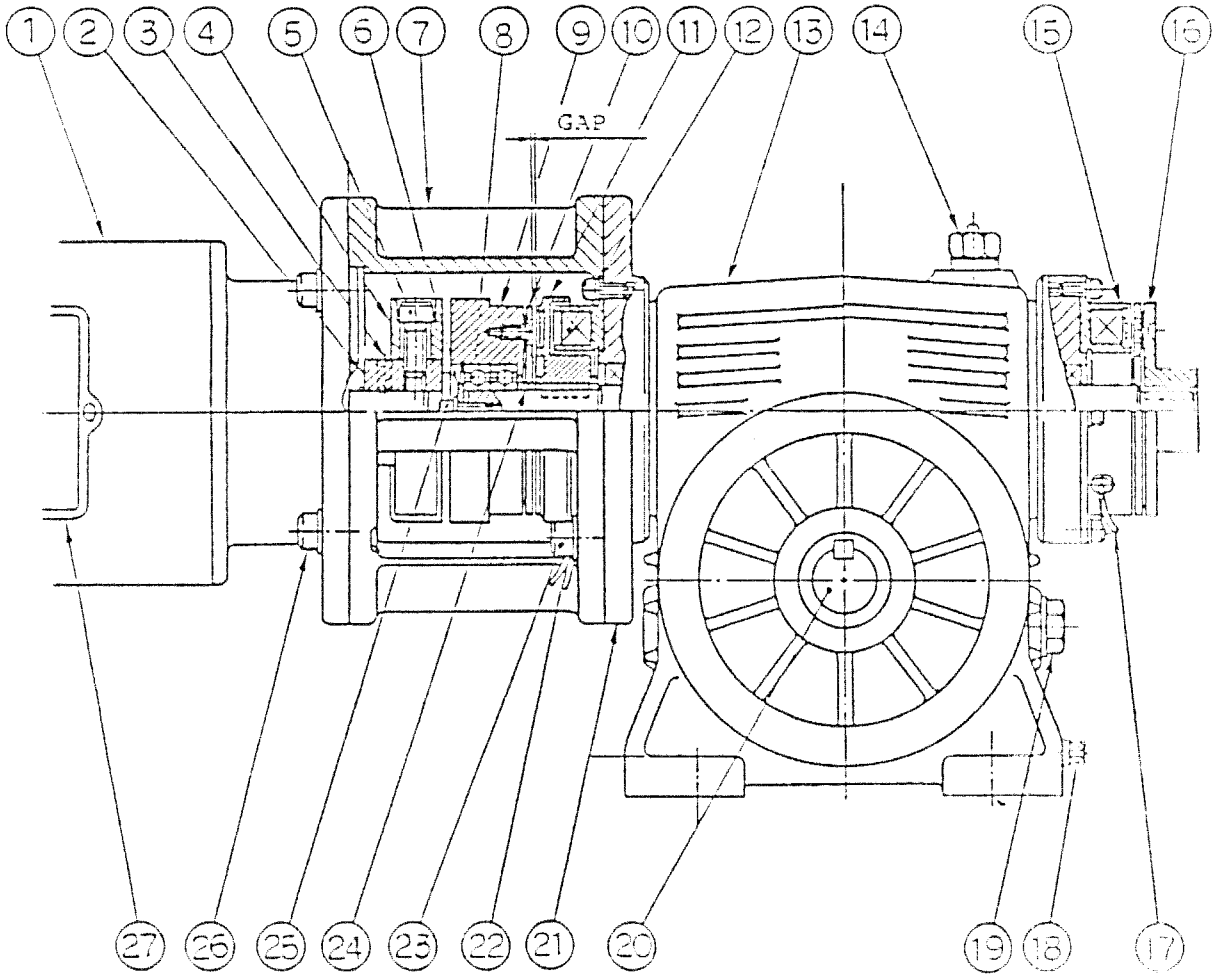
MIKI PULLEY's

ELECTROMAGNETIC CLUTCH & BRAKE

SIMPLATROLL

TYPE C M W

INSTRUCTION MANUAL



Part Names

① Motor (Universal Fully Enclosed External Fan Type)
② Cylindrical Hub
③ Set screw with hexagonal hole
④ Type CF Coupling with Rubber body
⑤ Bolt with hexagonal hole
⑥ Holding plate
⑦ Housing
⑧ Bearing
⑨ Hub
⑩ Type 3 Clutch Armature
⑪ Rotor
⑫ Clutch stator
⑬ Worm reducer
⑭ Lubricating plug
⑮ Brake stator
⑯ Brake armature Type 1
⑰ Brake lead wire
⑱ Drain plug
⑲ Oil level gauge
⑳ Output shaft
㉑ Reducer flange
㉒ Clutch lead wire
㉓ Bolt with hexagonal hole
㉔ Collar
㉕ Bolt with hexagonal hole
㉖ do.
㉗ Motor terminal box

Attachment and Handling

(1) This device should be firmly and properly attached onto a flat solid surface.

