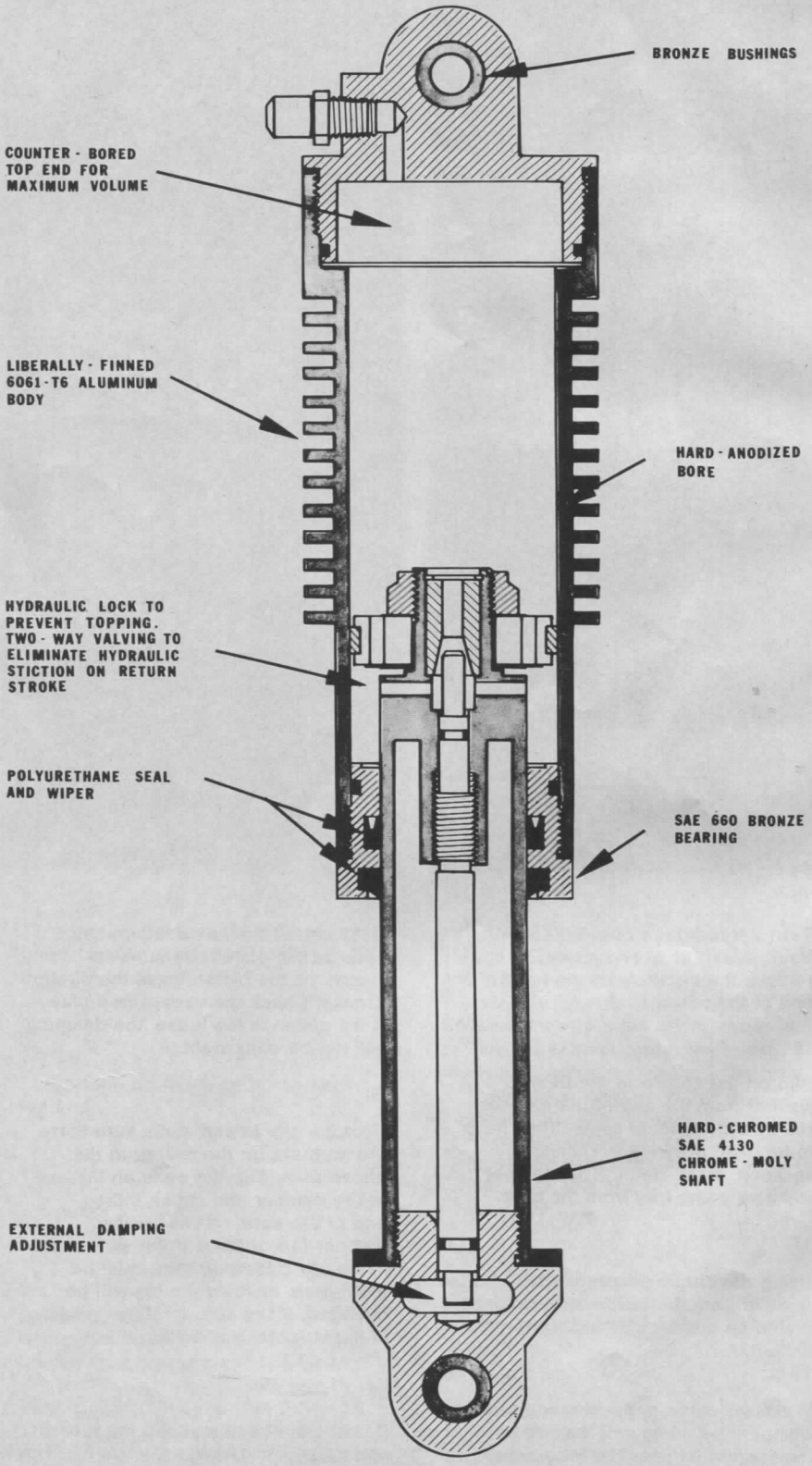
THE NEW FOX AIR BREAKTHROUGH!

Can any shock be worth $220, plus tax and title?

By the Editors of MODERN CYCLE

FOX AIRSHOX FEATURES



When we opened up the box with "The Moto-X Fox" on the label, we knew it would be something different. They always seem to be the first ones with any new ideas on the market.

But we weren't prepared for this: a pair of the wildest looking shocks ever built! And with the shocks came a 40 page manual that looked more foreboding than a Heathkit how-to book.

