

UGD-0343A

**5.25 INCH FLEXIBLE DISK DRIVE
MAINTENANCE MANUAL
MF504A-3**

 **MITSUBISHI ELECTRIC CORPORATION**

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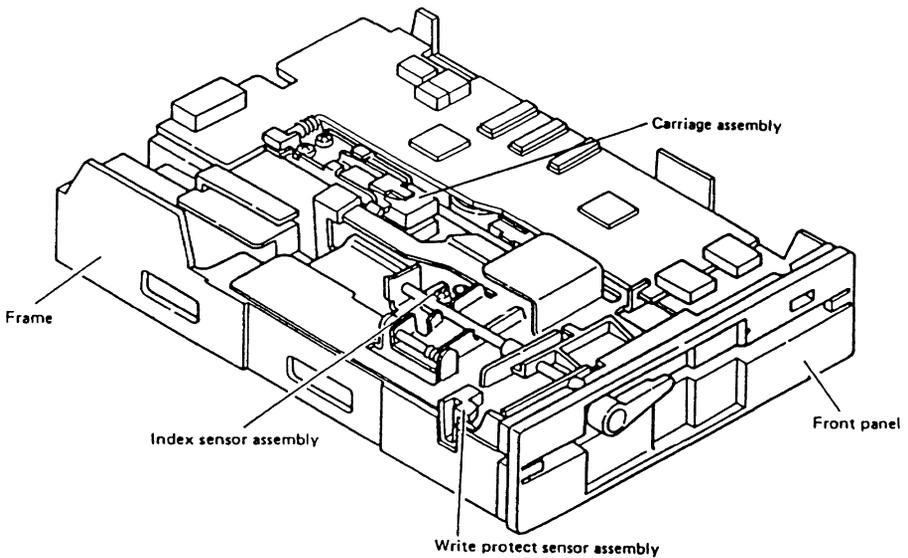
1. Introduction

This manual deals with the handling, maintenance, and adjustment of the MF504A-3 flexible disk unit.

2. Related diagrams and references

- Standard specifications of MF-504A-3
- Electrical diagram for maintenance of MF504A-3
- Illustrated parts list
- Packing instructions

3. Names of parts



4. Handling

4.1 Operating environment

No problems are likely occur when this unit is used under normal conditions. However damage to the unit or to disk is liable to occur if the unit is used under normal conditions outside the following:

- | | | |
|-------------------------------|--|---------------------------------|
| (1) Temperature and Humidity: | When in use | When not in use |
| Temperature range: | 5°C ~ 43°C | -10°C ~ 50°C |
| Humidity range: | 20% ~ 80% RH (non-condensating)
(Max. wet bulb 29.4%) | 20% ~ 80% RH (non-condensating) |
- (2) Vibration and Shock
When in use: less than 0.3 G (10 ~ 100 Hz)
When not in use: Continuous vibration less than 2 G (10 ~ 100 Hz)
- (3) Dust
Special caution should be taken regarding dust as it damages the magnetic head and recording surface of the disk.
- (4) Temperature drop
Less than 20°C/Hour (when unpacked)

4.2 Handling of disk cartridge (special caution should be taken regarding the following, see Diagram 1)

- (1) Do not place the unit near any device produces a magnetic field.
(For example, radios, TVs, motors, generators etc.)
- (2) Do not bring any magnetized objects near the cartridge.
(For example, rubber magnets, magnets for blackboards, screwdrivers etc.)
- (3) Do not bend the disk.
- (4) Place the disk cartridge into its paper case when it is transported or stored.
- (5) Do not touch the disk cartridge itself. Do not try to clean it with alcohol or similar liquids.
- (6) Do not place it in direct sunlight or in places which have high temperature or high dust levels.
- (7) Do not write anywhere but on the label. Use only a felttipped marker or similar pen.

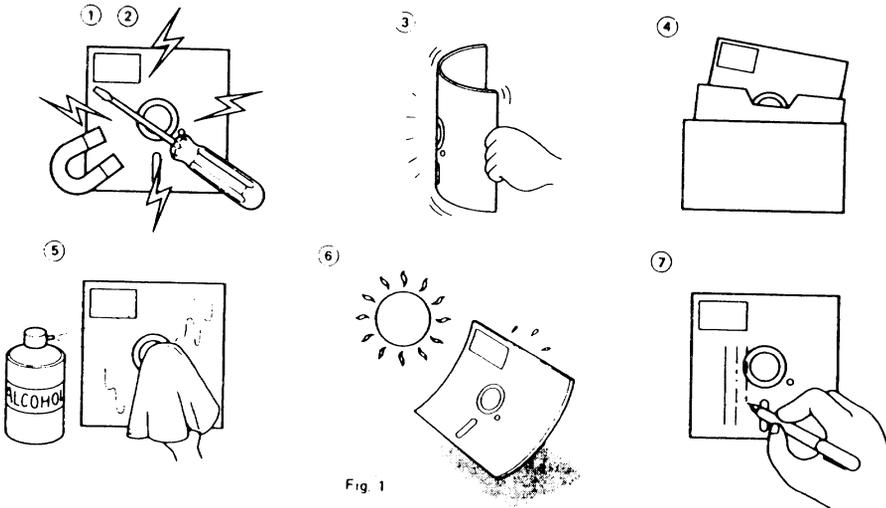


Fig. 1

5. Periodical maintenance

Periodical inspection, maintenance, cleaning, and replacement of worn-out parts is recommended to maintain the correct operation of this unit and to spot trouble quickly.

