

ML

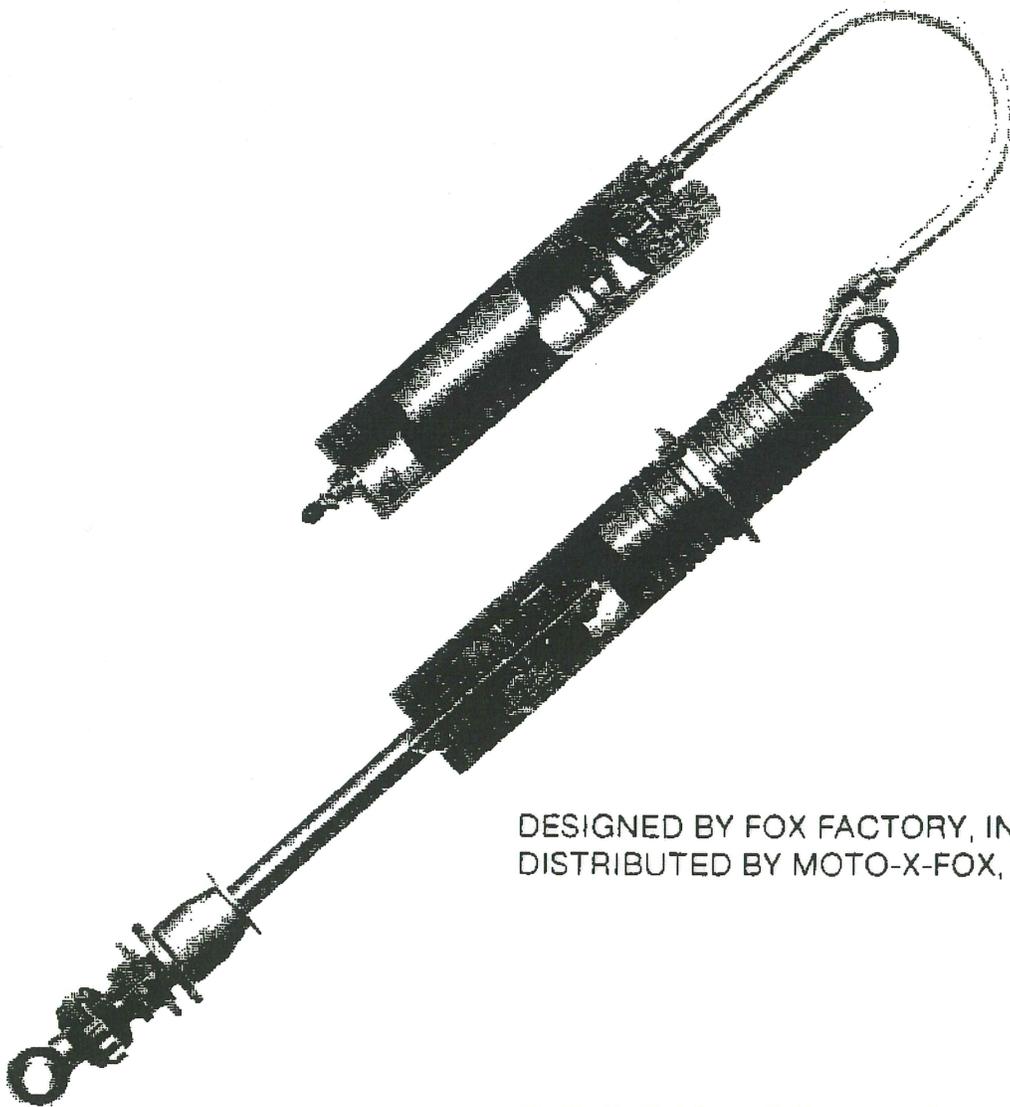
FOX TWIN-CLICKER

for Yamaha

Owner's Manual

with Exclusive Adjustable Compression Damping

Patent Applied for



DESIGNED BY FOX FACTORY, INC.
DISTRIBUTED BY MOTO-X-FOX, INC.

MOTO-X FOX

520 McGlincy Lane
Campbell, CA 95008 U.S.A.

PHONE. (408) 371-1221

DISCONTINUED

INTRODUCTION

Congratulations! You now own the most easily and fully adjustable shock absorber ever produced for motocross.

