MANITOU SWINGER REAR SHOCK
OWNER'S MANUAL

P/N 042105

MANITOU SWINGER REAR SHOCK

This Manitou Swinger SPV (Stable Platform Valve) shock is fully assembled and ready to be installed onto your bicycle. Special mounting hardware and a specific shock length is needed for each bicycle. Before riding, take the time to read this manual on set-up, use and service of your shock.

SWINGER COIL SPV 6-WAY ADJUST

Coil spring shock with rebound, preload, SPV pressure, SPV volume, high-speed compression, and low-speed compression adjustment.

SWINGER COIL SPV 4-WAY ADJUST

Coil spring shock with rebound, preload, SPV pressure, and SPV volume adjustment.

SWINGER AIR SPV 4-WAY ADJUST

Air spring shock with rebound, air spring pressure, SPV pressure, and SPV volume adjustment.

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 shock will reduce the possibility of injury or possible death. Prior to riding your bicycle, you should inspect your shock to ensure that no damage has occurred during the course of riding. Do not ride your bicycle if the shock 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 have any problems with this shock, contact a Manitou authorized dealer who can arrange for shipment to Answer Products, or you may call Answer to have it shipped directly at (661) 257-4411.

WARRANTY INFORMATION

Any Answer Products shock 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 shock that has been subject to misuse or whose serial number has been altered, defaced or removed. This warranty does not cover paint or other cosmetic 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 shock to the place of purchase. In the USA, dealers should call Answer Products for a return authorization number (RA#) at (661) 257-4411. 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.

WARNING! OPENING YOUR REAR SHOCK WITHOUT RELEASING PRESSURE SHOULD NOT BE DONE. DOING SO WILL RESULT IN SERIOUS INJURY.
If your shock ever loses oil, air pressure, or begins to make noise, stop riding the shock and have the shock inspected by an authorized Manitou dealer or contact Answer at (661) 257-441

WARNING! RIDING YOUR BICYCLE WITH IMPROPER SHOCK PRESSURE CAN RESULT IN LOSS OF CONTROL AND POSSIBLE SERIOUS INJURY OR DEATH.
Swinger SPV shocks depend on the reservoir air pressure to create damping and function properly. The air pressure range is 50-175 psi. A pressure within this range must be checked and maintained before each ride. Use of the shock with improper air pressure can cause a total loss of damping and malfunction of the shock.

WARNING! CHECK FRAME AND SEAT POST FOR SHOCK CLEARANCE
When the shock compresses, its position within the frame will change. Always check for adequate clearance between the shock and frame/seat post for the entire stroke/motion of the shock. Be careful not to lower the seat post below the bottom of the seat tube. It is the responsibility of the user to check for adequate clearance between the shock and frame/seat post for the entire stroke/motion of the shock. If your bicycle offers multiple shock mounting options, it is the user's responsibility to make sure that any mounting options also offer adequate clearance between the shock and frame/rocker/seat post.

SPV PERFORMANCE FEATURES

- Stable Platform Valve technology
- "Bump Dump" high velocity compression blow off
- Position sensitive compression damping
- Bottoming control
- Low-resonance threshold damping (compression)
- Hydraulic top out
- Externally adjustable rebound damping
- Externally adjustable Stable Platform Valve damping
- Externally adjustable position sensitivity
- Low speed compression damping adjustment (6-way shocks)
- High speed, velocity-sensitive compression damping adjustment (6-way shocks)

BENEFITS OF SPV TECHNOLOGY

- Creates an efficient, firm platform for pedaling that eliminates bobbing.
- Manages ride, attitude and cornering stability for greatly improved cornering, precision and speed. Improves overall stability.
- "Bump Dump" high velocity bump absorption allows for greater oil flow, virtually eliminating compression "spikes".
- Position-sensitive compression damping allows for light initial damping and much heavier damping at full compression.
- Low-resonance threshold damping eliminates much of the unwanted rider induced suspension motion.
- Improved traction.
- Externally adjustable damping that allows for any rider to achieve the optimum set up for any bike, trail conditions, rider weight in minutes with no disassembly.

