it's about 2/3 full (see Fig. 12), taking care not to pull shaft back through the seal and the piston out of the oil.
6. Let assembly set for minimum of 5 minutes to allow any residual air to escape.
7. Install top-out o-ring and seal washer onto shaft.
8. Fill cartridge body with RockShox oil to within 5mm of body edge.
9. Apply grease to upper seal, inside and out, fully filling pocket of seal with grease.
10. Using fishing line, cut main seal o-ring (PN 51104) or equivalent, place in I.D. of seal. (See Fig. 13)
11. Carefully install this seal assembly, pocket side down, over shaft, being careful not to damage sealing lips on the flats of shaft and maintaining orientation of line between seal and shaft. The line provides a leak path for the excess oil when seal is pressed into cartridge body.


Fig. 13

NOTE: Make sure line does not get caught between cartridge body and seal O.D.

12. Place Cartridge Lower Bushing Installation Spacer (PN 70181) step side down over exposed shaft. Place Lower Seal Installation tool (PN 70138) over shaft. Press fully into cartridge body leaving 1mm of exposed cartridge body above top of seal. (See Fig. 14)


Fig. 14

CAUTION: Hold a rag around lower seal installation tool as oil will be forced out through the vent holes of the tool.

NOTE: The lower seal should be pressed in to body until 1mm of cartridge body wall is exposed.

13. Remove line from seal. (See Fig. 15)
14. Adjustable cartridge only: Fill exposed adjuster rod shaft full with oil. (See Fig. 16)
15. Using a 3mm hex wrench, install adjuster rod with o-ring that is liberally greased. Thread into exposed shaft until rod bottoms out.


Fig. 15

CAUTION: Take care while installing adjuster rod to prevent damage to o-ring threads in shaft.

HINT: Spin adjuster rod as o-ring contacts shaft, effectively threading o-ring through the threads.

16. Install rebuilt cartridge assembly and neutral shaft assembly into upper tubes. Make sure all parts are clean, greased, and installed in the proper order.

NOTE: Be sure to properly install a cartridge washer and wave washer between cartridge and snap ring.

17. Install snap rings, sharp outside edge facing out into upper tube ring grooves. Make certain cartridge washer, wave washer, and snap ring are oriented correctly, and the snap rings are fully seated in the ring groove of the upper tubes.


Fig. 16

CAUTION: Snap rings must be properly oriented, sharp outside edge facing out, and fully seated in ring groove of the upper tubes.

18. Clean fork boots and slide onto uppers, and clean internals of lower tubes, bushings (two per leg), and double seal. A lint-free rag wrapped to a long 3/8" drive socket extension wrapped with cloth tape works well.

IMPORTANT: Clean lower bushings, approximately 6" (150mm) from top.

19. Apply Judy Butter to the surface of the four bushings, the inside of the lower tubes and fill the pocket between the lips of the double seal completely. Use a socket extension wrapped with cloth tape dipped in Judy Butter to reach inside the lower tubes. (See Fig. 17)


Fig. 17


Fig. 18


Fig. 19

Note: For best performance, avoid lithium-based greases. Some lithium greases can become sticky, turn gray and cake up when used to lubricate the bushings. When this happens, smooth fork action is greatly limited, and performance is greatly reduced. If you use lithium grease, check grease quality and condition at each 25-hour service interval to ensure grease is performing properly. If you experience problems, try using another type of lubricant.

Smear teflon based oil, 5wt oil or a thin layer of Judy Butter to the upper tubes under the fork boots.

19. Install one-piece lower assembly onto upper tubes, carefully engage upper double seal lip with the upper tubes, and gently rock the one-piece lower assembly to engage the lower bushings with the upper tubes. When installed properly, the cartridge and neutral shaft threads are visible through the holes in the lower tubes.
20. Refit shaft bolts, apply grease to steel bolts or anti-seize on titanium bolts. Use 6 or 8mm hex wrench to torque shaft bolts to 60 in-lb (7 Nm). (See Fig. 18)

NOTE: It is very easy to over tighten this bolt with an 8mm hex wrench. Use a torque wrench.

21. Refit fork boot into double seal groove using small blade screwdriver. (See Fig. 19) Engage boot with double seal groove at the rear and rotate boot around the upper tube to fully engage its lower edge behind the brace. A small amount of oil on the mating surfaces helps.
22. Repeat procedure on other leg.
23. On Judy SL, re-install red external damping adjuster by applying a light coating of oil to the O-ring and pushing it into the shaft bolt with an upward twisting motion.

Tightening Torque Table

Crown Bolts	60 in-lb	6.8Nm
Top Cap Assemblies	30 in-lb	3.4Nm
Fork Brace Bolts	60 in-lb	6.8Nm
Brake Posts	60 in-lb	6.8Nm
Shaft Bolts	60 in-lb	6.8Nm

Warranty

RockShox, Inc. warrants its forks for a period of one year from original date of purchase to be free from defects in materials or workmanship. Any RockShox fork that is returned to the factory and is found by RockShox to be defective in materials or workmanship will be repaired or replaced at the option of RockShox, Inc. This warranty is the sole and exclusive remedy. RockShox shall not be held liable for any indirect, special, or consequential damages.

The warranty does not apply to forks which have not been properly installed and adjusted according to RockShox installation instructions. The warranty does not cover any fork that has been subject to misuse or whose serial number has been altered, defaced or removed. This warranty does not cover paint damage or modifications to forks. Proof of purchase is required.

