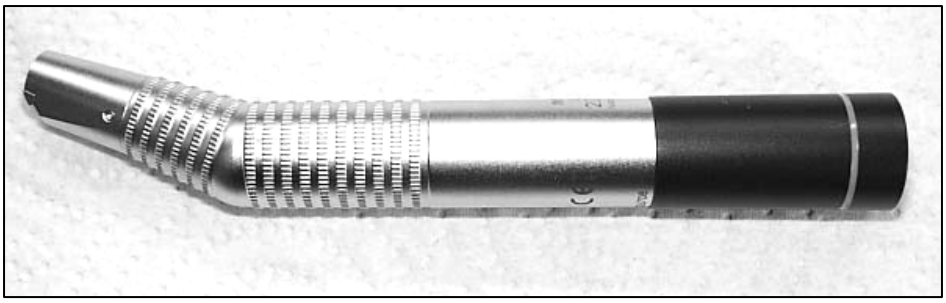
Kavo 2307LN Motor
Repair Procedure



This Kavo LN motor is slightly newer than the Kavo L models. It features a cellular optic rod as opposed to the old fiber optic bundles that tend to go bad quickly. As a result, the repair procedure requires more care but is easier as a whole. The repair procedure below will be using a 2307LN motor but the repair on this motor is very similar to that of the 2320LN, 2329LN and 2325LN motors. 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.
- There is a loud grinding noise inside the motor.
- The head is locked into the motor.

Disassembly

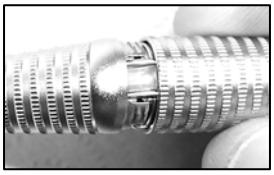
STEP 1
The first step is to make sure you have a tool that will allow you to reach inside the motor and turn the drive gear. This will allow you to try to jump-start the motor, which makes diagnosing the problem easier. Your tool will consist of a long shaft that has a star drive gear attached to one end. The opposite end of the shaft should be held by your wooden handled hand collet or other similar devise (see picture).

STEP 2
If the motor does not run, apply a minimum of 43psi to the unit (factory specs), and insert your tool into the top end of the motor. Twist the tool while applying pressure in an attempt to get the motor running. If it will run, you can test the torque and generally a cleaning will fix the handpiece. If the handpiece will still not run, there will be more serious problems inside.

STEP 3
Wrap the main housing of the motor with a strip of rubber (00032). Then wrap the black end cap with a strip of rubber. Hold the main housing piece firmly and unthread the end cap in a normal counterclockwise motion. Remove the end cap from the main housing.

STEP 4
Pull the visible coupler housing (air manifold), out of the main housing. You will notice the two water line o-rings (10117A), in the

long groove in the housing. If these are cracked or damaged, they can be replaced by removing them with a needle. Be careful not to lose the alignment ball located on the opposite side of the housing.

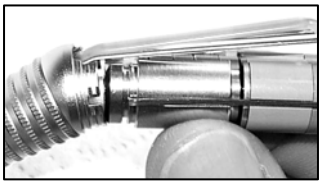


STEP 5

You now need to remove the main housing from the 45-degree elbow near the top of the handpiece. The main housing is held on by a series of cut grooves on its top inside edge. There are six of these cut grooves. Turn the housing 1/6 of a turn. Be sure the internal motor does not turn with the housing. Do not turn more than 7/6 as you can easily break the fiber optic rod. Once you have turned the housing and can slightly pull it away from the elbow…**STOP**. If you attempt to remove the housing, and the motor wants to slide out as well, you can break the fiber optics.

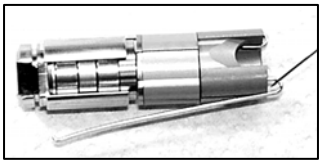
STEP 6

Look through the open end of the main housing. You will notice the fiber optic rod in the middle of the motor assembly (below left). The next step is to insert a small rod into the back of the housing that will press against the motor inside. Be sure this push rod has a blunt end and does not make any contact with the fiber optic rod in the center. While the push rod is in place against the internal motor, slide the main housing away from the elbow and off of the internal motor (below right).



STEP 7

Now that the main housing has been removed, the motor needs to be detached from the front elbow. Grab the internal motor assembly with one hand and the elbow section with the other. Be careful to avoid the fiber optic rod while you remove the motor assembly (see picture). Place the elbow and fiber optic rod assembly to the side. Also notice the water line. We will not disassemble this elbow section.

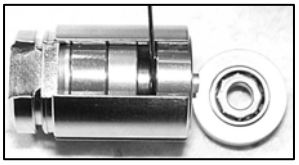


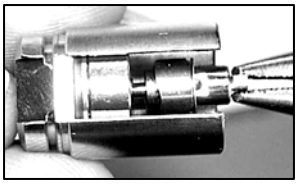
STEP 8

The two motor alignment rods on either side of the motor must be removed. Use a needle to remove these rods. Once they have been removed the following steps will describe how to pull the motor unit apart. Pay close attention to the direction and placement of those parts. Also be sure that your work surface is clean and free of other handpieces or parts.

STEP 9

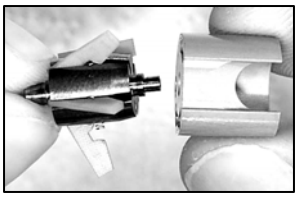
The internal motor consists of two halves: A reduction drive gear assembly, and a motor assembly. The picture shows the two halves. The reduction drive gear assembly is on the left while the motor assembly is on the right. Pull the two halves apart.





STEP 10

The first half we will deal with is the reduction drive gear assembly. This assembly is non replaceable. Do not loose any of these parts. This only requires a cleaning. Use a needle and small pliers to disassemble this section. You can ultrasonically clean these parts. The front bearing will fall apart very easily. You can leave it in the housing to avoid this. If it does require a cleaning, you can reassemble the front bearing. When you remove the drive shaft (left), notice there is a small washer on the right side of the post. Be careful not to lose this piece.