SPV SUSPENSION TERMINOLOGY EXPLAINED

- Bobbing: The up and down motion that robs pedaling power. This movement occurs due to the pedal pulse inputs (low resonance) and from weight shift during pedaling.
- Attitude & Ride Stability: Created by the SPV controlled damping action that manages excessive dive, squatting, bobbing, chassis motion and the springy ride of conventional shocks that can throw a rider off-line during aggressive riding and/or terrain.
- Stable Platform Damping: The new damping characteristics of the SPV technology that improves pedaling & attitude/ride stability.
- Spike: The harsh feeling that occurs when riding over high velocity compressions such as sharp, square-edge bumps, rocks, roots and big hits.
- Bump Dump: The shocks' ability to absorb the spike of high velocity (high-speed shaft movement) compressions due to the massive compression flow available through the SPV system.
- Position-Sensitive Compression Damping: Damping that increases automatically depending on the shock's location in its compression stroke. Position-sensitive damping allows for light initial damping that progressively increases as the shock is compressed.
- Sag: The amount of shock compression caused by the rider's weight while positioned on the bike in a normal riding position. Sag creates negative travel for better traction and control through turns and rough terrain.
- Spring Rate: The amount of force required to compress the spring a given length. English Standards are measured in pounds to compress one inch (I.E. 400#/in.)
- Spring Preload: The difference between the free length of a spring and the installed length of the spring when in a shock. Preload changes the starting force required to compress a spring.
- Air Spring Pressure: The air pressure that acts as the spring means on air shocks. More pressure equals a firmer and more progressive spring.
- SPV Air Pressure: The air pressure that controls the SPV compression damping qualities and characteristics. More air pressure creates a firmer platform and increased compression damping. Less pressure creates a lighter platform and more supple response.
- SPV Volume Adjustment: The volume adjuster located on the SPV reservoir. This adjuster controls how firm and progressive the position-sensitive compression damping feature acts. The smaller the volume in the SPV chamber, the more progressive and position sensitive the compression damping becomes.
- Compression Damping: The amount of resistance created by the shock during the bump induced movement of the shock. Compression damping controls how fast the shock is compressed by turning the energy created during the bump force into heat and dissipating it.
- Rebound Damping: The amount of resistance created by the shock during the return movement of the wheel. Rebound damping controls the speed at which the shock returns after being compressed, by turning the energy created by the spring into heat and dissipating it.

WHAT'S NEEDED TO ADJUST SPV TECHNOLOGY?

- Manitou air shock pump, part #85-4069.
- SPV 16mm volume adjust socket, part #85-3007.
- Swinger SPV owners/tuning manual, part #042105.

SETTING UP YOUR SWINGER SPV SHOCK

The following information will guide you through the set-up and tuning of your Swinger SPV shock. SPV technology offers the ability to quickly and easily tune the performance of your Swinger shock to your riding preference, bike or terrain conditions and offers the highest performing shock technology available. You should allow for a minimum of one-hour break-in period prior to determining your preferred settings. The sequence of the adjustment instructions below correlates to the recommended order of adjustments.

1 SPV Air Pressure- The SPV technology depends on air pressure to function properly. Use of the shock with improper air pressure will cause damage & failure of the shock and will void the warranty. Note that this is not spring pressure, but is the valve located on the reservoir of the shock. The air pressure setting controls the starting compression force that affects the pedaling platform and bump-dump blow-off, as well as the overall compression damping characteristics. This is the primary adjustment of SPV technology. The SPV air pressure range is 50-175 psi. Never use a pressure below or above this recommended pressure range. See warning above.

To quickly get "in the ballpark" for your weight, set the starting pressure at 50-70% of your weight. The air pressure also affects the sag, so you should set the air pressure before setting the spring (air or coil preload) & sag. The air pressure setting will vary according to the following: 1) Rider weight 2) spring rate 3) bike leverage ratio 4) personal preference. Lower pressures will create a lighter platform for a softer ride & lower blow off threshold to the bump dump feature. Higher pressures will provide a firmer platform for firmer pedaling, firmer ride control & a higher blow off threshold to the bump-dump feature.

Once you find an acceptable setting, note that this may not be the optimal setting for all riding. Some courses/trails may have more pedaling sections (requiring higher SPV pressure), some may have more small "chatter bumps" (requiring lower SPV pressure) and some may have more big hits, drops & jump landings (higher SPV pressure and volume ramp). With SPV, this can all be done in a matter of minutes with an air shock pump and a 16mm socket!

2 Adding SPV Air Pressure- Remove the air cap from the SPV reservoir Schraeder valve. Attach the air shock pump to the Schraeder valve. You can damage the pump by turning it on too far, so as soon as the gauge registers pressure, screw 1/2 turn more and pump to the desired level. You can use the micro-adjust feature on the Manitou air

shock pump to fine tune your air pressure. The hiss you hear when unscrewing the pump is only the air left in the pump itself and not from the shock! This does not affect your pressure setting in the shock. Likewise, when you install the pump, the shock will fill the pump and reduces the registered pressure previously installed in the shock. This is usually a 10-15 psi difference between what was in the shock and what the pump is reading. This is normal procedure when adjusting the SPV shock pressure. After removing the pump, be sure to reinstall the Schraeder valve cap. If the shock does not dampen properly after pressurizing, the air pressure was lost during pump removal as a result of a worn or malfunctioning pump fitting o-ring. Do not ride the bike until the shock is pressured.

