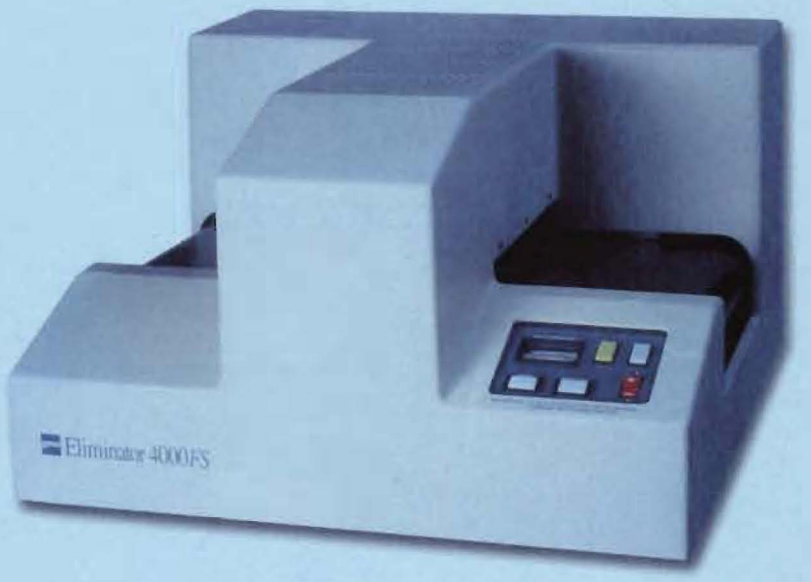
Eliminator CDS-4000FS Series
Owners Manual



READ OPERATING INSTRUCTIONS BEFORE OPERATING MACHINE

GARNER PRODUCTS

The World's Leading Degausser Manufacturer

(800) 624-1903
www.garner-products.com
www.audiolabelectronics.com

Manufactured in the U.S.A.

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SPECIFICATIONS

Degaussing Force:	4000 Oersteds
Belt Speed:	2.2 inches per second
Erasure Time:	16 seconds nominal
Erasure Depth:	-75 dB Analog Audio Tracks Ref. Level +12 dBm, 800 Hz Tone, 1500 Oe tape
Media Size:	27.3 x 3.25 cm
Run Time Before Overheat:	22 minutes from cold start (with proper operating procedure - nearly continuous)
Dimensions:	69.6 cm width 72.6 cm depth 43.4 cm height
Controls:	Power on/off circuit breaker Stop/STBY switch Erase Switch
Indicators:	Power Lamp Temperature Lamp Field Strength Meter
Protection:	Main Circuit Breaker Fused Control Circuits Automatic Thermal Protection
Power Requirements:	
Model CDS-4000FS	208/220/240 VAC 18 Amp. Nominal 60 Hz Single Phase {Note: 30 Amp circuit is required}
Model CDS-4000FSX	200/220/240 VAC 18 Amp. Nominal 50 Hz Single Phase {Note: 30 Amp circuit is required}
Weight:	147 Kg.

DESCRIPTION

The Eliminator CDS-4000FS Series Degausser is designed for fast, efficient erasure of magnetic media with coercivity levels up to 2400 Oersteds. It incorporates new technology which permits generation of an intense degaussing field without the usual power losses associated with such fields. The Eliminator CDS-4000FS Series develops its degaussing field in the center of a large coil through which the media passes. The magnetic field intensity is nearly uniform throughout the center area or window of the coil. This assures even erasure across the entire width of magnetic tapes.

Ease of operation is enhanced by the use of a conveyor transport system and a *user friendly* control panel. Typical erasure time for a single videocassette is 15 seconds.

INSTALLATION

Unpacking

Unpack the Degausser carefully, and inspect it for signs of physical damage. If damage is apparent, a claim should be filed with the carrier. It is recommended that all packing material and shipping cartons be retained to facilitate shipping, should factory service ever be required.

Power Requirements

The Eliminator CDS-4000FS Series comes with a factory installed six-foot cord and 30 ampere cord cap. The Degausser operates from single phase 208, 220, or 240 VAC at 60 Hz (CDS-4000FS models), or single phase 200, 220 or 240 VAC at 50 Hz (CDS-4000FSX models), by selection of the appropriate tap Figures 5 & 6 show how to change the tap to coincide with the available line voltage. This tap selection terminal strip is located behind the removable rear panel. The circuit supplying power to the machine should be rated at 30 ampere even though the average current draw is nominally 18 amperes.

Caution: a good electrical ground must be provided to ensure safe operation.

Important: Never operate the Degausser on a higher line voltage than the tap is selected for.

Panel Controls and Indicators

Power On/Off Switch

This rocker-actuated switch is a circuit breaker, which protects the power circuits of the Degausser.

Stop / Stby

This push button switch places the Degausser in a standby mode. Control circuits will have power applied and the cooling fan running, however, the Degaussing coil and conveyor transport are not energized.

Important: Before turning off the power switch, always return the Degausser to the standby mode.

Erase

The push button switch places the Degausser in the operational mode for degaussing media. The coil and conveyor are powered.

Power Light

This indicates that power is being applied to the Degausser. It should be lit whenever the power on/off switch is in the ON position.

Temp Light

This indicator lights up if the degaussing coil reaches too high of a temperature. In such a case, the machine will automatically de-energize the coil until it has cooled sufficiently.

Field Strength Meter

This precision meter indicates the magnetic flux density developed by the degaussing coil. Flux density indications in the green zone are sufficient for proper erasure. It is normal for the indication to drop slightly as the coil heats up during extended operation.

OPERATION

Turn - On

The operation location should be on a flat surface and kept *at least four feet away from any stored magnetic media or tape recorders*. With the machine properly connected to a power source, place the power switch in the "ON" position. The power and stop/stby indicators should light and the cooling fan should be running.

Erasing Procedure

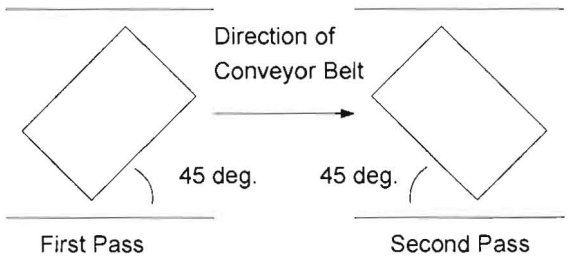
To enter the erase mode, simply push the erase switch. The erase switch will light and the stop/stby switch will be unlit. The field strength meter should indicate in the green zone and the conveyor will move from left to right. Tapes are erased by placing them on the left end of the conveyor and allowing them to pass through the coil.

Two passes are required for high coercivity tape with a 90-degree rotation of the tape for the second pass.

Note the position of the reel or cassette on the first pass and rotate it one-quarter turn for the second pass.

Note: For MII and Betacam formats, with analog audio tracks located along the upper edge of the tape, slightly deeper erasure of these tracks is achieved by placing the cassette upside down on the conveyor. This procedure provides about a 4 dB improvement in erasure and is often deemed unnecessary.

