2007 Manitou Rear Shock Service Guide

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2007 Manitou Rear Shock Service Manual Index

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SECTION 1: INTRODUCTION

This manual is intended to guide the user through basic service of Manitou Swinger rear shocks. Service is supported by the identification of common parts and assemblies that have been assembled into Service Kits. The purpose of this manual will be to describe conditions that may drive the need for service and to provide installation instructions for the kits.

Due to the time-consuming nature rear shock service, at this time our primary focus is to offer service kits that minimize the amount of downtime and labor involved. As the program matures, and we are able to gather feed back from our customers, we may offer kits to a more detailed level.

Important information is highlighted in this manual by the following notations:

WARNING
Failure to follow WARNING instructions could result in severe injury or death to the person inspecting or repairing the shock absorber or the shock absorber operator

CAUTION
A CAUTION a caution indicates special precautions that must be taken to avoid damage to the shock absorber.

NOTE
A NOTE provides key information to make procedures easier or clearer

GENERAL WARNING: Rear shocks by design contain gases and fluids under extreme pressure and warnings contained in this manual must be observed to reduce the possibility of injury or possible death. Following these instructions can help you reduce the risk of being injured. Any questions in regards to the information in this manual should be directed to Answer Products Customer Service at (661) 257-4411.

WARNING: The Swinger Shock uses compressed air to provide fluid pressure in the damping system and spring resistance in Air models. BOTH systems must be relieved of pressure prior to servicing these systems. Failure to relieve air pressure could result in injury or possible death.

CAUTION: The Swinger Shock uses precision machined aluminum and other soft alloy components. Using correct tools for assembly is essential to prevent damage.

SECTION 2: SETUP, TUNING, PERIODIC MAINTENANCE

Instructions for shock setup, tuning, and periodic rider maintenance is not covered in detail in this manual. Please refer to the Manitou Swinger Rear Shock Owner's Manual (PN 042105) for that information. If you did not receive a manual, you can download one at www.answerproducts.com or contact Answer Products Customer Service at (661) 257-4411.

SECTION 3: GLOSSARY OF TERMS

Air Canister – Can that holds the air spring air in an air shock.

Air Preload Adjuster – Located on the reservoir of SPV shocks. It contains the red Schrader valve for setting the SPV pressure and a hex fitting for adjusting the air volume (air preload)

Bottom Out – Point at which a shock reaches full compression.

Control Eyelet (C-End) – Eyelet that is on the rebound adjuster end of a shock. The air canister is attached to this end on air shocks and the spring retention collar is attached to this end on coil shocks.

Damper Eyelet (D-End) - Eyelet that is on the damper body end of a shock. On SPV shocks, this is the end that contains the SPV valve and reservoir if applicable.

Damper Body – Section of shock that contains the damping system

Damper Piston – Piston in that controls the flow of oil during compression and rebound.

Damper Shaft – Shaft attached to the damper piston that connects the two moving sections (damping system and control eyelet) of the shock together.

Damping System - Controls compression and rebound rate (speed). The system also provides the peddling platform unique to shocks with the SPV technology.

DU Bushing – Teflon guide bushing pressed into the eyelets. Mounting hardware is inserted into the DU bushings and rotates within the bushing as need by the suspension design.

Eyelet – Found on each end of the shock, it is where the DU bushing and mounting hardware are and provides the connection between the shock and bicycle.

Internal Floating Piston (IFP) - A floating piston that separates damping oil from the SPV air chamber or reservoir.

Mounting Hardware – Spacers that allow shocks to be mounted into the wide variety of suspension designs.

Schrader, Air – Black in color, it is the valve for pressurizing the air canister in an air shock

Schrader SPV - Red in color, it is the valve for pressurizing the SPV system.

Seals: O-Rings - Black synthetic rubber with a round cross section. Primarily used for fluid sealing.

Seals: Quad Seals - : Black synthetic rubber with an “X” cross section, primarily used for sealing air.

Seals: Wipers – Teflon ring, used for keeping debris out of quad seals, guiding the damper piston, and providing support.

Top Out – Point at which a shock returns to its full extension.

SECTION 4: AIR SPRING SYSTEM AND SPV AIR PRELOAD, SWINGER AIR, S-Type

WARNING: The Swinger Air uses compressed air to provide resistance to compression in place of a coil spring. You must be certain that the air canister is relieved of all pressure prior to servicing the air system. Failure to relieve air pressure could result in injury or possible death.

Sealing of the shock is accomplished through a series of o-rings, quad seals, and wipers. When the air canister is removed, these seals can be replaced from Seal Kit C.

1. Failure of an air shock to maintain air pressure is usually the result of defective or worn seals. If there is suspicion of an air leak, pressurize the air canister to 150psi from the adjuster eyelet Schrader Valve and the SPV Air Preload Schrader to 100psi. Locate the leak by spraying the air canister and Schrader joints with a mild solution of dish soap and water or submerge in a bucket of water. Bubbles will form in from the area of leakage.

2. For leaks at the adjuster eyelet or damper end of the air canister, refer to the detailed disassembly instructions contained in the section on DAMPING SYSTEM BLEEDING - Swinger Air. This will guide you on how to replace the applicable o-rings and seals.

3. For leaks at the Schrader valves, release all air pressure and replace the Schrader valve core or assembly as needed. The core is removed using a standard core removal tool. The assembly is removed by removing the core and unscrewing the assembly by inserting a 3mm hex into the center of the valve.

4. For leaks in the air preload reservoir area (4W Swinger), release all pressure replace the preload adjuster o-ring, Schrader valve core, or Schrader assembly as needed.

5. If when you pressurize the air canister the shock collapses to its shortest travel position, the shock has an air piston leak into the negative chamber. Place the shock in the shock tester and extend it to its full travel. Depress the adjuster eyelet Schrader while the shock is extended under load. If it remains in the full travel position, refer to the section on DAMPING SYSTEM BLEEDING - Swinger Air for instructions on servicing the air canister and piston seals.
6. If the shock returns to the short travel position, it is not serviceable and the entire shock must be replaced.
   WARNING: Attempting to service a shock with this condition could result in injury or possible death.

SECTION 5: COMPLETE SHOCK LESS MOUNTING HARDWARE AND COIL SPRING

The highest-level kit offered will be a complete shock, without mounting hardware or coil springs for coil forks. This kit is offered as a fast replacement where all that is need is to change out the hardware and spring and then reinstall the shock.

Swinger Air – Less Mounting Hardware	**Swinger Coil – Less Mounting Hardware and Coil**
	

SECTION 6: MOUNTING HARDWARE REMOVAL AND INSTALLATION

Mounting hardware is used to mount shocks to the various frame configurations. Over time, the hardware may wear between the mounting bolts or DU Bushing which will result in play in the connection.

Remove hardware using pliers as shown in Figure 1

Figure 1

DU Bushing Eyelet

Figure 2

MOUNTING HARDWARE REPLACEMENT

Hardware should have a slight press fit into the DU bushing and can be tapped in place with a rubber mallet or soft jaws in a vise. Apply a small amount of thick grease such as Motorex Bike Grease 2000 (PN 85-0033) to the hardware before installation.

There are virtually an infinite number of hardware combinations in use on bikes today. When ordering hardware from Answer Products, It will be necessary to identify the eyelet width, overall width and mounting hole diameter.

1. Measure the hardware width. 	2. Measure mounting hole size. Current hardware is typically designed to accept a 6mm or 8mm fastener. 

