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ANSWER MANITOU REAR SUSPENSION SYSTEM

Congratulations for choosing a mountain bike with the best rear suspension available. The Manitou Rear Suspension System is a highly sophisticated yet simple system that will provide excellent maintenance free performance.

The Manitou Rear Suspension System consists of specially drawn anodize outer legs pressed fit assembled into heat treated 6061 Aluminum components. The hard anodized aluminum inner legs have a proprietary Teflon coating to eliminate stiction. Suspension spring rate and damping are provided by the same polymer elastomers that have proven to be durable and outperform all other forms of suspension damping. Four standard rear fork sizes are matched with your Marin mountain bike to provide an integrated suspension system. Frame and fork sizes are shown in Figure 1.

Available spare parts for the Manitou Rear Suspension System are listed in Table 1. An exploded view of the rear suspension and swingarm pivots appears in Figure 2. All spare parts are available through approved Manitou or Marin dealers.

Figure 1: Answer Manitou Suspension Sets Customized for Marin

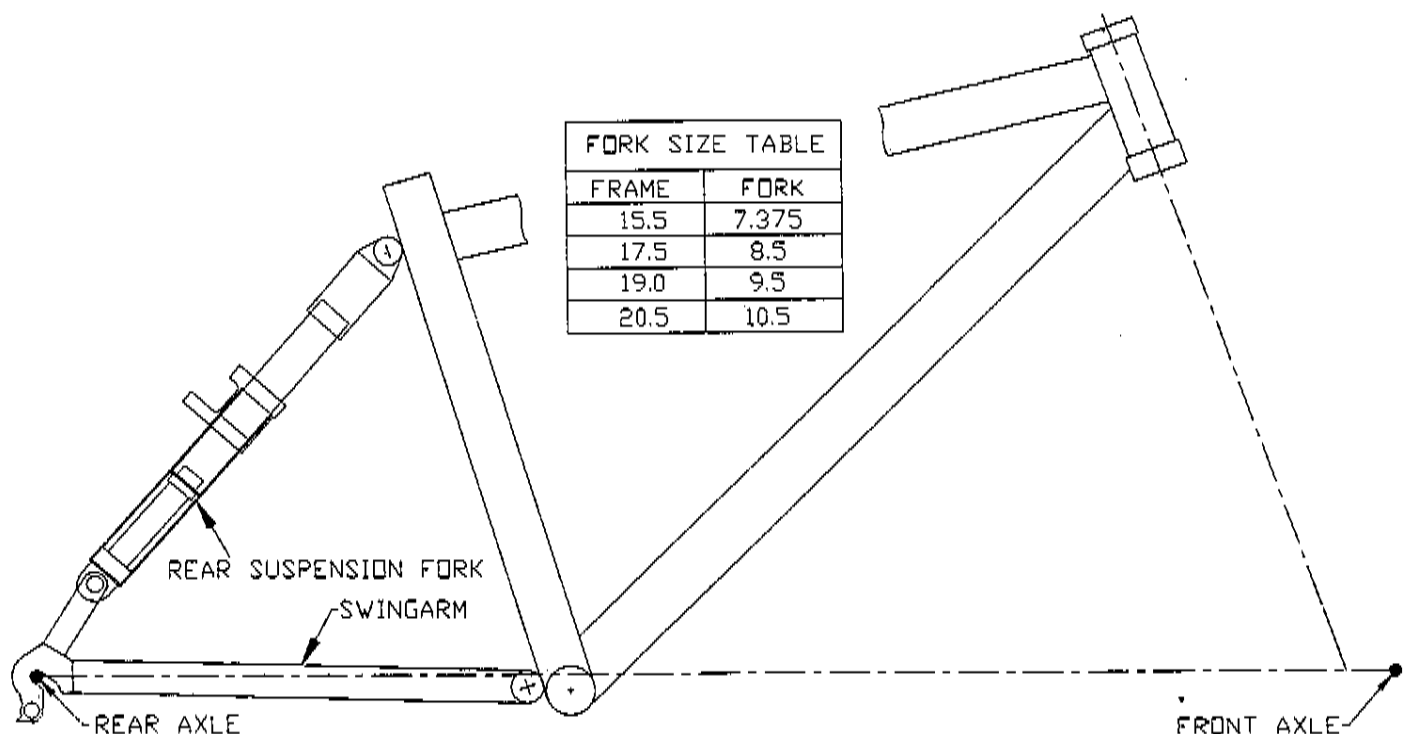
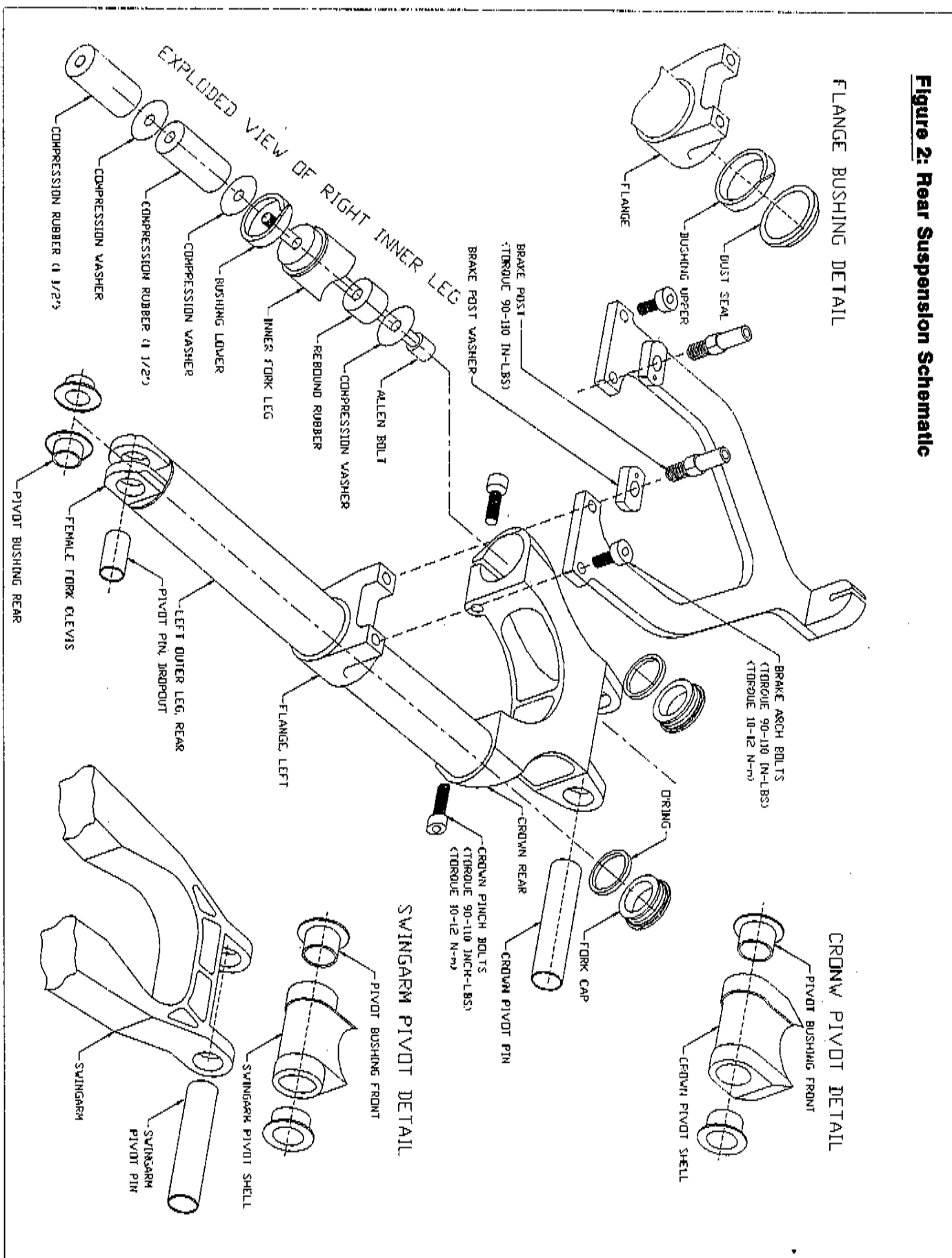


