MANITOU EFG

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MANITOU PRECISION SUSPENSION

CONGRATULATIONS FOR CHOOSING THE BEST MOUNTAIN BIKE SUSPENSION MADE. THE MANITOU EFC IS THE STATE OF THE ART IN ELASTOMER FLUID CONTROLLED SUSPENSION. THE EFC HAS BEEN DESIGNED TO BE EASILY MAINTAINED WITHOUT ELABORATE TOOLS HOWEVER IT IS MANDATORY TO READ THIS MANUAL ENTIRELY PRIOR TO WORKING ON YOUR FORK.

Your Manitou EFC Fork is fully assembled and ready to be installed onto your bicycle. The Manitou EFC suspension forks are mailable in three steer tube diameters 1" STD (25.4MM), 1.125 O.S. (28.6MM), and 1.250 EVO. (31.8MM) chromoly 12" (305MM) Threadless. Aluminum Threadless steerers are available in the O.S. and EVO. sizes. Different density polyurethane compression elastomers have been included with the EFC to permit tuning of the fork to your weight and riding style. Additional expanded option ride adjustment kits are available through your dealer carrying Manitou products.

The suspension spring rate and damping are provided by a seven inch stack of polyurethane elastopolymers. The EFC has a 3/4" and stage and a 3/4" third stage elastomer providing improved progressive spring rate for larger hits. These specially matrixed polymers provide simple yet effectively tuned and maintenance free off road performance. Standard travel for EFC is 3". Different elastopolymers can be combined in the damping stack to adjust ride stiffness and rebound performance and are easily changed by removing the adjuster mechanism. Fine tune preload adjustments are made using the adjuster knob located on top of the skewer assembly. Rebound damping adjustments are made using the adjuster knob located on top of the skewer assembly. Rebound damping adjustments are made using the adjuster knob located at the bottom of the left dropout. The upper and lower UHIVW bushings insure exact alignment between inner and outer legs and minimize front end flex. The EFCDH comes of the left dropout success the property of the dropouts clamp onto the oversize 12.7MM axis making the most rigid downhill fork available.

CONSUMER SAFETY INFORMATION

IMPORTANT: The Manitou Fork is a competition off road fork, and as such, does not come with proper reflectors for on road use. Have your dealer or mechanic install proper reflectors to meet the Consumer Product Safety Commission's (C.P.S.C.) Requirements for Bicycles Standard if the fork is going to be used on public roads at any time. If you have product safety C.P.S.C. Standards contact your dealer.

- 1. Never remove or have the steer tube removed from the crown. The steer tube is press fit assembled at the factory. Pressing the steer tube out will persuamently damage the crown beyond repair and render it unsafe for use.
- Any other alterations or modifications to your fork are probably unsafe. Contact Answer Products Technical Support prior to
- 3. Do not use the Manitou Fork if any parts are broken, bent, cracked, or damaged. Contact your dealer or Answer Products Technical Support. (805) 257-4411. if you have any questions concerning the integrity of your fork.
- 4 Assert Products recommends that you periodically inspect your fork for wear and damage. Inspect the Crown, Inner Legs, and Dropouts for cracks or damage. Before every ride check the elastomer stack to insure that the elastomers are not fractured and that proper period curso and that the positive rebound stop is in order to insure that the fork does not over extend.

INSTALLATION INSTRUCTIONS

Figures 1, 2, &3

Note: Prior to cutting the steer tube to length check to insure that adequate downtube clearance exists between the adjuster knobs and down tube when the fork is turned 90 degrees.

Insure that the proper steer tube diameter and length has been delivered with your Manitou. The steer tube may need to be cut to length to fit your bicycle head tube. If you are not familiar with this procedure or do not have the proper tools to cut the steer tube it is recommended that you seek a qualified bicycle mechanic to perform installation.

WARNING: The steer tube is a one time precision press fit at the factory and cannot be removed from the crown. Replacement of the entire crown/steerer assembly must be done to change steer tube lengths or diameters. Removing and replacing the steer tube will result in an unsafe condition and should never be done.

Note: Some low profile brakes may not clear the brake arch. Remove the brake post and install brake post spacer available at your dealer, P/N 040726. Align holes in spacer inward and torque brake post to 90-110 INCH-LB (10-12 N-m).

