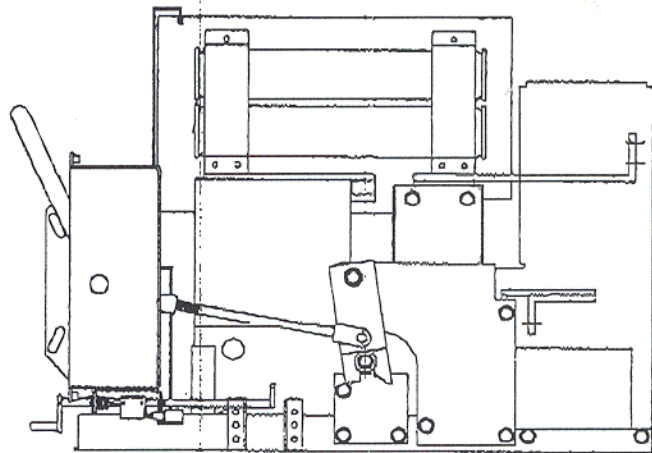
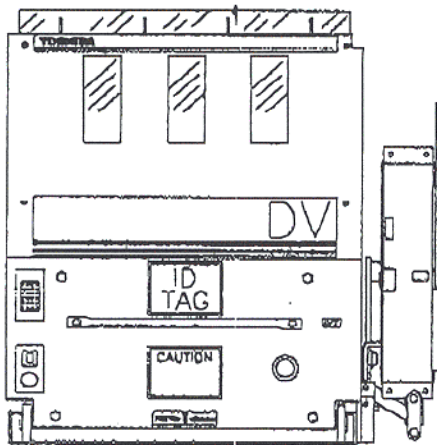


TOSHIBA

TOSHIBA INTERNATIONAL CORPORATION

POWER APPARATUS AND CONTROLS DIVISION

HOUSTON, TEXAS U.S.A.



TYPE DF & DV DRAWOUT UNITS USER MANUAL

Written By: TIC / Houston

Edited By: S. Horton Moreno
TIC / Houston
Engineered Products Division

Checked By: Roger Blankenheim
TIC / Houston
Engineered Products Division

Date: 15 June 1988
(Revised 16 May 1989)

CONTENTS

	Page No.
Preface	ii
RECEIVING & HANDLING	
Inspection	3
TYPES OF UNITS AVAILABLE	
DF - Drawout Fuse Type	4
DV - Drawout Vacuum Contactor Type	5
RATING	6
INTERLOCKS	
Electrical Interlocks	7
Mechanical Interlocks	7
DRAWOUT OPERATION	
Drawout Positions	9
Drawout Operation	10
CELL INSTALLATION	
Cell	11
Cell Installation	12
CONTROL CIRCUIT WIRING	14
MAINTENANCE & INSPECTION	15
RENEWAL PARTS	
Ordering Information	17

- PREFACE -

TIC/Houston prepared this User Manual to familiarize the user with the application and function of the drawout unit. TIC/Houston designed the Drawout Starter to control Medium Voltage AC Motors, Transformers, and Capacitors. Only Authorized and Qualified Personnel should install, operate, or maintain this unit.

These instructions do not cover all details, combinations, or variations of the equipment, storage, or installation. You must follow safety practices during operation of this equipment.

TIC/Houston strongly recommends that you read this manual in its entirety before installing.

TIC/Houston believes that the reliability and ease of use of this Manual will speed up user installation and start-up time. As a result, you will find further uses for this and other TIC/Houston products.

Thank you for buying TIC/Houston.

IMPORTANT

Unqualified personnel should not use this manual as a training tool.

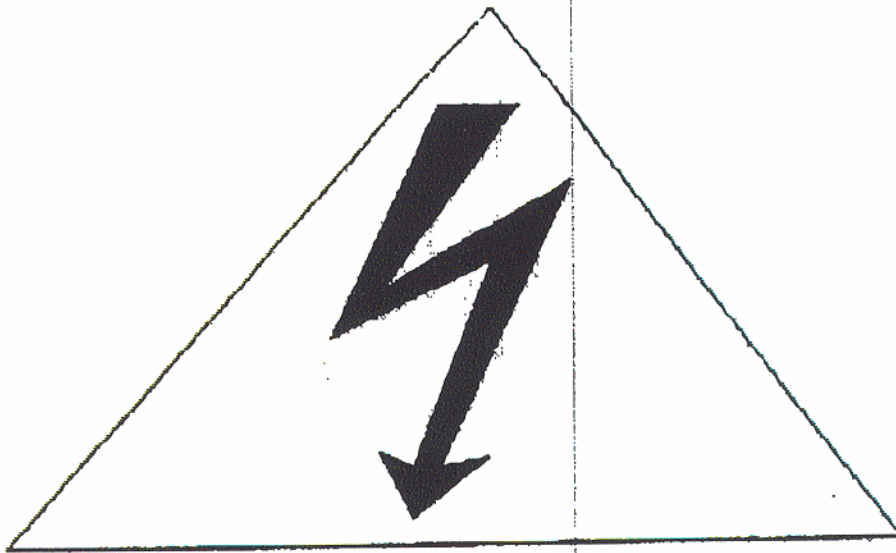
- NOTE -

Authorized and Qualified Personnel -

A qualified person is one who is familiar with the installation, construction or operation of the equipment and the hazards involved. In addition, he has the following qualifications:

- trained and authorized
to de-energize, clear, ground, and tag circuits and equipment by set safety practices.
- trained
in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., by set safety practices.
- trained
in giving first aid.

This manual does not relieve the user of responsibility to use sound practices in application, installation, operation and maintenance of this equipment. Personnel safety precautions are also the responsibility of the user. Should a conflict arise between the general information contained in this publication and the contents of drawings or supplementary material or both supplied with your equipment, the latter shall take precedence. TIC/Houston reserves the right to make changes or add improvements at any time without notice or liability.



D A N G E R

HAZARDOUS VOLTAGE WILL CAUSE

SHOCK, BURN, OR DEATH

DISCONNECT AND LOCKOUT ALL POWER

SOURCES BEFORE WORKING ON THIS

EQUIPMENT

THIS EQUIPMENT SHOULD BE INSTALLED AND MAINTAINED BY QUALIFIED PERSONNEL ONLY IN ACCORDANCE WITH RECOGNIZED SAFETY STANDARDS AND APPLICABLE ELECTRICAL OR BUILDING CODES. THE MANUFACTURER IS NOT RESPONSIBLE FOR DAMAGES OR INJURIES RESULTING FROM IMPROPER INSTALLATION OR USE.

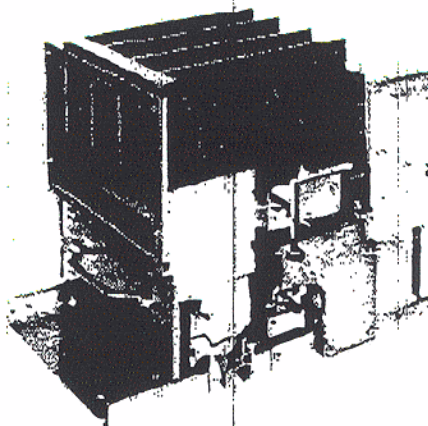
Fig. 1

RECEIVING AND HANDLING

Inspection *

INSPECTION - Upon receipt of the Drawout Starter Unit make an immediate inspection for any damage which may have occurred during shipment.

- a. Examine unit for missing or broken parts, free movement, or dirt.
- b. Examine insulating parts for cracks or breakage.
- c. Examine all wire and cable connections, re-tighten if necessary.
- d. Closely examine the fuse clips. Completely insert fuses and tighten all bolts.



TYPES OF UNITS AVAILABLE

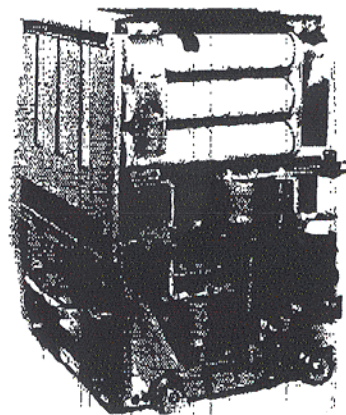
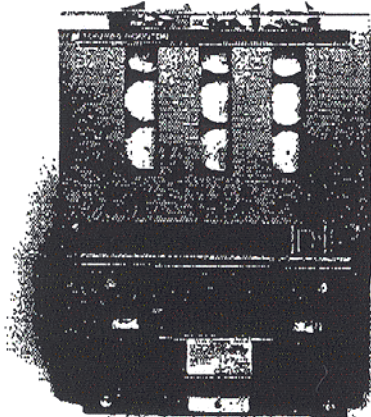
DF - Drawout Fuse *

DV - Drawout Vacuum Contactor *

DF

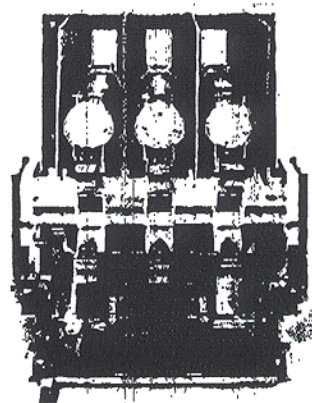
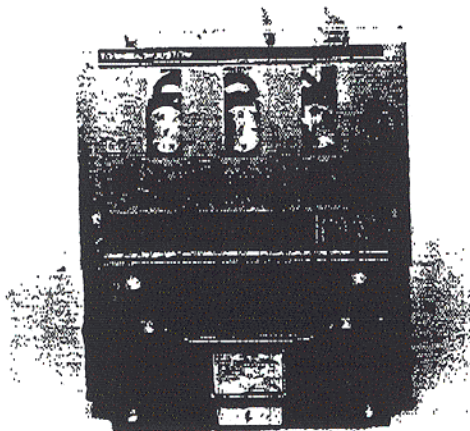
DRAWOUT

FUSE TYPE - This unit consists of drawout fuses (single, double, or triple barrel - with mechanical interlocks.