Then another shock on the shocks: the retail price of $219.50. We knew the shock thing was getting out of hand, but this!

Originally, we had planned to lump the new Fox Air Shox in with the others being tested in a later issue and test ride them at a later date. However, the day after the first shock dyno testing session, we installed them on a personal bike and rode on our private test track.

First, the specifics: The bike was a well set-up 400 Maico radial with the best forks in the business. We'd been running Marzocchi shocks on the back (number 1 style) with 140 pound Ken Ross springs (no preload). As the bike was set up, we found little to snivel about. The rear end worked well and didn't fade during a long moto, and the forks—well, they were a sano set of the finest Maico units made, with special factory modifications done to the internals.

After referring to the manual, we put the Fox Air Shox on and went riding. And immediately found that the forks were no longer sufficient.

Yes, the rear end was so good with the Fox Shox, that the forks seemed like trash. We pre-loaded the springs a bit and that helped. But the rear end was so superior to the front end, that we could only feel bumps being transmitted through the bars.

Most disconcerting.

We suspect that anyone who uses the Fox Air Shox will run into the same problem. To see if this was just a mental thing, we took off the Air Shox and reinstalled the Marzocchis. The ride returned to what it had been before, but now, strangely, the rear end felt much less smooth. Back to the Fox Shox.

Again, we got the tremendous feeling of security in the rear end and the front end felt harsh. As long as the front end of the bike was kept light (or up), we could hit anything in our way under full acceleration. Bravery (or lack of) was the only limitation.

Action of the Fox Air Shox is absolutely ideal. On the small bumps, the shox moved easily, yet when the frame crunchers were hit, the rear end felt like a monoshock unit being forced to its full travel. Progressive damping has been something that most engineers have been playing with, but the Fox Air Shox have it all worked out.

When sitting on the bike in the garage, it feels as if the unit is way too stiff. Bouncing on the saddle tells you nothing. Using the supplied charts, we were supposed to run our shocks up to 123 pounds, but the air compressor in our well-lit garage could only muster up 110 pounds. So, we went riding with 110 pounds and had no complaints.

Couple of things you'd better understand up front. Don't think that you can take the shox right out of the box (poetry?), slap them on and go riding. No way. Right up front in the manual, they tell you that you had damned well better sit down and read a while.

The Fox brothers believe that no one can make a shock to fit everyone if it isn't adjustable. And if you don't know how to adjust the shox, then you might as well not even have them.

When you get done reading the manual, you're going to have a well rounded knowledge of rear suspensions. If you don't want to take the time to read and understand the manual, then for chrissakes, don't even think of buying the shocks in the first place.

Fortunately, the manual is easy to read and gives clear directions. The most critical thing (after proper installation) is choosing the right pressure for your bike and body weight.

Take a look at how the suspension lever ratio is calculated and then take another look at Table 1.

TABLE 1
FOX AIRSHOX PRESSURE RECOMMENDATIONS

A. BIKE WEIGHT 170-190 LBS

RIDER WEIGHT*	SUSPENSION LEVER RATIO							
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
120 lbs	55psi	60psi	66psi	71psi	76psi	81psi	86psi	91psi
130 lbs	58	63	68	74	79	84	89	95
140 lbs	60	66	71	76	82	87	93	98
150 lbs	62	68	74	79	85	91	96	102
160 lbs	65	71	76	82	88	94	100	106
170 lbs	67	73	79	85	91	97	104	110
180 lbs	69	76	82	88	95	101	107	113
190 lbs	72	78	85	91	98	104	111	117
200 lbs	74	81	87	94	101	108	114	121
210 lbs	76	83	90	97	104	111	118	125
220 lbs	79	86	93	100	107	114	121	129

B. BIKE WEIGHT 190-210 LBS

RIDER WEIGHT*	SUSPENSION LEVER RATIO							
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
120 lbs	59psi	64psi	69psi	74psi	80psi	85psi	90psi	96psi
130 lbs	61	66	72	77	83	88	94	100
140 lbs	63	69	75	80	86	92	98	103
150 lbs	65	71	77	83	89	95	101	107
160 lbs	68	74	80	86	92	99	105	111
170 lbs	70	76	83	89	96	102	108	115
180 lbs	72	79	86	92	99	105	112	118
190 lbs	75	81	88	95	102	109	115	122
200 lbs	77	84	91	98	105	112	119	126
210 lbs	79	87	94	101	108	115	123	130
220 lbs	82	89	96	104	111	119	126	134