Your FOX TWIN-CLICKER is based on a state-of-the-art design which sets new standards for tuneability and fade-free performance. Both compression and rebound damping can be precisely adjusted to your requirements with the click of a knob.

Racers discovered years ago that different damping settings work best on different tracks. Settings that work best on a sand track, for example, are not optimum on a hard-packed track. In the past, most riders just set up their shocks as best they could for typical conditions and let it go at that. The alternative was to either re-valve their shocks every weekend or else own several shocks with different valving (factory riders often carried different shocks with them for various tracks).

Now with your FOX TWIN-CLICKER, you can set your damping to perfection for any course or event in a matter of seconds!

To ensure that you get the maximum performance and long service life that your new shock is designed for, take the time now to read this Owner's Manual carefully.

If you have any questions, comments, or problems, drop me a note.

Good luck and good racing,



Bob Fox
President
Fox Factory, Inc.

P.S. Please fill out and mail the enclosed Registration Card for your new shock. We keep these on file in order to update you on any new information regarding your shock. At Fox Factory, continuous research to improve our products is an ongoing process. Our interest in you, our valued customer, does not end the day you purchase one of our products.

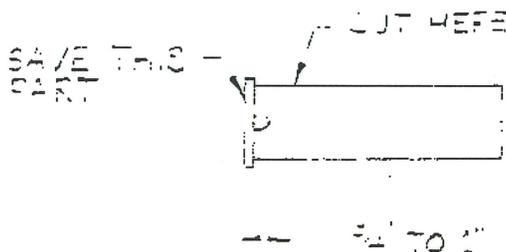
TABLE OF CONTENTS

Section I. Installation.	Page 1
Section II. Disassembly.	Page 2
Section III. Tuning-Damping.	Page 8
Section IV. Tuning-Spring Rate.	Page 9
Section V. Maintenance.	Page 10
Section VI. Troubleshooting.	Page 10
Section VII. Parts List.	Page 11

WARNING!

Failure to follow the instructions in this manual could cause damage or injury to your shock, your bike, your body, or "all of the above".

SECTION I. INSTALLATION

1. Remove stock shock from bike. Measure installed spring length for reference when installing on Fox shock.
2. Remove from stock shock:
 - *Spring Retainer Clips (the two U-shaped clips that hold the spring on).
 - *Spring.
 - *Spring Shield (the plastic shield inside the spring).
 - *Eyelet Dust Caps (the two rubber caps on the shaft end eyelet).
3. With a hacksaw, cut off plastic spring shield as shown:
(Note: Reason for doing this is to prevent "sticky" action in case mud or dirt accumulates between the shock body and the shield. The diameter of the Fox shock body is slightly greater than the stock shock.)

4. Install stock spring on Fox shock.
 - *Use cut-off plastic spring shield on end of spring.
 - *Use stock Spring Retainer Clips (U-shaped clips).
 - *Place wire retaining ring in groove on body to give approximate spring preload you want.
 - *Fine-tune spring preload with adjusting nuts at end of shaft (same size wrench as stock shock).
5. Install stock Eyelet Dust Caps on ends of eyelet at shaft end.
6. Install shock on bike.
 - *Note punch mark on one side of eyelet near BLUE adjusting knob. Install so this punch mark faces upward (for easy visibility).
 - *When mounting reservoir, note that stock upper retaining clip (the U-shaped bracket) does not quite reach far enough around.....there is a gap where the bolt tightens the bracket down. Install small washer/spacer supplied with the shock here. (Note: This is necessary because diameter and wall thickness of Fox reservoir is greater than stock reservoir--- --extra wall thickness minimizes chance of damage to reservoir due to flying stones, rocks etc.)

*(1980 Yamaha ONLY-C model): Stock reservoir upper retaining clip has a flange which seats on the top of the stock reservoir. This flange must be filed off to mount Fox reservoir, since Fox reservoir is longer than '80 stock reservoir.

*RED knob on reservoir should normally be located toward outside of the bike for easy access. Slight changes in position of RED knob can be made by slightly tightening or loosening hose connection at shock end.