Figure 2: Rear Suspension Schematic

REAR FORK PARTS	
PART NAME	PART NO.
Rear Fork Assy, Marin 7.375	85-3323
Rear Fork Assy, Marin 8.5	85-3326
Rear Fork Assy, Marin 9.5	85-3327
Rear Fork Assy, Marin 10.5	85-3328
Pivot Bushing Front	060020
Pivot Bushing Rear	060025
Pin, Swingarm Pivot	040475
Pin, Crown Pivot	060055
Pin, Dropout Pivot	060290
Owner's Manual, Rear (Marin)	040483
Brake Arch	040180
Brake Arch Bolts, M8x1.25x16MM SHCS	040159
Rear Crown	060063
Crown Bolts, M6x1.0x20 SHCS	040454
Inner Leg 7.375"	060350
Inner Leg 8.5"	060351
Inner Leg 9.5"	060352
Inner Leg 10.5"	060353
Fork Cap Assembly	85-3321
Inner Leg Bolt RR, M6x1.0x100 Alum	060267
Outer Leg, Left	040477
Outer Leg, Right	040481
Fork Bushing, Upper	040155
Fork Bushing, Lower	040154
Dust Seal	040166
Brake Post	040147
Brake Post Washer	040148

FRONT & REAR FORK ELASTOMERS	
PART NAME	PART NO.
1/2" Rebound Rubber, Black	040163
3/4" Compression Rubber, Red	040197
1 1/2" Compression Rubber, Blue	040177
1 1/2" Compression Rubber, Red	040175
1 1/2" Compression Rubber, Yellow	060337
Compression Washer, 1/4" x 1 1/8"	040165
Rebound Washer, 1/4" x 15/16"	040161

MAINTENANCE

Your Manitou Rear Suspension is intended to be nearly maintenance free. The rear suspension forks may develop moisture and contamination internally under adverse conditions. Although this may not affect the performance of the suspension it is recommended that they be periodically disassembled, cleaned, checked, and regreased to insure long life. The swingarm pivots require no maintenance unless play is noticeable.