Warranty repair

If for any reason it should be necessary to have warranty work done, return the fork to the place of purchase. In the USA, Dealers should call for a Return Authorization number (RA#) prior to returning product. Products returned for inspection must be sent freight prepaid to:

RockShox, Inc.
401 Charcot Ave.
San Jose, CA 95131

408.435.7469
FAX 408.435.7468
Toll-Free Technical Support in the USA 800.677.7177

Customers in countries other than the USA should contact their dealer or local distributor.

WorldWide Distributors

Argentina
Broni S.A.
Phone: 541 292 3000
FAX: 541 292 4453

Australia
Steve Cramer Products
Phone: 03 9587 1466
FAX: 03 9587 2018

Austria
Barisitz-Austria
Phone: 43 512 39 22 87
FAX: 43 512 39 45 19

Belgium
Vertex Cycle Systems BV
Phone: 31 23 57 18184
FAX: 31 23 57 18606

Brazil
Pacific Bicycle Company
Phone: 55 11 816 2249
FAX: 55 11 816 0544

Canada
Bell Sports Canada
Phone: 514 378 0452
FAX: 514 378 9934

Chile
Bicicletas Belda Limitada
Phone: 563 288 1799
FAX: 563 297 8799

Colombia
Disandina Ltda.
Phone: 576 320 5162
FAX: 576 320 4816

Costa Rica
SPC Bicicletas
Phone: 506 296 3383
FAX: 506 220 3580

Czech Republic
Vanek Praha S.R.O.
Phone: 4203 126 98189
FAX: 4203 126 98025

Denmark
Duell A/S
Phone: 45 86 36 7800
FAX: 45 86 36 7377

Ecuador
Bici Sport
Phone: 593 224 8737
FAX: 593 225 3691

Estonia
Estonian Unidream
Phone: 372 223 2976
FAX: 372 636 74 70

Finland
Mr. Cool OY
Phone: 358 9 325 0817
FAX: 358 9 325 0609

France
Philamy S.A.
Phone: 33 492 70 9700
FAX: 33 492 72 6070

Germany
Sport Import GmbH
Phone: 49 44 05 9280 0
FAX: 49 44 05 9280 49

Greece
Gatsoulis Stefanos Imports
Phone: 30 12512 779
FAX: 30 12533 960

Guatemala
BYS Importaciones S.A.
Phone: 502 366 7709
FAX: 502 363 3918

Holland
Vertex Cycle Systems BV
Phone: 31 23 57 18184
FAX: 31 23 57 18606

Hong Kong
Flying Ball Bicycle Company
Phone: 852 23974408
FAX: 852 23974406

Hungary
Prokero KFT
Phone: 361 131 3184
FAX: 361 331 3184

Iceland
Orninn Hjol Ltd.
Phone: 354 588 9892
FAX: 354 588 9896

Italy
Motorquality
Phone: 39 2 249511
FAX: 39 2 24951228

Japan
Yoshigai Corporation
Phone: 81 729 88 5461
FAX: 81 729 88 5463

Korea
KS Trading
Phone: 822 548 5408
FAX: 822 512 3230

Luxembourg
Vertex Cycle Systems BV
Phone: 31 23 57 18184
FAX: 31 23 57 18606

Mexico
Grupo Scandi
Phone: 525 281 14 39
FAX: 525 281 27 21

New Zealand
W.H. Worrall & Co. Ltd.
Phone: 64 9 6303901
FAX: 64 9 6303839

Norway
Foss Sykler
Phone: 47 22 38 2636
FAX: 47 22 38 2644

Panama
Distribuidora Rali S.A.
Phone: 507 220 3844
FAX: 507 220 5303

Peru
Rojo Sports
Phone: 511 447 0838
FAX: 511 447 0838

Poland
Giant Polska S.P. ZOO
Phone: 48 22 645 14 34
FAX: 48 22 645 14 36

Portugal
Bicimax
Phone: 351 44 553276
FAX: 351 44 553187

Russia
Sportex
Phone: 7 095 2550831
FAX: 7 095 2550831

St. Maarten
Tri-Sport International
Phone: 5995 43462
FAX: 5995 43928

Singapore
Treknology Bikes 3
Phone: 65 466 2673
FAX: 65 466 7610

Slovakia
Velo Gepard Ltd.
Phone: 4202 243 15631
FAX: 4202 243 16189

Slovenia
Proloco Trade
Phone: 386 64 4380200
FAX: 386 64 3802012

South Africa
Coolheat (SA) (PTY) Ltd.
Phone: 27 11 493 7430
FAX: 27 13 493 1794

Spain
K. Motor Dealer S.L.
Phone: 34 91 637 70 97
FAX: 34 91 637 72 64

Sweden
Hallman Sports
Phone: 46 18 56 16 00
FAX: 46 18 13 24 26

Switzerland
CILO Bike Service
Phone: 41 21 641 63 22 (French)
Phone: 41 21 641 63 33 (German)
FAX: 41 21 641 63 82

Taiwan
Biketech Co. Ltd.
Phone: 886 22 694 5808
FAX: 886 22 694 6133

Thailand
Probike Co. Ltd.
Phone: 66 225 33384
FAX: 66 225 41078

Trinidad
Let's Ride Instead
Phone: 868 636 2277
FAX: 868 636 4181

Turkey
EBSAT
Phone: 90 212 514 0525
FAX: 90 212 511 5171

United Kingdom
Caratti Sport Ltd.
Phone: 44 1 454 201700
FAX: 44 1 454 202577

Uruguay
International Sports
Phone: 598 241 8450
FAX: 598 241 2514

USA
RockShox, Inc.
401 Charcot Avenue
San Jose, CA 95131
Sales & Tech Support
Phone: 800 677 7177
FAX: 408 435 7468

Venezuela
Bike Sports
Phone: 582 751 9709
FAX: 582 751 9730



© RockShox, Inc. January 1997