



N21

ENGEL

SERVICE MANUAL

F SERIES MODEL

MR040F-U1
MR040F-G3



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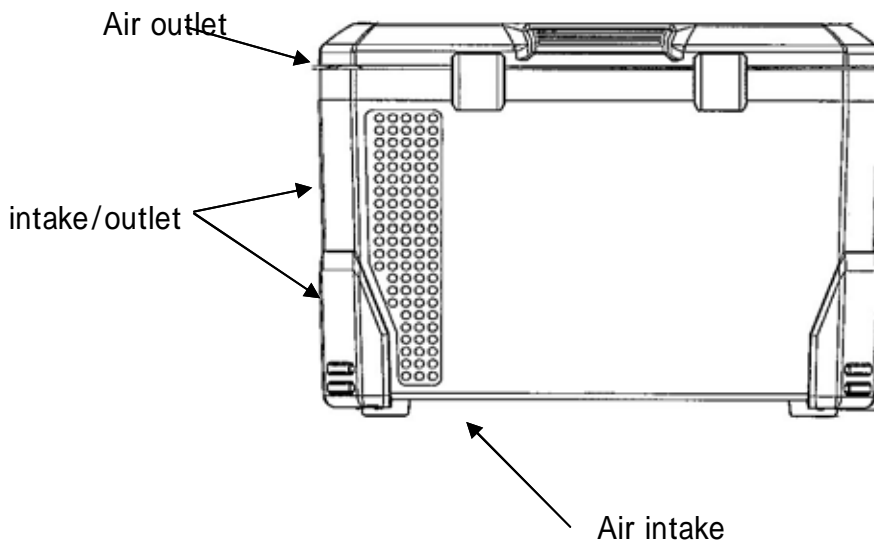
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1. SPECIFICATIONS

MODEL		MR040F-U1	MR040F-G3
STORAGE VOLUME	(liter)	38	
EXTERIOR DIMENSIONS W × D × H	mm	636 × 396 × 471 (Including Lid(door) handles on Depth)	
		768 × 396 × 471 (Including handles on Width)	
INTERIOR DIMENSIONS W × D × H	mm	380 × 258 × 365	
EXTERIOR FINISH	Lid	P.P. RESINE	
	CABINET		
INTERIOR FINISH	Lid	ASA RESINE	
	CABINET	P.P. RESINE	
INPUT VOLTAGE	AC	AC85 ~ 132V 50/60Hz (USA, CANADA, JAPAN)	AC185 ~ 64V 50/60Hz (Europe, Asia Africa)
	DC	DC 11V ~ 32V	
RATED AMPERAGE	DC	2.75A (Input voltage DC 12.8 V, Ambient temperature 30)	
RATED POWER CONSUMPTION	W	AC 42W (85-132/185-264V)	
COMPRESSOR RATING		AC 13 ~ 16 V/27W 50Hz	
TEMPERATURE CONTROL NOTCH 5 OR FREEZE		Under -18 +/- 2 (at Ambient air temperature 30)	
REFRIGERANT		HFC-134a	
TEMPERATURE CONTROL		Electronic thermostat	
WEIGHT	LBS.	49	
	Kg	22	

4. INSTALLATION AND VENTING

- (1) Your shockproof fridge is best installed on a and solid surfsafe
- (2) Be sure your fridge is not in direct sunlight, near a gas stove, heater or other heat-generating appliances.
- (3) Adequate ventilation and suitable distanse from each wall (at least 100mm or more) result in maximum cooling efficiency and minimum electric current consumption for "free standing use" (refer to Fig. shown as below).
- (4) Avoid installing your fridge close to kitchen sink or faucet.