STEP 11

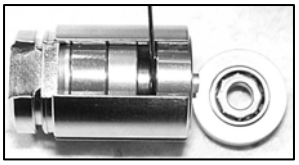
Now pull the upper motor plate and washer off the rotor. Then pull the rotor housing off of the rotor and blade assembly (see left). You can then pull the rotor out of the rear motor insert. Here you can examine the blades and rotor housing. If they are damaged or worn, they will need to be replaced.

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

- *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. Take a close look at the inside of the rotor housing as well. If it is really scarred up, it needs to be replaced.
- *The Motor has Low Torque*. In addition to the repair steps mentioned above, you need to do the following. Lap all the motor plates on fine grit sandpaper, (2000 grit). Replace the blades if they are grooved at all on their top edge. When replacing the blades, again look at the inside of the rotor housing to see if it needs to be replaced. If it still has low torque, you may need to adjust the motor bearing screw. It is part number 20 on your exploded picture. This screw is very touch so even a 1/32 adjustment might suffice. Turn this screw either direction to fine tune the adjustment.
- *There is a Loud Grinding Noise Inside the Motor*. This can be caused by old rotor blades or bad bearings. Try changing the blades first. If that does not remedy the problem, change the end plate bearing (MM1500) or drive plate bearing (MM1500). Look at the schematic drawing to find the location of these bearings. A last resort would be to change the rotor bearing (SO-KVLN-Rear), which is located inside the Rear Motor Insert.
- *There is a Water Leak*. Generally, this is caused by either bad o-rings on the coupler or bad o-rings on the Kavo Coupler Housing (air manifold). First, make sure the o-rings on the doctors coupler are good. Then replace the two o-rings (10117A) on the coupler housing. See **STEP 4**.
- *The Head is Locked into the Motor*. The Latch head release collar is located just above the 45-degree elbow on the motor. This collar often becomes jammed or locked up. To release it, you may need to use a strip of rubber to twist. If you were to look down on the motor from a birds-eye-view, you will need to turn the collar in a clockwise motion to release the head.

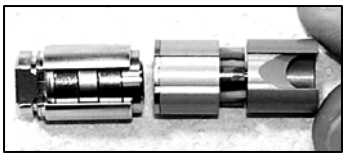
Picture Number	Part Number	Description
1	N/A	Angle and Head Release Collar Assembly
2	10123	Kavo LN Style Motor Housing
3	N/A	Kavo Coupler Housing
4	SO-2307LN Cap	Kavo LN Style End Cap
5	N/A	Gear Reduction & Bearing Housing
6	N/A	Drive Gear and Front Bearing
7	N/A	Bearing Spacer
8	N/A	Drive Shaft
9	10186-P	Kavo Drive Bearing
10	MM1500	End Plate and Bearing
11	10162	Small Spacer Washer .008”
12	N/A	Upper Motor Plate
13	10121	Kavo LN Style Rotor Housing
14	N/A	Rotor
15	10119S	Rotor Blade Spring Set
16	10119	Rotor Blade Set
17	10141	Kavo LN Style Motor Alignment Rod
18	10121B	Rear Motor Insert
19	SO-KVLN-Rear	Rotor Bearing
20	N/A	Motor Adjustment Screw

Reassembly



STEP 12

The first reassembly step is to put the gear reduction assembly together. Place the front, wavy inner race bearing, onto the drive gear assembly. This is part 6 on your schematic drawing. Then insert the drive shaft into the drive gear assembly (see above left picture). Push the large spacer, bearing and end plate into the assembly. Note that the end plate bearing is open to the spacing plate.



STEP 13

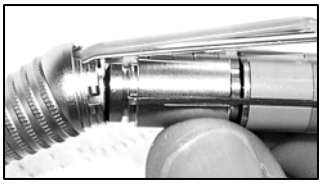
Press the rotor into the rear motor insert. Insert the springs into their appropriate holes in the rotor. With this partial assembly together, place the rotor blades into the open slots on the rotor. The springs will try to shoot the blades out of the slots so hold the blades carefully. Now push the rotor housing over the blades. The rotor housing is non-directional so it does not matter which side you press on first.

STEP 14

Once the rotor housing is over the blades, place the spacing plate over the end of the rotor. There is a small round groove cut around the inner hole on the plate on one side (see picture). This groove will house the small spacer washer (part 11 on the above exploded view). Be sure this groove is facing away from the rotor. Once the plate is on the rotor post, place the washer in the appropriate groove.

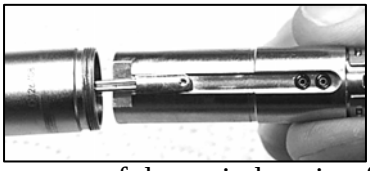
STEP 15

Push the drive gear assembly and the motor assembly together. Note that the fork on the end of the rotor must line up with the flat edge on the end of the drive shaft for a nice fit. Complete this part of the assembly by installing the alignment rods.



STEP 16

Place the drive gear and motor assembly back into the elbow section. With this in place, slide the main housing over the motor and twist-lock it to the elbow. Note: there is a cut out on the inside of the main housing for the water lines and optics. Remember to only twist it 1/6 of a turn. At that point, the grooves will be aligned.



STEP 17

Insert the coupler housing back into the main housing. There is a small alignment ball in the middle of the connector housing. This must line up with a small groove cut out of the main housing for the two pieces to merge correctly.

STEP 18

Wrap the main housing with a piece of rubber (00032). Then screw the end cap firmly onto the main housing to insure that it will not come loose. Test and evaluate.