



# INTRODUCTION

Congratulations, you have purchased an excellent pair of shock absorbers, FOX SHOX. In order to obtain maximum performance from your FOX SHOX it is suggested that you take the time to read this manual fully before installing and using FOX SHOX. The installation and tuning instructions will enable you to get optimum results with FOX SHOX.

FOX SHOX are gas pressurized shock absorbers. FOX SHOX were originally offered for sale in the fall of 1975 at the beginning of the long travel revolution in motocross. They soon became the standard of the industry. Since these revolutionary beginnings developments have continued. Improvements have been made on a regular basis in order to keep FOX SHOX in the forefront of suspension technology.

We no longer recommend FOX SHOX for the demands of Grand Prix or National caliber motocross competition however. For these ultra-long travel grueling conditions we recommend the excellent products manufactured by our sister company, Fox Factory Inc. and sold by ourselves.

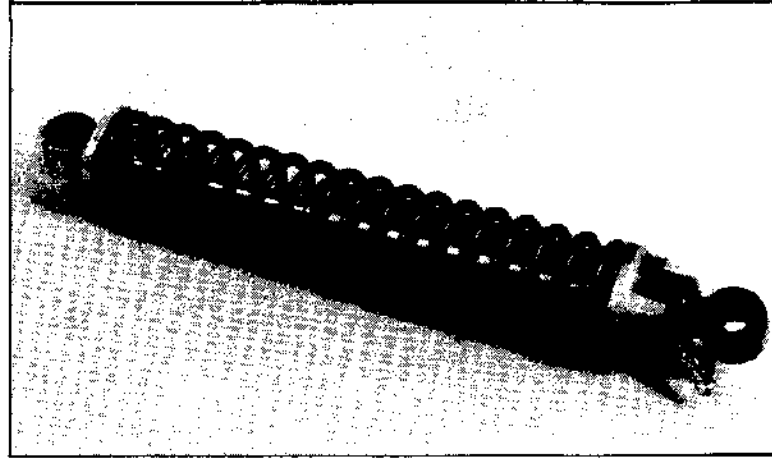
We do heartily recommend FOX SHOX for the following applications.

STREET & ROAD RACING

OBSERVED TRIALS

MINI-MOTOCROSS

TRAIL & MOTOCROSS on bikes with 8" or less rear wheel travel.



If you have any questions please feel free to phone.

Geoffrey T. Fox  
President  
April 1, 1981

# INSTALLATION TIPS

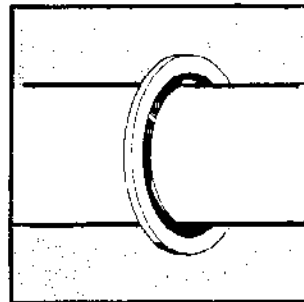
1. FOX SHOX are designed to be operated with the large end of the shock absorber up. This ensures proper operation and also reduces unsprung weight. **IF YOU MOUNT FOX SHOX IN THE CONVENTIONAL MANNER (LARGE END DOWN) THEY WILL NOT OPERATE PROPERLY.**

2. Shock absorbers should be free to rotate on their mounting bolts. This is especially important in cantilevered or laydown installations because of the considerable amount of angular variation in such installations. Thus **DO NOT** pinch the shock mounts tightly when installing. **DO** use nyloc nuts or safety wire to ensure the bolts don't fall out.

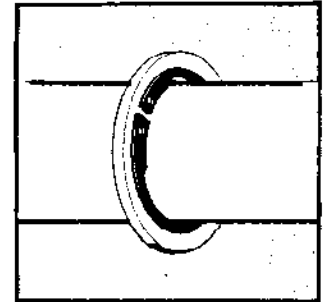
3. **BE CERTAIN** that both the gas valve **AND** the shock body do not interfere with the frame or mounts at any point in the travel.

Attach the shox without springs and rotate the swing-arm through its full travel. You should have at least  $\frac{1}{8}$ " clearance at any position. The rubber shock eye bushings **DO GIVE** with sudden impacts so clearance **IS IMPORTANT**. (Some bikes will require filing or grinding)

**\*FAILURE TO FOLLOW THE ABOVE STEPS CAN RESULT IN SHOCK DAMAGE, BIKE DAMAGE, OR BOTH!!**



YES



NO

4. (Snap Ring Models) Be certain the spring retainer ( $\neq 20$ ) encloses the snap ring ( $\neq 21$ ) with the shock spring installed. The retainer is made with a machined recess to ensure that the snap ring can not come loose in actual operation.

