

RING COMPRESSORS

【OTH SERIES & 4TH SERIES】

SERVICE SEQUENCE

This is a service manual for the maintenance and repair of VFC600A, Ring Compressor. This manual serves as a repair guide for our entire line of Ring Compressors, because VFC600A is used as an archetype of our ring compressors. Refer to manual INV-YH309 for part names and assembly diagrams.

Refrain from reusing of worn parts, especially oil seals, bearings and silencers.

When ordering a part, please specify model No., serial No. on nameplate, and the name and code No. of the part.

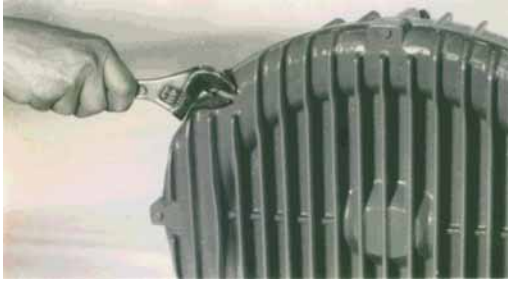
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1: DISASSEMBLING COMPRESSOR UNIT



STEP DC 1

To check or replace the impeller ball bearings, oil seal and / or motor winding, first remove bolts and casing cover from the casing.



STEP DC 2

To loosen the bolt, bend back nailed washer using a screwdriver and hammer.



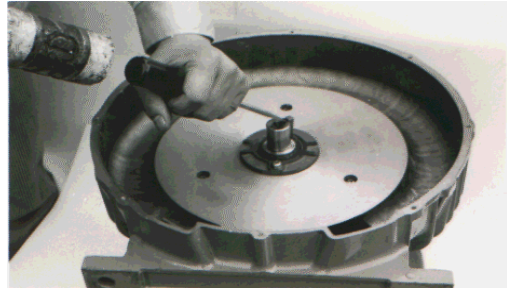
STEP DC3

Remove the bolt and take off the nailed washer and retaining plate with pin from the motor shaft. To prevent the impeller from moving, insert a screwdriver between the blades of the impeller as shown.



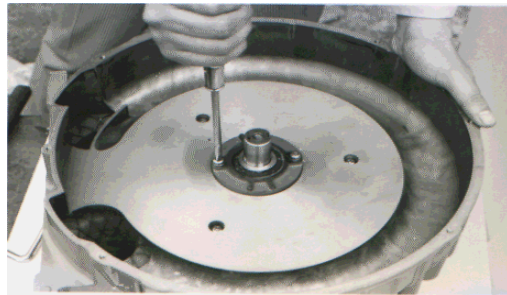
STEP DC 4

Lift and pry the impeller off from the casing with two screwdrivers. Exert equal force on both screwdrivers.



STEP DC 5

Remove a key on the shaft gently.



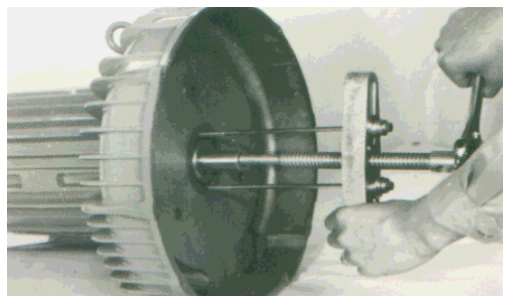
STEP DC 6

Remove screws holding end cover in place and pick up bearing shims on the shaft. Be careful not to lose them.



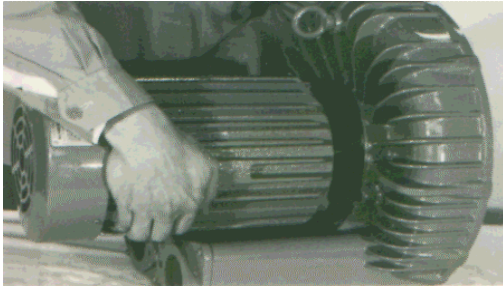
STEP DC 7

Remove bolts holding the motor in place.