DV
DRAWOUT VACUUM
CONTACTOR TYPE

- This unit consists of a drawout (movable)
contactor -400A with:
 - power fuse clips
 - up to two control transformers
(with primary and secondary fuse/breaker)
 - secondary (control) socket block
(with electrical and mechanical interlocks)
 - vacuum contactor (VCTT)



RATING (DRAWOUT CONTACTOR)

RATED INSULATION VOLTAGE	7200V
RATED OPERATIONAL VOLTAGE	5000V (6600V MAX.)
RATED OPERATIONAL CURRENT	400A
INTERRUPTING RATING (SYM.)	250MVA (2400V) 400MVA (4160V) 520MVA (6000V) 570MVA (6600V)
AMBIENT TEMPERATURE	-5 - 40°C (Enclosure not to exceed 55°C)
ALTITUDE	1000M or Below
RELATIVE HUMIDITY	45 - 85 %
CPT RATING	300VA, 400VA, 600VA or 800VA (As required)
CONTROL FUSE/BREAKER RATING	250V - 5A
WEIGHT:	
DRAWOUT UNIT (1 BARREL)	134 LBS.
DRAWOUT UNIT (2 BARREL)	161 LBS.
DRAWOUT FUSE (2 BARREL)	142 LBS.
DRAWOUT FUSE (3 BARREL)	164 LBS.
FIXED PORTION	45 LBS.

PRIOR TO PUTTING THE STARTER INTO SERVICE, BECOME FAMILIAR WITH THE MECHANICAL INTERLOCKS.

INTERLOCKS

Electrical Interlocks *
Mechanical Interlocks *

ELECTRICAL

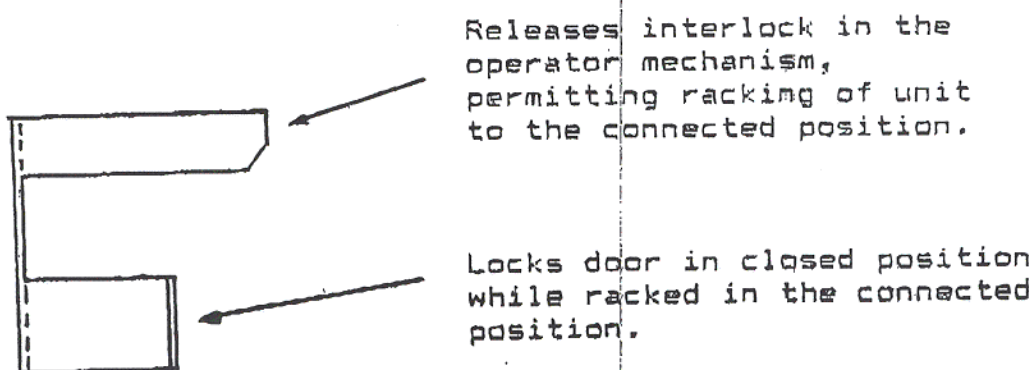
INTERLOCKS - LS1 - Location: Lower right rear of moveable unit
Purpose: Position switch, closed in test or run position

LS2 - Location: Underside of mechanical operator (Racking Handle) assembly

Purpose: Not meant to open VCTT, but to ensure that it has been opened

MECHANICAL

INTERLOCKS - Close and securely latch the door before racking the moveable unit to the connected position.



(Located On Drawout Door)

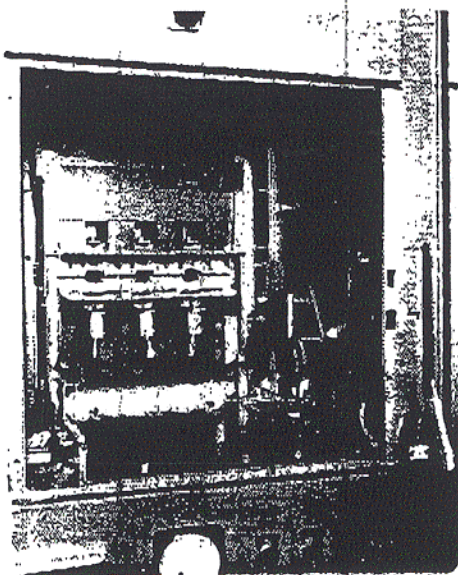
- Do not rack the moveable unit into the "test position" unless the contactor has been de-energized. Turn the "release Lever" near the bottom of the operator mechanism handle to unlock the moveable unit.

- If the Shutter Barrier does not open to allow stabs to connect, the reverse unit will stop, so as not to damage the shutter barrier. At this point do not continue applying force to the handle of the operator mechanism. Return to the "test position," open door, remove unit and inspect shutter assembly for obstructions or damage.

WARNING

HAZARDOUS VOLTAGE
CAN CAUSE ELECTRICAL SHOCK
AND BURNS.

DISCONNECT POWER BEFORE PROCEEDING
WITH ANY WORK ON THIS EQUIPMENT.



- The Mechanical Interlock locks the contactor in place if closed in test or connected positions. Also prevents contactor closure during motion between both positions.

DRAWOUT OPERATION

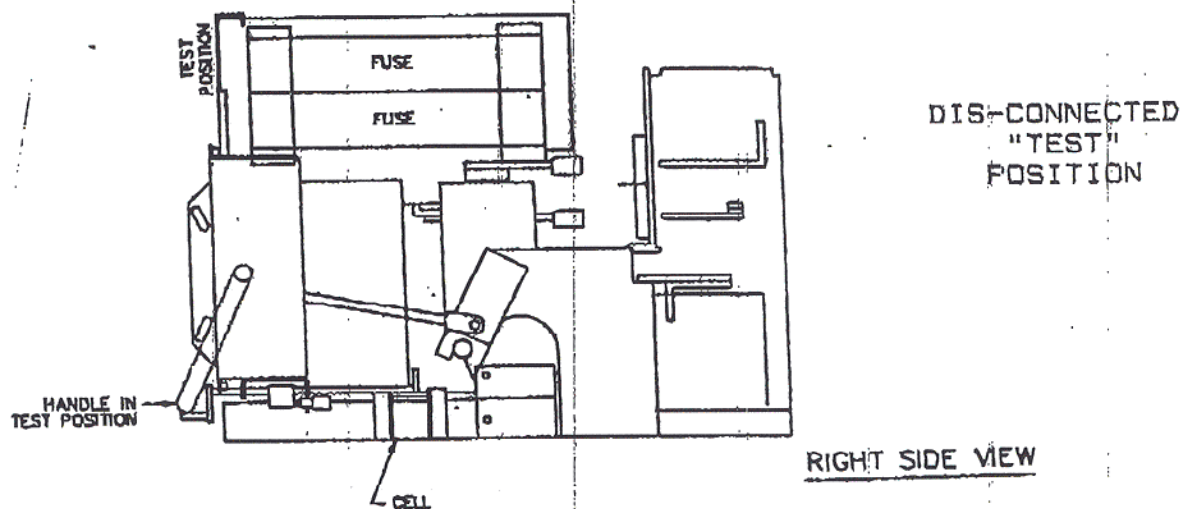
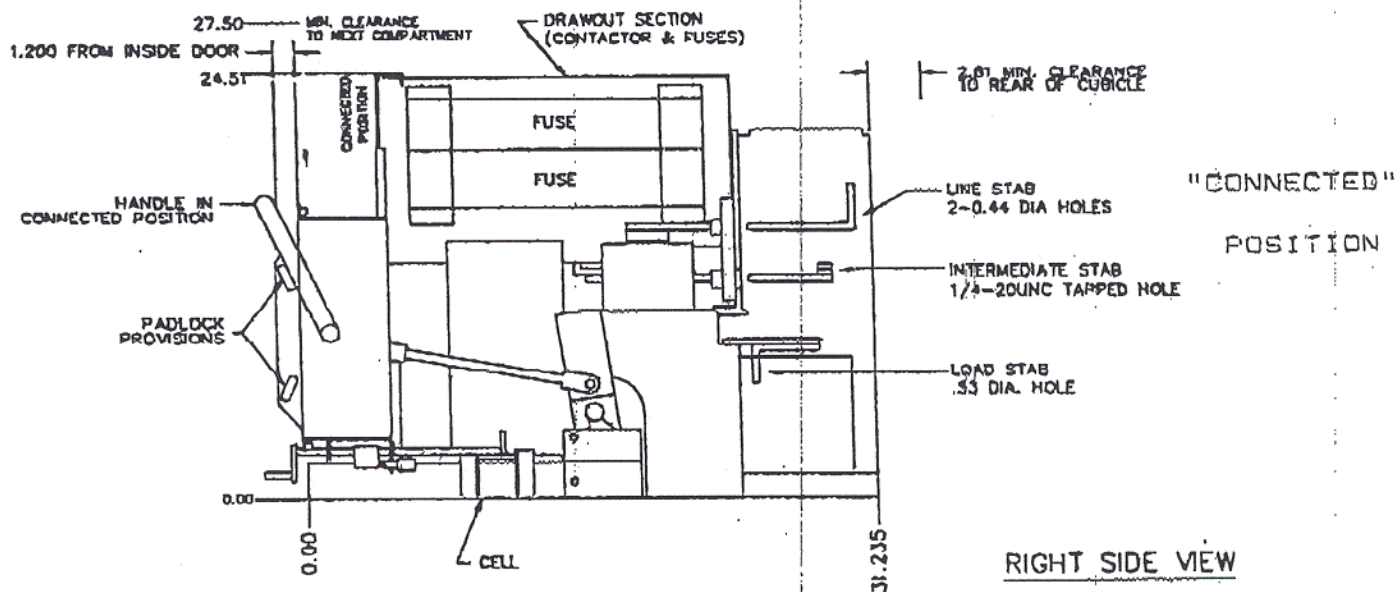
Drawout Positions *

Drawout Operation *

DRAWOUT

POSITIONS - These units have two positions, "Connected" and "Test" (Disconnected).

The moving truck locks at each position by a complete interlocking mechanism.



DRAWOUT
OPERATION

- Performed the drawout operation from the exterior of the enclosure with the drawout door closed by the operating handle. The cell has a shutter to isolate the moving truck automatically from the line side terminals of the fixed portion.
- Drawout Operation - (From "Connected" to "Test" positions)
 - a. Confirm that VCTT is OFF.
 - b. Rotate lock lever counter-clockwise until it stops.
 - c. Pull the operating handle down-ward releasing the lever when handle is at the mid-travel position.
- Insert Operation - (From "Test" to "Connected" positions)
 - a. Close and latch M.V. compartment door.
 - b. Pull handle up-ward until it reaches its highest position.

NOTE: Move the handle as quickly and smoothly as possible.

- Removal of movable portion - (From "Test" position)

CAUTION: DO NOT FORCE THE RACKING MECHANISM.