3 Air Volume Adjuster Settings- The SPV air volume settings control the position sensitivity compression damping feature of the shock. The SPV air-chamber volume adjuster is the red 16mm nut that is located on the end of the reservoir. The volume adjuster controls the shocks bottoming resistance by varying the rise in compression force during the last 50% of the shock stroke. We recommend using the SPV Volume Tuning Socket (part #85-3007) to tune this adjustment. This tool has markings that easily show where the volume adjustment is in its range.

The Swinger shock's volume adjuster has six turns of adjustment range. Turning the adjuster out (counterclockwise) makes the volume larger and decreases the compression damping and bottoming resistance during the last 50% of the shock stroke. Turning the adjuster in (clockwise) makes the volume smaller and increases the compression damping and bottoming resistance during the last 50% of the shock stroke. As a general rule, you will use a smaller air volume adjustment with lower pressures and a larger air volume adjustment with higher pressures. The air pressure will change when adjusting the volume adjuster, especially when changing from full out to full in, so always re-adjust your air pressure to your preferred settings after adjusting the air volume. When the volume adjuster assembly has reached its counterclockwise stop limit, continued force on the

adjuster may cause damage to the adjuster mechanism that is not covered under warranty. Do not try to continue to rotate adjuster once you feel resistance.

4 Adjusting Sag- Always adjust your SPV air pressure before adjusting the sag. Sag adjustments will vary according to rider's weight, the bike leverage ratio, the type of bike, the type of riding and personal preference. As a general rule, the Swinger SPV shock works best with slightly more sag than conventional shocks. The recommended amount of sag is as follows:

Cross country:	25-30% Sag
Freeriding:	30-40% Sag
Downhill:	30-45% Sag

Remember that sag only sets the initial starting force required to compress the main spring and does not compensate for a spring that is either too soft or too firm for a given rider.

Coil Shocks Spring Preload & Sag Adjustments- Spring preload adjustments are done with the spring preload adjustment ring. Measure the distance between the centers of the shock mounting bolts (eye-to-eye length of your shock) and record the first measurement (measurement A). If you have a bike that does not easily let you measure this point, an alternative is to measure from the rear wheel axle to the back of your saddle. Next, sit on the bike in a normal riding position near a wall to steady yourself. Without bouncing on the saddle or pedals, distribute your weight on the saddle and pedals in a normal riding position while holding the handlebars. Have a friend measure the new distance between the two points described above and record it (measurement B). Use the following formula to calculate the sag:

beginning measurement	A
subtract the ending measurement	-B
equals the distance sagged	C

Sag % = distance sagged, divided by the beginning measurement (C/A)

Adjust the spring preload adjuster up or down to achieve the desired amount of sag. **Never exceed 8mm/.325" of preload on the coil spring. Always make sure that you have a minimum of 1mm of preload on the spring.** If you reach the maximum spring preload (8mm) and the sag is too much, you'll need to go to the next higher spring rate. If you reach the minimum amount of spring preload (1mm) and there is not enough sag, you'll need to go to the next lightest spring rate. Optional spring rates are available from Answer Products. Part numbers, spring rates and travel are stamped on the outside of the spring coils.

Air Shocks Spring Adjustment- The main air spring adjustments are done with the Schraeder valve located above the large air canister. Always adjust your SPV air pressure before adjusting the main air spring. The Swinger SPV Air shock has recommended sag adjustment indicators on the SPV reservoir. On the inner side of the reservoir you will find two sag indicator marks. One calls out 25% sag, while the other calls out 35% sag. This is your recommended range of sag. To set sag, sit on the bike in a normal riding position near a wall to steady yourself. Without bouncing on the saddle or pedals, distribute your weight on the saddle and pedals in a normal riding position while holding the handlebars. Next, get off the bike and look for the sag indicator o-ring position on the damper body. This o-ring should be aligned somewhere between the two sag indicator marks on the reservoir (25% and 35%). Adjust the air pressure accordingly. If the o-ring is past the 35% mark, it is too much sag and the spring is too soft. If the o-ring has not reached the 25% mark, the sag is too little and the air spring is too firm.

