



**GROVE<sup>®</sup>**  
**CRANE**

**A GROVE WORLDWIDE COMPANY**

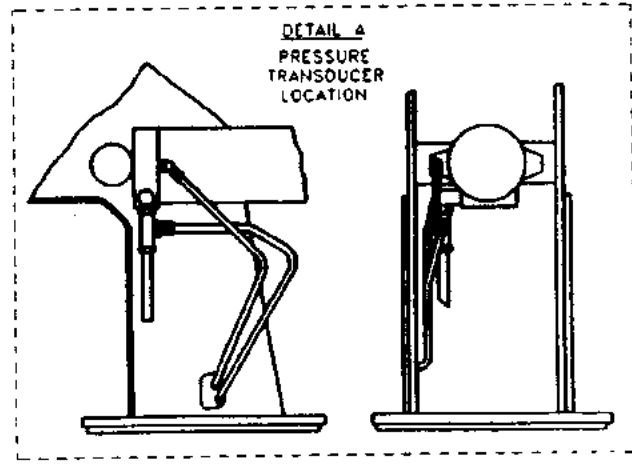
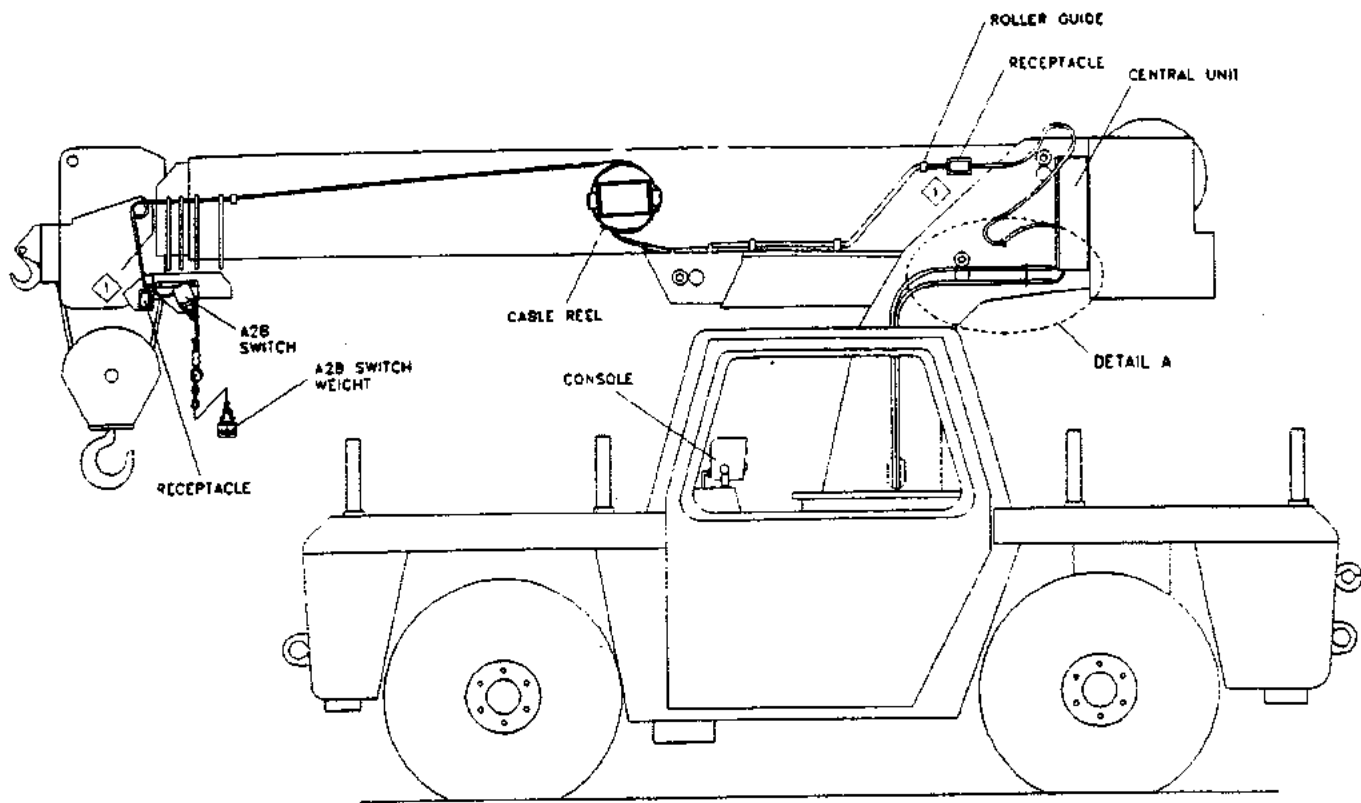
**PARTS AND  
INSTALLATION  
MANUAL**

**AP308**

**DS350  
LMI SYSTEM**  
**(CE & 30 V/M EMC)**

**TABLE OF CONTENTS**  
**AP308 - LMI SYSTEM (CE/EMC)**

<b>LMI COMPONENT LOCATIONS</b> .....	<b>PAGE(S)</b>	<b>1</b>
<b>A2B SYSTEM INSTALLATION</b> .....		<b>2,3</b>
<b>...CABLE REEL ASSEMBLY</b> .....		<b>4,5</b>
<b>.....SLIP RING ASSEMBLY</b> .....		<b>6,7</b>
<b>LMI MOUNTING KIT</b> .....		<b>8,9</b>
<b>LMI SYSTEM KIT (CE)</b> .....		<b>10,11</b>
<b>...CONSOLE ASSEMBLY</b> .....		<b>12,13</b>
<b>...CENTRAL UNIT ASSEMBLY</b> .....		<b>14,15</b>
<b>LMI SYSTEM KIT (CE/EMC)</b> .....		<b>16,17</b>
<b>...CONSOLE ASSEMBLY</b> .....		<b>18,19</b>
<b>...CENTRAL UNIT ASSEMBLY</b> .....		<b>20,21</b>
<b>...CABLE INSTALLATION INSTRUCTIONS</b> .....		<b>22,23</b>
<b>...WATER DEFLECTION FRAME INSTALLATION</b> .....		<b>24</b>
<b>MOUNTING HARDWARE - MAINBOOM</b> .....		<b>25</b>
<b>3RD WRAP LIMIT INSTALLATION (MAIN HOIST)</b> .....		<b>26,27</b>
<b>...CONTROL UNIT ASSEMBLY (MWD 100)</b> .....		<b>28,29</b>
<b>JUMPER CABLE ASSEMBLY</b> .....		<b>30,31</b>
<b>A2B WEIGHT AND CHAIN</b> .....		<b>32,33</b>
<b>WIRING DIAGRAMS</b> .....		<b>34,35</b>
<b>SWINGAWAY EXTENSION INSTALLATION</b> .....		<b>36-38</b>
<b>TELE EXTENSION INSTALLATION</b> .....		<b>40-43</b>



NOTES:

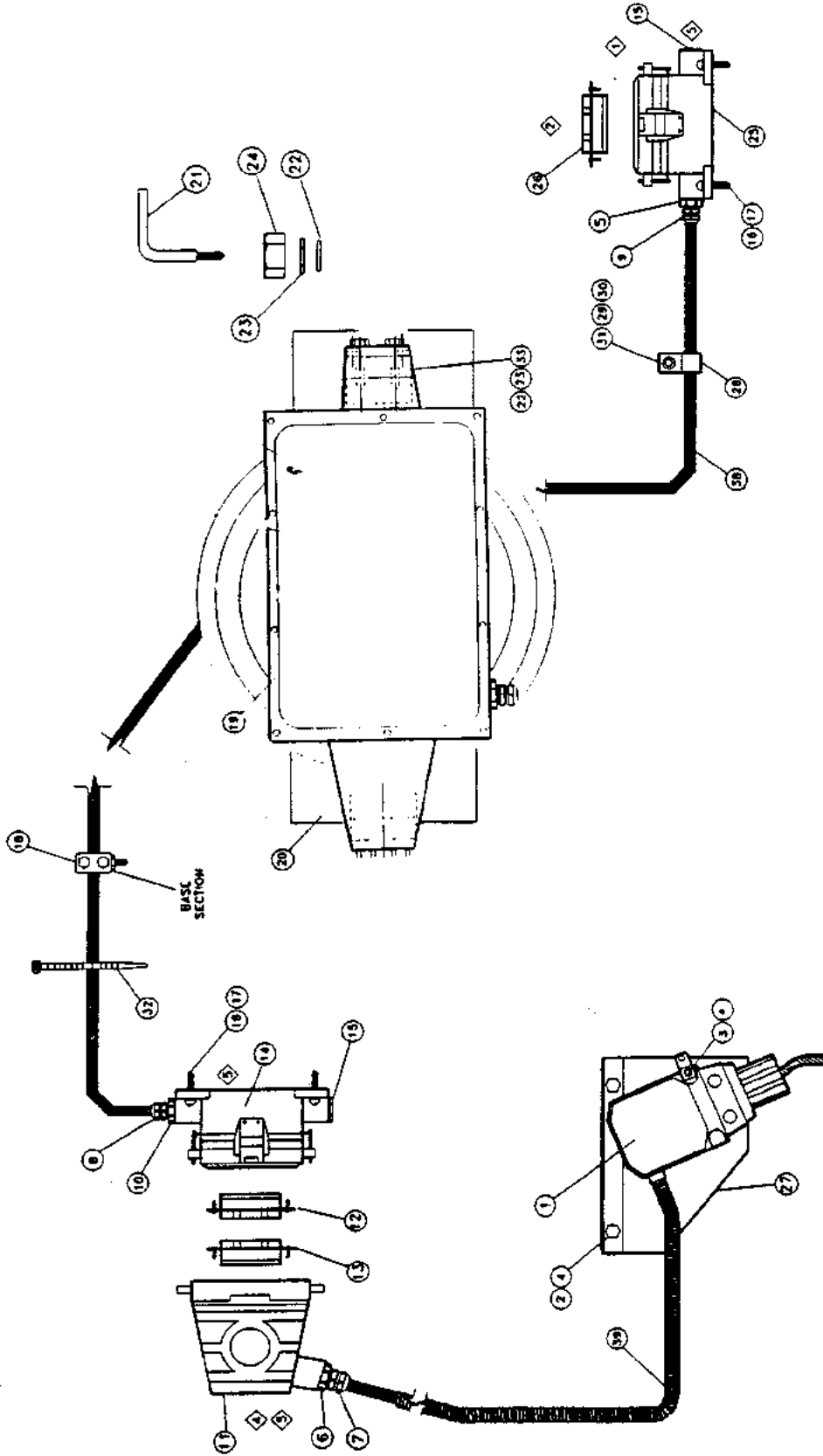
- ① ROLLER GUIDE ON BASE SECTION TO BE CENTERED ON CABLE DRUM. REMAINING GUIDES TO FORM STRAIGHT PATH TO DEAD END ON NOSE.
- ② POSITION HEIGHT OF ROLLER GUIDE TO OBTAIN CABLE REEL LINE PATH WHICH IS PARALLEL TO TOP SURFACE OF BOOM SECTIONS.

ALL WELDS TO BE A.W.S. CR. 60

④ ADD DIELECTRIC LUBRICANT (e.g. NYOGEL 7590) TO INSIDE OF RECEPTACLES, PLUGS, AND ELECTRICAL CONNECTORS, TO IMPROVE PROTECTION AGAINST CORROSION AND MALFUNCTION DUE TO CONDENSATION.

- A. CLEAN ELECTRICAL CONTACTS AND CONNECTORS OF ALL FOREIGN MATERIAL SUCH AS GREASE, OIL, AND DIRT BEFORE APPLYING LUBRICANT.
- B. APPLY A GENEROUS AMOUNT OF LUBRICANT ON THE ELECTRICAL CONTACTS AND CONNECTORS BEFORE MOUNTING.
- C. AFTER MATING CONTACTS AND CONNECTORS, CLEAN OFF THE EXCESS SQUEEZED OUT.

INSTALLATION  
LMI COMPONENTS

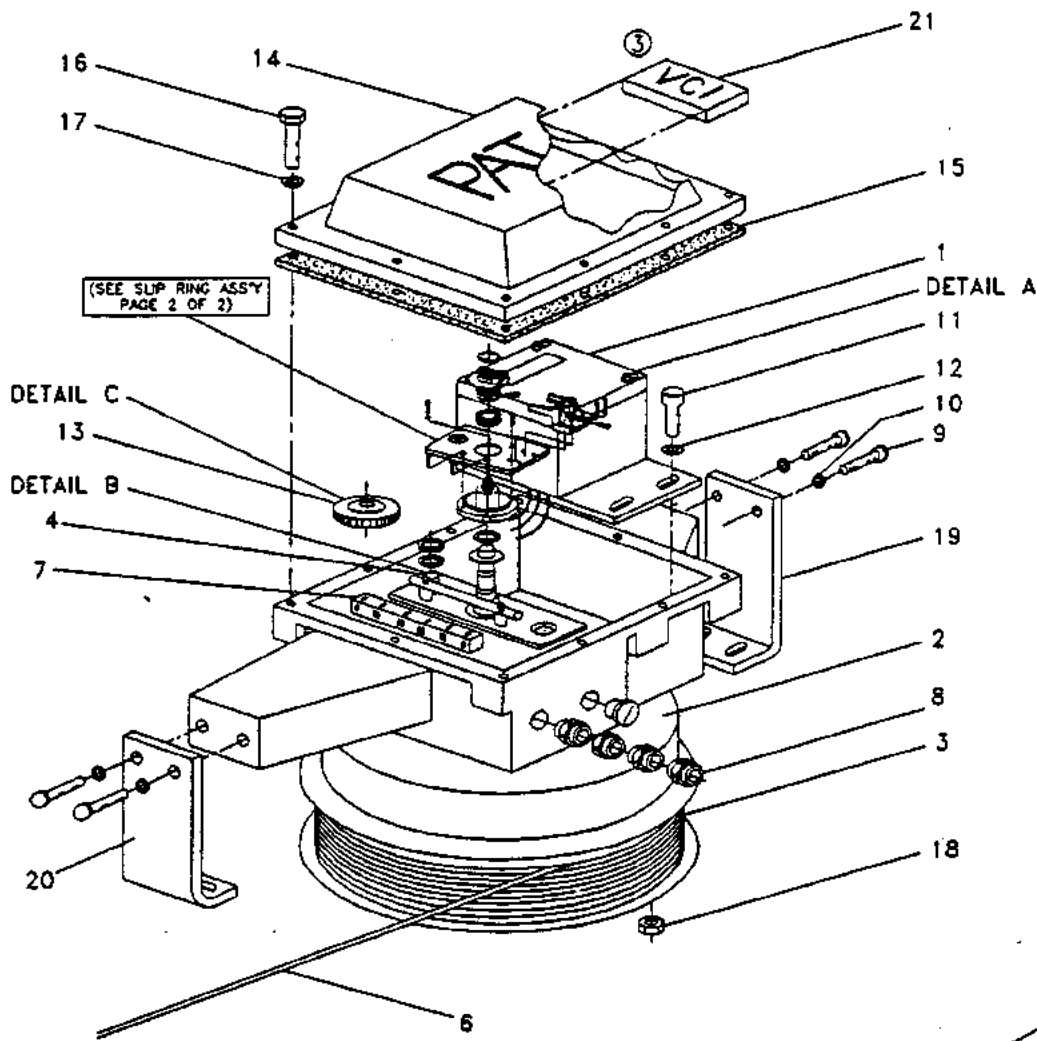


A2B SYSTEM INSTALLATION

- NOTES:
- ① CONNECTOR LOCATED AT THE REAR OF THE BOOM.
  - ② CONNECT PLUG FROM CENTRAL UNIT INTO RECEPTACLE.
  - ③ REFER TO INSTALLATION DRAWING AND GROVE WELDMENT DRAWING FOR INSTALLATION AND LOCATION.
  - ④ WHEN OPTIONAL SWINGAWAY EXTENSION IS IN USE, UNPLUG CONNECTOR AND PLUG IN EXTENSION CONNECTOR CABLE.
- ⑤ ADD DIELECTRIC LUBRICANT (i.e. NYODOL 7500) TO INSIDE OF RECEPTACLE PLUGS AND ELECTRICAL CONNECTORS TO IMPROVE PROTECTION AGAINST CORROSION AND MALFUNCTION DUE TO CONDENSATION.
  - A. CLEAN ELECTRICAL CONTACTS AND CONNECTORS OF ALL FOREIGN MATERIAL SUCH AS GREASE, OIL, AND DIRT BEFORE APPLYING LUBRICANT.
  - B. APPLY A GENEROUS AMOUNT OF LUBRICANT ON THE ELECTRICAL CONTACTS AND CONNECTORS BEFORE MOUNTING.
  - C. AFTER MATING CONTACTS AND CONNECTORS, CLEAN OFF THE EXCESS SQUEEZED OUT.

