WORKS PERFORMANCE PRODUCTS, INC.
21045 Osborne St., Canoga Park, CA 91304
818.701.1010 fax 818.701.9043
www.worksperformance.com

#UAADJ - 10/03/2005

REAR SINGLE SHOCK SET-UP AND ADJUSTMENTS

NOTE: Not all Works single shocks are equipped with external rebound and compression adjustment features. Before making any damping adjustments to the shock, measure the ride height and adjust the preload if necessary. Always set the ride height before doing any damping adjustments. The amount of preload on the shock spring will have a direct effect on the rebound adjustments.

Thank you for choosing Works Performance shock absorbers. These helpful installation tips will enable you to enjoy maximum performance for years to come.

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 preload, 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, and 1/4 to 1/3 for road racing, flat track and street use.

The proper way to measure the ride height:
1. Support the vehicle on a frame stand or on its center 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. On shaft drive models, measure from the center of the gear case up to the upper point.

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 preload changes, make sure that the area around the preload 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 preload 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 preload 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 preload by 10 percent. So adjust it a turn and then check the measurements again.

The very best tool for turning the preload nut is a spanner wrench. In fact, a large pair of channel lock pliers skillfully used will accomplish the job with a minimum of aggravation. If you have access to the spring and can

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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 preload. 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 preload. This makes the installed length of the spring longer. For a competition vehicle, record this installed length.

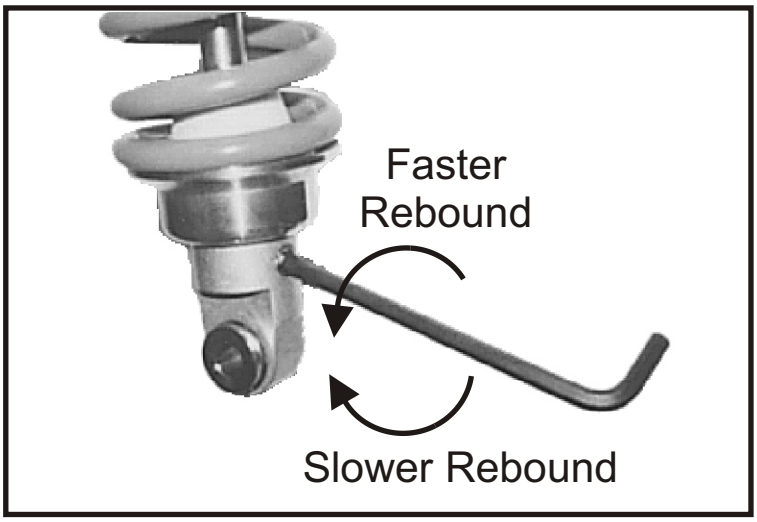

Fig. 1: Typical adjuster position on eye-style shock ends (hex driver positioned for adjustment). Adjustment is clockwise for slower rebound, and counterclockwise for faster rebound.

REBOUND
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.

REBOUND ADJUSTER LOCATION

NOTE: If it appears that the adjuster screw would be more easily accessible on the opposite side from where it is situated, the eye or clevis can be rotated to the opposite side. Secure the shock body and rotate the clevis/eye (the spring will probably turn, too) 180 degrees.

The rebound adjustment screw is located on the shaft end of the shock in the eye or clevis (as installed). On most clevis applications the adjuster is in line with the shock mounting bolt. On the shocks built with eye ends, the adjuster is usually at a right angle to the shock mounting bolt. The adjuster is a hex socket screw, that can be turned with a 1/4” socket key wrench.

CAUTION: The adjuster mechanism inside the shaft includes a tapered needle and seat. Do not over-tighten the adjuster screw. The needle or seat can be damaged and can result in poor performance. Use a light touch on the 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.

NOTE: The rebound adjusters on Works shocks are very sensitive. When making adjustments, turn the adjuster only one or two clicks, then check the results by riding the vehicle. In addition, the shocks are setup individually, and a good starting point is where the adjuster is set by the technician. Arbitrarily starting at the mid-position, full stiff or full soft will only slow your setup. When you find the right rebound position, then you will normally only make adjustments of two or three clicks in either direction when tuning for conditions.

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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.

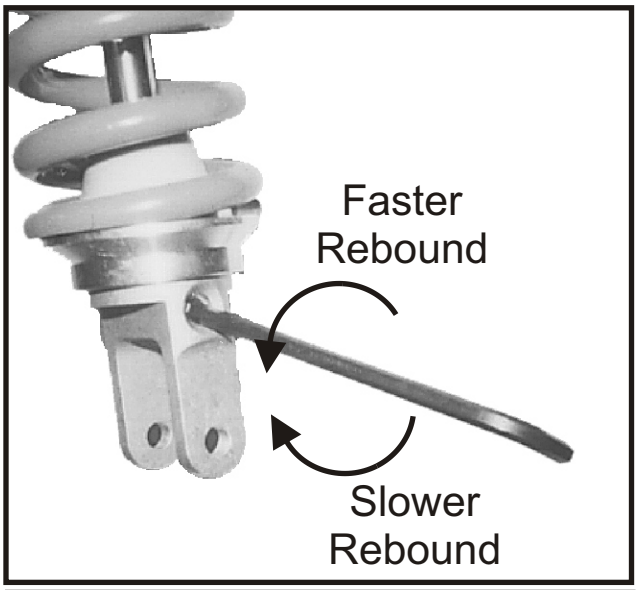

Fig. 2: Typical adjuster position on clevis-style shock ends (hex driver positioned for adjustment). Adjustment is clockwise for slower rebound, and counterclockwise for faster rebound.