Before every ride you should:

1. Wipe the rear inner legs clean.
2. Visually inspect the rear suspension forks and swingarm for dents or damage.
3. Check rear crown bolt torque, 90-100 in-lbs. (10-12 N-m) and check for inner fork leg slippage in crown.
4. Verify that brake and shifting cables are working properly and that the rear brake outer cable is properly seated in the rear arch brake retainer.

NOTE: The Manitou suspension should not be ridden if any parts are damaged or if any components are out of adjustment. Contact your local dealer for replacement parts or service if necessary.

DISASSEMBLY INSTRUCTIONS

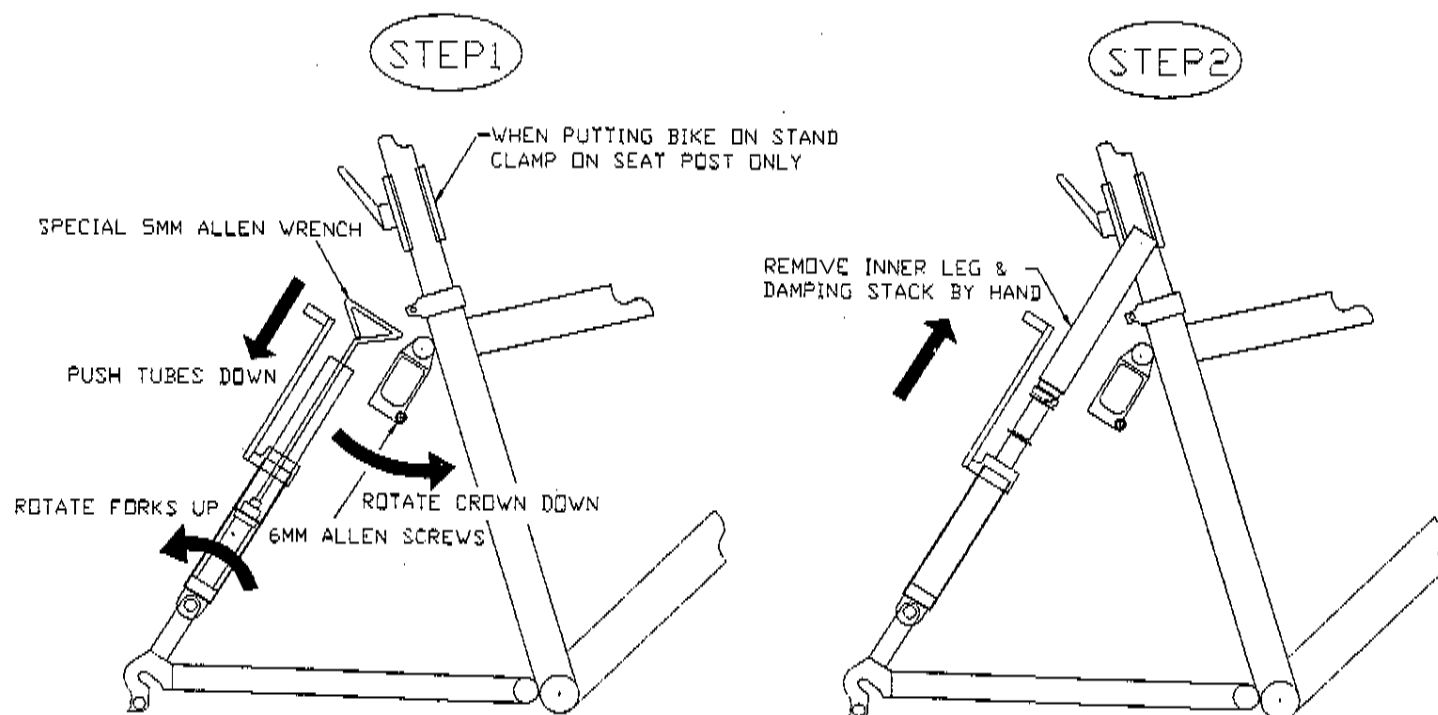
Rear Suspension Forks

The rear suspension forks can be disassembled without removing the cantilever brakes, brake arch, cables, or pivot pins. It is recommended that these components be left undisturbed to preserve the thread torquing and press fits.