(Cam Adjuster Models). Our street models feature a cam adjuster to enable the rider to quickly adjust Spring Preload when carrying a passenger. On these shocks there is no snap ring at this point to check.

### TUNING: Spring Rate & Damping

Selecting the proper spring rate and damping settings are extremely important in order to obtain maximum performance from your shock absorbers. At Moto-X Fox we continue to test and develop shock absorbers as new bikes are brought into the market place. Currently, we offer 10 different damping settings (four for Street/Road Racing, five for moto-

cross, and one for Trials). Please consult our **MOTO-X FOX SUSPENSION CATALOG** for our suggested applications, or phone our order desk.

### SPRINGS Dual Rate FOX Springs:

Part No.	Spring Rate	Length	Spring Color	Color Code
87-0050	50	8.55 ins.	Blue	White
87-0060	60	8.55 ins.	Blue	Orange
87-0125	135	8.55 ins.	Blue	Red
87-0165	165	8.55 ins.	Blue	Lime Green
87-1450	Soft	2.85 ins.	White	No color code
87-2500	Stiff	2.85 ins.	White	Yellow

### COMBINATIONS OF SPRINGS

Two springs are used on each shock absorber. One spring is painted white and the other longer spring is painted blue. The springs are designed so that initially **both** the white and the blue spring are working together to give a soft spring rate. About halfway through the travel the white spring coil binds and then the spring rate is determined by the blue spring alone.

Spring Rate	Blue Spring	White Spring	Remarks
37/50	87-0050	87-1450	For minicycles—soft
42/60	87-0060	87-1450	For minicycles—firmer
70/135	87-0135	87-1450	
77/165	87-0165	87-1450	
74/105	87-0105	87-2500	
86/135	87-0135	87-2500	
100/165	87-0165	87-2500	

13" through 16" FOX SHOX use dual rate springs OR 11" springs, EXCEPT for 13" preload cam style shox which must use 9" springs. All shox shorter than 13" can only use 9" springs. 17" and 17.5" shox use 11" springs in conjunction with our short white springs.

### 9" Springs:

65 lbs./in.	gold-red-gold	85-0065
75 lbs./in.	gold-green	85-0075
80 lbs./in.	gold-white	85-0080
90 lbs./in.	gold-pink	85-0090
100 lbs./in.	gold-violet	85-0100
125 lbs./in.	yellow-red	86-0125
70/100 lbs./in.	gold-gold-gold	85-7010
85/115 lbs./in.	white-red	85-8511
95/125 lbs./in.	white-blue	85-9512
100/140 lbs./in.	white-violet	85-1040

### 11" Springs:

60 lbs./in.	plain	86-0060
70 lbs./in.	blue-blue	86-0070
80 lbs./in.	blue-red	86-0080
90 lbs./in.	blue-brown	86-0090
100 lbs./in.	blue-orange	86-0100
110 lbs./in.	blue-pink	86-0110
125 lbs./in.	blue-purple	86-0125
70/100 lbs./in.	gold-gold	86-7010
85/115 lbs./in.	white-red	86-8511
95/125 lbs./in.	white-blue	86-9512

## REBUILDING PROCEDURE

The rebuilding procedure listed below is for FOX SHOX without REMOTE RESERVOIRS. If you have REMOTE RESERVOIRS installed please see the special instructions further on.

### DISASSEMBLY

1. Remove shock from bike and remove spring.
2. Remove cap on air valve. While directing the valve up and away from any persons release the gas pressure inside the shock absorber. Some liquid may escape at the same time. Wait five minutes and then release pressure again (some gas is dissolved in the liquid and comes out of solution) to be certain there is no pressure in the shock.
3. Push the bumper (#10) away. Hold the eye assembly (#4) in a vise and loosen the jam nut (#8) with a 3/4" wrench.
4. Release the vise and unscrew eye assembly (#4).
5. Remove jam nut (#8). Remove spring retainer.
6. Remove flat washer (#9) and rubber bumper (#10).
7. Clean the exterior of the shock absorber, especially the shaft and seal area.

