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KTM SX50 LC PRO SENIOR INSTALLATION TIPS

CAUTION: These shocks are pressurized to 250 psi nitrogen. This pressure is not an adjustable feature of the shock. Unless there is a leak, the shock should not normally lose pressure. If the shock damping becomes soft or mushy (after an extended period of time or number of miles) the shock may need to be serviced, which includes shock oil and a nitrogen charge. In this situation, re-pressurizing the shock alone may not improve the action of the shock. The shock should be returned to Works Performance Products, Inc., or to a qualified shop that has the appropriate tools, training and nitrogen handling equipment.

SHOCK TYPES

Works offers two types of shocks for the LC Pro Senior. One is a gas emulsion shock where the gas is charged into the oil. The second is a piggyback reservoir type with adjustable damping. The mounting and adjusting tips for each shock follows.

EMULSION SHOCK

This shock is an emulsion shock similar to the shock that comes stock on the 50LC Pro Sr. It mounts shaft down, body up just like the stock shock. Make sure that the gas charging valve at the top of the shock is not contacting the frame, mount, air box or other part of the bike. A hose-mounted reservoir cannot be fitted because of the limited room around the shock. The Works reservoirs are too large to fit. The emulsion shock offers spring pre-load adjustments only.

PRO SERIES PIGGYBACK SHOCK

Because of the tight confines of the area left for the shock, the only way to mount the shock is with the body down and the reservoir towards the front inside the swing arm. (See Photo.) Make sure that wires, cables or vent hoses are routed away from the area above the reservoir. As the shock compresses and the swing arm moves up, the reservoir will move up into that space. The shock was designed around the stock exhaust pipe/expansion chamber, so make sure that if an aftermarket exhaust is used that it does not interfere with the shock. There should be nothing on the bike that will make contact with the spring, shock body, or reservoir at any time during its stroke. This is very important for the life of the seals and long service life between oil changes. Use a thread locking compound on the shock bolts when tightening them to the manufacturer's specifications.



Fig. 1. Works' Pro Series Piggyback mounts with the reservoir down and toward the front of the bike. Make sure that the area above the reservoir is clear of lines, hoses, wires, etc. because the reservoir will move into this area as the shock compresses.

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ADJUSTMENTS

The Pro Series Piggyback has externally adjustable compression and rebound damping adjustments, as well as spring pre-load. Compression adjustments are made on the shock body at the reservoir and the rebound adjustments are made at the eye on the shaft end of the shock.

RIDE HEIGHT MEASUREMENT

Correct ride height is important. If the ride height is too high, the vehicle will "top out" too easily and fail to allow enough travel for appropriate rebound from bumps. If the ride height is too low, the shock can bottom too easily, resulting in a harsh ride. The spring rates are set up for the full amount of travel. If there is not enough pre-load, the total spring rate would not be enough to resist bottoming. Generally speaking, the vehicle should settle 1/3 of its wheel travel with the rider on board for motocross, desert, trail and enduro use.

The proper way to measure the ride height:

1. Support the vehicle on a frame stand with the rear wheel clear of the ground. If it only has a side stand, pull the bike over far enough to "top-out" the suspension.
2. Have an assistant measure and record the vertical distance between the rear axle and a point directly above it. This could be the seat, fender, frame, body panels, muffler, etc.
3. Take the motorcycle off the stand and sit on it in a normal riding posture, with one foot on the peg and the motorcycle balanced so as to have minimal weight on your other foot.
4. Have the assistant carefully measure from the same two points. Subtract the second measurement from the first. The difference is the amount of settling or "sag," in the suspension.

PRELOAD ADJUSTMENT

CAUTION: Before attempting any pre-load changes, make sure that the area around the pre-load nut and the threaded portion of the shock body are clean, free from grit and road grime, and lightly lubricated with a spray lubricant. Failure to heed this advice may result in a pre-load nut that is seized on the shock body.

Once you have determined the amount of change required at the wheel you will want to adjust the pre-load accordingly. Keep in mind that the change at the shock is much less, and varies from vehicle to vehicle based on the frame geometry, spring rates, etc. On Works shocks, two (2) full turns will change the pre-load by 10 percent. So adjust it a turn and then check the measurements again.

The very best tool for turning the pre-load nut is the spanner wrench provided. If you have access to the spring and can grab it with both hands and turn it, it will often turn the nut along with it. If they turn together, the friction is lessened somewhat and the task is easier.