Inner Leg Removal: Figure 3

1. Elevate bike on stand by clamping on the seat post. *Do not clamp on any part of the frame. Clamping on the thin wall frame tubing will damage it.*
2. Slacken and detach rear brake cable.
3. Remove rear wheel
4. Loosen rear crown pinch bolts.
5. Remove fork caps by gently prying with screw driver.
6. Press inner legs down through crown taking care not to stretch cables.
7. Rotate crown down out of the way and rotate fork assembly up to gain access to the inside of the fork legs as shown in Figure 3.
8. Using the special 5MM allen wrench loosen the two long 6MM×100MM bolts.
9. Remove the two inner legs by pulling upward. A sharp pull at the end will remove the lower bushing from its race and free the inner leg.
10. Remove the lower bushing by hand if necessary. It is not necessary to remove the dust seal and upper bushing unless inspection or replacement is required.
11. Rotate the bike upside down on the stand to let the compression rubbers and washers fall out of the outer fork legs.

Figure 3: Inner Leg Removal



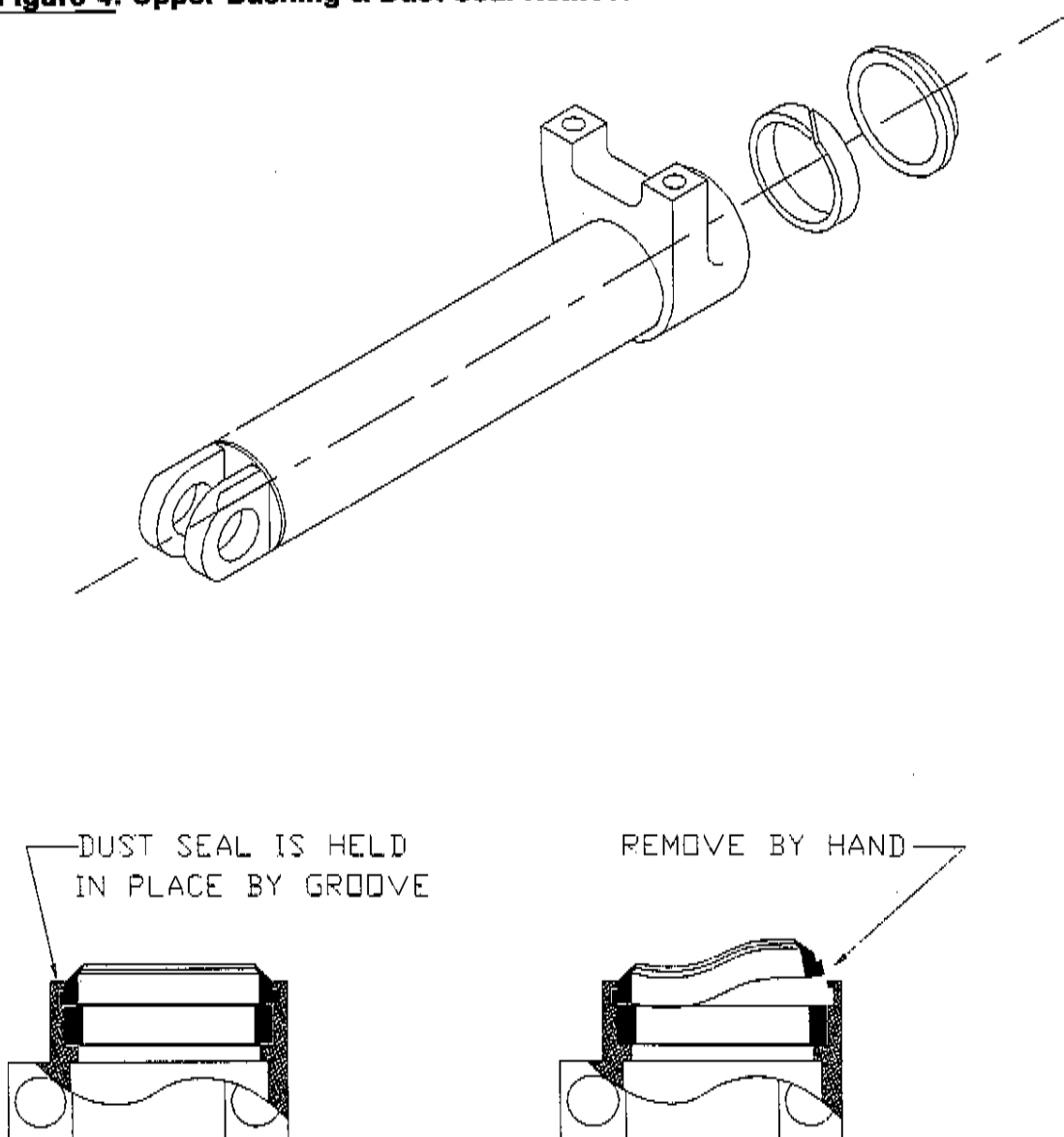
DISASSEMBLY (cont.)

Removal of Dust Seal and Upper Bushing: Figure 4

The dust seal is captured by a groove in the flange and holds the upper bushing in place. It is soft and pliable and may be removed by hand with the aid of a small screw driver. See Figure 4 for removal schematic.