NO.	PART NO.	QTY DESCRIPTION	NO.	PART NO.	QTY DESCRIPTION
	3-486-0-00464	COMPLETE ASSY	29	7-950-140141	5 WASHER
1	9-333-102238	1 SWITCH, A2B W/O CRIMP			1/4" I. D.
2	7-112-150650	2 BOLT, HEX 5/16"-18 NC X 3/4" - GRD 2	30	7-950-140050	5 LOCKWASHER
3	7-110-151205	2 CAP SCREW 5/16" - 18 NC X 1 1/2"	31	7-660-140000	5 NUT, HEX
4	7-950-150050	4 LOCKWASHER 5/16" I. D.	32	7-850-000805	10 TIE, CABLE (BLACK)
5	9-333-101424	1 REDUCER PG16-13.5	33	7-112-160850	2 REPLACED BY 7115160850
6	9-333-102057	1 REDUCER PG16-9	38	9-333-102040	1 CABLE, ELEC
7	9-333-102674	1 STRAIN RELIEF PG9	39	9-333-102235	1 CONDUIT
8	9-333-102058	1 STRAIN RELIEF WHITE INSERT - PG9			7 X 0.5 D. S.
9	9-333-101440	1 STRAIN RELIEF RED INSERT - PG13.5			
10	9-333-102058	1 REDUCER			
11	9-333-101481	1 PLUG - 6 PIN			
12	9-333-101426	1 INSERT, FEMALE - 6 PIN			
13	9-333-101459	1 INSERT, MALE - 6 PIN			
14	9-333-101425	1 RECEPTACLE - 6 PIN			
15	9-333-101443	2 PLUG, HOLE			
16	7-111-100410	8 MACHINE SCREW 3/16" - 24 NC X 1/2" GRD 1			
17	7-950-100050	8 LOCKWASHER 3/16" I. D.			
18	9-333-101437	1 ROLLER GUIDE ASSY			
19 +	9-333-101899	1 CABLE REEL ASSEMBLY			
20	9-333-101433	1 PLATE			
21	6-099-000431	2 BOLT, NOOK 3/8"-16 X 2 3/4"			
	6-099-000432	2 BOLT, NOOK 3/8"-16 X 4"			
22	7-950-160141	6 WASHER 3/8" I. D.			
23	7-950-160050	6 LOCKWASHER 3/8" I. D.			
24	7-660-160000	6 NUT, HEX 3/8" - 16 NC GRD 1			
25	9-333-101441	1 RECEPTACLE - 10 PIN			
26	9-333-101442	1 INSERT, MALE - 10 PIN			
27	9-333-101450	1 PLATE			
28	9-333-101839	5 CLAMP 3/16"			

+ SEE FURTHER BREAKDOWN THIS GROUP



**NOTES:**

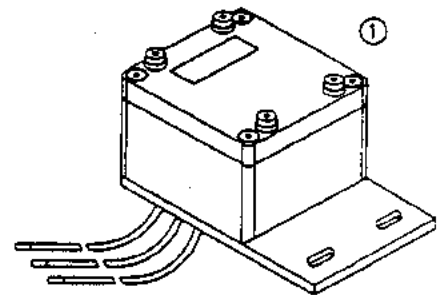
- ① INSTALL SENSOR TO THE MOUNT INSIDE THE CABLE REEL. CONNECT WIRES (SOLDER TO TERMINALS) AS SHOWN IN ELECTRICAL DIAGRAM. ADJUST ANGLE SENSOR TO OBTAIN A TRUE BOOM ANGLE DISPLAY ON CONSOLE. TIGHTEN UP SCREWS AND SECURE WIRES.

**CAUTION:** DO NOT TRIP WIRES BETWEEN ANGLE SENSOR PLATE AND MOUNTS INSIDE CABLE REEL.

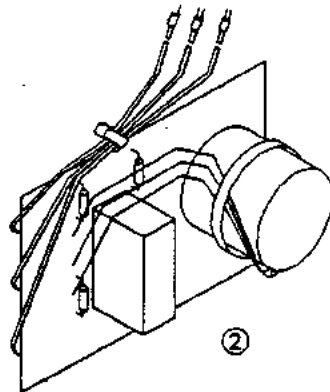
- ② INSTALL LENGTH SENSOR TO THE MOUNT IN CABLE REEL. CONNECT WIRES (SOLDER TO TERMINALS) AS INDICATED IN ELECTRICAL DIAGRAM. WITH FULLY RETRACTED BOOM, TURN SLOTTED POTENTIOMETER SHAFT OF LENGTH SENSOR COUNTERCLOCKWISE UNTIL A RESISTANCE STOPS THE TURN. REFER TO DETAIL C.

**CAUTION:** ALTHOUGH 20 TURNS MAX. ARE POSSIBLE, DO NOT FORCE THE SHAFT AS DAMAGE TO POTENTIOMETER MAY OCCUR.

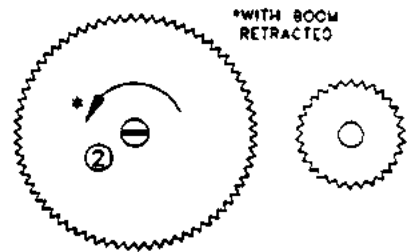
- ③ PEEL OFF PROTECTIVE PAPER FROM SELFADHESIVE BACK OF DEVICE. ADHERE TO INSIDE WALL OF ENCLOSURE.



ANGLE SENSOR  
DETAIL A



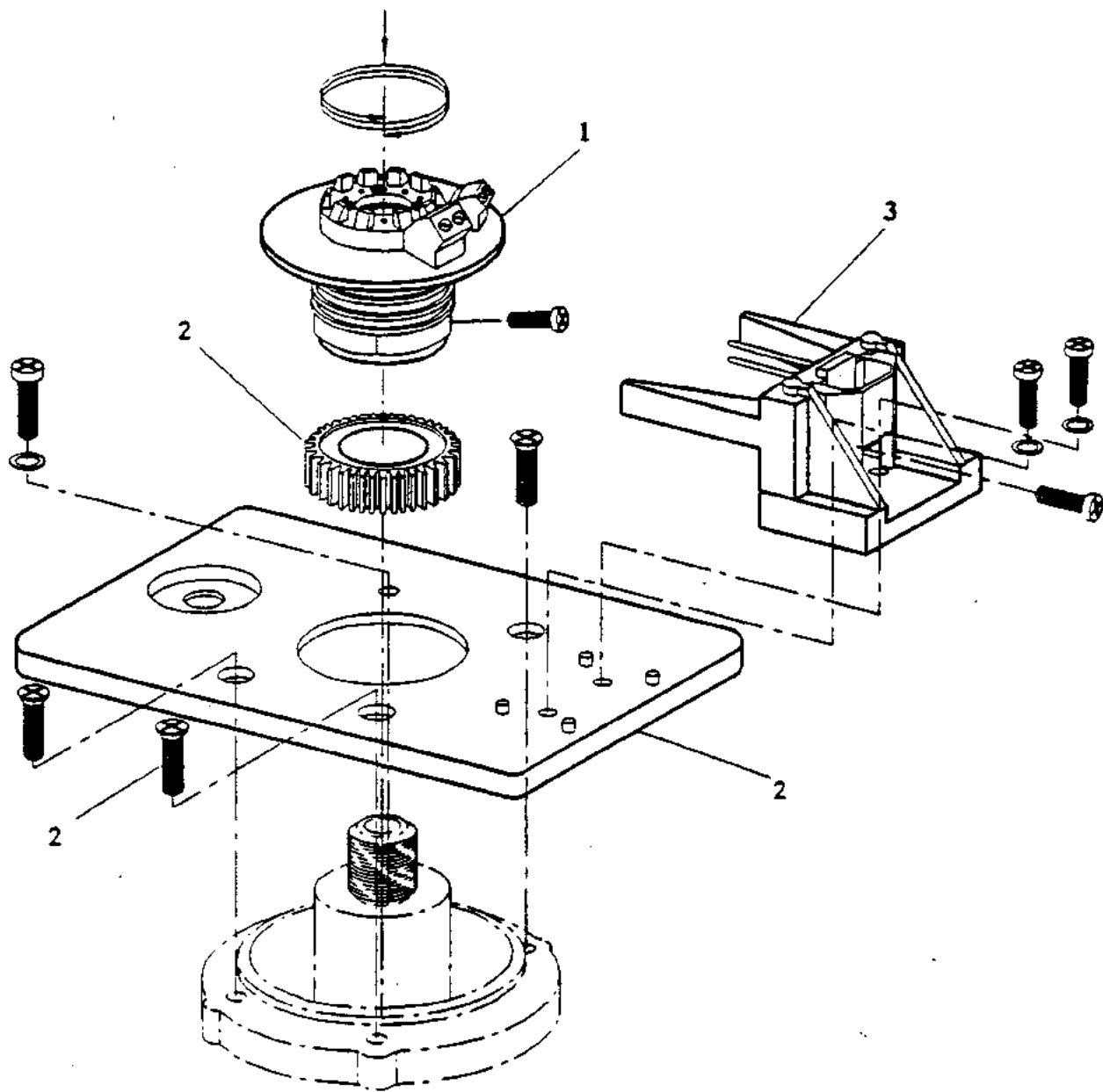
LENGTH SENSOR  
DETAIL B



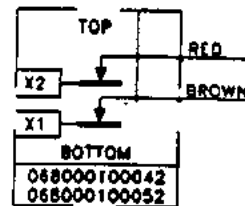
POTENTIOMETER  
DETAIL C

NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
	9-333-101899		COMPLETE ASSY				
1	9-333-101454	1	SENSOR, ANGLE				
2	9-333-101623	1	SPRING ASSY				
3	9-333-101624	1	REEL, CABLE				
4	9-333-101617	1	POTENTIOMETER AND CIRCUIT BOARD ASSY				
5 +	9-333-102418	1	SLIP RING ASSEMBLY - 2 CAB.				
6	9-333-101618	1	CABLE				
7	9-333-101557	1	STRIP, TERMINAL				
8	9-333-101558	1	RELIEF, STRAIN				
9	9-333-101559	4	SCREW				
10	9-333-101560	4	LOCKWASHER - #12				
11	9-333-101561	2	SCREW				
12	9-333-101562	2	WASHER				
13	9-333-101625	1	GEAR + CLUTCH				
14	9-333-101564	1	COVER, HOUSING				
15	9-333-101565	1	SEAL, COVER				
16	9-333-101566	10	SCREW, COVER				
17	9-333-101567	10	WASHER				
18	9-333-101568	4	NUT, HEX				
19	9-333-101569	1	BRACKET				
20	9-333-101570	1	BRACKET				
21	7-296-000004	1	INHIBITOR, CORROSION - VAPOR CONTROL				

+ SEE FURTHER BREAKDOWN THIS GROUP



SLIP RING ASSEMBLY  
(2 CONDUCTOR)