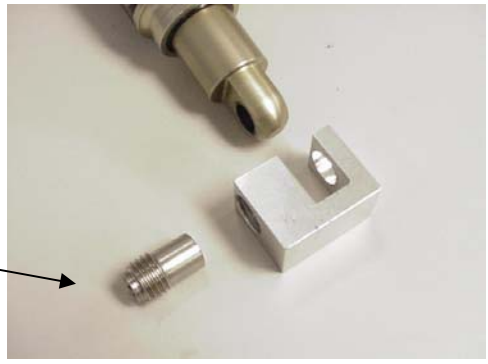
SECTION 7: DU BUSHING REMOVAL AND INSTALLATION

DU bushings are press fit into the shock eyelets at each end of the shock. The hardware fits into the bushings and will rotate slightly within the bushing during suspension compression. DU Bushings, like hardware, may wear over time. Removal and installation is accomplished using tool PN 85-6075.

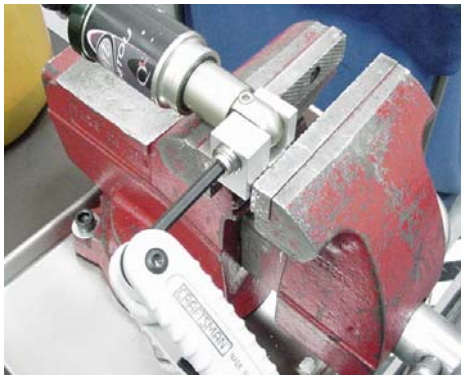
REMOVAL

1. Remove hardware from the shock.
2. Insert unthreaded end of punch into the removal tool first and screw in about half a turn.

Punch



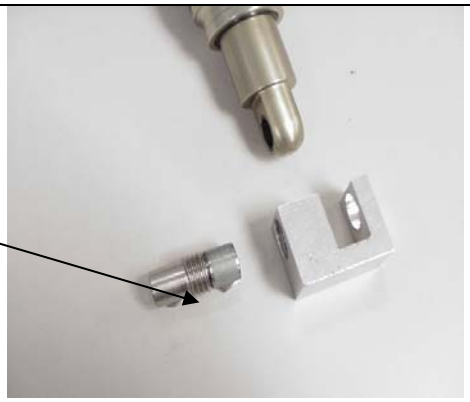
3. Clamp removal tool in vise.
4. Insert eyelet into tool.
5. Use 6mm hex wrench to screw in punch, making sure that it is centered on the bushing. This will press out the bushing.



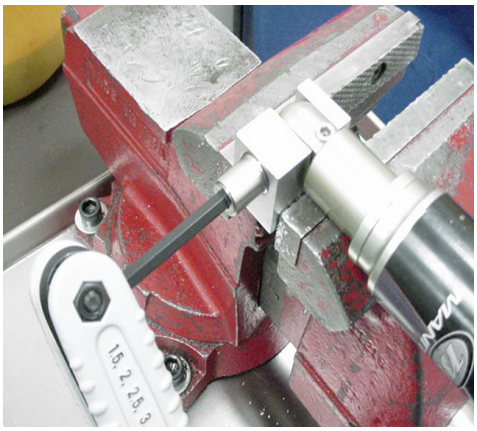
INSTALLATION

1. Place a bushing onto the threaded end of the punch and into the removal tool; screw in about half a turn.

Bushing



2. Clamp removal tool in vise.
3. Insert eyelet into tool.
4. Use 6mm hex wrench to screw in punch, making sure that it is centered on the bushing and that the bushing is centered to the eyelet. This will press in the bushing.



SECTION 8: RIDE KITS

Ride kits (Coil Swinger only) consist of a replacement spring of a specific spring rate that is firmer or softer depending on the rider's preference. Most manufacturers using Swinger Coil shocks vary the stock spring rate that is the standard offering based on frame size. Larger frame sized have higher spring rates to accommodate bigger riders. Due to the wide variety of frame geometry in use, it is left to the rider to determine if they are satisfied with their stock spring rate.

Spring rates and travel/stroke are marked on the outside of each spring.

Example: "300 X 2.75" Is a 300lb spring for a 2.75" Travel Shock

To change out the coil spring:

1. Turn the spring preload adjustment ring to release any preload and back it away from the spring as far as possible.
2. Remove the retaining collar.
3. Slide spring over eyelet. You may need to turn the rebound control knob in **clockwise** to its fully closed position. **NOTE:** Model year 2003 Swingers use a rebound knob that can be removed by taking out a hex screw. **Do not attempt to remove the 2004-2005 rebound knobs by unscrewing the 3mm hex in the knob, it will break.**
4. Slide the new spring over the eyelet.
5. Reinstall the spring collar so that it butts against the eyelet, and the spring nests in the appropriate groove.
6. Turn the spring preload adjustment ring until it contacts the spring and then apply 2mm of preload.

SECTION 9: BOTTOMOUT BUMPER REPLACEMENT, SWINGER COIL

WARNING: The Swinger Shock uses compressed air to provide fluid pressure in the damping system. The damping system must be relieved of pressure prior to servicing. Failure to relieve air pressure could result in injury or possible death.

1. Remove hardware as shown under HARDWARE REMOVAL and remove Spring as shown under RIDE KIT Section.
2. Release reservoir pressure from the air preload.

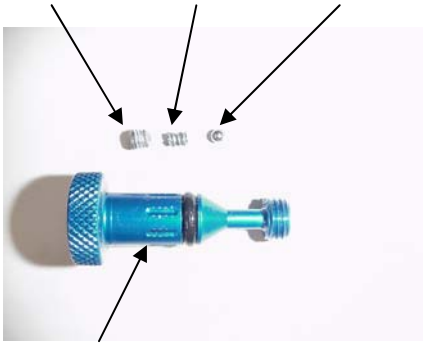
SPV Air Reservoir 3W Swinger Coil

SPV Air Reservoir 4 & 6W Swinger Coil

3. Extend and clamp damper shaft in a vise using 12.7mm (.500) soft jaws, Answer PN 85-5148 4. Remove eyelet using adjustable open-end wrench.	
5. Slip off old bumper. 6. Install new bumper, Larger diameter face of the bumper should face the eyelet 7. Clean damper shaft threads with alcohol and apply Blue Loctite. 8. Install damper shaft in vise using soft jaws as shown above and torque per Table 1. 9. Add air to re-pressurize the air preload reservoir per instructions in the Owner's Manual.	

SECTION 10: REBOUND ADJUSTER KNOB REMOVAL AND INSTALLATION, SWINGER COIL

Instructions in the 2004 Swinger Shock Owners Manual were incorrect when it stated that the rebound knob had to be removed to replace shock springs. Turning the knob to its full clockwise setting is sufficient to provide clearance for removal.

Removal 1. Remove control eyelet as shown under Bottom out Bumper Replacement, Swinger Coil. 2. Remove 1.5mm hex set screw located under the control eyelet with the set screw pointed up. Underneath the set screw is a spring and detent ball bearing. Turn the eyelet over on a cloth rag and tap the eyelet to dislodge the spring and ball. 3. Unscrew the rebound knob from the eyelet.	Rebound Knob  Set Screw
Installation 1. Installation is in reverse order. Place a small amount of grease on the ball and rebound knob detents. Screw in the knob and place the ball and spring in the set screw hole. 2. Apply a small amount of blue Loctite to the set screw threads. Screw in the set screw until it is flush with the eyelet.	Set Screw Spring Detent Ball  Knob Detents

SECTION 11: DAMPING SYSTEM

The damping system controls compression and rebound rate (speed). The system also provides the peddling platform unique to shocks with the SPV technology. The main conditions requiring service you may encounter in regards to the damping system are leaks, a suspect SPV, broken rebound adjuster knob, or lose damper or reservoir body.

SPV VALVE INSPECTION

If you are unable to achieve the pedaling platform after adjusting the shock per the Owner's Manual, you will need to inspect the SPV. Follow the instructions under the damping bleeding section for the shock in question in order to inspect the SPV.

LEAKS

If oil is found to be leaking from the shock, the seals and/or o-rings that seal that suspect joint must be serviced. Once the system has lost oil, the faulty seals must be replaced and the shock bled to restore the shock to full performance.