[CAUTION]

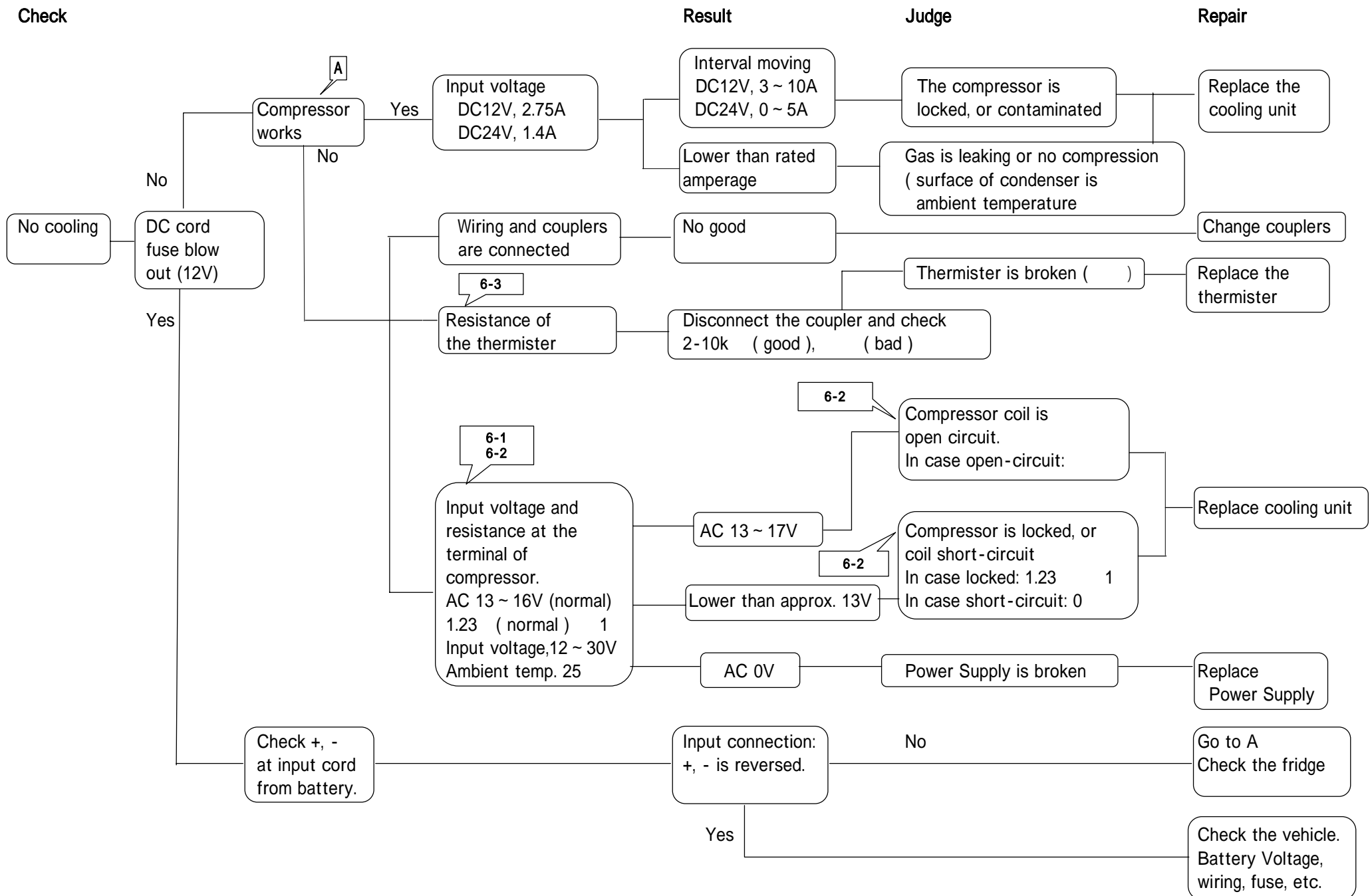
Failure to provide the necessary venting will result in poor refriberation, continuous compressor operation and accerated battery discharge, sometimes shorten the life of fridge.

Note WIRE GAUGE IS IMPORTANT !

Connect refrigerator to battery by use of the following wire:

Distance Between Fridge and battery	Wire gauge (DC 12 - 24 Volt)		
	AWG	SWG	metric
Less than 3.7 m (12 ft.)	AWG 16	SWG 18	1.2mm ²
From 3.7 m (12 ft.) to 6.1 m (20 ft.)	AWG 14	SWG 16	2.1mm ²
More than 6.1 m (20 ft.) (Not recommended, too long)	AWG 12	SWG 14	3.3 mm ²