The time between periodical maintenance is calculated based on a 8 hour/day schedule. Thus, it may have to be adjusted if actual use is different. Based on usage of 8 hours/day under normal conditions, periodical maintenance should be once a year.

5.1 Precautions regarding maintenance

5.1.1 Precaution

- (1) Be sure that dust does not get inside the unit and that the head is not damaged.
- (2) Be sure that the power is off before beginning maintenance.
- (3) The DC power must be off when the connector is inserted or removed from the PC board. This is to prevent damage to the semiconductors.
- (4) Do not touch the surface of the disk or the magnetic head.
- (5) When this unit is used for playback (when CE disks etc. are being used), be careful of operations such as write protection for the protection of recorded data.
- (6) Do not touch or attempt to adjust the steel band.
- (7) Do not force or subject the head carriage assembly to shock of any sort as it was precision adjusted. Do not use screws or nuts other than those specified and do not attempt to re-adjust the assembly.

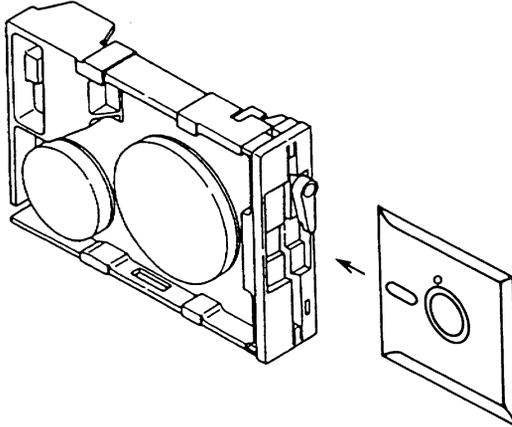
5.1.2 Disks which can be used

- (1) CE diskettes: 502-1D standard diskette made by DYMEK
- (2) Cleaning diskette: CFD-5W made by Nihon Micro Coating

5.2 Head Cleaning

Clean the head as dirt on the head can lead to read errors and damage to the disk. The head is cleaned by the following procedure:

- 1) Equipment
 - CE tester
 - Cleaning diskette



2) Cleaning method

- 2) -1 Connect the CE tester to the unit and turn the power on.
- 2 Insert the cleaning diskette and start head loading.
- 3 Remove the cleaning diskette after about 1 minute of cleaning.

3) Precautions

- 3) -1 Match the head to the track of the disk to improve cleaning efficiency.
- 2 Clean the unit for about 1 minute.
- 3 The cleaning diskette is good for 1 hour per track. Replace it after the expiration of this period.
- 4 Do not clean the unit more than once at a single time or more than twice a month. This will prevent the head from being deformed.

5.3 Testing and adjustment

5.3.1 Adjustment of position of TK00 sensor

1) Equipment

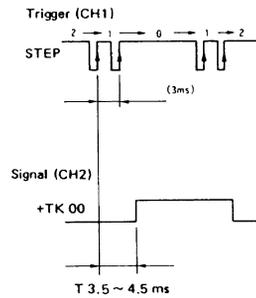
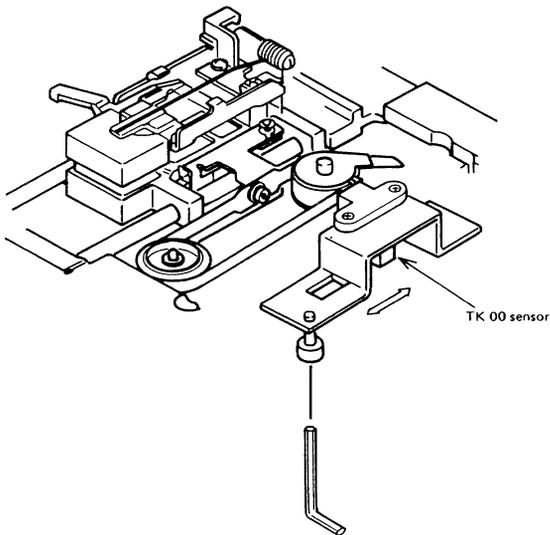
CE tester
Blank diskette
Allen wrench (2.5 mm)
Oscilloscope

2) Adjustment

- 2) -1 Connect the CE tester to the unit, turn the power on and insert the diskette into the unit.
- 2 Turn the motor on and start drive select operations.
- 3 Perform repeat seeking on tracks 00 ~ 02. (step rate 3 ms)
- 4 Monitor the TPC13 waveform (TK00) with the oscilloscope.
Trigger CH1—STEP (DC, -) (TPC15)
Signal CH2—+TK00 (DC) (TPC13)
- 5 Turn the installation screw until the time of T is 3.5 ~ 4.5 ms. This will move the TK00 sensor in the direction of the arrows for adjustment.
- 6 Confirm that there are two STEP signals.

