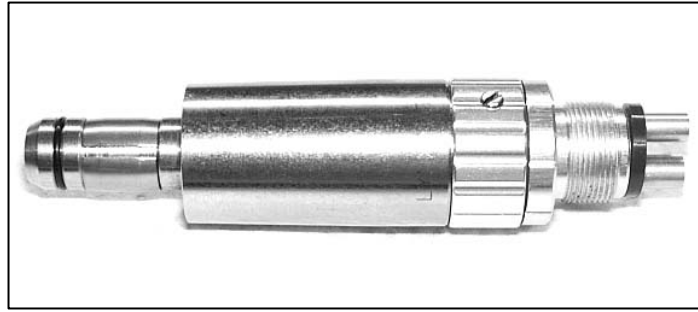


# LYNX 20K E-TYPE MOTOR REPAIR PROCEDURE



The Lynx 20K Motor is used with a number of attachments. Two of the attachments, the Lynx 4:1 and 1:1 Straight Nosecones are also covered in this manual. It has gone through very little change since its inception so the following procedure will be relevant for most of the Lynx 20K E-Type motors you encounter. Most replacement parts are available for this motor. As always, try to determine the problem before disassembling the motor.

Some of the most common problems with this handpiece are:

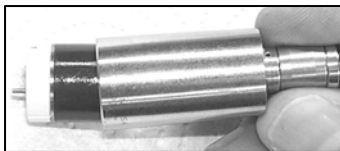
- The motor is locked up.
- The motor has low torque.
- The threads are worn.

The repair procedures for each of these problems is addressed below



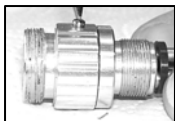
## STEP 1

Place the threaded portion of the motor into a 9/16" collet. Once the collet is secure, wrap the main housing of the motor with a rubber strip. Now unscrew the motor housing from the head. All thread patterns on this handpiece are regular so turn the housing counterclockwise to unscrew.



## STEP 2

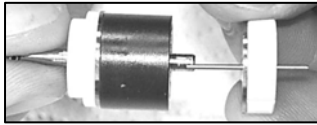
Once the housing has been unthreaded from the head, tap the internal motor parts out onto your work surface and remove the head from the collet. If the problem with the handpiece was only worn threads, replace the head (10008) and reassemble by following **STEP 3** and **STEP 9**. Otherwise, proceed to the next step.



## STEP 3

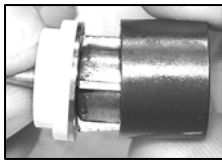


In a complete overhaul you will want to replace the three o-rings on the head and also the forward/reverse valve o-ring. First, remove the large white o-ring and then the screw from the forward/reverse ring. Once the screw is removed you can pull the ring off of the head and remove the remaining o-rings. Then you will need to tap the forward/reverse valve out of the head and remove the o-ring found under the valve.



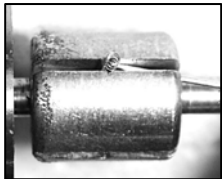
#### STEP 4

Now that the head is disassembled, we will disassemble the internal motor. You will need to pull the alignment pin, distributor plate and thin metal motor plate off of the motor.

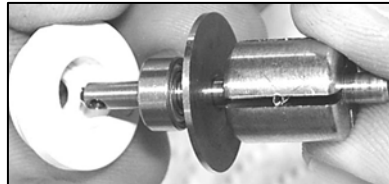
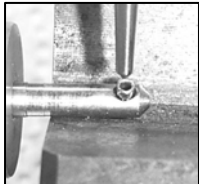


#### STEP 5

At this point, you can pull the rotor housing off of the rotor. Carefully remove the blades and springs. Be aware that some models have four blades and springs while newer models have five. Generally, ultrasonically cleaning the internal motor parts and replacing the blades and springs can repair a locked up motor, or a motor that produces low torque. Sometimes a new rotor housing is needed as well.