LOOSE DAMPER OR RESEVOIR BODY

All Swinger service can be performed without removing the damper or reservoir bodies where they are threaded into a machined casting. This joint is bonded in place during final assembly at the factory. If either becomes loose during service, remove the body, and thoroughly clean the threads on each part. Apply green Loctite the threads and use the Answer reservoir clamp PN 85-6037 to tighten the bodies.

SECTION 12: DAMPING SYSTEM BLEEDING – SWINGER X3/S-TYPE/RADIUM AIR SHOCKS

WARNING: The Swinger Shock uses compressed air to provide fluid pressure in the damping system. The damping system must be relieved of pressure prior to servicing. Failure to relieve air pressure could result in injury or possible death.

Tools Needed: -
-
-

Disassembling

1. Secure the shock in the vise by clamping the Top Cap eyelet in the jaws of the vise. Remove the Schrader valve core form the air spring valve to relief all pressure in the air canister.

2. Remove the Air Can from the shock using a 39mm wrench or an adjustable wrench if it is an X3, if it is a Radium or S-Type you will need to use a strap wrench to remove the air can. It will unscrew in a counter-clockwise direction.

3. Remove MCU bottom out bumper from the Air Can. Thoroughly clean out the interior of the can and MCU. Replace the glide ring and seals in the end of the canister. Set aside for reassembly. If you are only solving an air spring leak you do not have to proceed any further, go to step **

4. Remove the Air pressure and Valve from the HP IFP system. You will need to use P/N#

A. Remove the cap covering the Schrader assembly.
B. Using the valve adapter and a shock pump release air pressure in the IFP.
C. Remove the Schrader valve core

5. Remove the Damper Cap/ Air Piston Cap from the damper body. Using an adjustable wrench or 14mm wrench. Pull damper shaft assembly from the damper body. Pour out the oil that is in the damper body.

	6. Remove the IFP by threading in the valve adaptor and using a shock pump to slowly pressurize the chamber which will blow the Piston out of the bottom of the damper body. NOTE: Be sure to cover the end of the damper body with a shop rag so that the piston and any remaining oil don't shoot across the work area.
	7. If this is an SPV equipped rear shock, remove the SPV valve assembly from the damper piston using a pin wrench or an SPV valve tool (P/N **-****). You will want to insert the tool into the 3 slots in the piston, DO NOT try to remove the SPV valve using the Phillips screw in the center of the assembly.
	8. Check the SPV to make sure that it is functioning correctly. The valve should look like the top picture, with a space between the piston and the top plate and should spring open and closed when the two pieces are squeezed together. If it has failed it will look like the second picture and when it is squeezed it will not spring back open.
	9. Pull apart the two pieces of the SPV valve, gently clean both the inside of the piston and the out side of the shim head to remove any oil or old grease that maybe on them. Lightly grease the o-ring with Wacker grease and reassemble the valve and recheck for proper function. Set aside for reassembly.
	10. Remove the SPV Adjustment spring that is inside the damper piston. Set aside for reassembly.
	11. Secure the Damper shaft using shaft clamps and a vice and remove the top cap by unscrewing it counter-clockwise. You can use an adjustable wrench to turn the cap.
	12. Remove the Top-out bumper and the SPV/lockout adjustment needle by pulling it out of the damper shaft. Screw the rebound adjustment shaft down so that the flange is just below the top of the damper shaft.

13. **Thoroughly clean all parts and replace all o-rings and seals.**

Reassembling the Swinger 3-Way

14. Lightly grease the seal on the IFP. Insert the IFP into the damper body with the cupped side up (towards the open end of the body). Push the IFP all the way to the bottom of the damper body. Fill damper body with 5wt. Shock oil to the top of the bore.

15. If this is an SPV shock, install the SPV spring into the damper piston through the rebound adjustment shaft. Screw the SPV valve assembly into the top of the damper piston and tighten to 80 inlbs.

16. Push the Damper cap/Air piston down the damper shaft so that the inside surface of the air piston is even with the hole in the damper shaft. You don't want to cover the hole as it will prevent the air from bleeding out of the damper assembly.

Damper Shaft Hole

Air Piston Surface

When the air piston is in the proper position relative to the hole your assembly will look similar to this.

17. Insert the Damper piston in into the damper body. It will be helpful to wrap a shop rag around the damper body to catch the overflow in the next couple of steps.

18. As you are installing the damper piston and damper cap, you will have some air and oil coming up through the center of the rebound adjusting shaft this is normal. Tighten down the Air Piston/Damper cap to 85inlbs.

19. Push the damper shaft down into the damper body until the shaft extends from the top of the damper cap 8.75mm. This is measured from the top of the piston to the top of the flange above the threads on the damper shaft. This is critical to proper function of the shock but it is better to err on the short side, if it is too long you will not get full travel. Adjust the rebound adjusting needle until the flange on the needle is flush with the top of the damper shaft by screwing it in or out.

	20. Insert the SPV adjusting needle fully into the rebound adjusting needle until the o-rings have seated. Screw on the Top Cap as snugly as possible. Fully extend the damper shaft by pulling up on the Top Cap to the end of the travel. Reinstall the high pressure Schrader valve into the IFP chamber port but DO NOT charge the IFP. Remove the Top Cap.
	21. Keep the damper shaft pointed straight up and clamp it in the vise with the clamp shafts. Install bottom out bumper and reinstall the top cap using red Loctite. Torque the top cap to 85 inlbs. Note: you may need to turn the Rebound counter clockwise a couple of turns as you are threading the top cap on as it will thread the adjusting needle in due to the detent plate.
	22. Charge the IFP to 125psi using a standard shock pump. Install the small, threaded metal cover over the Schrader valve. You will need to use components from the HP IFP tool kit for this.
	23. Install the top out bumper into the air can. Side the air can over the damper body. Thread the top cap into the air can and tighten to approximately 100inlbs. Note: It may be helpful to secure the end of the damper eyelet in the vise so that you can pull up the air can up to meet the top cap.
	24. Reinstall the Schrader core in the air can valve. Charge the air spring to 100psi, check to make sure that there are no air leaks. Check the shock function for lack of rebound or compression damping and dead spots in the travel.

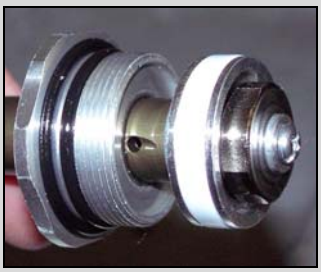
<u>SECTION 13:</u> INSTRUCTIONS FOR SWINGER X4, EVOLVER 4/6-WAY, AND SPLIT REAR SHOCKS – SPV AND SHIM STYLES

Tools Needed:
- .9mm, 1.3mm, 6mm Allen wrenches
- 39mm, 10mm, wrench
- 1.3mm Allen wrench
- 39mm wrench or suitable crescent wrench

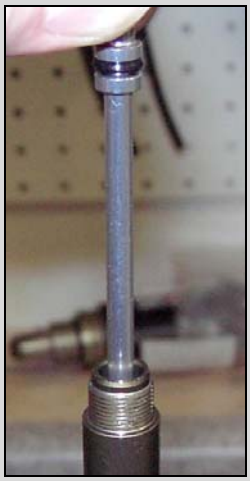
	1. Release air in the main air spring and remove the Schrader valve.
	2. Release the air that is in the IFP chamber and remove this Schrader valve also.
	3. Remove the air can using a 39mm wrench or a crescent wrench. Once the can is free from the top cap slide the can down as far as possible to the damper eyelet.
	4. Secure the damper shaft in the vise using the appropriate shaft clamps. Unscrew the top cap counterclockwise. After removing the top cap remove the bottom out bumper and the metal washer also.
	5. Remove the damper cap using the special socket (P/N**-****) Pull out the damper shaft, cap and damper piston as an assembly.
	6. Pull firmly on the air can to remove it from the damper body. The air piston will come off with the air can.
	7. Remove the piston and top out bumper from the air can.