IMPORTANT NOTE: Do not kink or sharply bend reservoir hose. Such abuse could damage this high-pressure, aircraft-quality hose! Also, make sure there are no points of contact with frame etc., which could cause abrasion damage.

7. Set initial rebound and compression adjustments:

*Rebound (BLUE knob). Turn BLUE knob clockwise as far as it will go. **DO NOT FORCE.** Punch mark on BLUE knob should line up with punch mark on eyelet at this position. (This is the maximum rebound position). Now back off $1\frac{1}{2}$ turns (18 "clicks"). This is the suggested initial setting for your first test lap. After first test lap, change at your discretion (see Tuning Section for suggestions).

*Compression (RED knob). Turn RED knob to "3" ("3" lines up with drill point mark on aluminum reservoir cap). This is your suggested initial setting for your first test lap.

8. Ready to go. Get out to your favorite test area and dial the shock in to your preferences. See Tuning Section for suggestions.

SECTION II. DISASSEMBLY

Disassembly is not required unless you want to make internal changes (e.g., increase or decrease travel), or change oil (we recommend changing oil once every 6 months---more often if you frequently ride in muddy conditions).

BASIC DISASSEMBLY

Step 1. Clean shock thoroughly. Be sure shock is meticulously clean before beginning disassembly.

Step 2. Depressurize reservoir. Do this with air valve pointed away from your face and body.

WARNING: Never attempt disassembly before depressurizing shock. This could cause severe injury!

Step 3. Unscrew shaft bearing. Hold shock upright with body eyelet clamped in soft-jaw vise. Use extra large crescent wrench (or special wrench #97-5640 available from Moto-X Fox) on bearing flats.

If you do not have a large enough crescent wrench, turn shock upside down and clamp bearing flats in soft-jaw vise. Now break bearing loose by turning body end cap with a crescent wrench. Do this just enough to break bearing loose ($\frac{1}{2}$ to $\frac{1}{2}$ turn), then turn shock upright to complete removal of bearing (otherwise oil will pour out).

Step 4. Remove shaft assembly. After bearing is unscrewed, the entire bearing/piston/shaft assembly comes out together.

Step 5. Remove piston assembly. (Skip this step if you only want to change oil.)

*Remove locknut at end of shaft.

*Remove piston assembly, carefully noting exact position of all parts. Lay out parts in exact order of removal.

*Remove aluminum shaft spacer and rubber top out bumper.

*Do not remove bearing unless you wish to change seal or wiper.

*Make changes required (e.g. install new shaft spacer for more or less travel).

*Reassemble piston assembly. Note that piston consists of two pieces. Be sure locating pin between piston halves is installed to correctly align the piston halves.

Step 6. Pour out old oil.

Step 7. Unscrew hose from reservoir. Use soft-jaw vise (aluminum or wood jaws) to firmly clamp end of reservoir (the end where the hose enters). Clamp ONLY in the area within 1" from the end' (Do NOT clamp near the middle of the reservoir!) Now unscrew hose. Carefully remove any particles of teflon tape on the end of the hose or in the threads of the reservoir.

Step 8. Pour out old oil from reservoir.

Step 9. Pressurize reservoir to 20-50 psi, then depressurize. Have ends of reservoir pointed away from your face and body when you do this.

WARNING: Do not skip this step. This could cause severe injury or damage.

NOTE: Purpose of this step is to correctly locate the floating piston in the reservoir. If the piston is not properly located, it is possible to have insufficient air space for shaft travel. This could cause extreme pressures and possible explosive failure of the shock.