- Remove old forks from bicycle.
- 2. Measure and cut the steer tube to fit your bicycle head tube.
- 3. Remove crown race from old forks and press onto Manitou steerer until seated on crown (Figure 1).
- 4. Clean and grease headset bearings and races of bicycle.
- 5 Install lower bearings on fork crown race seat.
- 6. Insert steer tube into head tube of frame.
- Install upper bearings and race, tighten until slack just disappears.
- 8. Install washer and headset lock nut.
- 9. Install stem and handlebars to desired height and torque stem
- bolt/clamping system to manufacturers instructions.





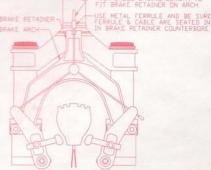
IMPORTANT: Do not run your brake cable through the stem cable system of your bicycle. Bypass the stem routing completely and go directly to the brake arch of the Manitou Fork.

10. Install cantilever brakes and adjust per manufacturer's instructions.

Note: All 95 Manitou Forks are equipped with a secondary catch dropout.

- 11. Adjust front wheel quick release to clear the 1/4" thick secondary catch dropout. The quick release must be tightened after it is properly seated into the dropout counter bores. Insure that there is adequate thread engagement (4 or more threads with the release adjusted to lock) due to the wider adjustment. Install front wheel to bievele per manufacturer's specification.
- 12 Obtain new brake inner and outer cable.
- 13. Trim outer cable length to fit into new brake cable retainer on brake arch. Do not use old retainer.





IMPORTANT: When installing wheel or any new tire be sure to check the minimum tire clearance per the table in figure 3. Measure from the highest point on the tire to the bottom of the crown.

WARNING: Do not raise or lower the fork tubes in the crown. This could cause lack of proper tire clearance when the fork compresses or reduce the amount of adjuster engagement in the leg. Either case constitutes an unsafe condition that may cause rider injury.

FIGURE 3: TIRE CLEARANCE



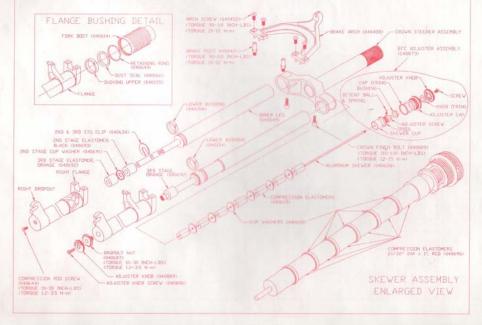
SPARE PARTS Tables 1&2

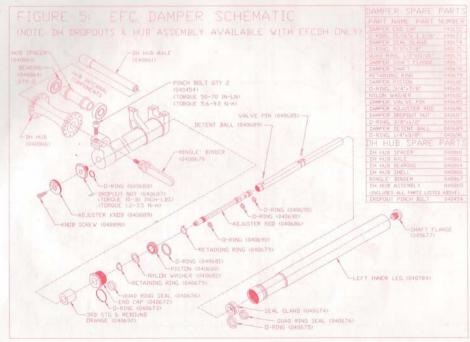
Spare parts can be ordered through your dealer. If you have any problems that you cannot resolve with your dealer, you may call Answer Products customer service at (805) 257-4411, 8:00 AM to 5:00 PM Monday through Friday. NOTE: FLUID DAMPER EXPLODED VIEW AND SPARE PARTS APPEARS ON PAGE 5. ELASTOMER SPARE PARTS APPEAR IN TABLES 2 AND 3 ON PAGE 10.

September 1997	
TABLE I: SPARE PA	RTS
PART NAME PAR	T NUMBER
SPAKE ARCH	04040B
BRAKE ARCH SCREW	040452
BRAKE POST	040442
BRAKE POST SPACER	040726
CROWN PINCH BOLTS (6MMx25MM)	040889
DENER LEG RIGHT	040783
DOER LEG LEFT	040784
COMPRESSION ROD	040632
COMPRESSION ROD SCREW	040644
FORC BODTS, BLACK	040614
TUST SEAL RETAINING RING	040640
	040166
BUSHING UPPER	040155
BUSHING LOVER	040154
ALLMINUM SKEWER, 7, 1781	040628
STOCK EFE ELASTONER, RED	040696
CUP VASHER	040620
THE STE & REBOUND ELASTOMER, DRANGE	040692
PAS STE ELASTOMER BLACK	040693
END & SED STAGE CUP VASHER	040691
200 4 MO STATE ELASTOMER CLIP	040634
ASSETTED ASSEMBLY, REPLACEMENT EFC	040873
RANKTON HEX YEY, SHOT	040171
DAMEST MANUAL 95 CFC	040874
FORM BOUTE CLEAR 93 & SUBS FORKS	85-3508
FOR BUTTLE BLACK THE SUBS FORKS	85-3509
FORM MOUTH BLUE BOLL SUBS. FORKS	85-3523
THESE ADMINES ADDRESS ON THE PARTY	٥
(34(E73)	SCREW (840644)
STOR SHE SHEETS SALL FOR	(040438) (540658)
ROOM OWEN	74