Important: D-2 format cassettes have ferrous metal hubs, which are attracted by magnetic fields. This can cause the smaller size cassettes to become trapped within the degaussing field if proper operator procedure is not followed. Entrapment occurs when both metal hubs pass through the degaussing coil at the same time. This happens if the cassette is run widthwise through the coil. To prevent entrapment, place the D-2 cassette on the belt at a 45-degree angle to the direction of belt travel. For the second pass, rotate the tape one-quarter turn (90°). This places the cassette at the opposite 45° angle with respect to belt travel. Refer to figure below.



Turn-Off

Place the Degausser in the standby mode by pushing the stop/stby switch. Return the on/off power switch to the off position. Damage to the contacts of the on/off power switch may occur if it is turned off while the machine is in the erase mode.

Important: Before turning off the power switch, always return the Degausser to the standby mode.

Extended run time procedure

Whenever the degaussing coil is energized, heat is being built up within it. Eventually the coil will reach a temperature where its thermal protector will de-energize it to prevent damage. From an initial start at room temperature the time before this thermal shut down occurs is about 20 minutes.

The run time before thermal shut down can be greatly increased by following a simple procedure.

During an erase session, whenever tapes are not actively being passed through the machine, return the machine to the standby mode by pushing the stop/stby switch.

Over Temp

In the event that the coil reaches too high a temperature, it will automatically de-energize and the conveyor belt will stop. The temp indicator will be lit and both the erase and stop/stby switches unlit. Leave the power switch in the "on" position as this keeps the fan running to assist in cooling the coil.

When the coil cools sufficiently, the temp indicator will automatically go out and the stop/stby switch will light. This indicates that the machine is again ready to be placed in the erase mode.

Troubleshooting

Electrical

The symptoms of the Eliminator CDS-4000FS Series at the time of malfunction provide clues for quickly diagnosing the cause. Table 1 is a list of observed symptoms and possible causes.

The electrical schematics of the Eliminator CDS-4000FS Series are shown in Figures 10 & 11. Control circuits operate on 24 VAC provided by transformer T1. The electromagnet L1 and resonating capacitors C1 through C5 are powered by thyristors SCR1 and SCR2. Gating of the thyristors is provided by the printed circuit electronics assembly.

Control circuits can be operated without energizing the electromagnet, L1, by simply removing the power tap connection between TB1 terminal 3 and the appropriate voltage terminal 4, 5, or 6. When restoring operation of the electromagnet be certain to re-connect the tap to the appropriate voltage terminal. See Figure 8.

Caution: Troubleshooting should only be performed by qualified personnel. The secondary winding of the electromagnet and its associated capacitors C1 through C5 operate with voltages near 2700 VAC. These voltages are lethal, as are the lower voltages of the power mains. Extreme care should be exercised when troubleshooting. It is advised that the machine cover be in place whenever the electromagnet is energized.

For technical assistance contact:

Garner Products
(916) 784-0200
(800) 624-1903
Info@Garner-Products.com

Belt Replacement and Adjusting

Start Up

The belt has been adjusted at the factory for proper tracking. After operating the machine for a minimum of 72 hours the belt may stretch which will require an adjustment to be made in the field. In most cases only one start up adjustment will be needed during the life of the belt.

Adjusting the belt for proper tracking

Located on the input end of the degausser are two screws. These screws are used to control the preload and tracking of the belt. As shown in Figure 11, the belt will move away from the screw that is being turned in the clockwise direction.

Centering the belt can be accomplished by turning the right or left hand adjusting screws one complete turn (see Figure 11). After the belt is centered, which will take about 15 seconds, turn the adjusting screw in the opposite direction ¾ of a turn. If more adjustment is required, repeat the above steps until the belt remains centered.

Belt Replacement

A belt may easily be replaced by following the step by step instructions as shown below.

Disconnect the power source and remove the top cover.

Turn the adjusting screws counter clockwise until all the tension is removed from the belt.

Remove the old belt by rotating the belt until the hinge splice is located on the topside of the machine (See Figure 12). This will allow easy removal of the hinge pin with a needle nose pliers.

After the splice pin has been removed, assemble the new belt. Replace the top cover and connect the power source.

To preload the belt, simply turn the screws in the clockwise direction until the adjustment nut is located 1.00 inches away from the guide block. (See Figure 12).

After preload, adjust the belt for proper tracking by simply following the instructions as noted under "Adjusting the belt for proper tracking"

After the machine has been allowed to operate for a minimum of 72 hours further adjustment may be required.

TROUBLESHOOTING CHART

Table 1

Symptom	Possible Cause
Power Light Not Lit	DS1, R1
Fan does not run	F1, FM
Power light lit, stop/stby light unlit	F2, S4 Open, DS2
On/off breaker trips when "erase" is pressed	C1, C2, C3, C4, C5, C6, L1, PCB Assembly
On/off breaker trips when turned on	SCR1, SCR2, PCB Assembly
Temp light always lit	S3, Q1
Field Strength Low	Power tap set incorrectly, line voltage low, PCB Assembly, SCR1, SCR2
Field Strength meter does not indicate	PCB Assembly, L1 tap not connected, F3, M1
Will not remain in erase mode	K1
Conveyor does not run	Belt jammed (check under machine), motor overheated, DM, sprocket loose.

MODEL CDS-4000FS SERIES TUNING INSTRUCTIONS

With the machine OFF and the power cord unplugged form the power source, measure the power line voltage and check to see that the voltage tap for the coil is properly connected for the corresponding measured voltage. (Refer to manual)

Connect an oscilloscope to the terminals of the front panel "FIELD" meter.

WARNING: When energized, the magnet coil operates at about 2700 volts AC RMS. The high voltage is also present across the associated capacitors. Keep hands, tools, and other items clear of the coil, capacitors, and the associated wiring.

Reconnect power to the machine and place the unit in the "ERASE" mode. The coil should energize and a 20 Hz sine wave should be observed on the oscilloscope.

This sine wave should have a pulse occurring at its crest and trough. This pulse should occur just ahead of the crest and trough. (See figure 1)

Pulses appearing too far ahead of the peak indicate too low a system resonant frequency. (See figure 2)

Pulses appearing at or behind the peak indicate too high a resonant frequency. (See figure 3)

The resonant frequency can be shifted (tuned) by changing capacitor values and/or manipulating the tertiary winding of the coil.

The tertiary winding can be connected with the secondary winding as series aiding for maximum inductance, series opposing for minimum inductance, or disconnected (open) for nominal inductance. (See figure 4)

(Be certain to turn machine OFF and disconnect from the power source when making any tertiary winding changes.)