5. TROUBLE SHOOTING
5-1 BLOCK DIAGRAM
Check



1 This data come from Laboratory standard measurement.

5-2 TYPICAL TROUBLE

Condition		Source	Measuring Result	Operations
Control indicating lamp is lighting	No cooling Compressor does not operate.	Compressor coil is open circuit	Compressor coil resistance is (Normal: 1.23 1)	Replace the cooling unit
		Power Supply brake down	Power Supply output voltage is AC 0V (Normal: AC13 ~ 16V)	Replace the Power Supply
		Wire thermistor is open circuit	Thermistor resistance is (Normal: 2k ~ 10k)	Replace the thermistor
	Cooling performance is not enough.	* Cooling Unit gas leak		Replace the cooling unit
		* Fan motor brake down		Replace the fan motor
		* Input voltage is lower than DC 10V		Charge the battery
		* Ambient temperature is higher than 30		
* Ventilation for compressor and condenser is not enough			At least make clearance 100 mm between fridge and wall	
	* To be stored too much in the fridge		Make good circulation of cold air	
Control indicating lamp is not light		* The special fuse of the DC cord blow out		Replace the fuse
		* Fuse of the vehicle blow out		Replace the fuse
		* DC power line of the vehicle is not good		Check the vehicle

5-3 TECHNICAL DATA

1 This data come from Laboratory standard measurement.

Checking items	Measuring Points	Normal data
Compressor input voltage	At the terminals of the compressor	Approx. AC 13V ~ 16V
Power Supply output voltage	At the output cords from the Power Supply (Unfasten the output cords to the compressor)	Approx. AC 13V ~ 16V
Compressor coil resistance	Between compressor terminals (Unfasten output cords from compressor)	Approx. 1.23 1
Thermister resistance	Between 2 pins of the thermistor connecter	Approx. 2K ~ 10K
DC cord Fuse resistance	Both side of Fuse	Normal: 0

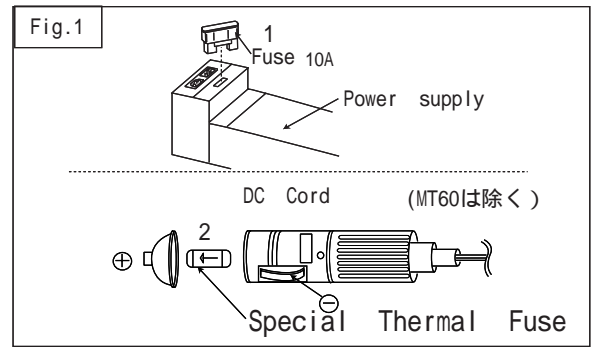
6. CHECK POINT & CHECK METHOD

[Check 1] Fuse(Fig.1)

Check the resistance of fuse by tester.

Test result	Judge
0	Normal
	Broken

Note) When broken eye-checking in not possible.

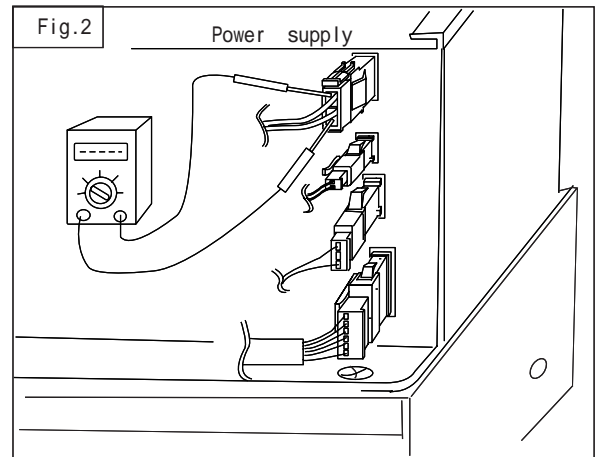


[Check 2] Input voltage of the compressor.