TABLE 2:	CROWN/STE	ERER ASSE	MBLY GUID
	STEER TUBE DIAMETER		
STEER TUBE LENGTH	1.000 IN (25.4 MM) STANDARD	1.125 IN (28.6 MM) DVERSIZE	1.250 IN (31.8 MM) EVOLUTION
55 IN (140 MM)	85-3440	85-3450	85-3460
6.5 IN (165 MM)	85-3441	85-3451	85-3461
7.5 IN (190 MM)	85,-3442	85-3452	85-3462
8.5 IN (216 MM)	85-3443	85-3453	85-3463
THREADLESS CHROMOLY 12' (305MM)	85-3445	85-3414	85-3464
THREADLESS ALUMINUM 12' (305MM)	X	85-3456	85-3466
FITS ALL 9	STEERER 4 & SUBSEQUEN SHOWN	m.r	THE NAME

FIGURE 4: MANITOU EFC FORK SCHEMATIC





MAINTENANCE

NOTE: The Manitou should not be used if any parts appear to be or are damaged. Contact your local dealer or Answer Products for replacement parts.

Your Manitou Fork is nearly maintenance free. However, moisture and contamination may build up inside the fork. Although this may not affect the performance of the Manitou, to insure long life it is recommended that the fork be periodically disassembled, cleaned, dried and re-greased. When cleaning the fork, it is **NOT RECOMMENDED** to direct water spray at the seals.

Before every ride you should:

- 1. Ensure that quick release skewers are properly adjusted and tight.
- 2. Check entire fork for any obvious damage.
- 3. Check tightness of front wheel quick release.
- 4. Check headset slack.
- 5. Insure that the front brake cable is properly seated in the cable retainer & check brake adjustment

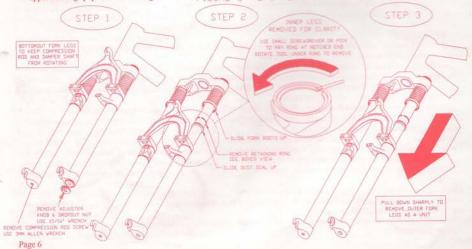
GENERAL DISASSEMBLY

NOTE: The cantilever brakes, brake arch, and inner legs DO NOT need to be removed for general disassembly or cleaning. We recommend you AVOID DISASSEMBLING these components unless absolutely necessary. Fork crown and inner legs may be left installed on bicycle during disassembly. It is also not necessary to disassemble the 95 Manitou Forks for compression elastomer replacement. Elastomer replacement is accomplished by removing the adjuster assembly per figure 7

Removal of outer legs Figure 6:

- Remove the 5MM lower compression rod screw from the dropout and the dropout nut from the left dropout. Bottom out fork to
 prevent the compression rod and damper shaft from turning while removing screws. Pull outer legs down gently to get more
 room to work with the seal.
- Lift fork boots off of flange boss and slide it up inner fork leg.
- 3. Use a small screwdriver or point tool to remove retaining ring (Figure 6).
- 4. Pry up dust seal until it is above flange, take care not to damage lip of dust seal.
- 5. Pull outer leg assembly down sharply to force upper bushing out of the flange. It maybe necessary to pull several times before upper bushings pops out of the flange.

 FIGURE 6: FFC FORK DISASSEMBLY



Skewer & Compression Rod Removal Figure 7:

- 1. Remove 2nd stage clip from the groove in compression rod.
- 2. Slide off the second and third stage elastomers.
- 3. Unscrew and remove the adjuster assemblies by hand.
- 4. Turn fork upside down to remove the compression rod. Giving the rod a quick upward thrust and catching them works also.

Fluid Damper Disassembly Figure 8:

Note: Damper disassembly is best done with the left inner leg removed from the crown. Complete diassasembly is not recommended unless all seals need to be changed.