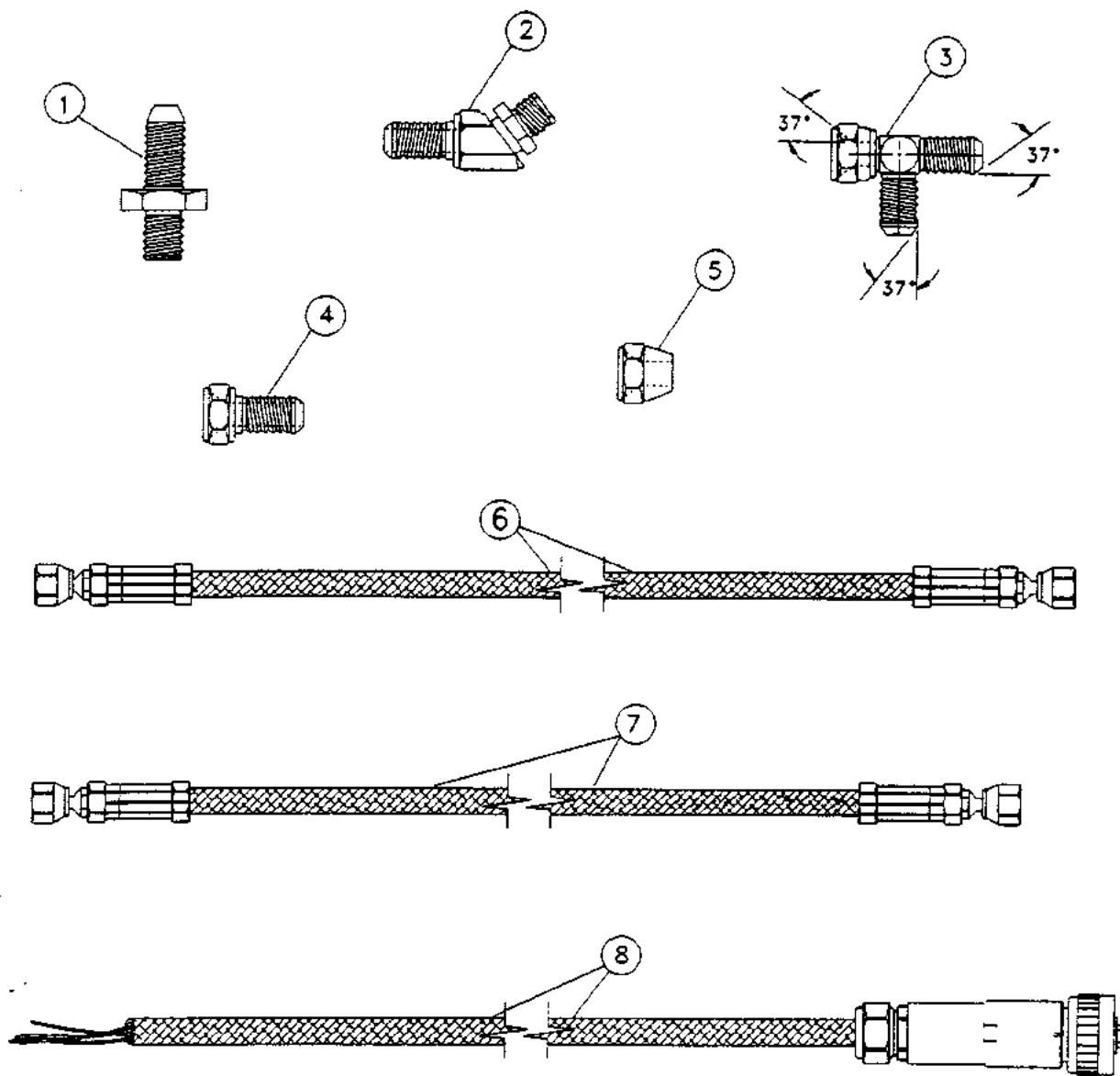




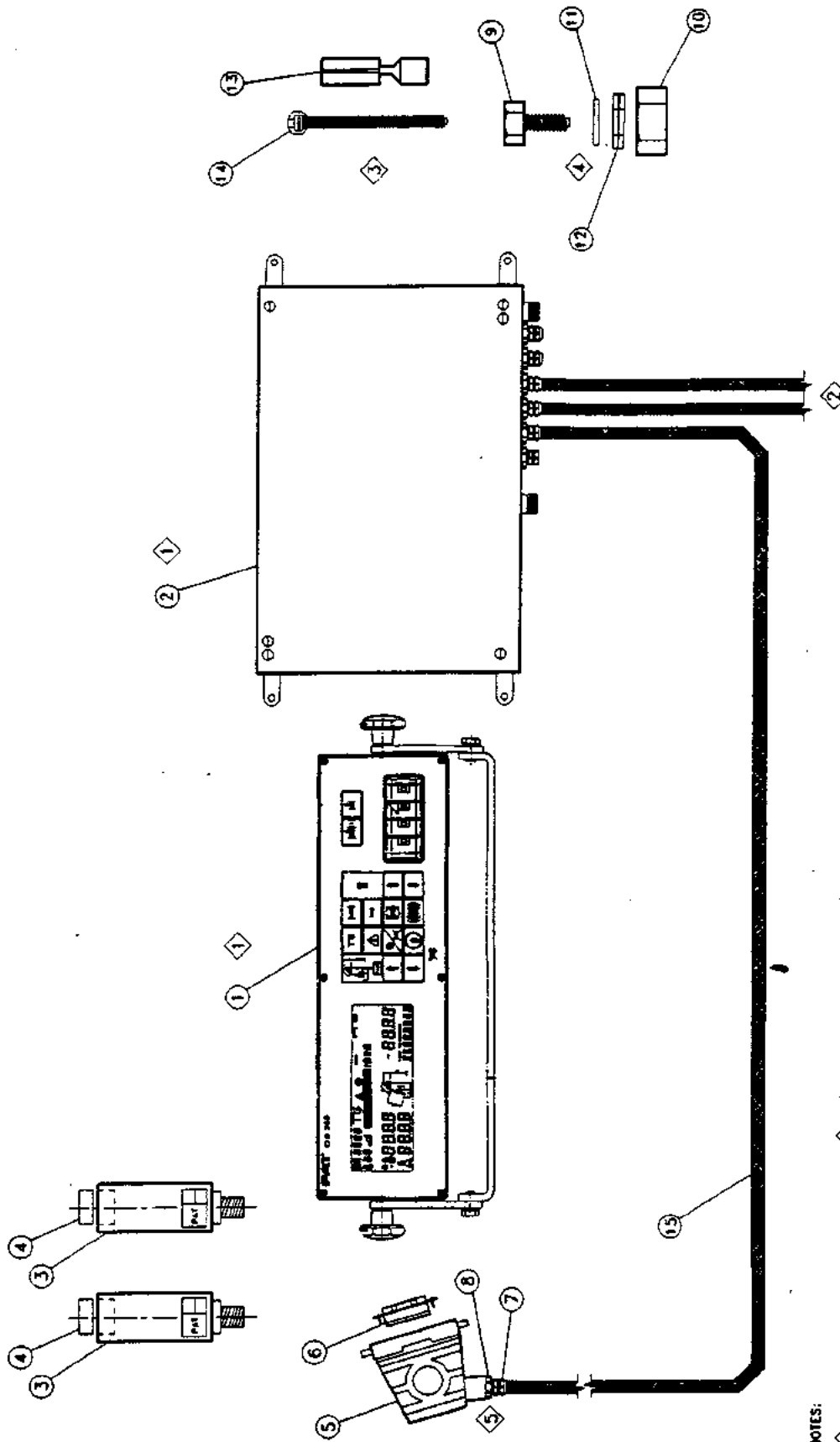
SLIP RING ASSEMBLY - 2 COND.

GROVE

NO.	PART NO.	QTY DESCRIPTION	NO.	PART NO.	QTY DESCRIPTION
	9-333-102418	COMPLETE ASSY			
1	9-333-102731	1 SLIPRING, 2-COND			
2	9-333-102732	1 GEAR W/ PLATE, 2-COND			
3	9-333-102733	1 CONTACT BRUSH ASS'Y - 2 COND.			



NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
	3-486-0-00474		COMPLETE ASSY				
1	9-333-101471	2	FITTING, BULKHEAD ADAPTER 9/16-18 JIC				
2	7-445-060446	1	ELBOW, 45 DEGREE 7155904002 O-RING .351" ID				
3	7-888-000147	1	TEE				
4	7-445-120639	1	ADAPTER, REDUCING				
5	7-445-121242	1	NUT, SHORT				
6	7-550-207220	1	HOSE ASSY 3/8" X 12"				
7	7-550-206020	1	HOSE ASSY 3/8" X 60"				
8	9-333-101830	2	CABLE, ANGLE TRANSDUCER				

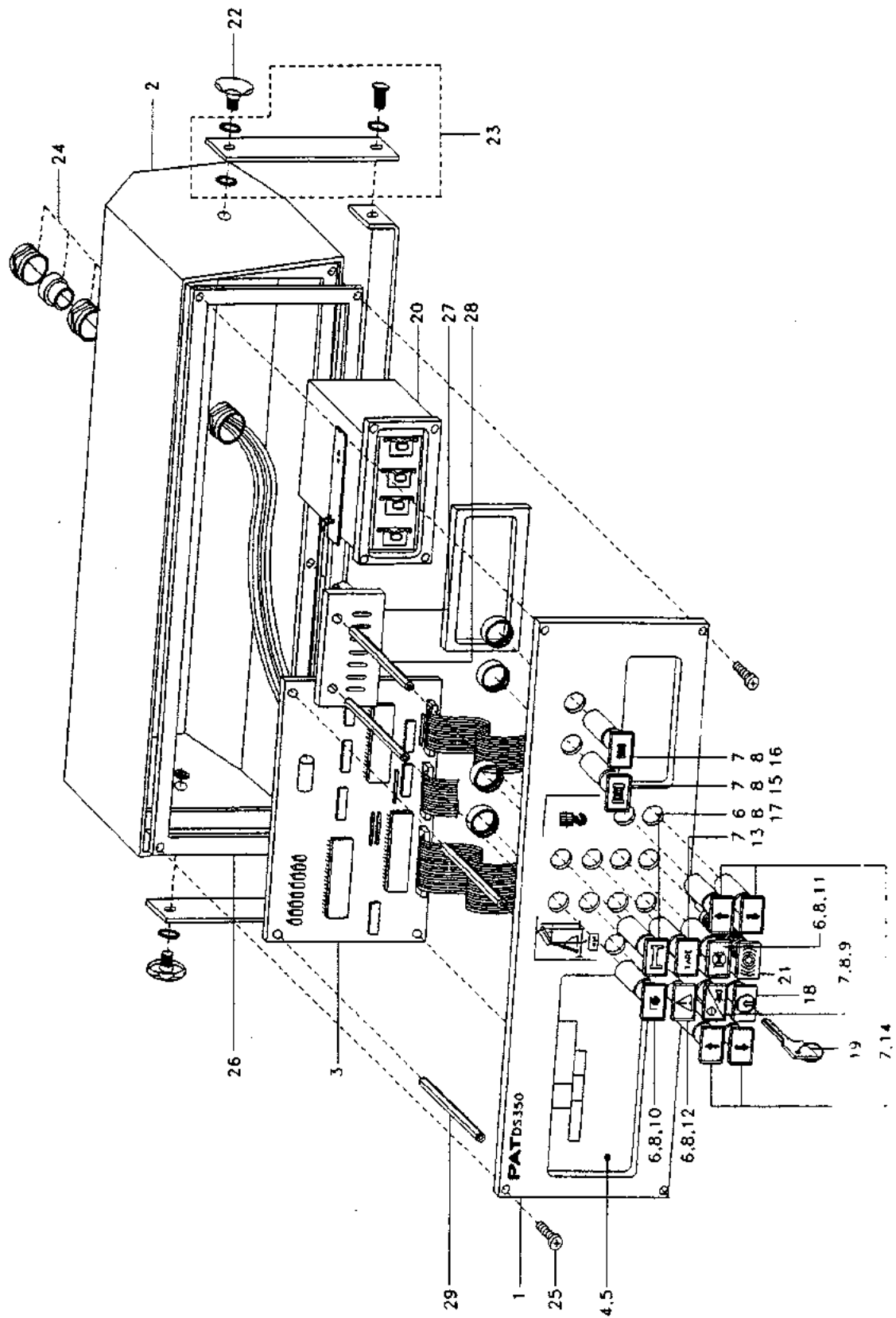


**NOTES:**

- ① SEE PART BREAKDOWN DWG. FOR PARTS DETAIL.
- ② REFER TO LMI MOUNTING KIT.
- ③ ACCESSORIES USED FOR WIRING IN CENTRAL UNIT AND INTERFACE TO GROVE HARNESS.
- ④ MOUNTING HARDWARE FOR CENTRAL UNIT AND CONSOLE.
- ⑤ ADD DIELECTRIC LUBRICANT (e.g. NYOGEL 7596) TO INSIDE OF RECEPTACLES, PLUGS, AND ELECTRICAL CONNECTORS, TO IMPROVE PROTECTION AGAINST CORROSION AND MALFUNCTION DUE TO CONDENSATION.
  - A. CLEAN ELECTRICAL CONTACTS AND CONNECTORS OF ALL FOREIGN MATERIAL SUCH AS GREASE, OIL, AND DIRT BEFORE APPLYING LUBRICANT.
  - B. APPLY A GENEROUS AMOUNT OF LUBRICANT ON THE ELECTRICAL CONTACTS AND CONNECTORS BEFORE MOUNTING.
  - C. AFTER MATING CONTACTS AND CONNECTORS, CLEAN OFF THE EXCESS SQUEEZED OUT.

NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
	3-486-0-00465		COMPLETE ASSY				
1 +	9-333-102377	1	CONSOLE ASSEMBLY - DS350G W/ REG DISPLAY				
2 +	9-333-102943	1	CENTRAL UNIT, 120 (CE)				
3	9-333-101469	2	TRANSDUCER, PRESSURE				
4	9-333-101472	2	SEAL, CUTTING				
5	9-333-101438	1	PLUG - 10 PIN				
6	9-333-101439	1	INSERT, FEMALE - 10 PIN				
7	9-333-101440	1	STRAIN RELIEF RED INSERT - PG13.5				
8	9-333-101424	1	REDUCER PG16-13.5				
9	7-112-140850	6	CAP SCREW 1/4"-20 NC X 1" - GRD 2				
10	7-660-140000	6	NUT, HEX 1/4" - 20 NC GRD 1				
11	7-950-140141	6	WASHER 1/4" I. D.				
12	7-950-140050	6	LOCKWASHER 1/4" I. D.				
13	9-333-102376	35	CONNECTOR, FEMALE				
14	7-950-000102	10	WRAP, TIE				
15	9-333-102851	1	CABLE, 7 X 0.5 D. S. (1000' REEL) CUT TO 10' LENGTH				