Checking point

- Check at 2 pin coupler of Power Supply (Fig.2) or at input terminals of the compressor.
- (Should be checked when the compressor is connected)

Test result	Judge
Approx. AC13-16V	Normal
AC 0 V	Power Supply is broken
Approx. AC13V or lower	Compressor is locked

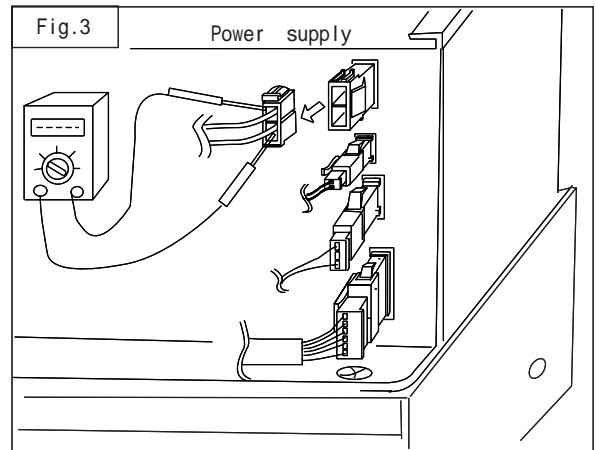


[Check 3] Check the resistance at the coil if compressor would not run (Fig.3)

Checking points

Remove 2p couplers at motor cord, and check.

Test result	Judge
約 1.23	Normal
	Broken
0	Coil of compressor is short circuit



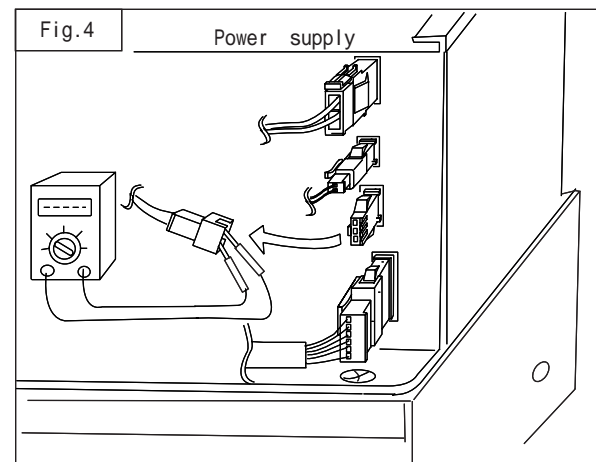
[Check 4] Resistance of thermistor (Fig.4)

Checking points

Remove the 3 pin couplers from Power Supply, and test.

Test result	Judge
Approx. 2k - 10k	Normal
	Broken
0	Short Circuit

Note) When short circuit, motor runs continuously.



7. WORKING ORDER FOR REPLACEMENT

7-1 Cooling Unit

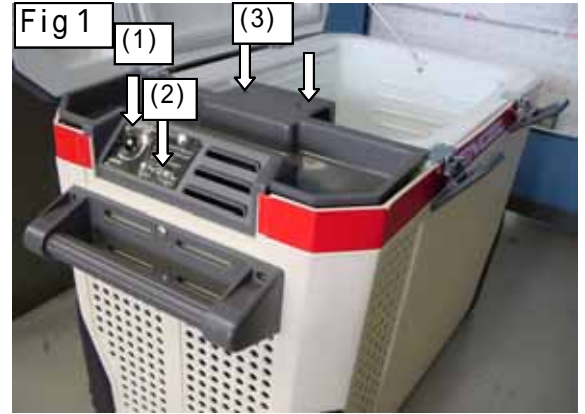
Process

1 Remove Motor Cover (Fig.1-(1))

(1) Remove(Pull out) "Thermo dial nob"

(2) Remove "Thermo label"

(3) Remove (Pull out) two(2) fastners



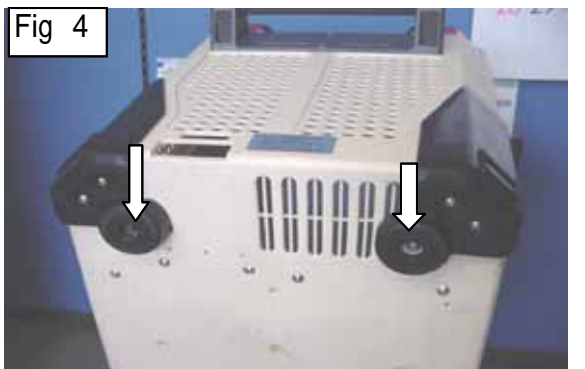
2 Remove one (1) screw (Fig 2)