(2) Parts forming the joints with the machine side should be attached carefully as regards the travelling line and eccentricity.

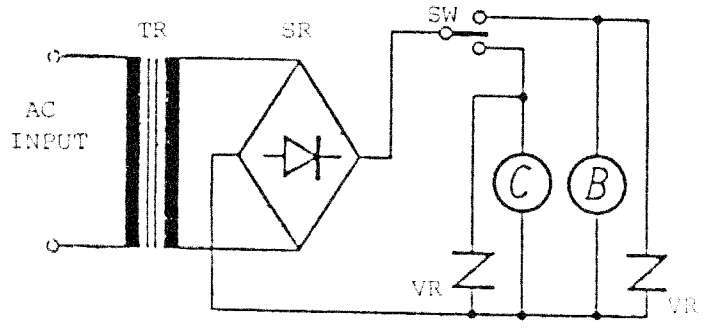
(3) The clutch unit is enclosed in a drip-proof housing but the brake unit is exposed. Care should be paid to prevent the mixture of oils, grease, dust and dirt.

(4) With regard to the reducer, please follow the Instructions Manual of the manufacturer of the reducer (enclosed in the main unit).

☐ Wire Distribution and Connections

The power supply for operating the clutch and brake is DC-24V. Voltage fluctuations should be maintained within ±10%. This point should be carefully observed as the application of a different voltage will adversely affect performance, or cause other troubles such as the burning of the coil, etc.

A protective element (varistor) to absorb surge is attached to each clutch & brake through parallel connections. Also, a power source box exclusively designed for the clutch & brake is available from this Company. Please refer to our catalogue.



TR : Transformer
SR : Rectifier (Bridge)
SW : Switch
VR : Varistor
C : Clutch
B : Brake

Fig. 2 Connections Diagram

Note: Power source capacity should be designed at over 125% of clutch & brake capacity.
The switching of the clutch & brake should be performed on the DC side.

☐ Operation

After the attachment and the connections have been completed, switch on the power source and check the operation of the device. If an abnormality should generate, stop operation immediately and remove the cause.

☐ Specifications

Size	Excitation Voltage DC-V	Torque Kgm	Capacity W	Resistance Ω	Current A
CBW - 06	24	0.5	11	52	0.46
CBW - 08		1.0	15	38	0.65
CBW - 10		2	20	29	0.83
CBW - 12		4	25	23	1.09

Table 1

The above specifications are identical for both clutch and brake.

☐ Maintenance

This device will not require intermediate maintenance operations if it is handled correctly. However, if periodical inspections are carried out, it will result in

a longer life and ensure continuous operation at high performance.

(Items to be Inspected)

(1) Is the ON - OFF operation being performed correctly ?

(2) Is abnormal noise issuing ?

(3) Is there no abnormal heating ?

(4) Check whether foreign matter, oils and grease are present in the rotating units or parts subject to friction ?

(5) Is the gap in the friction parts too large ?

(6) Is the excitation voltage being applied properly ?

With regard to (5), as this is the only item requiring maintenance in the friction clutch & brake, adjustments should be carried out by referring to the following page. For abnormalities generating in the other items, please refer to the section on [GUIDE TO DIAGNOSIS].

☐ Gap Adjustment

As the clutch & brake transmit torque through friction, the surfaces subject to friction wear out to increase gap 'a' after many hours of operation. If this gap exceeds permissible limits, performance (torque, operating characteristics) will be disturbed, necessitating adjustments to be made in the gap. Operation will return to normal after adjustment.

[Tools required for making the adjustment]

1. Thickness gauge 2. Hexagonal rod spanner 3. Puller 4. Small press (May be either manual or hydraulic if it will not cause impact or other types with similar functions) 5. Plate and screw rod (prepare in advance a simple shaped plate such as that shown below) 6. General tools

Plate & threaded hole

When extracting the brake armature hub and the rotor, advantage should be taken of the threading which will be found at the end surfaces of the respective parts, and by attaching a plate such as that shown in Fig. 3. extract with a puller.

