

REPAIR PROCEDURE



KUKEN CO., LTD.

*OVERHALING THE MOTOR ASSEMBLY

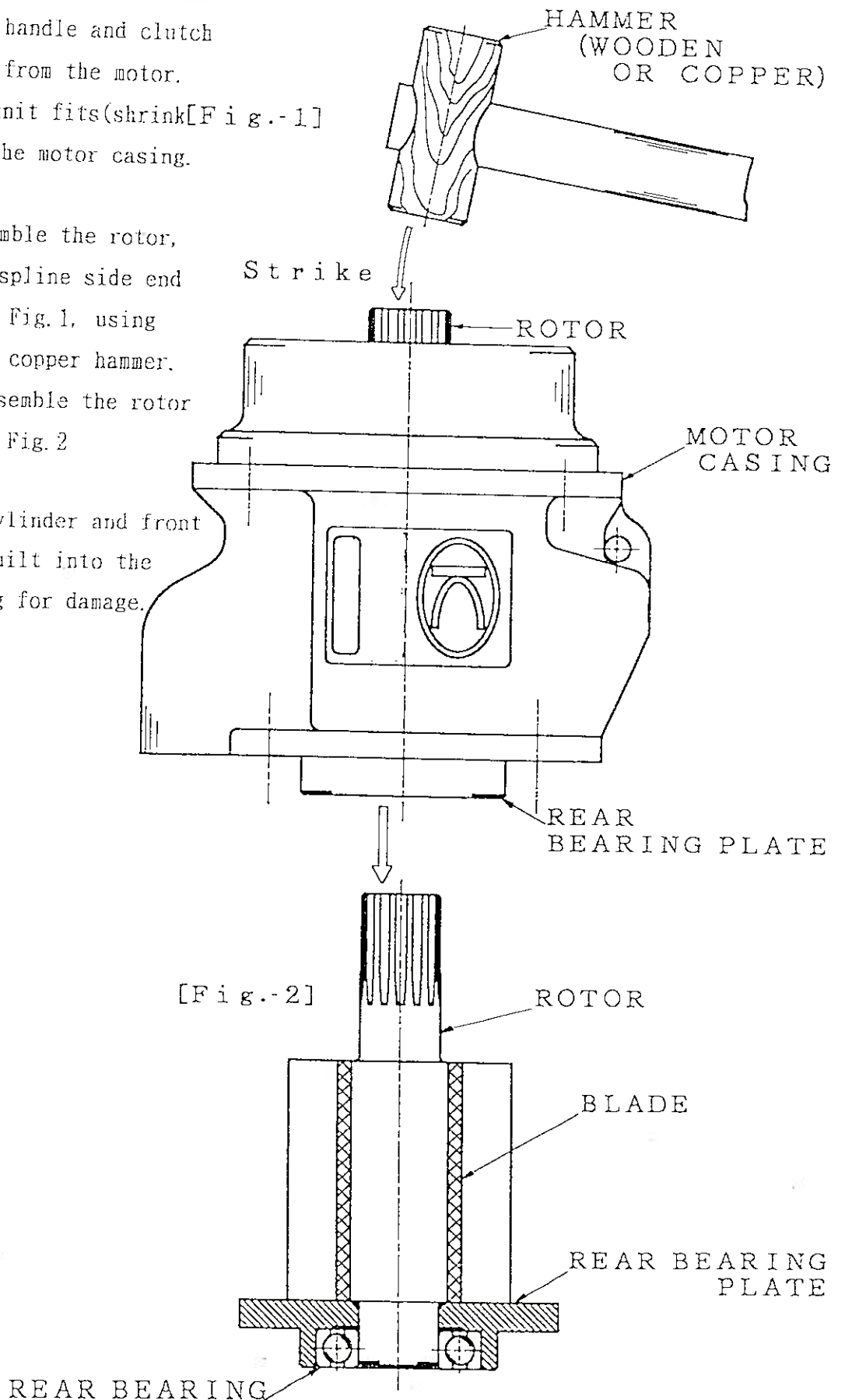
Remove the handle and clutch assemblies from the motor.

The motor unit fits (shrink fit) into the motor casing.

To disassemble the rotor, hammer its spline side end as shown in Fig. 1, using a wooden or copper hammer.