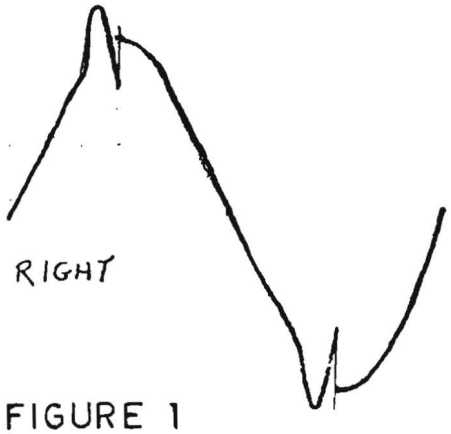


FIGURE 1

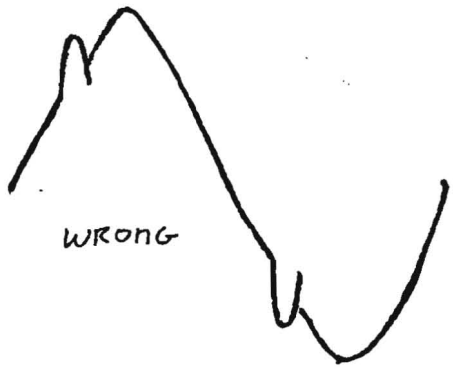


FIGURE 2

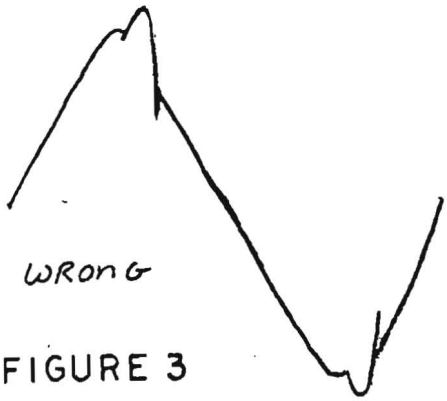
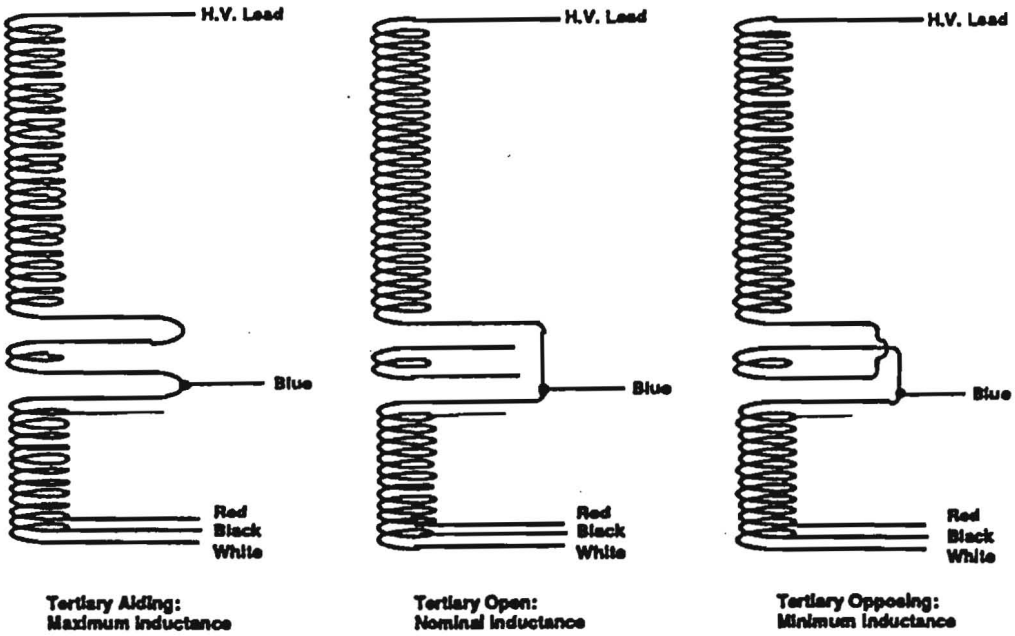