3 Push both side of cover like show in picture (Fig 3) and push up word and remove



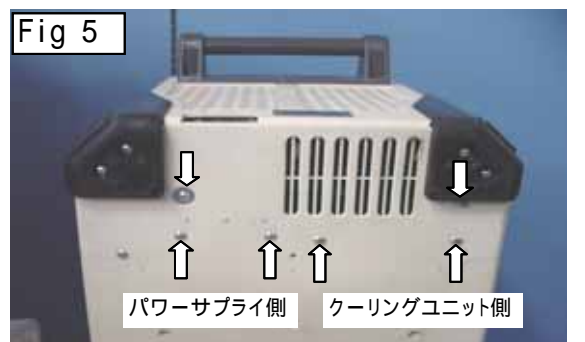
4 Remove two (2) screws. (Fig 4)
In case of U1, G3, these round rubber cushions are not fitted, only 2 screws are fixed.



5 Remove Six(6) screws shown in Fig 5

a) Remove right side 3 screws (fixing cooling unit)

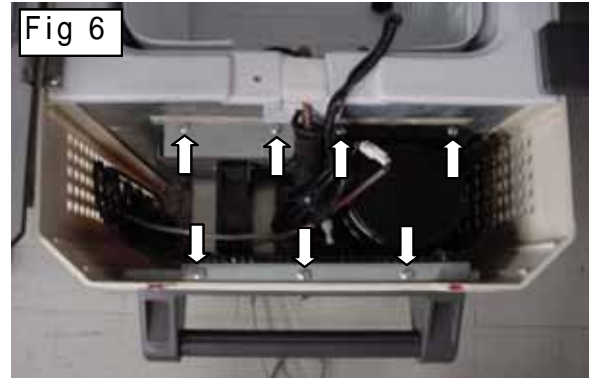
b) Remove left side 3 screws (fixing power supply)



Process

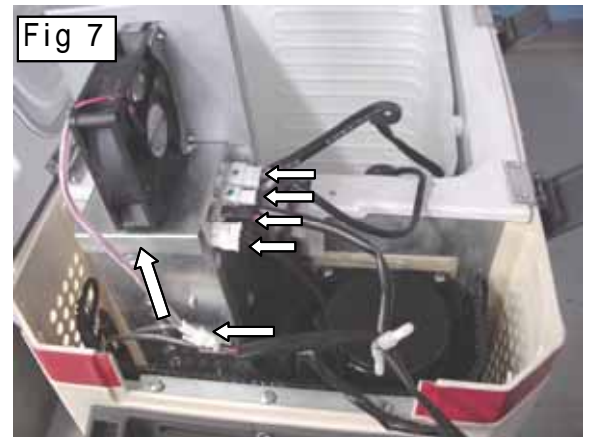
6 Remove Seven (7) screws shown in Fig 6

- a) Remove right side 2 screws (fixing cooling unit)
- b) Remove left side 2 screws (fixing power supply)
(Note. 1 of them fixes Earth code also)
- c) Remove 3 screws (fixing plate to outer case)



7 Remove 5 sets of couplers (cord set) (Fig 7)

- 1) Cut 2 pcs of plastic cable fastners
- 2) Pull up "Power supply" around half hight of cabinet depth.
- 3) Pull out 4 pcs of coupler (cord sets) from "Power supply"



8 Remove 3 screws fixing Evaporator (Fig 8)



9 Pull up "Cooling unit" from Cabinet (Fig 9)



10 Remove "Thermistor" from Evaporator (Fig 10)

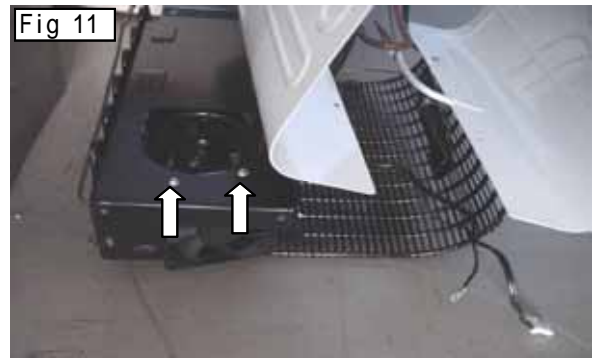


11 Remove cooling fan (Fig 11)

Remove 2 fixing screws

Remove "compressor power input cord" (Fig 13-1)

Remove "Compressor Earth cord" (Fig 13 - 2)



