

# Complete Aura Damper Rebuild



## Necessary tools, parts, and supplies:

- Snap ring pliers
- Socket wrenches, 10 and 24 mm
- Rebound removal knob WB-97-702 (optional)
- Open-end wrench, 10 mm
- Hex keys, 1-1/2, 2 and 3 mm
- White Brothers bleed tool WB-FT180-2 (or substitute 6 cm cut piece of 1.75 section innertube)
- Spare o-rings 102523
- Fork or suspension oil, 5 wt., 8 oz (total oil retained in legs and damper, 6 oz.)

## Removal of lowers assembly

After removing the fork from the bicycle, loosen the air side screw until it protrudes 3 - 5 mm from the bottom of the fork and tap it firmly with a mallet to unseat the compression rod inside the leg. Remove the screw. Release all air pressure from the air spring leg by depressing the valve core in the cap. Lubricating oil may drip from the leg with the screw removed and pressure released.

Slide the lower casting to the fully extended position on the stanchion assembly and turn the blue compression knob clockwise to the closed position.

Loosen the set screw on the red rebound knob until the knob can slide off of the damper screw.

Remove the damper screw using the rebound removal knob in combination with the open end 10 mm wrench. Holding the removal knob while turning the screw will maintain the position of the rebound needle in the damper rod.

If the removal knob is not used, the rebound needle will unthread to the end of the damper rod as the screw comes out. Use the 3 mm hex key to turn the rebound needle back down into place. Tighten until firm resistance is encountered, then back off by 2 turns.

Thread the spring side screw part way into the damper rod and tap the screw firmly with the mallet to unseat the damper rod. Remove the screw. Slide the fork lower casting off of the stanchion assembly. Lubricating oil may drip from the casting and stanchions.

Use a rag to wipe off the wiper seals, making sure dirt does not fall into the lower casting. Inspect the wipers for damage and wear, replace wipers if needed.

## **Disassembly of damper**

To perform this service be sure to remove the fork lowers first. With the lowers off, I prefer to have the damper at full extension (position of the damper is not important to disassembly).

Use 3mm hex wrench to remove blue center screw (102399), on damper cap and set aside. Carefully lift the damper cap (102398), off and set aside. Be sure not to loose the steel balls under the cap, they can stick to the damper cap some times. Take a 1.5mm hex wrench and unthread the set screws on either side of the indexer (102493). No need to remove them just thread out enough to remove the indexer.

Use 24mm socket and un-thread the damper from the crown. Careful as oil may come out the top of the fork while removing the damper. Once the damper is un-threaded slowly pull damper unit out of the top of the crown. Make sure to hold over a bucket so oil may drain out the bottom of the stanchion.

With the damper unit removed from the fork, drain any remaining oil out of the damper unit. Take the damper knob and turn the valve to open, then invert the damper and pour the dampening oil out of the unit.

Take your snap ring pliers and remove the snap ring holding in the reservoir. Take a screwdriver or a hooked tool and gently pull the reservoir out of the stanchion. Make sure not to damage the reservoir as you are removing it from the stanchion.

Clean and dry all disassembled parts.

## **Assembly of Damper**

Start with installing the reservoir. To install the oil reservoir, remove the bleed screw and set it aside. Coat the internal o-rings of the seal head and the outer o-ring with fork grease. Coat the lower 10 cm of the damper-side fork stanchion liberally with fork grease to ease installation. With the stanchion assembly inverted, tuck the upper end of the reservoir into the bottom of the stanchion. There is a counter boar in the bottom for the shaft seal end of the reservoir. Using fingers of both hands, put even pressure on opposite sides of the top fitting of the reservoir until the o-ring slides past the small lip in the lower end of the stanchion. If the o-ring is difficult to seat, rotate the position of the top fitting and push again firmly. Repeat until the o-ring moves past the lip.

Once the o-ring has passed the lip of the stanchion, insert a long hex wrench or other long, blunt tool through the center of the seal head at a slight angle. Feel for a small internal ridge near the top of the reservoir (opposite end of the reservoir from the shaft seals) and push against it with moderate force to move the reservoir deeper into the stanchion. Apply force at different points to overcome resistance. Once the aluminum collar of the reservoir touches the stanchion, guide the collar into the lower cavity as the reservoir continues to move inward until the collar seats against the internal lip of the

stanchion.