 	8. If this is a twin-tube Evolver: Remove the snap ring at the base of the can. It is easiest to do this by inserting a small pick into the gap on the ring and lifting one end free of the groove, and then just walk the rest of the ring out. Once the ring is removed, pull the outer can off of the inner can.
	9. Remove the No Tools Volume adjust by unscrewing it counter clockwise. There is no need to disassembly the assembly any further as there are no parts to wear in the no tools adjuster.
	10. Pour out the oil in the damper body. Cover the Reservoir with a rag to catch the IFP and any oil which might be trapped to the reservoir. Insert the IFP removal tool, into the damper body. Cover the hole in the tool with your finger and press the tool down firmly into the damper body. This will push the piston out of the reservoir.
	11. If you are servicing an ISX-6, remove the red and black knobs, use caution as the detent balls and springs are VERY small. Next remove the Intrinsic damping assembly by unscrewing it counter clock-wise. Pull the assembly out of the damper body. Do not disassembly the Intrinsic damping unit as there are no serviceable parts inside and several of the parts are easily lost or damaged.
	12. If this is an ISX-4, use the special penta-hex tool (P/N 83-3236) to remove the non-adjustable Intrinsic damping assembly. As with the ISX-6, other than the O-rings on the out side of the assy. There are no serviceable parts inside the damping unit so do not attempt to disassemble the unit further.
 	13. If this is an SPV shock, you need to make sure that the SPV valve is functioning correctly. The valve should look like the top picture, with a space between the piston and the top plate and should spring open and closed when the two pieces are squeezed together. If it has failed it will probably look like the second picture and when it is squeezed it will not spring back open.

	14. To Remove the SPV valve for service, clamp the shaft in the vise using the proper size shaft clamps. Using a **mm wrench loosen the clamp bolt. Remove the bolt, shim stack, piston and the SPV valve. Be sure to keep all items in the proper order and orientation
	15. Pull apart the two pieces of the SPV valve, gently clean both the inside of the piston and the out side of the shim head to remove any oil or old grease that maybe on them. Lightly grease the quad seals with Silicone grease and reassemble the valve and recheck for proper function. Set aside for reassembly.
	16. Inspect air can, pistons and damper body for excessive or abnormal wear. Replace all o-rings, seals and glide rings.
	17. Secure the shock eyelet in a vise with the mounting hole for the intrinsic damper up. Fill the hole with oil and install the Intrinsic damping control unit. If it is an adjustable unit for an X6, be sure that the adjusters are turned out to the lowest settings.
	18. Turn the shock body so that the damper body is vertical. Fill the damper about 3/4 full, using the IFP removal tool push oil thru the Intrinsic damping unit into the Reservoir. Do this until you no longer see bubbles coming through the port in the bottom of the reservoir.
	19. Install the bleed bowl, and fill the reservoir and bowl with 5wt shock fluid. Install the IFP by lowering it into the fluid vertically so no air is trapped in the cavity if the piston. Turn the piston 90 degrees and push it into the reservoir past the threads. Remove the oil above the piston. Remove the bleed bowl.

	20. Make sure that the IFP Positioning Tool is in its shortest position; Screw it down into the reservoir pushing the IFP into the bore.
	21. If you are servicing an Evolver with a twin tube, grease the two o-rings on the inner can with a small amount of silicone grease. Reinstall the outer can by sliding it on the inner can, be sure that is slid all the way to the end of the inner can.
	22. Install the snap ring to retail the outer can by pressing it into the groove. Makes sure that is firmly seated into the groove, you will be able to that it completely seated as the ends of the snap ring will be almost touching.
	23. Insert the air can installation tool into the damper body. Slide the air can over the tool and on to the damper body. Next install the top out bumper then remove the Installation tool.
	24. Install the air piston into the air can and push it all the way down until it seats fully on to the top of the damper body. There should be no space between the top of the damper body and the bottom of the air piston.
	25. Reinstall piston, shim stacks and the SPV valve on to the damper shaft, tighten bolt to 80inlbs. Line the damper cap up so that the inner end of the cap is lined up with the edge of the bleed hole in the damper shaft. Fill the damper body with oil.

26. Insert the damper piston/shaft assembly into the damper body. Screw down the top cap and torque to 60-70inlbs.



27. Insert the rebound preload spring and rebound needle into the damper shaft and then screw on the top cap. Using the top cap fully extend the damper shaft. Remove the top cap and the rebound needle.

28. Next using a 6mm Allen wrench screw the IFP Positioning tool down to the line matching the travel/stroke of the shock you are servicing, you want the line to just disappear below the top of the flange, see the picture below. You will have oil come out of the damper shaft as you do this. This gives you the final bleed on the shock.

29. Reinstall the rebound needle, bottom out bumper, and the bottom out washer. Clean the tread of all oil residue.

30. Clamp the damper shaft in a vise using the 12.5mm shaft blocks. Apply blue Loctite to the threads of the damper shaft. Screw on the damper cap and to torque it to 110inlbs. (12 Nm)

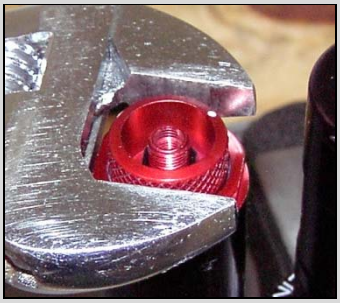
	31. Remove the IFP tool from the reservoir and install the Volume control assembly. Torque the assembly to 100inlbs (11Nm). Turn the control to the open position, this is where the indicator is in the number 1 position, this allows the entire volume control to be pressurized. On Swinger X4 shocks charge the IFP to 125psi. For the Evolver shocks the SPV version is charged to 120psi and the shim version to 150psi. The charge pressure is 250psi on the Split shocks.
	32. Pull the air can up and screw the top cap down. Clamp the top cap in the vise and using a 39mm wrench torque the air can to 80 inlbs (9Nm)
	33. If applicable, install the detent springs, balls and knobs on the Intrinsic Adjuster. Make sure that the set screw on the high speed compression knob (black knob) is lined up with the pocket on the adjuster shaft before tightening it. Next install the red lox speed compression knob.
	34. Charge the air spring and check for proper function of the shock.

SECTION 14: INSTRUCTIONS FOR REVOX/SWINGER COIL/METAL REAR SHOCKS WITH SPV OR SHIM DAMPING

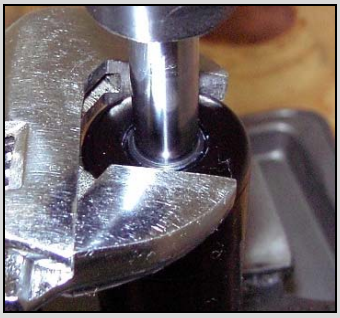
Tools Needed:
- .9mm, 1.3mm, 6mm Allen wrenches
- 26mm, 28mm or suitable adjustable wrench
- Manitou Rear Shock Service Tool Kit

1. **Turn the Volume adjuster so that it is in position. Release the air in the IFP chamber and remove the Schrader valve core.**

Caution – If you do not have the adjuster in the number 1 position you will not full discharge the IFP system and risk serious injury if you continue with the disassembly process**.**



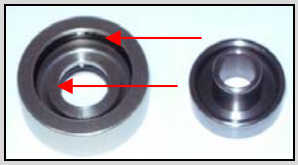
2. Remove the No Tools Volume adjust by unscrewing it counter clockwise. There is no need to disassembly the assembly any further as there are no parts to wear in the no tools adjuster.

