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OVERHAUL INSTRUCTIONS FOR ULTRACROSS, ULTRASPORT, QUADSTAR, DURACROSS, DURASPORT SERIES

CAUTION: This shock is 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.

These guidelines are for servicing the large-body series of shocks manufactured by Works Performance Products, Inc. The large-body shocks have a 1-13/16-inch (46mm) bore, and are built with both billet aluminum, welded steel, or screw together shock bodies. This series of shocks includes UltraCross, DuraCross, QuadStar, UltraSport and DuraSport. Some shocks have hose mounted remote reservoirs, others are emulsion shocks with no reservoir. Originally, the shocks were constructed with a push-in, clip-style seal holder with an external dust cap. In the early '90's, design of the shocks was changed to a screw-in seal holder. The seal kits are different for each type of shock, so identify which you have before you order parts.

These guidelines will follow the disassembly and reassembly of both types, referred to as "Thread-In" and "Push-In." The guidelines will follow the procedures that are common to both and then highlight each of the areas that differ between the two designs.

Refer to the exploded view for the nomenclature of the components.

Caution:

If you do not have the proper tools and equipment to perform this service do not continue.

Required Tools / Equipment

Equipment for removing the spring (hydraulic press and bearing press may be necessary)

Nitrogen tank and pressure manifold

Seal head wrench (for thread-in seal heads)

Vise with soft jaws

Eye protection or face shield

Note: On aluminum bodied shocks, the pre-load threads are machined into the body. On steel bodied shocks the pre-load threads are on a separate sleeve that slides over the body and is held in place with a wire ring. It is advisable to clean and lubricate the threaded area before attempting to loosen the pre-load rings. On aluminum shocks, corrosion can cause the pre-load ring to seize onto the threads. In this case, it is simpler to leave the ring in position and remove the spring using method 2.

Remove Eyelet Bushings(Optional)

Depending on the width of the bushings in the shaft end eye, It may be necessary to remove the bushings in order to remove the spring retainer. Shock eye bushings primarily come in two styles, a one- or two-piece steel spool that rides in a plastic sleeve (referred to as an Iigus bushing) and a spherical bearing ("Heim") that has aluminum or steel spacers that press in to each side. The steel spool sleeves in the Iigus should pull out or drop out without too much effort. The spherical bearing

spacers may have to be driven out from opposite sides with a suitable drift, and may become damaged as a result. Remember to keep the old parts and refer to them when ordering replacements.

Removing the spring: Method 1

Place the shock in the jaws of a vise at the body eye. **Do not clamp at any point on the round part of the body tube itself.** If the bushings remove easily, take them out. If they do not easily come out, clamp against the bushings. Take care to avoid clamping the hose or fittings at the body end. Back off the pre-load nut (counter-clockwise) until the spring is loose and is about 3/16 to 1/4 -inch away from the retainer under the eye or clevis. (If you cannot back off far enough to make the spring loose, you will need to refer to Method 2.) With a rubber or plastic mallet, tap the spring retainer toward the shock body until two half clips are exposed. Remove the clips, and slide the retainer over the eye or clevis and follow it with the spring. It should come off easily now.

Note: In some rare cases there are shocks with a single clip on the shock body underneath the retainer or threaded collar that must be removed first to remove the spring. In most of those cases the spring will come off the body end of the shock. For this type, it may be necessary to use Method 2 below.

Removing the spring: Method 2

Method 2 utilizes a hydraulic press and a bearing splitter. With the splitter against the retainer and on the table, run the ram down on the end of body eye to push the shock eye through the retainer to expose the clips.

Discharge the shock

(Non-reservoir shocks) With the shaft down, point the valve towards a bucket and depress the core. Oil may shoot out of the valve. Make sure all the pressure is released before proceeding. (Reservoir style) A bladder usually separates the oil and nitrogen. If the bladder has failed oil could come out. Use caution and point the valve towards a bucket. Depress the core and be sure all the pressure is released.

Tear down

Inspect the bushings at both ends of the shock for wear. Remove bushing side spacers or heim spacers. Do not remove Icus bearings or heims unless they are to be replaced.

Place the shock in a vise with the shaft up. Unscrew the seal head using a proper wrench or spanner. If you do not have either, you can file two small flats and use a large adjustable wrench or use a strap wrench. (Using a pipe wrench, channel locks, or vise grips may damage the seal head and is not recommended)

Remove the shaft assembly from the shock body. Place it on a clean rag. Remove the shock body from the vise and dump out all the oil.

If the shock has a remote reservoir, remove the bladder from the remote. Push the bladder cap in. Remove the clip and then pull the cap out. Use an automotive style tire valves stem tool to help remove the bladder cap. Screw it onto the valve, and can then grab onto the tool with vise grips allowing you to pull the bladder cap out of the assembly.

Wash the bladder assembly and then inspect the bladder for damage. Due to heat and age the urethane may become brittle. Look for cracks. Press with your thumb at the base and check for flexibility. If the bladder is questionable, replace it. Then replace the O-rings in the bladder cap.



Clip removal on the reservoir

Wash the shock body in a solvent tank. **For safety, do not use gasoline to wash parts in!** Inspect the bore on all aluminum bodies to be 1.817 max in both the X and Y-axis in several axial locations.