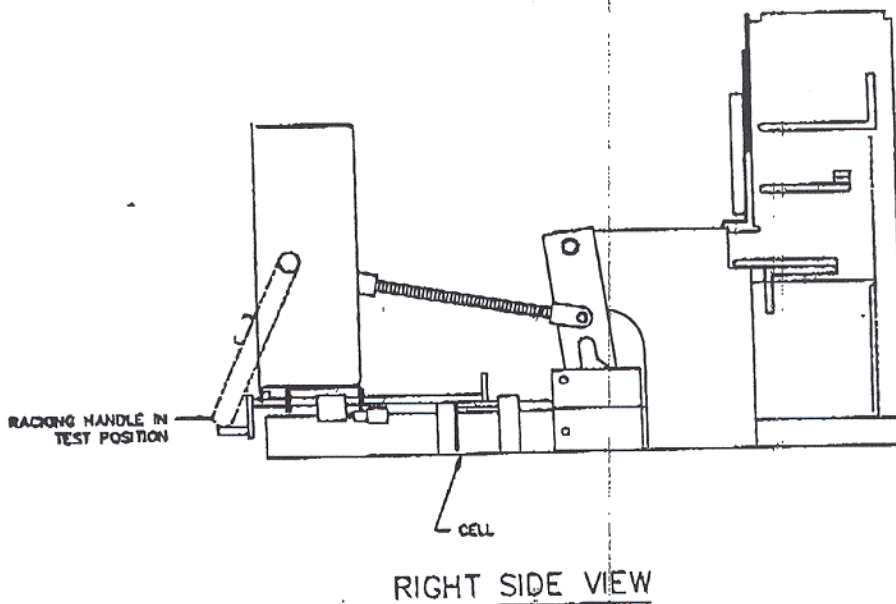
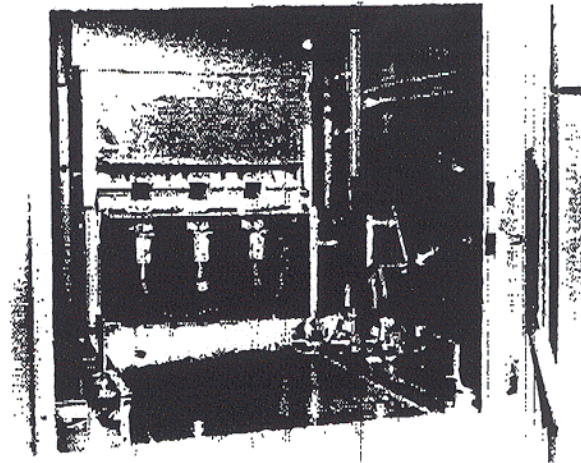
Draw the unit out carefully. Take necessary precautions not to drop unit when taking it out of the panel.

- a. Remove wheel stop (located by front left wheel).
- b. Install extension rail and secure with bolt on left side.
- c. Turn release lever counter-clockwise.
- d. Pull unit carefully onto extension rail, lifting the moving portion slightly for complete removal.

CELL INSTALLATION

CELL

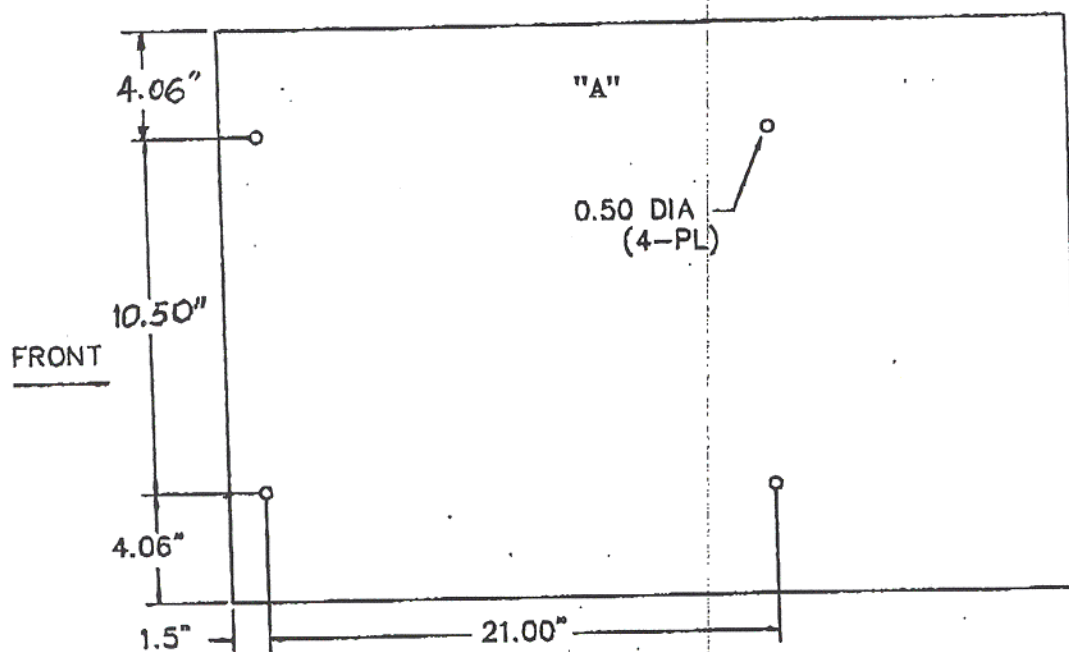
- The Cell houses the main power bus stabs, the shutter mechanism, and various mechanical interlocks. The Cell also provides structural support for the handle mechanism.
- a. The position of the contactor directly controls the shutter mechanism.



CELL
INSTALLATION

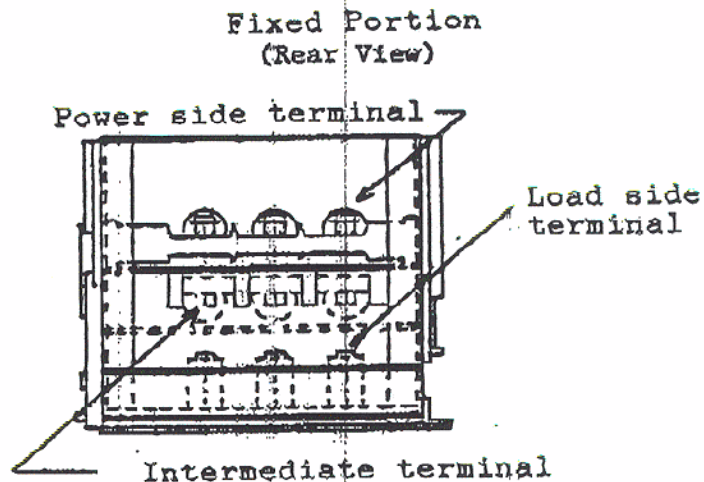
- Installation

Install by securing it at the four "A" marked locations shown in the following illustration. The installation surface must be on a level plane. If surface is not level, adjust with shims or spacers.



- Main Circuit Wiring

Connect the main circuit wiring to the line side and load side terminals with 3/8" bolts. If providing intermediate terminals, connect the wiring to them with the 1/4-20 bolts provided. Take care to connect cables in proper phase rotation.



WARNING

**HAZARDOUS VOLTAGE
CAN CAUSE ELECTRICAL SHOCK
AND BURNS.
DISCONNECT POWER BEFORE PROCEEDING
WITH ANY WORK ON THIS EQUIPMENT.**

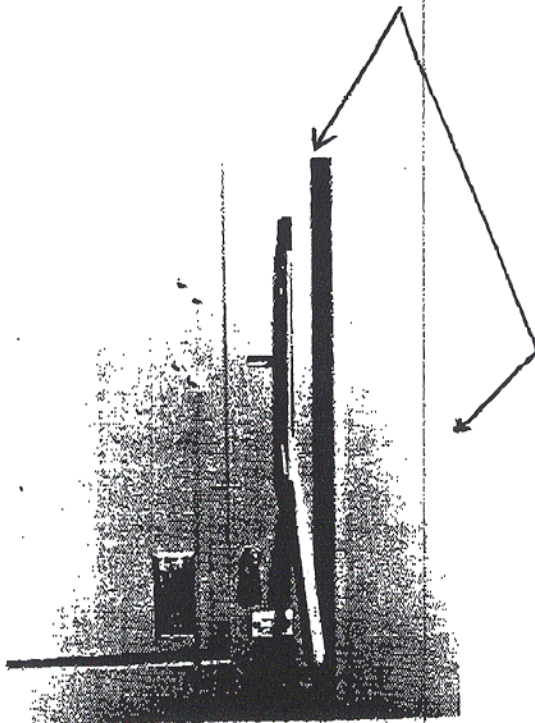
CONTROL CIRCUIT WIRING

Current
photo
not
available

The connector housing and pins will ship together as standard accessories.

Connect the control wire to the pin with the standard tool - "CERTI-CRIMP," manufactured by AMP Inc. for AMP Pin No. 66602-1

These units have provision for a padlock on the handle mechanism. Padlocking can be done for either test or connected position.



MAINTENANCE AND INSPECTION

MAINTENANCE & INSPECTION

- Set up a regular maintenance schedule to receive better service and reliability from your drawout unit. Inspect the drawout unit at least once a year, or more often if necessary. Plant operating and local conditions will dictate the frequency of inspection required.

1 WARNING

HAZARDOUS VOLTAGE
CAN CAUSE ELECTRICAL SHOCK
AND BURNS.

DISCONNECT POWER BEFORE PROCEEDING
WITH ANY WORK ON THIS EQUIPMENT.

Keep a permanent record of all maintenance work. The degree of detail depends on the operating conditions. This record will be a valuable reference for later maintenance work and equipment operation. The record should include reports of tests made, the condition of equipment, the repairs or replacements, and adjustments that you make.

CAUTION: This manual covers equipment selected for a specific application. Only thoroughly trained qualified persons with an understanding of the hazards which could arise should install this equipment. Do not substitute this manual for adequate training and experience in safety procedures for this type of equipment.

MAINTENANCE &
INSPECTION

WARNING

HAZARDOUS VOLTAGE
CAN CAUSE ELECTRICAL SHOCK
AND BURNS.
DISCONNECT POWER BEFORE PROCEEDING
! WITH ANY WORK ON THIS EQUIPMENT.

- a. Examine unit for broken parts, free movement, rusting or corrosion, dirt and excessive wear.
- b. Examine insulating parts for cracks or breakage. If you find any evidence of arcing, clean or replace the parts. Make sure you maintain the dielectric strength of the affected parts.
- c. Examine all wire and cable connections, re-tighten if necessary. If dis-coloration of cable or wire insulation is clear, replace the damaged wire or cable.
- d. Closely examine the fuse clips. Completely insert the fuses and tighten all bolts. Dis-assemble and clean or replace discolored, corroded, or pitted joints or ends on the drawout unit or cell. Lubricate the line and load stabs twice a year with Toshiba 87 grease or equal. Do not apply the grease on insulators or barriers. APPLY GREASE ONLY ON STABS.

RENEWAL PARTS

Ordering Information *

- Renewal parts should be order from TIC/Houston
(713) 466-0277.

