Information about Lubricating the Flexshaft Core

The flexshaft core is the part of the machine that transmits the torque of the AC cutting motor to the cutting bit. It is housed in the black sheath that exits the back of the machine and is connected to the cutting head. Other common applications of flexshafts are seen in weed-eaters and automotive speedometer cables.

The flexshaft core construction consists of several layers of tightly wound springs around a solid wire core. These springs are wound in alternating directions to maintain the torsional stiffness in either direction. This layered construction provides the needed flexibility but also causes considerable internal frictional heating because the layers are rubbing against each other rapidly as the shaft spins at over 20,000 RPM. If there is not sufficient lubrication within this layered structure the flexshaft will heat up.

Each flexshaft is coated with a dry film lubricant at the factory and should only need additional lubrication if it begins to heat up after a period of time. The flexshaft will generate a fair amount of heat during operation especially when using larger bits. Monitor your flexshaft heating by feeling the temperature of the flexshaft assembly during operation. Under normal circumstances it will be warm to the touch along its length. Monitor the temperature as the machine is used and see if the temperature ever increases over a period of time. In many circumstances the flexshaft will heat up immediately after a repair has been done. Simply remove and re-seat the flexshaft using the procedure detailed below, as it is most likely not seated into the motor or spindle correctly.

Lubricating the Flexshaft Core

To properly lubricate the Flexshaft Core you will need an approved lubricant: Use only the CarveWright Flexshaft Lubricant available in the CarveWright store. This lubricant is a penetrating oil containing solid graphite particles in suspension.

You can think of the graphite particles as millions of tiny ball bearings that penetrate the internal windings of the flexshaft. Using any other unapproved lubricant will void the warranty and can potentially cause damage to the machine.

Removing the Flexshaft Core

1. **Ready the machine** by unplugging it from the power outlet and placing it on a stable work platform. Raise the head up to within .5 inches of the top and move the Y-truck to the center of the machine for best access. Do not raise it all the way up as it will wedge in place.

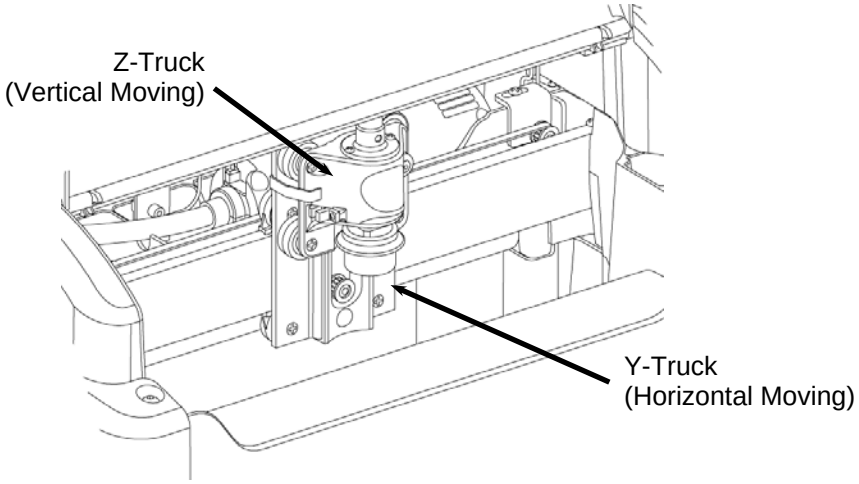

FIGURE 1: VIEW OF THE Z-TRUCK

2. **Ready the flexshaft for removal from the Z-truck:** Move the Z-truck to the very top of its travel (until it reaches the hard stop) so that the flexshaft support tube protrudes from the head cover (See Figure 2).