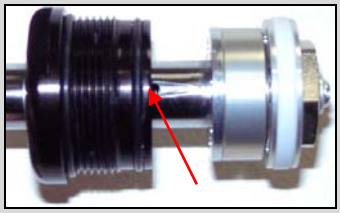


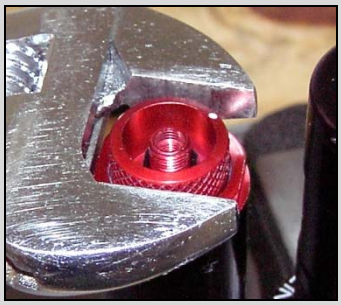
3. Make sure that the shock is full extended. Clamp the shock in a vise by the damper eyelet. Using a 28mm or an adjustable wrench, remove the damper cap and shaft from the shock by turning it counter-clockwise. Drain out as much fluid as possible after pulling the damper assembly out of the shock.

4. Pour out the oil in the damper body. Cover the Reservoir with a rag to catch the IFP and any oil which might be trapped to the reservoir. Insert the IFP removal tool, into the damper body. Cover the hole in the tool with your finger and press the tool down firmly into the damper body. This will push the piston out of the reservoir.

5. If you are servicing an ISX-6, remove the red and black knobs, use caution as the detent balls and springs are VERY small. Next remove the Intrinsic damping assembly by unscrewing it counter clock-wise. Pull the assembly out of the damper body. Do not disassembly the Intrinsic damping unit as there are no serviceable parts inside and several of the parts are easily lost or damaged.

	6. If this is an ISX-4, use the special penta-hex tool (P/N 83-3236) to remove the non-adjustable Intrinsic damping assembly. As with the ISX-6, other than the O-rings on the out side of the assembly there are no serviceable parts inside the damping unit so do not attempt to disassemble the unit further
 	7. If you are working on a shim style shock skip to step #10, if this is an SPV shock, you need to make sure that the SPV valve is functioning correctly. The valve should look like the top picture, with a space between the piston and the top plate and should spring open and closed when the two pieces are squeezed together. If it has failed it will probably look like the second picture and when it is squeezed it will not spring back open.
	8. To Remove the SPV valve for service, clamp the shaft in the vise using the proper size shaft clamps. Using a **mm wrench loosen the clamp bolt. Remove the bolt, shim stack, piston and the SPV valve. Be sure to keep all items in the proper order and orientation for reassembly.
	9. Pull apart the two pieces of the SPV valve, gently clean both the inside of the piston and the out side of the shim head to remove any oil or old grease that maybe on them. Check the quad seals for damage and replace if needed. Lightly grease the quad seals with Silicone grease and reassemble the valve and recheck for proper function. Set aside for reassembly.
	10. For all shocks, clamp the damper shaft in a vise using the shaft clamps. Using an adjustable wrench remove the control eyelet by turning it counter-clockwise. Take care that you do not apply force to the rebound knows as the can be bent or broken. After removing the eyelet, remove the rebound needle.
	11. **Inspect damper body, reservoir, pistons and damper shaft for excessive or abnormal wear. Replace all o-rings, seals and glide rings and any other parts that are showing excessive wear.**

	12. Secure the shock eyelet in a vise with the mounting hole for the intrinsic damper up. Fill the hole with oil and install the Intrinsic damping control unit. If it is an adjustable unit for an X6, be sure that the adjusters are turned out to the lowest settings
	13. Turn the shock body so that the damper body is vertical. Fill the damper about 3/4 full, using the IFP removal tool push oil thru the Intrinsic damping unit into the Reservoir. Do this until you no longer see bubbles coming through the port in the bottom of the reservoir.
	14. Install the bleed bowl, and fill the reservoir and bowl with 5wt shock fluid. Install the IFP by lowering it into the fluid vertically so no air is trapped in the cavity if the piston. Turn the piston 90 degrees and push it into the reservoir past the threads. Remove the oil above the piston. Remove the bleed bowl.
	15. Make sure that the IFP Positioning Tool is in its shortest position; Screw it down into the reservoir pushing the IFP into the bore. If you are rebuilding a Revox shock, be sure that you fit the IFP extension (P/N **-****) to the Positioning tool before installing it into the reservoir.
	**16.** Reinstall piston, shim stacks and the SPV valve on to the damper shaft, tighten bolt to 80inlbs if it was removed earlier. Line the damper cap up so that the inner end of the cap is lined up with the edge of the bleed hole in the damper shaft. Fill the damper body with oil.
	17. Insert the damper piston/shaft assembly into the damper body. Screw down the top cap and torque to 60-70inlbs. Make sure that the shaft isn't moving out as you do this.

	18. Extend the damper shaft, it might be necessary to screw on the top cap so you have something to grip to pull it out with. Next using a 6mm Allen wrench, screw the IFP Positioning tool down to the line matching the travel/stroke of the shock you are servicing, you want the line to just disappear below the top of the flange. You will have oil come out of the damper shaft as you do this. This gives you the final bleed on the shock.
	19. Reinstall the rebound needle, and bottom out bumper. Clean the tread of all oil residue.
	20. Clamp the damper shaft in a vise using the 12mm shaft blocks. Apply blue Loctite to the threads of the damper shaft. Screw on the damper cap and to torque it to 110inlbs. (12 Nm)
	21. Remove the IFP tool from the reservoir and install the Volume control assembly. Torque the assembly to 100inlbs (11Nm). Turn the control to the open position, this is where the indicator is in the number 1 position, this allows the entire volume control to be pressurized. On Swinger and Revox SPV shocks, charge the IFP to 120psi. For the shim versions of the Revox and Swinger coil the charge pressure is 150psi. For the metal shocks the IFP charge pressure is 250psi.
	22. If this is an X6, install the detent springs, balls and knobs on the Intrinsic Adjuster. Make sure that the set screw on the high speed compression knob (black knob) is lined up with the pocket on the adjuster shaft before tightening it. Next install the red low-speed compression knob, use a small amount of blue Loctite on the fixing screw.
	23. Test shock for proper rebound and compression characteristic.

SECTION 15: MANITOU REAR SHOCK TROUBLESHOOTING CHART

Symptom	Cause	Solution	Service Section
ALL SHOCKS			
Damping System			
Cannot set pedaling platform	Air loss from SPV system: SPV Schrader valve leaks	Tighten or replace Schrader core or replace Schrader assembly.	4
	SPV Valve failure	Close rebound knob (clockwise). If the shock rebounds fast after compression, the SPV valve may be defective. If the rebound is very slow, the valve is probably OK. Inspect and replace if necessary	12 - 15
	Air in damping system	Bleed damping system	12 - 15
SPV Schrader valve snapped off at base on 3 Way Air and Coil Swingers.	Interference with suspension linkage or other frame components	Replace. Confirm clearance after Schrader replacement	4
Adjusting rebound knob has no effect.	Air in damping system	Bleed damping system	12 - 15
Oil comes out of the SPV Schrader valve	Damping oil has leaked past the IFP	Replace o-ring on the IFP and bleed the damping system	12 - 15
Mounting Hardware			
Play in shock eyelets when mounted in bike	Worn DU bushing or mounting hardware	Replace	6 -7
SWINGER AIR/ S-TYPE/ RADIUM/ EVOLVER/ SPLIT			
Air Spring			
Air loss from air spring	Air spring Schrader valve leaks	Tighten or replace Schrader core or replace Schrader assembly.	4
	Seal failure on Air Canister	Replace seal(s)	4
	Seal failure on Air Piston	Replace seal(s)	4
Air shock does not return to full travel but has adequate air spring pressure	Failure of negative spring	Replace air canister and seals	4
Oil comes out of the Air Spring Schrader valve	Damping oil has leaked past the damper cap	Replace seals on the damper cap and bleed the damping system	14 - 15

MANITOU REAR SHOCK TROUBLESHOOTING CHART (CONT.)

