2003

MANITOU

Eldorado

SC DC

OWNER'S MANUAL

P/N 042101

answer products incorporated

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AMERICAN MADE MANITOU SUSPENSION

CONGRATULATIONS ON CHOOSING THE LATEST IN SUSPENSION TECHNOLOGY AVAILABLE, A 2003 MANITOU DORADO FORK BUILT IN THE USA. This DORADO fork is fully assembled and is ready to be installed onto your bicycle. It comes equipped with a 1 1/8-inch threadless steerer tube, AND is only available with a disc brake version.

2003 DORADO FORK LINE

DORADO DH . . . . . 180 MM TRAVEL / COIL SPRING / TPC+ DAMPING

DORADO SC. . . . . 130 MM TRAVEL / COIL SPRING / TPC+ DAMPING

You can also download this manual at www.answerproducts.com.

⚠ GENERAL WARNING BICYCLING IS A HAZARDOUS ACTIVITY THAT REQUIRES THAT THE RIDER STAY IN CONTROL OF HIS OR HER BICYCLE AT ALL TIMES. READING THIS MANUAL ENTIRELY AND PROPERLY MAINTAINING YOUR BICYCLE AND SUSPENSION FORK WILL REDUCE THE POSSIBILITY OF INJURY OR POSSIBLE DEATH. PRIOR TO RIDING YOUR BICYCLE, YOU SHOULD INSPECT YOUR SUSPENSION FORK TO ENSURE THAT NO DAMAGE HAS OCCURRED DURING THE COURSE OF RIDING. DO NOT RIDE YOUR BICYCLE IF THE FORK SHOWS ANY SIGNS OF BENDING, CRACKING, LEAKING, OR IF IT IS MISSING ANY OF THE ORIGINALLY SUPPLIED COMPONENTS. ANY FALL FROM YOUR BICYCLE CAN RESULT IN SERIOUS INJURY OR EVEN DEATH. FOLLOWING THESE INSTRUCTIONS CAN HELP YOU REDUCE THE RISK OF BEING INJURED.

IF YOU ARE A MODERATE OR AGGRESSIVE OFF-ROAD RIDER, OR RIDE AT LEAST THREE TIMES A WEEK OVER ROUGH TERRAIN, ANSWER RECOMMENDS RETURNING YOUR SUSPENSION FORK EVERY 2 YEARS FOR A THOROUGH INSPECTION AND UPDATE. TAKE YOUR FORK TO A MANITOU AUTHORIZED DEALER WHO CAN ARRANGE FOR SHIPMENT TO ANSWER PRODUCTS, OR YOU MAY CALL ANSWER AT (661) 257-4411 TO HAVE YOUR FORK SHIPPED DIRECTLY.

IMPORTANT: The DORADO fork is an off-road fork, and as such, does not come with proper reflectors for on-road use.

CONSUMER SAFETY INFORMATION

1. Never remove or have the steerer tube or legs (SC version only) removed from the crown. The steerer tube and legs are press fit at the factory. Pressing the steerer tube or legs out will permanently damage the crown beyond repair and render it unsafe for any continued use.
2. Never attempt to thread a threadless steerer tube. Cutting threads will weaken the steerer tube and cause an unsafe condition. The only safe thing to do is to obtain the proper crown/steerer from your dealer.
3. Any other alteration or modification to your fork should be considered unsafe. Contact Answer Warranty prior to modifying your fork in any way for safety information.
4. Do not use the DORADO fork if any parts are broken, bent, cracked, or you suspect may be damaged. Contact your dealer or Answer Warranty at (661) 257-4411 if you have any questions concerning the integrity or condition of your fork.
5. Answer Products recommends that you inspect your fork before every ride for wear and damage. Inspect the crown, inner legs, outer legs, and dropout areas for cracks or damage.

WARRANTY INFORMATION

Any Answer Products fork found by the factory to be defective in materials and/or workmanship within one year from the date of purchase (or two years in EU countries) will be repaired or replaced at the option of the manufacturer, free of charge, when received at the factory with proof of purchase, freight prepaid. This warranty does not cover breakage, bending, or damage that may result from crashes or falls. This warranty does not cover any fork that has been subject to misuse or whose serial number has been altered, defaced or removed. This warranty does not cover paint damage. Any modifications made by the user will render the warranty null and void. This warranty is expressly in lieu of all other warranties, and any implied are limited in duration to the same duration as the expressed warranty herein. Answer Products shall not be liable for any incidental or consequential damages.