<u>PART NUMBER</u>	<u>DESCRIPTION</u>
PC18580P31 2 ³	MICROSWITCH LS1 & LS2
PC17650P005	CIRCUIT BREAKER, 5A
PC17650P006	CIRCUIT BREAKER, 7A
LCVD0STAB1	LINE SIDE STAB - 400A (MOVEABLE) D/P VCTT
LCVD0STAB2	INTERMEDIATE STAB - 400A (MOVEABLE) D/O VCTT
LCVD0STAB3	LOAD SIDE STAB - 400A (MOVEABLE) D/O VCTT
PC18595P030	LINE SIDE STAB - 400A (STAT.) D/O VCTT
PC18595P031	INTERMEDIATE STAB - 400A (STAT.) D/O VCTT
PC18595P032	LOAD SIDE STAB - 400A (STAT.) D/O VCTT
LCVDOCELL1	DRAWOUT CELL 400A
LCVDOCELL2	DRAWOUT CELL FOR D/O FUSE
LCVD0FUSE1	* DRAWOUT FUSE ASSEMBLY D - SINGLE
LCVD0FUSE2	* DRAWOUT FUSE ASSEMBLY DD
LCVD0FUSE3	* DRAWOUT FUSE ASSEMBLY DDD
PC75801P021	SEC. PLUG ON MOVEABLE PORTION AMP # 207305-1 (BROWN)
PC75801P020	SEC. PLUG ON STAT. PORTION AMP # 207304-1 (BROWN)
PC75801P009	INSERT PIN FOR MOVEABLE SEC. PLUG AMP # 66602-1
PC75801P010	INSERT PIN FOR STAT. SEC. PLUG AMP # 66601-1
LCVDOPLUG1 (BLACK)	} D/O UNIT SECONDARY PLUG ASSEMBLY
LCVDOPLUG2 (BROWN)	
PC18595P116	FUSE CLIP SIZE D
PC18595P117	FUSE CLIP SIZE DD
PC18595P123	FUSE CLIP SIZE DDD
PC18595P083	FUSE BARRIER SINGLE BARREL INBOARD 2 Per Unit
PC18595P002	FUSE BARRIER SINGLE BARREL OUTBOARD 2 Per Unit
PC18595P001	FUSE BARRIER DOUBLE BARREL INBOARD 2 Per Unit
PC18595P000	FUSE BARRIER DOUBLE BARREL OUTBOARD 2 Per Unit
PC18595P627	FUSE BARRIER TRIPLE BARREL 4 Per Unit
PC18595P154	EXTENSION RAIL
PC18595P499	B7 GREASE

* Fuses Not Included With Drawout Cell.

CONTACTORS

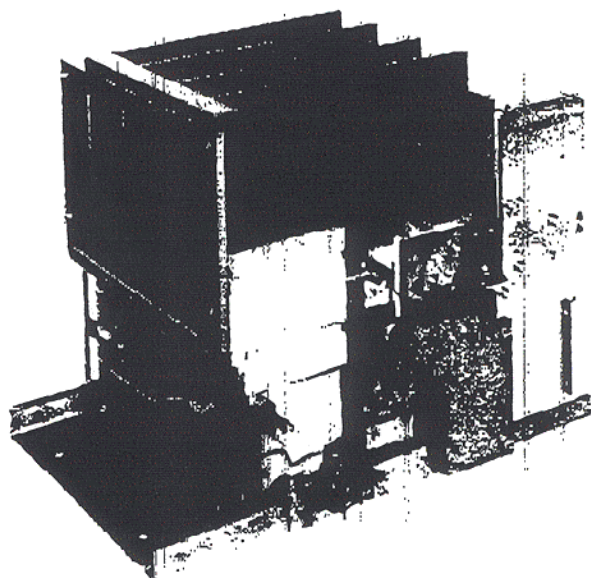
Medium Voltage - Vacuum Drawout Units

Drawout Elements

- Line and load spring-loaded power stabs
- Main fuse clips (Fuses not included)
- Vacuum contactor
- PT/CPT with primary fuses
- Complete electrical and mechanical interlock system
- Dead front with fuse viewing window

Stationary Portion:

- Line and load rear connected power stabs
- Line shutter/barrier
- Drawout element support and positioning tray
- Complete electrical and mechanical interlocking and operating system
- Simple four bolt location and hold down system
- Provisions for maintenance extension rail



■ Specifications

Type DV high-voltage combination starter units.

Rated Operational Voltage (kV)		2.2 - 2.5	4.0 - 5.0
Continuous Current (A)		400	400
Rated Interrupting Current (kA)	With Fuse	40	40
	Without Fuse	7.0	7.0
Withstand Voltage		AC 18kV/BIL 45kV (Except between the contacts)	AC 22kV/BIL 60kV (Except between the contacts)
Control Voltage (V)	Continuous Excitation	AC 115/120V - 50/60 Hz (PT secondary voltage)	
	Instantaneous Excitation (with latch mechanism)	DC 24/32/48/120/125 (Shunt trip)	
Connection		Main circuit Automatic connection Control circuit Manual plug connection	
Weight lb. (Approx.)	Moving Portion	200	200
	Total	315	315
Application (Max. Capacity)	Motor (HP)	1750	3000
	Transformer (kVA)	1500	3000
	Condenser (kVA)	1500	2000
Applicable Standard		NEMA ICS2-324	
Dimensions (inches) H x W x D		24.51 x 22.00 x 31.77	

■ Drawout Unit Pricing

	CATALOG NO.	LIST PRICE*
Non-Latched Type	DV-_____ CM	\$6,700
	DV-_____ SM	7,000
	DV-_____ DM	7,200
Latched Type	DV-_____ CL	\$8,700
	DV-_____ SL	7,000
	DV-_____ DL	7,200

* Price includes one CPT/PT.

No price deduction for no CPT/PT.

■ Factory Installed Modifications

DESCRIPTION	LIST PRICE (\$a)
Add Second Potential Transformer/CPT	
2400/120VAC-100VA/500VA	\$820
3300/110VAC-100VA/450VA	\$860
4200/120VAC-100VA/500VA	\$880
4800/120VAC-100VA/450VA	\$880
6000/109VAC-100VA/300VA	\$860
6600/109VAC-100VA/300VA	\$880

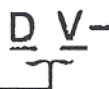
TOSHIBA INTERNATIONAL CORPORATION

INDUSTRIAL DIVISION: 13131 WEST LITTLE YORK HOUSTON, TEXAS 77041 1-800-231-1412 CANADA 1-800-527-1204

CONTACTORS

Medium Voltage - Type DV Vacuum Drawout Units

■ D/O Unit Ordering Information

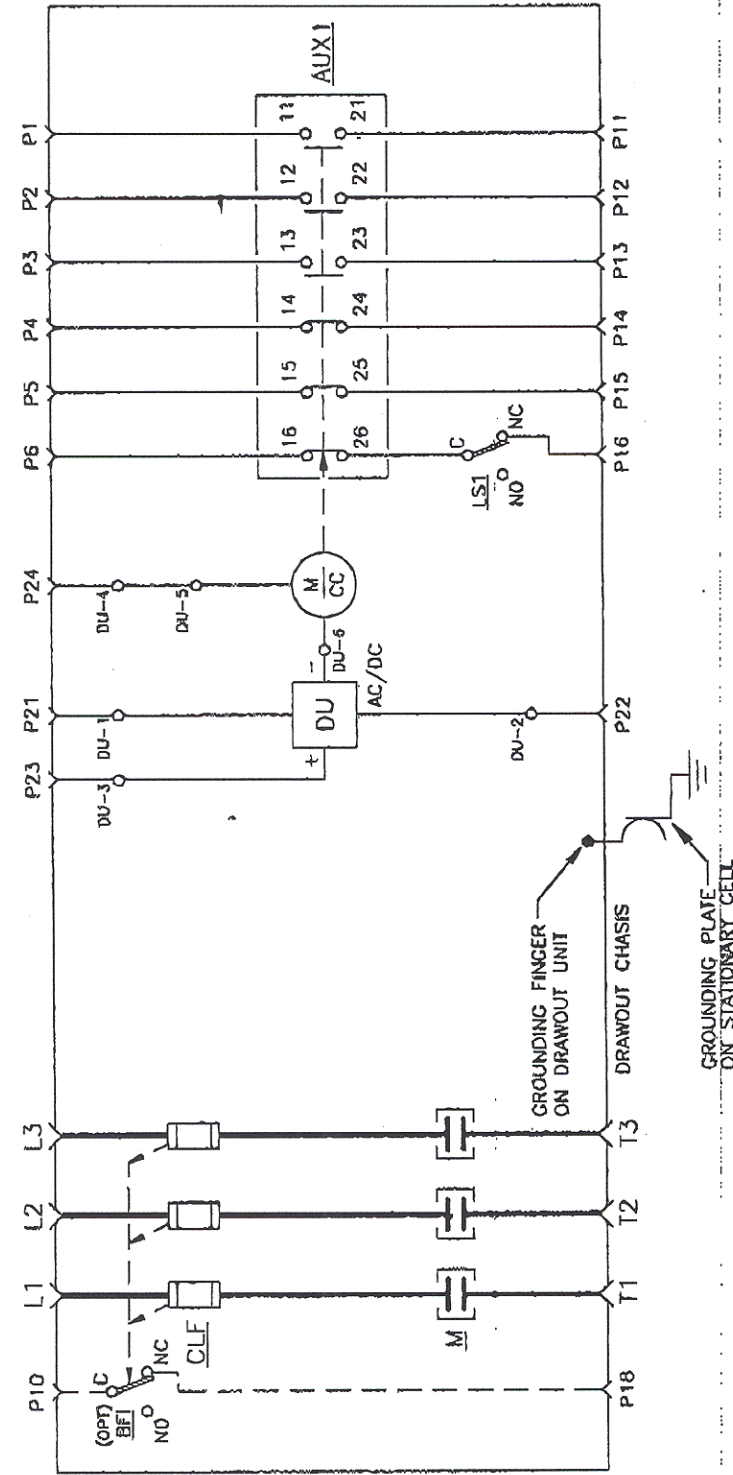
D/O WITH CELL (NO FUSES)  PT or CPT PRIMARY VOLTAGE (SECONDARY: 120VAC) 0 = NO XFMR 2 = 2400V 3 = 3300V 4 = 4200V 5 = 4800V 6 = 6000V 7 = 7200V 8 = 8800V # OF PT'S or CPT 0 = NONE 1 = 1 2 = 2 IN PARALLEL % = 2 IN OPEN DELTA		TRIP VOLTAGE 0 = NONE 1 = 125VDC 2 = 250VDC 3 = 24VDC 4 = 32VDC 5 = 48VDC CLOSE VOLTAGE 1 = 120VAC 2 = 240VAC 3 = 125VDC 4 = 250VDC TYPE OF VCTT M = NON-LATCHED L = LATCHED TYPE OF FUSE ARRANGEMENT S = SINGLE BARREL (D-3") 12" CLIP D = DOUBLE BARREL (D-3") 12" CLIP C = SINGLE BARREL (C-2") 12" CLIP
--	--	---