FIGURE 3

FIGURE 4



THREE WIRING CONFIGURATIONS TO VARY INDUCTANCE OF THE COIL

Figure 1 - 4

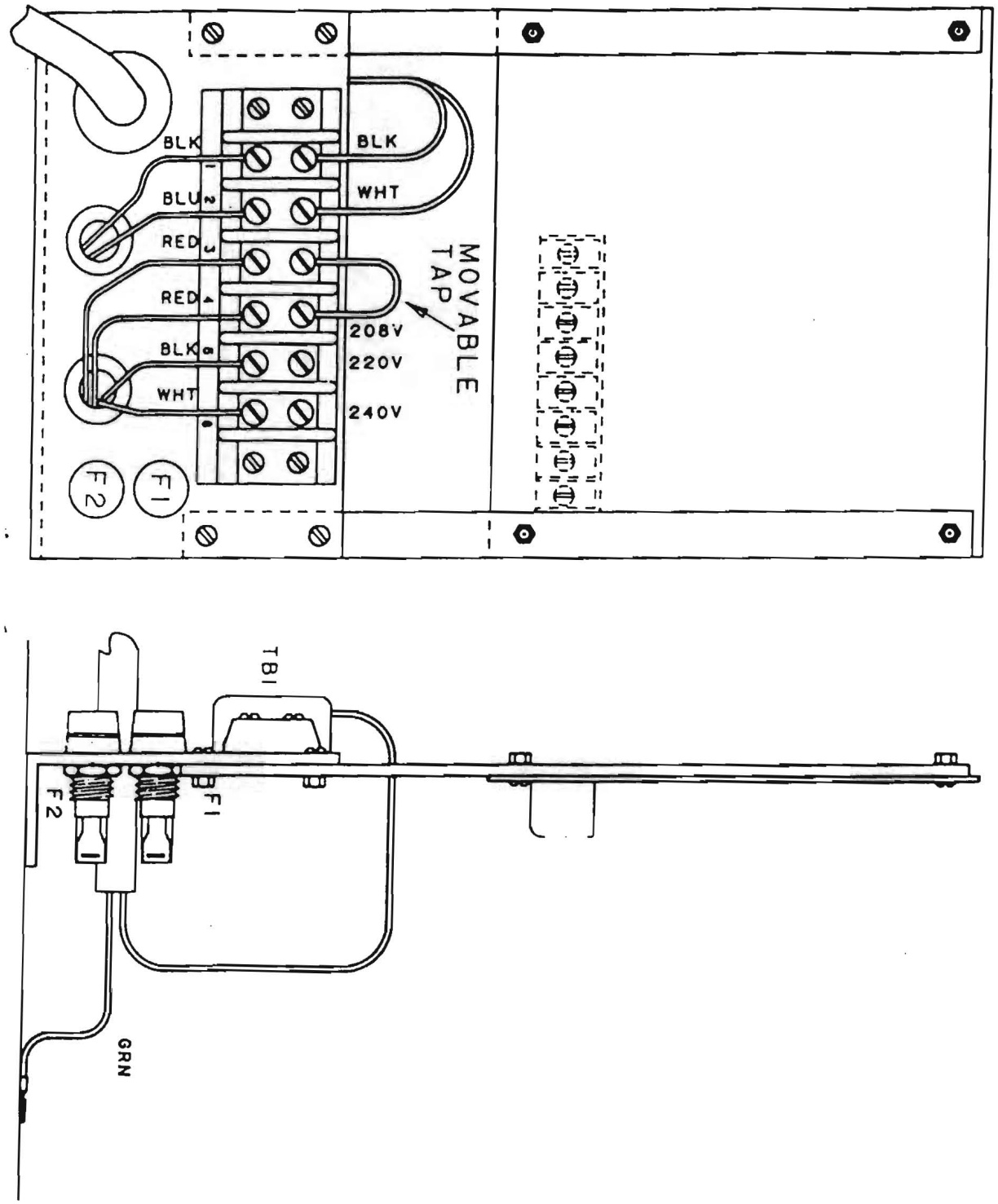


Figure 5 – CDS-4000FS Voltage Tap

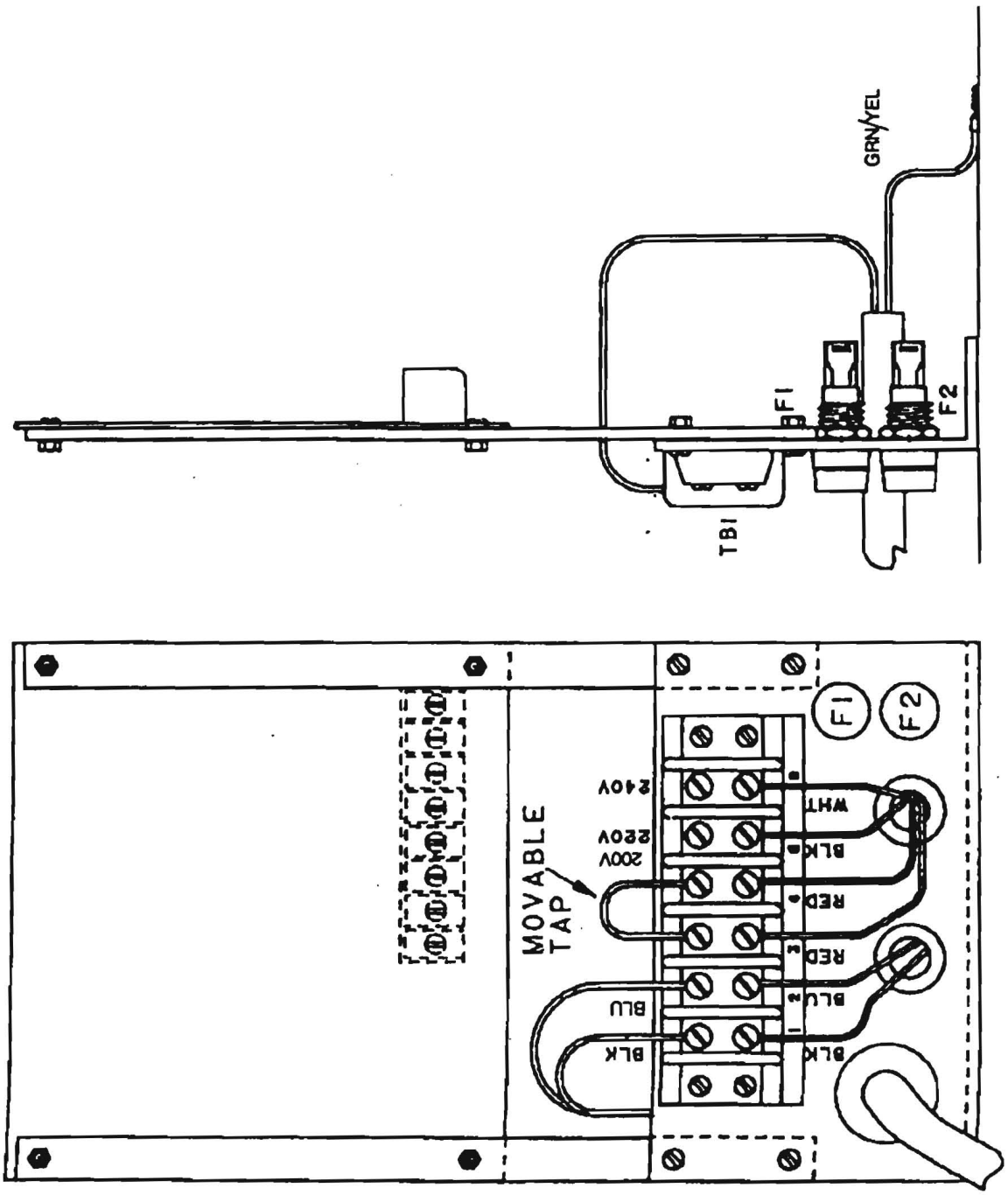


Figure 6– CDS-4000FSX Voltage Tap