Then, disassemble the rotor as shown in Fig. 2

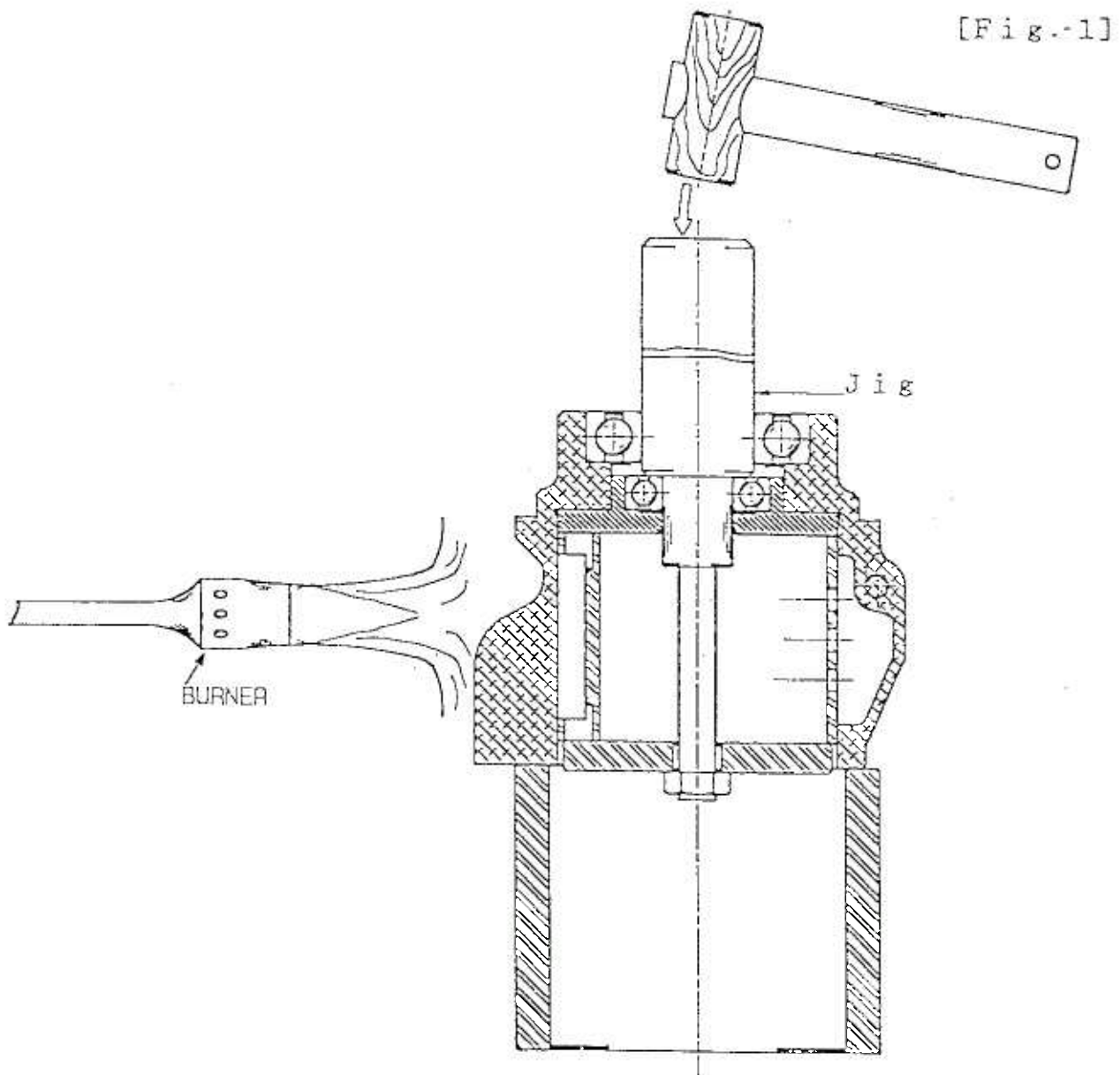
Check the cylinder and front end plate built into the motor casing for damage.



*REMOVE CYLINDER AND FRONT END PLATE FROM THE MOTOR CASING

As the cylinder and the front end plate are not detachable from each other, use the jig as shown in Fig.1, to remove them from the motor casing.

Insert the jig and uniformly warm the outer surface of the motor casing using a burner. Then lightly hammer the top of the jig to draw it out.

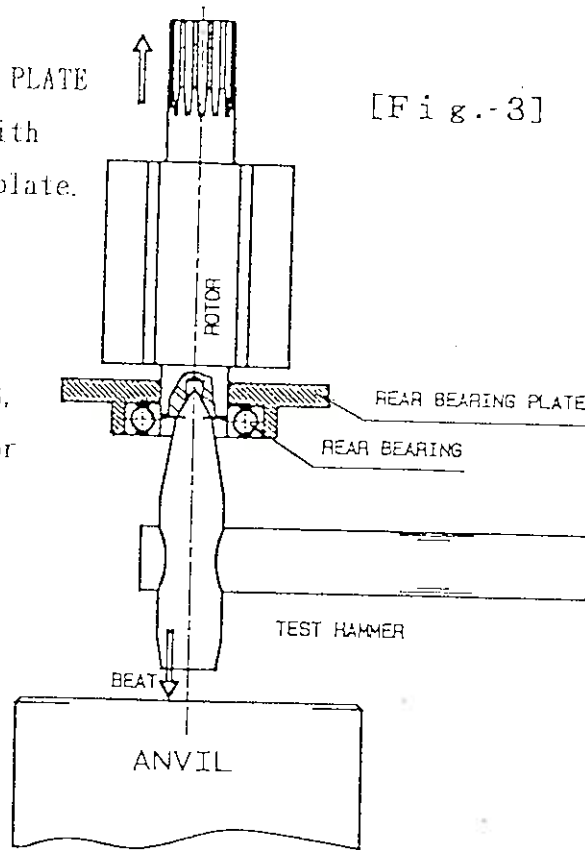


*REMOVING ROTOR FROM THE UPPER END PLATE

The rear end plate shrink fits with the rotor shaft end of rear end plate.