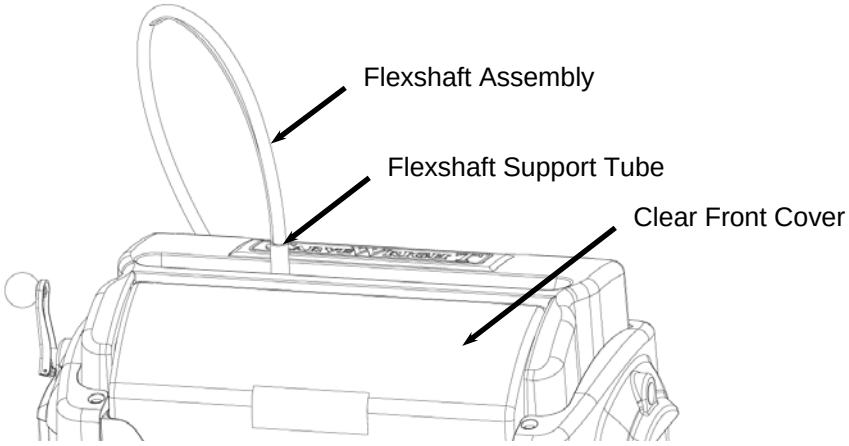

FIGURE 2: EXTERIOR VIEW OF THE FLEXSHAFT AND HEAD COVERS

3. **Detach the flexshaft from the top of the Z-truck:** The flexshaft assembly is retained by a ball detent located in the flexshaft receptacle (See Figure 3). Firmly grasp the flexshaft support tube while reaching under the clear front cover with your other hand to grab the Z-truck. Pull up firmly on the flexshaft support tube and twist slightly while bracing the Z-truck. **DO NOT PULL ON THE SHEATH.** The flexshaft will pop out of the detent.

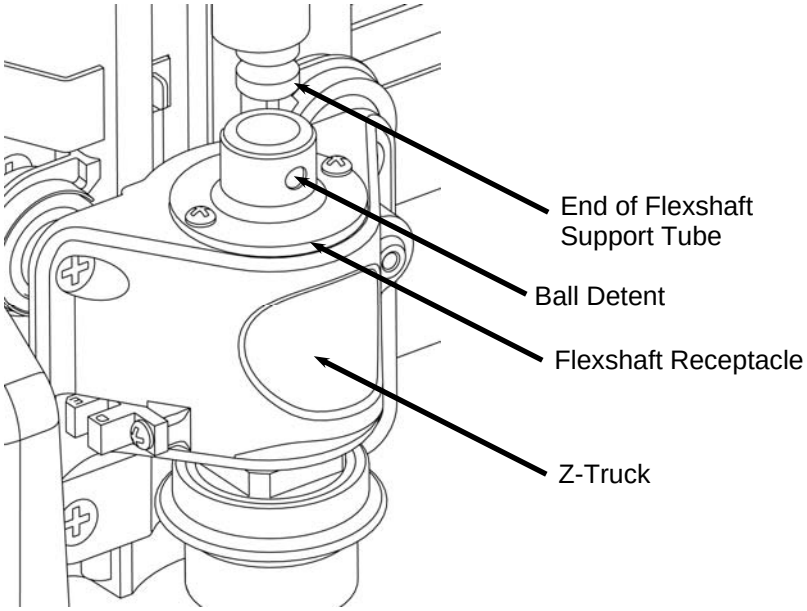

FIGURE 3: VIEW OF THE FLEXSHAFT CONNECTION TO THE Z-TRUCK

4. **Remove the Flexshaft Core:** Lay out a plastic bag or plastic sheet long enough to lay the flexshaft on. Grab the exposed end of the flexshaft core and pull it out of the sheath and lay it on the plastic.

5. **Apply lubrication to the Flexshaft Core:** Using gloves and eye protection spray down the entire length of the flexshaft with the graphite lubricant. Rotate the flexshaft and spray again. It is important that you let the oil penetrate the core so lay it on the plastic in the excess lubricant. **Use extreme caution when using this lubricant. It is an irritant and is toxic.**

6. **Dry the Flexshaft Core:** Let the core dry for a few minutes and dab any excess off with a rag. Make sure that any excess lubricant is removed as it will seep into the spindle bearings if placed back into the sheath wet.

Reassembling the Flexshaft

1. **Prepare the flexshaft assembly for re-insertion into the machine:** Reinsert the flexshaft core. Push the core into the sheath and make sure that it slips into, and engages, the AC cutting motor. It will drop into the receptacle on the motor side about 5/8ths of an inch. Turn the core by hand and feel for resistance of the motor. If the shaft spins without resistance, push the core inward while rotating until it drops into the slot and engages the motor.

2. **Insert the flexshaft into cutting head:** Looking through the slot in the top cover, locate the flexshaft receptacle on the top of the Z-truck. Inside the receptacle there is a square recess that mates with the exposed square end of the flexshaft core. Turn the chuck on the bottom of the cutting head (open the safety cover for access) until the square core end can be inserted into the recess. Press the flex shaft all the way down into its receptacle. A click will be heard and felt as the shaft snaps into place.

3. **Monitor the flexshaft while running your next project:** Normally the entire length of the flexshaft sheath will be the same temperature and slightly warm. If the sheath is running hot to the touch or exhibits localized hot spots along the length please contact CarveWright.