metron

ACCUTRAC AT270

Traction Unit

Operating Instructions

Metron Medical Australia Pty Ltd A.C.N.050 240 527

Prepared by: David Mitchell, Metron Medical Australia, Rev 1V0, Mar 2005.

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1. GENERAL DESCRIPTION

1.1 INTRODUCTION

This manual contains operating instructions for microprocessor- controlled traction system.

NOTE: KEEP ONE COPY OF THIS MANUAL WITH THE UNIT AT ALL TIMES.

1.2 INTENDED USE OF EQUIPMENT

To provide a traction force to selected sections of the body for rehabilitation.

1.3 EFFECTS OF TRACTION

1.3.1 Distraction or separation of the vertebral bodies.

1.3.2 A combination of distraction and gliding of the facet joints.

1.3.3 Tensing of the ligamentous structures of the spinal segment.

1.3.4 Widening of the intervertebral foramen.

1.3.5 Straightening of spinal curves.

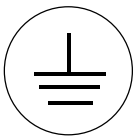
1.3.6 Stretching of the spinal musculature.

1.4 SAFETY NOTES

1.4.1 Information Signs

Attention, see instructions for use
This is refers the user to the documents accompanying the unit.

This symbol identifies the unit as a BF type equipment.



This symbol identifies the PE.

1.4.2 Caution

(1) The unit may only be opened by authorized personnel !

(2) Always remove the main plug prior to opening the unit!

(3) The unit is not designed for use in hazardous locations.

(4) Never spray the unit when cleaning it.

(5) No water or liquid cleaning agents may enter the unit, since this may cause damage to the unit and may endanger the life of the patient.

(6) The device does not be used along with other equipment.

(7) Please study the operation manual carefully.

(8) The device can only be used in the presence of a doctor or therapist.

(9) Please inform distributor when operation manual is incomplete or defective.

(10) If the Manual is missing pages or of poor quality, please contact the distributor for replacement.

(11) The unit should be sent to the local service agent for calibration after the product has been used for more than one year.

(12) Please use an easy unlocked Traction-Belt so that it can be easily taken off from the patient in case the main power of the unit fails.(see the section of TRACTION BELT on OPERATION INSTRUCTIONS in this manual)

1.5 CLASSIFICATION

EQUIPMENT shall be classified by marking and/or identification as described in Clause 6. This includes:

1.5.1 Type of protection against electric shock:
EQUIPMENT energized from an external electrical power source: CLASS I EQUIPMENT.

1.5.2 Degree of protection against electric shock: TYPE BF EQUIPMENT.

1.5.3 Degree of protection against harmful ingress of water: Ordinary EQUIPMENT(enclosed EQUIPMENT without protection against ingress of water).

1.5.4 The EQUIPMENT not suitable for use in the presence of a FLAMMABLE ANAESTHETIC MIXTURE WITH AIR or WITH OXYGEN OR NITROUS OXIDE.

1.5.5 Mode of operation: CONTINUOUS OPERATION.

1.6 ENVIRONMENTAL CONDITIONS

1.6.1 Transport and storage

(1) An ambient temperature range of 40 to 70 C.

(2) A relative humidity range of 10% to 100%, including condensation.

(3) An atmospheric pressure range of 500hPa to 1060hPa.

1.6.2 Operation

(1) An ambient temperature range of 10 to 40 C.

(2) A relative humidity range of 30% to 75%.

(3) An atmospheric pressure range of 700hPa to 1060hPa.

1.7 FUNCTIONAL DESCRIPTION

The Traction Unit provides the following function:

1.7.1 Force Setting System

(1) For cervical traction (upright position), the setting force does not exceed 40 lbs.(20kgs) in general. However, if the force should be set above 40 lbs. (20kgs) for special requirements, the maximum force must not be set above 80 lbs. (40kgs).

(2) Hold (Pull) and Rest (Release) forces are controlled independently. Each knob provides dual scales for kilograms and pounds.

(3) Hold force must be 1 lb. (0.45kg) greater than that of Rest; otherwise, visual and audible alarms will be activated.

(4) LED-displays the actual tension of the cord, Scales for kilogram and pound are interchangeable by using the “kg/lb” switch on the front panel of the unit.

(5) Turning the knob of hold or rest force, will cause the LED-displays to show the set value.

1.7.2 Control System

(1) The unit is equipped with a variable speed motor. This enables the therapist to have an infinite speed adjustment in the Pull and Release modes.

(2) Hold / Rest Times are set separately by independent two-digit-push-button-switches. The times can range independently from 00~99 seconds each other. If static traction is required, set Hold-timer switch to "--".

(3) Start/Reset buttons. Press “Start” to begin the treatment after all the parameters are programmed into the unit.
Press "Reset" to release traction cord gradually, to zero out treatment time, and shut off warning beeper.

(4) Traction cord pulls out easily for patient setup.

(5) The selection of lb, kg: lb/kg are selected based on the force unit required. The signal light will show the current selected unit.

(6) Volume control: Total 4 sections, Static/Low/Mid/Max. level

1.7.3 Timer System

(1) Treatment time is set by a two-digit push button switches (i.e., treatment time can be selected from 01-99 min.).

(2) During operation, the remaining treatment time is shown on the TIME display. A decimal point flashes once per second.

(3) If an error occurs, the Traction Cord is released automatically, the timer will stop, and the WARNING lights up till the error is removed and the reset button is pushed.

1.7.4 Safety System

(1) Warning alarm and indication lamps will be activated if any of the following situations occur:

Overload: Actual traction force exceeds preset force by approximate 8 lb. (3.6kg)

Remote: The remote switch is pressed.

Rest>Hold: Rest force is set exceeding or equal to that of pull force.

Service: Malfunction! Motor shuts down and the unit needs service.

(2) Traction safety devices are overriding all other controls. The safety devices include

Manual release: Activated by pushing patient safety remote button.

Auto shutdown: Occurs when the circuit malfunction is detected. (service)

Safe protect: If machine is out of control and traction force exceeds 200±4lb. (91±2kg), machine will stop till repaired.