*Tip: To avoid losing springs, remove them with a needle and immediately place them on a magnet.*

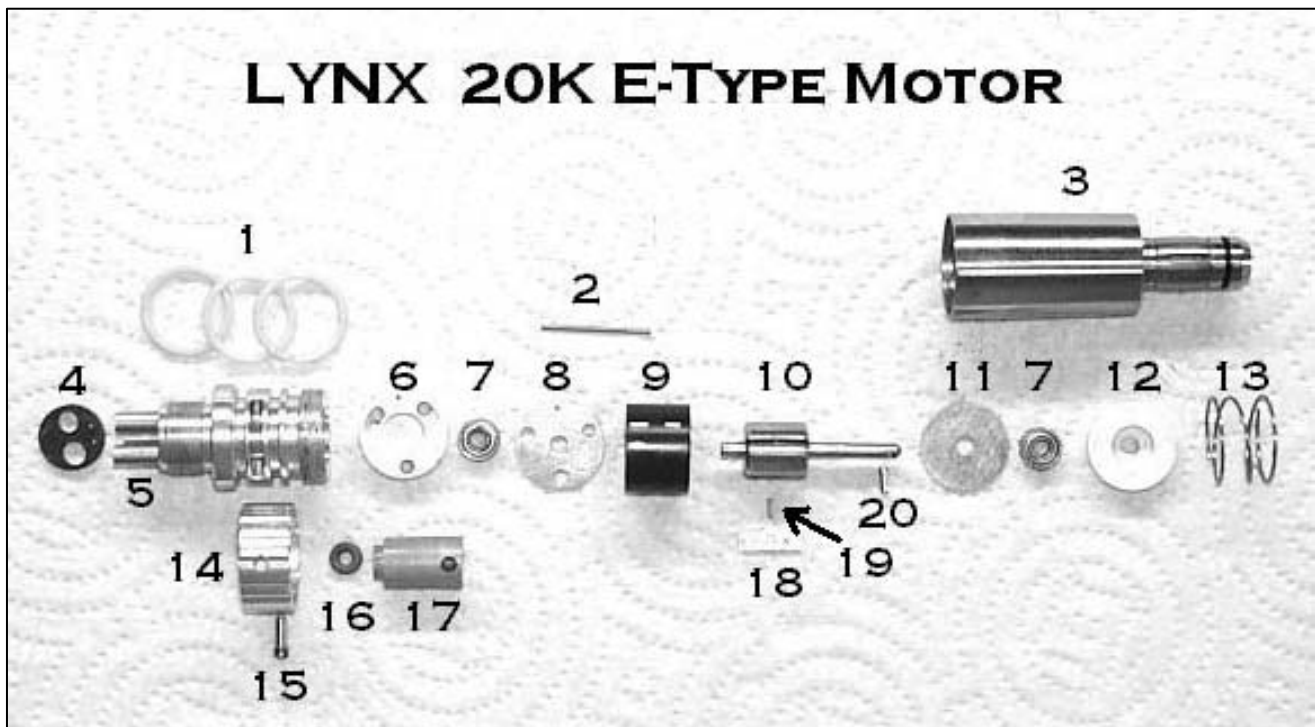


#### STEP 6

To replace the top bearing, follow this step. First, place the rotor assembly over two v-blocks (far left). Once the drive pin is visible, tap it out of the shaft using a small thin punch. Once the pin

has been removed, simply pull the top motor plate, bearing and thin plate off the shaft. Try lapping the thin motor plate on some fine (1500 or 2000) grit sandpaper to remove any scarring. You can then slide the thin plate back onto the shaft. Replace the bearing (60101), and slide the top plate back onto the shaft as well. Lastly, reinsert the pin into the drive shaft. Notice that some motors have spring washers (10027) between the bearings and bearing plates.