(Dimensions are given in Table 2)

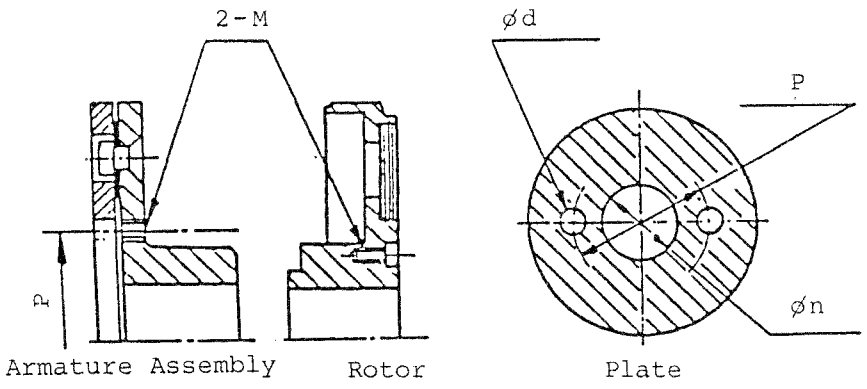


Fig. 3

Table 2

mm

Size	Armature Assembly		Rotor		Plate	
	P	M	P	M	d	n
06	31	M4	28	M4	5	18
08	37		34			22
10	47		45			30
12	56		54			40
16	73	M5	71	M5	6	55

[Specified Gap and Allowance]

When adjusting gap 'a', follow the procedures given below, to attain values as given in Table 3.

Table 3

mm

Size	06	08	10	12	16
Specified gap	0.2			0.3	
Allowance	±0.05			+0.05 -0.1	

[Adjustment]

(1) First of all measure gap 'a' between clutch and brake. As this measured value is required when making adjustments it should be recorded.

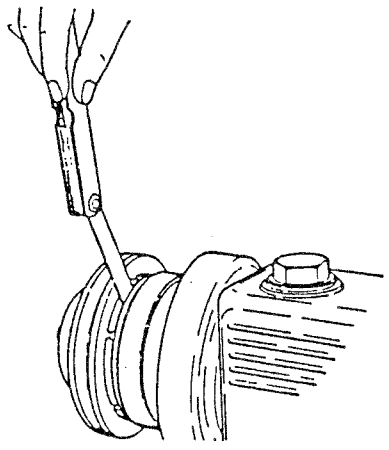


Fig. 4

o Adjustment of the Gap in the Clutch

(2) Loosen bolt (25) with the hexagonal hole, and detach shaft holding plate (6) (Fig. 5).

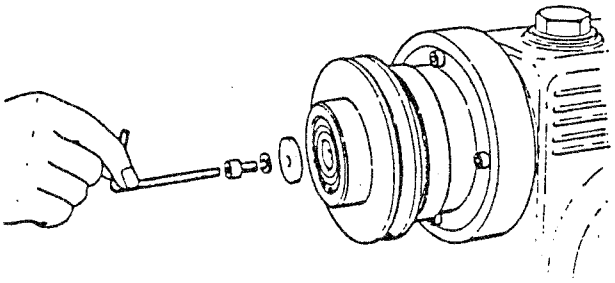


Fig. 5

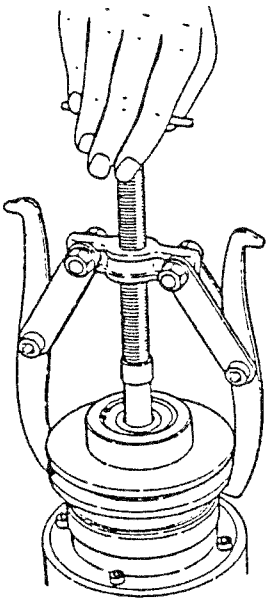


Fig. 6

(3) Extract hub (9) from the shaft. Use a puller as shown in (Fig. 6) to draw out the hub.