REBOUND ADJUSTMENTS

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, pavement seams, 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 pavement, this can deliver a jolt, or harsh whack on the riders seat. 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 pavement, this is seen most in fast sweepers. The bike will alternately set, then unload; set, unload. This translates into "sawing" at the handlebars, which is caused by the changes in trail at the front suspension. On dirt, the action is similar, but in many cases not as noticeable. 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.) On the pavement, too little rebound can be much more unsettling than the loss of comfort from too much rebound. To slow the rebound, turn the screw in (clockwise).

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 (off-road). 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 preload and bump configuration).

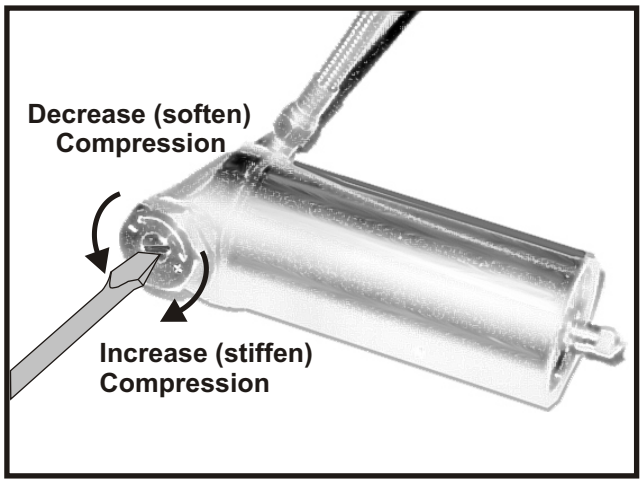

Fig. 3: Compression adjuster screw location on the remote reservoir. Adjustment is clockwise for stiffer, and counterclockwise for softer using a screwdriver. Do not attempt to turn the large hex.

COMPRESSION ADJUSTER 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 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

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number of positions is determined when the screw is turned clockwise to its stop (approximately 3 to 3-1/2 turns in). This is the stiffest setting.

COMPRESSION ADJUSTMENTS

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.

COMPRESSION AND REBOUND 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.

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. Works has determined that 250 p.s.i. is most suitable for 99 percent of the applications. 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

CAUTION: The pressure in these shocks cannot successfully be checked. The same concerns with the gauge volume and the gas volume in the shock body create a situation where you cannot accurately determine what the pressure was in the shock. In addition, the gas is in a column on top of the oil, and when the pressure is lowered (i.e. checking the pressure) the gas will come out of solution. This will cause the gas and some of the shock oil to escape into the gauge. It is possible to lose a large percentage of the shock oil by depressing the core of a charged shock to the atmosphere.

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.

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#HACR SUP -- 01/04/2005

HI-LOW COMPRESSION ADJUSTMENT SUPPLEMENT

Note: This supplement should be used in conjunction with the adjustable shock instruction sheet # UAADJ.

HI-LOW Compression Adjustments
Various Works shocks are now fitted with the Hi-Low compression adjustment mechanism. This adjuster varies from the basic adjuster in appearance by the hex part that protrudes from the center of the adjuster housing. Inside the hex adjuster is a slotted screw head The single stage adjuster has a slotted screw that is flush with the adjuster housing.

Note: On either adjuster, the large hex part (the adjuster housing) does not turn and is not part of the adjustment mechanism. Do not attempt to turn it as loss of oil or damage to the shock can occur.

Adjustment Sequence
Note: Normally the shocks will be shipped with the adjusters on the initial settings. If this is not the case, or you are starting over, please follow the two step initial setup that follows.

1. Part one of the initial setting is: turn the high speed screw all the way in--clockwise--approximately 3 full turns or 18 clicks. The hex should rotate with the screw.

2. Part two of the initial setting is: hold the screw stationary and turn the hex counter-clockwise to the stop. The low speed adjustment range is 16 clicks, less than one revolution. The low speed hex adjuster has a positive stop in each direction. When using a wrench to adjust the hex, take care to cease turning when the stop is reached so as to not damage internal components.