3) Checking

Check that seeking starts from track 00 and stops on track 02. Be sure the voltage of of TPD1 is 0 ~ 0.6V when the unit is stopped on track 02.



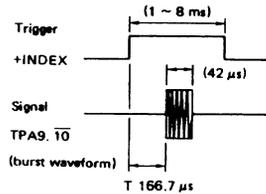
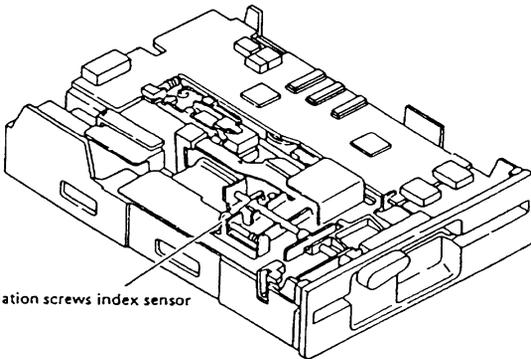
5.3.2 Testing of position of index sensor

- 1) Equipment
 CE tester
 CE diskette
 No. 2 ⊕ screw driver
 Oscilloscope

2) Testing

- 2) -1 Connect the CE tester to the unit, turn the power on and insert the diskette into the unit.
 -2 Turn the motor on and start drive select operations.
 -3 Set the unit to the read mode and monitor the TPA9 and TPA10 waveforms of track 02 with the oscilloscope.

Trigger	EXT—+INDEX (DC,+) (TPB14)		
Signal	CH1—output waveform (AC)		(TPA9)
			ADD
	CH2—output waveform (AC,INV)		(TPA10)
Standard	Side 0	Side 1	
Testing	166.7 ± 100μs	166.7 ± 150μs	
Adjustment	166.7 ± 50μs	166.7 ± 100μs	



5.3.3 Adjustment of head alignment

1) Equipment

- CE tester
- CE diskette
- Oscilloscope
- Allen wrench (2mm)

2) Adjustment

- 1 Connect the CE tester to the unit, turn the power on and insert the diskette into the unit.
- 2 Turn the motor on and start drive select operations.
- 3 Set the unit to the read mode and monitor the TPA9 and TPA10 waveforms, while the unit goes from track 00 to track 32, with the oscilloscope.

Trigger	EXT—+INDEX (DC,+)	(TPB14)
Signal	CH1— output waveform (AC)	(TPB9)
	CH2— output waveform (AC, INV)	(TPA10)
		} ADD

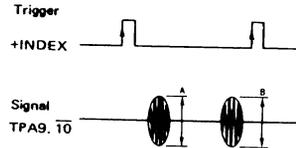
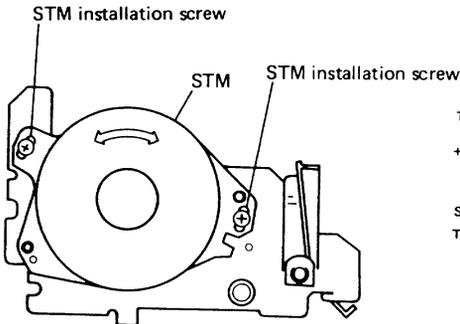
Standard	Testing	Adjustment
When $A > B$ B/A	0.57,	0.60
When $A < B$ A/B	0.57,	0.60

- 4 Adjust the carriage installation screws to obtain the above standards while the unit goes from track 00 to 32 or from track 9 to 32. This will move the carriage in the direction of the arrows for adjustment. (tighten the screws after adjustment)
- 5 Adjust both head 0 and head 1 until both are within the above specifications.

3) Precautions

Perform adjustment until the following conditions:

Temperature $23 \pm 2^\circ\text{C}$
 Humidity $50 \pm 5\%RH$ } after waiting 2 hours



5.3.4 Testing of head azimuth

1) Equipment

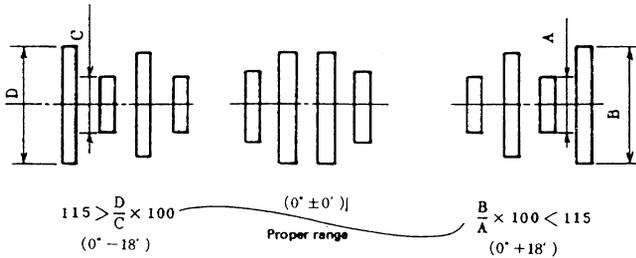
- CE tester
- CE diskette
- Oscilloscope

2) Testing

- 1 Connect the CE tester to the unit and turn the power on.
- 2 Insert the diskette, turn the motor on, and start drive select operations.
- 3 Set the unit to the read mode, perform seek operations for track 68, and monitor the TPA9 and TPA10 waveforms with the oscilloscope.

Trigger	EXT—+INDEX (DC,+)	(TPB14)
Signal	CH1—output waveform (AC,)	ADD (TPA9
	CH2—output waveform (AC,INV)	

- 4 The unit is operating correctly if the waveforms are within the following ranges.



Reference