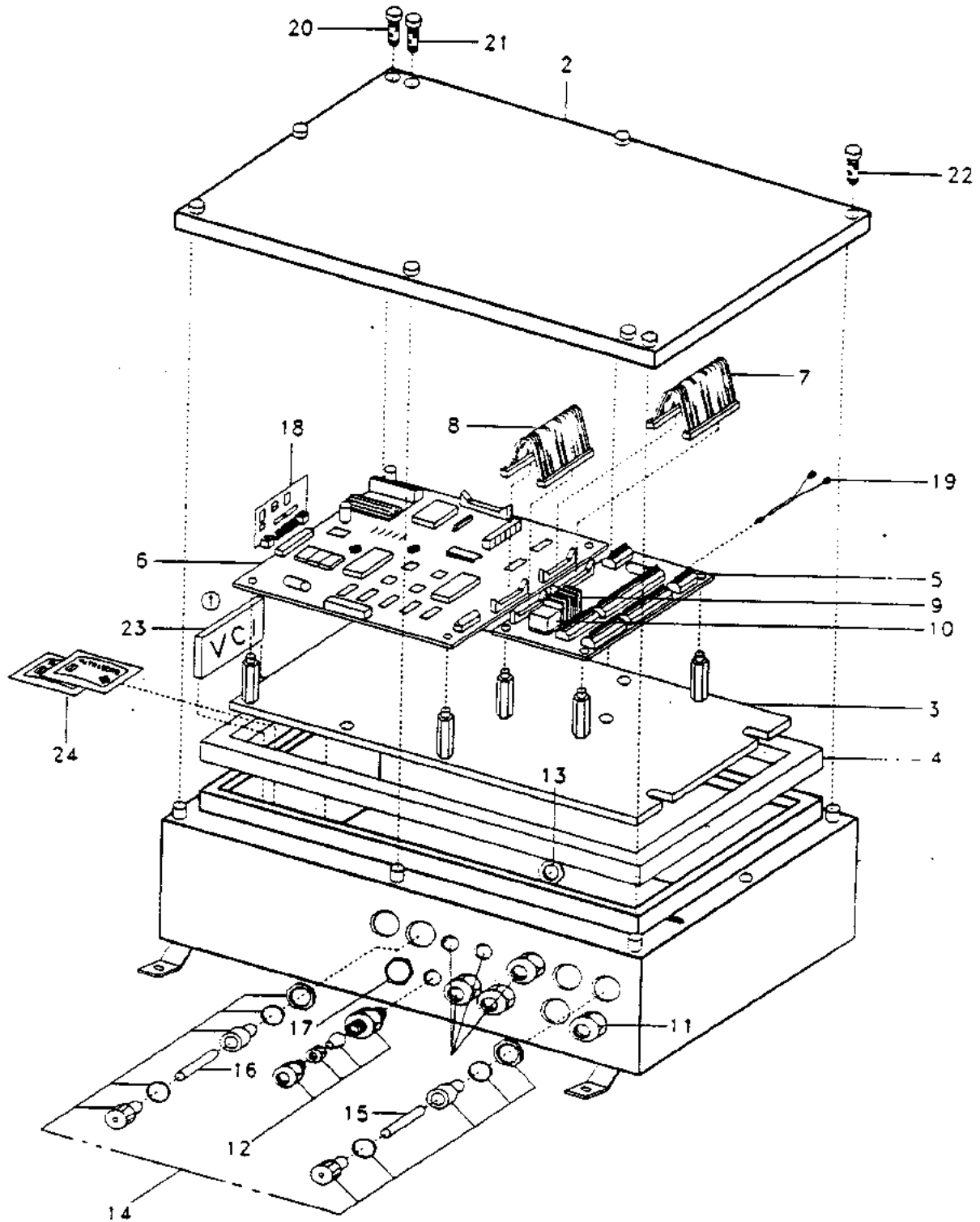
+ SEE FURTHER BREAKDOWN THIS GROUP



# CONSOLE ASSEMBLY - DS350G W/ AEG DISPLAY

GROVE

NO.	PART NO.	QTY DESCRIPTION	NO.	PART NO.	QTY DESCRIPTION
	9-333-102377	COMPLETE ASSY			
2	9-333-101670	1 SEAL, PANEL			
3	9-333-101671	1 HOUSING			
4	9-333-102771	1 PROCESSOR BOARD, DATA DISPLAY (AEG)			
7	9-333-101946	1 SWITCH			
8	9-333-101674	1 BUZZER			
9	9-333-101675	1 SWITCH, KEY			
10	9-333-101676	1 CAP, RED			
15	9-333-101681	1 CAP, RED			
16	9-333-101682	1 CAP, YELLOW			
20	9-333-101683	12 BULB			
21	9-333-101686	2 MOUNTING SET			
22	9-333-101579	1 STRAIN RELIEF PG13.5			
23	9-333-101689	1 KIT, SCREW			
24	9-333-101691	1 KEY, CONSOLE			
25	9-333-101684	4 SOCKET, LIGHT			
26	9-333-101685	8 SWITCH			



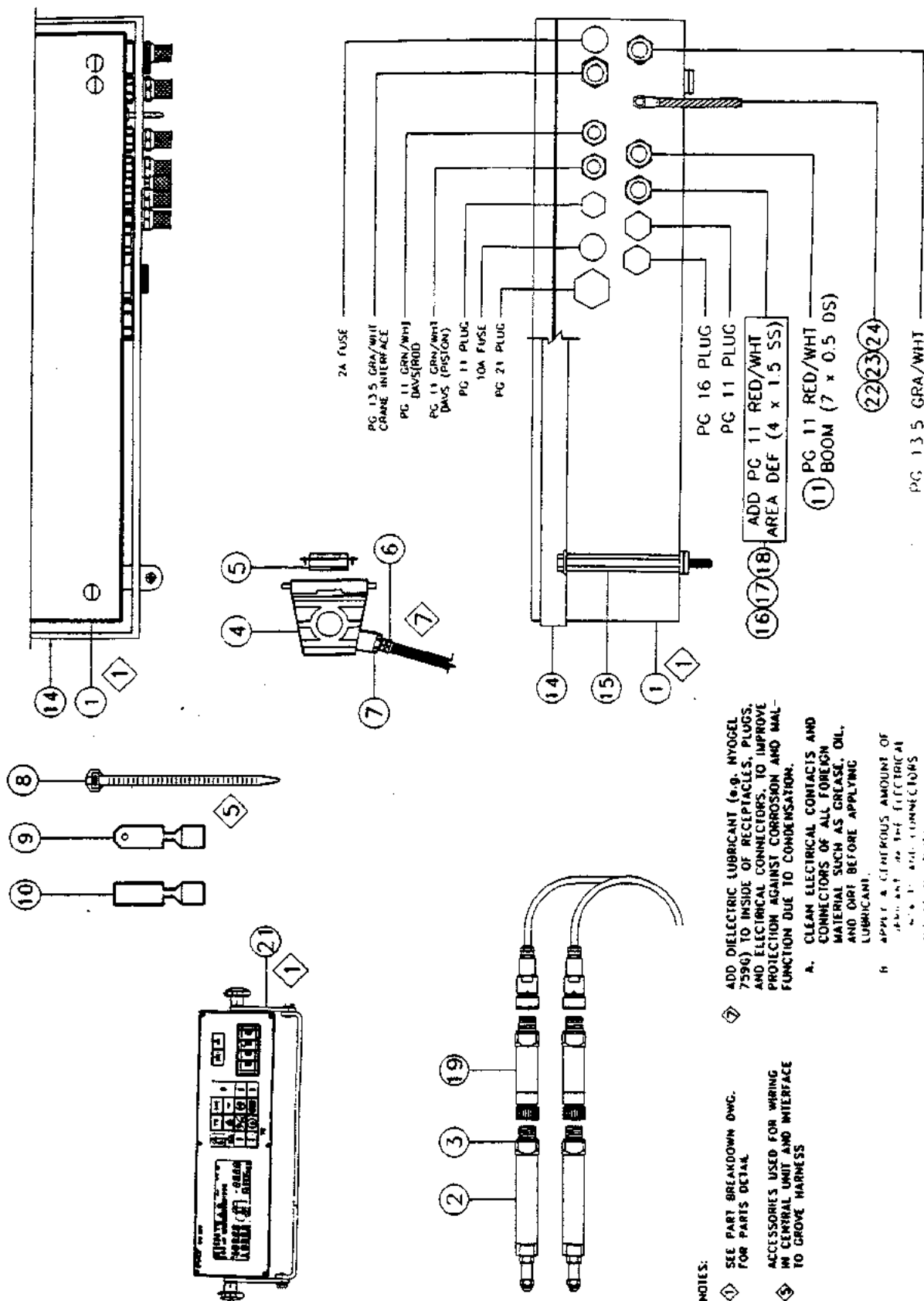
NOTE:

- ① PEEL OFF PROTECTIVE PAPER FROM SELFADHESIVE BACK OF DEVICE. ADHERE TO INSIDE WALL OF ENCLOSURE.

CENTRAL UNIT (CE)

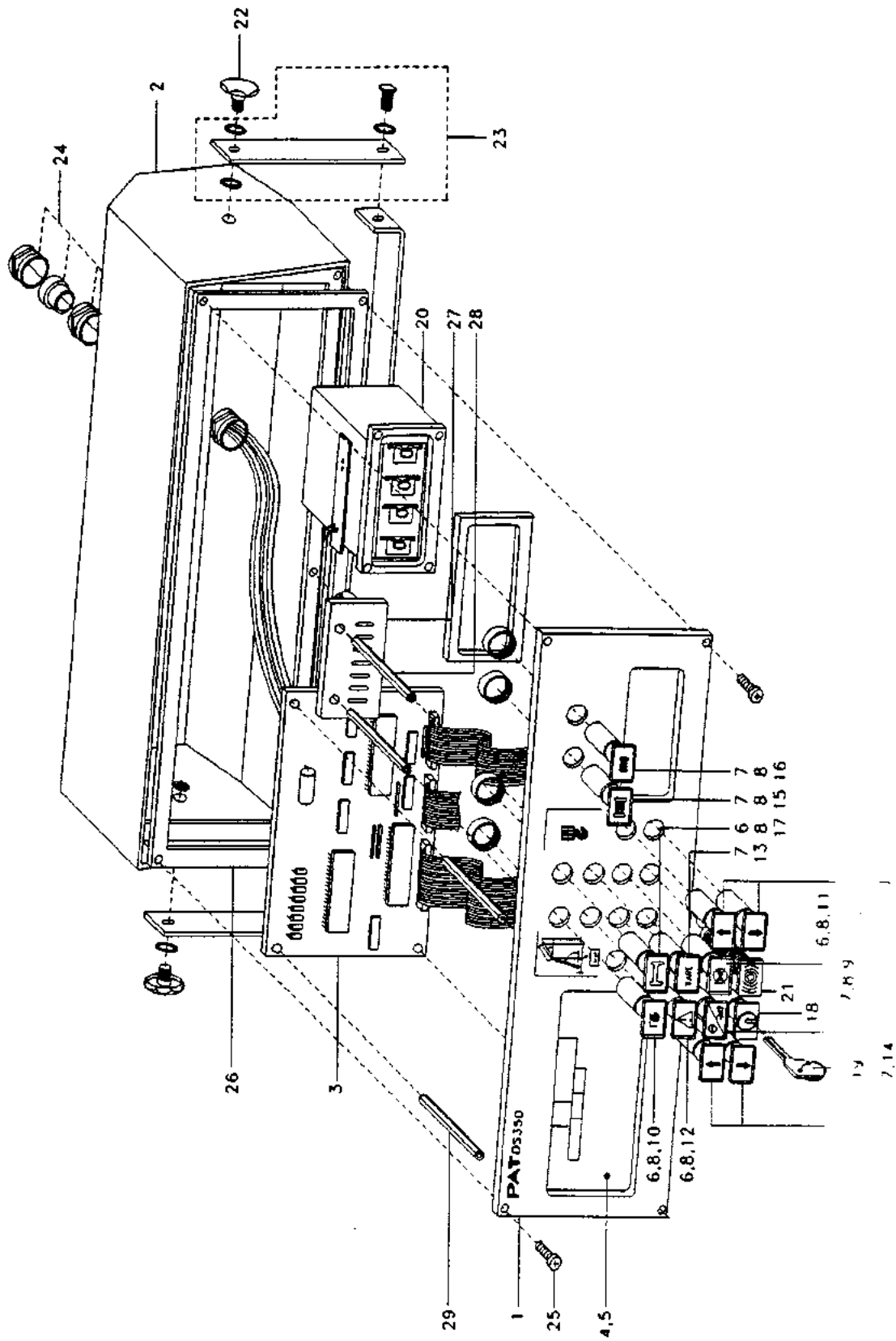


NO.	PART NO.	QTY DESCRIPTION	NO.	PART NO.	QTY DESCRIPTION
	9-333-102943	COMPLETE ASSY			
1	9-333-101662	1 HOUSING			
2	9-333-101589	1 COVER			
3	9-333-101590	1 PLATE			
4	9-333-101591	1 SEAL, COVER			
5	9-333-101663	1 BOARD, TERMINAL			
6	9-333-101593	1 BOARD, MAIN			
7	9-333-101594	1 CABLE, CONNECTING 26 CORE			
8	9-333-101595	1 CABLE, CONNECTING 40 CORE			
9	9-333-101596	2 RELAY			
10	9-333-101597	1 RELAY, SHUT-OFF			
11	9-333-101579	1 STRAIN RELIEF PG13.5			
12	9-333-101599	5 STRAIN RELIEF GREEN INSERT - PG11			
13	9-333-101729	1 LOCKNUT			
14	9-333-101666	2 HOLDER, FUSE			
15	9-333-101667	1 FUSE, AMP 2			
16	7-482-000019	1 FUSE, 10 AMP			
17	9-333-101443	1 PLUG, HOLE			
18	9-333-102023	1 TIMER, MODULE			
19	9-333-102643	1 DIODE ASSY			
20	9-333-102380	2 SCREW #5 X 30 W/HOLE			
21	9-333-102381	2 SCREW #5 X 10 W/HOLE			
22	9-333-102379	6 SCREW #5 X 30 W/O HOLE			
23	7-296-000004	1 INHIBITOR, CORROSION - VAPOR CONTROL			
24	9-333-101918	2 DESSICANT PACK, MOISTURE ABSORBING			