(4) A collar (24) and several shims (2 types of thin spacers of 0.1mm and 0.5mm thick) will be left. The number of these shims to be used for adjustment should be calculated through the following equation. (Fig. 7)

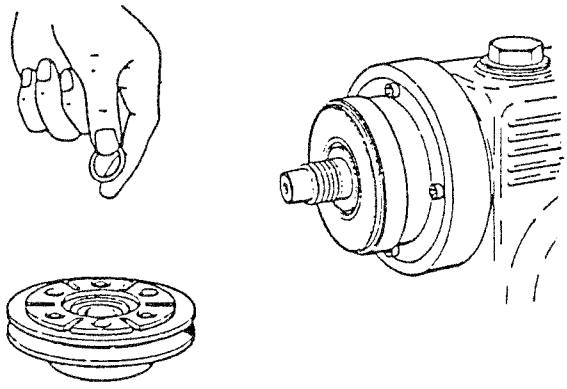


Fig. 7

Value of gap as measured in (1) -
Specified amount of gap = Amount to be adjusted

(5) After the adjustments have been completed, insert hub (9)

into the shaft. In order to apply force uniformly to the inner ring of bearing (8) during this operation, apply pressure through a pipe or other material. (Fig. 8)

(6) After bearing (8) has been pushed in until it contacts collar (24), check the amount of gap.

(7) After ascertaining that the gap conforms to the value specified in Table 3, tighten shaft holding plate (6) by using bolt (25) with hexagonal hole and fix the hub into position.
Apply a small amount of adhesive to the bolt to prevent loosening. (Fig. 9)

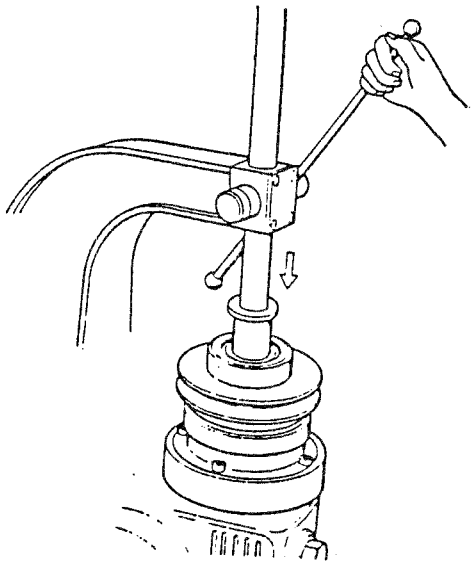


Fig. 8

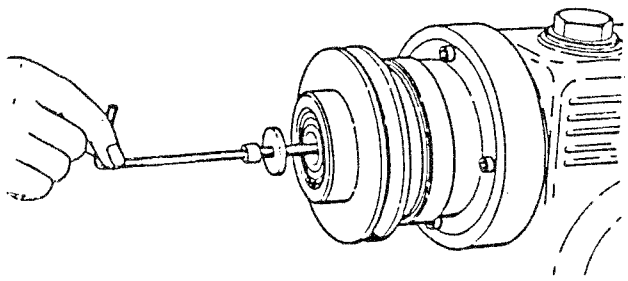
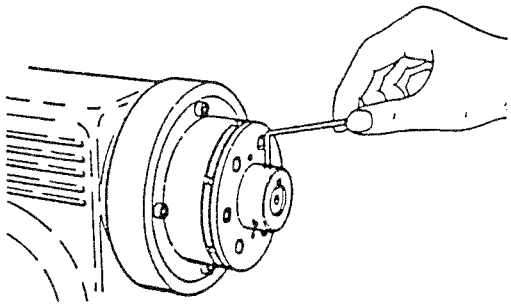


Fig. 9

o Adjustment of the Gap in the Brake

(8) Set screw with hexagonal hole Loosen 2 screws (Fig.10)



Fig, 10

(9) Press in the armature assembly until the specified value for the gap as given in Table 3 is attained. During this operation, apply pressure to the boss of armature hub (16). (Fig 11)

(10) If the gap is too narrow, use the threaded hole in armature gap (16) to attach the plate, and draw out the puller until the gap is at specified value. (Fig. 12)