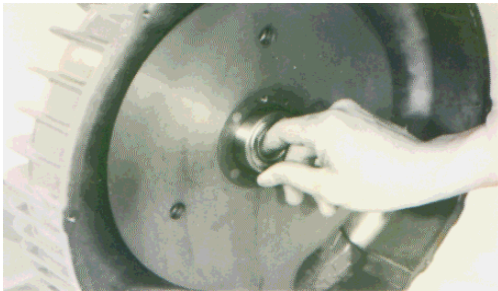
STEP DC 8

Push out the motor from the casing by puller whose two bolts can be placed in screw holes of the end cover bolt. To avoid damaging the shaft end, insert a disk or metal piece between the shaft end and the tip of puller.



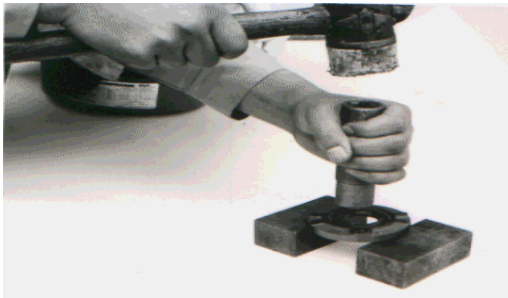
STEP DC 9

Remove the motor from the casing carefully.



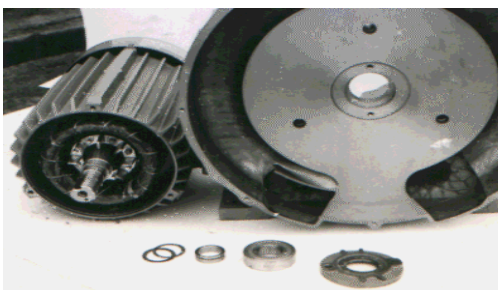
STEP DC 10

Pull the front bearing out from the casing by hand, if this is not successful, push it out from the back side of the casing with a socket and hammer using a straight and gentle motion.



STEP DC 11

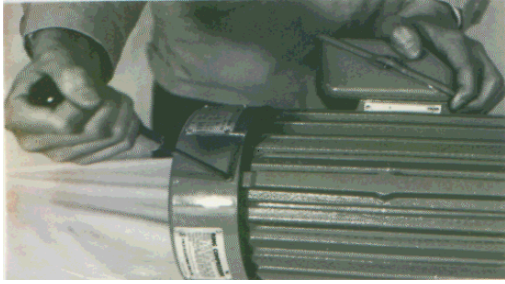
Tap the oil seal out from the end cover with socket and hammer.



STEP DC 12

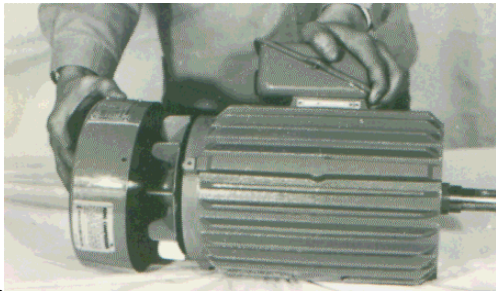
Now you have disassembled the compressor unit.

2 : DIASSEMBLING MOTOR UNIT



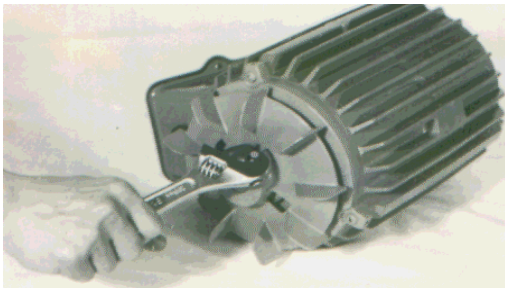
STEP DM 1

Remove screws holding fan the cover in place. Before doing this, mark positions between the fan cover and the motor frame for easier reassembling.



STEP DM 2

Pull the fan cover out of the motor.