1. Gently pry one edge of the dust seal inward taking care not to damage it with sharp or metal tools. Remove by hand.
2. Remove the upper bushing.

Figure 4: Upper Bushing & Dust Seal Removal



Rear Suspension Fork Reassembly: Figures 5, 6 & 7

1. Clean all parts thoroughly.
2. Inspect inner and outer legs for damage or dents.
3. Replace the bushings if play between inner and outer legs developed.
4. Select new compression rubbers to change fork performance if desired.
5. Grease all parts lightly but thoroughly with a good quality waterproof molybdenum or lithium grease.
6. Place upper bushing into flanges and install dust seal. Be sure that dust seal is fully seated in its groove as shown in Figure 5.
7. Slide rebound washer and rubber onto 6MM bolt and drop into inner leg. Shaking it gently will help the bolt find the hole in inner leg plug.
8. Slide on the lower bushing, compression washer, first compression rubber, compression washer, and second compression rubber. **NOTE: Compression washers must be between every rubber.** Slide second compression rubber only half way onto bolt to leave enough room to work with the lower bushing.
9. Slide inner leg and damping stack into outer leg. Use your fingers to squeeze the lower bushing and feed it past the dust seal and upper bushing. Take care not to overlap the ends as shown in the figure.

NOTE: Do not slide the lower bushing onto the inner leg plug. The fork will not be able to be assembled with the lower bushing seated on the inner leg plug.