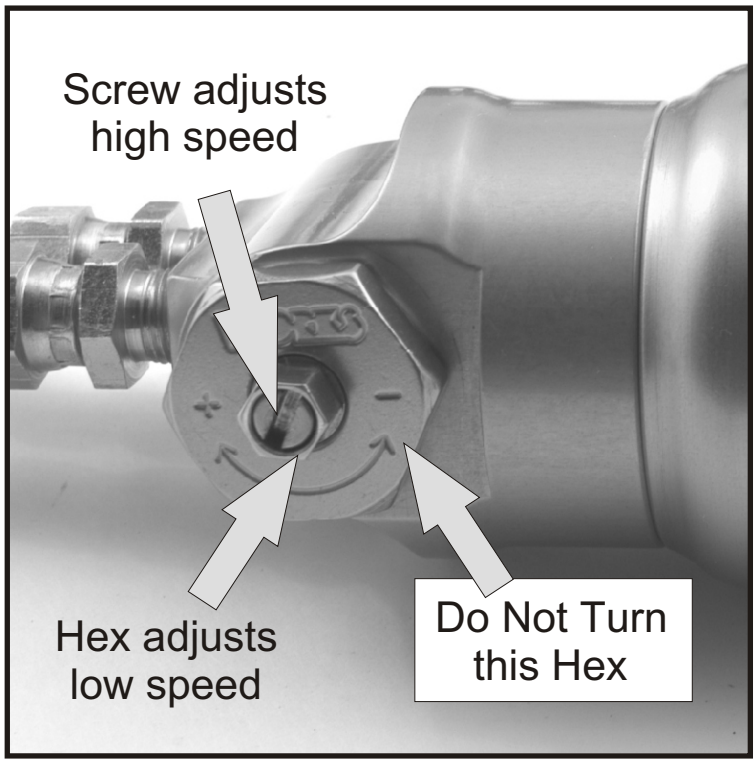

Fig.1--The compression adjuster is located on the remote reservoir (dual-line recirculating shown) or the front or rear shock piggyback reservoir.

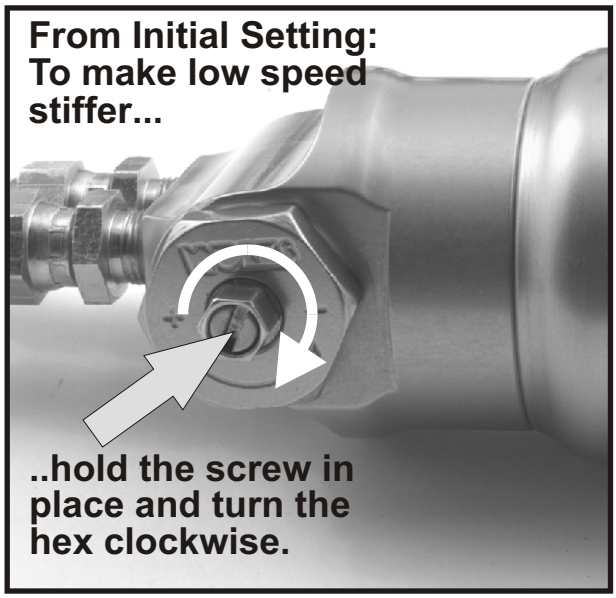

Fig. 2

3. The adjusters are now set with the low-speed by-pass on full soft, and the high-speed compression on full stiff-- which is the suggested starting point. Although the high-speed compression adjuster is on full stiff, it is negated until the low speed adjuster reduces some of the low speed bypass. As a result it may be necessary to increase the low-speed adjustment to achieve the desired high-speed compression adjustment.

4. As required, add low speed compression by turning the hex clockwise (See Fig. 2). While making low speed compression adjustments, the slotted high-speed compression adjuster screw must be held in position. Once the low speed adjustment has been made,

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make a mark with a Sharpie indicating the relationship of the inner screw to the hex. This way you can keep the marks aligned when making high speed adjustments so that your low speed setting will not change.

5. Test the vehicle to determine if the high speed compression is excessive. High speed damping occurs with sharp edged bumps and large impacts. If the high speed compression is too stiff, the suspension will feel harsh when experiencing these impacts.

6. If the high speed damping is excessive, turn the slotted adjuster screw and the hex counterclockwise--at the same time keeping the Sharpie marks aligned (See Fig. 3). There are three full revolutions of the high speed adjuster.

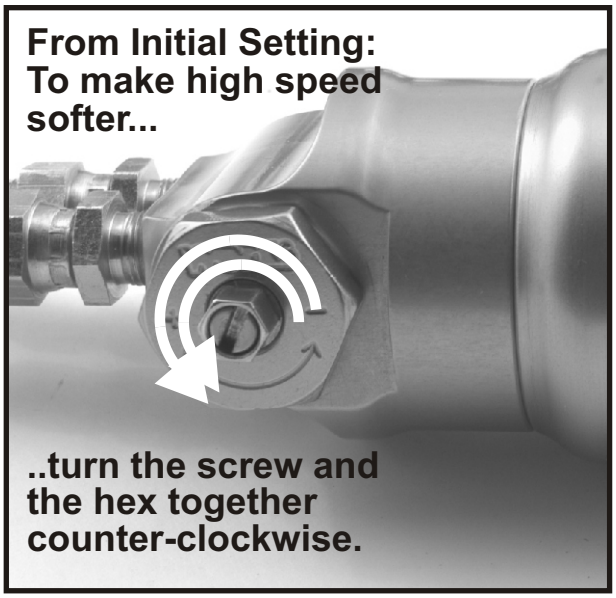

Fig. 3