With the reservoir fully inserted, look down inside the top of the stanchion to check that the center hole of the seal head is clear and that the flexible sleeve is not crumpled. Install the snap ring in the end groove of the stanchion with the sharp edge of the snap ring facing outward. Check that the snap ring is seated by rotating it in the groove. Position the ears of the snap ring so that they are away from the bleed screw hole.

Insert the damper tube and rod down through the top of the stanchion. Move the rod until it enters the center hole of the seal head and push it downward through the seal. Screw the damper cap into the stanchion and tighten to 70 inch-lbs (8.2 Nm) with the 24 mm socket.

**The clocking of the damper knob must be set with the threshold adjustment closed.** Using the 1-1/2 mm hex key, tighten one of the three set screws in the damper cap snug to keep the valve from turning. Use the blue compression knob to turn the adjustment clockwise, if necessary, until it stops. Remove the knob, loosen the set screw, and put the knob back so that the tab of the knob is somewhere between the 3-o'clock and 6-o'clock positions relative to the fork crown. Turn the valve assembly clockwise with the knob until the tab is at or slightly past the 6-o'clock position (pointing rearward). Remove the knob again. Tighten the set screws progressively until all three are moderately tight in order to lock the valve in place (overtightening can strip the hex sockets of the set screws).

Install the indexer on the cap. The indexer is an aluminum disk with a stepped profile and a hole that slides over the stem of the cap. Orient the indexer so that the large diameter is on the right side and the upper corner of the larger diameter is a few degrees clockwise of the 12-o'clock position. Push downward on the indexer to hold it in position and turn the two set screws to moderately tight.

With very slight back-and-forth movement the blue compression knob should engage the cap with the tab at or near the 6-o'clock (fully closed) position. In this position, the index screw in the blue knob should rest against, or very close to, the upper corner of the indexer. If the blue knob will not engage the cap or if the index screw in the knob is far from the corner of the indexer, remove the knob, loosen the set screws of the indexer, and reposition it. Once the blue knob fits correctly, remove it and check that both of the indexer set screws are moderately tight.

The indexer should already contain small springs in its two upward facing holes. Carefully place one of the 3/32 stainless steel balls on each hole. Install the blue knob with the tab in the 6-o'clock position over the balls. Hold the knob down and install the blue retaining screw. Tighten the screw moderately tight with the 3 mm hex key (excessive tightness can round out the hex socket in the aluminum screw).

With the screw in place, the knob can be operated between the fully closed position (tab at 6-o'clock) and fully open position (tab at 1-o'clock). The balls provide indexed knob positions. For the following steps that require filling the damper with oil and bleeding away air, set the knob at 1 or 2 clicks away from the fully closed position. This will help

prevent sudden movement of the damper rod that might result in spraying of oil.

Invert the stanchion assembly and check that the damper rod is fully compressed into the stanchion.

Push the bleed tool (or the cut piece of innertube) onto the stanchion to create a bleed reservoir that extends at least 3 cm above the seal head. Fill the bleed reservoir with oil up to about 1 cm from the top. (Important: Wear eye protection whenever working with oil.)

Pour oil into the bleed reservoir. Pouring oil directly into the center of the damper rod will allow the damper to fill more quickly. At first, air bubbles will rise rapidly through the bleed reservoir. When bubbles rise more slowly, insert the rebound needle down into the damper rod and pump it up and down to expel air more quickly. Replenish the bleed reservoir as needed.

When pumping of the needle in the rod no longer brings bubbles, insert the needle below the surface of the oil and screw it down into the rod with the 3 mm hex key. Light resistance will be felt as the seal of the needle seats. Continue to turn the needle until firm resistance is felt, then back it off counterclockwise by 2 turns.

Install the air spring screw into the rod several turns to form a gripping surface on the end of the rod. Refill the bleed reservoir to within 1 cm of the top with fresh oil and slowly pull the damper rod to full extension. Fresh oil will be drawn into the damper as the rod extends. Do not allow the oil level in the bleed reservoir to fall so low that air is drawn into the damper.