IF THE RIDE HEIGHT IS TOO LOW.....

To raise the vehicle and reduce the amount of ride sag, screw the adjuster nut towards the spring to increase the pre-load. This makes the installed length of the spring shorter. If this is for competition, record this installed length so that you can set the bike up the same after having the shock disassembled for service.

IF THE RIDE HEIGHT IS TOO HIGH.....

To lower the vehicle and increase the amount of ride sag, screw the adjuster nut away from the spring to decrease the pre-load. This makes the installed length of the spring longer. For a competition vehicle, record this installed length.

REBOUND DAMPING

Rebound is the damping of the shock as it recovers, or extends from a bump. Increasing, or stiffening, the rebound damping makes the shock recover slower. Decreasing, or softening, the rebound damping allows the shock to recover faster.

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REBOUNDADJUSTER LOCATION

The rebound adjustment screw is located on the shaft end of the shock in the eye. The adjuster is a hex socket screw, that can be turned with a 1/4" socket key wrench.

The rebound adjuster screw has three full turns available. Each full revolution has 6 detent positions. Hence there are 18 rebound positions. Position number one is when the adjuster screw is turned clockwise all the way to stop. This is the stiffest (slowest recovery speed) setting. For determining rebound position for recording purposes, this is the starting point.

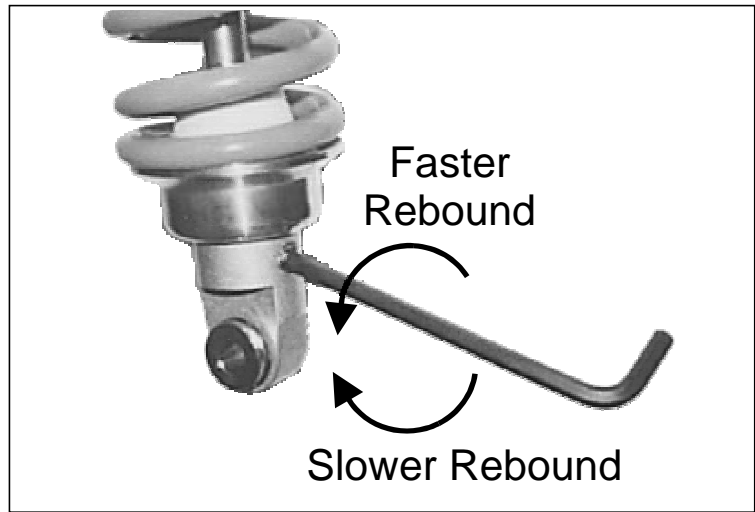


Fig. 2: Typical adjuster position on eye-style shock ends (hex driver positioned for adjustment). Adjustment is clockwise for slower rebound, and counterclockwise for faster rebound.

Unscrewing the adjuster screw counter-clockwise will yield 18 positions (three full turns) from that point. This is the softest (fastest recovery speed) position. The detents are very light, so a deft hand should be used. **If you exceed three full turns out, the rebound damping will get full-stiff again. On many of the eyes, this will expose the O-ring seal. If you continue to turn the screw out, you will eventually dislodge part of the adjuster mechanism, and the shock will have to be rebuilt.**

REBOUNDADJUSTMENTS

If a shock exhibits too much rebound damping, it will have a tendency to “pack.” This is seen over multiple bumps, such as stutter bumps, or off-road whoop-de-dos. The suspension will react well over the first bump, but seems to get stiffer on each successive bump. On off-road situations, the back end of the vehicle will want to pass you either to the left, or to the right, or over your head (endo)! In off-road this is often described by the rider as “swapping” or “kicking up.” The fix for this condition is to decrease (soften) the rebound. Turn the screw counter-clockwise to make the rebound faster.

When a shock exhibits too little rebound damping, the suspension may feel too mushy, or “pogo.” On dirt, as a general rule, having too little rebound at the rear of a dirt machine is much better than having too much (see “swapping”, “kicking up”, and “endo”, above.)

COMPRESSION

Compression damping, is the action of the shock as it compresses or closes when the wheel moves up from hitting a bump or coming off of a jump. Increasing, or stiffening, the compression slows the shock's movement and makes the suspension less compliant. Decreasing, or softening, the compression allows the shock to collapse more easily and allows the wheel to move further (than a stiffer setting at the same spring pre-load and bump configuration).