C. BIKE WEIGHT 210-230 LBS

RIDER WEIGHT*	SUSPENSION LEVER RATIO							
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
120 lbs	62psi	67psi	73psi	78psi	84psi	90psi	95psi	101psi
130 lbs	64	70	76	81	87	93	99	105
140 lbs	66	72	78	84	90	96	102	108
150 lbs	69	75	81	87	93	100	106	112
160 lbs	71	77	84	90	97	103	109	116
170 lbs	73	80	86	93	100	106	113	120
180 lbs	75	82	89	96	103	110	117	123
190 lbs	78	85	92	99	106	113	120	127
200 lbs	80	87	95	102	109	116	124	131
210 lbs	82	90	97	105	112	120	127	135
220 lbs	85	92	100	108	116	123	131	139

*Add approximately 15 lbs for weight of riding equipment.

HOW TO USE TABLE 1

To determine recommended pressure from Table 1, you must answer three questions:

1. *What does your bike weigh?*

This is actual weight ready to race, including gas, oil, etc. Use Section "A", "B", or "C" of Table 1, depending on your bike weight.

2. *What do you weigh?*

Be sure to add about 15 lbs for weight of riding equipment. For example, if your body weight is 165 lbs, use 180 lbs in the "Rider Weight" column.

3. *What is your bike's "Suspension Lever Ratio"?*

Determine this as shown in Figure 11. For your convenience, Suspension Lever Ratios (SLR) for a few stock bikes are listed in Table 2. If your bike is in this Table, you can simply use the number listed. If not, or if you have a custom LTR setup, you will have to calculate it yourself.

EXAMPLE: You have a 1975 Husky GP 250 CR with laydown shock geometry. It weighs 215 lbs ready to race. You weigh 155 lbs. Add 15 lbs for riding equipment and your "Rider Weight" is 170 lbs. Your Suspension Lever Ratio (you were lucky . . . it's listed in Table 2, so you don't have to figure it out) is 1.78 . . . call it 1.8. From Table 1, Section "C", your recommended pressure is 120 psi.

IF TABLE 1 DOESN'T COVER YOUR SITUATION . . .

Table 1 covers rider weights from 120 to 220 lbs, bike weights from 170 to 230 lbs, and SLRs from 1.1 to 1.8. If you *or* your bike do not fall within those ranges, calculate recommended pressure as follows:

Step 1: Multiply your bike weight by 0.14.

Step 2: Multiply your rider weight by 0.21.

Step 3: Add the numbers from Steps 1 and 2, and multiply this by your SLR. The resulting number is your recommended pressure in psi.

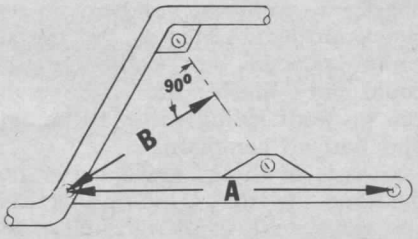
EXAMPLE: Your bike weight is 220 lbs, your rider weight is 240 lbs (too high to use Table 1), and your SLR is 1.6.

Step 1: 220 times 0.14 = 30.8

Step 2: 240 times 0.21 = 50.4

Step 3: 30.8 plus 50.4 = 81.2
81.2 times 1.6 = 130 (approx.)

Your recommended pressure is 130 psi.



A = SWINGARM LENGTH FROM PIVOT BOLT TO REAR AXLE.

B = DISTANCE FROM SWINGARM PIVOT BOLT TO SHOCK ABSORBER CENTERLINE, TAKEN AT RIGHT ANGLE TO SHOCK AS SHOWN.

$$SLR^{*} = \frac{A}{B}$$

***Suspension Lever Ratio**

Even though every suspension lever ratio can be custom calculated, the manual shows SLRs of some of the more popular racers.