Tip the stanchion to nearly horizontal to pour off most (but not all) of the oil left in the bleed reservoir into a clean container. Wrap a shop rag around the stanchion just below the bleed tool and remove the tool from the stanchion. The end of the stanchion should retain a shallow pool of oil. Install the bleed screw and turn until moderately tight; excessive tightening can strip the threads in the seal head.

Replace the bleed tool on the stanchion and push the rod down once again. This will expel oil trapped around the internal reservoir of the fork into the bleed reservoir. Turn the fork right-side-up over the wide-mouthed container and let the excess oil drain out. As the oil drains, slowly stroke the damper rod into and out of the stanchion several times. When most of the oil has drained, remove the bleed tool from the stanchion.

Push the rod into the stanchion as far as it will go, turn the blue knob to fully closed and quickly turn the stanchion assembly back to the inverted position. This step will force remaining air bubbles out of the damper tube and into the stanchion so that they can be bled away.

Pull the rod out to full extension, remove the bleed screw and reattach the bleed reservoir to the stanchion. Compress the rod slowly until it bottoms, then fill the bleed reservoir to

within 1 cm from the top. Slowly stroke the rod up and down. As bubbles rise, replenish the oil as needed. Continue stroking and refilling until bubbling stops.

As in step 16 above, extend the rod, pour off the excess oil, remove the bleed tool and install the bleed screw moderately tight.

Free oil remaining around the damper reservoir must be drained completely before inserting the stanchion assembly into the lower casting. Turn the fork upright with the damper-side stanchion over a clean container. Turn the blue knob counterclockwise to the fully open position. Stroke the damper rod up and down through its travel several times to expel excess oil. Continue until oil drainage stops.

After excess oil has drained, the damper rod should compress fully. In Loop models for 26/650 wheels, the damper rod at full compression will protrude approximately 9 mm from the end of the stanchion, in models for 29-inch wheels approximately 34mm. If the rod does not compress fully, invert the stanchion assembly, loosen the bleed screw by several turns and put moderate pressure on the rod. With the bleed screw nearly removed, the rod should slowly move downward as excess oil is expelled. When the rod reaches a hard bottom, retighten the bleed screw to prevent entry of air. Stroke the damper rod again with the assembly upright to drain free oil into the container. Extend the rod fully and reset the blue knob to the closed position (clockwise as far as possible).

## **Assembly of lower assembly**

Before reassembling the lower casting to the stanchion assembly, check the o-rings on the air spring screw and damper screw. Damaged o-rings should be replaced and coated with fork grease before further reassembly.

For 26/27.5 models, make sure the bottom out bumper and washer are on the compression rod of the air spring. For 29, make sure the bumper is on the compression rod and the riser is inside the left leg of the casting. With the stanchion assembly still inverted, slide the lower casting onto the stanchions. As soon as the lower bushings in the casting engage the stanchions, stop and pour approximately 10 ml of fork oil into the screw hole of the spring leg for lubrication, 2 ml of oil into the damper leg. Hold the fork at an angle while pouring to avoid getting oil in the ends of the damper and compression rods.

Resume sliding the casting onto the stanchions until the casting touches the damper rod and compression rod. Use the corner of a shop rag or cotton swabs to remove excess oil from the end of the damper rod, then install the damper screw.

Use the rebound removal knob to hold the rebound adjustment stationary as the damper screw is tightened. If the screw encounters resistance before fully tightening, oil may still be trapped in the socket of the rebound needle. Remove the screw and use a cotton swab to wick away oil pooled in the hex socket, then install the screw and tighten to 75 inch-lbs (8.5 Nm).

If the rebound removal knob is not used, before installing the screw use the 3 mm allen key to unscrew the rebound needle inside the damper rod until it is near the end of the rod. This should only be done with damper rod fully extended. Use a cotton swab to wick away any oil trapped in the socket of the rebound needle. Insert the key of the damper screw into the socket of the rebound needle and thread the screw into the rod. Tighten the screw to 75 inch-lbs (8.5 Nm).

Wipe away any oil on the screw and install the red rebound knob. Turn the blue compression knob to the fully open position and compress the fork until the casting touches the compression rod of the air spring. Install the air spring screw and tighten to 75 inch-lbs (8.5 Nm). Inflate the fork to working pressure.