Symptom	Cause	Solution	Service Section
SWINGER AIR/ S-TYPE/ RADIUM/ EVOLVER/ SPLIT			
Air Spring			
Hard Bottomout	Air spring pressure too low	Increase air canister air pressure	4
	Worn bottomout bumper	Replace bottomout bumper	14 - 15
Hard top out	Failure of negative spring	Replace air canister and seals	4
Air Volume adjuster on 4 Way Swinger has no affect on damping rate.	Damaged adjuster piston o-ring	Replace o-ring	15
Oil leak at base of air canister	Worn or damaged seals allowing oil to escape from damper chamber	Replace seals and bleed damping system	4
SWINGER COIL/ REVOX/ METAL			
Spring System			
Hard bottomout	Spring rate too low	Replace with firmer spring	8
	Worn bottomout bumper	Replace bottomout bumper	9
Hard top out	Air in damping system	Bleed damping system	12 - 13
Damping System			
Oil leak at high and low speed compression adjuster screws	Worn or damaged adjuster needles and/or o-ring allowing oil to escape	Replace adjuster needle and/or o-rings	13
Oil leak at damper shaft	Worn or damaged seals allowing oil to escape from damper chamber	Replace seals and bleed damping system	12 - 13
Broken rebound knob on coil shocks	User attempted to remove knob during spring replacement	Replace rebound knob	11
Air Volume adjuster on 4 or 6 Way Swinger has no affect on damping rate.	Damaged adjuster piston o-ring	Replace o-ring	13

SECTION 16

TABLE 1
FASTENER TORQUE REQUIREMENTS

Feature	Torque
Swinger Air/ S-Type/ Radium/ Evolver	
Air Canister	15 – 24KgCm (13 – 21inlbs)
Air Piston to Damper	70 - 90 KgCm (61 to 78 inlbs)
Air Volume Adjuster, Swinger Air 4 Way	70 - 90 KgCm (61 to 78 inlbs)
Damper Piston Bolt	70 - 90 KgCm (61 to 78 inlbs)
Damper Shaft to Control Eyelet	70 - 90 KgCm (61 to 78 inlbs)
Schrader Valve Stem	5 – 10 KgCm (4 to 9 inlbs)
Swinger Coil/ Revox/ Metal	
Air Volume Adjuster, Swinger Coil 4&6 Way	70 - 90 KgCm (61 to 78 inlbs)
Damper Cap	70 - 90 KgCm (61 to 78 inlbs)
Damper Piston Bolt	70 - 90 KgCm (61 to 78 inlbs)
Damper Shaft to Control Eyelet	90 - 110 KgCm (78 to 95 inlbs)
Schrader Valve Stem	5 – 10 KgCm (4 to 9 inlbs)

SECTION 17: 2007 MANITOU REAR SHOCK SERVICE KITS

2007 SWINGER AIR/ S-TYPE/ RADIUM/ SPLIT SERVICE KITS

Kit Description	Kit	Radium		Split		Swinger Air		S-Type		Evolver		
		R	RL	RP	RPA	Air X3	Air X4	SRL	SR SPV	ISX-4	ISX-4 SPV	ISX-6
		Shim				SPV				Shim	SPV	Shim
Air Canister												
Air Canister, 152mm Eye to Eye, 32mm Travel	A	83-2221				83-2999		83-2698				
Air Canister, 165mm Eye to Eye, 38mm Travel	A	83-2222				83-3000		83-2699				
Air Canister, 178mm Eye to Eye, 40mm Travel	A	83-2224				83-3001		83-2700				
Air Canister, 190/200/210mm Eye to Eye, 50mm Travel	A	83-2227				83-3003		83-2702		83-3005		
Air Canister, 200mm Eye to Eye, 56mm Travel	A	83-2228				83-3004				83-3006		
Air Canister, 215mm Eye to Eye, 63mm Travel	A	83-2229								83-3007		
Air Canister, 222mm Eye to Eye, 70mm Travel	A	83-2230								83-3008		
Air Canister, 230mm Eye to Eye, 70mm Travel	A									83-3009		
Air Canister, 240mm Eye to Eye, 76mm Travel	A									83-3010		
Air Canister, 320mm Eye to Eye, 63mm Travel LRS	A					83-2271						
Schrader Valves												
Radium, Radium R, & Swinger Air Canister Schrader Valve Assy - Black	A	83-2231				83-2231						
Radium RL Air Canister Schrader Valve Assy; inc O-Ring, Black	A		83-2232									
Swinger SPV Schrader Valve Assy; inc O-Ring, Red	A					83-2233						
90 Degree Schrader Air Valve, Black	A	83-2240				83-2240						
360 Degree SPV Schrader Air Valve, Red	A					83-2241	83-2243	83-2241		83-2242	83-2243	
360 Degree Air Can Schrader Air Valve, Black	A					83-3242				83-3242		
Complete Shock Body, No Hardware or Spring												
Shock, No Hardware, 152mm Eye to Eye, 32mm Travel	B	85-6715	85-6719			85-7100		85-6735	85-6740			
Shock, No Hardware, 165mm Eye to Eye, 38mm Travel	B	85-6716	85-6720	85-6723	85-6728	85-7101		85-6736	85-6741			
Shock, No Hardware, 190mm Eye to Eye, 50mm Travel	B	85-6717	85-6721	85-6724	85-6729	85-7102	85-7104	85-6737	85-6742	85-7106	85-7160	85-7113
Shock, No Hardware, 200mm Eye to Eye, 50mm Travel	B	85-6718	85-6722	85-6725	85-6730	85-7103	85-7105	85-6738	85-6743	85-7107	85-7161	85-7114
Shock, No Hardware, 200mm Eye to Eye, 57mm Travel	B			TBD	TBD	85-7167	85-7168			85-7108	85-7162	85-7115
Shock, No Hardware, 215mm Eye to Eye, 63mm Travel	B			85-6726	85-6731					85-7109	85-7163	85-7116
Shock, No Hardware, 222mm Eye to Eye, 70mm Travel	B			85-6727	85-6732					85-7110	85-7164	85-7117
Shock, No Hardware, 230mm Eye to Eye, 70mm Travel	B									85-7111	85-7165	85-7118
Shock, No Hardware, 240mm Eye to Eye, 76mm Travel	B									85-7112	85-7166	85-7119
Shock, No Hardware, 320mm Eye to Eye, 63mm Travel/w hiemjoint LRS						85-17134						
Trunion - 63mm Wide, 44mm Travel Ref OE PN 85-17181						TBD						
Trunion - 61mm Wide, 44mm Travel Ref OE PN 85-17182			TBD									
Trunion - 61mm Wide, 44mm Travel Ref OE PN 85-17183						TBD						
Radium, Metel Shock IFP Chamber Refill Plug	B	83-2703										
Rebound Knob	B	83-3013		83-3013		83-3013		83-3013		83-3013		
Swinger 4/6W Reservoir Air Volume Adjuster	B					85-4493						
Swinger 4/6W Reservoir No-Tools Volume Adjuster	B						85-4485			85-4485		
Comp Speed Adjuster Knob/Needles Kit	B				83-2239							83-2879
Comp Speed Adjuster Knob/Needles Kit O-Rings	B				066299		066299				066299	066299
SPV Valve	B					83-3015			83-2706	83-3016		
H/L Compression Assembly	B									83-3014		83-2878
Remote Lockout Cable			83-2526					83-2526				
Remote Lockout Conversion Kit (Updated Cable Spool)			83-2974					83-2974				
Remote Ready Conversion Kit (Non Warranty)			83-3142					83-3240				
Seal Kit	C	83-2708				83-2708		83-2709		83-2707		
Swinger 3W LRS Seal Kit	C					85-6277						
Swinger 6W Remote Reservoir Seal Kit	C											83-2710
Heim Joint Mounting Hardware - Swinger 3W LRS	D					83-2273						
DU Bushing Kit	E											
DU Bushing Kit	E	85-6105										
Heim Joint - Swinger 3W LRS	E					83-2272						
Sticker Kit	F	83-2244	83-2246	83-2711		83-2250	83-2251	TBD	TBD	83-2252	83-2253	83-2254
Tools	H											
Tool for adjusting Swinger Air Reservoir Volume	H						85-3007				85-3007	
Tool for locating Swinger IFP during bleed process	H						85-6107				85-6107	
DU Bushing Tool	H	85-6075										
Guide for Air Canister Seals over Damper Body	H	85-4430				85-4430						
Plunger for Removal of IFP Piston, Swinger Air	H						85-4413					
Tool for Bleeding Swinger Air & Coil Reservoir Shocks	H						85-4414				85-4414	
Fixture to Hold and Compress Shocks	H	85-3008										
Fixture for Clamping 10mm Damper Shaft	H	85-4406				85-4406						
Fixture for Clamping 12.7mm Damper Shaft	H									85-5148		
Shock Pump - Air Canister	H	85-4162				85-4162						
Shock Pump - SPV Reservoir	H					85-4163						
Fixture for Clamping Reservoir and Damber Body, Swinger Air and Coil	H					85-6031						
High Pressure IFP Tool set	H	83-2694						83-2694				