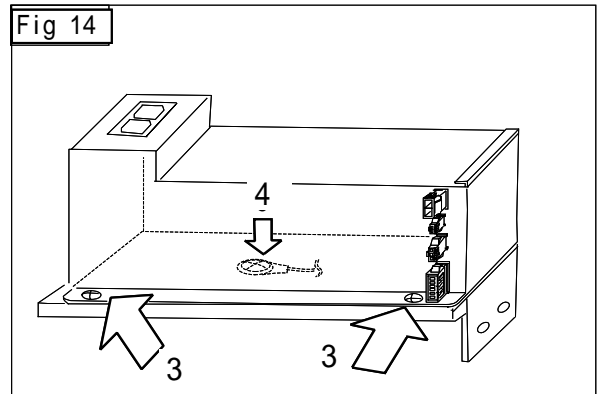
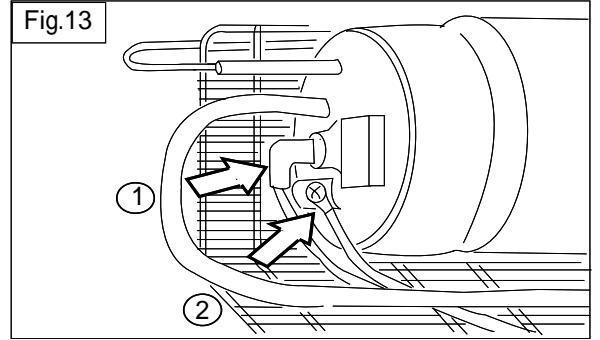
7-2 Power Supply

1 The 1st-7th processes are the same as "7-1 Cooling unit" except 5th a) and 6th a) each 2 screws fixing cooling unit. except 5th a) and 6th a) each 2 screws fixing cooling unit. (This means that the case only remove power supply, the screws fixing cooling unit would not be required to remove)

2 Remove power supply shown as Fig 7 and further pull up for fully removing. (before fully removing, remove fuse at first)

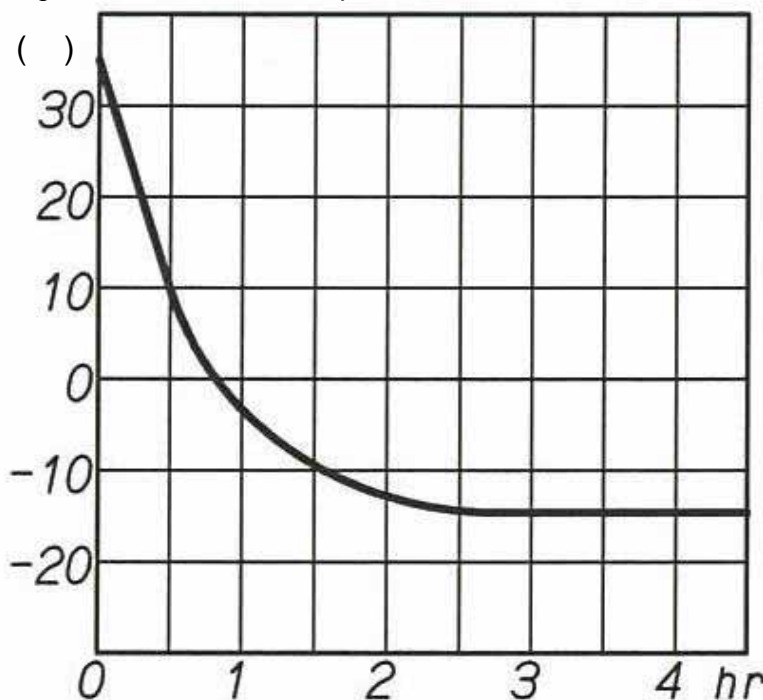
3 Remove Power supply from mounting plate (Fig 14, arrow "3")

4 Remove "Earth terminal" (Fig 14, arrow "4")



[Reference]

8 Cooling performance characteristic curve averaged cabinet air temp.



Measuring conditions

Ambient air temp
30
No load(no food
or drinks)

← - 18 ± 2
(0 ° F ± 3.5 ° F)

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Arranged by	Refrigerator Business dept.
Nitta plant	Nitta Hayakawa 3, Ota city, Gunma Japan, 370-0344 TEL 0276 56 7325 FAX 0276 56 6075

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