TABLE 2
SUSPENSION LEVER RATIOS FOR CERTAIN BIKES (STOCK)

BIKE	SUSPENSION LEVER RATIO	COMMENTS
Bultaco ('75)	1.65	125, 250, 360 Pursang
Can-Am ('75)	1.53	250 MX-2
CZ ('75 Falta)	1.58	250, 400
CZ (Other)	1.20	Other late models
Husky ('75 GP)	1.78	Laydown geometry
Maico ('75)	1.63	Factory moved-up
Maico (Other)	1.20	Old shock location
Montesa VR ('75)	1.70	Laydown geometry
Montesa VR ('74)	1.31	Not laydown
Penton ('75)	1.56	250, 400; Laydown position
Suzuki RM 125 ('75)	2.18	Laydown geometry

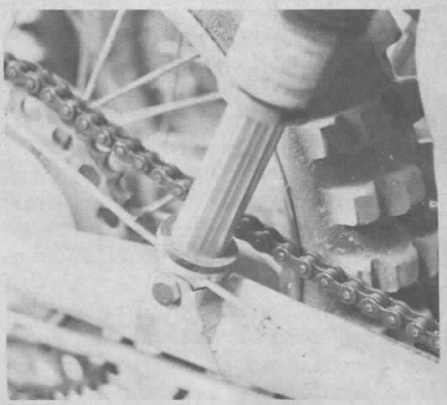
As you can see, the ratios vary greatly from one bike to another, so you just can't switch the shox from bike to bike without recalculating the pressure. One nice thing, though. The cantilevered types of rear suspensions can use the shocks as well as the more common forward mounted types.

Fox seems to have perfected an idea that the Arnaco people pioneered (and never got sorted out), adjustable damping. Because the shox must be as universally adaptable as possible, and because they'll be used in everything from a conventional mount to a radical cantilever, damping requirements will vary greatly. Fortunately, the Fox Air Shox are externally adjustable. Anyone who has had to mess around with a Koni and the accompanying hassles will appreciate this feature.

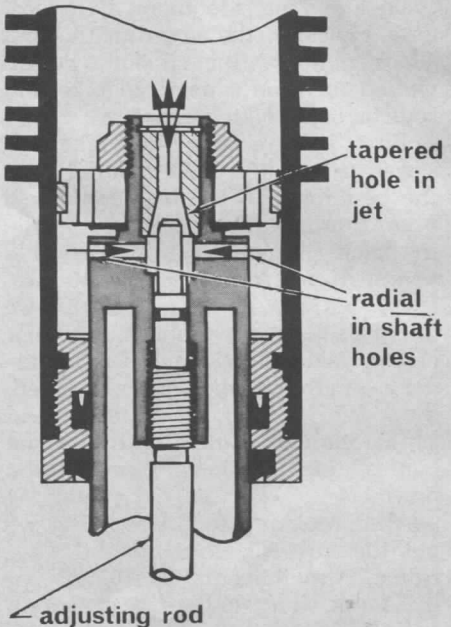
RECOMMENDED DAMPING ADJUSTMENTS

PRESSURE BEING USED	DAMPING[1]	PRESSURE BEING USED	DAMPING[1]
50 psi	4½ turns	85 psi	2¾ turns
55 "	4¼ "	95 "	2½ "
60 "	4 "	105 "	2¼ "
65 "	3¾ "	115 "	2 "
70 "	3½ "	125 "	1¾ "
75 "	3¼ "	140 "	1½ "

NOTES:
1. Damping is adjusted as "turns out" from full-in position.
2. Adjustments based on use of Bel-Ray LT-100 fluid. This is the recommended fluid for FOX AIRSHOX



ADJUSTABLE DAMPING



ON EXTENSION ("OUT") STROKE, OIL BELOW PISTON FLOWS THRU RADIAL HOLES AT END OF SHAFT, THEN THRU CENTRAL JET.

DAMPING ADJUSTED BY CHANGING POSITION OF ADJUSTING ROD TIP IN TAPERED JET.

Included in the manual, is a guideline to keep you from merely guessing what damping will be compatible with the pressure you run. This puts you in the ballpark and then the damping can be fine tuned from this basic point.

We got our shocks shipped to us from the MX Fox with the damping turned out 2¼ turns. This is supposed to be compatible with 105 pounds of pressure in the shock. We used 110 pounds and everything worked just fine. So, it's obvious that the combinations are flexible and can be altered to suit the rider.

We only had an hour of riding time on the Fox Shox before this rag had to go to press, so we don't really know yet if we have the ultimate ride obtainable with the new units. We plan to experiment and see just what can be done. In fact, we'll install them on as many test bikes as we can in the future and let you know how things develop.

One thing we certainly plan to do, is test the shocks in some long desert races and see how they hold up. Based on our experiences on the shock dyno, we don't think they'll ever get hot enough to fade. We couldn't get the Shox past 150 degrees until we subjected them to the torture test. Every other shock we ever tested eventually got to over 200 degrees at the intensity of testing that the Fox Air Shox stabilized.