8. Using a vise, hold the body by closing the vise on its eye. **DO NOT CLAMP THE VISE ON THE SHOCK BODY ITSELF!**

9. Use a knife to pry the plastic protector (#11) off.
10. Using a good snap ring pliers push down on seal cap and remove snap ring (#16). Remove seal cap.
11. Remove bearing O-ring.
12. Turn body upside down and work bearing (#17) out of body by pushing shaft in and out.
13. Pour remaining oil out of shock.
14. Use snap ring pliers to remove snap ring (#19). This snap ring differs from (#16) in that it is bowed. (Place on a flat surface to distinguish.)
15. Lift shaft and piston assembly out of shock body.
16. Using small screwdriver pry shaft seal (#13) out of seal cap. Take care to not damage sealing edges. **DO NOT REMOVE** shaft wiper (#12) at this time unless you want to install a new one. If you wish to install a new one, remove old one by prying out. (You will mangle it.) Install new wiper by pushing in carefully with fingers, get one edge in and then distort wiper. Using a blunt instrument be sure wiper is fully seated in its groove.
17. Replace jam nut (#8) and eye assembly (#4) and tighten. Now you hold shaft in vise by clamping on eye.

18. Unscrew piston nut (#25) using 9/16" socket.

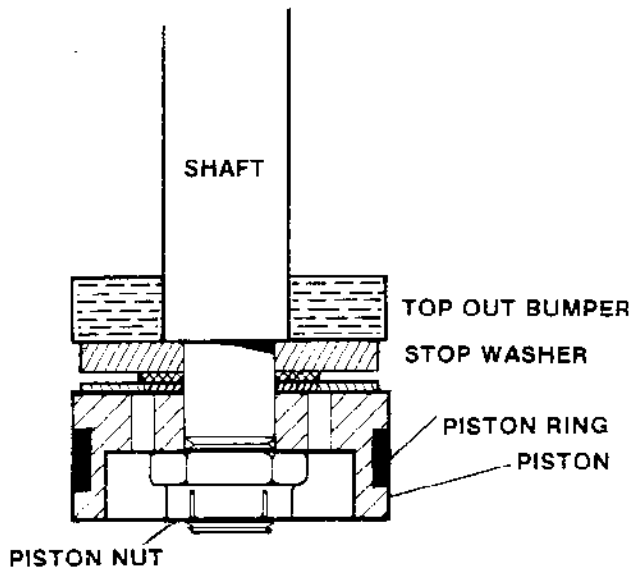
19. Lift off piston (#23) and series of flat washers. These washers constitute the major portion of the valving. The arrangement is very important. The sketch and chart below can be helpful in changing damping if you are not sure what order the parts came off in.




20. Inspect valving washers "C" for any indications of cracks. If any are visible replace them.

**VALVING WASHERS (steel piston)**

Application	Damping	B	C	Part No.
Trials	Trials	2 (.010")	1 (.015")	38-0099
Motocross	Soft	1 (.012")	1 (.015")	38-0090
	Medium	1 (.010")	2 (.010")	38-0091
	Firm	1 (.015")	1 (.020")	38-0092
	XFirm	1 (.015")	1 (.008") 2 (.010")	38-0093
	XXFirm	1 (.015")	3 (.010")	36-0094
Road Race	S-4 Soft	2 (.012")	1 (.020")	38-0098
Street Flat Track	S-3	3 (.010")	2 (.010") 1 (.008")	38-0097
		3 (.012")	2 (.010") 1 (.012")	38-0096
	S-1 Stiff	2 (.015") 1 (.010")	3 (.012")	38-0095