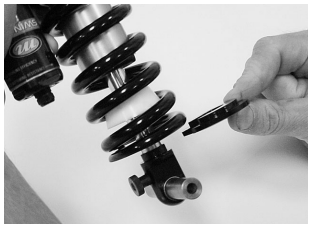
To install air pressure in the main air spring, remove the air cap from the Schraeder valve located above the large air spring canister. Attach the pump to the Schraeder valve. You can damage the pump by turning it on too far, so as soon as the gauge registers pressure, screw 1/2 turn more and pump to the desired level. You can use the micro adjust feature on the Manitou air shock pump to fine tune your air pressure. The hiss you hear when unscrewing the pump is only the air left in the pump itself and not from the shock! This does not affect your pressure setting in the shock. Likewise, when you install the pump, the shock will fill the pump and reduces the registered pressure previously installed in the shock. This usually is a 10-15 psi difference between what was in the shock and what the pump is reading. This is all normal procedure when adjusting the air spring pressure. After removing the pump, be sure to reinstall the Schraeder valve cap.

5 Rebound Damping Adjustment - The rebound damping controls the return rate of the shock after it has been compresses to absorb a bump. Rebound damping can be adjusted for different spring rates, terrain

and rider preferences. Rebound on the Swinger SPV shocks can be adjusted by the blue knob located on the shaft eyelet mount on the coil shocks and the air canister eyelet mount on the air shocks. As a general rule, rebound that is adjusted too fast will exhibit a springy ride that has excessive pedaling movement and kick up the rear end on multiple bumps and big hits. Rebound that is adjusted too slow will exhibit a packing of the rear wheel that is identified by a low ride height, stiff feeling on multiple bumps and the rear wheel drifting to one side on stutter (braking) bumps. A good rebound starting point is to set the shock to achieve a return movement that is just short of "snapping back".

6 Installing and Removing Coil Springs - The following steps should be followed to remove and install the coil spring on Swinger shocks.

REMOVAL OF SPRING



1 Remove the blue rebound adjuster knob by loosening the small Allen head screw located in the center of the knob.
2 Loosen the preload adjuster ring until the spring retainer clip can be removed from the shock.
3 Slide the spring off of the shock.

Note: If the spring will not clear the mounting hardware, the hardware must be removed and re-installed after the new spring is installed. Care should be taken when removing or installing the mounting hardware as to not damage the DU bushing or eye.

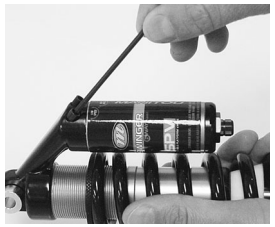
INSTALLATION OF SPRING

1 Slide spring onto shock. Install the spring retainer clip.
2 Tighten the preload adjuster ring until 1mm of spring preload is achieved.
3 Re-install mounting hardware and rebound adjustment knob.
4 Adjust spring preload according to the spring preload & sag adjustment sections of this manual.