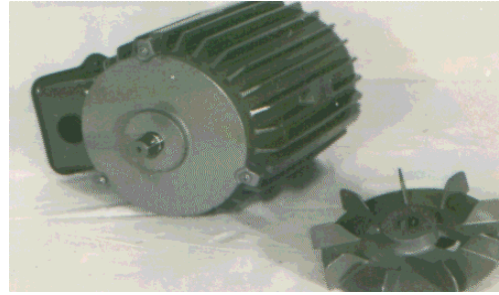
STEP DM 3

Take off the bolt with the motor fan.



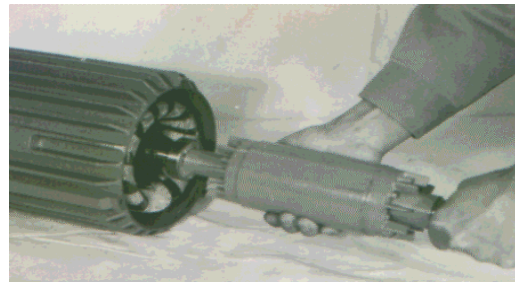
STEP DM 4

Pull straight out and pry the fan cover off from the shaft with two screwdrivers. Use puller for easier handling.



STEP DM 5

You have removed the fan and fan cover.



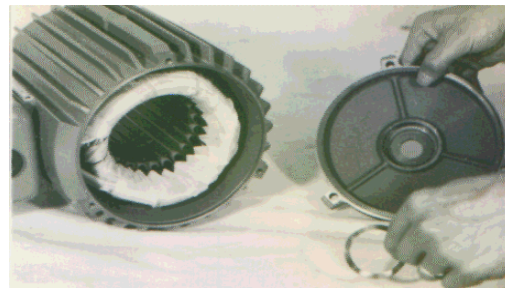
STEP DM 6

Pull the rotor-shaft straight out of the stator. Be careful to avoid damaging the stator winding.



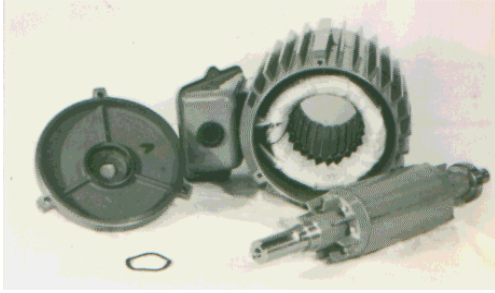
STEP DM 7

Remove the rear housing by hammering on a screwdriver.



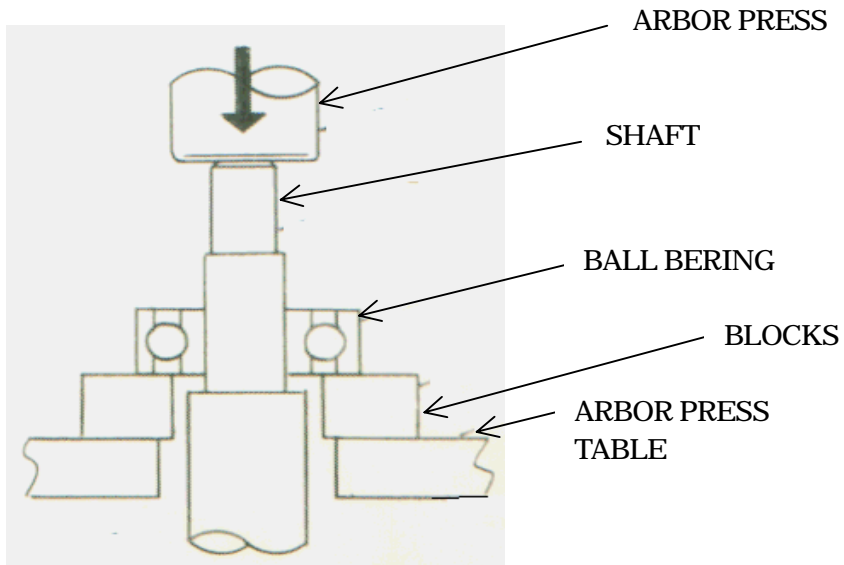
STEP DM 8

When removing the rotor shaft and the rear housing, be careful not to lose the spring washer.