If your shock does not have a steel piston please consult our order desk



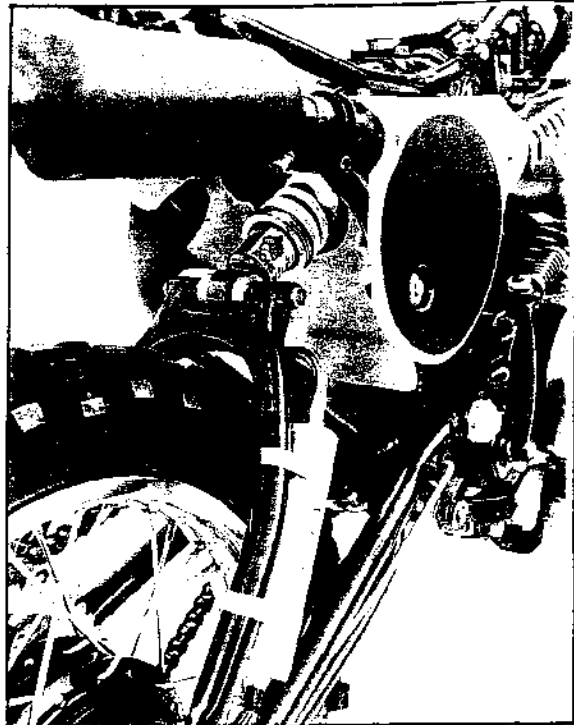
-  **A** - Spacer washer (O.D. = 0.710", thickness 0.032") 1 only
-  **B** - Valving washer (O.D. = 0.690", thickness see chart)
-  **C** - Valving washer (O.D. = 1.200", I.D. = 0.690", thickness see chart)

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21. Inspect top out bumper (#20) on shaft. Replace if worn.

22. Do not remove gas valve (#32) unless it has been damaged. If you do replace it use teflon tape on the threads. Then inspect inside of body. If you notice teflon tape hanging inside the body you **MUST** remove it (use a long, long scissors) or it will eventually break loose and get caught in the valving in the piston reducing damping.

23. Clean all parts thoroughly in solvent and inspect for wear. Piston should be replaced if outside diameter measures less than 1.300". Shaft bearing should be replaced if inside is greater than 0.504". Piston ring is made of specially compounded teflon derivative and should only need to be replaced with piston. Shaft should be replaced if it becomes bent or badly scratched. Piston should need replacement about once a year . . . other parts less frequently.



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## ASSEMBLY

1. Install jam nut (#8) and eye assembly (#4) on shaft in vise by clamping on eye.
  2. Slip top out bumper (#20) onto shaft.
  3. Place stop washer (#21) on shaft.
  4. Install valving washers (A,B,C) onto shaft. See previous diagram for arrangement. Different thicknesses give different damping.
  5. Make sure all washers are lined up and not pinching one another then slip piston over shaft.
  6. Install piston lock nut and tighten to 15 foot-pounds maximum. (Excessive torque will increase damping in a non-calibrated way.) We suggest using Permatex "Lock Nut" on this nut for security.
  7. Be sure piston ring is on piston.
  8. Loosen and remove jam nut (#8) and eye assembly (#4).
  9. Hold shock body in vise by grabbing shock eye (not body).
  10. Add about one inch of Bel-Ray LT-56 Shock Oil to shock. **(WE HIGHLY RECOMMEND BEL-RAY LT-56 . . . all damping values are based upon its use. We will not be responsible for use of any other oil.)**
- AGAIN WE STRESS THE IMPORTANCE OF CLEANLINESS. ANY PARTICLES WHICH GET INTO THE SHOCK WILL EVENTUALLY GET STUCK IN THE VALVING REDUCING THE DAMPING BELOW WHAT IS REQUIRED.**
11. Install piston/shaft assembly into shock body. (Do **NOT** force. If it hangs up it is the piston ring getting caught in the snap ring groove. Forcing will nick the ring. Remove the ring and bend it into a tighter circle, then reinstall carefully . . . this will make it pull itself in against the piston so it will not hang up.)
  12. Now add remaining Bel-Ray LT-56 shock oil. How much? Have the piston/shaft assembly bottomed out in the body and then add oil until the level is 1/4" below the lower snap ring groove.
  13. Install snap ring (#19) in lower snap ring groove. This is the "bowed" snap ring . . . do not confuse with (#16). Install sharp edge down.
  14. Install shaft bearing (#17) grooved end up.
  15. Install bearing O-ring in bearing groove.
  16. Install new O-ring (#15) in seal cap (#14).
  17. Install the shaft seal over the threads and onto the shaft. Use our bullet tool (#38-0001). You will find it easier if you install it quickly. (These seals are quite tough and long lasting, but if you nick one it will weep.)
  18. Push the seal cap (#14) with the shaft wiper installed over the threads and onto the shaft (do not try to cover the threads for this).
  19. Now, using your thumb nail, push the shaft seal (#13) up into the seal cap (#14) until it is seated.

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20. Push the seal cap into the body. Use your thumb nail to help the O-ring to enter without getting cut. (Wetting the O-ring helps.)