- 1 Slide off second stage elastomer and catch the 1/8" diameter detent ball. The ball is held in by the elastomer.
- Compress the shaft until it bottoms out in the leg and remove the end cap. Pour out the oil and discard appropriately. Replace oil with Silkolene 2 1/2 or 5 weight or equivalent oil. For complete disassembly continue with step 3.
- 3. Using the special long 5MM wrench, remove the shaft flange and then pull the shaft out of the leg assembly. 4. Use a long shaft or drift larger than 1/2" (12.7mm) and smaller than
- 3/4" (19mm) to push out seal gland from the top end of the leg.
- 5. Remove retaining ring, piston and nylon washer from top end of shaft. Knock shaft against soft surface like a tire to remove thevalve pin and push out the plastic adjuster rod from top end of shaft. Note: It is recommended to replace the retaining rings if they are removed. Do not remove them unless necessary.

DAMPER INSPECTION

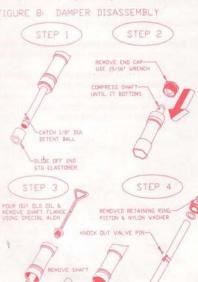
- 1. Check the shaft for scratches, wear at the retaining ring grooves and other obvious damage.
- Check the damper body for deep gouges.
- Check seal gland and end cap seal grooves for damage.
- 4. Check all other parts for obvious damage, replace if necessary.
- 5. Replace all seals and retaining rings.

OTHER INSPECTION

- Check the dust boots for tears, wear through or obvious damage.
- 2. Check the dust seal for tears or damage. Replace if needed.
- 3. Inspect the lower bushing for excessive wear or damage. Check the drag between the lower bushing installed on the inner leg and the outer les with the upper bushing removed. Drag should be very slight, enough to hold the weight of the inner leg but not more.
- 4. Check the drag between the upper bushing installed in the flange and the inner leg with the lower bushing removed. Drag should be the same as step 3. Replace bushings if necessary.
- 5. Check all elastomers for splitting, cracks or other obvious damage.
- 6. Check the aluminum skewer for straightness, Straighten or replace.
- 7. Check smooth action of the adjuster. Clean and re-grease threads.
- 8. Check the outer leg I D for deep gauges or dents. Replace if
- 9. Check the inner leg O.D. for deep gouges, check for other obvious damage. Minor wear resulting in color change is not detrimental to the hard anodized surface. Replace if needed.
- 10. Check 2nd stage clip grooves on the compression rod for damage. Replace if damaged

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RE-ASSEMBLY

Fluid Damper Figure 9:

- 1. Install three o-rings onto adjuster rod and piston.
- 2. Install o-rings and Quad Seals onto seal gland and end cap.
- 3. Grease all seals lightly with a seal grease.
- Put on the lower retaining ring first. Open the retaining ring just enough to slide on shaft without scratching shaft.
- Gently push plastic adjuster rod into shaft until groove in rod lines up with the center hole in the shaft. Be carefulnot to damage O'rings as they slide past the holes in the shaft.
- Drop in the valve pin and slide on the nylon washer, piston and retaining ring.
- Install seal gland and shaft into damper body. Put the quad ring end of the seal gland in first. Slide the gland onto the shaft and use the shaft to press it into the body. Be careful not to damage the seals.
- Compress the shaft until the seal gland and piston are bottomed.
 Fill with 2 1/2 or 5 weight Silkolene or equivalent fork oil.
- Stroke the shaft slowly until air bubbles come to the surface.
 Let them settle and add oil until it is just past the bottom of the threads.
- 10. Find the bleed hole in the end cap. Install by holding the leg at a 45 degree angle with the bleed hole up. Screw in cap by rotating the leg. Air and then a small amount of oil should bleed out of cap. Torque to 30-50 IN-LB. (3.4-5.6 N-m).
- Place detent ball into hole in shaft and slide 2nd stage elastomer over to hold in place.

Fork Assembly Figure 10:

- 1. Clean all parts thoroughly.
- Slide fork boots or dust cover, dust seal, retaining ring, and upper bushing onto inner legs.
- 3. Grease compression rod lightly.
- Drop compression rod down into inner leg. Shake inner leg to get rod through inner leg plug.
- Clean adjuster cap threads thoroughly. Grease threads on inside of inner leg.
- Grease aluminum skewer and install desired compression elastomers. A cup washer must be between every elastomer.
- Back off adjusters to soft setting and install skewer assemblies into inner legs.
- Slide on 3/4" black second stage elastomers, 2nd stage cup washer and orange 3rd stage elastomer just past clip groove.
- Install 2nd stage clip. Note: The grooves are marked, see view figure 8. Use the bottom groove for EFC and EFCDH. The clip must be in the proper groove to avoid bottoming the tire on the crown. Riding with the clip missing or in the wrong groove is unsafe.
- 10. Grease and install lower bushings.
- Install outer legs as a unit onto inner legs. Force lower bushings past flange area until dropouts contact compressions rod and damper shaft.
- Install and torque 5MM compression rod screw and dropout nut to 10-30 inch-lb. (1.1-3.5 N-m). Install adjuster knob.