1.7.5 Indication System

Two LED lights indicate pull and release position. During the rest and hold position, the rest of the timing unit of every level will appear on the screen with indicating light flashing every 0.5 second until the end of time set. The order of force status is pull, hold, release, rest.

1.8 Technical Data:

Traction force	The maximum traction force is 200 lb. (approximately 91 kg)±5 lb (2.5kg)
Traction force compensation	Computerized automatic compensation
Force display	Actual force / preset force – automatic switching display
Traction speed	Step-less, continuous and adjustable
Continuous traction/release time	00_99 seconds, by static traction force "--" selection.
Therapy mode	Continuous/intermittent/harmonized intermittent/progressive
Treatment time	1_99 minutes ±2%
Safety system	Multiple protection alarms – service/overload/rest>hold/remote
Power supply	100V, 120V, 220V, 240V (option) 50/60Hz
Current	1.2A(100V, 120V),0.6A(220V, 240V)
Power consumption	150VA max.
Allowable voltage fluctuation	Max ±10%
Mains fuses	F 1.6A 250V(for 100V, 120V); F 0.8A 250V(for 220V, 240V)
Casing leakage of electricity	< 100_A
Ground resistance	< 0.1_
Electric safety degree	Class I / Type BF (IEC 60601-1)
EMC tested	IEC 60601-1-2 requirements
Classification of equipment	Class IIb as per MDD 93/42/EEC Annex IX
CE Marking	CE 0197
Weight	30 lb. (13.6 kg)
Dimensions	34 (L) x 27 (W) x 27 (H) cm

Note: Designs and specifications are subject to change without notice

2. DESCRIPTION OF CONTROLS

2.1 INDICATIONS OF CONTROLLING PANEL (See Fig 2.1)

2.1.1 POWER SWITCH

Lighted pilot lamp indicates the switch "|" is ON position., lighted pilot lamp indicates the switch "O" is OFF position.

2.1.2 TIME SELECTOR

Select UP/DOWN buttons to setup the time scope of therapy period 01 ~ 99 minutes. Adjust the therapy timer (minute):

UP Button: Each press will increase one min. till the timer is 00 min., then the timer will restart shown on “99”. Holding the button for 0.6 seconds will speed the timing with 10 min. increments. Without releasing the button a further increase with 10 min. increments per 0.4 seconds.

DOWN Button: Each press will decrease one min. till the timer is 100 min., then the timer will restart shown on “0”. Holding the button for 0.6 seconds will speed the timing with 10 min. decrements. Without releasing the button a further increase with 10 min. decrements per 0.4 seconds

2.1.3 START BUTTON

Timer automatically turns on when button is pushed, and a beeper signal sounds when treatment is finished.

2.1.4 RESET BUTTON

If treatment is interrupted, immediately push this button to release the tension.

2.1.5 TIMER

Down-counts the prescribed time of treatment by digital readout when "START" Button is pressed.

2.1.6 Remote STOP

Controlled by patient.

CAUTION: Notify the patient before the start of therapy, that if the patient feels any of the conditions below to press the REMOTE STOP:

(1) If the traction force is stronger than last cycle during treatment.
(2) If tension exceeds patient's tolerance
(3) The machine malfunctions – strange sounds, smoke etc.

2.1.7 “SP” Switch(7)

Setup Volume Switch_(total 4 sections Static/Low/Mid/Max)_

2.1.8 " kg/lb" Switch(8)

Selection button for lb and kg unit.

2.1.9 TRACTION READOUT

This digital-readout indicates the pounds or kilograms of traction either on "hold" or "Rest" conditions. In reset mode, this digital displays '000'. It can readout the value while dialing either hold or rest knob to desired value, then the LED will automatically turn back to '000' in two seconds later.

During treatment, traction forces can be altered by dialing the rest or hold knob. The digital readout displays the new force which will be initiated upon pressing the start button.

CAUTION: DO NOT operate the unit if the readout is defective.

2.1.10 hold CONTROL (11)
From 4 – 200 lb. or 2 – 91 kg
This tension will hold for the time selected.

2.1.11 hold TIMER (12)
Provides 00 - 99 seconds adjustable in steps of 1 second when traction is increased to the Hold position that was selected in item #11 above. “--“ second is set for static traction.

2.1.12 rest CONTROL (13)
From 0 – 197 lb. or 0 – 90 kg

2.1.13 rest TIMER (14)
Provides 0 - 99 seconds adjustable in steps of 1 second. “--“ second is set for static traction

2.1.14 PERFORMANCE INDICATION LAMPS (15)

(1) PULL: the traction force increases from "Rest" to "hold."
(2) HOLD: The hold LED lights up, while traction force is holding.
(3) RELEASE : the traction force decreases from "Hold" to "Rest."
(4) REST: while keeping on rest position, the rest LED lights up, the tension on "Rest" condition.

2.1.15 WARNING INDICATION LAMPS (16)

(1) SERVICE : System malfunction_call distributor for service.
(2) REST > HOLD : When "Rest" dial selected is exceeded "Hold" dial.
(3) OVERLOAD : Holding force is larger than selected, that means the machine is out of control.
(4) REMOTE : Lights up when patient presses the remote button.