- Step 10. Pour fresh oil into reservoir. Hold reservoir straight up, and tap to help remove air bubbles. Have RED knob set at "1" while doing this. (Use a lightweight oil such as Spectro Suspension Fluid 5 wt. or Bel-Ray LT-100.)
- Step 11. Thread hose into reservoir. Do not tighten with wrench. Hand tight is OK.
- Step 12. Pour fresh oil into body. Have eyelet end of body clamped in vise and reservoir hanging straight down. Fill shock right to the top.
- Step 13. Install bearing/piston/shaft assembly. With shaft fully extended, slowly immerse piston assembly in oil. It helps to wiggle the piston assembly around somewhat to eliminate trapped air. Have paper towels or shop rags handy to wipe up excess oil which will flow down the body. Use care to avoid scratching teflon surface of piston ring on internal threads at end of body.
- Step 14. Tighten bearing with large crescent wrench (or special Fox wrench) to about 50-75 ft-lbs.
- Step 15. Press in reservoir air valve to release slight pressure. (Note: When bearing was installed, some oil was displaced into the reservoir. This re-located the reservoir floating piston to its correct final position. This created a slight air pressure in the the reservoir. By depressing the air valve stem you release this slight pressure to ensure that the floating piston stays in its correct final position.)
- Step 16. Unscrew hose from reservoir. Place reservoir aside temporarily, keeping it upright so that oil does not leak out. Place finger over hose to prevent oil flow.
- Step 17. Bleed air bubbles out of shock.
- *Clamp shock eyelet at hose end of shock in vise with shaft pointing down.
 - *Immerse end of hose in container of oil (transparent plastic bottle preferred).
 - *Slowly stroke shaft all the way in, then all the way out. Make sure end of hose is fully immersed in oil while doing this.
 - *Quickly take end of hose out of the oil and point

straight up.

*Wait 2-3 minutes then immerse end of hose in oil and stroke shock again.

*Repeat above steps until bubbles no longer appear when oil flows out as shaft is stroked in.

*Finish with shaft fully extended and hose pointing straight up.

Step 18. Carefully apply teflon tape to hose threads. Do not apply teflon tape to the first two threads (this could come off and get in the oil, affecting damping). Apply teflon tape starting at about the third thread. Before applying teflon tape, wipe excess oil off threads and, while holding finger over end of the hose, spray threads with Contact Cleaner. This helps teflon tape "stick" on the threads.

Step 19. Thread hose into the reservoir. This is easiest if you leave the snock clamped in the vise with the shaft end pointing down. Hold the reservoir upright in one hand. Bend the hose down quickly with the other hand, then rotate the reservoir to thread in the hose. After it is handtight, take the shock out of the vise and clamp the end of the reservoir (last 1" only at the hose end) in the vise. Tighten hose securely with wrench. (Note: Position of RED knob when mounted will depend on final tightening of hose. Check on bike to determine exact final tightening.)

Step 20. Repressurize reservoir to 190-200 psi. Use nitrogen (preferred) or air. Be sure reservoir end caps are properly located flush with the ends of the reservoir, and be sure wire retaining rings for end caps are in place before pressurizing. (The wire retaining rings can only be removed by pushing the reservoir end caps in about $\frac{1}{2}$ ". But do not do this unless it is necessary to disassemble the reservoir for some reason.) Point ends of reservoir away from your face and body when pressurizing.

Step 21. Reinstall shock on bike.

MISCELLANEOUS DISASSEMBLY

Basic disassembly and assembly are covered above. The following covers other specific operations.

A. Installing New Shaft Wiper and Seal.

- *Remove bearing from shaft.
- *Remove old seal (O-ring) and wiper. Use paper clip and bend small "hook" at one end with needle-nose pliers to help remove these parts.
- *Install new seal and wiper. Lubricate thoroughly with grease before installing.
- *Reinstall bearing on shaft. Apply grease at shoulder on shaft to help wiper and seal pass this point without damage. Push bearing on slowly and wiggle bearing slightly to help wiper and seal pass over shoulder of shaft. Be very careful not to cut or nick teflon surface in bearing on shaft threads. After installing bearing, inspect shoulder area of shaft for possible small pieces of black rubber. This would indicate that the O-ring or wiper has been cut and the above procedure must be repeated with a new wiper and O-ring.
- *Complete reassembly of shock.

B. Installing New O-Ring On Rebound Metering Needle. This is not necessary unless this O-ring fails, which would be very rare. Failure would be indicated by oil leaking out in the area of the BLUE knob.

