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## "No Solder" Bellows Replacement Method for Old Style Atmos by Daniel Henderson

I recently purchased an old ATMOS with defective bellows. These bellows were held into the motor housing by a back plate, which was soldered to the full 5" circumference of the motor housing. The traditional repair method would be to unsolder this assembly, replace the bellows, and resolder the assembly. This method is not only extremely difficult, but will destroy the factory finish on the housing. The following method was used successfully and required around 3 hours to complete.

The old style bellows assembly is soldered to the back plate, and is significantly larger in diameter than new replacement bellows (around 5" vs. 4 3/8"). Because of the new bellows are smaller in diameter, it is possible to cut the old back plate open while leaving the solder and an annular ring of the original back plate attached to the motor housing. With this removed, the old bellows may be removed in pieces and the new components installed.

Once the bellows and spring have been installed, the old back plate is installed and pressed just under the lip and secured in place using retaining washers which function like a "snap ring" holding the assembly together.

The method I used to accomplish this is as follows:

1. Several layers of masking or blue tape were applied around the outside side of the motor housing to prevent scratching.
2. The motor housing was mounted in a lathe chuck with the stud end facing the lathe tail stock. (Figure 1)

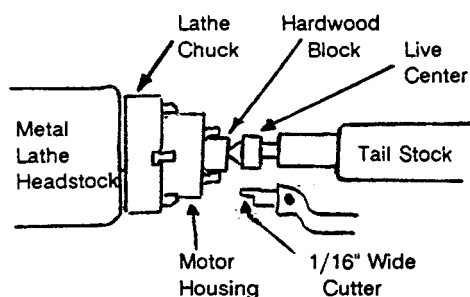


Figure 1  
Cutting Old Backplate On Lathe

3. A block of 3/4" hardwood was cut to fit between the mounting studs and cover the back plate opening.
4. A live center was placed against the wood block and moderate pressure applied to ensure the housing was held firmly against the chuck. This also ensures that the housing will not spring open when cut.
5. A narrow "parting tool", 1/16" or less is mounted in the tool post holder and positioned to cut an opening slightly larger in diameter than the new bellows (approximately 4 3/8").
6. Slowly a plunge cut is made until the back plate is cut through.
7. Once the back plate is cut, the bellows may be removed by breaking it into pieces and removing it through the formed opening. Peel all remaining bellows material from the inside of the back plate and use a utility knife to remove any solder burr.
8. Remove any burr from the back plate and housing.
9. Fabricate a split-retaining washer as shown below. I recommend using a good quality, 26GA (Gauge) sheet metal. I used 0.015" (0.38mm) blue spring steel. I fabricated it as a single washer then cut it in two.

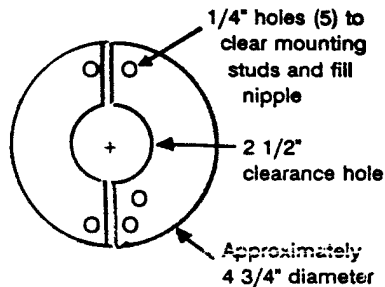


Figure 2  
Retaining washers

10. Assemble motor housing by pre-chilling the bellows in a freezer for 4-5 minutes. Place the collapsed bellows into the housing, install the spring, and cover. Depress the cover into the housing and place one, then the other retaining washer over the mounting studs. The force of the spring makes this moderately difficult. A fully collapsed bellows is essential.

Note: I prefer to use a cube of ice because of the visual advantages and you may well forget that the bellows is in the freezer. Please be sure to wipe the bellows dry with a paper towel and never use heat to dry.

11. Once both plates are installed, the spring force will hold the assembly together and the drum cover will hide the repair.

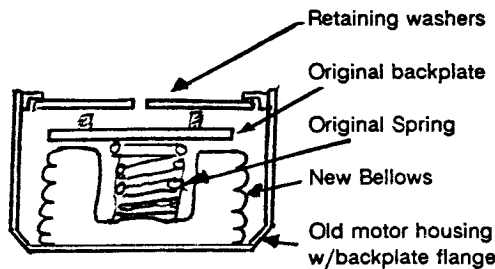


Figure 3  
Motor Assembly Method

If you would like for me to do the same procedure, which keeps the original bellows completely original, except the "dead" bellows, I charge \$1,200.00, which includes the new bellows. This price assumes it would be part of a complete overhaul. The actual original bellows is replaced with a new one.

The procedure is very time consuming. After I have the bellows cut and the retaining washer made, I first have to extract the old bellows. This involves cutting and separating the bellows. Since the bellows indicator and the original back plate are one unit, I have to painstakingly cut and remove all of the old bellows from both pieces.

This saves the original back plate and bellows indicator. The bellows indicator has the date of production on it. Then placing the retaining washer is a difficult procedure which can take ½ hour.

The result is all the original parts are reused and the only changes are the new bellows and the retaining washers, which are hidden from view by the drum cover.

I do offer this procedure as a “stand-alone” service and the cost will be \$1,400.00. That includes return shipping (in the US) and you will have to remove the entire bellows (cover and motor included) and sent it to me and reinstall the completed bellows. At least ½ of the \$1,400.00 (\$700.00) must be pre-paid and the service can take as long as 3 months because of slowness in the ordering process for the new bellows.

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