2.1.16 kg/lb indicator light (17)

2.1.17 SPEED CONTROL (19)
Variable "Pull" speeds.

2.1.18 POWER SOCKET (20)

2.1.19 TRACTION PULLEY (21)
Can be rotated in any desired position.

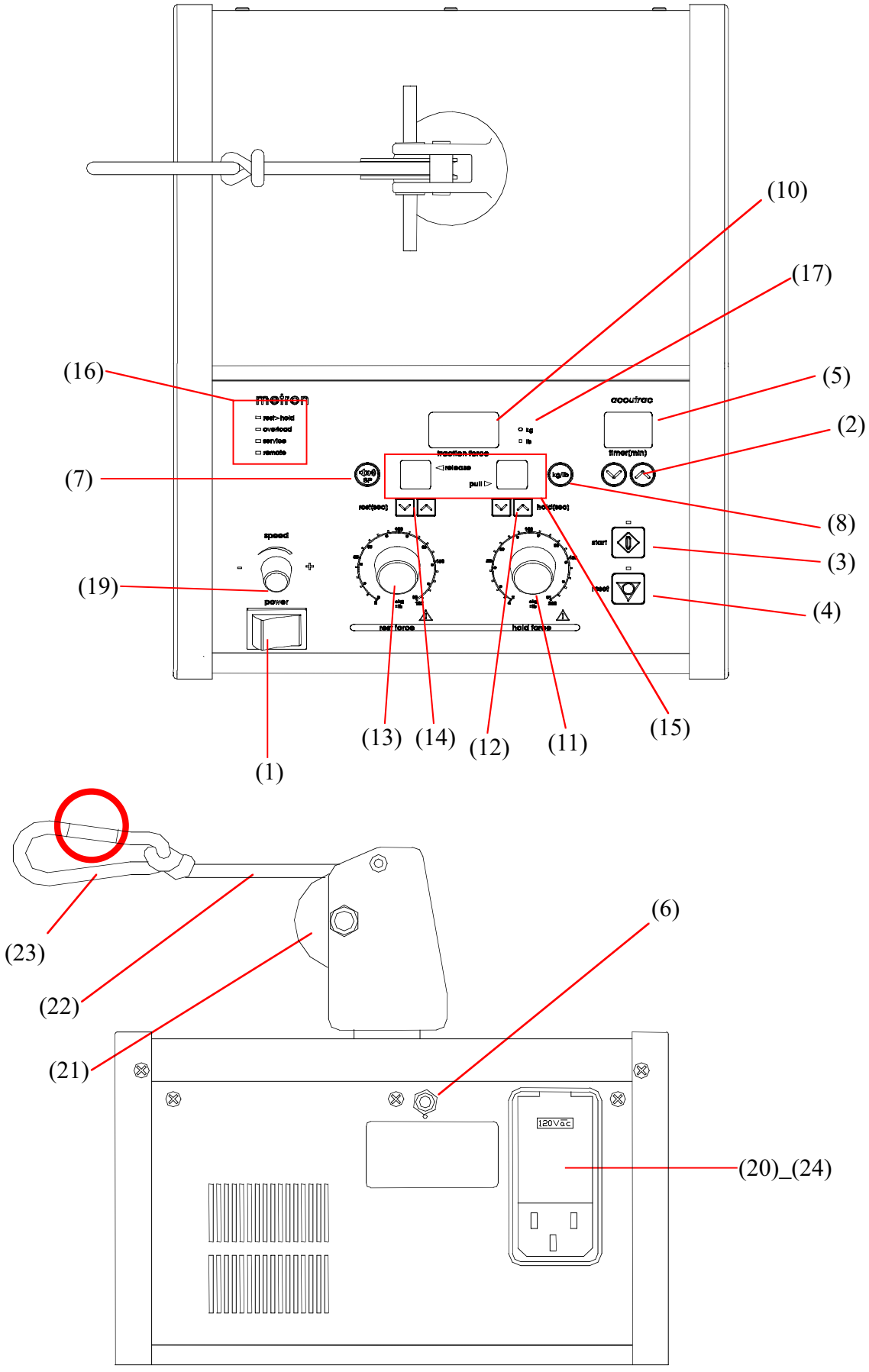
2.1.20 TRACTION CORD (22)

CAUTION: Scale adjustment must be calibrated by an authorized technician.

CAUTION: The traction cord must be replaced by an authorized technician at least once a year.

2.1.21 TRACTION HOOK (23)
When using, please settle the hook at the position of artwork (fig 2.1 circle) shown.
(The traction hook needs to be mounted like the bold circle of Fig. 2.1)

2.1.22 FUSES (24)



(Fig 2.1)

2.2 CONFIGURATION

It is envisioned the traction unit can be used in 4 different treatment configurations. As shown below. With the four configurations, different accessory packages can be selected.

Item	Description	-IA	-I	-II	-III
5009930	main unit with Remote Stop x 1 Hand Screw x 4 Power cord x 1	_	_	_	_
5000210	Traction Table			_	_
5000300	Mounting Stand (for cervical traction)		_		
5000400	Flexion Chair (for cervical traction)		_		
6000103	Mounting Bracket (for cervical traction)	_			
6000206	Pelvic Spreader Bar			_	_
6000233	Flexion Stool			_	_
6000238	Cervical Traction Harness, Velcro-type	_	_		_
6000239	Pelvic Traction Belt, Velcro-type			_	_
6000242	Cervical Spreader Bar	_	_		_
60000243	Cervical Roll			_	_
6000244	Double-sectioned fastening strap			_	_

Note: Please refer the accessories list from your local distributor.

3. OPERATING INSTRUCTIONS

Check the unit is operating normally before start of treatment!

3.1 INTRODUCTION

This section contains detailed procedures for use of the traction unit. It is designed to familiarize experienced users with the operation & function of the unit. Read this section thoroughly before operating this unit.

Installation

The device must be installed only by authorized person.

Do not install the device by yourself.

3.2 OPERATING PROCEDURE

3.2.1

(1) Connect the unit to AC power outlet or as indicated on the nameplate affixed to the back of the machine.

(2) Connect the remote switch plug to the remote connector.

CAUTION: Please assure the remote-stop is set to normal before using.
Confirm the remote stop is being held by the patient before pushing the START button.
Whenever the remote stop pushed, the device will stop running immediately.

(3) Turn Power switch ON, indicator light should be illuminated.

(4) Set required Treatment time. Hold time, Rest time, Hold force, Rest force.(IT IS NECESSARY TO PRESET “Hold” FORCE WHENEVER “Rest” FORCE IS SELECTED. OTHERWISE, THE MACHINE WILL NOT OPERATE.)

(5) Press Start button to begin treatment. If beeper sounds, be sure Rest force must be set lower than Hold force. Press Reset button to reset alarm and indicator lamps. Repeat items #4 and #5.

CAUTION: Ensure the traction cord is releasable and has a smooth action before starting treatment.