Figure 5: Dust Seal Installation

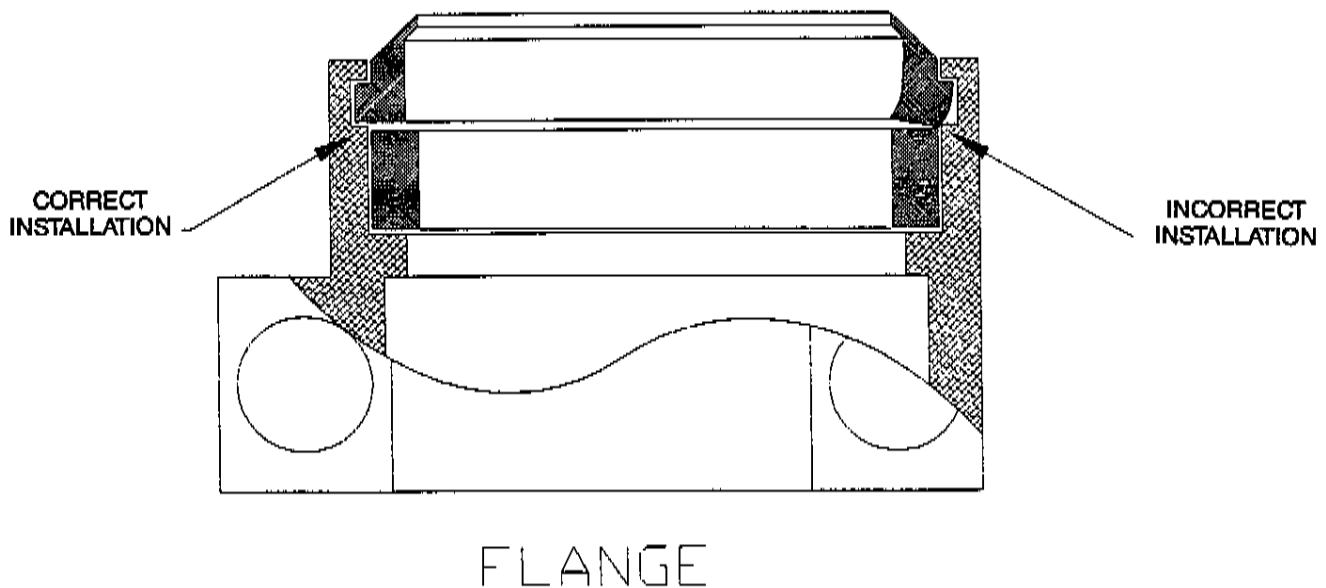