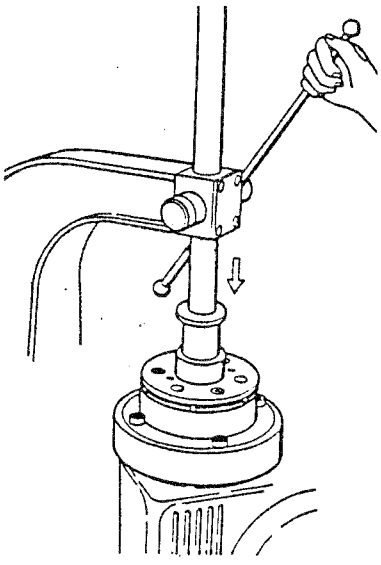


Fig. 11

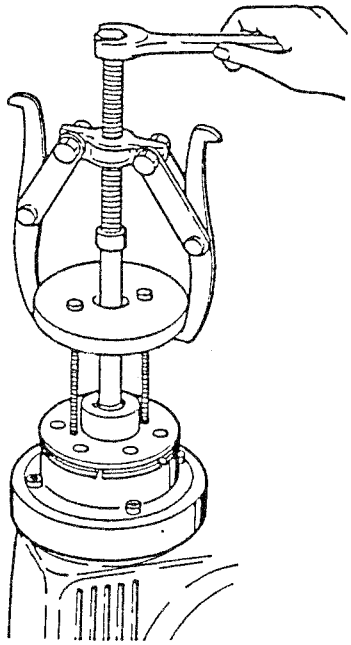


Fig. 12

(11) Tighten the set screw with hexagonal hole, and firmly fix armature hub 16 to the shaft. Apply a small amount of adhesive to the set screw to prevent loosening. (Fig. 13)

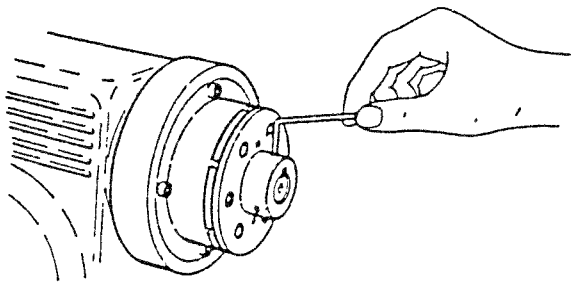


Fig. 13

(12) When tightening the set screw, marks left from the preceding adjustment position may prevent correct adjustments to be made. In such cases, follow procedures explained in (10) to draw out the armature assembly, use a file to remove the tightening marks left on the shaft and then push it in by following procedures given in (9).

(13) Finally, switch on the power supply to the crutch & brake to check operation. The work is completed.

(Note 1) Do not start operation until the adhesive applied to the set screw in (11) has had time to dry.

(Note 2) If wear is excessive in the parts subject to friction, replace with a new part as normal operation may not be attained even if adjustments are made.

GUIDE TO DIAGNOSIS

Abnormality		Probable Cause	Remedy
Will not operate	Does not operate at all	Clutch & brake not supplied with power Voltage too low	Check wiring and circuits and apply proper voltage
		Gap too large cannot be attracted	Adjust gap
		Coil burned out	Check voltage, work performed, etc. and replace
	Does not operate from time to time	Large voltage fluctuation Improper connections, contacts	Check wiring and circuit
		Increase in gap approaching limit of attraction	Adjust gap
Will operate, but	Load side does not rotate (nor be braked)	Voltage too low - insufficient torque	Apply proper voltage
		Oil or grease mixed in friction surface	Remove oil and grease by using thinners or other solvents
		Excessive load causing clutch to slip	Decrease load or increase size
	Coupling and braking actions takes too long	Low voltage resulting in insufficient torque	Apply proper voltage
		Increase in gap with resultant long operating time	Adjust gap
		Adherence of oils and grease in friction surfaces	Remove oil and grease with thinner or chemical agent
		'Break-in' runs not sufficient	Carry out lapping operations ('Break-in' runs)
		Load torque, load inertia (GD2) too large	Reduce to proper load after after conducting studies
Temperature too high		Voltage too high	Reduce to proper voltage
		Interference between clutch and brake	Check control circuit

Abnormality	Probable Cause	Remedy
Temperature too high	Used too frequently	Use at proper frequency
	Ambient temperature too high	Increase ventilation and admit draft to improve heat dissipation
	Load torque, load inertia (GD2) too large	Conduct studies and reduce to proper load
	Contamination of reducer oil	Replace with new lubrication oil
	Faulty bearings	Replace bearings
Generation of abnormal noise	Intrusion of foreign matter in rotating parts	Remove foreign matter and take steps to prevent recurrence
	Faulty bearings	Replace bearings
	Load torque (GD2) excessive	Reduce load inertia
	Bad quality or insufficient lubrication oil for reducer	Either fill with new lubricating oil or replenish to proper level
Slips after coupling	Large voltage fluctuation	Check wiring and circuits
	Large load fluctuation	Investigate peak load conditions and increase size
Bad cut-off conditions at release time	Switching effected on the AC side	Install a switch on the DC side
	Unsuitable protective element	Replace with the accessorial element or with another possessing the same functions