If for any reason warranty work is necessary, return the fork to the place of purchase. At that time, instructions for repair, return, or replacement shall be given. Customers in countries other than USA should contact their dealer or local distributor.

INSTALLATION AND SETUP INSTRUCTIONS

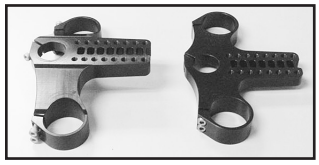
Ensure that the proper top crown has been delivered on your DORADO first. The steerer tube may need to be cut to length to fit your bicycle head tube. If you are not familiar with this procedure, or do not have the proper tools to cut the steerer tube, it is recommended that you seek a dealer with a qualified bicycle mechanic to perform installation.

⚠ WARNING THE STEERER TUBE AND LEGS (SC VERSION) ARE 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 STEERER TUBE LENGTHS OR DIAMETERS. REMOVING AND REPLACING THE STEERER TUBE OR LEGS WILL RESULT IN AN UNSAFE CONDITION AND SHOULD NEVER BE DONE.

FORK INSTALLATION

1. Remove the old fork from your bicycle.
2. Measure and cut the steerer tube to fit your bicycle head tube. You generally will want to leave about 10–20 mm excess length for the DH version.
3. Remove the headset crown race from the old fork and press onto the DORADO steerer until the race is seated over the crown.
4. Clean and grease the headset bearings and races.
5. Install the lower bearings (if applicable) on fork crown race.
6. Insert the steerer tube into the head tube of the frame.
7. Install the upper bearings, small spacer ring, and then the top crown (for DH model).
8. Install the stem cap and bolt. Tighten the bolt to headset manufacturer's specifications.
9. Install the handlebars to the desired height and torque stem bolts to manufacturer's specifications. On the DH model, torque the 5 mm stem clamping system bolts to 60–75 in.-lbs. (7.3–8.5 Nm).
10. Install the brakes and adjust per the manufacturer's instructions.
11. Install the small side of the hex lock through-axle through the large opening and wheel. Tighten down the hex lock end bolt until it is snug. Then tighten the dropout pinch bolts to 40–60 in.-lbs. (4.5–6.8 Nm).

UPPER TRIPLE CLAMP SIZING – DORADO DH



To fit a variety of bike head tube sizes, there are two distinct upper triple clamps. The flat upper triple clamp is the small size and fits head tubes between 130 mm and 160 mm in length. The drop upper triple clamp is the large size and fits head tubes between 155 mm and 185 mm in length. Both clamps must fully engage the aluminum bulges on the outer tubes without extending beyond the small taper line with the upper and lower clamps. All triple clamp bolts must be torqued to 60–75 in.-lbs. (7.3–8.5 Nm).

HEX AXLE INSTALLATION

The hex axle used on DORADO forks is unique in that it allows the legs to be locked together once the pinch bolts have been tightened. To install the hex axle, simply slip the axle into the dropout, small axle hex side first into the large dropout hex. Thread in the set bolt into the small hex side and snug slightly. Push the fork up and down a few times to center the axle and hub and then tighten all pinch bolts to 40–60 in.-lbs. (4.5–6.8 Nm).

ATTACHMENT OF THE BRAKE CABLE

Failure to properly route and securely attach the brake cable to the fork can cause serious injury or death. Included with the fork is a small black cable guide that can be attached to the fork guard depending on how you attach the cable. The best method we've found is to attach the cable so that it runs down the outside of the left fork leg. Just make sure that you do not attach the cable to the fork any other place than on the fork guard, as this will cause the cable to bind and possibly crimp as the fork is compressed. The cable should be routed through the guides located on the upper carbon tubes but should be free to slide.