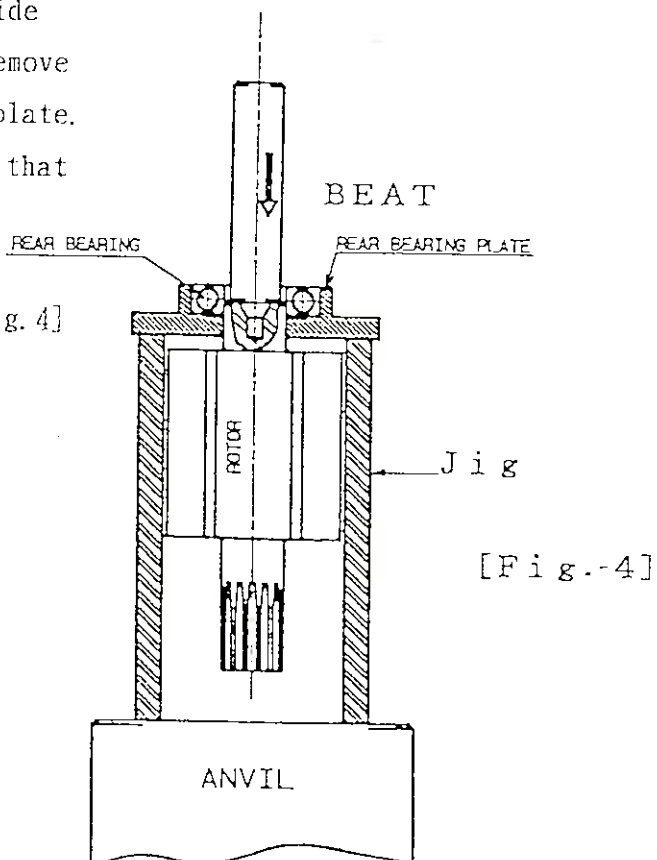
(Installation without jig)

Remove the blades from the rotor assembly. Then, as shown in Fig. 3, apply the test hammer to the rotor end which appears through the end plate. Hit them on the anvil to remove the rotor from the upper end plate.



(Installation with jig)

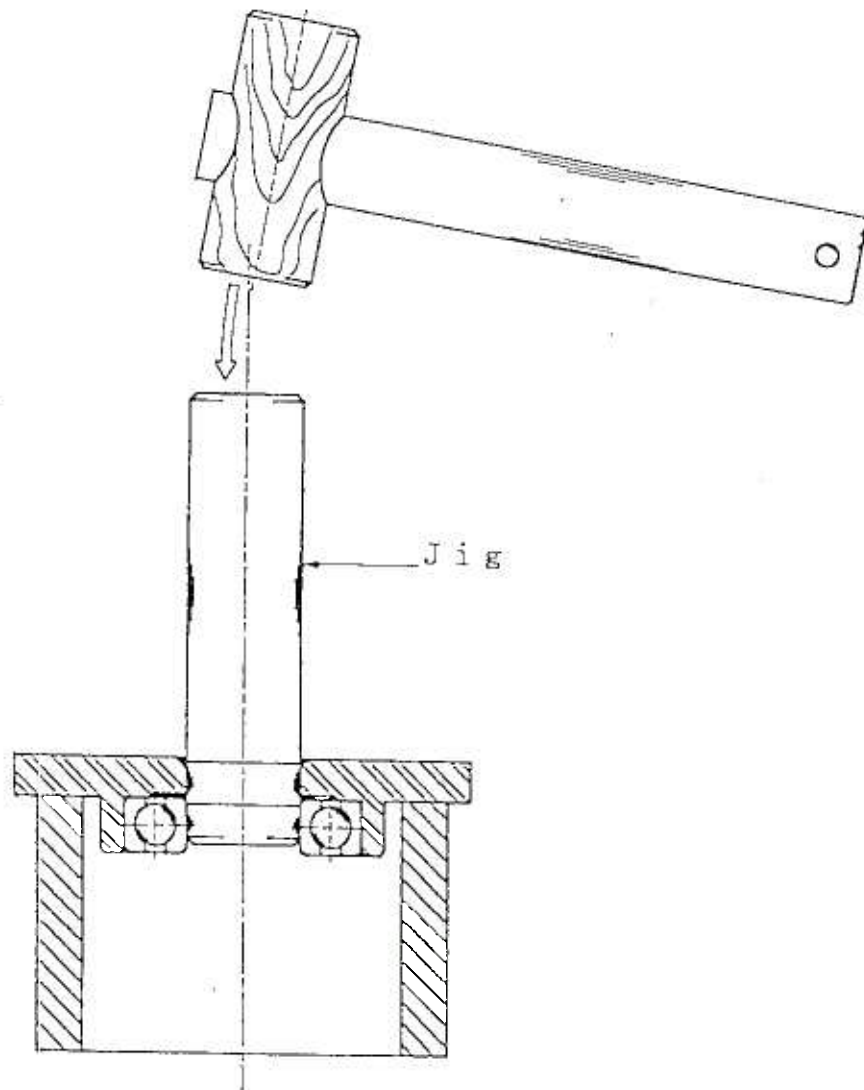
Use a cylindrical jig that has a larger inside diameter than the outside diameter of rotor. Place the rotor assembly inside the jig. Then use a rod to remove the rotor from the rear end plate. Apply a rod to the rotor end that appears through the rear end plate and lightly strike the rod to draw out the rotor. [Fig. 4]