21. Install snap ring (#16) while pushing down on seal cap (#14). Install snap ring with the sharp edge up (it makes it easier to remove next time). **BE SURE THAT SNAP RING SEATS COMPLETELY IN ITS GROOVE.**

22. Snap plastic protector (#11) into place on top of body.

23. Slide rubber bumper (#10) and flat washer (#14) over shaft.

24. Thread on jam nut (#25) to shaft.

25. Screw eye assembly (#4) onto shaft.

26. Place eye assembly in vise and using 3/4" wrench tighten jam nut to prevent eye from working loose off shaft.

27. Pull shaft out to full extension.

28. Now pressurize shock absorber through gas valve. Have valve pointing up for this operation. We use 200 P.S.I. of nitrogen on motocross shock, and 100 P.S.I. on street and trials shock. Contrary to some magazine reports, changing pressure **DOES NOT** change damping.

29. Reinstall spring. Put shock back on bike and go racing.

Drawing Number	Part Number	Description	Price/Qty.	
1	38-1033	Shaft, 13", 13 3/4"	9.95/ea	
	38-1034	Shaft, 13 1/2"	9.95/ea	
	38-1035	Shaft, 14 1/4", 14 3/4"	9.95/ea	
	38-1038	Shaft, 15 1/4"	9.95/ea	
	38-1036	Shaft, 15 1/2", 16"	9.95/ea	
	38-1037	Shaft, 17", 17 1/2"	9.95/ea	
	2	38-1113	Body, 13"	14.95/ea
		38-1123	Body, 13" (preload cam style)	14.95/ea
	3	38-1114	Body, 13 1/2"	14.95/ea
		38-1124	Body, 13 1/2" (preload cam style)	14.95/ea
38-1115		Body, 14 1/4", 14 3/4"	14.95/ea	
38-1125		Body, 14 1/4" (preload cam style)	14.95/ea	
38-1119		Body, 15 1/4"	14.95/ea	
38-1117		Body, 15 1/2", 16"	14.95/ea	
38-1118		Body, 17", 17 1/2"	14.95/ea	
4		38-1009	Eye Assembly, Std. Gold	4.97/ea
		38-1010	Eye Assembly, Std. Silver	4.97/ea
		38-1011	Eye Assembly, 1/2" Longer, Silver	4.97/ea
5	38-1012	Eye Assembly, 3/4" Silver	4.97/ea	
	38-1013	Eye Assembly, Honda Clevis	6.95/ea	
6	38-1014	Eye Assembly, Suzuki Clevis	5.95/ea	
	38-0120	Rubber Bushing, 12mm	4.50/pr	
7	38-0121	Rubber Bushing, 14mm	4.50/pr	
	38-0122	Rubber Bushing, 16mm	4.50/pr	
8	38-0285	Reducer bushing, 14mm to 12mm	1.95/4	

38-0280	Reducer bushing, 12mm to 10mm	1.95/4
38-0290	Reducer bushing, 12mm to 8mm	1.95/4
38-0130	Jam nut	1.67/pr
38-0140	Flat washers	1.25/pr
38-0040	Rubber bumper	1.95/pr
38-0270	Plastic body cap	1.95/pr
38-0260	Shaft wiper	4.50/pr
38-0300	Shaft seal	5.00/pr
38-0052	Seal cap	3.95/ea
38-0170	O-ring, seal cap	1.50/pr
38-0230	Snap ring, seal cap (flat)	.75/pr
38-0060	Shaft bearing	3.95/ea
38-0171	O-ring, bearing	1.50/pr
38-0231	Snap ring, inner (bowed)	.75/pr
38-0100	Top out bumper	2.50/pr
38-0110	Shaft stop washer	1.00/pr
VALVING WASHERS (see application chart)		2.95/pr
38-0072	Piston with ring	4.95/ea
38-0073	Piston ring only	2.89/pr
38-0250	Piston nut	1.00/pr
38-0150	Spring retainer, slotter, silver	4.95/pr
38-0151	Spring retainer, slotted, gold	4.95/pr
38-0200	Spring retainer, body (clip style)	3.95/pr
38-0210	Snap ring, body	1.00/pr
38-0201	Preload cam, gold	5.95/ea
38-0202	Preload cam, silver	5.95/ea
38-0310	Spring locators	1.50/pr
38-0320	Spring guides	1.50/pr