The following is an exploded view of the Lynx E-Type Motor:

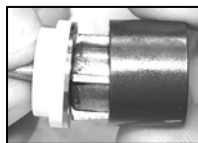


Picture Number	Part Number	Description
1	10024	O-Rings
2	10022	Alignment Pin
3		Main Housing
4	40422A	Gasket
5	10008	Head
6		Rear Motor Bearing Plate
7	60101	Motor Bearing
8		Thin Rear Motor Plate
9	10005	Rotor Housing
10	10025	Rotor/Spindle Assembly (Complete motor assembly is # 10030)
11	Part of 10025	Thin Front Motor Plate
12	Part of 10025	Front Motor Bearing Plate
13	10051	Motor Spring
14	10010	Forward/Reverse Ring
15	10011	Forward/Reverse Ring Screw
16	10023	Forward/Reverse Valve O-Ring
17	10009	Forward/Reverse Valve
18	10018	Motor Blades (Sold Individually)
19	10019	Motor Blade Springs (Set of Five)
20		Drive Shaft Pin
No Pic	10027	Wavy Bearing Spring (Sits behind bearings in the motor plates)

We will address some of the troubleshooting tips now that we are about to reassemble our motor.

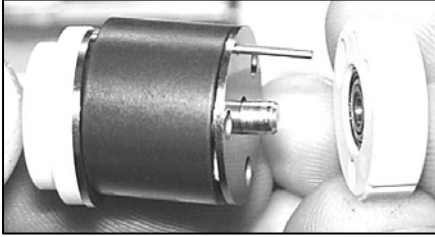
- *The Motor is Locked Up.* This is usually caused by the existence of rust and debris in the internal motor. Disassemble and clean all the motor parts to cure the problem. Occasionally, a broken rotor blade will seize the motor up. Replacing the blades will remedy that problem
- *The Motor Has Low Torque.* In addition to the repair step mentioned above, you need to do the following. Lap all the motor plates on fine grit sandpaper, (2000 grit). Replace the Forward/Reverse Valve O-Ring like in **STEP 9**. You may also need to replace the rotor housing (10009), if it is damaged. Also replace the motor blades (10018). A new motor spring (10051) can also help increase torque.
- *The Threads are Worn Out.* Simply replace the head as described in **STEP 9**.

## REASSEMBLY



### STEP 7

If you have completed **STEP 6** by replacing the front bearing and pin, it is time to assemble the motor. First insert the springs into the openings in the slots cut into the rotor. Next, place the motor blades into the long slots in the rotor over the springs. While carefully holding the blades in place, slide the rotor housing over the rotor containing the springs and blades.



### STEP 8

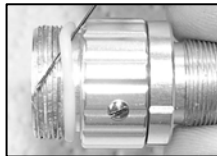
Now we need to insert the alignment pin into the rotor housing. This will allow us to correctly line-up the rear motor plates and head. Place the pin in the small hole in the rear of the rotor housing. Next, place the thin motor plate onto the rear rotor post and be sure that the alignment pin is through the small

hole in the plate. The thin plate can go on either way, but it is a good idea to lap it on some fine grit sand paper to get rid of any scarring first. With the bearing in the rear motor bearing plate, slide the rear motor plate onto the alignment pin. Make sure the pin slides through the small hole on the plate. Also make sure the bearing is no longer visible. It should but up next to the thin motor plate, hidden inside the large rear motor bearing plate.



### STEP 9

To reassemble the head, or connector end, first install the two big head o-rings (shown at left). Next, install the forward/reverse valve o-ring into the valve. Slide it into the head so the hole in the side of the valve will be visible through the groove in the head. Do this procedure vertically so the valve o-ring stays in place throughout the procedure.



With the valve in place, slide the forward/reverse ring onto the head and line the hole in the ring up with the hole in the side of the valve. Notice that the hole in the ring is slightly off center. Slide it onto the o-rings with the thin

edge closest to the threads (as shown). Insert the ring screw and tighten. Lastly, slide the third large o-ring onto the head.



### STEP 10

Place the threads of the head back into the 9/16" collet and secure. Place the inner motor assembly properly onto the head. Do this by placing the alignment pin in the small hole in the head. Make sure the large motor spring is sitting atop the motor (as shown). You should now lower the outer housing over the inner motor and begin to thread it onto the head. Snug the housing securely onto the head, add a drop or two of lube and test.

*Tip: The Five rotor blade motors generally have slightly more torque than the four blade motors.*