STEP DM 9

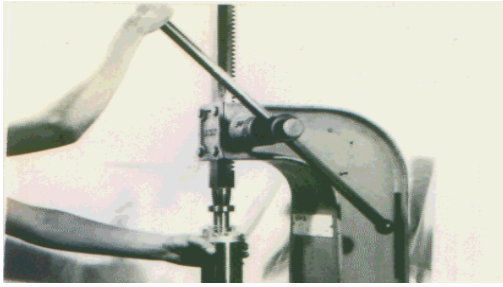
After disassembling the motor, clean it with a cloth, brush, and air, then apply a few drops of machine oil to the machine worked surfaces.



STEP DM 10

Check the rear bearing. If it is worn, press it out of the shaft. Never use a worn, damaged or used bearing.

3 : ASSEMBLING MOTOR UNIT

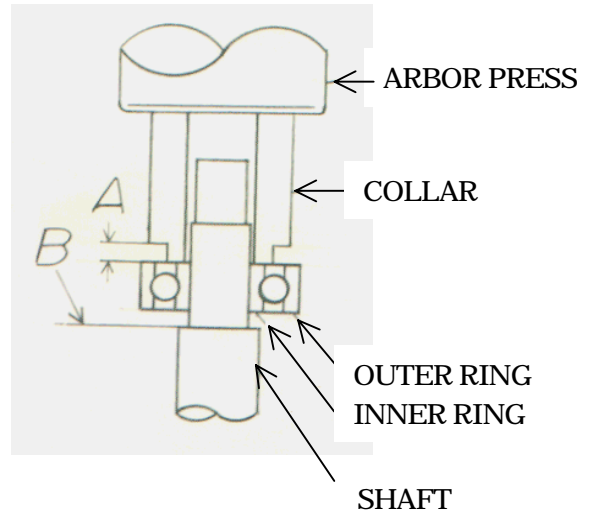


STEP AM 1

Begin by mounting the rear-bearing. Press the rear bearing straight and gently onto the shaft as shown in the illustration and photo.

Notice

1. Use a specified new bearing and grease.
2. Keep a clearance "A" between the outer ring of bearing and the collar.

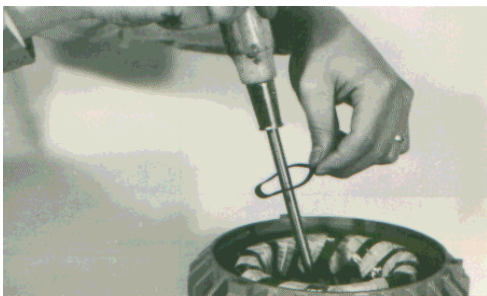


3. Make sure that there is no gap between the inner ring of bearing and the surface "B" of the shaft.



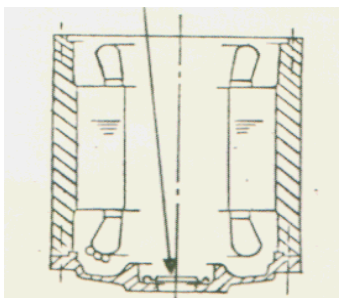
STEP AM 2

Fit and tap the rear housing onto the motor frame, and tighten screws. Be sure to line up the marks mentioned earlier.

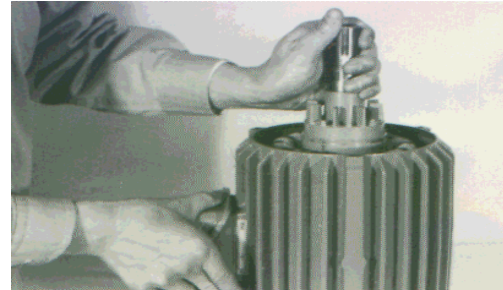


STEP AM 3

Refer to the photo and illustration for a close look at application of the spring washer into the bearing housing of the rear-housing.