2007 SWINGER COIL/ RREVOX/ METAL SERVICE KITS

Kit Description	Kit	Metel			Swinger Coil						Revox	Revox
		R	RP	RPA	Coil X3-SFS	Coil X4-SFS	Coil X6-SFS	Coil X3-SPV	Coil X4-SPV	Coil X6-SPV	ISX	ISX
					Shim			SPV			Shim	SPV
Schrader Valves												
Swinger SPV Schrader Valve Assy, inc O-Ring, Red	A											
360 Degree SPV Schrader Air Valve, Red	A				83-2242	83-2243		83-2242	83-2243			
Complete Shock Body, No Hardware or Spring												
Shock, No Hardware, 165mm Eye to Eye, 38mm Travel	B	85-6745	85-6755	85-6765	85-7120	85-7130		85-7170	85-7176			
Shock, No Hardware, 190mm Eye to Eye, 50mm Travel	B	85-6746	85-6756	85-6766	85-7121	85-7131	85-7145	85-7171	85-7177	85-7183		
Shock, No Hardware, 200mm Eye to Eye, 50mm Travel	B	85-6747	85-6757	85-6767	85-7122	85-7132	85-7146	85-7172	85-7178	85-7184		
Shock, No Hardware, 215mm Eye to Eye, 63mm Travel	B	85-6748	85-6758	85-6768	85-7123	85-7133	85-7147	85-7173	85-7179	85-7185		
Shock, No Hardware, 222mm Eye to Eye, 70mm Travel	B		85-6759	85-6769		85-7134	85-7148		85-7180	85-7186	85-7155	85-6775
Shock, No Hardware, 230mm Eye to Eye, 70mm Travel	B	85-6750	85-6760	85-6770	85-7124	85-7135	85-7149	85-7174	85-7181	85-7187	85-7156	85-6776
Shock, No Hardware, 240mm Eye to Eye, 76mm Travel	B	85-6751	85-6761	85-6771	85-7125	85-7136	85-7150	85-7175	85-7182	85-7188	85-7157	85-6777
Shock, No Hardware, 267mm Eye to Eye, 90mm Travel	B			85-6772			85-7151			85-7189	85-7158	85-6778
Swinger 6W Remote Reservoir Hose Kit	B						85-6280			85-6280		
Swinger 6W Remote Reservoir Hose Fitting Kit	B						85-6281			85-6281		
Radium, Metel Shock IFP Chamber Refill Plug	B											
Rebound Knob	B	83-3012			83-3012			83-3012			83-2876	83-2876
Swinger 4/6W Reservoir Air Volume Adjuster	B				85-4493			85-4493				
Swinger 4/6W Reservoir No-Tools Volume Adjuster	B					85-4485			85-4485		85-4485	85-4485
Comp Speed Adjuster Knob/Needles Kit	B			83-2239			83-2879			83-2879	83-2879	83-2879
Comp Speed Adjuster Knob/Needles Kit O-Rings	B		066299	066299		066299	066299		066299	066299		
SPV Valve	B							85-6098				83-2880
H/L Compression Assembly	B					83-3014	83-2878		83-3014	83-2878	83-2878	83-2878
Seal Kit	C	83-2707			83-2707			83-2707			83-2881	83-2881
Swinger 6W Remote Reservoir Seal Kit	C						83-2710			83-2710		
DU Bushing Kit	E											
DU Bushing Kit	E	85-6105										
Sticker Kit	F	83-2247	83-2248	83-2249	83-2252	83-2253	83-2254	83-2252	83-2253	83-2254		
Spring Retention Collar	G				85-5437			85-5437			83-2882	
Tools	H											
Tool for adjusting Swinger Air Reservoir Volume	H					85-3007			85-3007			
Tool for locating Swinger IFP during bleed process	H					85-6107			85-6107		TBD	TBD
DU Bushing Tool	H											
Plunger for Removal of IFP Piston , Swinger Coil	H				85-4423							
Tool for Bleeding Swinger Air & Coil Reservoir Shocks	H					85-4414			85-4414			
Fixture to Hold and Compress Shocks	H											
Fixture for Clamping 12.7mm Damper Shaft	H	85-5148			85-5148			85-5148				
Fixture for Clamping 14mm Damper Shaft	H										TBD	TBD
Shock Pump - SPV Reservoir	H				85-4163							
Fixture for Clamping Reservoir and Damber Body, Swinger Air and Coil	H				85-6031							
High Pressure IFP Tool set	H	83-2694										

2007 COIL SPRING RIDE KITS

Kit Description	Kit	Metel			Swinger Coil						Revox	Revox
		R	RP	RPA	Coil X3-SFS	Coil X4-SFS	Coil X6-SFS	Coil X3-SPV	Coil X4-SPV	Coil X6-SPV	ISX	ISX
					Shim			SPV			Shim	SPV
Ride Kits	G											
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 250	G	85-6660			85-6660			85-6660				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 300	G	85-6661			85-6661			85-6661				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 350	G	85-6662			85-6662			85-6662				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 400	G	85-6663			85-6663			85-6663				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 450	G	85-6664			85-6664			85-6664				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 500	G	85-6665			85-6665			85-6665				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 550	G	85-6666			85-6666			85-6666				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 600	G	85-6667			85-6667			85-6667				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 650	G	85-6668			85-6668			85-6668				
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 700	G	85-6669										
Spring for Coil Shock 165 X 38 (6.5" X 1.5"), Rate: 750	G	85-6670										
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 250	G	85-6185			85-6185			85-6185				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 300	G	85-5431			85-5431			85-5431				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 350	G	85-6111			85-6111			85-6111				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 400	G	85-6112			85-6112			85-6112				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 450	G	85-6113			85-6113			85-6113				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 500	G	85-6114			85-6114			85-6114				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 550	G	85-6136			85-6136			85-6136				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 600	G	85-6671			85-6671			85-6671				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 650	G	85-6672			85-6672			85-6672				
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 700	G	85-6673										
Spring for Coil Shock 190 or 200 X 50 (7.5" or 7.875" X 2.0"), Rate: 750	G	85-6674										
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 250	G	85-6700			85-6700			85-6700				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 300	G	85-6701			85-6701			85-6701				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 350	G	85-6702			85-6702			85-6702				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 400	G	85-6703			85-6703			85-6703				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 450	G	85-6704			85-6704			85-6704				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 500	G	85-6705			85-6705			85-6705				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 550	G	85-6706			85-6706			85-6706				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 600	G	85-6707			85-6707			85-6707				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 650	G	85-6708			85-6708			85-6708				
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 700	G	85-6709										
Spring for Coil Shock 200 x 57mm (7.875" X 2.25"), Rate: 750	G	85-6710										
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 250	G	85-6186			85-6186			85-6186				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 300	G	85-6187			85-6187			85-6187				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 350	G	85-6188			85-6188			85-6188				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 400	G	85-6189			85-6189			85-6189				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 450	G	85-6190			85-6190			85-6190				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 500	G	85-6191			85-6191			85-6191				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 550	G	85-6192			85-6192			85-6192				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 600	G	85-6675			85-6675			85-6675				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 650	G	85-6676			85-6676			85-6676				
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 700	G	85-6677										
Spring for Coil Shock 215 X 63 (8.5" X 2.5"), Rate: 750	G	85-6678										
Spring for Coil Shock 222 X 70 (8.75" or 9.0" X 2.75"), Rate: 250	G	85-6193			85-6193							
Spring for Coil Shock 222 X 70 (8.75" or 9.0" X 2.75"), Rate: 300	G	85-6137			85-6137							
Spring for Coil Shock 222 X 70 (8.75" or 9.0" X 2.75"), Rate: 350	G	85-6117			85-6117							
Spring for Coil Shock 222 X 70 (8.75" or 9.0" X 2.75"), Rate: 400	G	85-6118			85-6118							
Spring for Coil Shock 222 X 70 (8.75" or 9.0" X 2.75"), Rate: 450	G	85-6119			85-6119							
Spring for Coil Shock 222 X 70 (8.75" or 9.0" X 2.75"), Rate: 500	G	85-6120			85-6120							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 250	G	85-6193			85-6193							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 300	G	85-6137			85-6137							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 350	G	85-6117			85-6117							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 400	G	85-6118			85-6118							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 450	G	85-6119			85-6119							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 500	G	85-6120			85-6120							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 550	G	85-5432			85-5432							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 600	G	85-6679			85-6679							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 650	G	85-6680			85-6680							
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 700	G	85-6681										
Spring for Coil Shock 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 750	G	85-6682										
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 150	G	85-6711			85-6711							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 200	G	85-6712			85-6712							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 250	G	85-6194			85-6194							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 300	G	85-6195			85-6195							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 350	G	85-6196			85-6196							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 400	G	85-6197			85-6197							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 450	G	85-6198			85-6198							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 500	G	85-6199			85-6199							
Spring for Coil Shock 240 X 76 (9.5" X 3.0"), Rate: 550	G	85-6201			85-6201							