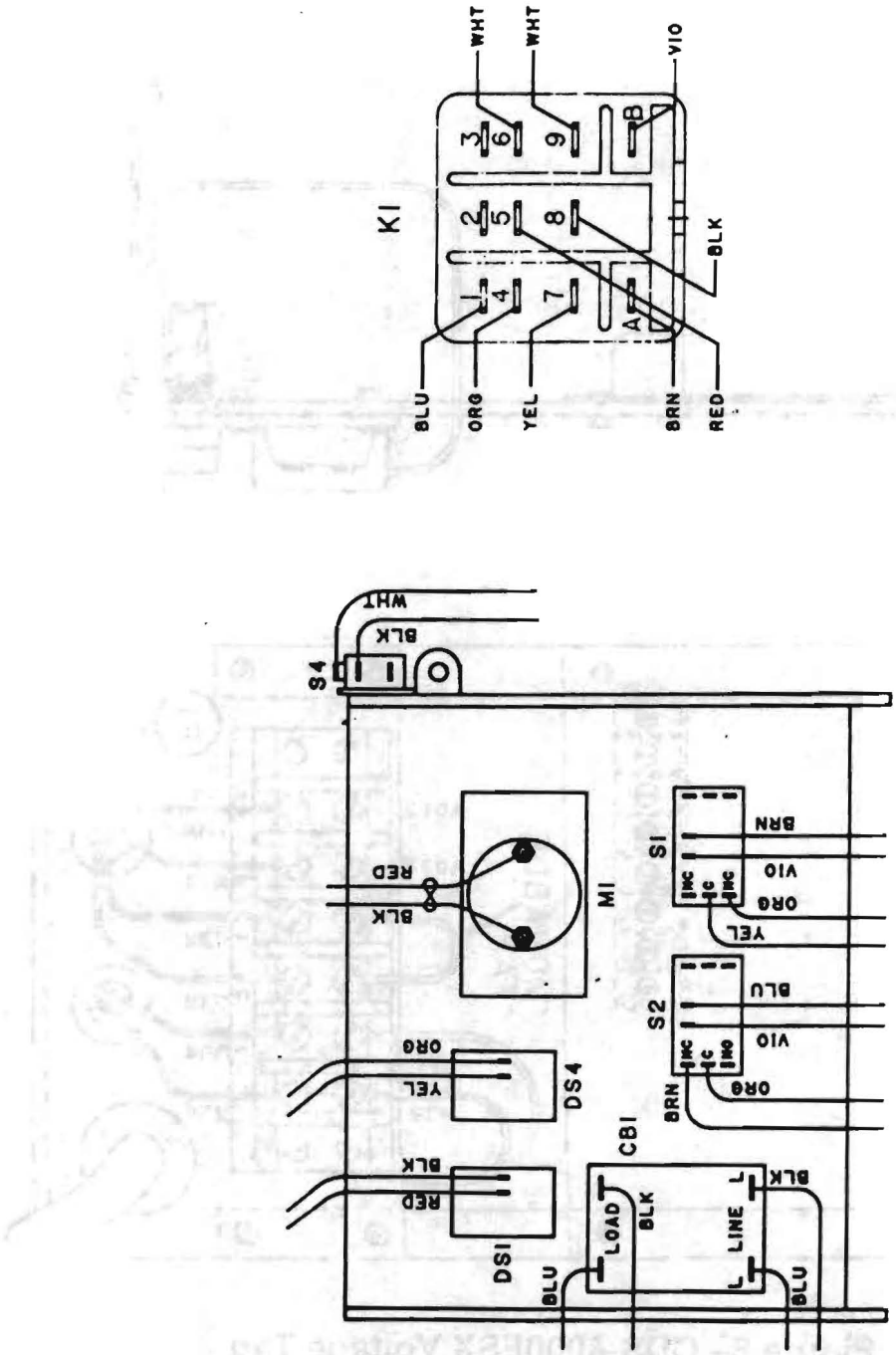

K1
1
4
7
2
5
8
3
6
9
A
B
BLU
ORG
YEL
BRN
RED
WHT
WHT
VIO
BLK
S4
WHT
BLK
M1
RED
BLK
S1
BRN
VIO
ORG
YEL
S2
BLU
VIO
ORG
BRN
DS4
ORG
YEL
DS1
BLK
RED
CB1
LOAD
BLK
LINE
L
BLK
BLU
BLU