COMPRESSIONADJUSTER LOCATION

Compression adjustments are made by turning the screw on the top edge of the reservoir (if so equipped). A flat blade screwdriver is used to make the adjustments. In some cases a coin can be used.

CAUTION: Do not attempt to turn the hex as part of the adjustment procedure.

The approximate range of adjustment is 18 to 25 “clicks.” This

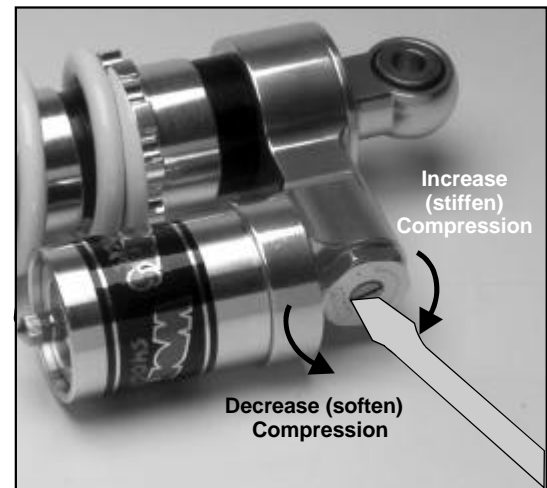


Fig. 3: Compression adjuster screw location on the remote reservoir. Adjustment is clockwise for stiffer, and counterclockwise for softer using a screwdriver. Do not attempt to turn the large hex.

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varies depending on the spring selected for use in the adjuster mechanism. For determining compression position, turn the screw counterclockwise until it stops. This is the number one position--full soft. Then turn the screw in (clockwise) and count the number of clicks. The maximum number of positions is determined when the screw is turned clockwise to its stop (approximately 3 to 4 turns in). This is the stiffest setting.

COMPRESSIONADJUSTMENTS

The compression adjuster is used to make fine adjustments to the compression damping. Normally, the starting point for the tuning the shock is compression on full soft (counterclockwise turns to stop). If the suspension bottoms too often, then turn the screw in (clockwise) several clicks, and then ride the bike through the same sections again. If you end up with the adjuster near or at full stiff position, then you may experience a loss of feel on small bumps or washboard surfaces. If this the only way to keep the suspension from bottoming too often, then the spring and/or damping rates may be incorrect for the application. If the spring and main compression damping rates are too light, then the adjuster may not compensate for this, and the shock should be re-sprung and the damping rates changed internally.

COMPRESSIONANDREBOUND INTERACTION

Compression adjustments are often "tied" to the rebound adjustments and visa-versa. For instance, if you have increased the compression damping to slow the shock thereby using less of the wheel travel (for a given bump), you may end up slowing the rebound to compensate for the shorter recovery distance. Conversely, if you lighten the compression, you will probably end up reducing the rebound damping to enable the wheel to recover faster because the wheel has further to travel.

NITROGEN PRESSURES

RESERVOIR SHOCKS

On the shocks equipped with reservoirs, the permissible range of pressure is 150 to 300 p.s.i. of dry nitrogen. The pressure setting is not intended as an adjustment, but will affect the compression damping to some small degree. Please note that in order to check the pressure, some of the gas must escape and fill the gauge assembly. The volume of the bladder is about the size of your thumb, so a very small volume change results in a large pressure drop. Because the gauges' volumes vary, it is not possible to deduce the actual pressure in the shock prior to attaching the gauge. Therefore it is imperative that any attempt to check pressure be accompanied by the capability of refilling the reservoir. In other words: If you don't have a nitrogen source handy, don't check the pressure!

The best gauges for this purpose screw on to the valve and incorporate a T-handled core depressor to isolate the shock from the gauge. This allows a leak-free separation once the desired pressure is reached. For simplified operation, an extra valve is provided for the filling apparatus, allowing pressure adjustment with the gauge in place. Works offers a suitable gauge for filling the shocks. Most motorcycle shops that sell and service dirt bikes can pressurize the shock.

NON-RESERVOIR (EMULSION) SHOCKS

To pressurize a shock that is partially pressurized (or you don't know if it is fully pressurized), bring the gauge manifold up to 250 p.s.i. and depress the core with the T-handle. This will either equalize the pressure or refill the shock without losing oil from the shock. Make sure that the shock is fully extended with no vehicle weight on it.

The pressure setting for emulsion gas shocks is 250 p.s.i.