*REMOVEING BEARINGS FROM THE END PLATE

The special jig shown in Fig. 2 is recommended for removing the bearings. Hold the end plate in your hand for the smaller and medium sized machines, and plate it on the cylindrical base for larger ones. Then hammer the top of jig to draw out bearings.

[Fig.-2]



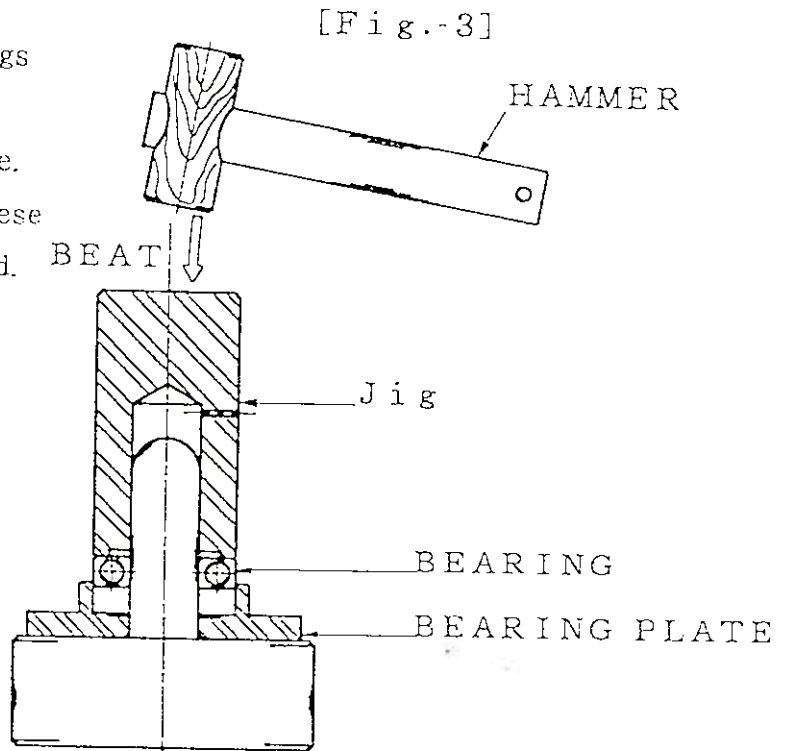
*INSTALLING BALL BEARINGS IN THE END PLATE

(Installation with jig)

Use the jig as shown in Fig. 3.

The rod through the end plate and ball bearings will guide the ball bearings to be easily and rapidly inserted into the end plate. No damage can result to these pieces by using this method.

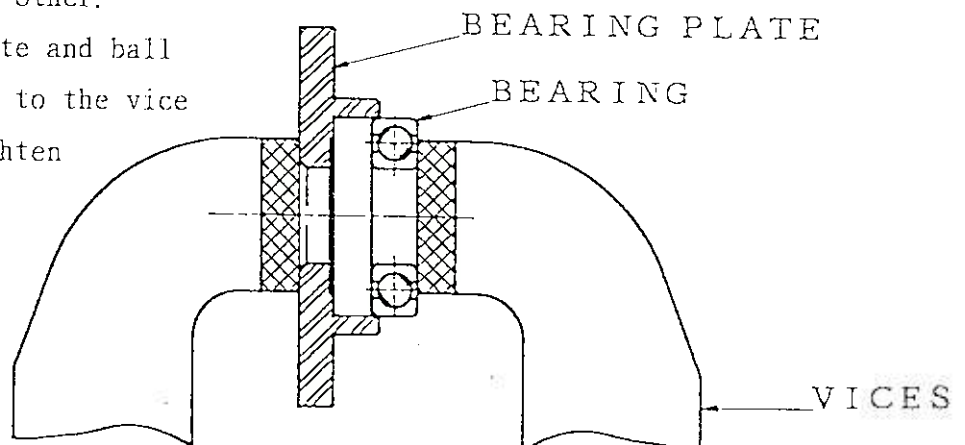
[Fig. 3]



(Installation without jig)

Using a vice, press the ball bearings onto the end plate. For correct installation, the following checks are required: the contact surfaces of the vice must be completely flat, and the surface must be parallel each other.