FIGURE 9 DAMPER DISASSEMBLY

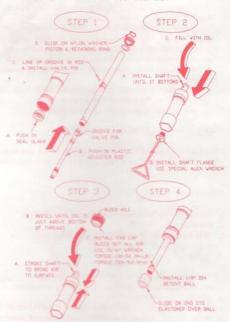
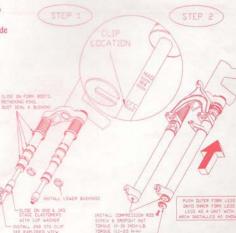


FIGURE 10: FORK REASSEMBLY



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Seal and Bushing Figure 11:

- Using a screwdriver like tool push the upper bushing into the flance. Talk care not to damage bushing or scratch the inner leg.
- 4. Using similar tool push the dust seal down into its cavity,
- Install retaining ring by starting the wide end in the flange groove.
 Pushing down with a screwdriver, rotate to feed ring into the
 groove, see figure 8 view). Install the ring so the end gap is
 oriented straight back. This will leave ring in the best position for
 removal later.
- 6 Slide fork boots down inner fork leg onto the flange boss. Be sure the lip snaps into the groove in the flange boss.
- 7. Readjust preload adjuster knobs to desired preload.

INNER FORK LEGS Figure 12:

During normal maintenance the inner fork legs do not need to be removed from the crown. It is recommended that the torque joints be left undisturbed.

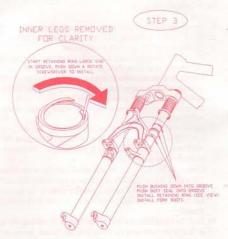
Disassembly:

- 1. Loosen the two 6MM allen screws located in the crown.
- Remove adjuster assemblies.
- 3. With twisting movement remove the inner fork legs.

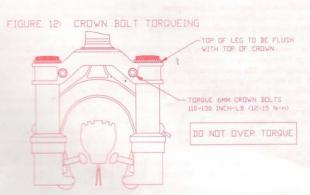
Re-assembly:

- 1. Clean mating surfaces of crown and inner fork legs.
- 2 Install inner fork legs into crown so top of leg is flush with crown surface.
- 3. Install adjuster assemblies until hand tight.
- 4 Tighten and torque two 6MM allen bolts to 110-130 inch-lb. (12-15 N-m).
- 5. Inspect to verify minimum clearance between tire and crown per figure 3, page 3.

FIGURE 11 SEAL & BUSHING



WARNING: Do not over tighten or under tighten crown pinch bolts. Tighten only to 110-130 inch-lb. (12-15 N-m). Over tightening may collapse inner legs and bind skewer threads. Under tightening may cause legs to slip in crown.



ADJUSTING RIDE QUALITIES Figures 13 & 14

Manitou forks offer a wide adjustment range to suit individual riding preference and rider weight by simply changing the urethane elastomers. Fine tune adjustments can be made using the preload adjusters located on top of the fork crown and by using the rebound damping adjuster located at the left dropout. Each production fork comes with an all red compression stack appropriate for an aggressive rider of 155-180 lb. Softer, blue and harder, yellow elastomers are available from your authorized Manitou Dealer.

Fine Tuning the Spring rate:

Fine tuning adjustments can be made by rotating the adjuster knobs located on top of the crown. Rotating the knob clockwise will firm the ride, adding preload to the compression stack. This will firm initial travel for small bumps but will not limit the full travel for larger bumps. Rotating the knobs counter clockwise will soften the ride. Five revolutions of the adjuster knob will take the adjuster from full soft to the extreme firm ride setting, changing the preload by 1/2 inch (12.7MM). It is not necessary to have the right and left adjusters set exactly the same.

Fine Tuning the Rebound Damping:

Fine tuning adjustments are made by rotating the adjuster knob located at the bottom of the left dropout. Rotating the knob clockwise will increase rebound damping, rotating the knob counter clockwise will reduce the rebound damping. Full adjustment, nine clicks of the detent, will almost lockup the fork preventing it from returning after compression. It is not recommended to ride the fork with full damping. Adjusting the rebound damping will only slightly affect the compression damping which is set at the factory.