SPRING WASHER



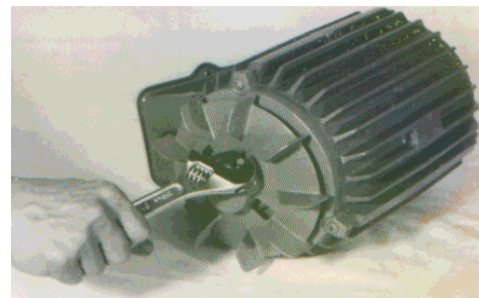
STEP AM 4

Mount the rotor-shaft back into the motor frame. Be sure not to damage winding.



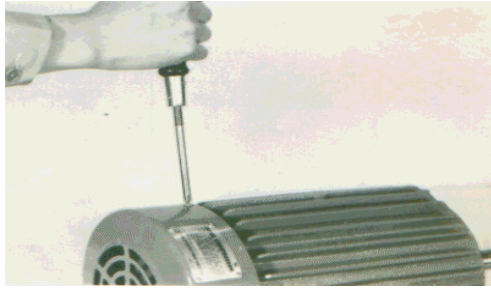
STEP AM 5

Straight and gently tap the motor fan back onto the shaft while holding onto the opposite shaft end.



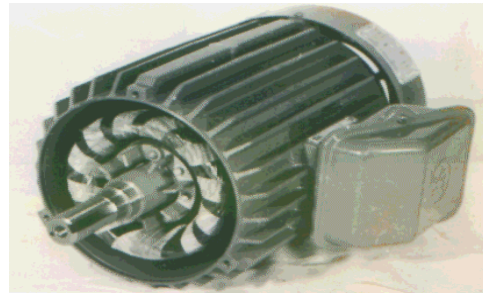
STEP AM 6

Tighten the fixing bolt for the motor fan securely to avoid looseness.



STEP AM 7

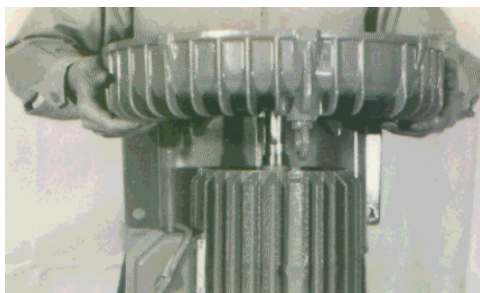
Slide the fan cover onto the motor and tighten screws. Be sure to line up the marks as mentioned earlier.



STEP AM 8

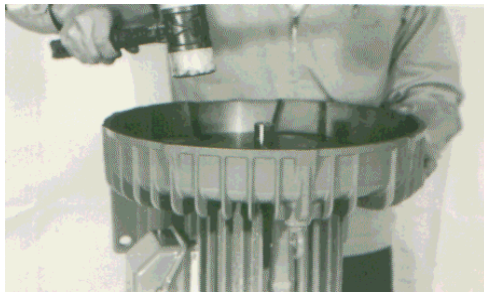
Now you have assembled motor the unit. Go on to the next step to assemble the compressor unit.

4 : MOUNTING MOTOR ONTO CASING



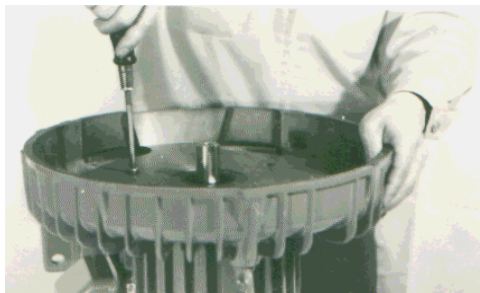
STEP MM 1

Mount the casing on the motor upright as shown. Be sure not to damage the inside of the oil seal by the edge and the key way of the shaft.



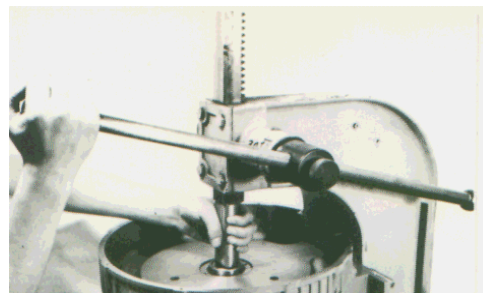
STEP MM 2

Tap and fit hermetic seals of casing and motor. Use plastic head hammer.