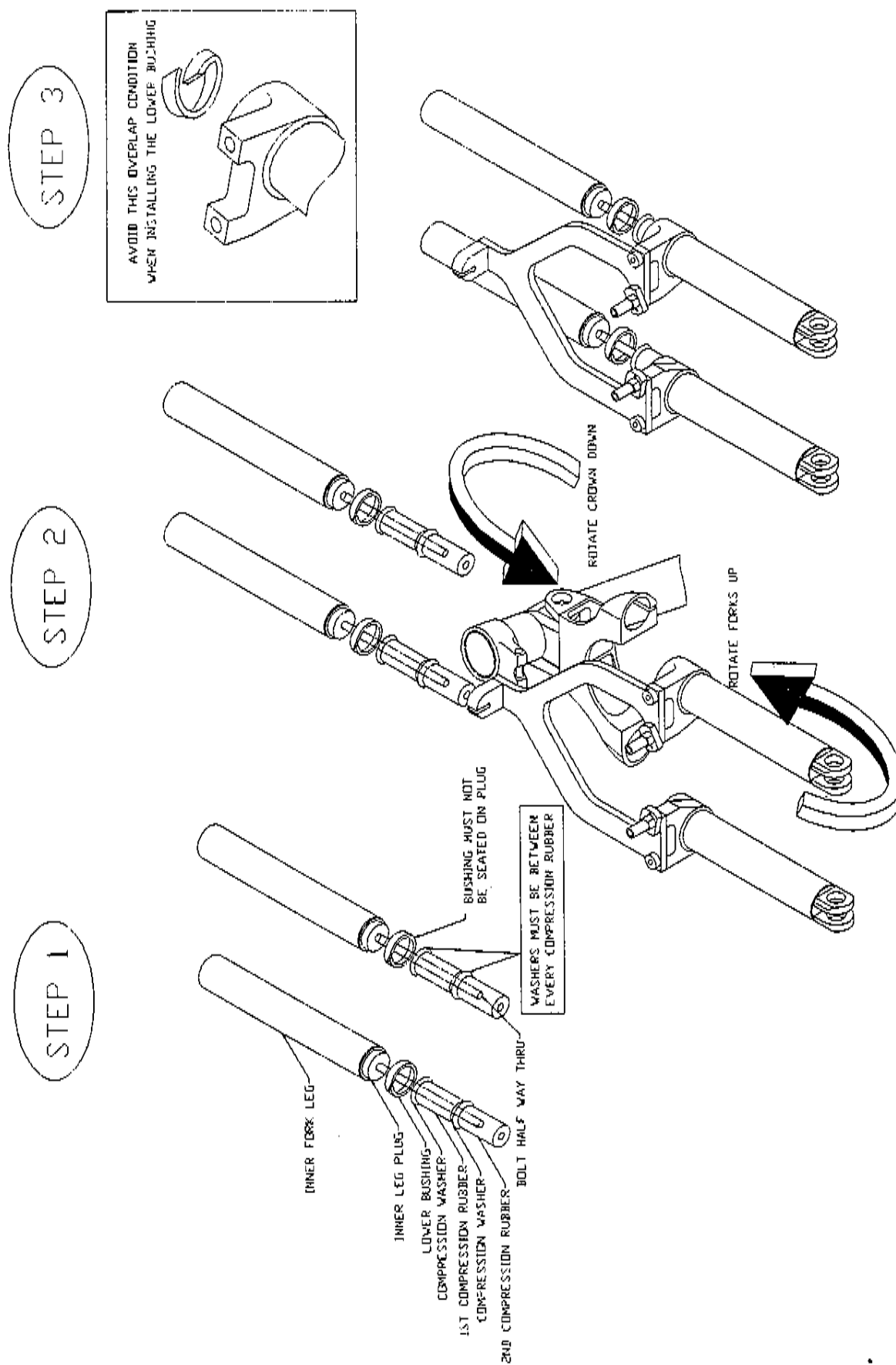
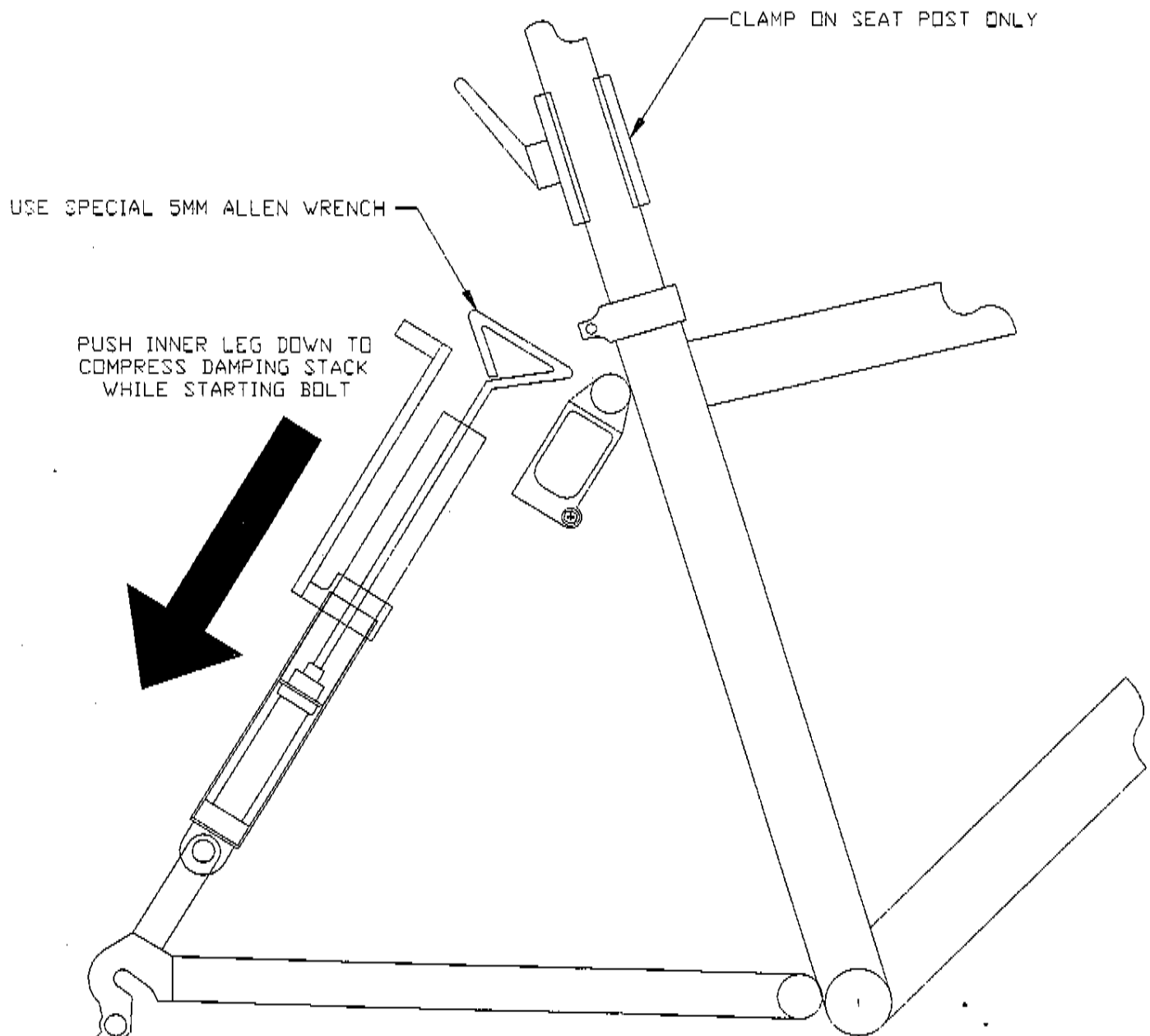