Hole the end plate and ball bearing parallel to the vice pieces. Then tighten the vice slowly. [Fig. 4]



[Fig.-4]

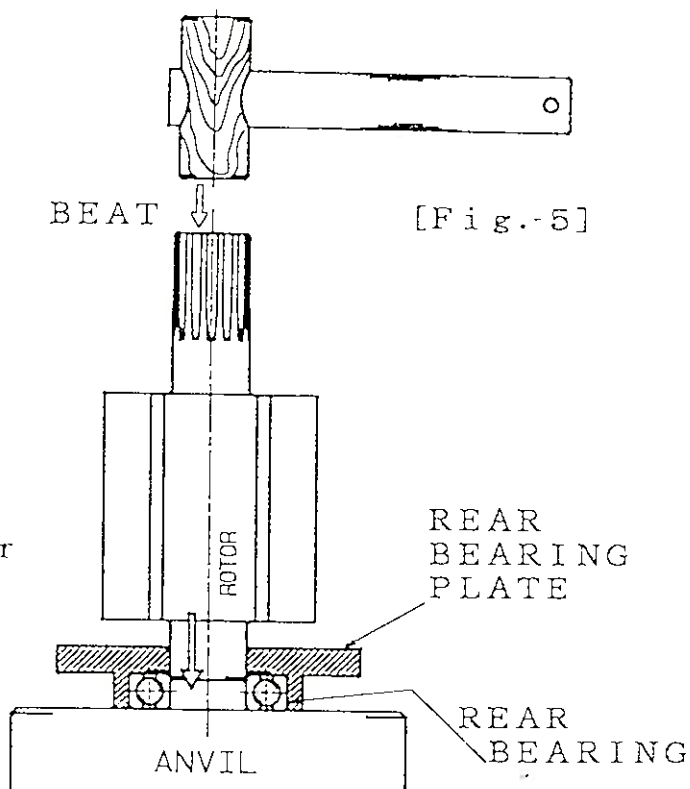
*ASSEMBLE ROTOR ON REAR END PLATE

(Installation without jig)

Inspect the related parts.
In case the parts are still usable or repairable, confirm the replacement of parts, and replace any damaged parts with new ones. Clean and degrease each parts.

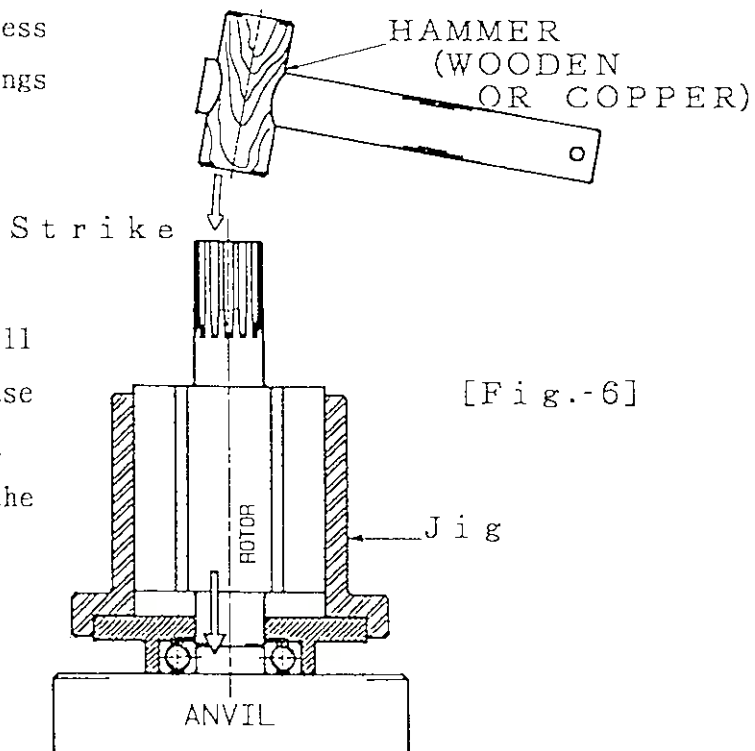
Using a copper or wooden hammer, press the rotor into the hole for the ball bearings on the rear end plate as per Fig. 5.

While lightly hammering, rotate the rotor several times to be sure of its squareness in relation to the surface of the rear end plate. [Check the top of anvil for flatness because poor flatness can result in an inclined bearings unit.]