STEP MM 3

Tighten screws and spring washers securely.

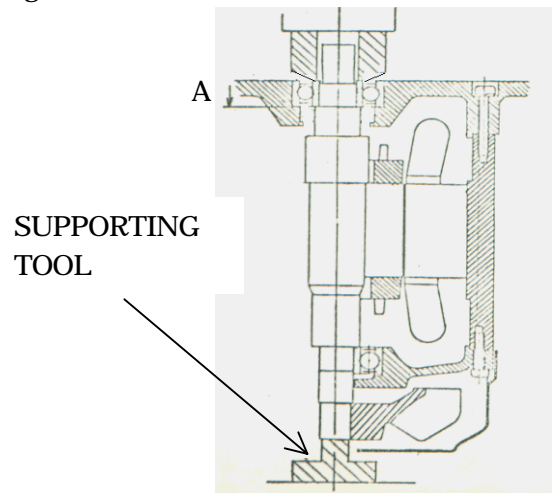


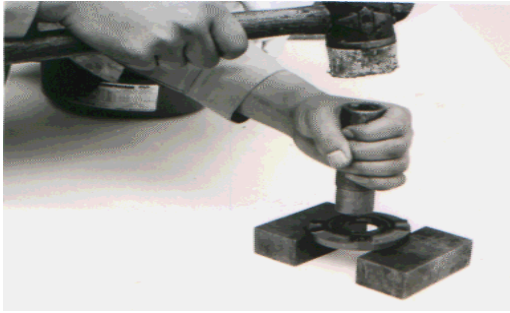
STEP MM 4

Press the front bearing straight and gently into the bearing housing between the shaft and the casing.

Notice

1. Use a specified new bearing which is lubricated with specified grease.
2. Collar for pressing the the front bearing should have a flat end wide enough to press equally on both the outer and inner ring. Don't use the rear bearing collar.
3. Support the opposite end of the shaft with a special supporting tool.
4. Make sure that there is no gap between bearing and the surface "A" of the shaft.





STEP MM 5

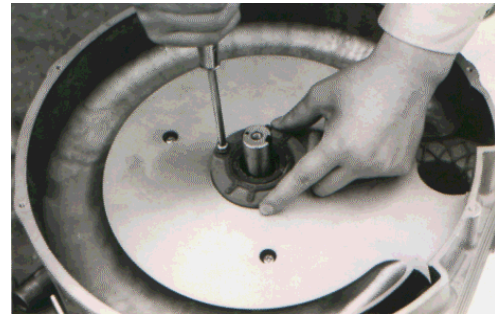
Gently tap the oil seal into the end cover with oil seal-tapping tool, and fill in with grease.

Notice

1. Use a specified new oil seal.
2. Be sure the oil seal is facing the same direction as shown in the illustration.
3. Fill in 2/3 of the volume of space (A) with the following specified grease, as shown in the illustration.

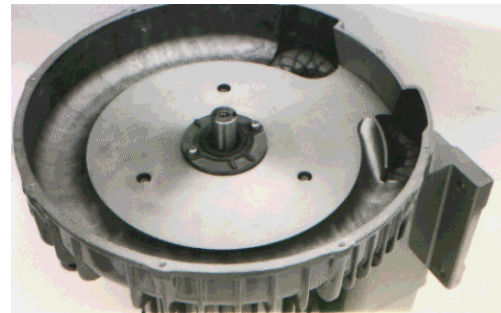
VFC100A(P).....VFC40(P)
Multemp SRL grease

VFC500A.....VFC904A
Urea grease(Ens)