- *Unscrew metering jet at end of shaft.
- *Turn BLUE knob full out (minimum damping position).
- *Shake shaft up and down until metering needle and aluminum rod fall out. (Note: By shaking shaft, aluminum rod inside shaft impacts on metering needle to force it out.)
- *Remove old O-ring and install new one. Apply grease on O-ring and metering needle and push O-ring on from pointed end of metering needle.
- *Reinstall aluminum rod and metering needle.
- *Reinstall metering jet. Before installing, clean mating threads with Contact Cleaner and apply Blue Loctite. Apply light torque only on metering jet or it may break.
- *Heat end of shaft under heat lamp (or similar device) for 10-15 minutes to setup Loctite, then reassemble shock.

C. Disassembling Reservoir. This is not necessary unless there is an O-ring failure or other problem, which would be rare. Failure would be indicated by leaking air or oil from reservoir or by oil coming out of air valve when depressurizing (failed O-ring on floating piston).

- *Depressurize reservoir.
- *Remove hose from reservoir and drain oil from reservoir.
- *Push in ends of reservoir about $\frac{1}{2}$ " and remove wire retaining rings.
- *Remove reservoir ends.
- *Push out floating piston.
- *Do not disassemble adjustable compression damping assembly unless there is O-ring failure indicated by oil leaking out under RED knob. See following procedure "D" if this is necessary.
- *Replace O-rings as required.
- *Reassemble reservoir. Be sure wire retaining rings are properly seated as indicated by end caps located flush with ends of reservoir.
- *Pressurize reservoir to 20-50 psi, then depressurize.

WARNING! Do not skip this step. This could cause serious injury or shock failure. See previous Basic Disassembly Section.

- *Fill reservoir with oil, pouring oil through hole for hose.
- *Hand-tighten hose to reservoir.
- *Stroke shaft in about 3" and hold there for the next two steps. (This locates floating piston at its correct final position.)
- *Depress air valve to release slight pressure in reservoir.
- *Disconnect hose from reservoir.
- *Bleed shock as covered in Basic Disassembly Section.
- *Reconnect hose to reservoir and repressurize as covered in Basic Disassembly Section.

D. Disassembling Adjustable Compression Damping Assembly.

- *Clamp Assembly Housing lightly in soft-jaw vise, with one jaw against flat on housing.
- *Unscrew Plate from end of Housing with crescent wrench.
- *Remove flat-head screw in middle of RED knob with allen wrench.
- *Remove RED knob. Be careful not to lose two small springs and two steel balls under RED knob.

*Remove Compression Adjusting Drum (the part with 7 holes in it) by pushing in on the stem which the RED knob was attached to.

*Replace O-ring on stem. Grease O-ring before installing.

*Reassemble. Clean all threads with Contact Cleaner and apply Blue Loctite before assembly.

IMPORTANT: When installing RED knob, be sure it is set at "1" when the largest hole in the drum is lined up with the hole in the housing. It is possible to install the RED knob 180° from correct position if you are not careful--then the numbers on the RED knob would not correspond with the correct holes.

OTHER DISASSEMBLY

Disassembly other than covered in the foregoing should rarely, if ever, be required. Call Moto-X Fox at (408) 371-1221 if any questions arise.

SECTION III. TUNING-DAMPING

Basic initial settings for rebound and compression are covered in the Installation Section. Go out to your favorite test area and try a few laps with these settings. Do NOT go 100% WFO; instead, try to concentrate on how the rear of your bike is working.

Now make changes and try again. Tune your senses in to the changes in handling. Keep testing until the shock is perfectly dialed in to your preferences for that particular track.

IMPORTANT:

1. Change only one thing at a time---either compression or rebound.
2. At first, make BIG changes. For example, on compression go from "3" all the way to "8". On rebound make changes of one full turn (12 clicks).

These are big enough changes so you will definitely notice the difference right away! The idea here is to "bracket" the best setting. Then you can "fine-tune" from there.

Example (Rebound): With the rebound at 1½ turns (18 clicks) from maximum, perhaps the bike feels too "springy". Now increase damping one full turn (12 clicks clockwise) and try again. Maybe now it feels too stiff; perhaps you notice "packing down" in some sections. OK, you've already got it "bracketed".....

...somewhere between these two settings should be just right. Now try a setting somewhere in-between (perhaps back it off $\frac{1}{2}$ turn--6 clicks), and ride again.