3.2.2 Adjust hold/rest forces after machine has started working :

(1) In intermittent mode :
Set the knob to new value then press START button. Machine will change to this new force in the next period.

(2) In static mode :
Machine doesn't accept any change until in RESET mode.

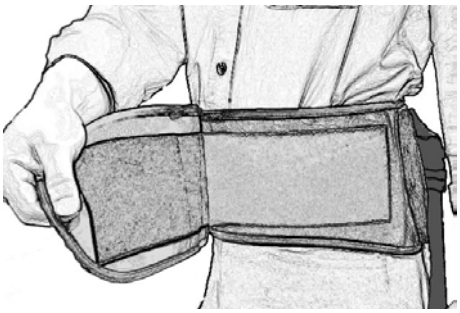
3.3 FAULT CONDITION

In the case of a sudden power shut or if the device runs abnormally or the patient feels uncomfortable during treatment, turn the power off immediately and undo the belt in order to release the patient from the device. Call the authorized service department as soon as possible.

3.3.1 The following figures indicate how to release patient from the easy unlocked Traction-Belt !

3.3.2 The operation method of cervical belt is completely same as that of Pelvic Belt.

3.3.3 The suitable Traction-Belt is with velcro.



3.3.4 The Traction-Belt can purchased through our authorized representative. (see the section of AUTHORIZED REPRESENTATIVE IN EUROPEAN COMMUNITIES on MAINTENANCE INSTRUCTIONS in this manual)

3.4 MODES

Intermittent	Program: Press Reset button
	Hold and Rest seconds
	Treatment time
	Hold and Rest force
	Set speed to fast
	Press Start button
Static	Program: Press Reset button
	Hold seconds to "--"
	Treatment time
	Hold force only
	Set speed to fast
	Press Start button
Step-less	Program: Press Reset button
Progressive	Hold and Rest times
	Treatment time
	Hold and Rest force
	Set speed to minimum
	Press Start button
Harmonic	Program: Press Rest button
	Hold seconds to "00"
	Rest seconds to "00"
	Treatment time
	Hold and Rest force
	Set speed to minimum
	Press Start button

TECHNICAL CAUTION NOTES:

IF THE REAR PANEL IS REMOVED OR REFITTED, ALL CONNECTORS/LINES TO REAR PANEL MUST BE RELOOMED TIGHTLY AND MUST BE KEPT AWAY FROM VR201 (LINEAR POTENTIOMETER).

THE PROGRAM ROM MUST NOT MODIFIED UNLESS UNDER DIRIECTION OF THE MANUFACTURER.

4. MAINTENANCE INSTRUCTIONS

Preventive inspection and maintenance please notify distributor locally.

4.1 AUTHORIZED REPRESENTATIVE IN EUROPEAN COMMUNITIES:

Metron Medical
c/- Physiomed Services
Attention: Kevin Lee
8-11 Glossop Brook Business Park
Surrey Street
Glossop
DERBYSHIRE SK13 91J UNITED KINGDOM

4.2 OEM MANUFACTURER

EVER PROSPEROUS INSTRUMENT, INC.
ADDRESS_4F, No. 2/ No. 4, Alley 59, Lane 42, Ming-Chuan Road, Hsin-Tien, Taipei, 23120, Taiwan
P. O. Box. 10009 Hsin Tien., Taipei.

TELEPHONE NUMBER_886-2-29186363

TELEFAX NUMBER_886-2-29188288

⚠ **For technical documentation please contact manufacturer.**

4.3 HOW TO CLEAN THE UNIT

Please clean the unit with a longhair brush or dry cloth. Never use alcoholic liquid or solvent liquid.

The users should contact the nearest licensed recycling firms, according to the Directives of ISO-14000, to properly handle the products or/and related accessories whenever these materials to be disposed. Otherwise the users may consult the vendors for further assistance.

4.4 CALIBRATION OF TRACTION FORCE

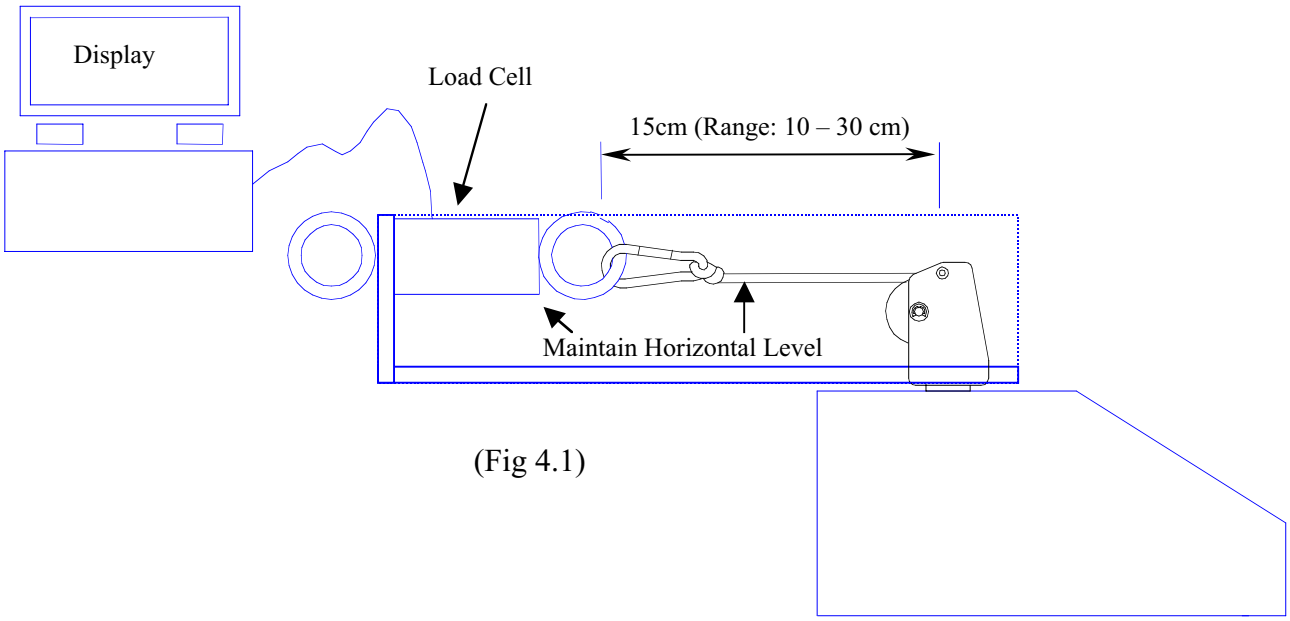
CAUTION_Calibrate regularly Suggest calibrate annually.