Replace if out of spec.

Wash the piston assembly and dry it. Mark the piston and flapper orientation. Loosen the nut holding the piston on. Be sure to hold the entire piston assembly together. It will want to come apart. Don't let the balls and springs fall out the back of the piston. Use a couple twist ties to hold the piston assembly together. Put it in a safe place. Remove the topping cup. Note the way it comes off the shaft. Inspect the cup for damage. Replace if distorted.



Inspect the shaft for dents and nicks. If there are small nicks in the shaft, spin the shaft in a drill press or lathe and lightly sand the shaft with 600 grit or finer paper. If the nicks are small they may come out. Do not remove more than a few tenths of chrome from the shaft. Inspect the shaft. If the nicks are still present, the shaft should be replaced to prevent leakage. If the shaft is adjustable rebound, you will need to purchase an entire adjustable shaft assembly from Works or send you damaged shaft assembly to Works and we will transfer the components onto the new shaft. Setting up a rebound adjustable shaft is beyond the scope of a basic service.

Inspect the bumper for wear. If the bumper has cracks or has chunks missing, replace it. Do not remove the bumper permanently in an attempt to gain travel as the shock can be damaged internally.

Locate the seal head and wash it. Remove and replace all O-rings and seals, also, replace the Igus bearing (shaft guide bushing). Place a small amount of grease on the bearing and seals.

Inspect the hose (if applicable) for damaged or frayed strands. Replace if damaged.

Inspect the piston components. If the piston ring shows excessive wear, replace it. Replace the O-ring behind the piston ring. Look at the piston star (ball and spring keeper), determine if the springs have dug excessively into the surface. Replace if necessary. If the star is worn, the valve springs are most likely shot. Replace them as well. There are 3 different types of springs in your piston and 6 springs total, note which spring comes out of which hole.

Re-assembly

Start with the shaft assembly. Place any spacers that were between the bumper and the eye or clevis back on the shaft. Re-install the bumper and then the seal head. Place the topping cup back on the shaft. Now, fit the piston assembly. Rotate the star so that the holes in it are centered between the valve springs. Mark this on the edge so that you can keep it lined up during assembly. Place the piston assembly on the shaft. Rotate the flappers (rebound shims) so that you can see the ball holes through the flapper holes. If you marked this during disassembly this should be easy. Just line up the marks you made. Next, while keeping the piston, star, and flappers in the correct position, torque the nut to 38 ft-lbs. If you did not replace the self-locking nut, use a drop of loctite to retain it.

Now that the shaft assembly is complete, set it to the side and let's proceed with the filling process. Place the shock body in a vise open end up. Pour oil in the reservoir until you can see it flow into the shock. Cup your hand and slap the open end of the reservoir. This helps to drive the air out of the system. Watch until no more bubbles come out of the shock end. Add more oil to the reservoir and then insert the bladder assembly into the end. Oil should spill out as you put the bladder in. If you don't spill any oil you may have trapped air in the system. Push the assembly down, install the clip, and then pull the cap firmly against the clip. Be sure not to slice up the O-ring when installing the bladder assembly.

Determine what type of seal head you have. A 101 is 2.0" over-all length, and a 102 is 1.440" over-

all. Set the oil level accordingly. These are oil levels with the shaft assembly completely out of the shock body. (Oil level from lip)

101 with Reservoir	1.80 inches
101 without Reservoir	2.80 inches
102 with Reservoir	1.40 inches
102 without Reservoir	2.40 inches

Non-reservoir style: With the seal head up against the bumper, insert the assembly into the body. Screw the seal head down and pressurize to 250 psi with nitrogen gas.

Reservoir style: With the seal head centered between the bumper and piston, insert the assembly into the body. Screw the seal head down a couple turns and then pull the shaft to full extension. Screw the seal head down until the O-ring is about to touch the lip of the shock tube. Remove the shock from the vise and turn it over just for a second (allowing the trapped air bubble to escape from under the seal head) and then place it back in the vise. Push the shaft down half way and wait for the oil to start to come out around the gap between the O-ring and the lip of the body. The instant the oil appears, tighten down the seal head. Next, pressurize to 250 psi with nitrogen gas.

Last steps

Replace any bearings at this time.

Re-install the spring with the appropriate pre-load.

Finally, replace the shock eye bushings.

NITROGEN PRESSURE GUIDELINES

CAUTION: The pressure in these shocks cannot successfully be checked. Concerns with the gauge volume and the gas volume in the shock body create a situation where you cannot accurately determine what pressure was in the shock. In addition when the pressure is lowered (i.e. checking the pressure) the gas and some of the shock oil escapes 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.

Please note that in order to check the pressure, some of the gas must escape and fill the gauge assembly. The volume of the gas pocket is about half 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 shock. In other words: If you don't have a nitrogen source handy, don't check the pressure!

PRESSURIZING THE SHOCK AFTER SERVICE

The pressure setting for emulsion gas shocks is 250 p.s.i. To pressurize a shock with some residual pressure in it, 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 transferring oil from the shock into the gauge assembly.

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. Most motorcycle shops that deal with dirt bikes can pressurize the shock.