HANDLEBAR INSTALLATION – DORADO DH

The DORADO DH comes equipped with an integrated handlebar upper triple clamp system. This provides additional steering stiffness as well as puts the handlebars straight every time. All handlebar bolts should be torqued to 50–60 in.-lbs. (5.7–6.8 Nm). All triple clamp bolts and steerer tube bolts should be torqued to 60–75 in.-lbs. (7.3–8.5 Nm).

SPRING SETUP – MEASURING SAG

You'll need a tape measure, a pencil and a piece of paper.

1. Measure the distance from the front axle's centerline to the bottom of the lower crown without anyone sitting on the bike and write this distance down. (Remember the exact locations of the two points because you'll need to use them later.)
2. Have the rider sit on the bike and measure the distance between the same two points as in step one. It's important to be in the normal riding position (weight centered) with your feet on the pedals.
3. Subtract the second measurement from the first. The resulting measurement is the static sag.

SAG MEASUREMENT CHART

FORK MODEL	FORK TRAVEL	SAG
DORADO SC	130 mm	25 to 32 mm
DORADO DH	180 mm	40 to 45 mm

RIDE KITS

Each DORADO fork comes with two medium rate springs installed. In addition, one firm spring and one soft spring have also been packaged with the fork. Using the recommended sag measurements listed above, adjust the spring stack as necessary. If there is too much sag, replace a single spring at a time with a firmer one; if too little sag, replace with a softer one. If additional adjustments are required, ride kits can be purchased from Answer under the following part numbers:

MODEL DH		MODEL SC	
SPRING RATE	PART NO.	SPRING RATE	PART NO.
Soft	85-4946	Soft	85-4534
Medium	85-4947	Medium	85-4538
Firm	85-4948	Firm	85-4539
Extra Firm	85-4949		

DAMPING ADJUSTMENTS – DORADO FORKS

With DORADO forks, since the fork features an upside-down design, the damping system is also reversed. As a result, compression damping adjustment is now located at the bottom of the right leg and rebound damping is on top of the right leg.

COMPRESSION DAMPING ADJUSTMENT – TPC PLUS

For TPC Plus-equipped DORADO forks, a turn of the knob located on the bottom of the right leg is all that is needed to adjust compression damping. Turning the knob clockwise (as you are looking at the fork from the bottom) increases compression damping, while turning it counterclockwise decreases compression damping.

REBOUND DAMPING ADJUSTMENT – TPC PLUS

Rebound adjusters on DORADO forks are located on the top of the right fork leg. Turning the knob clockwise (as you are looking from a rider's position) increases rebound damping, while turning it counterclockwise decrease rebound damping.

BEFORE EACH RIDE

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

IMPORTANT: Before every ride you should:

1. **Ensure that the through-axle is properly adjusted and tight.**
2. **Wipe the inner legs and clean and check the entire fork for any obvious damage.**
3. **Check the headset for proper adjustment.**
4. **Ensure that the front brake cable is properly routed and check brake adjustment.**

BREAK-IN

Your new fork is designed to break in during your first few rides (about 20 hours total riding time). Prior to break-in, you may notice your fork feels tight and slightly sticky. Following the break-in period, your fork will feel much smoother and react to bumps much better than when you first put it on your bike. After 20 hours, you may want to recheck your compression and rebound to fine tune the fork completely.

MAINTENANCE

IMPORTANT:

1. **Use of dirt guards is recommended to keep your DORADO fork performing at its optimum for extended service cycles and maintaining maximum life of the fork.**
2. **Use of this fork without dirt guards will require frequent service intervals to maintain performance and normal life of the fork.**
3. **Warranty will be void if fork is found to show that dirt guards were not in place and frequent service was not performed.**

Your DORADO fork requires periodic maintenance, cleaning and inspection performed by a qualified service technician. This is because moisture and contamination may build up inside the fork depending on the severity of riding conditions.

If you have any questions regarding your 2003 Manitou DORADO suspension fork in the U.S., contact the Answer Customer Service Department at (661) 257-4411. For information outside of the U.S., contact your authorized Manitou dealer or distributor. You can also log on to www.answerproducts.com and download this manual or see detailed instructions on how to service your suspension fork.

Thank you again for choosing a 2003 Manitou DORADO suspension fork.