Figure 6: Rear Fork Assembly

10. Take care not to damage dust seal when starting inner leg into outer leg.
11. Continue to slide inner leg into outer leg until bottomed on compression rubbers.
12. Press firmly on inner leg to compress rubbers while using the special allen wrench to start the 6MMx100MM bolt. Having the fork legs vertical will help start the allen bolt.
13. Torque 6MM allen bolt to 30-40 in-lbs. (3.4-4.5 N-m)
14. Repeat the process for the other leg.
15. With twisting motion slide inner legs into crown until outside edge is flush with outside edge of crown.
16. Replace fork caps.
17. Torque 6MM crown pinch bolts to 90-110 in-lbs (10-12 N-m).
18. Replace rear wheel and rear brake cable.
19. Adjust rear brake.

Figure 7: Starting Inner Leg Bolt

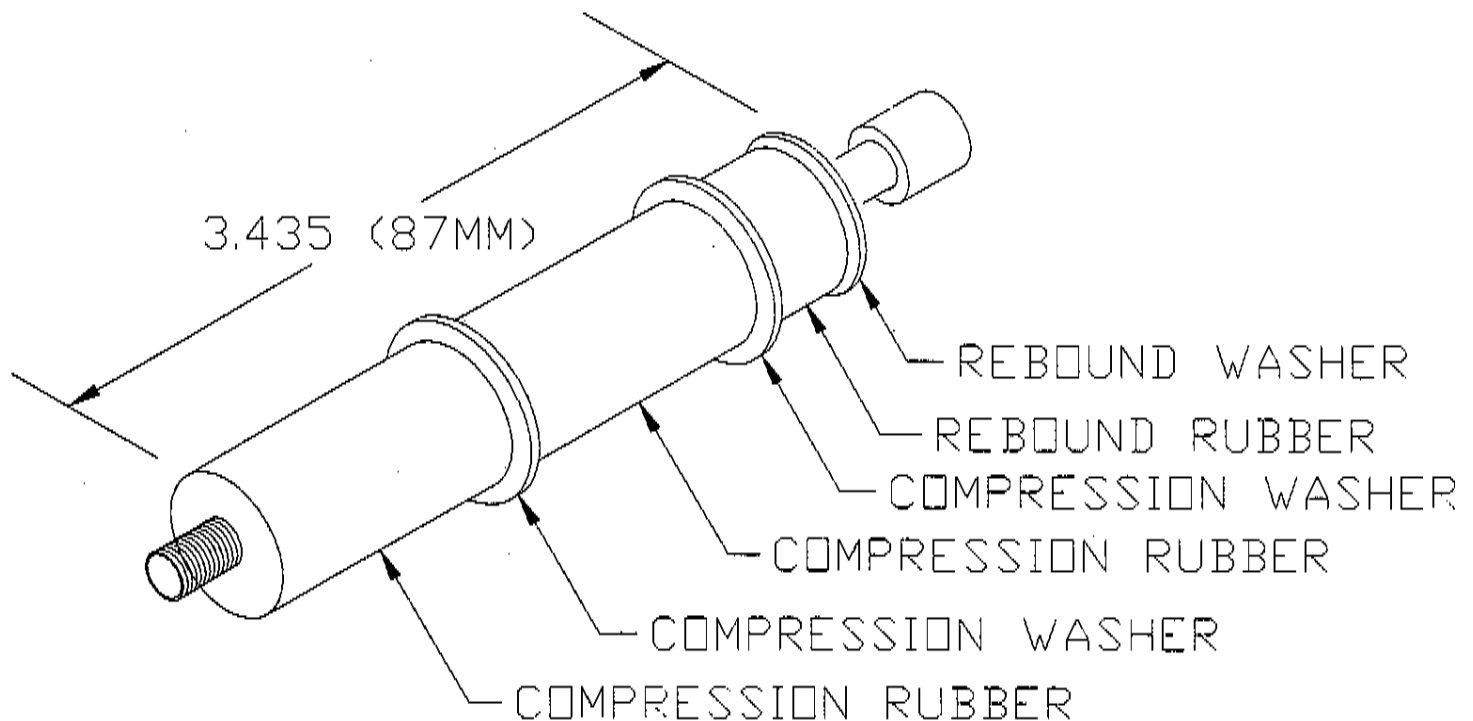


Swingarm and Pivot Pin Removal

Normal maintenance and use do not require the removal of the pivot pins and swingarm. It is recommended that the pins are not removed unless necessary for the replacement of damaged parts. The pivot pins are press fit into the rear crown, swingarm H-section, rear dropouts, and are a tight fit in the pivot bushings. The bushings are press fit into the pivot shells and the female fork clevis.

1. Follow the steps in rear suspension fork disassembly to separate the inner legs from the rear crown.
2. Remove chain, chain rings, cables, and rear derailleur as required.
3. Using a drift that will not damage the pivot pins or bushings, press the 0.624" (15.85MM) dia. swingarm pivot pin completely out of the H-section. (A pin removal tool is available from your local dealer or Answer Products.)
4. Remove the swingarm fork assembly.
5. Using tools similar to Step 2, press the 0.498" (12.65MM) dia. dropout pivot pins completely out of the fork clevis. Removing the brake arch will allow the removal of each fork leg separately.
6. Inspect the pins and bushings for wear and damage. Replace if necessary.
7. New bushings may need trimming or sanding on the outside flange surfaces to properly fit the crown and H-section. Do not alter the inside or outside diameter of the bushings.
8. Re-assemble reversing the order of these steps taking care not to damage the pins or bushings during the press fit assembly.

Figure 8: Damping Stack Length



ADJUSTING RIDE QUALITIES

The Manitou Suspension Systems offers full adjustability for the front and rear suspension. Tuning the front suspension is described in the Manitou 2 Front Fork Manual. The rear suspension, like the front, is adjustable by changing the urethane elastomers. The production rear fork is set up with all yellow elastomers suitable for an aggressive rider of 155-180 lbs. (70.5-82.0 Kg). Replacement red elastomers that will soften the ride are included with the suspension. It is normal to experiment with elastomers and with different riding styles before settling on the right combination for your style and preference.

A properly set up rear suspension fork should be getting full travel. 3/4" - 1" (19MM-25.4MM) of travel at the fork leg is optimum for normal riding. Large hits, gullies, or jumps should result in up to 1 1/4" (32MM) of travel. Placing a "zip tie" on the inner fork leg right above the outer leg flange is a good travel indicator. If your suspension is too firm or too soft and needs adjustment follow the steps in "Disassembly Instructions" to remove the inner legs and damping stack. Replace the elastomers and re-assemble per those instructions. The front, rear, and all ride kit elastomers are interchangeable and can be used and mixed in any order on the front and back. *NOTE: Compression washers must be between every urethane elastomer.*

In addition to the elastomers provided, soft and firm ride kits are available. Each ride kit contains twelve elastomers; (8) large 1 1/2" and (4) 3/4". Table 2 shows the ride kits that are available through your local dealer.

Two 3/4" elastomers or custom cut elastomers may be used in place of the larger ones as long as washers are between every one. When cutting elastomers the cuts must be straight, square and precise to 1/16" (1.6MM). Increasing the free damping stack height will increase the preload while decreasing the height will decrease the preload. A damping stack of 3.310" (84MM) results in no preload. 1/8"-3/16" (3-5MM) is normal preload. The recommended free damping stack length is 3.435" (87MM) as shown in Figure 8.

TABLE 2: Elastomer Ride Kits			
COLOR	STIFFNESS	RIDE KIT	PART NO.
Black	Extra Soft	Soft Ride	85-3501
Blue	Soft		
Red	Medium	Alternates	1 1/2" 040175
Yellow	Firm	Stock	1 1/2" 060337
Yellow	Firm	Firm Ride	85-3502
Brown	Extra Firm		

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