CAUTION_Only a certified technician is allowed to calibrate the traction system.

CAUTION_Measurement equipment used for maintenance, calibration and inspection shall meet the direct or indirect approval of national laboratories with proper certificates.

CAUTION_The maintenance and calibration specifies the proper parts with parts number, no substitution is authorized. The distributor shall reorder the parts if it runs short.

4.4.1 Calibration procedure



(Fig 4.1)

(1) Fixed the Traction Unit

(2) Length of Traction cord : 15cm(Range : 10_30cm)

(3) Fixed the Load Cell along with Traction cord.

(4) Maintain the Load Cell and Traction cord on Horizontal level.(Horizontal level)

(5) Please set hold SEC.=02
rest SEC.=02
Please adjust the SPEED CONTROL at extreme fast.
Please record hold _The Max. data for display of load Cell.
rest _The Min. data for display of Load Cell

(6) Clockwise_Increase the Force

(7) Tolerance of Traction Force.
Hold Force _±4 lb. (2kg)
Rest Force _±4 lb. (2kg)

4.5 TECHNICAL CHECKS

The following activities and test must be carried out after service and calibrate.

Date_____Y____M____D Inspector_

Serial No._

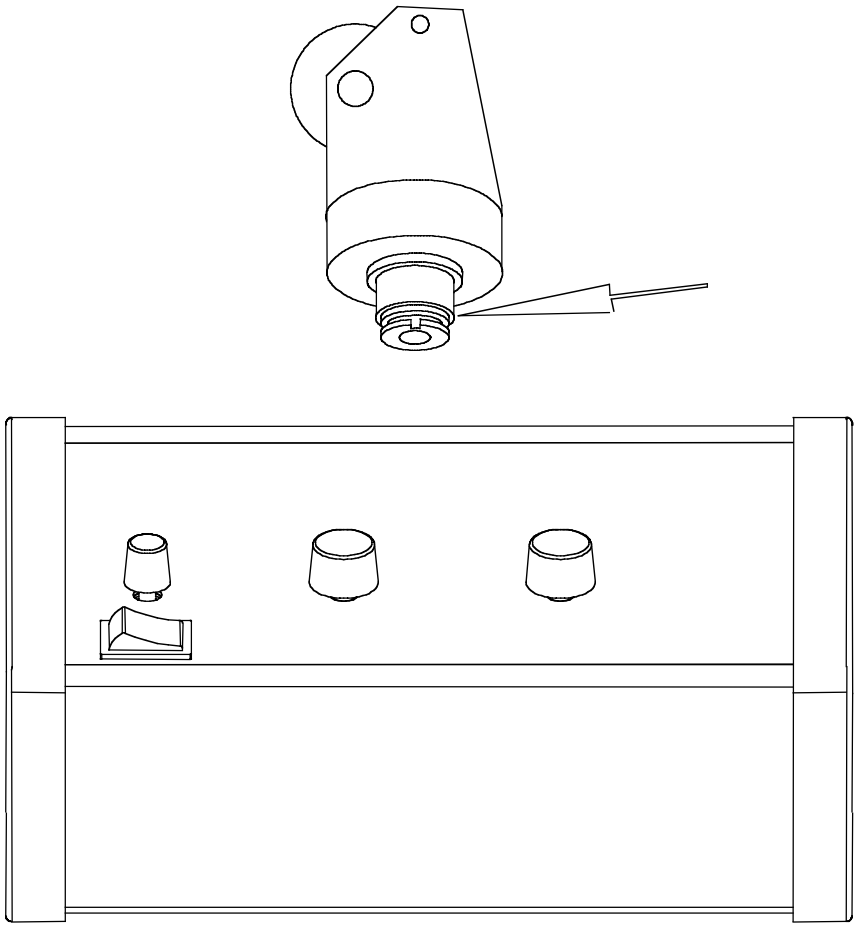
Item	Standard	Result
A. Duration Test	24 Hours	
B Rest Test (Hold=2kg_Rest=0 kg)	(1) Speaker has a long sound.	
	(2) Reset pilot lamp glows red.	
	(3) Time display in "00".	
	(4) STATUS & WARNING pilot lamps are all off.	
C. lb/ kg Switch	(1) lb / kg pilot are OK.	
	(2) 200 lb/ 91 kg force display are correct.	
E. STATUS test (Hold=2sec_Rest=2sec)	(1) Press START button, START light on, RESET light off.	
	(2) pull→hold→release→rest (pilot lamps and action)	
	(3) hold set_40 lb alarm sounds.	
F. WARNING test (push START)	(1) Actual force_holding force set, then "OVERLOAD" pilot lamp is illuminated.	
	(2) Holding force setting_resting force setting, then "rest_hold" pilot lamp is illuminated.	
	(3) When the remote safety switch is pressed, then "remote" pilot lamp is illuminated and audible alarm sounds.	
	(4) Warning status-Rope releases_Audible alarm sounds, "RESET" pilot lamp flashes.	
G. Speaker volume	Volume adjustable button SP is working properly with Max. / Mid. / Static sections.	