DEALER SERVICE ADDENDUM

INTRODUCTION When servicing the fork, take the time to inspect all parts for excessive wear or damage. There are basically three aspects of a fork that will require attention:

1. Lubrication of stanchions (inner legs) and bushing inspection
2. Spring stack
3. Damping system

LUBRICATION OF STANCHIONS (INNER LEGS) AND BUSHING INSPECTION The outer leg bushings need to be serviced approximately every 40 hours of riding (depending on conditions – extreme conditions may require a more frequent service schedule). The method used to determine if your fork requires the lubrication system to be cleaned and serviced is if stiction (binding as you compress the fork) develops. If you feel any stiction, remove the inner legs per the instructions below and inspect the bushings for signs of excessive wear. Pay close attention to the bushing contact surface, which can be damaged by contamination in severe conditions. Replace any worn or damaged parts that are discovered.

SPRING STACK Inspection and service of the spring stack should be performed after 80 hours of riding. The spring stack may require servicing if there is an audible rubbing sound coming from the left side of the fork during compression. The spring stack can be removed and serviced using the instructions below.

DAMPING SYSTEM The damping system on your DORADO fork needs to be serviced approximately every 40 hours. The DORADO fork uses a sealed gas free hydraulic damping system. The damping oil and foam compensator (if installed) should be removed at this time and replaced with 5WT fork oil as described in the instructions below.

Hex Axle – Removal (Figure 1)
To remove the front wheel, loosen the four dropout pinch bolts (1) using a 5 mm hex wrench. Loosen the button head screw (2) on the right side of the fork (while facing the fork) using a 6 mm hex wrench. Push the axle through the dropouts from right to left.

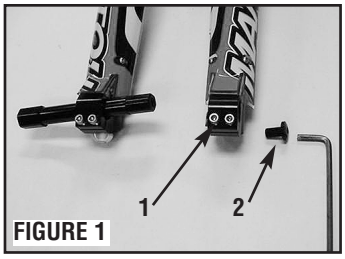


FIGURE 1

Hex Axle – Installation
Reverse the steps above. Torque the button head screw to 15–20 in.-lbs. (1.7–2.3 Nm). Torque the pinch bolts to 40–45 in.-lbs. (4.5–5.1 Nm).

Triple Clamp Removal (Figure 2)
Loosen the five pinch bolts (1) using a 4 mm hex wrench and slide the outer leg down through the assembly.

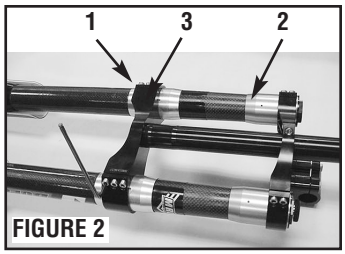


FIGURE 2

Triple Clamp Installation (Figure 2)
Wipe the aluminum sleeves (2) on the outer legs and inside of each triple clamp (3) with isopropyl alcohol. Position the lower clamp on the flat surface of the leg sleeves; the inside of the clamp must have full surface contact with the sleeve. Torque the pinch bolts to 60–75 in.-lbs. (7.3–8.5 Nm).

Coil Spring Removal (Figure 3)
Use a 20 mm socket to remove the bottom right leg (facing the fork) end cap (1). Pull the spring stack (2) consisting of one MCU, two springs and connectors out of the fork leg.

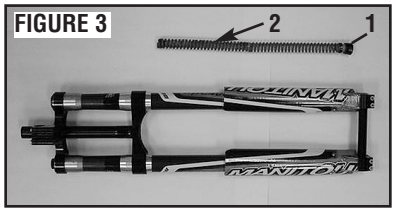


FIGURE 3

Coil Spring Service, Ride Kit Installation (Figure 3)
Replace the spring in the sequence shown, coating the spring with a liberal amount of Maxima spring grease. Install the end cap. Torque the end cap to 60–70 in.-lbs. (6.9–7.90 Nm).