Figure 7

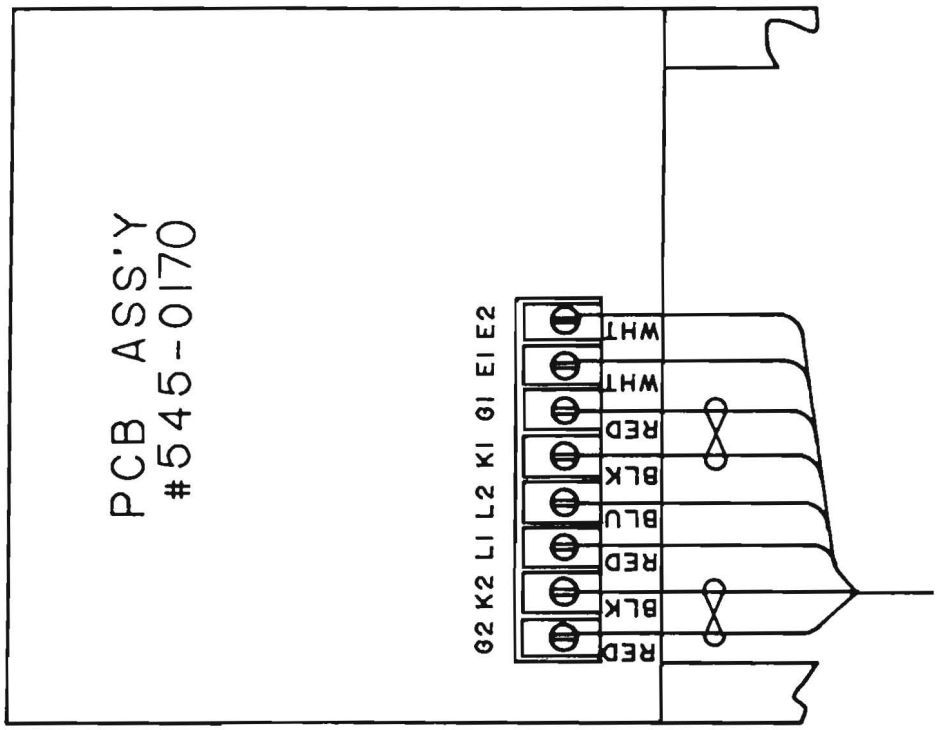

PCB ASS'Y
#545-0170
G2 K2 L1 L2 K1 G1 E1 E2
RED
BLK
RED
BLU
BLK
RED
WHT
WHT

Figure 8

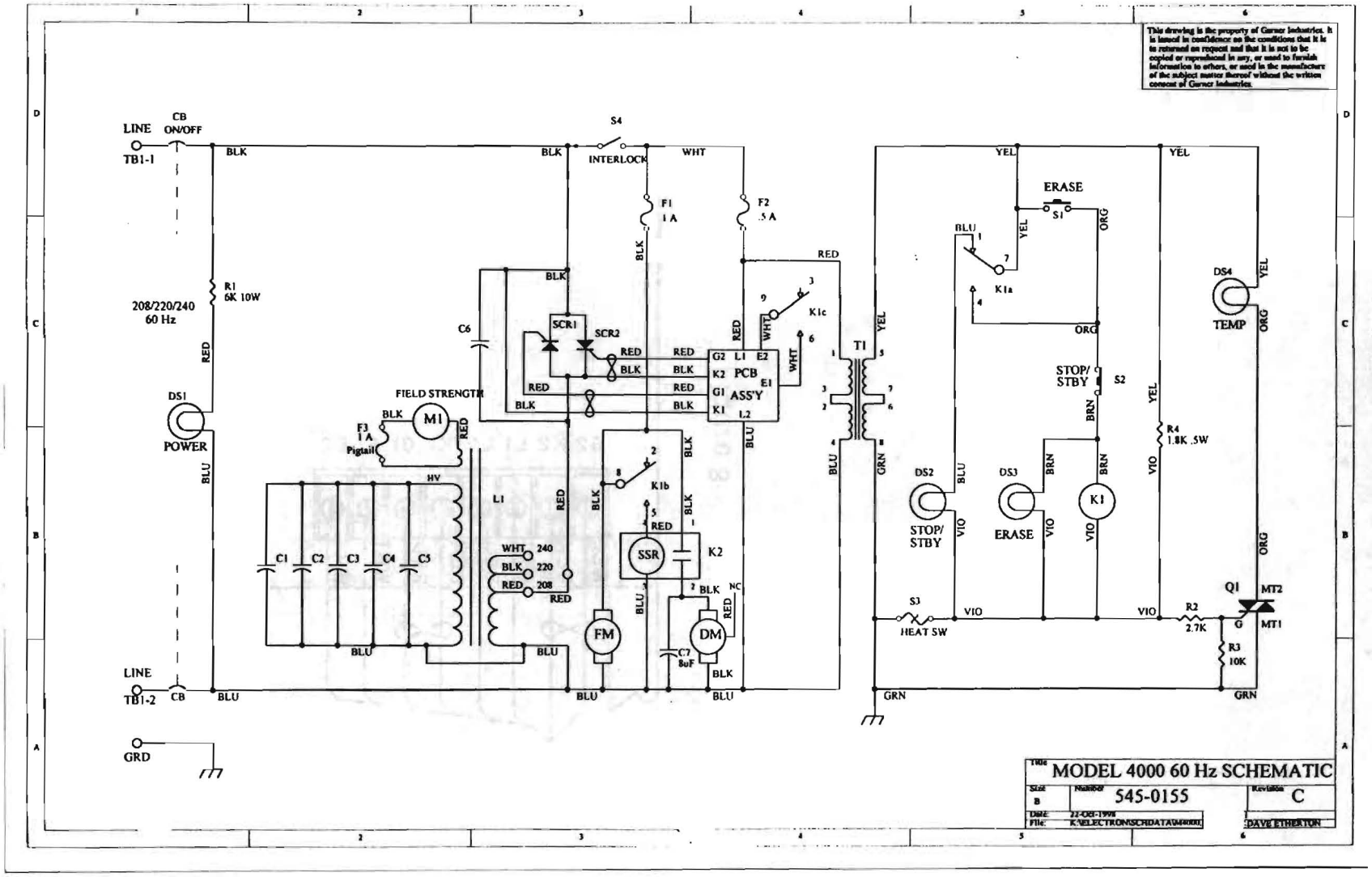
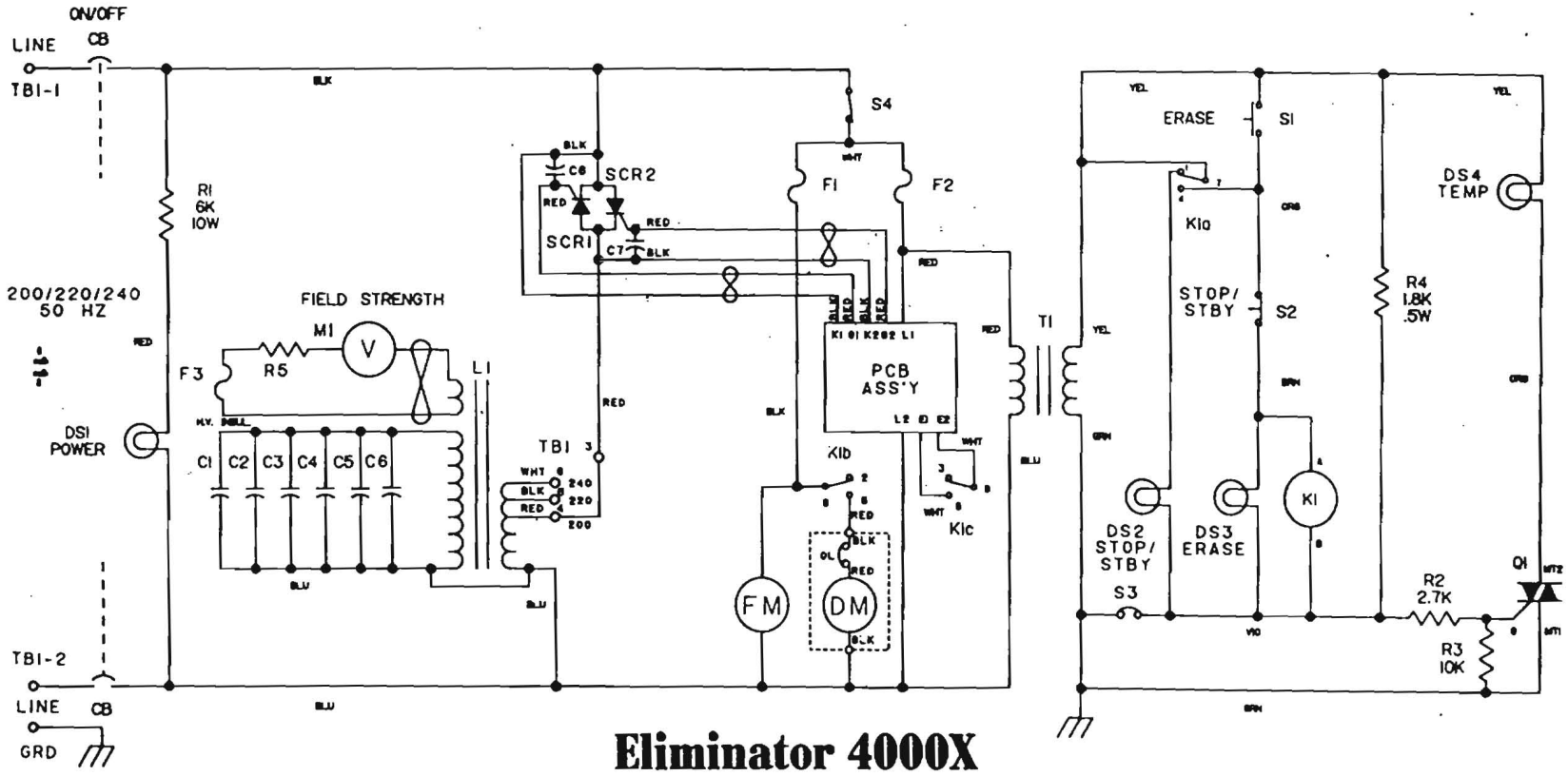