4.6 TROUBLE SHOOTING

ERROR MESSAGES	PROBABLE CAUSE
(A) Can not turn POWER ON	1. AC voltage has not supplied 2. Fuse burned off 3. Power transformer abnormal
(B) POWER ON but can not RESET	1. U104 (CPU) damage 2. X101 (CRYSTAL) error 3. U105 DS1233
(C) SEVEN-segment LED does not display"0" in RESET MODE	1. U104 error 2. SEVEN-segment LED error 3. U109 error
(D) ROTATE hold knob or RESET knob but does not display its value (in RESET MODE)	1. VR abnormal 2. U104 (CPU) damage
(E) kg /lb Switch fail	1. SWITCH connection error 2. U104 (CPU) damage
(F) START_RESET button or remote switch fail	1. Switch connection error 2. 104 (CPU) damage
(G) FORCE is not accurate or ERROR	1. Re-calibrate the traction system 2. VR201 damage 3. VR201 connection error
(H) WARNING & STATUS LED not all off in RESET MODE	1. LED abnormal 2. U104 (CPU) damage
(I) MOTOR works abnormally	1. U115, U116 error 2. RL101_RL103 (RELAY)error 3. U104 (CPU) damage
(J) SPEED abnormal or invalid	1. VR error 2. TRC101 error 3. UJT101 (FET) error
(K) Machine is normal but has no tension	1. Check the gear if engage. 2. Check the wave washer
(L) Motor has abnormal noise	1. Check the gear 2. Check the motor brake

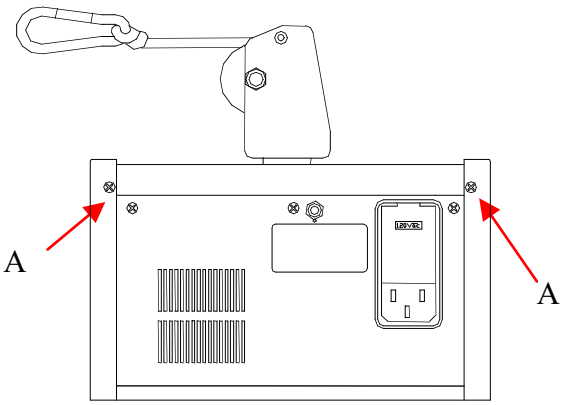
4.7 INSTALLATION & REPLACING PARTS:

4.7.1 HOW TO INSTALL & REPLACE THE TRACTION PULLEY

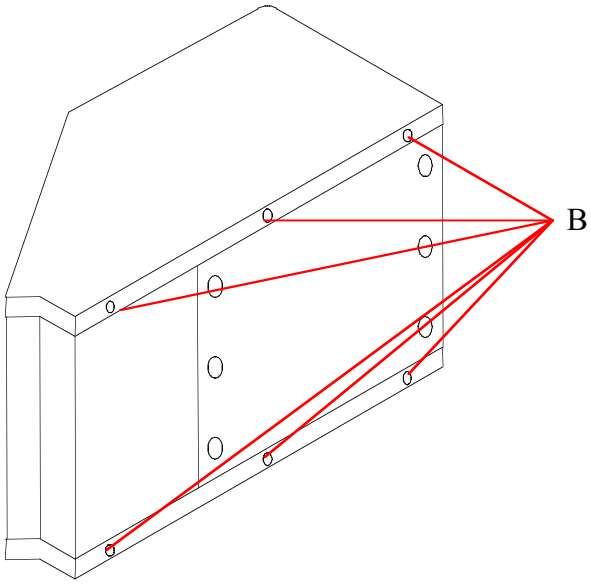


Whenever put the head pulley on the machine (or take out from machine) be sure to turn the pulley to the left side or make the breach as pointer shown to rear side.