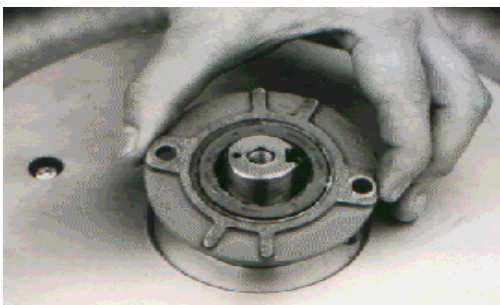
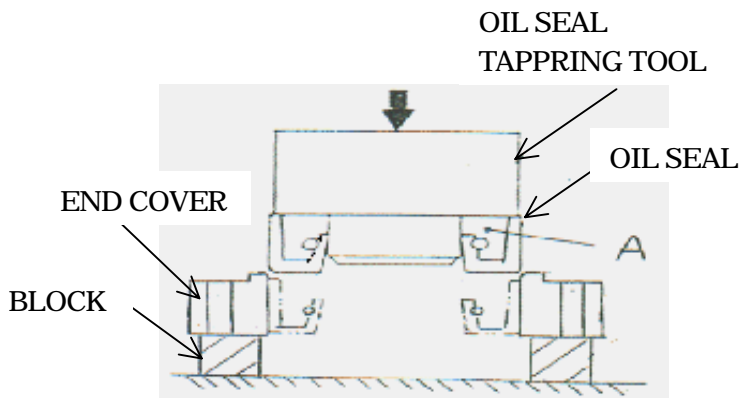
STEP MM 7

And tighten screws and spring washers.



STEP MM 8

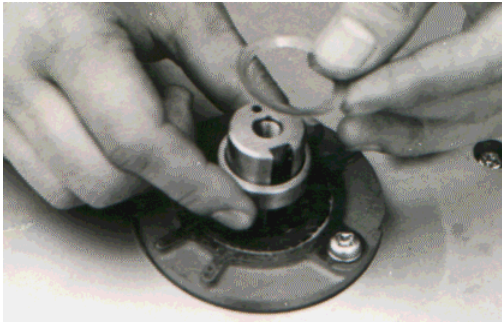
After finishing intermediate assembling, clean the inside of the casing with cloth, brush and air.



STEP MM 6

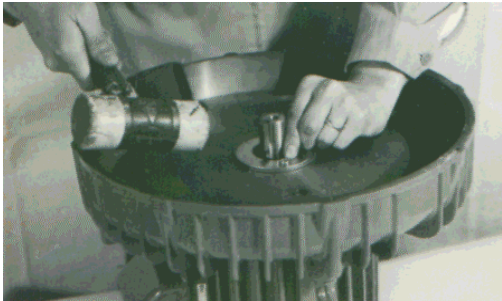
Set the end cover on the casing.

5 : ASSEMBLING COMPRESSOR UNIT



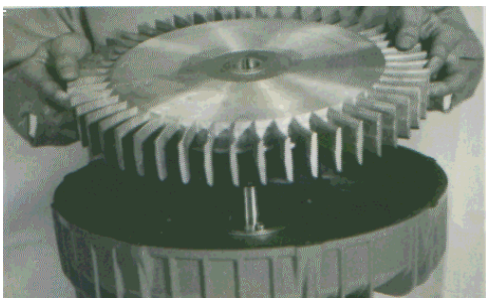
STEP AC 1

Remount all of the collar and bearing shims which you took off, on the shaft. When using a new impeller, casing and / or motor or if you have lost a part of shims.



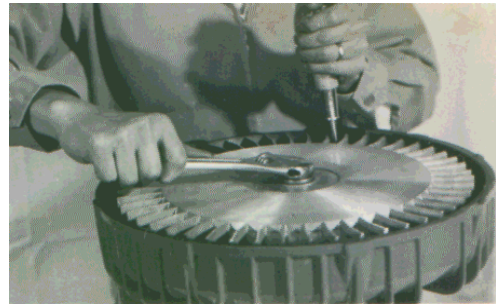
STEP AC 2

Measure depth "A" and width "B" as shown in the figure in step AC-5, and apply bearing shims of approximately half the thickness of the difference between A and B. Then mount key onto shaft



STEP AC 3

Set impeller straight on the shaft. Rotate impeller slowly by hand making sure it does not come in contact with the casing.