2007 TI COIL SPRING RIDE KITS

Kit Description	Kit	Metel			Swinger Coil						Revox	Revox
		R	RP	RPA	Coil X3-SFS	Coil X4-SFS	Coil X6-SFS	Coil X3-SPV	Coil X4-SPV	Coil X6-SPV	ISX	ISX
					Shim			SPV			Shim	SPV
Ride Kits	G											
Ti Spring Coil Shocks 222 or 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 300	G	85-6686			85-6686							
Ti Spring Coil Shocks 222 or 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 350	G	85-6687			85-6687							
Ti Spring Coil Shocks 222 or 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 400	G	85-6688			85-6688							
Ti Spring Coil Shocks 222 or 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 450	G	85-6689			85-6689							
Ti Spring Coil Shocks 222 or 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 500	G	85-6690			85-6690							
Ti Spring Coil Shocks 222 or 230 X 70 (8.75" or 9.0" X 2.75"), Rate: 550	G	85-6691			85-6691							
Ti Spring Coil Shocks 240 X 76 (9.5" X 3.0"), Rate: 300	G	85-6692			85-6692							
Ti Spring Coil Shocks 240 X 76 (9.5" X 3.0"), Rate: 350	G	85-6693			85-6693							
Ti Spring Coil Shocks 240 X 76 (9.5" X 3.0"), Rate: 400	G	85-6694			85-6694							
Ti Spring Coil Shocks 240 X 76 (9.5" X 3.0"), Rate: 450	G	85-6695			85-6695							
Ti Spring Coil Shocks 240 X 76 (9.5" X 3.0"), Rate: 500	G	85-6696			85-6696							
Ti Spring Coil Shocks 240 X 76 (9.5" X 3.0"), Rate: 550	G	85-6697			85-6697							
Ti Spring for Coil Shock 267 X 90 (10.5" X 3.5"), Rate: 250	G										85-6855	
Ti Spring for Coil Shock 267 X 90 (10.5" X 3.5"), Rate: 300	G										85-6856	
Ti Spring for Coil Shock 267 X 90 (10.5" X 3.5"), Rate: 350	G										85-6857	
Ti Spring for Coil Shock 267 X 90 (10.5" X 3.5"), Rate: 400	G										85-6858	
Ti Spring for Coil Shock 267 X 90 (10.5" X 3.5"), Rate: 450	G										85-6859	

Swinger Rear Shock Service Kits - Description

A - Air Canister

A - Air Valve Assembly

B – 3 Way Swinger Air Shock, No Hardware

B – 4 Way Swinger Air Shock, No Hardware

B – 3 Way Swinger Coil Shock, No Hardware, No Coil

B – 4 & 6 Way Swinger Coil Shock, No Hardware, No Coil

B - Low and High Speed Adjuster Kit

B- Rebound Adjuster Knob Kit

Swinger Rear Shock Service Kits - Description (CONT.)

B- SPV Air Preload

C - Seal Kit

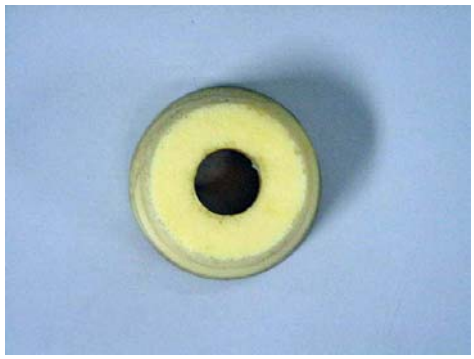
D - Hardware

E - DU Bushing Kit

F - Sticker Kit

G - Ride Kits

G – Spring Collar



G - Bottomout Bumper

‘06 Swinger Rear Shock Service Kits - Description (CONT.)

H - DU Bushing Tool

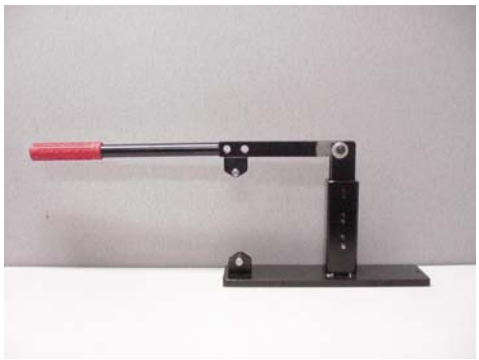
H - Swinger Air Reservoir Volume Tool

H - Swinger IFP Locating Tool

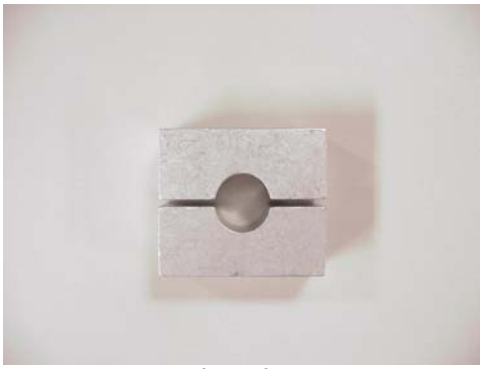
H - Swinger Air IFP Removal Tool

H - Swinger Coil IFP Removal Tool

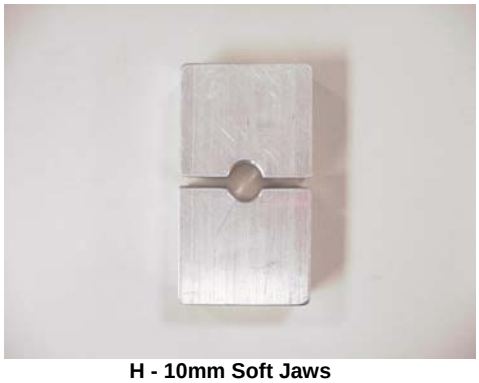
H - 6 Way Damper Body and Reservoir Clamp



H - Rear Shock Compression Test Fixture



H - 1/2" Soft Jaws



H - 10mm Soft Jaws