ADDITIONAL ADJUSTMENTS FOR THE SWINGER 6-WAY COIL SHOCKS

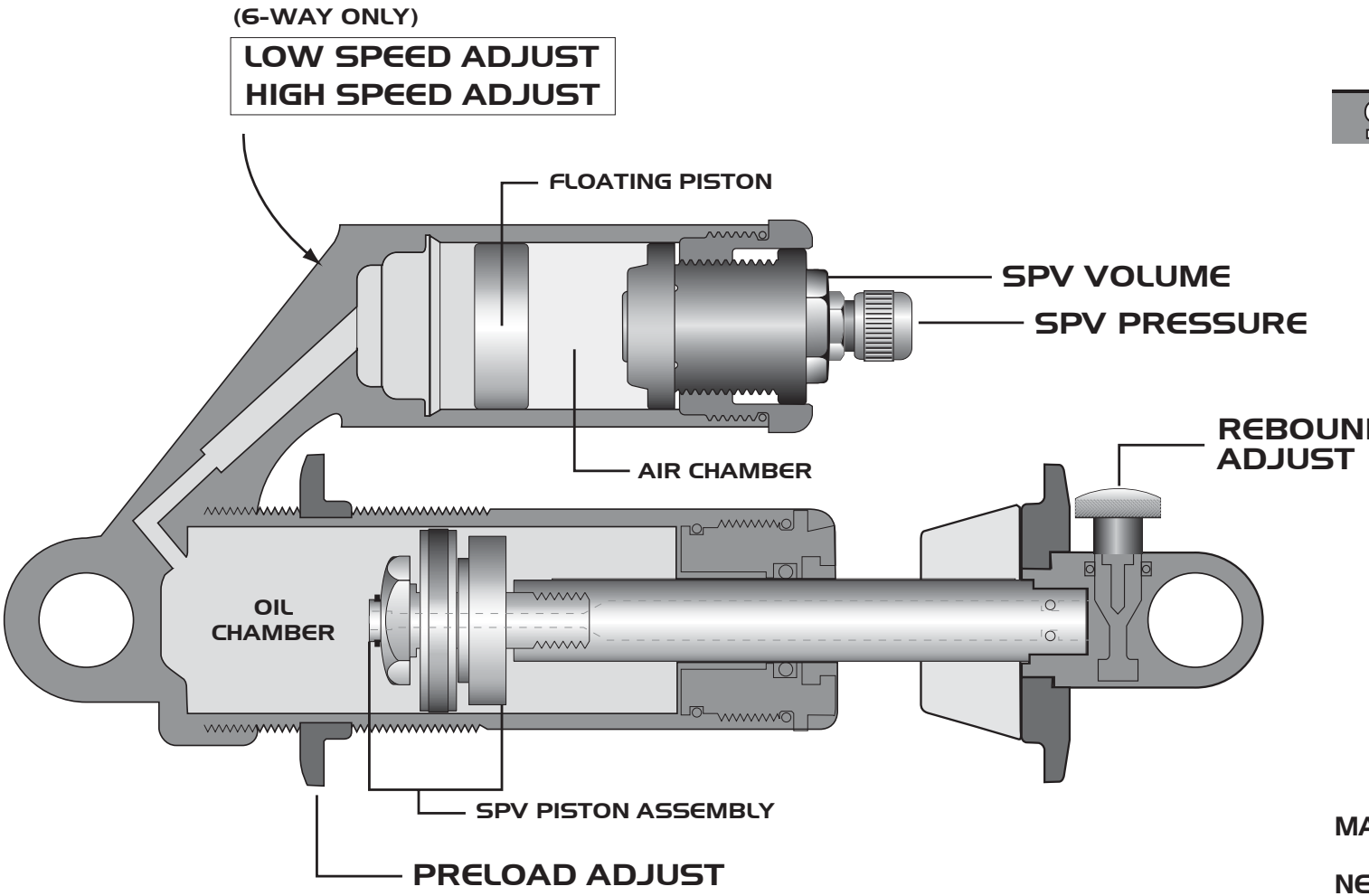
The Swinger SPV 6-way coil shock offers two additional compression damping adjustment features. These two adjustment knobs are located on the reservoir base and allow for extreme fine tuning of the shock's velocity/speed sensitive compression damping characteristics. The red knob controls low speed compression and the black knob controls high speed compression. You can choose to leave these two adjustments at their minimum setting (all the way out counterclockwise) and just use the SPV air pressure and volume adjustments to control the compression damping. If you choose to fine-tune the shock with these adjusters, the following information will help you make the most of the features:

Low Speed Compression Damping - This adjustment controls low-velocity shock compressions and the general ride firmness, and adds additional chassis-stability platform to the bike. Lighter (counterclockwise) adjustment provides a more supple/active ride but less chassis stability platform. Firmer (clockwise) adjustments provide a less supple/active ride but greater chassis stability platform. Starting at the minimum, turn the adjuster in until you achieve the stability platform desired without any "spiking". As a general rule, a firmer setting of the low speed compression will allow for lower pressures in the SPV reservoir and larger volume settings. The optimal performance will be achieved by balancing the low speed compression with the SPV pressure settings.



High Speed Compression Adjustment - This adjustment controls high velocity shock compressions and the response to sharp edge bumps and big hit conditions. The faster the shock is compressing, the more impact this adjuster has. This adjuster has its greatest impact at mid to 3/4 stroke, when shaft velocities are at the highest. This is usually the last adjustment made to fine-tune the shock. As a general rule, firmer (clockwise) adjustments will provide more hi-speed (velocity) bottoming resistance and allow for larger SPV volume settings. The optimal performance will be achieved by balancing this adjustment with the SPV volume adjuster setting.

NOTE: Always refer to your bicycle manufacturer's recommendation for appropriate torque specifications of your mounting hardware.



SWINGER SPV
STABLE PLATFORM VALVE

MAINTENANCE SCHEDULE

NEW
- Check/set shock sag/preload
- Check SPV air pressure
- Check mounting hardware torque

EVERY RIDE
- Check SPV air pressure

EVERY 8 HOURS
- Check/set shock sag and preload
- Check mounting hardware torque

EVERY 200 HOURS
- Send shock to service center for oil change and inspection.

For updates and tuning information, visit our website at
www.answerproducts.com