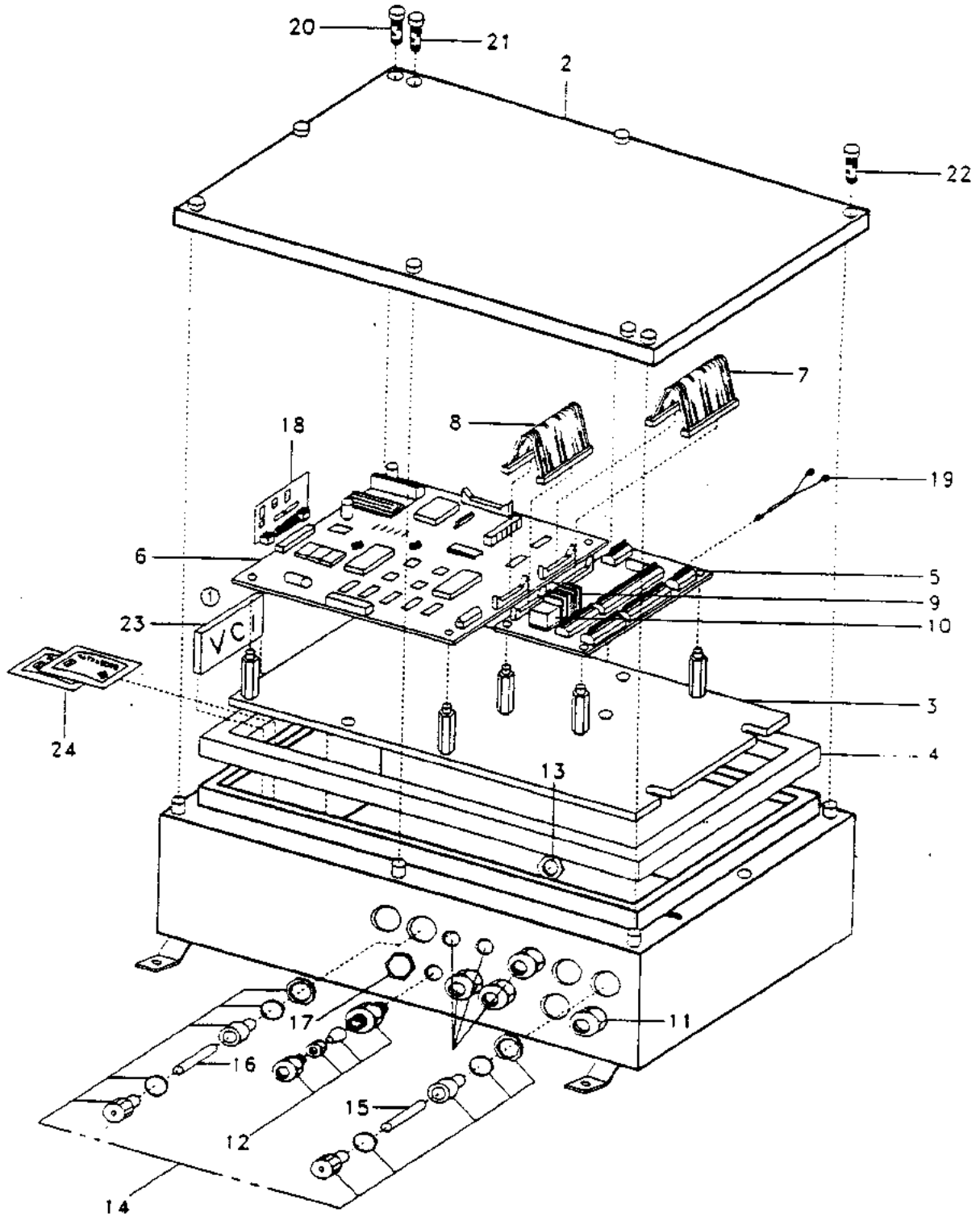


NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
	3-486-0-00534		COMPLETE ASSY				
1 +	9-333-103121	1	CENTRAL UNIT - DS350G, 12U (CE 30M/U ENC)				
2	9-333-101469	2	TRANSDUCER, PRESSURE				
3	9-333-101472	2	SEAL, CUTTING				
4	9-333-101438	1	PLUG - 10 PIN				
5	9-333-101439	1	INSERT, FEMALE - 10 PIN				
6	9-333-101440	1	STRAIN RELIEF RED INSERT - PG13.5				
7	9-333-101424	1	REDUCER PG16-13.5				
8	7-850-000805	10	TIE, CABLE (BLACK) 13 3/8" LONG				
10	9-333-101765	1	FASTON, FEMALE				
11	9-333-102851	1	CABLE, 7 X 0.5 D.S. (1000' REEL) CUT TO 10' LENGTH				
14	9-333-102576	1	FRAME				
15	9-333-102628	4	STANDOFF				
16	9-333-102746	1	STRAIN RELIEF, PG13.5				
17	9-333-101462	1	REDUCER PG13.5-11				
18	9-333-103315	1	FERRITE FILTER				
19	9-333-103124	2	FILTER PLUG				
21 +	9-333-103122	1	CONSOLE - REG LCD, 12U (CE 30M/U ENC)				
22	7-660-140000	7	NUT, HEX 1/4" - 20 NC GRD 1				
23	9-333-103275	1	CABLE ASSY, GROUND STRAP 12" LENGTH W/ 1/4" RING TERMINAL				
24	9-333-103191	1	WASHER, 1/4 TOOTHED				

+ SEE FURTHER BREAKDOWN THIS GROUP



NO.	PART NO.	QTY DESCRIPTION	NO.	PART NO.	QTY DESCRIPTION
	9-333-103122	COMPLETE ASSY			
1		1 P/N UNAVAIL. AT THIS TIME			
2		1 P/N UNAVAIL. AT THIS TIME			
3	9-333-102771	1 PROCESSOR BOARD, DATA DISPLAY (AEG)			
4		1 P/N UNAVAIL. AT THIS TIME			
5	9-333-102162	1 ILLUMINATION SET			
6	9-333-102069	4 HOLDER, LAMP			
7	9-333-102068	8 BUTTON, PUSH			
8		7 P/N UNAVAIL. AT THIS TIME			
9	9-333-102070	1 CAP			
10	9-333-101682	1 CAP, YELLOW			
11	9-333-102784	1 LENS, RED BY-PASS WARNING			
12	9-333-101682	1 CAP, YELLOW			
13	9-333-102127	1 CAP, YELLOW			
14		4 P/N UNAVAIL. AT THIS TIME			
15		1 P/N UNAVAIL. AT THIS TIME			
16		1 P/N UNAVAIL. AT THIS TIME			
17	9-333-102334	1 CAP			
18		1 P/N UNAVAIL. AT THIS TIME			
19	9-333-101691	1 KEY, CONSOLE			
20		1 P/N UNAVAIL. AT THIS TIME			
21	9-333-102125	1 BUZZER			
22	9-333-101990	2 GRIP			
23		1 P/N UNAVAIL. AT THIS TIME			
24	9-333-102747	1 STRAIN RELIEF, PG13.5			
25	9-333-101689	1 NUT, SCREW			
26		1 P/N UNAVAIL. AT THIS TIME			
27		1 P/N UNAVAIL. AT THIS TIME			
28		2 P/N UNAVAIL. AT THIS TIME			
29		4 P/N UNAVAIL. AT THIS TIME			



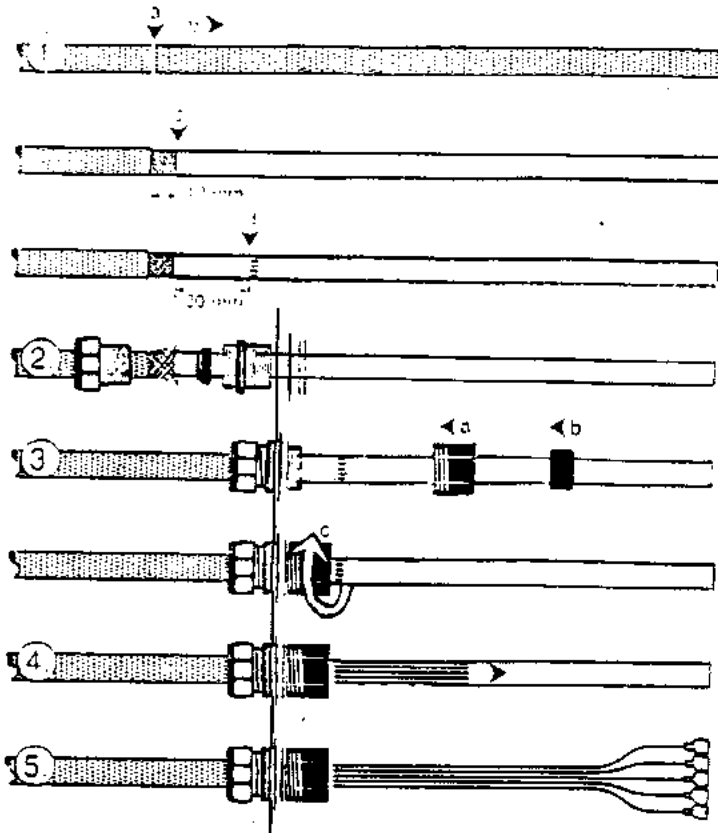
NOTE:

- ① PEEL OFF PROTECTIVE PAPER FROM SELFADHESIVE BACK OF DEVICE. ADHERE TO INSIDE WALL OF ENCLOSURE.

CENTRAL UNIT, (CE)

NO.	PART NO.	QTY DESCRIPTION	NO.	PART NO.	QTY DESCRIPTION
	9-333-103121	COMPLETE ASSY			
1	9-333-101662	1 HOUSING			
2	9-333-101589	1 COVER			
3	9-333-101590	1 PLATE			
4	9-333-101591	1 SEAL, COVER			
5	9-333-101663	1 BOARD, TERMINAL			
6	9-333-101593	1 BOARD, MAIN			
7	9-333-101594	1 CABLE, CONNECTING 26 CORE			
8	9-333-101595	1 CABLE, CONNECTING 40 CORE			
9	9-333-101596	2 RELAY			
10	9-333-101597	1 RELAY, SHUT-OFF			
11	9-333-101579	1 STRAIN RELIEF PG13.5			
12	9-333-101599	5 STRAIN RELIEF GREEN INSERT - PG11			
13	9-333-101729	1 LOCKNUT			
14	9-333-101666	2 HOLDER, FUSE			
15	9-333-101667	1 FUSE, AMP 2			
16	7-482-000019	1 FUSE, 10 AMP			
17	9-333-101443	1 PLUG, HOLE			
18	9-333-102023	1 TIMER, MODULE			
19	9-333-102643	1 DIODE ASSY			
20	9-333-102380	2 SCREW #5 X 30 W/HOLE			
21	9-333-102381	2 SCREW #5 X 10 W/HOLE			
22	9-333-102379	6 SCREW #5 X 30 W/O HOLE			
23	7-296-000004	1 INHIBITOR, CORROSION - VAPOR CONTROL			
24	9-333-101918	2 DESSICANT PACH, MOISTURE ABSORBING			

# INSTRUCTIONS FOR MOUNTING SINGLE SHIELDED CABLE



- ① CUT (a) AND (b) REMOVE OUTER COVERING OF CABLE.

CUT (c) AND REMOVE OUTER SHIELD OF CABLE, LEAVING 10mm OF THE OUTER SHIELD EXPOSED.

MARK INNER INSULATION COVERING 30mm FROM END OF OUTER SHIELD.

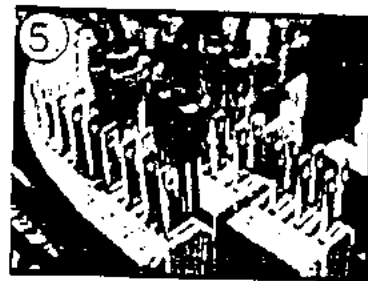
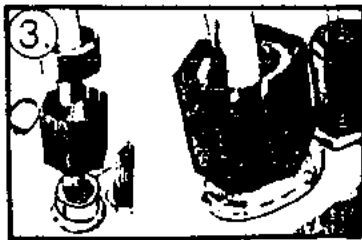
- ② PLACE APPROPRIATE STRAIN RELIEF, NUT, AND INSERT ON CABLE AND INSERT CABLE THROUGH PROPER CENTRAL UNIT OPENING.

- ③ FASTEN STRAIN RELIEF, NUT, AND INSERT TO CENTRAL UNIT HOUSING AND ADD FERRITE FILTER AS SHOWN IN (FIG 3). (<a) (<b)

FASTEN FERRITE FILTER TO STRAIN RELIEF THREAD. (c)

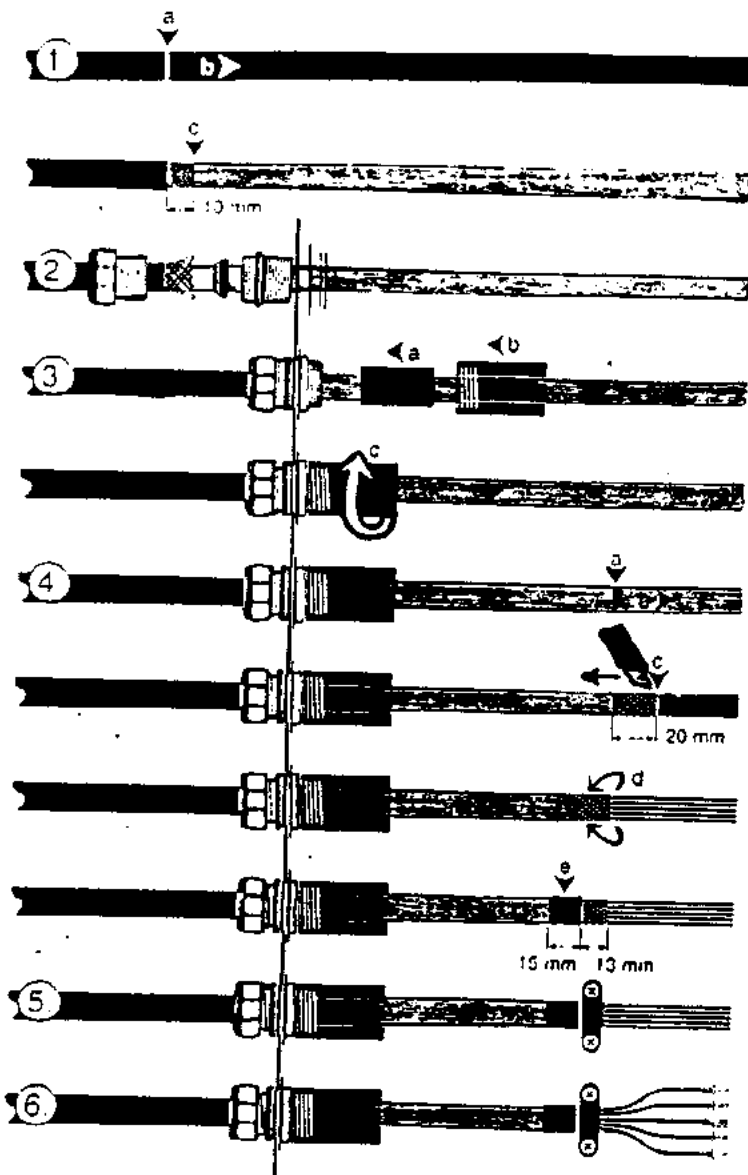
- ④ CUT AND REMOVE INNER INSULATION COVERING OF CABLE WHERE PREVIOUSLY MARKED.

- ⑤ ADD FEMALE WIRE CONNECTORS TO WIRE ENDS AND CONNECT TO TERMINALS.





# INSTRUCTIONS FOR MOUNTING DOUBLE SHIELDED CABLE



- ① CUT (a) AND (b) REMOVE OUTER COVERING OF CABLE.

CUT (c) AND REMOVE OUTER SHIELD OF CABLE, LEAVING 10mm OF THE OUTER SHIELD EXPOSED.

- ② PLACE APPROPRIATE STRAIN RELIEF, NUT, AND INSERT ON CABLE AND INSERT CABLE THROUGH PROPER CENTRAL UNIT OPENING.

- ③ FASTEN STRAIN RELIEF, NUT, AND INSERT TO CENTRAL UNIT HOUSING AND ADD FERRITE FILTER AS SHOWN IN (FIG 3) (<a) (<b)

SCREW FERRITE FILTER TO STRAIN RELIEF THREAD. (c)

- ④ CUT (a) AND REMOVE (b) INNER INSULATION COVERING OF CABLE.

CUT (c) AND REMOVE INNER SHIELD OF CABLE LEAVING 20mm OF INNER SHIELD EXPOSED.

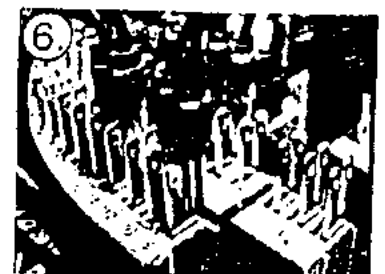
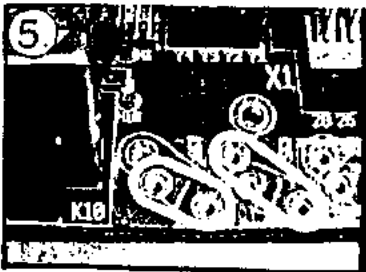
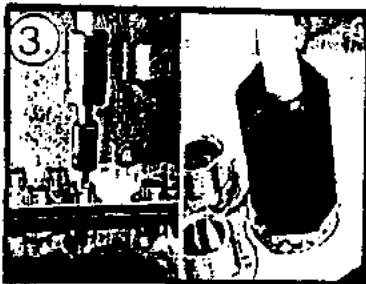
CUT INNER SHIELD ON BOTH SIDES OF CABLE (180° APART).