■ Accessories / Miscellaneous

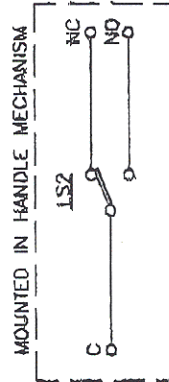
ITEM	CATALOG NUMBER	LIST PRICE
OPERATING HANDLE & MECHANISM	LCVDOLOCK1	\$ 700
POTENTIAL TRANSFORMER (Low Profile with Primary Fuses)		
2400 / 120VAC 500VA	GCVDV24PT&FU	775
3300 / 110VAC 450VA	GCVDV33PT&FU	775
4200 / 120VAC 500VA	GCVDV42PT&FU	825
4800 / 120VAC 450VA	GCVDV48PT&FU	825
6000 / 109VAC 300VA	Consult Factory	825
6600 / 110VAC 300VA	GCVDV66PT&FU	825
EXTENSION RAIL	LCVDORAIL1	360
INTERMEDIATE STAB KIT	GCVDOSTABKIT	700
LUBRICATING GREASE (B7 Grease)	429G0375G001	15
LIFTER (for Installation & Removal of Movable Portion)	LCVDOTMLIFT1	8,000
DRAWOUT CELL - Stationary Portion Only (minus Contactor/PT-movable portion and operating handle & mechanism)		
For Single or Double Barrel Fuses	LCVDOCELL1	2,000
For Triple Barrel Fuses	LCVDOCELL2	2,200
DRAWOUT FUSE ASSEMBLY - (Includes operating handle & mechanism) (Fuses not included)		
For Single Barrel Fuses	LCDF-OS	4,000
For Double Barrel Fuses	LCDF-OD	4,200
For Triple Barrel Fuses	LCDF-OT	4,500
For Non-Fused with Shorting Bars	LCDF-DO	-

TOSHIBA INTERNATIONAL CORPORATION

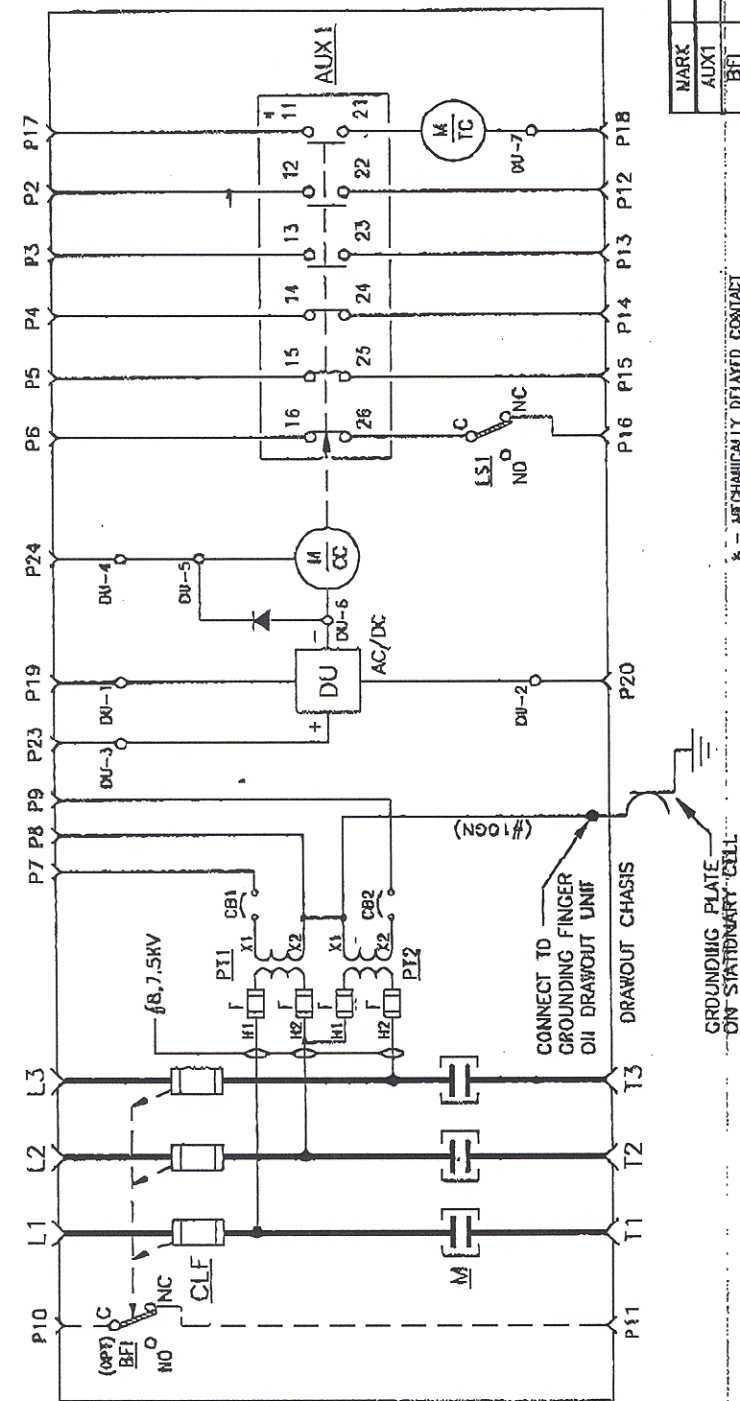
INDUSTRIAL DIVISION: 13131 WEST LITTLE YORK HOUSTON, TEXAS 77041 1-800-231-1412 CANADA 1-800-527-1204



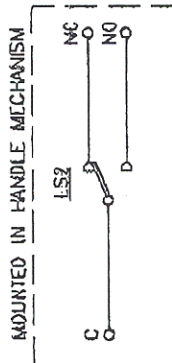
MARK	DESCRIPTION
AUX1	AUXILIARY SWITCH No.1
BFI	BLOWN FUSE INDICATOR - OPTIONAL
CLF	CURRENT LIMITING FUSE
DU	DRIVE UNIT
LS1,2	LIMIT SWITCHES
M	HIGH VOLTAGE CONTACTOR
MCC	CLOSING COIL OF CONTACTOR
P	PLUG



TITLE: SCHEMATIC & WIRING DIAGRAM		REVISION: 2	SCALE: 1.0=1.0
M.V. DRAWOUT UNIT DV SERIES (NO PT'S)		DRAWING NUMBER: V900KS07	
CUSTOMER:		JOB NUMBER:	
TOSHIBA INTERNATIONAL CORPORATION 10000 WEST 10TH AVE., SUITE 100, DALLAS, TEXAS 75243		THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF TOSHIBA INTERNATIONAL CORPORATION AND SHALL NOT BE REPRODUCED, USED, OR DISCLOSED TO OTHERS WITHOUT WRITTEN AUTHORIZATION OF TOSHIBA.	
REV	DATE	DESCRIPTION	BY
1	04/18/04	PLUG NOTE 4	AL
2	05/31/93	CHG SS TO AWM & ADD "BFI"	DC
3	09/19/91	FIRST ISSUE	WPK
4			AL
5			AL
6			AL
7			AL
8			AL
9			AL
10			AL
11			AL
12			AL
13			AL
14			AL
15			AL
16			AL
17			AL
18			AL
19			AL
20			AL
21			AL
22			AL
23			AL
24			AL



- NOTES
- 1 - LS1 IS CLOSED IN TEST OR CONNECTED POSITIONS
 - 2 - LS2 IS ACTIVATED DURING RACKING MOTION OF DRAWOUT
 - 3 - ALL WIRES ARE #18 AWG UNLESS OTHERWISE NOTED



* - MECHANICALLY DELAYED CONTACT WITH MAGNETIC BLOWOUT

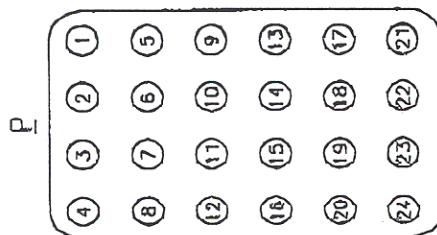
REAR VIEW
PLUG MOUNTED ON
FRONT OF DRAWOUT UNIT

PLUG: AMP #207304-1 (PC75801P020)
SOCKET: AMP #66601-1 (PC75801P010)

MARK	DESCRIPTION
AUX1	AUXILIARY SWITCH No.1
BFI	BLOWN FUSE INDICATOR - OPTIONAL
CB1,2	CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
DU	DRIVE UNIT
F	PT PRIMARY FUSE
LS1,2	LIMIT SWITCHES
M	HIGH VOLTAGE CONTACTOR
MCC	CLOSING COIL OF CONTACTOR
MTC	TRIP COIL OF CONTACTOR
P	PLUG
PT1,2	POTENTIAL TRANSFORMER