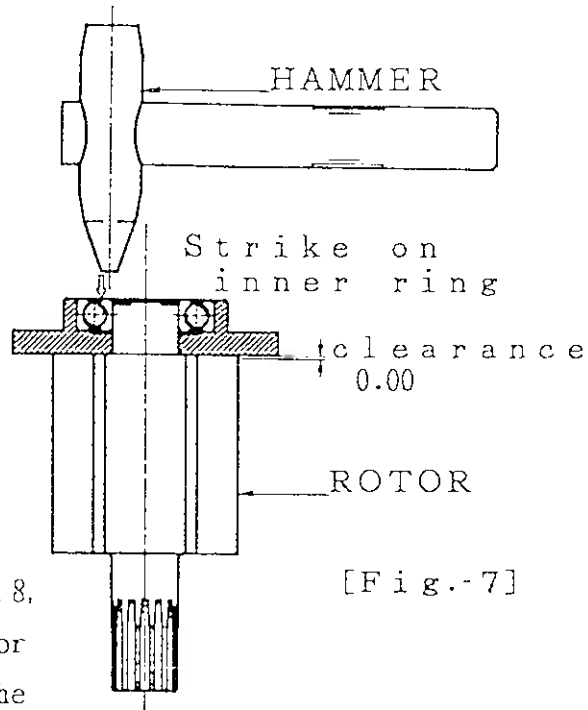
(Installation with jig)

Using the jig shown in Fig. 6 will facilitate rotor assembly because it holds the rotor exactly at a right angle to the surface of the rear end plate.

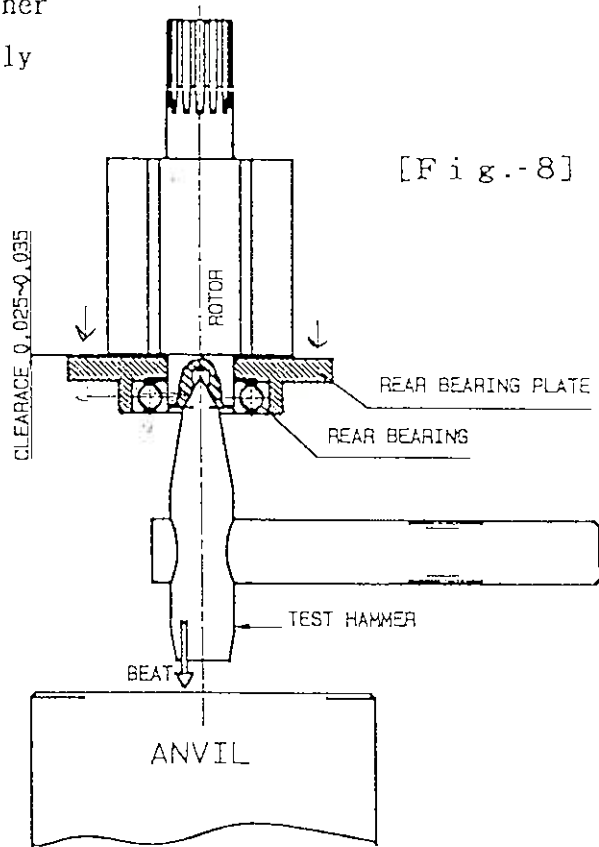


*ADJUSTING CLEARANCE BETWEEN THE REAR END PLATE AND CONTACTOR FACE ON ROTOR

After pressing the rotor through the ball bearings according to Fig. 5 and 6, lightly hammer the inner ring of the ball bearings to eliminate clearance between the rear end plate and contact face on the rotor.



To from the required clearance (0.025-0.035), as shown in Fig. 8, apply a test hammer to the rotor end that appears through all the bearings and lightly strike it on the anvil. If the clearance is too large, hammer the inner ring of ball bearings lightly as specified in Fig. 7 until a suitable is obtained.



Be sure to hammer the inner ring of ball bearings alternately to achieve a symmetrical position against motor shaft center.