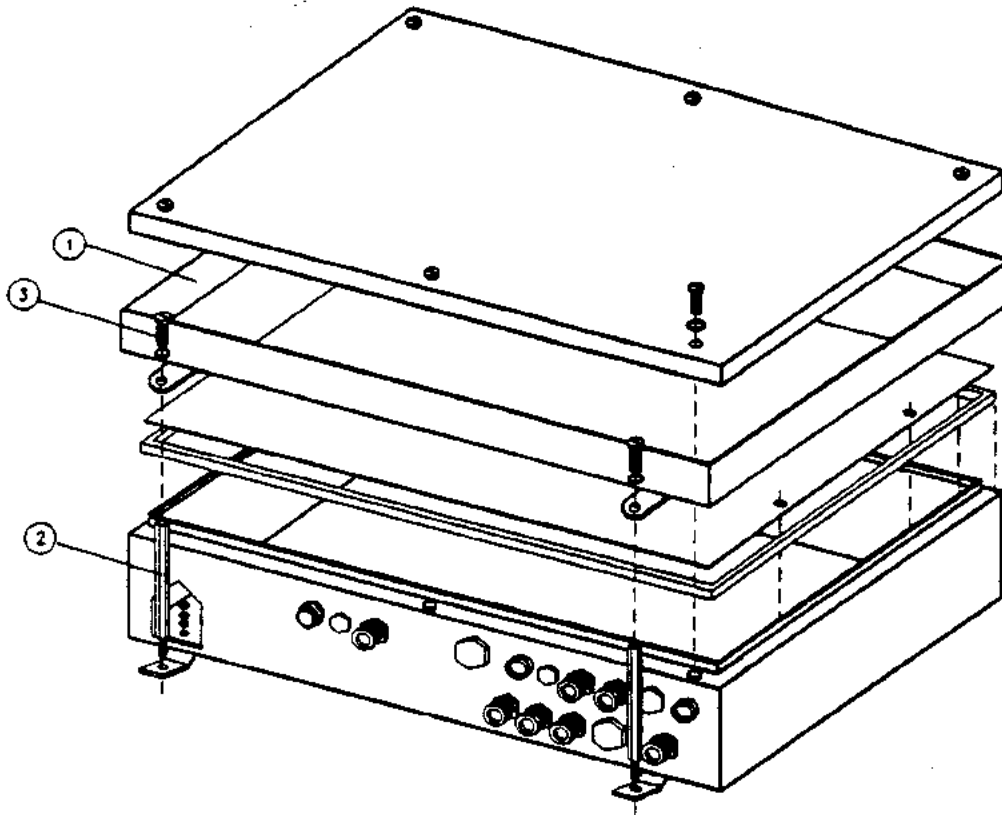
FOLD BACK INNER SHIELD OVER THE INNER INSULATION COVERING AS SHOWN. (d)

HEAT SHRINK TUBING TO COVER RAW EDGE OF INNER SHIELD AS SHOWN. (e)

- ⑤ SECURE INNER SHIELD TO GROUND CLAMP ON TERMINAL BOARD.

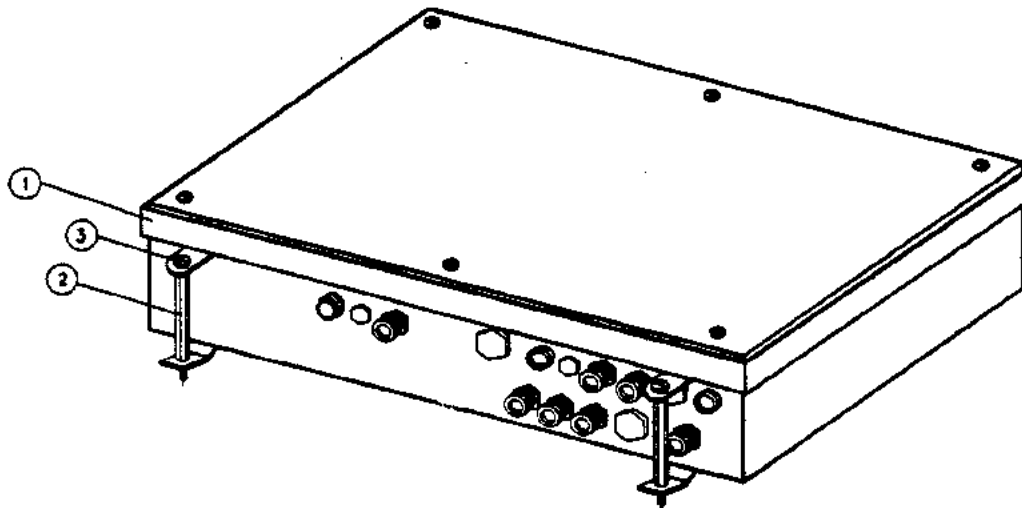
- ⑥ ADD FEMALE WIRE CONNECTORS TO WIRE ENDS AND CONNECT TO TERMINALS.

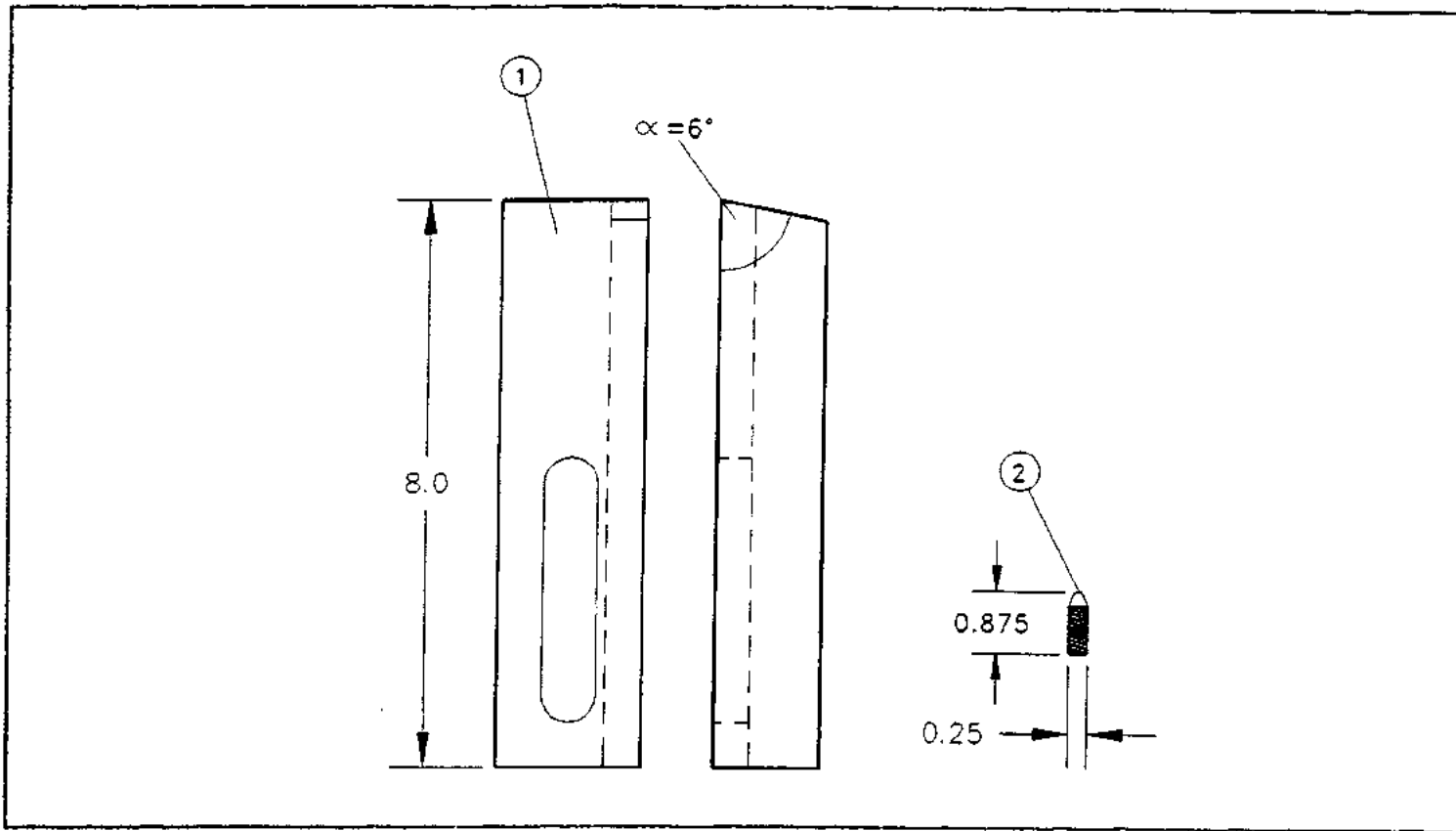




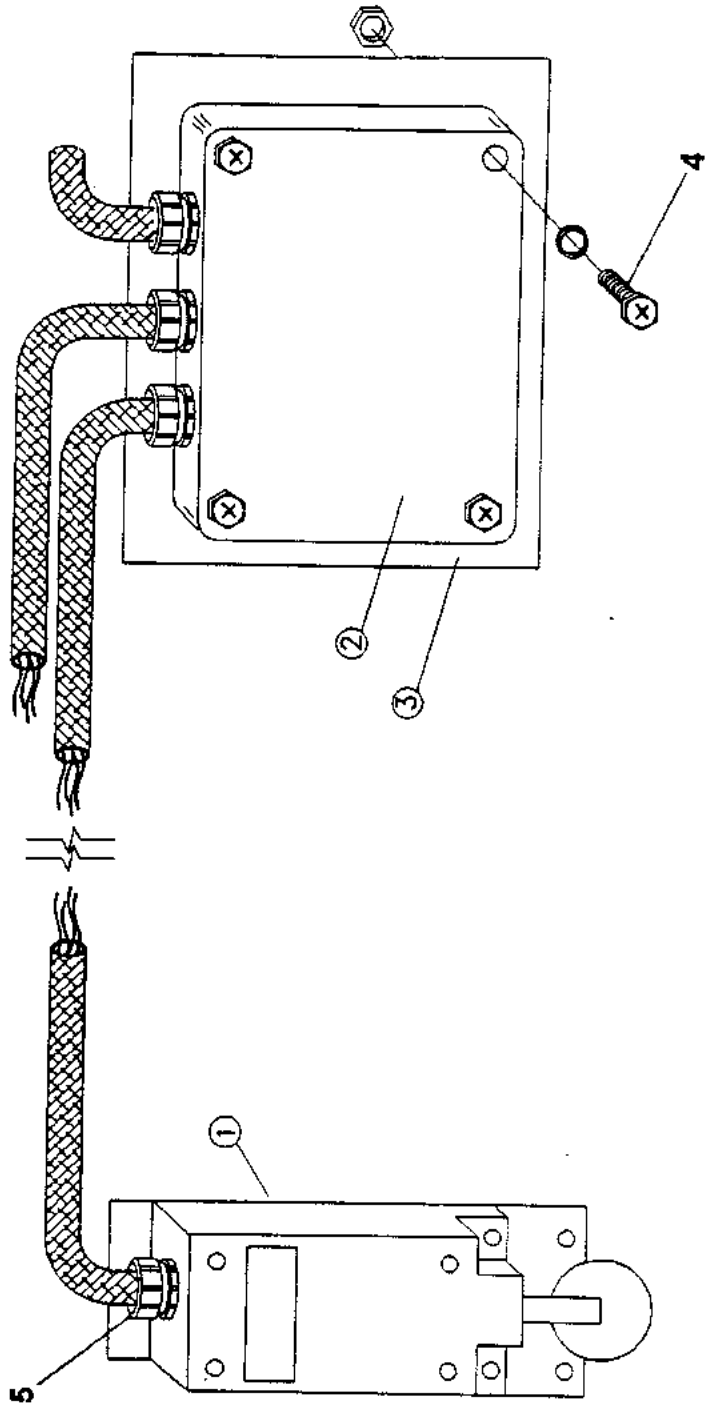
## WATER DEFLECTION FRAME INSTALLATION

1. REMOVE EXISTING MOUNTING HARDWARE SCREWS (3) AND REPLACE THEM WITH THE REQUIRED STAND-OFFS (2) TO FIT YOUR APPLICATION.
2. PLACE THE WATER DEFLECTION FRAME (1) ATOP THE STAND-OFFS AND SECURE THE FRAME WITH THE MOUNTING SCREWS (3) REMOVED PREVIOUSLY.
3. ENSURE THAT THE WATER DEFLECTION FRAME (1) SURROUNDS THE SEAL WHERE THE CENTRAL UNIT COVER MEETS THE HOUSING.