Inner Leg Removal (Left Leg, Figure 4)
Remove the coil spring (see above) prior to removing the compression rod. Unscrew the top cap (1) with a 1 1/16" socket. Pull the shaft out of the inner leg until it stops; do not force. Clamp the shaft using soft jaw blocks (Answer tool P/N 064615). Using a 1 1/16" socket, unscrew the top cap off of the compression rod (2). Pull the inner leg downward from the outer leg.

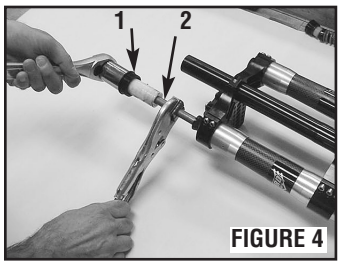
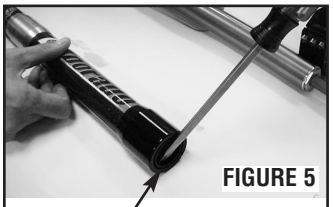


FIGURE 4

Seal System Removal and Bushing Replacement (Figures 5 and 6)
There are two seals that make up the sealing system on the bottom of the outer carbon legs: an outer (dust) seal to prevent contamination from the outside, and an internal (oil) seal to retain lubrication grease inside the fork. The seals should be replaced if excessive grease is found to be leaking out of the fork or if on inspection, excessive contamination is found inside the outer leg. The seals must also be removed if it becomes necessary to replace the bushings.


FIGURE 5

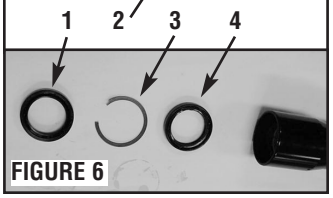


FIGURE 6

Remove the outer (dust) seal (1) as shown (2). Pry out the metal circlip (3) and then the lower (oil) seal (4). Discard both seals and circlip; they cannot be reused once removed.

The bushings should be inspected for signs of wear (discoloration) or tears on the surface. Bushings can be replaced using tools and instructions found in Answer bushing removal and installation tools PN 85-3909 and 85-3911.

Seal System Installation (Figure 7 and 8)
The two seals must be identified and oriented before installation:

1. The oil seal is installed first and is rubber on the outside diameter. It is installed so that the lip is pointing to the inside of the outer leg. Install using Answer seal installation tool P/N 064000 (1).
2. Install the circlip into the machined groove in the outer leg.
3. The dust seal is installed last and has metal on the outside diameter. It is installed so that the lip is pointing to the outside and metal surface towards the circlip. Use the installation tool to tap the seal into place. The dust seal will be flush with the rim (2) of the outer leg when the seal system installation is complete.



FIGURE 7



FIGURE 8

Before reinstalling the inner leg after servicing, liberally apply Motorex grease to the upper and lower outer leg bushings (3). Lightly grease the inner legs before insertion.

Damping System (Right Leg) Service – Leg Removal (Figure 9)

It is recommended that the right leg be removed before service. Remove inner leg from outer leg as follows:

1. Pull the rebound damper adjuster knob (1) out of the damper nut.
2. Remove the damper nut (2) with an 8 mm hex wrench.
3. Pull the inner leg (3) out of the outer leg (4).
4. Remove the leg guard.

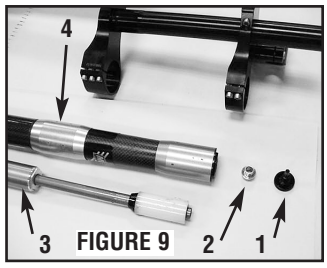


FIGURE 9

Damping System (Right Leg) Service – Leg Disassembly (Figure 10)

Oil is removed from the inner leg (3) by removing the rebound and compression assemblies to ensure that all old oil is removed from the system. The compression damping assembly (2) is located at the bottom (dropout) end and the rebound assembly (1) is at the top.