*INSERT ROTOR ASSEMBLED WITH REAR END PLATE INTO MOTOR CASING

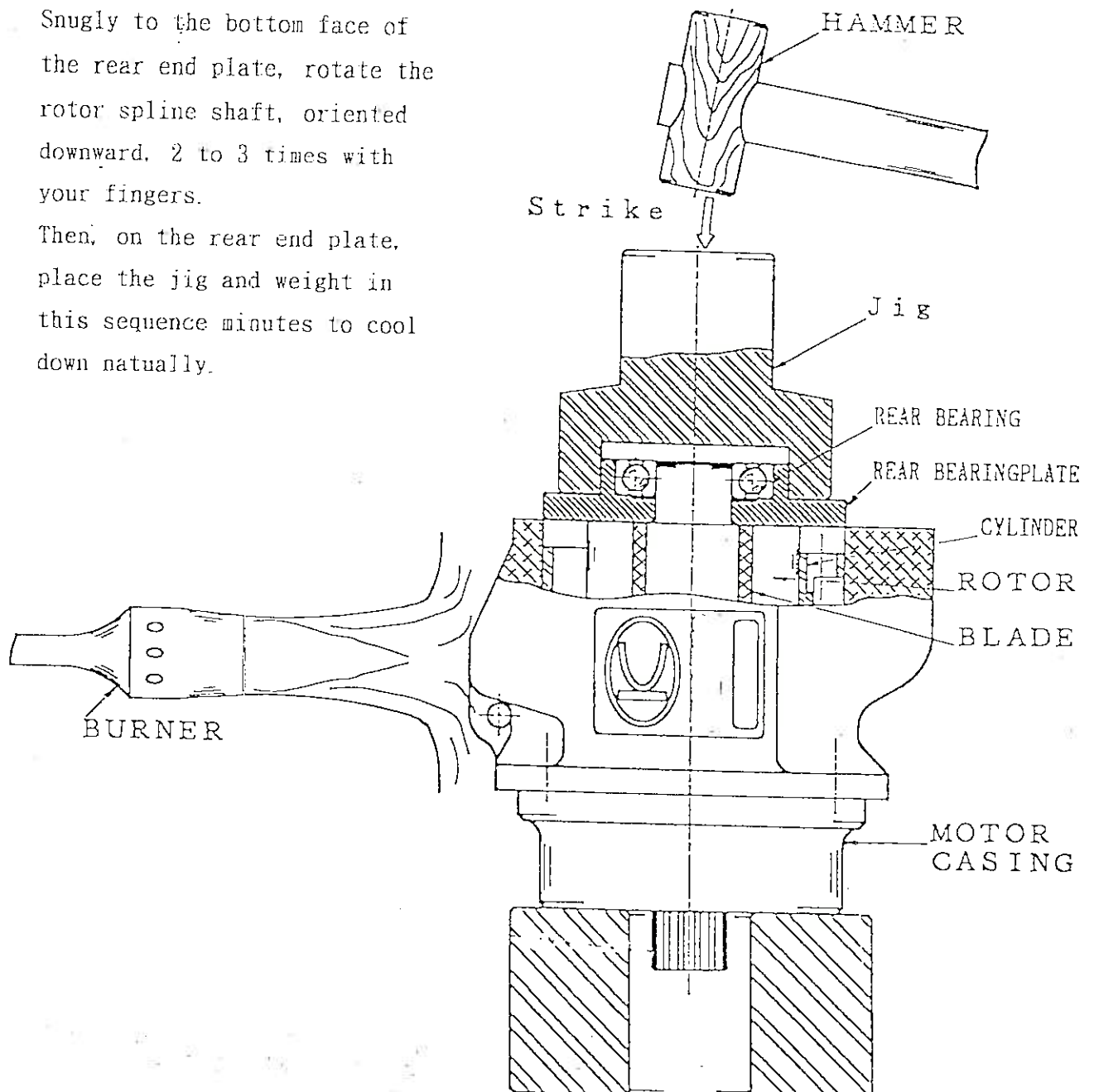
(Method 2: Without jig/weight)

As shown in Fig. 10, set the assembly with the rear end plate to inner diameter and rotor onto the motor casing using a burner, warm the outside of the motor casing, then the rear end plate and rotor assembly will be inserted to inside the motor casing naturally.

Snugly to the bottom face of the rear end plate, rotate the rotor spline shaft, oriented downward, 2 to 3 times with your fingers.

Then, on the rear end plate, place the jig and weight in this sequence minutes to cool down naturally.

[Fig.-10]