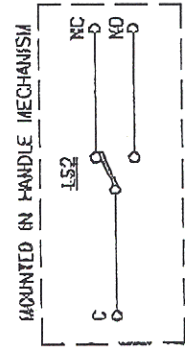
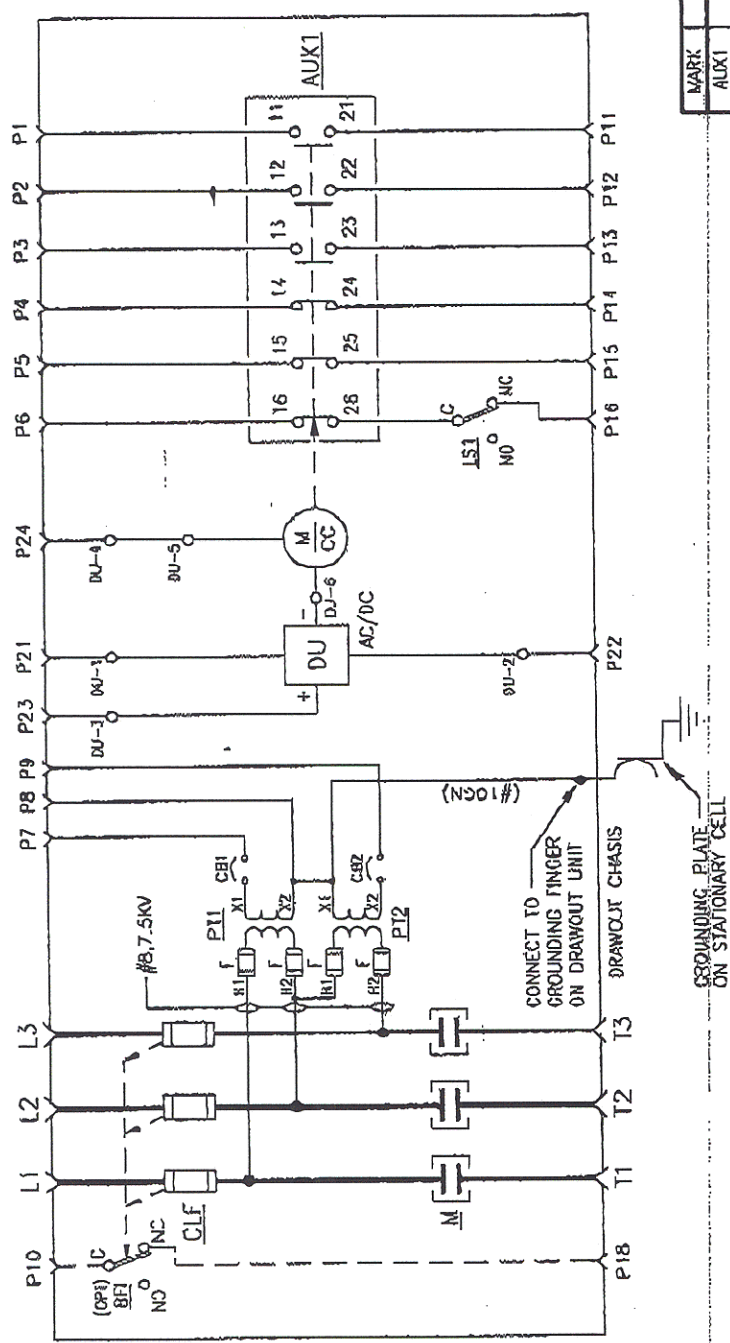
REV	DATE	DESCRIPTION	BY	CHK	APPR
4					
3	04/19/94	CHG 16 CABLE FROM 5 TO 7.5KV	GB	OC	AL
2	03/31/92	CHG 15 TO AMP A AND 16C	OC	ON	AL
1	08/02/90	CHG "11" TO "CB1/2BT"	LVH	AL	AL
0	12/06/88	FIRST ISSUE	LVH	AL	CH
TITLE: SCHEMATIC & WIRING DIAGRAM					
M.V. DRAWOUT UNIT DV LATCHED SERIES					
{WITH 2-OPEN DELTA CONNECTED P.T.'S}					
CUSTOMER:					
JOB NUMBER:					
DRAWING NUMBER: V900KS05					
REVISION: 3			SCALE: 1.0=1.0		

TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
JANESVILLE, WISCONSIN, U.S.A.
THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF
TOSHIBA INTERNATIONAL CORPORATION AND
MAY BE REPRODUCED, USED, OR DISCLOSED TO OTHERS
WITHOUT PRIOR WRITTEN AUTHORIZATION IS OBTAINED.



REAR VIEW
PLUS MAXIMUM ON
FRONT OF DRAWOUT UNIT

PLUG: AMP #207304-1 (PC75801PD20)
SOCKET: AMP #6601-1 (PC75801PD10)

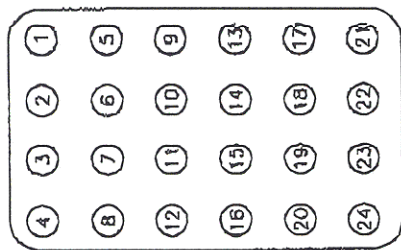


- NOTES
- 1 - LS1 IS CLOSED IN TEST OR CONNECTED POSITIONS
 - 2 - LS2 IS ACTIVATED DURING BACKING MOTION OF DRAWOUT
 - 3 - ALL WIRES ARE #18 AWG UNLESS OTHERWISE NOTED

MARK	DESCRIPTION
AUX1	AUXILIARY SWITCH No. 1
BT1	BLOWN FUSE INDICATOR - OPTIONAL
CB1,2	CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
DU	DRIVE UNIT
F	PT PRIMARY FUSE
LS1,2	LIMIT SWITCHES
M	HIGH VOLTAGE CONTACTOR
MCC	CLOSING COIL OF CONTACTOR
P	PLUG
PT1,2	POTENTIAL TRANSFORMER

TITLE: SCHEMATIC & WIRING DIAGRAM M.V. DRAWOUT UNIT DV SERIES (WITH 2-OPEN DELTA CONNECTED PT'S)		REVISION: 3	SCALE: 1.0=1.0
CUSTOMER: V900KS04		DRAWING NUMBER: V900KS04	
TOSHIBA INTERNATIONAL CORPORATION MADE IN JAPAN, TEXAS, U.S.A.		THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF TOSHIBA INTERNATIONAL CORPORATION AND SHALL NOT BE REPRODUCED, USED, OR DISCLOSED TO OTHERS WITHOUT WRITTEN AUTHORIZATION OF TOSHIBA	
REV	DATE	BY	CHK
1	04/11/84	CHG #5	AL
2	03/31/82	CHG #6	AL
3	06/02/80	CHG #7	AL
4	12/06/80	CHG #8	AL
5	01/02/81	CHG #9	AL
6	01/02/81	CHG #10	AL
7	01/02/81	CHG #11	AL
8	01/02/81	CHG #12	AL
9	01/02/81	CHG #13	AL
10	01/02/81	CHG #14	AL
11	01/02/81	CHG #15	AL
12	01/02/81	CHG #16	AL
13	01/02/81	CHG #17	AL
14	01/02/81	CHG #18	AL
15	01/02/81	CHG #19	AL
16	01/02/81	CHG #20	AL
17	01/02/81	CHG #21	AL
18	01/02/81	CHG #22	AL
19	01/02/81	CHG #23	AL
20	01/02/81	CHG #24	AL
21	01/02/81	CHG #25	AL
22	01/02/81	CHG #26	AL
23	01/02/81	CHG #27	AL
24	01/02/81	CHG #28	AL
25	01/02/81	CHG #29	AL
26	01/02/81	CHG #30	AL
27	01/02/81	CHG #31	AL
28	01/02/81	CHG #32	AL
29	01/02/81	CHG #33	AL
30	01/02/81	CHG #34	AL
31	01/02/81	CHG #35	AL
32	01/02/81	CHG #36	AL
33	01/02/81	CHG #37	AL
34	01/02/81	CHG #38	AL
35	01/02/81	CHG #39	AL
36	01/02/81	CHG #40	AL
37	01/02/81	CHG #41	AL
38	01/02/81	CHG #42	AL
39	01/02/81	CHG #43	AL
40	01/02/81	CHG #44	AL
41	01/02/81	CHG #45	AL
42	01/02/81	CHG #46	AL
43	01/02/81	CHG #47	AL
44	01/02/81	CHG #48	AL
45	01/02/81	CHG #49	AL
46	01/02/81	CHG #50	AL
47	01/02/81	CHG #51	AL
48	01/02/81	CHG #52	AL
49	01/02/81	CHG #53	AL
50	01/02/81	CHG #54	AL
51	01/02/81	CHG #55	AL
52	01/02/81	CHG #56	AL
53	01/02/81	CHG #57	AL
54	01/02/81	CHG #58	AL
55	01/02/81	CHG #59	AL
56	01/02/81	CHG #60	AL
57	01/02/81	CHG #61	AL
58	01/02/81	CHG #62	AL
59	01/02/81	CHG #63	AL
60	01/02/81	CHG #64	AL
61	01/02/81	CHG #65	AL
62	01/02/81	CHG #66	AL
63	01/02/81	CHG #67	AL
64	01/02/81	CHG #68	AL
65	01/02/81	CHG #69	AL
66	01/02/81	CHG #70	AL
67	01/02/81	CHG #71	AL
68	01/02/81	CHG #72	AL
69	01/02/81	CHG #73	AL
70	01/02/81	CHG #74	AL
71	01/02/81	CHG #75	AL
72	01/02/81	CHG #76	AL
73	01/02/81	CHG #77	AL
74	01/02/81	CHG #78	AL
75	01/02/81	CHG #79	AL
76	01/02/81	CHG #80	AL
77	01/02/81	CHG #81	AL
78	01/02/81	CHG #82	AL
79	01/02/81	CHG #83	AL
80	01/02/81	CHG #84	AL
81	01/02/81	CHG #85	AL
82	01/02/81	CHG #86	AL
83	01/02/81	CHG #87	AL
84	01/02/81	CHG #88	AL
85	01/02/81	CHG #89	AL
86	01/02/81	CHG #90	AL
87	01/02/81	CHG #91	AL
88	01/02/81	CHG #92	AL
89	01/02/81	CHG #93	AL
90	01/02/81	CHG #94	AL
91	01/02/81	CHG #95	AL
92	01/02/81	CHG #96	AL
93	01/02/81	CHG #97	AL
94	01/02/81	CHG #98	AL
95	01/02/81	CHG #99	AL
96	01/02/81	CHG #100	AL
97	01/02/81	CHG #101	AL
98	01/02/81	CHG #102	AL
99	01/02/81	CHG #103	AL
100	01/02/81	CHG #104	AL
101	01/02/81	CHG #105	AL
102	01/02/81	CHG #106	AL
103	01/02/81	CHG #107	AL
104	01/02/81	CHG #108	AL
105	01/02/81	CHG #109	AL
106	01/02/81	CHG #110	AL
107	01/02/81	CHG #111	AL
108	01/02/81	CHG #112	AL
109	01/02/81	CHG #113	AL
110	01/02/81	CHG #114	AL
111	01/02/81	CHG #115	AL
112	01/02/81	CHG #116	AL
113	01/02/81	CHG #117	AL
114	01/02/81	CHG #118	AL
115	01/02/81	CHG #119	AL
116	01/02/81	CHG #120	AL
117	01/02/81	CHG #121	AL
118	01/02/81	CHG #122	AL
119	01/02/81	CHG #123	AL
120	01/02/81	CHG #124	AL
121	01/02/81	CHG #125	AL
122	01/02/81	CHG #126	AL
123	01/02/81	CHG #127	AL
124	01/02/81	CHG #128	AL
125	01/02/81	CHG #129	AL
126	01/02/81	CHG #130	AL
127	01/02/81	CHG #131	AL
128	01/02/81	CHG #132	AL
129	01/02/81	CHG #133	AL
130	01/02/81	CHG #134	AL
131	01/02/81	CHG #135	AL
132	01/02/81	CHG #136	AL
133	01/02/81	CHG #137	AL
134	01/02/81	CHG #138	AL
135	01/02/81	CHG #139	AL
136	01/02/81	CHG #140	AL
137	01/02/81	CHG #141	AL
138	01/02/81	CHG #142	AL
139	01/02/81	CHG #143	AL
140	01/02/81	CHG #144	AL
141	01/02/81	CHG #145	AL
142	01/02/81	CHG #146	AL
143	01/02/81	CHG #147	AL
144	01/02/81	CHG #148	AL
145	01/02/81	CHG #149	AL
146	01/02/81	CHG #150	AL
147	01/02/81	CHG #151	AL
148	01/02/81	CHG #152	AL
149	01/02/81	CHG #153	AL
150	01/02/81	CHG #154	AL
151	01/02/81	CHG #155	AL
152	01/02/81	CHG #156	AL
153	01/02/81	CHG #157	AL
154	01/02/81	CHG #158	AL
155	01/02/81	CHG #159	AL
156	01/02/81	CHG #160	AL
157	01/02/81	CHG #161	AL
158	01/02/81	CHG #162	AL
159	01/02/81	CHG #163	AL
160	01/02/81	CHG #164	AL
161	01/02/81	CHG #165	AL
162	01/02/81	CHG #166	AL
163	01/02/81	CHG #167	AL
164	01/02/81	CHG #168	AL
165	01/02/81	CHG #169	AL
166	01/02/81	CHG #170	AL
167	01/02/81	CHG #171	AL
168	01/02/81	CHG #172	AL
169	01/02/81	CHG #173	AL
170	01/02/81	CHG #174	AL
171	01/02/81	CHG #175	AL
172	01/02/81	CHG #176	AL
173	01/02/81	CHG #177	AL
174	01/02/81	CHG #178	AL
175	01/02/81	CHG #179	AL
176	01/02/81	CHG #180	AL
177	01/02/81	CHG #181	AL
178	01/02/81	CHG #182	AL
179	01/02/81	CHG #183	AL
180	01/02/81	CHG #184	AL
181	01/02/81	CHG #185	AL
182	01/02/81	CHG #186	AL
183	01/02/81	CHG #187	AL
184	01/02/81	CHG #188	AL
185	01/02/81	CHG #189	AL
186	01/02/81	CHG #190	AL
187	01/02/81	CHG #191	AL
188	01/02/81	CHG #192	AL
189	01/02/81	CHG #193	AL
190	01/02/81	CHG #194	AL
191	01/02/81	CHG #195	AL
192	01/02/81	CHG #196	AL
193	01/02/81	CHG #197	AL
194	01/02/81	CHG #198	AL
195	01/02/81	CHG #199	AL
196	01/02/81	CHG #200	AL
197	01/02/81	CHG #201	AL
198	01/02/81	CHG #202	AL
199	01/02/81	CHG #203	AL
200	01/02/81	CHG #204	AL
201	01/02/81	CHG #205	AL
202	01/02/81	CHG #206	AL
203	01/02/81	CHG #207	AL
204	01/02/81	CHG #208	AL
205	01/02/81	CHG #209	AL
206	01/02/81	CHG #210	AL
207	01/02/81	CHG #211	AL
208	01/02/81	CHG #212	AL
209	01/02/81	CHG #213	AL
210	01/02/81	CHG #214	AL
211	01/02/81	CHG #215	AL
212	01/02/81	CHG #216	AL
213	01/02/81	CHG #217	AL
214	01/02/81	CHG #218	AL
215	01/02/81	CHG #219	AL
216	01/02/81	CHG #220	AL
217	01/02/81	CHG #221	AL
218	01/02/81	CHG #222	AL
219	01/02/81	CHG #223	AL
220	01/02/81	CHG #224	AL
221	01/02/81	CHG #225	AL
222	01/02/81	CHG #226	AL
223	01/02/81	CHG #227	AL
224	01/02/81	CHG #228	AL
225	01/02/81	CHG #229	AL
226	01/02/81	CHG #230	AL
227	01/02/81	CHG #231	AL
228	01/02/81	CHG #232	AL
229	01/02/81	CHG #233	AL
230	01/02/81	CHG #234	AL
231	01/02/81	CHG #235	AL
232	01/02/81	CHG #236	AL
233	01/02/81	CHG #237	AL
234	01/02/81	CHG #238	AL