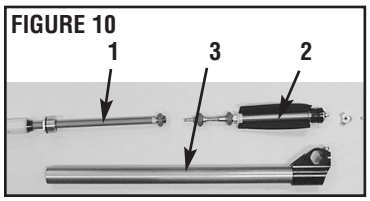


FIGURE 10

1. Rebound Assembly Removal – With the rebound assembly end of the leg pointing up (to minimize spilling damping oil), unscrew the end cap and slowly pull out the assembly over a drip pan. Pour out and discard the damping oil.
2. Compression Damping Assembly Removal – Unscrew the screw holding the adjuster knob and remove the knob. Loosen the 13 mm adjuster needle lock nut (Figure 11, #1). Unscrew the end cap using a 20 mm socket and slowly pull out the assembly over a drip pan. A piece of black foam (compensator) may come out as part of some production models.

Damping System (Right Leg) Service – Leg Assembly (Figures 11, 12 and 13)

The damping system contains no air and when replacing damping oil, must be bled to remove all air.

1. Install the rebound damper assembly and torque the end cap to 60–75 in.-lbs. (7.3–8.5 Nm).
2. Hang the leg vertical at a 45° angle as shown in Figure 11. Place a drip pan under the leg.
3. Fully extend the rebound damping assembly shaft and fill with 5WT Maxima fork oil (Answer PN 85-3814) up to the bottom of the inner leg threads. Cycle the rebound damper shaft several times, covering the open end of the leg with a rag. Allow the leg to sit for two minutes to allow any air bubbles in the system to rise to the top.


FIGURE 11

4. On the compression damping assembly, remove and discard the foam compensator if one was there during damper removal. A replacement is found in tune-up kit PN 85-4953. Remove the 13 mm adjuster needle locknut (1). Unscrew the needle (2) until it is loose from the assembly, but **do not** remove.

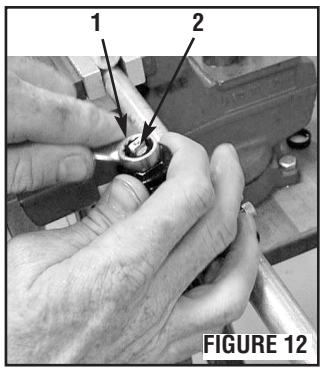


FIGURE 12

5. Insert the compression damping assembly with its foam compensator (if applicable) wrapped tightly around the shaft into the leg. Oil will be displaced during this step. Be sure that the foam does not bunch up against the leg cap and is fully inserted into the leg. Screw in the assembly and torque to 60–75 in.-lbs. (7.3–8.5 Nm) using a 20 mm socket.



FIGURE 13

6. Install the adjuster needle and 13 mm lock nut and torque to 10–15 in.-lbs. (1.1–1.7 Nm).
7. Install the compression adjuster knob.
8. Inspect the damper bleed process by compressing the rebound shaft to the bottom out bumper. This is to ensure that the foam compensator did not bind up internally to limit the travel. If it does not fully compress, the system must be re-bled.
9. Fully extend the damper shaft and install the inner leg into the outer leg. Lubricate the bushings and inner leg as specified under Seal System Installation.
10. Install the damper nut using an 8 mm hex wrench and torque to 15–30 in.-lbs. (1.7–3.4 Nm).
11. Push the rebound damper adjuster knob into the nut until it snaps in place.

Disk Brake Adapters (Figure 14)

There are three disk brake caliper adapters included with the DORADO forks:
(1) International Standard
(2) Post Mount – 6" Disk
(3) Post Mount – 8" Disk

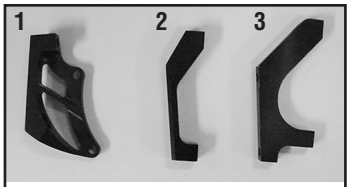


FIGURE 14

DORADO SC (Single Crown) Fork Service (Figure 15)

Service procedures for the DORADO SC fork are the same as for the DH model except for the method used to remove the left inner leg. Leg removal is accomplished by removing the 6 mm button head cap screw (1) on top of the crown and pulling the inner leg out. Re-torque the screw to 15–30 in.-lbs. (1.7–3.4 Nm) upon assembly.

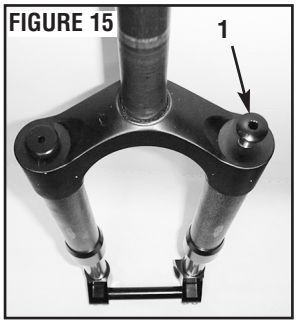


FIGURE 15