The key point here is: make big changes at first. Do not make "1 click" or "2 click" changes until you have closely "bracketed" the best setting. Note that a "1 click" change is very small---even a pro would have difficulty noticing the difference.

Example (Compression): With the compression set at "3", perhaps the bike feels too soft. Now go all the way to "8". This will probably feel too stiff. Now try "5". And so on.

NOTE: Another good thing about making BIG changes at first is this: You will "learn", perhaps for the first time in your career, exactly what too much or too little rebound damping and too much or too little compression damping really feels like! In the past many riders probably weren't really sure what was wrong with their shock(s). Maybe they felt their shock wasn't right, but they didn't really know what the problem was. Maybe they took their shock(s) apart and changed the damping; but this probably took an hour or so to do and by then the track had changed or they had a hard time remembering exactly how the bike felt before. Now, with your new Fox Twin-Clicker you can learn very quickly!

This "learning process" is important for another reason. When riding at a different track you will quickly recognize what changes you want to make to dial your shock in perfectly for that particular track. This is important because practice time is often very limited.

Special Damping.

The wide range of compression and rebound damping available in your new shock should suit at least 99% of all riders. However, for unusual applications or conditions where the standard adjustment range is not satisfactory, it is also possible to revalve the shock internally. If you have an unusual application, supply Moto-X Fox with all pertinent details and we will make recommendations.

SECTION IV. TUNING-SPRING RATES

We recommend using the fine range of standard Yamaha springs with your new shock. These are an excellent true-progressive design utilizing tapered-wire for light weight.

For your convenience, listed below in order of stiffness are the standard Yamaha part numbers and color codes:

Yamaha Part No.	Color Code	Rate	Note
#3R3-22212-10	Red/Green	Softest	
#3R3-22212-00	Red	↓ ↓ ↓ ↓ ↓	(Std.125)
#3R3-22212-20	Red/Blue		
#3R4-22212-10	Green		
#3R4-22212-00	No Mark		(Std.250)
#3R4-22212-20	Blue		Stiffest

As this manual is being written, we are continuing experiments with a dual spring in combination with the standard spring. If we come up with a dual spring which offers improved performance, you will be notified (send in your Registration Card!).

SECTION V. MAINTENANCE

1. Clean shock periodically, particularly after riding in muddy conditions. Especially clean caked mud off shaft between motos to prolong seal life.
2. Change oil every 6 months. More often if you frequently ride in muddy conditions.

SECTION VI. TROUBLESHOOTING

1. Problem: Loss of air pressure. (This is indicated if the BLUE knob does not "click" in any position. NOTE: There is no "click" when the BLUE knob is completely backed off, but it should "click" when turned in.)
Solution: Remove shock from bike. Repressurize and immerse in container of water. Locate leak and correct.
2. Problem: Oil Leak.
Solution: Determine source of leak and correct.
3. Problem: Erratic damping.
Solution: Indicates dirt or foreign particles in valving. Disassemble shock and piston assembly. Clean all parts thoroughly. Change oil.