Figure 9 CDS-4000FS Schematic



Eliminator 4000X

Figure 10 – CDS-4000FSX Schematic

-11-

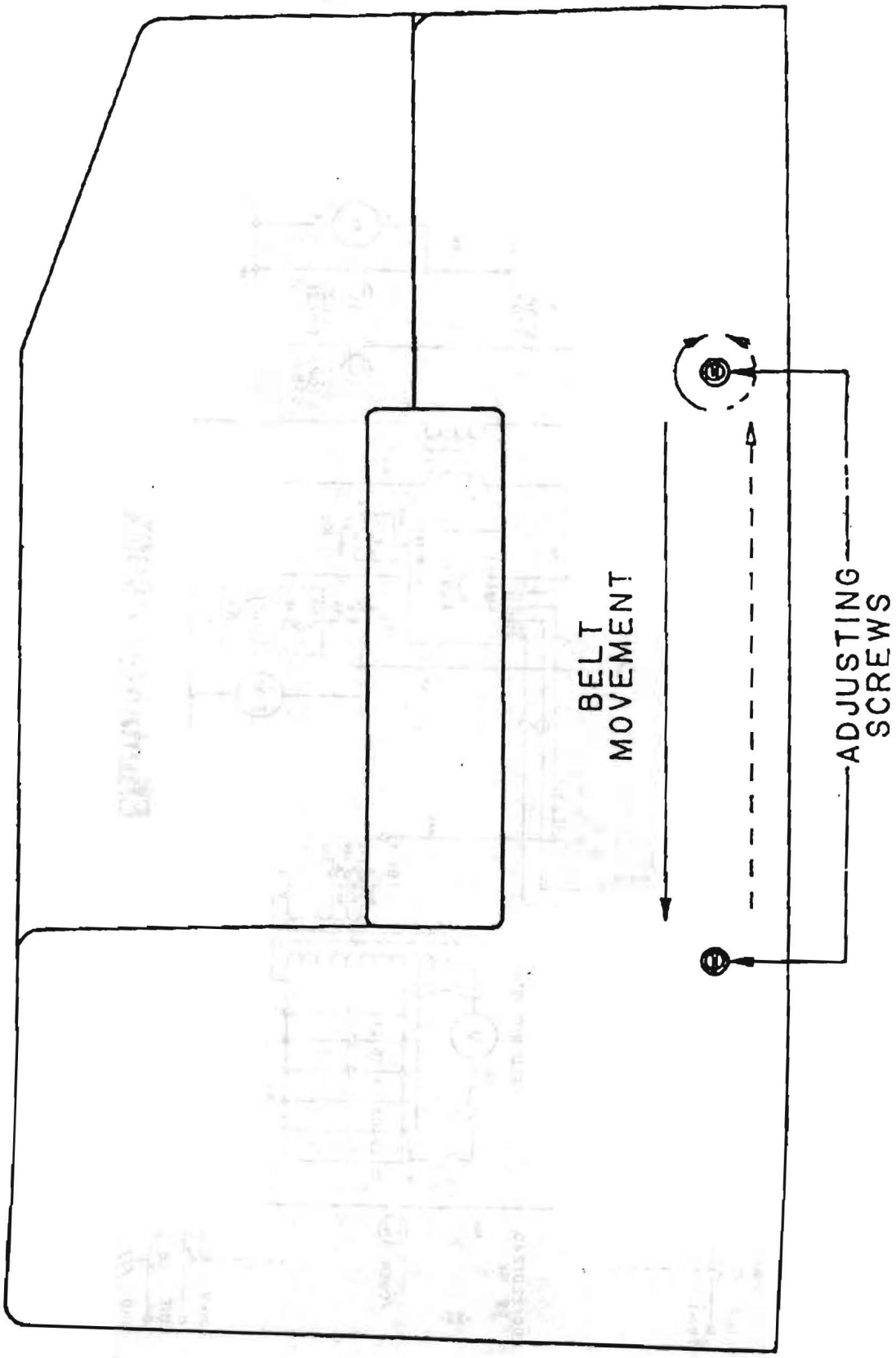


Figure 11

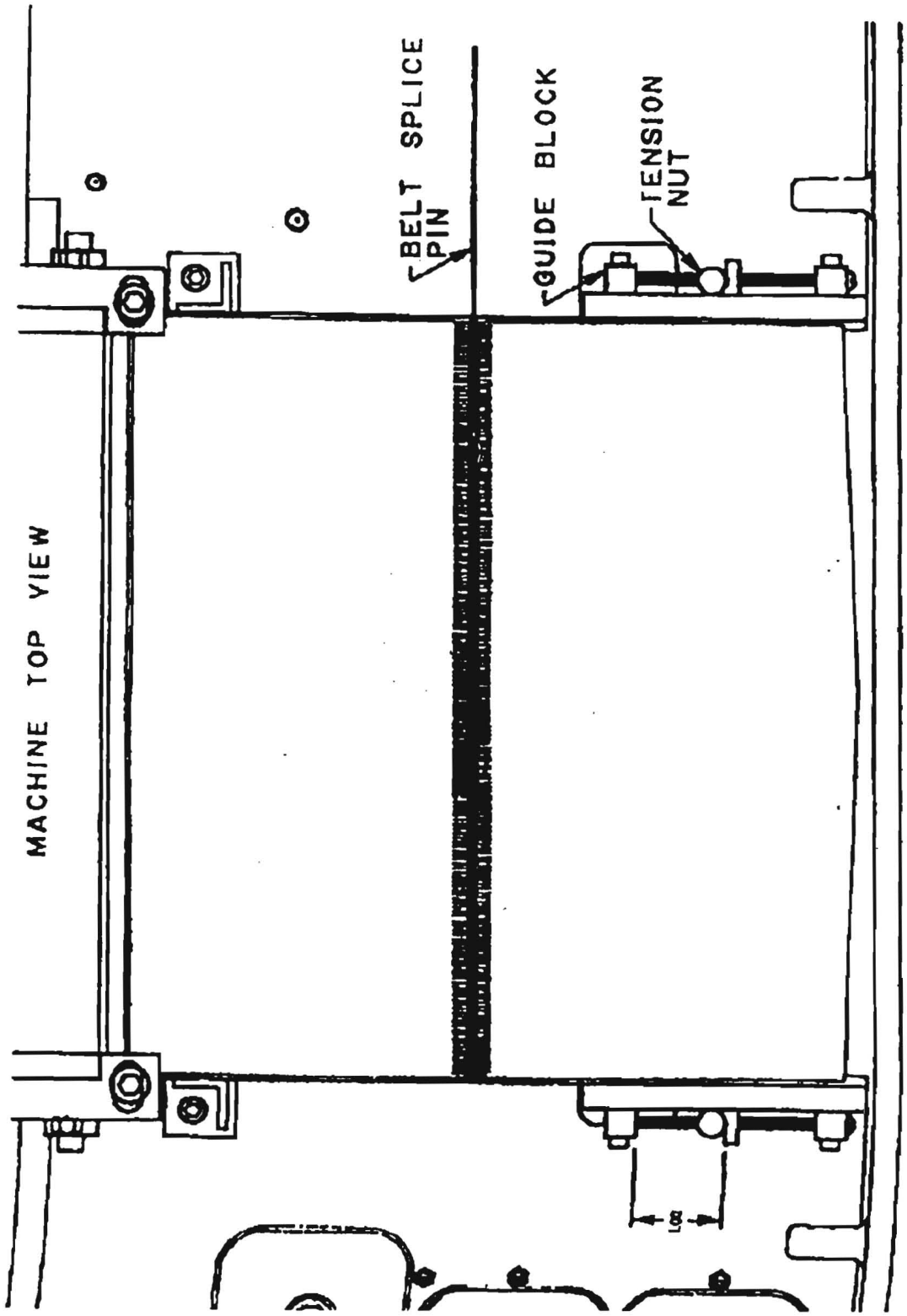


Figure 12

MODEL CDS-4000FS SERIES PARTS LIST

Designation	Part Number	Description
	SA415-0154	Belt Assembly, CDS-4000FS Series
	SA4525-014	Shielding, coil CDS-4000FS Series
	299-0129	Filter, 6 inch Fan
C1, C2, C3, C4, C5	310-0051	Capacitor, 6.0 uF 2750 VAC
C6	310-0055	Capacitor, 0.1 uF 250 VAC
C7	310-0072	Capacitor, 7.5 to 10 uF 250 VAC
F1	328-0001	Fuse, 1.0A S.B. 250 V
F2	328-0025	Fuse, 0.5A S.B. 250 V
CB	328-0027	Breaker, 25A Rocker
F3	328-0028	Fuse, 1A Pigtail
DS1, DS2, DS3, DS4	335-0045	Lamp holder
DS4	335-0046	Lens, Yellow
DS1, DS2, DS3	335-0047	Lens, White
DS1, DS2, DS3, DS4	345-0004	Lamp, #85
M1	348-0007	Meter, Field Strength
DM	3500-046	Motor, 42 RPM 230V 50/56Hz
FM	350-0019	Fan, 6 inch 230 VAC
K1	355-0015	Relay, 3PDT 24 VAC
SSR	356-0001	Relay, SS 240V 40A
R2	360-0083	Resistor, 2.7K 0.25W
R3	360-0097	Resistor, 10K 0.25W
R4	360-0240	Resistor, 1.8K 0.5W
R1	361-0012	Resistor, 6.0K 10W
Q1	370-0006	Triac
SCR1, SCR2	370-0009	SCR, 50 A
S3	375-0031	Switch, Thermal 180°F
S1, S2	375-0040	Switch, DPDT Momentary
S4	375-0042	Switch, Interlock
T1	388-0005	Transformer, 230/24V 2 A
	SA299-0601	Shield, Magnetic Field Rear
	SA299-0600	Shield, Magnetic Field Front
L1	SA545-0150	Coil assembly, Model CDS-4000FS 60 Hz
PCB Assembly	545-0161	SCR Gate Driver Assembly, 60 Hz
SCP	SA545-0183	Snubber
	MHD-4000	Kit, retrofit Media Hold Down
	HDH-4000	Hard Drive Rotator Platter