They've done extensive testing of their own that matches what we've learned on various shock dyno test sessions. Of particular interest, is the percentage of damping fade compared to the other popular shocks. It's not too hard to get minimal fade if you don't have much damping, but when you have a large amount of resistance, the temperature rise is quite fast. Here's where the Fox Shox shines. They're able to sustain heavy damping loads without the normally corresponding temperature gains.

TEST DATA SUMMARY

SHOCK TYPE	"TORTURE TEST" DATA		"STANDARD TEST" DATA		MISC. DATA	
	Time To Reach 212°F	Damping Fade @ 212°F	Stabilization Temperature	Damping Fade @ Stab. Temp.	Cooling Area	Weight w/Spring
Standard Koni	9 Minutes	36%	145°F	20%	42 in²	3# 14 oz
Koni w/Poppy Elephant Body:						
a) Koni Fluid	17 Minutes	29%	105°F	14%	129 in²	4# 2 oz
b) LT-100	15 "	21%	110°F	6%	"	"
c) Fortner	15 "	16%	110°F	4%	"	"
Koni w/MCM Reservoir Body	Temperature and damping data essentially identical to Poppy Elephant Body above. See text for comment.				112 in²	4# 1 oz
Bilstein	3½ Minutes	14%	180°F	11%	38 in²	3# 10 oz
Gas Girlings	4½ Minutes	53%	155°F	42%	36 in²	3# 9 oz
FOX AIRSHOX	21 Minutes	12%	95°F	2%	139 in²	3# 7 oz

NOTES:
1. See text for test conditions and comments.
2. Weight data based on shock with a standard 9" long "110 lb." spring, except Gas Girlings weighed with spring as supplied on 1975 Husqvarna 250 GP. No spring on FOX AIRSHOX (Figure 48).
3. Cooling area calculated on the basis of total shock body external area plus shaft area.

Simply put, the shocks get rid of heat efficiently and damping fade is minimal.

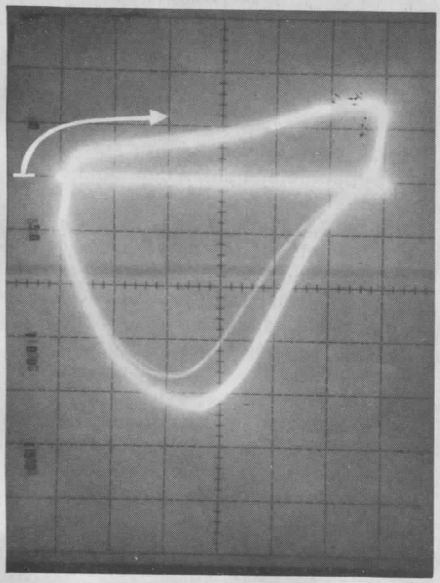
Part of the reason is the size. In appearance, they're quite massive, yet the total weight of the shock is quite light when you consider that no springs are used as with conventional suspenders.

There's quite a bit of seal drag from the wiper and the hefty seal, but it doesn't affect the actual ride of the bike. On the dyno, we picked up a glitch that covered perhaps a half inch of the actual travel. It would be impossible to notice this during riding. Your rear tire alone gives an inch or more of additional undamped travel, and that cannot be felt by any rider that we know of.

All things considered, the Fox Air Shox must be considered the breakthrough of the decade in suspension. It's as important a gain in technology as the long travel rear suspension.

And the manual is damned near worth the price they're asking for the shocks. Expensive? Not when you consider that the most troublesome problem of the last two years has been whipped.

The only thing that remains is to see how they hold up during extended service. And that we plan to do. We'll keep you posted. ●



Dyno curve of the Fox Air Shox from the scope of the S&W shock dyno. Unlike the curve in our last test, this one runs from the centerline in a clockwise motion. The heavy curve shows readings taken at 100 and 150 degrees F. The faint line shows the damping reduction after the shock was torture tested to 220 degrees. Once we returned to the normal testing Cycles Per Second, the damping curve came right back to the original stabilization shape of 100 degrees. While no one can say with certainty that one shaped curve is better than another, at least the Fox Air Shox curve remains constant and is fully adjustable. Under normal riding conditions, we could not get the shock too hot to touch with our bare hands. In other words, it works.