STEP AC 4

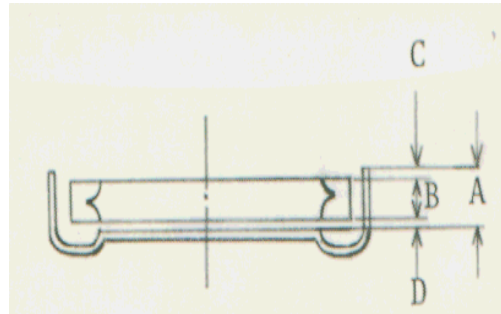
After setting a pin, retaining plate and nailed washer on the shaft, tighten the bolt and calk the pin. To prevent the impeller from moving, use screwdriver in the same manner as it is used in the disassembling process.



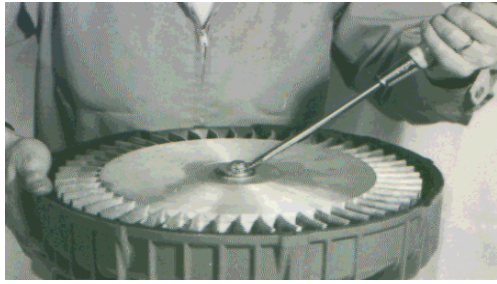
STEP AC 5

Measure the gap C and use the following equation to calculate gap "D".

$$D=A-B-C$$

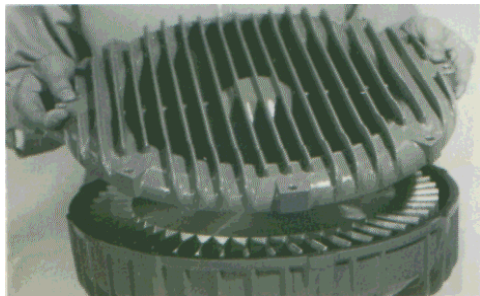
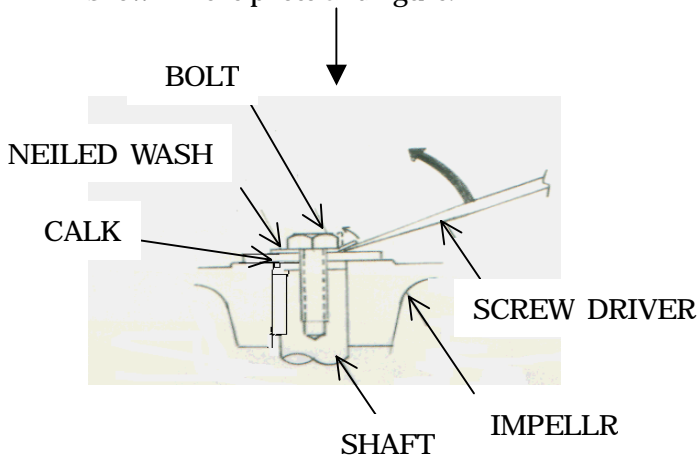


Make sure the difference between the gap C and D is less than 30%, if not, remove the impeller again and adjust thickness of the shims.



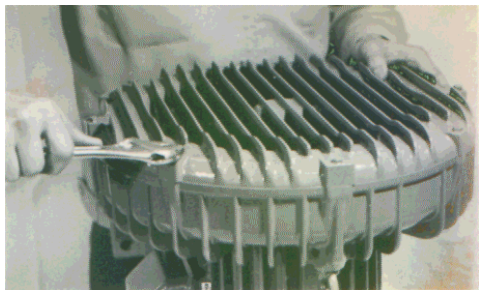
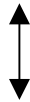
STEP AC 6

After adjustment of the gap, tighten the bolt securely and bend up an edge of the nailed washer to prevent the bolt from loosening as shown in the photo and figure.



STEP AC 7

Put the casing cover on the casing.



STEP AC 8

Tighten the bolts to finish the whole assembling.



STEP AC 9

After assembling, check to see if the motor rotates smoothly by turning the motor fan by hand.