SECTION VII. PARTS LIST

<u>Item</u>	<u>Part No.</u>	<u>Description</u>	<u>Price/Qty</u>
1	97-5010	Shaft Sleeve/Eyelet Weldment	\$20.00/each
2	97-5020	Shaft Eyelet Bushing w/Inserts	\$14.00/each
3	97-5030	Dust Cover	\$8.00/pair
4	97-5040	BLUE Knob	\$22.00/each
5	97-5050	Cross Pin	\$1.00/each
6	97-5060	Preload Locknut	\$8.00/each
7	97-5070	Preload Nut	\$10.00/each
8	97-5080	Bottom-Out Washer	\$8.00/each
9	97-5090	Bottom-Out Bumper	\$8.00/each
10	97-5100	Bumper Ring	\$4.00/each
11	97-5110	Shaft	\$35.00/each
12	97-5120	Bearing w/Insert	\$25.00/each
13	97-5130	Shaft Wiper	\$4.00/each
14	97-5140	Shaft Seal	\$1.00/each
15	97-5150	O-Ring (Bearing Outer/End Cap)	\$1.00/each
16	97-5160	Adjusting Rod	\$4.00/each
17	97-5170	O-Ring (Metering Needle)	\$1.00/each
18	97-5180	Metering Needle	\$10.00/each
19	97-5190	Metering Jet	\$12.00/each
20	97-5200	Top-Out Bumper	\$4.00/each
21	97-5211	Top-Out Spacer: Standard travel	\$8.00/each
	97-5212	Minus 1" travel	\$8.00/each
	97-5213	Minus ½" travel	\$8.00/each
	97-5214	Plus ½" travel	\$8.00/each
	97-5215	Plus 1" travel	\$8.00/each
22	97-5220	Top-Out Baffle	\$10.00/each
23	97-5230	Top-Out Plate	\$2.50/each
24	97-5240	Compression Valves	\$5.00/set
25	97-5250	Compression Piston	\$12.00/each
26	97-5260	Rebound Piston	\$24.00/each
27	97-5270	Locating Pin	\$1.00/each
28	97-5280	Piston Ring	\$6.00/each
29	97-5290	O-Ring (Piston)	\$1.00/each
30	97-5300	Rebound Valves	\$5.00/set
31	97-5310	Rebound Washer	\$2.50/each
32	97-5320	Shaft Locknut	\$2.50/each
33	97-5330	Shock Body	\$45.00/each
34	97-5340	Spring Retainer	\$10.00/each
35	97-5350	Wire Ring (Spring Retainer)	\$1.00/each
36	97-5360	Body End Cap	\$32.00/each
37	97-5370	End Cap Eyelet Bushing	\$10.00/each
38	97-5380	Reservoir Hose	\$15.00/each
39	97-5390	Screw (RED Knob)	\$1.00/each

40	97-5400	RED Knob	\$16.00/each
41	97-5410	O-Ring (RED Knob)	\$1.00/each
42	97-5420	Detent Ball/Valve Ball	\$1.00/pair
43	97-5430	Detent Spring	\$2.50/pair
44	97-5440	Wire Ring (Reservoir)	\$2.00/pair
45	97-5450	O-Ring (Adjusting Drum)	\$1.00/each
46	97-5460	Adjusting Drum	\$15.00/each
47	97-5470	Adjustable Compression Housing	\$25.00/each
48	97-5480	O-Ring (AC Housing)	\$1.00/each
49	97-5490	O-Ring (Damping Plate)	\$1.00/each
50	97-5500	Damping Plate	\$15.00/each
51	97-5510	Bolt (Damping Plate)	\$8.00/each
52	97-5520	Washer (Damping Plate Bolt)	\$1.00/each
53	97-5530	AC Valves	\$3.00/set
54	97-5540	Backup Washer (AC Valves)	\$3.00/each
55	97-5550	Screw (Damping Plate)	\$1.00/each
56	97-5560	O-Ring (Floating Piston/Res.Cap)	\$1.00/each
57	97-5570	Piston Ring (Floating Piston)	\$4.00/each
58	97-5580	Floating Piston	\$12.00/each
59	97-5590	Reservoir Body	\$35.00/each
60	97-5600	Reservoir Cap	\$10.00/each
61	97-5610	Air Valve	\$1.50/each
	97-5620	Owner's Manual	\$4.00/each
	97-5630	Stickers (Fox Twin-Clicker)	\$2.50/set
	97-5640	Bearing Wrench	\$8.00/each
	98-2200	Deluxe Gauge w/Hose 0-200 psi	\$39.50/each

Following is a list of standard parts that you can obtain from your local bearing/seal supply house as well as Moto-X Fox. One such supply house in California is King Bearing.

<u>Item</u>	<u>Description</u>	<u>Standard Part No.</u>
13	Wiper	#86-0062
14	O-Ring	#2-114
15	O-Ring	#2-223
17	O-Ring	#2-007
29	O-Ring	#2-029
41	O-Ring	#2-019
42	Steel Ball	Std. 3/16" Ball
45	O-Ring	#2-008
48	O-Ring	#2-222
49	O-Ring	#2-125
56	O-Ring	#2-324

FOX TWIN-CLICKER

for Yamaha

with Exclusive Adjustable Compression Damping

Patent Pending