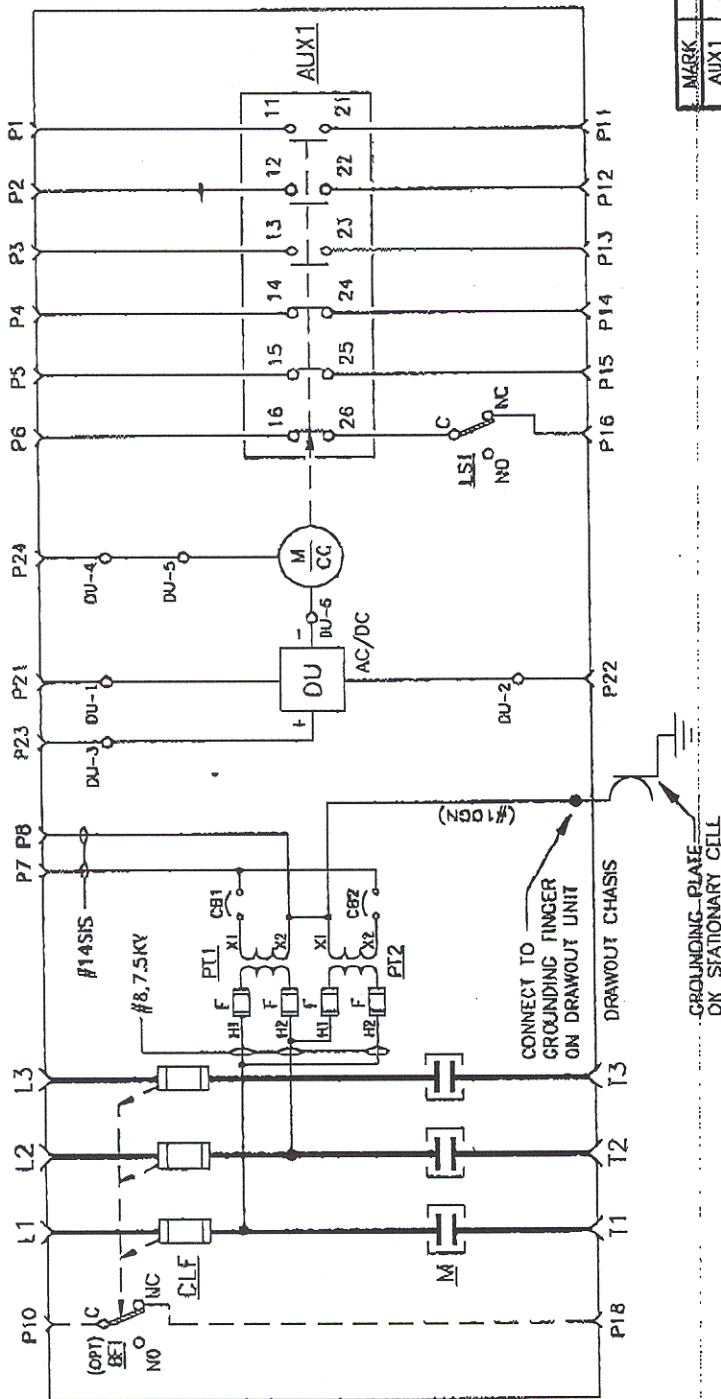
P



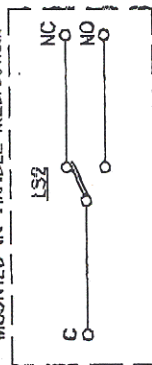
REAR VIEW

PLUG MOUNTED ON
FRONT OF DRAWOUT UNIT

PLUG: AMP #207304-1 (PC7580IP020)
SOCKET: AMP #66601-1 (PC7580IP010)



MOUNTED IN HANDLE MECHANISM



- NOTES
- 1 - LS1 IS CLOSED IN TEST OR CONNECTED POSITIONS
 - 2 - LS2 IS ACTIVATED DURING RACKING MOTION OF DRAWOUT
 - 3 - ALL WIRES ARE #18 AWG UNLESS OTHERWISE NOTED

MARK	DESCRIPTION
AUX1	AUXILIARY SWITCH No.1
BFI	BLOWN FUSE INDICATOR - OPTIONAL
CB1,2	CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
DU	DRIVE UNIT
F	PT PRIMARY FUSE
LS1,2	LIMIT SWITCHES
M	HIGH VOLTAGE CONTACTOR
NCC	CLOSING COIL OF CONTACTOR
P	PLUG
PT1,2	POTENTIAL TRANSFORMER

REV	DATE	DESCRIPTION	BY	CHK	APPR
5	04/18/94	CHG JA CABLE FROM 5 TO 7.5KV	DC	OW	AL
4	03/30/93	CHG SS TO NMM & ADD "BFI"	DC	OW	AL
3	09/12/91	ADD "CB2"	WVH	AL	AL
2	06/02/90	CHG "1" TO "B1"	WVH	IL	AL
1	01/28/89	REVISED	WVH	IL	AL
0	12/06/86	FIRST ISSUE	WVH	IL	CH
REV	DATE	DESCRIPTION	BY	CHK	APPR

TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
MADE IN HOUSTON, TEXAS U.S.A.
THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF
TOSHIBA INTERNATIONAL CORPORATION AND SHALL
NOT BE REPRODUCED, USED, OR DISCLOSED TO OTHERS
UNLESS PRIOR WRITTEN AUTHORIZATION IS OBTAINED.