*INSERT ROTOR ASSEMBLED WITH REAR END PLATE INTO MOTOR CASING

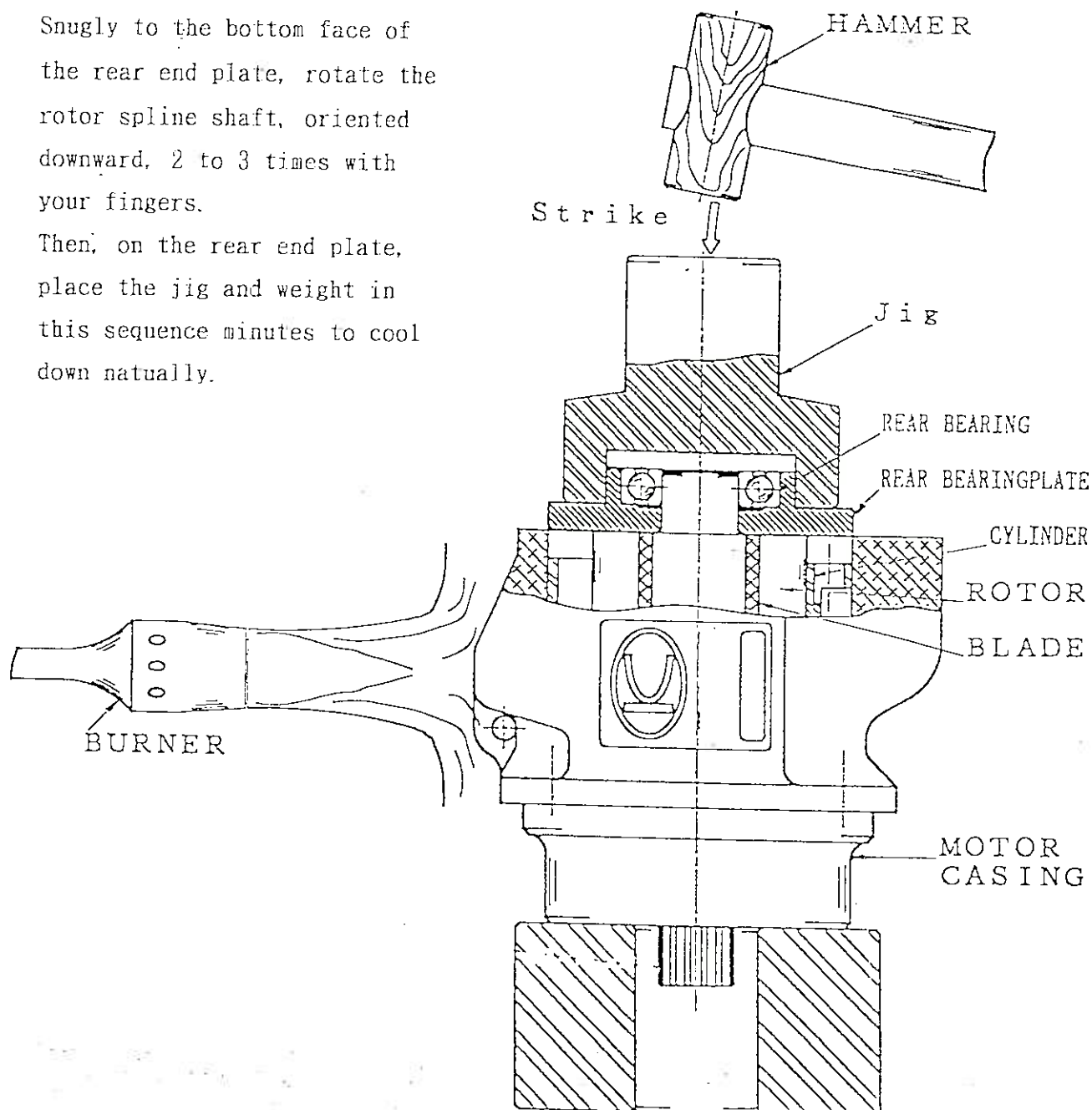
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[Fig.-10]



HOW TO CHECK IMPACT CLUTCH PARTS

BEFORE DISASSEMBLY

1. Observe there is any big damage and abrasion on housing parts.
2. Round ANVIL with hand and check the clutch can impact or not.
3. If you have testers, check torque value and revolution speed before disassemble. (It is better to take memo the result value to compare with those of after assembly.)

AFTER DISASSEMBLY

1. Check there is any big damage or abrasion on each parts.
2. Check lubrication on clutch parts. (Less grease? Not grease adhesive?)
3. Wash out each parts except broken parts which are not used again. Wash out very well inside Clutch Case. (remove grease contains powdery metal.)
4. After checking each parts, replace broken parts into new parts on basis hereafter explanations, then paste grease each parts mostly impact part and assemble them again.

AFTER ASSEMBLY ALL THE PARTS

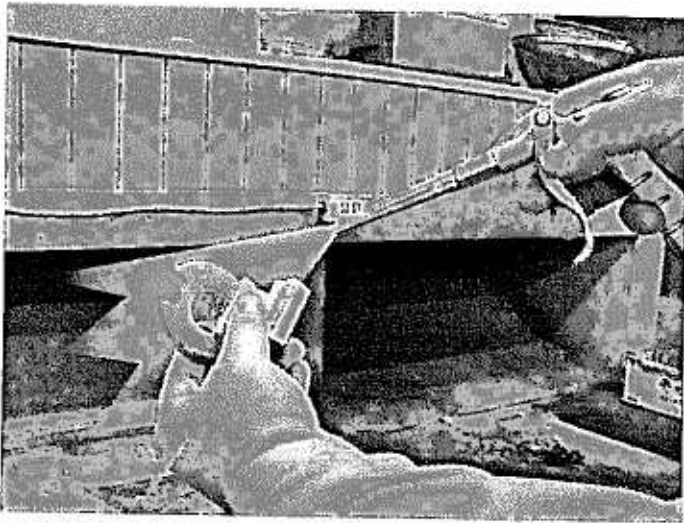
1. Check the torque value and revolution speed. (Compare values the one of before disassembly and the one of after assemble.)
2. After the performance has been improved, put spindle oil into air inlet and go through air inside tool to spray around spindle oil inside motor part.

HOW TO PASTE GREASE ON IMPACT CLUTCH PARTS

Wash out very well clutch parts and the old grease and oil on each parts must be removed completely before paste grease.

*HAMMER, HAMMER PIN, CAM, IMPACT CAGE etc: Wash out whole surface. ANVIL: mainly impact part surface.

*In the case old grease, oil and water are still remained when new grease are pasted, the grease might be easier to be brown away by centrifugal force of clutch action.



The important point to paste grease is to paste intensively the connection and impact part. The connection part of HAMMER and CAM, we recommend to paste by brush, and then rub by finger.