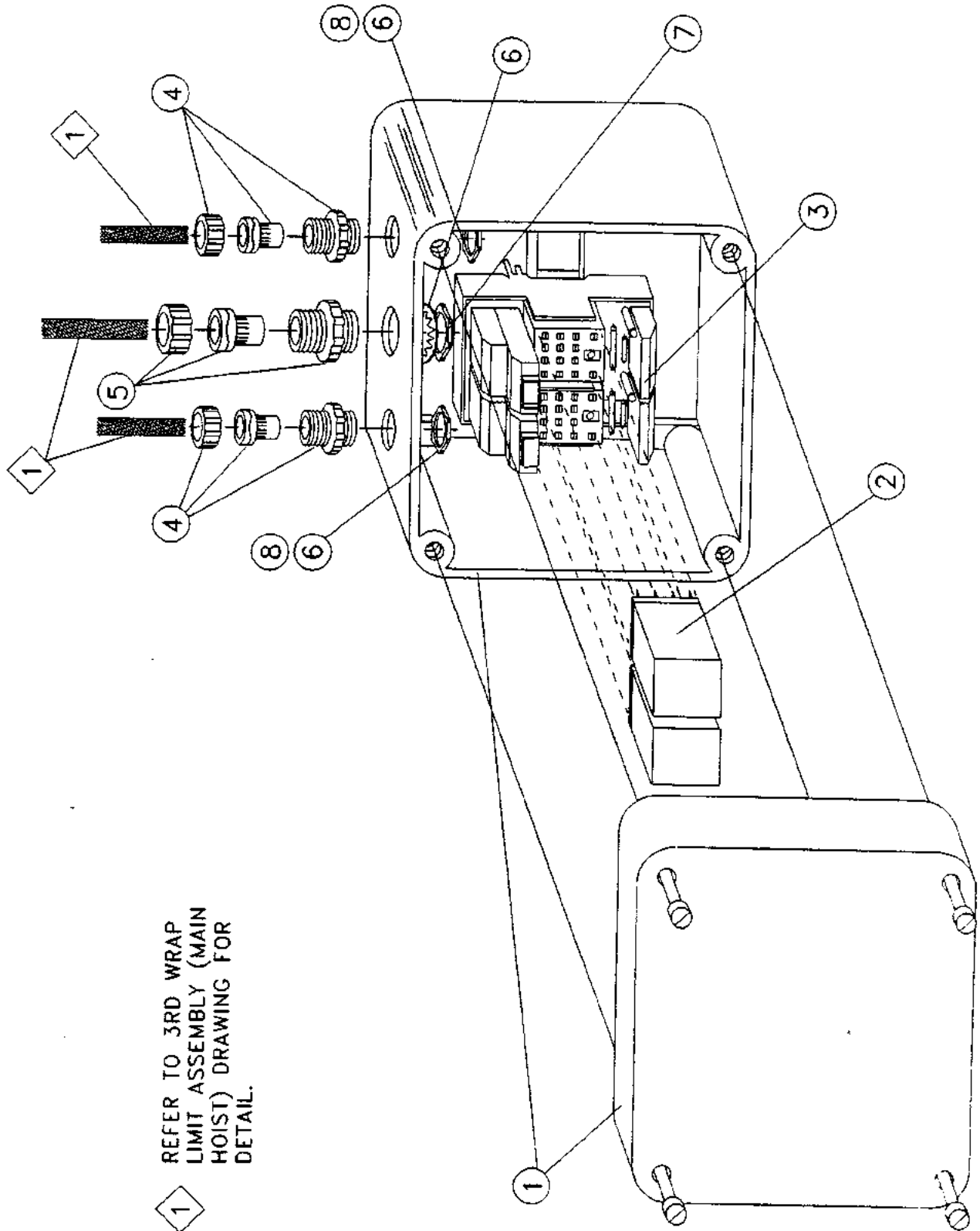


NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
1	9-333-101532	1	BRACKET, STANDOFF 6 DEG				
2	7-866-142140	5	STUD 1/4"-20 X 7/8"				



NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
	3-486-0-00458		COMPLETE ASSY				
1	9-486-990238	1	SWITCH				
2 +	9-333-102925	1	MWD CONTROL UNIT ASSEMBLY, 12V. AP308				
3	9-333-102729	1	PLATE, MNTG. - MWD100				
4	9-333-102586	4	SCREW				
5	9-333-101995	1	STRAIN RELIEF BLACK INSERT - PC9				

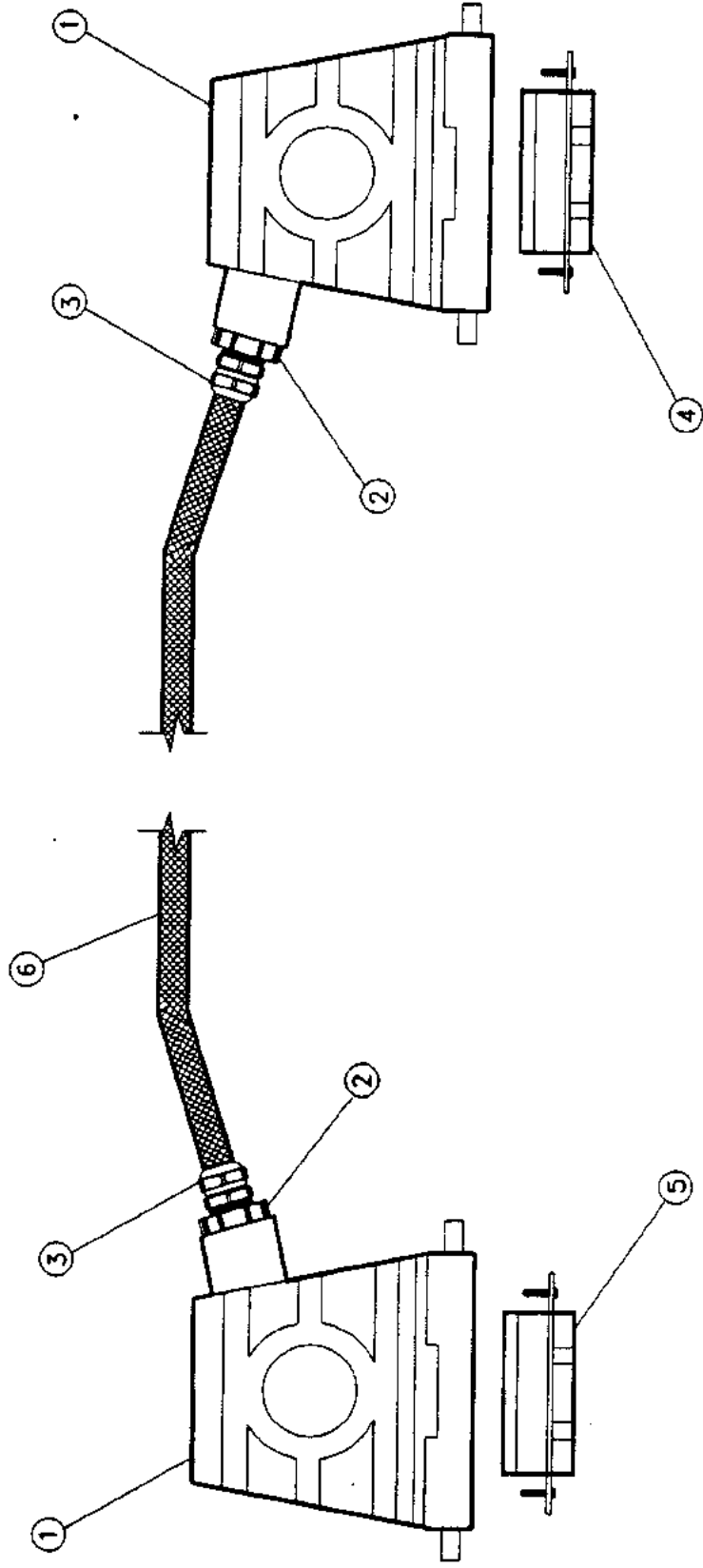
+ SEE FURTHER BREAKDOWN THIS GROUP



REFER TO 3RD WRAP  
LIMIT ASSEMBLY (MAIN  
HOIST) DRAWING FOR  
DETAIL.



NO.	PART NO.	QTY DESCRIPTION	NO.	PART NO.	QTY DESCRIPTION
	9-333-102925	COMPLETE ASSY			
1	9-333-102345	1 HOUSING			
2	9-333-102346	2 RELAY			
3	9-333-102347	2 RELAY, MODULE			
4	9-333-101995	2 STRAIN RELIEF BLACK INSERT - PG9			
5	9-333-101440	1 STRAIN RELIEF RED INSERT - PG13.5			
6	9-333-101560	3 LOCKWASHER - M12			
7	9-333-101547	1 LOCKNUT PG 13.5			
8	9-333-101984	2 LOCKNUT PG9			

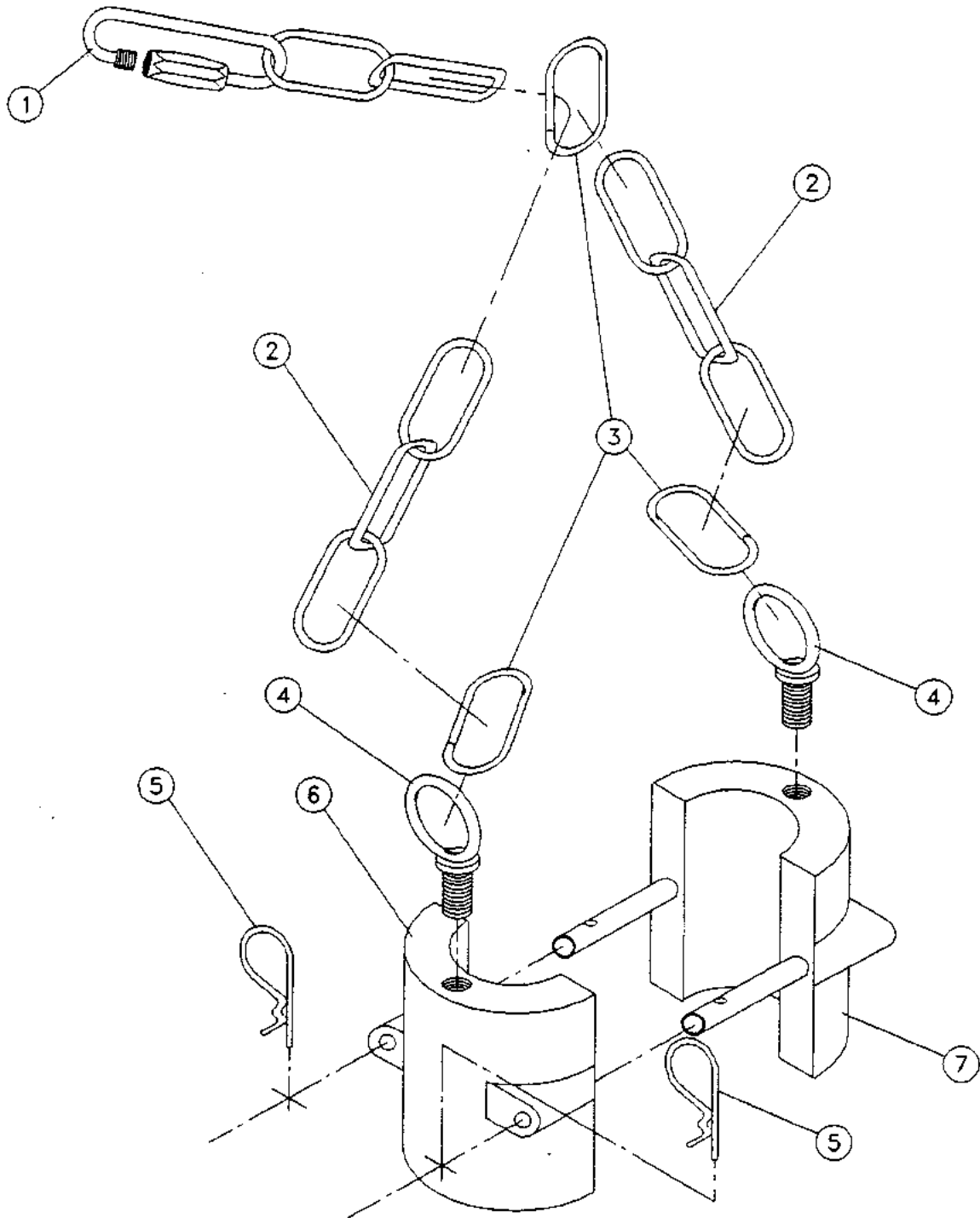




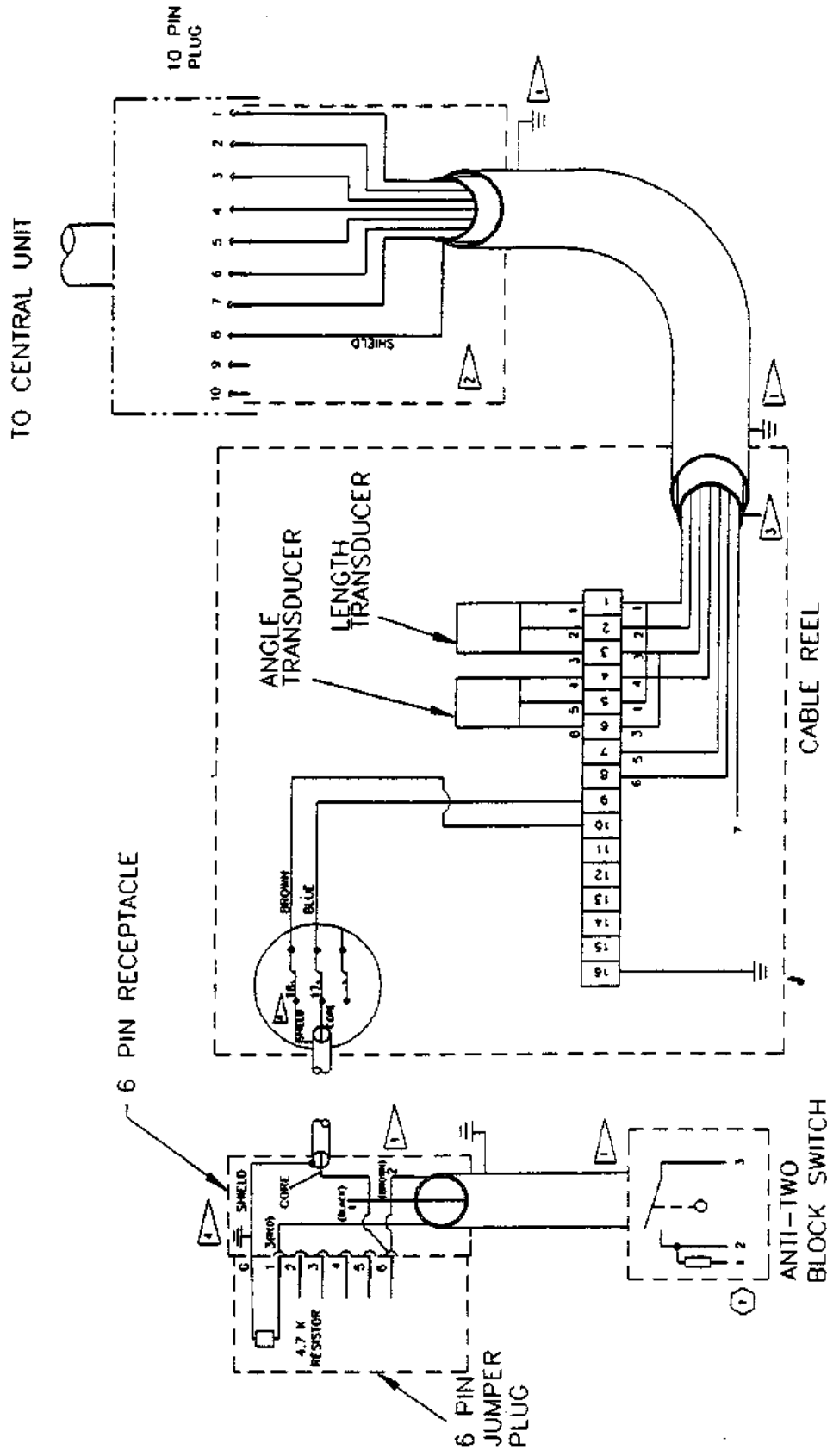
# JUMPER CABLE ASSEMBLY

# GROVE

NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
1	9-333-101461	2	PLUG - 6 PIN				
2	9-333-102058	2	REDUCER				
3	9-333-101995	2	STRAIN RELIEF BLACK INSERT - PG9				
4	9-333-101459	1	INSERT, MALE - 6 PIN				
5	9-333-101426	1	INSERT, FEMALE - 6 PIN				
6	9-333-102396	1	CABLE				