MODEL CDS-4000FSX SERIES PARTS LIST

Designation	Part Number	Description
	SA415-0154	Belt Assembly, CDS-4000FS Series
	SA4525-014	Shielding, Coil CDS-4000FS Series
	299-0129	Filter, 6 inch Fan
C1, C2, C3, C4, C5, C6	310-0051	Capacitor, 6.0 uF 2750 VAC
C7	310-0055	Capacitor, 0.1 uF 250 VAC
C8	310-0072	Capacitor, 7.5 to 10 uF 250 VAC
F1	328-0001	Fuse, 1.0A S.B. 250 V
F2	328-0025	Fuse, 0.5A S.B. 250 V
CB	328-0027	Breaker, 25A Rocker
F3	328-0028	Fuse, 1A Pigtail
DS1, DS2, DS3, DS4	335-0045	Lamp holder
DS4	335-0046	Lens, Yellow
DS1, DS2, DS3	335-0047	Lens, White
DS1, DS2, DS3, DS4	345-0007	Lamp, #85 28V
M1	348-0007	Meter, Field Strength
DM	3500-046	Motor, 42RPM 230V 50/60Hz
FM	350-0019	Fan, 6 inch 230 VAC
K1	355-0015	Relay, 3PDT 24 VAC
SSR	356-0001	Relay, SS 240V 40A
R5	360-0068	Resistor, 680 0.25W
R2	360-0083	Resistor, 2.7K 0.25W
R3	360-0097	Resistor, 10K 0.25W
R4	360-0240	Resistor, 1.8K 0.5W
R1	361-0012	Resistor, 6.0K 10W
Q1	370-0006	Triac
SCR1, SCR2	370-0009	SCR, 50 A
S3	375-0031	Switch, Thermal 180°F
S1, S2	375-0040	Switch, DPDT Momentary
S4	375-0042	Switch, Interlock
T1	388-0005	Transformer, 230/24V 2 A
	SA299-0601	Shield, Magnetic Field Rear
	SA299-0600	Shield, Magnetic Field Front
PCB Assembly	545-0170	SCR Gate Driver Assembly, 50 Hz
L1	SA545-0171	Coil assembly, Model CDS-4000FSX 50 Hz
SCP	SA545-0183	Snubber
	MHD-4000	Kit, retrofit Media Hold Down
	HDH-4000	Hard Drive Rotator Platter

MAGNETIC FIELD EXPOSURE CONTROVERSY

Degausser products, like power lines, electric motors, and other common electric tools and appliances, produce a magnetic field both inside and to a lesser extent outside their enclosure. A controversy presently exists as to whether these fields have any detrimental effect on the human body. For your consideration, a listing of reports and studies regarding this issue is provided below.

ELECTRIC POWER RESEARCH INSTITUE, Palo Alto, CA, Technical Publications Dept. (415) 855-2281.

BIOLOGICAL EFFECTS OF POWER FREQUENCY ELECTRIC AND MAGNETIC FIELDS – Available through the Government Printing Office, Supt. Of Documents, Washington DC 20402, Stock # 052-003-01152-2.

HEALTH EFFECTS OF TRANSMISSION LINES – Also available through Government Printing Office, Stock #052-070-06461-7 Serial No. 100-22.

ELECTRIC AND MAGNETIC FIELD FROM 60 HERTZ ELECTRIC POWER: WHAT DO WE KNOW ABOUT POSSIBLE HEALTH RISKS? Department of Engineering and Public Policy, Carnegie-Mellon University, Pittsburgh, PA 15213, (412) 268-2670

LIMITED WARRANTY

Garner Products warrants to the purchaser of the ***CDS-CDS-4000FS Series*** degausser, that any part thereof, which proves defective within 1 year of the date of shipment, will be repaired or replaced free of charge if returned to the factory **FREIGHT PREPAID**. Manufacturer's obligation is limited to the cost of material and labor to repair or replace and does not include transportation expenses.

All returns must be specifically authorized by the factory prior to shipment as represented by a factory specified return authorization number marked prominently near the shipping label.

This warranty shall not apply to any product, which has, in our judgment, been tampered with, altered, subject to misuse, neglect or accident. In addition, the warranty does not extend to repairs made necessary by normal wear.

This warranty extends to the original purchaser only and begins on the date of original purchase as evidenced by your packing slip or invoice. ***The warranty period is not extended if we repair or replace a warranted product or any parts. Garner Products may change the availability of limited warranties at its discretion, but any changes will not be retroactive.***

DAMAGE
This shipment was packaged and delivered to the carrier with utmost care to insure safe delivery of goods. When the shipment is received and signed for by the Transportation Company, consignor's responsibility ceases. Do not accept shipment, which evidences damage or shortage until the agent of the carrier endorses a statement of the irregularity on the face of the transportation receipt. Without documentary evidence, claim cannot be filed.

CONCEALED DAMAGE
Interstate commerce commission has indicated that a carrier is as much responsible for concealed damage as for visible damage in transit. Upon receipt of shipment, promptly unpack and check thoroughly. If concealed damage is discovered, cease further unpacking and request immediate inspection by the local agent of the carrier. A written report of the agent's finding, with his signature, is necessary to support claim.

SHORTAGE
Check shipment against shipping papers. Do not discard packing materials or cases until contents have been found to be correct. The removal of badly needed items before a shipment is checked may create a shortage. Check all possibilities before reporting a shortage. RETAIN SHIPPING CONTAINER FOR FUTURE SHIPMENTS.

CLAIMS
If your agent of carrier has been given an opportunity to inspect the shipment, any claim or a shortage or damaged merchandise can be handled as a simple and routine procedure. CONSIGNEE MUST FILE CLAIMS. Shipping terms are F. O. B. point of shipment.

WARRANTY RETURNS
All returns must be specifically authorized by the factory prior to shipment as represented by a factory specified return authorization number marked prominently near the shipping label. ***Call (800) 624-1903.*** When you contact us, we will issue a Return Material Authorization Number for you to include with your return. You must return the products to us in their original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk if the product is lost or damaged in shipment. We will return the repaired or replacement products to you. We will pay to ship the repaired or replaced products to you if you use an address in the United States (excluding Puerto Rico and U.S. possessions and territories). Otherwise, we will ship the product to you freight collect. Proper documentation should include the return address, a name and phone number of the contact person, the serial number of the merchandise being returned and a description of the reason for the return. Omission of any of this information will delay service. Garner Products will select method for return shipment, usually via UPS Ground Service. Alternate shipment methods may be made at the customer's expense.

NON-WARRANTY RETURNS
All returns must be specifically authorized by the factory prior to shipment as represented by a factory specified return authorization number marked prominently near the shipping label. ***Call (800) 624-1903.*** When you contact us, we will issue a Return Material Authorization Number for you to include with your return. You must return the products to us in their original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk if the product is lost or damaged in shipment. Proper documentation should include the return address, name and phone number of the contact person, the serial number of the merchandise being returned and a description of the reason from the return. Omission of any of this information will delay service. ***Non-warranty returns are subject to a restocking fee, up to 25% of the purchase price at the discretion of Garner Products.*** Unless specified otherwise, Garner Products will select method of return shipment after repairs, usually via UPS Ground Service. Alternate shipping arrangements may be made at the customer's expense. All repair shipments will be returned to the customer C. O. D. repair and freight cost.