4.7.2 HOW TO INSTALL & REMO.VE THE MACHINE

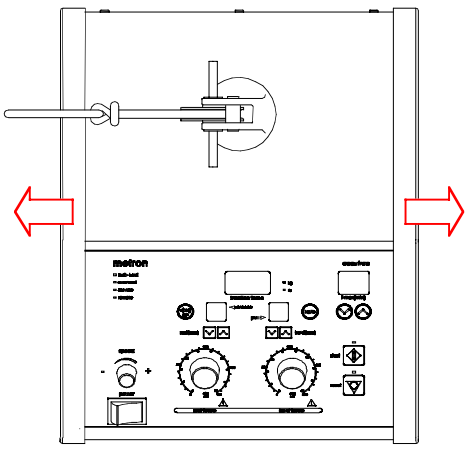


1. Remove 2 screws A

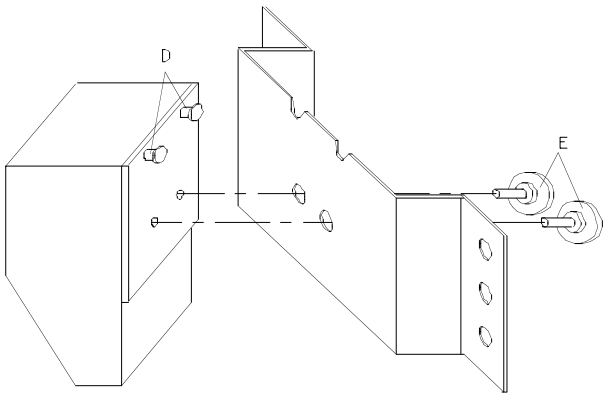


2. REMOVE THE BACKPLATE:
   Remove 6 screws B

3. REMOVE THE SIDE CASE:

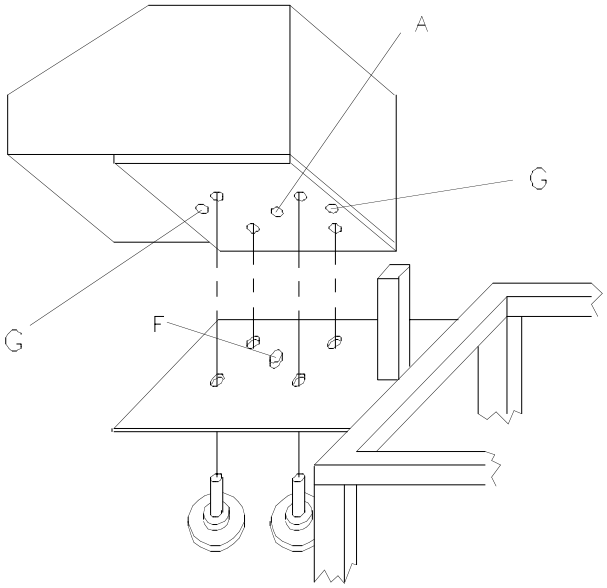


4.7.3 INSTALL MACHINE ON WALL



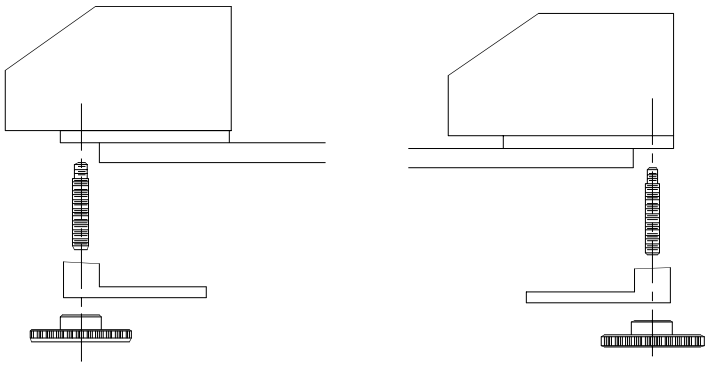
1. Lock 2 special screws D in screw-holes D.
2. Locate machine on the mounting bracket.
3. Fix the machine by hand-screws E.

4.7.4 INSTALL MACHINE ON THE TABLE



1. Hole A of the machine fix on pin F of installing plate.
2. Turn the machine to setting position you want (there are 3 positions for setting.
3. Lock 4 hand – screws.

4.7.5 INSTALL INSTALLING BY MOUNTING BRACKET



1. Lock stud to screw hole G.
2. Put in the universal mounting bracket to stud.
3. Lock the knob.

4.7.6 HOW TO REPLACE A TRACTION CABLE

⚠**The traction cable should be non-conductive**

⚠**The least strength of traction cable should be withstood a force of 320 kgs (3200N).**

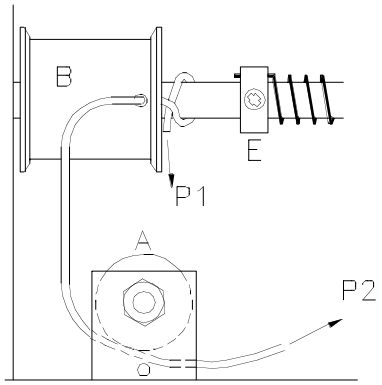


Fig 1

1. Loose the screw E. (Fig 1)
2. Pass the cable around pulley A. (Fig 1)
3. Penetrate the hole of pulley B & go around the main shaft; strain the cable, it will be fixed by this way. (Fig 1)
4. Pass side P2 of cable to pulley C. (Fig 2)
5. Then pass pulley D. (Fig 3)
6. Go around head pulley. (Fig 4)
7. Tie the hook with cable as shown in Fig 5 – 7.
8. En-cycle the cable on pulley B.
9. Turning pulley B till the keyway to face of us. (Fig 8)
10. Turning the rotary spring about 2 cycles by reverse of cable direction then lock screw E.