Elastomer Replacement Tuning:

Normal riding should result in 2 3/4" to 3" travel. Large hits should use full travel. An excessively soft compression stack will rely too heavily on the second stage elastomer and will cause the fork to sag excessively with just the rider's weight. 1/2" to 3/4" of sag is good. An excessively firm compression stack will not use full travel. If your forks are too soft or too firm and need elastomer replacement, remove the adjuster assemblies, replace the elastomers and ride test. Disassembly of the fork is not required. In addition to the replacement elastomers provided with the EFC, an expanded soft ride and firm ride kit are available through your dealer as an accessory. The soft ride kit is a complete set of blue compression elastomers and the firm ride kit is a complete set of vellow compression elastomers. Any combination of colors can be used to obtain the ride that suits your preference. however the softer elastomer should be put on the skewer first.

The EFC fork is assembled at the factory with SAE 5 weight Silkolene fork oil. If you prefer more or less compression damping heavier or lighter oil can be used. We recommend not to exceed the range from SAE 2 1/2 to 7 1/2.





FIGURE 141 ZIP-TIE TRAVEL INDICATOR



TABLE 3	ELASTOMER	RIDE KITS, MA	ANTIDU EFC
COLOR	STIFFNESS	RIDE KIT	PART NO.
BLUE	SDFT	SOFT RIDE	85-3526
RED	MEDIUM		040696
ELLOW	FIRM	FIRM RIDE	85-3527
CUMPRESSIEN STACK CUP WASHERS		040620	
REBOUND ELASTOMER		040692	
PND STAGE ELAST		040693	
3RD STG ELASTOMER		040692	
SMD &	3RD STG CUP	WASHER	040691

TROUBLE SHOOTING

The adjuster knob is locked and will not turn:

The adjuster is probably at one extreme end of the travel. Unscrew the skewer cap assembly and remove the skewer to see if the adjuster is at the extreme firm or soft end of its travel. The spool will almost be off of the two dowel pins at the extreme firm setting. Unlock the knob by rotating it clockwise, if at the extreme soft setting, or counter clockwise, if at the extreme firm setting.

The fork feels less active and is not getting the travel it used to when it was new:

Chances are that the fork is developing stiction. Greasing the skewer so the elastomers slide easily will help. Complete disassembly, cleaning, and re-greasing is also recommended periodically, especially after mud rides. This will keep the fork in good shape and working like new.

Outer legs feel loose on inner legs and bushings, a knock or rock can be felt when pushed from side to side:

Either the lower bushing is missing or worn out. Disassemble per instructions, check both the upper and lower bushings for excessive damage and replace if necessary. Clean, grease, and reassemble.

Fork feels overactive, rebound damping does not seem to adjust:;

Either the seals have worn out and air has entered into the damper or the piston is sliding on the shaft. Disassemble the damper per the manual instructions, replace all seals and retaining rings and re-assemble.

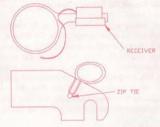
CYCLE COMPUTER INSTALLATION INSTRUCTIONS Figure 15:

Follow the instructions in your owners manual with the following exceptions:

- Remove the front wheel and locate the receiver on the top of the right dropout.
- Use the template to locate any holes drilled in the dropout in the acceptable region.
- Use a center punch or nail to punch mark the location of the hole in the right dropout.
- 4 Drill 1/8" dia, hole through the dropout,
- Attach the receiver to the dropout by passing a zip tie through the hole and the receiver and tighten it securely (see sketch).
- 6. Attach the wire to the wheel side of the fork leg using zip ties or a strip of electrician's tape. Wind the wire around the brake arch and then the front brake cable casing on its path up to the handlebar mount. Do not attach the wire to the bicycle frame or any other part that does not turn with the handlebar and fork. Doing so will reduce the life span of the wire.

Note: The drill template shows the acceptable region to drill a 1/8" (3MM) dia, hole through the dropout. Drilling in other areas could damage the dropout and render that fork unsafe to use. The template also shows the recommended location for the Avocet receiver. Use the newer Avocet adjustable receiver identified by its lateral ratchet slider. Old Avocet receivers are fixed position and will not perform correctly on the Maniton Fork.





DRILL TEMPLATE



ANSWER PRODUCTS, INC.

27460 AVENUE SCOTT, VALENCIA, CA 91355