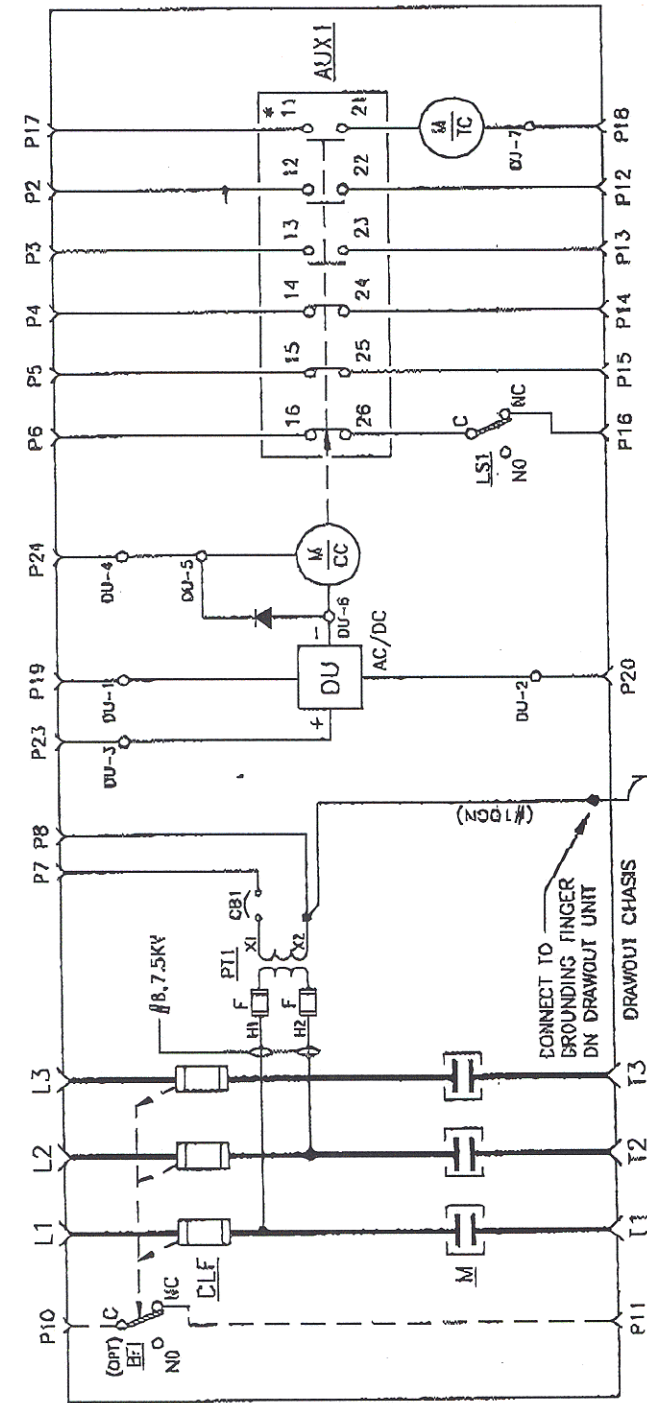
TITLE: SCHEMATIC & WIRING DIAGRAM

M.V. DRAWOUT UNIT DV SERIES (WITH 2-PARALLELED PT'S)

CUSTOMER: JOB NUMBER:

DRAWING NUMBER
V900KS03

REVISION: 5 SCALE: 1.0=1.0



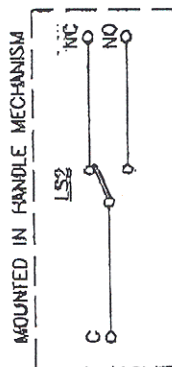
REAR VIEW

PLUG MOUNTED ON
FRONT OF DRAWOUT UNIT

PLUG: AMP #207304-1 (PC75801P020)
SOCKET: AMP #66601-1 (PC75801P010)

MARK	DESCRIPTION
AUX1	AUXILIARY SWITCH No. 1
BFI	BLOWN FUSE INDICATOR - OPTIONAL
CB1	CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
DU	DRIVE UNIT
F	PT PRIMARY FUSE
LS1,2	LIMIT SWITCHES
M	HIGH VOLTAGE CONTACTOR
MCC	CLOSING COIL OF CONTACTOR
MTC	TRIP COIL OF CONTACTOR
P	PLUG
PT1	POTENTIAL TRANSFORMER

* - MECHANICALLY DELAYED CONTACT
WITH MAGNETIC BLOWOUT



- NOTES
- 1 - LS1 IS CLOSED IN TEST OR CONNECTED POSITIONS
 - 2 - LS2 IS ACTIVATED DURING RACKING MOTION OF DRAWOUT
 - 3 - ALL WIRES ARE #18 AWG UNLESS OTHERWISE NOTED

REV	DATE	DESCRIPTION	BY	CHK	APPR
5	04/19/94	DESIGN FROM 3 TO 7.5KV	BB	AL	AL
4	03/20/92	DESIGN TO AWG & ADD "B"	DC	AL	AL
3	08/02/90	CHANGE "I" TO "B"	LWK	AL	AL
2	03/08/89	REVISED	LWK	AL	AL
1	01/16/89	REVISED	LWK	AL	AL
0	12/06/88	FIRST ISSUE	LWK	AL	CH

TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
"MADE IN KANSAS, TEXAS, U.S.A."
THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF
TOSHIBA INTERNATIONAL CORPORATION AND SHALL
NOT BE REPRODUCED, USED, OR DISCLOSED TO OTHERS
UNLESS PRIOR WRITTEN AUTHORIZATION IS OBTAINED.

TITLE: SCHEMATIC & WIRING DIAGRAM
M.V. DRAWOUT UNIT DIV LATCHED SERIES (WITH 1-P1)

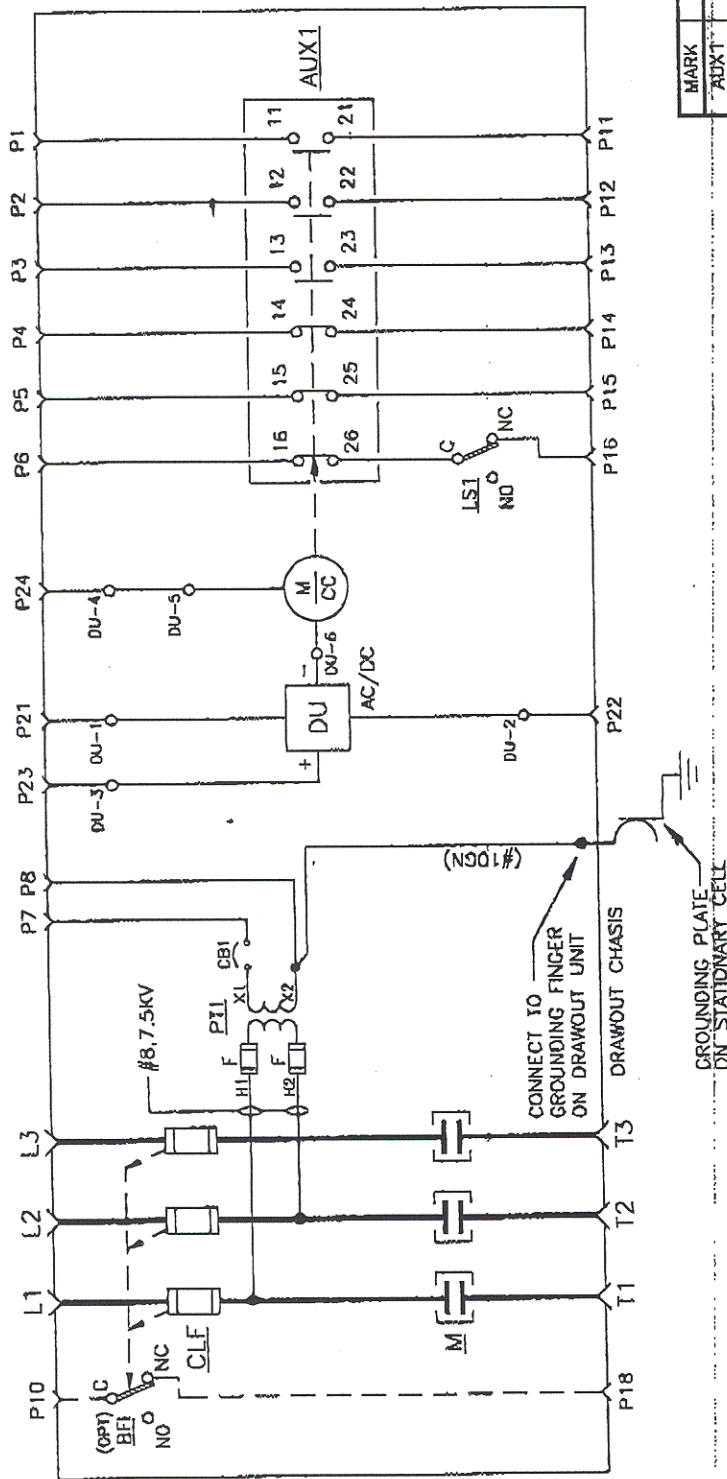
ADVISION: 5
SCALE: 1.0=1.0

JOB NUMBER:

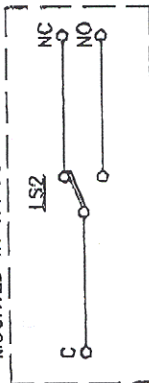
DRAWING NUMBER:

V900KS02

P



MOUNTED IN HANDLE MECHANISM



NOTES

- 1 - LS1 IS CLOSED IN TEST OR CONNECTED POSITIONS
- 2 - LS2 IS ACTIVATED DURING RACKING MOTION OF DRAWOUT
- 3 - ALL WIRES ARE #18 AWG UNLESS OTHERWISE NOTED

MARK	DESCRIPTION
AUX1	AUXILIARY SWITCH-NO.1
BFI	BLOWN FUSE INDICATOR - OPTIONAL
CB1	CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
DU	DRIVE UNIT
F	PT PRIMARY FUSE
LS1,2	LIMIT SWITCHES
M	HIGH VOLTAGE CONTACTOR
MCC	CLOSING COIL OF CONTACTOR
P	PLUG
PT1	POTENTIAL TRANSFORMER

REV	DATE	DESCRIPTION	BY	CHK	APPR
5	04/19/94	CHK #8 CABLE FROM 5 TO 7.5KV	BB	DC	AL
4	01/30/92	CHG. SS TO AWG & ADD "BFI"	OC	GW	AL
3	08/02/90	CHG "T1" TO "CB1"	LVR	AL	AL
2	03/05/85	REVISED	DN	AL	AL
1	01/26/88	REVISED	LVR	AL	AL
0	12/06/88	FIGS1 ISSUE	LVR	AL	GH

TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
1000 N. HOUSTON, TEXAS 77060 USA

THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF TOSHIBA INTERNATIONAL CORPORATION AND SHALL NOT BE REPRODUCED, USED, OR DISCLOSED TO OTHERS WITHOUT PRIOR WRITTEN AUTHORIZATION IS OBTAINED.

TITLE: SCHEMATIC & WIRING DIAGRAM
M.V. DRAWOUT UNIT DV SERIES (WITH 1-PT.)

CUSTOMER: JOB NUMBER:

DRAWING NUMBER: V900KS01

REVISION: 5 SCALE: 1.0=1.0