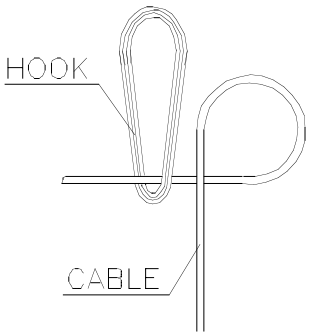


Fig 5

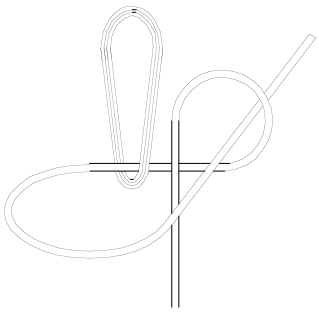


Fig 6

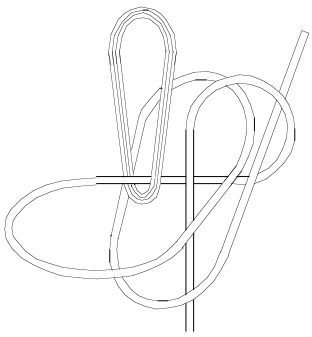


Fig 7

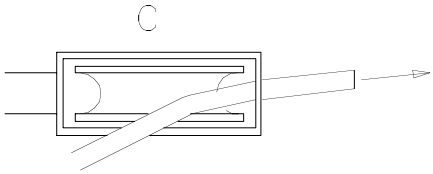


Fig 2

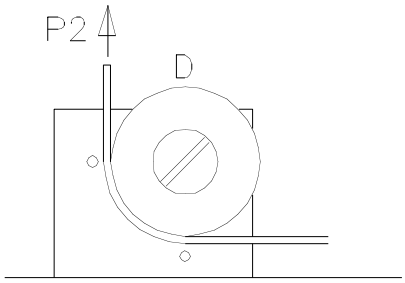


Fig 3

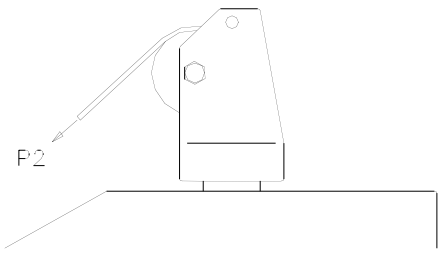


Fig 4

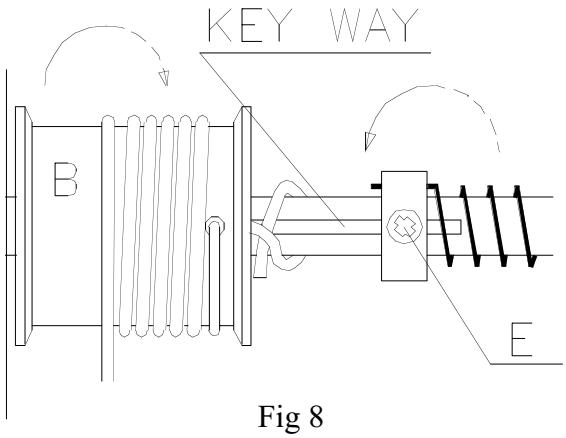


Fig 8

4.7.7 FUNCTION OF HOLES ON MACHINE BOTTOM

A. : Alignment hole 3/8” dia.

B. : Alignment set pin holes _” dia.

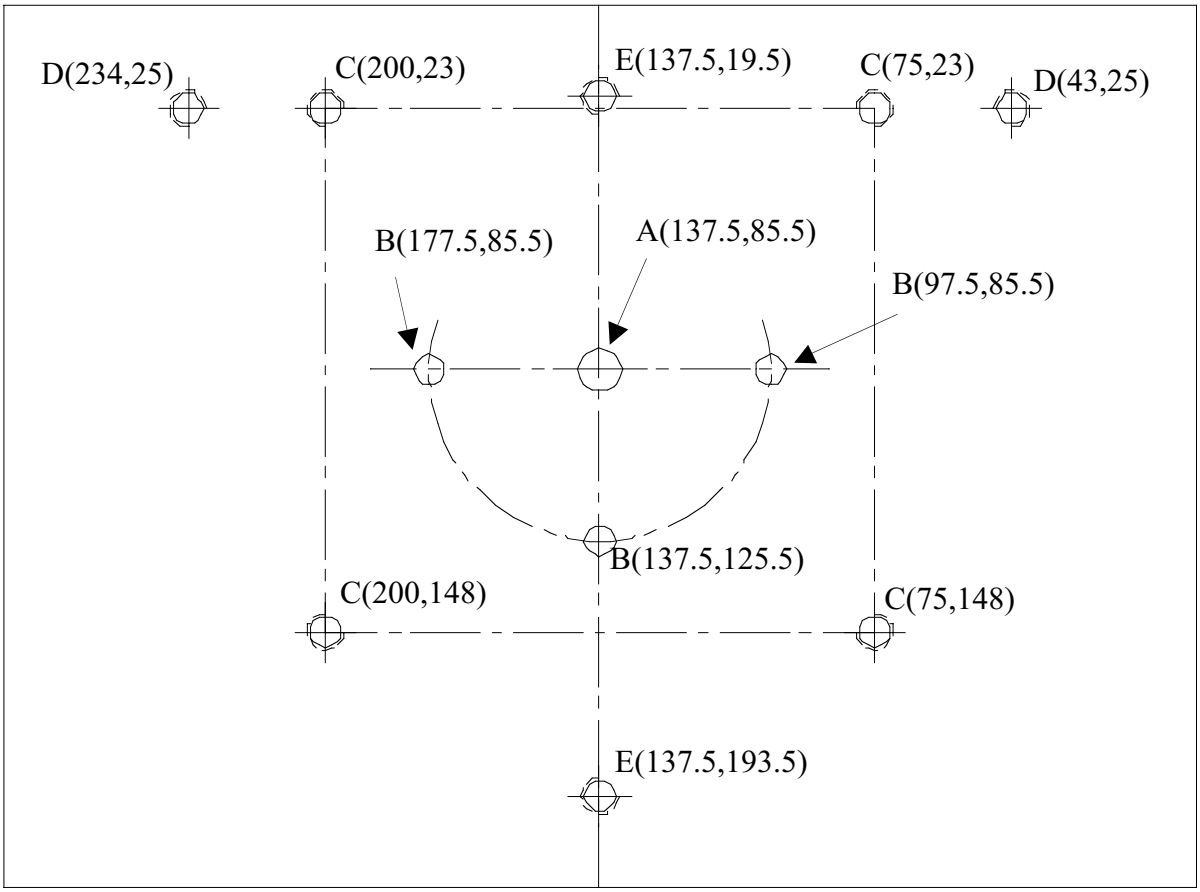
C. : Screw-holes for table mount & wall mount 5/16”-18UNC

D. : Knob for wall bracket 5/16”-18UNC

E. : Screw-holes for stand-mount or mounting bracket 5/16”-18UNC

BACK SIDE

(0,0)



FRONT SIDE

4.7.8 HOW TO REPLACE THE FUSE-LINKS

Step 1:
With screw driver take off the fuse cover.
(Fig 1)

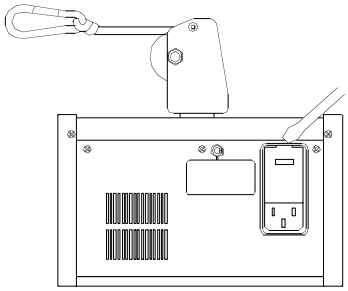


Fig 1

Step 2:
Take out the fuse case from the fuse holder, then check up the fuse and replace it if the fuse blowout. (Fig 2)

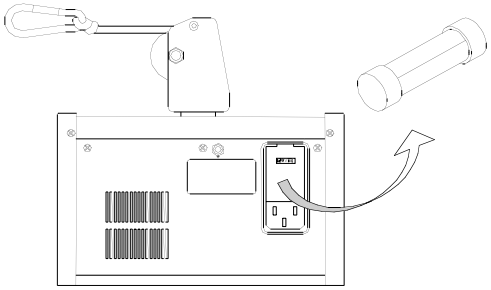


Fig 2

Step 3:
Place the fuse case into fuse holder, then replace the fuse cover. (Fig 3)
.

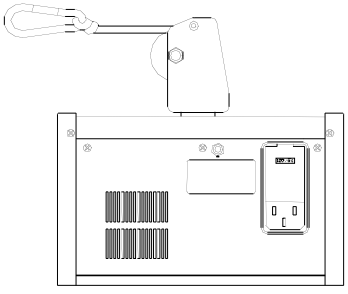


Fig 3

4.7.9 RECORDS OF INSTALLATION AND SERVICE

RECORDS OF INSTALLATION AND SERVICE

Serial No.:

Date	Type of Action	Performed by(person) / Company	Result / Comment