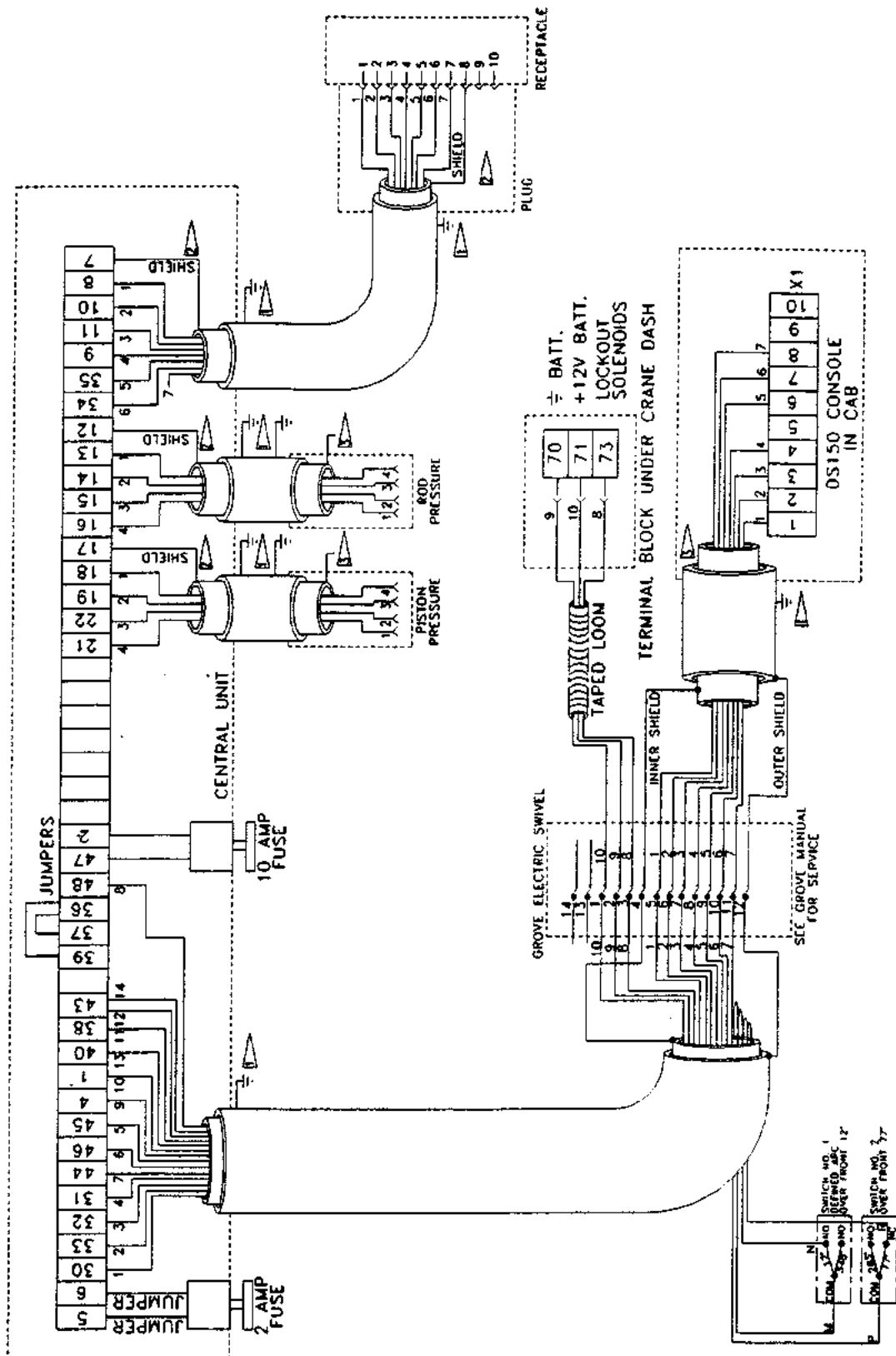


NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
	3-486-0-00212		COMPLETE ASSY				
1	9-333-101840	1	CLEVIS				
2	9-333-101921	1	CHAIN ASSY				
3	9-333-101922	3	CLAMP, CHAIN				
4	9-333-101923	2	EYEBOLT				
5	9-333-101916	2	PIN, COTTER				
6	9-333-101924	1	WEIGHT, FEMALE				
7	9-333-101925	1	WEIGHT, MALE				



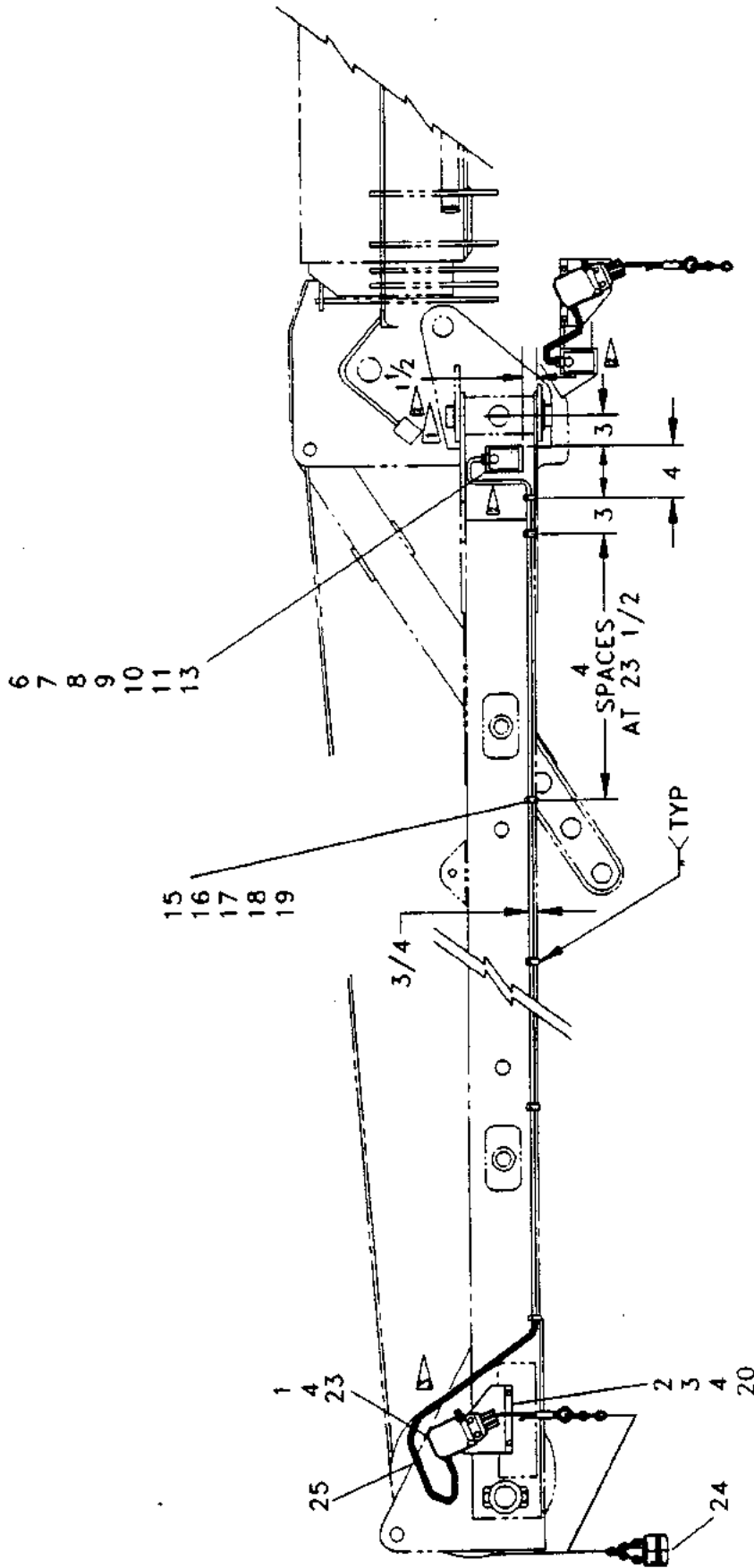
ELECTRICAL DIAGRAM  
BOOM

- NOTES:
- △ OUTER SHIELD GROUNDED AT STRAIN RELIEF CONNECTOR
  - △ INNER SHIELD INSULATED AND CONNECTED AS SHOWN
  - △ INNER SHIELD CUT OFF AND TAPED
  - △ OUTER SHIELD INSULATED AND CONNECTED AS SHOWN
  - ⊙ SWITCH PREWIRED AND POTTED



- ⊞ OUTER SHIELD GROUNDED AT STRAIN RELIEF CONNECTOR
- ⊞ INSULATED WIRE SOLDERED TO INNER SHIELD AND CONNECTED AS SHOWN.
- ⊞ INNER SHIELD CUT OFF AND TAPED.

ELECTRICAL DIAGRAM - LOWER



NOTES:

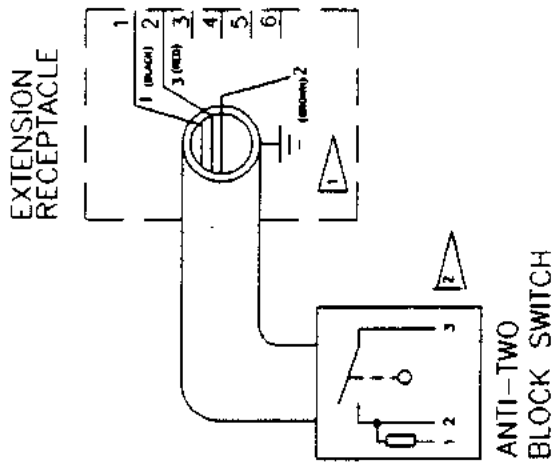
- 1 6 PIN PLUG REMOVED FROM 6 PIN RECEPTACLE ON MAIN BOOM NOSE AND INSTALLED IN 6 PIN RECEPTACLE ON JIB BASE
- 2 ADD DIELECTRIC LUBRICANT (e.g. MOGEL 758G) TO INSIDE OF RECEPTACLE, PLUGS, AND ELECTRICAL CONNECTORS. TO IMPROVE PROTECTION AGAINST CORROSION AND MAL-FUNCTION DUE TO CONDENSATION.
  - A. CLEAN ELECTRICAL CONTACTS AND CONNECTORS OF ALL FOREIGN MATERIAL SUCH AS GREASE, OIL, AND DIRT BEFORE APPLYING LUBRICANT.
  - B. APPLY A GENEROUS AMOUNT OF LUBRICANT ON THE ELECTRICAL CONTACTS AND CONNECTORS BEFORE MOUNTING.
  - C. AFTER MATING CONTACTS AND CONNECTORS, CLEAN OFF THE EXCESS SQUEEZED OUT.
- 3 CUT A29 SWITCH CABLE AND CONDUIT TO DESIRED LENGTH.

# PAT SYSTEM - AP410

SWINGAWAY EXTENSION

GROUE

NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
1	9-333-102238	1	SWITCH, A2B W/O CRIP				
2	7-112-150650	2	BOLT, HEX 5/16"-18 NC X 3/4" - GRD 2				
3	7-950-150141	2	WASHER 5/16" NARROW				
4	7-950-150050	4	LOCKWASHER 5/16" MED				
6	9-333-101425	1	RECEPTACLE - 6 PIN				
7	9-333-101459	1	INSERT, MALE - 6 PIN				
8	9-333-102233	1	STRAIN RELIEF YELLOW INSERT - PG9				
9	9-333-101443	1	PLUG, HOLE				
10	9-333-102057	1	REDUCER PG15-9				
11	7-111-100410	4	SCREW, MACH 19-24 NC X 1/2" - GRD 1				
13	7-950-100050	4	LOCKWASHER #10 REG				
15	7-866-142140	6	STUD 1/4"-20 X 1/8"				
16	7-300-000101	7	CLAMP 1/2"				
17	7-950-140141	6	WASHER 1/4" NARROW				
18	7-950-140050	6	LOCKWASHER 1/4" REG				
19	7-660-140000	6	NUT, HEX 1/4"-20 NC - GRD A				
20	9-333-101450	1	PLATE				
23	7-110-151205	2	CAPSCREW 5/16" - 18 NC X 1 1/2"				
24	3-486-0-00212	1	WEIGHT ASSY - A2B <SEE FURTHER BREAKDOWN IN THIS PACKAGE>				
25	9-333-102235	1	CONDUIT 10 FEET <MUST CUT TO LENGTH>				



NOTE:

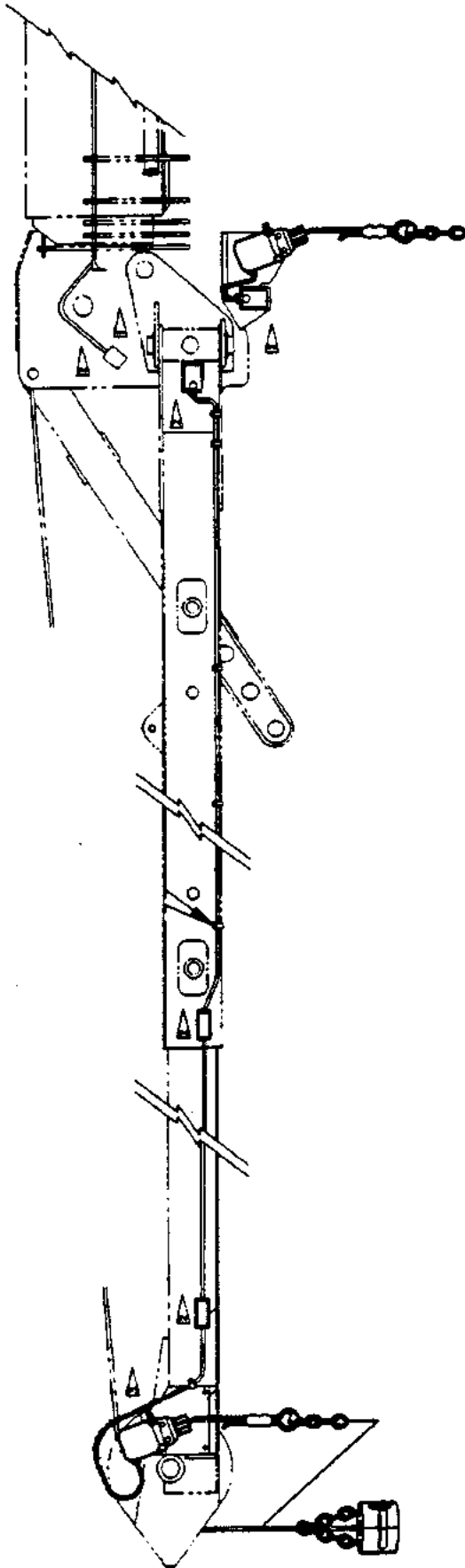
1 OUTER SHIELD GROUNDED AT STRAIN RELIEF CONNECTOR

2 SWITCH PREWIRED AND POTTED

SWINGAWAY EXTENSION



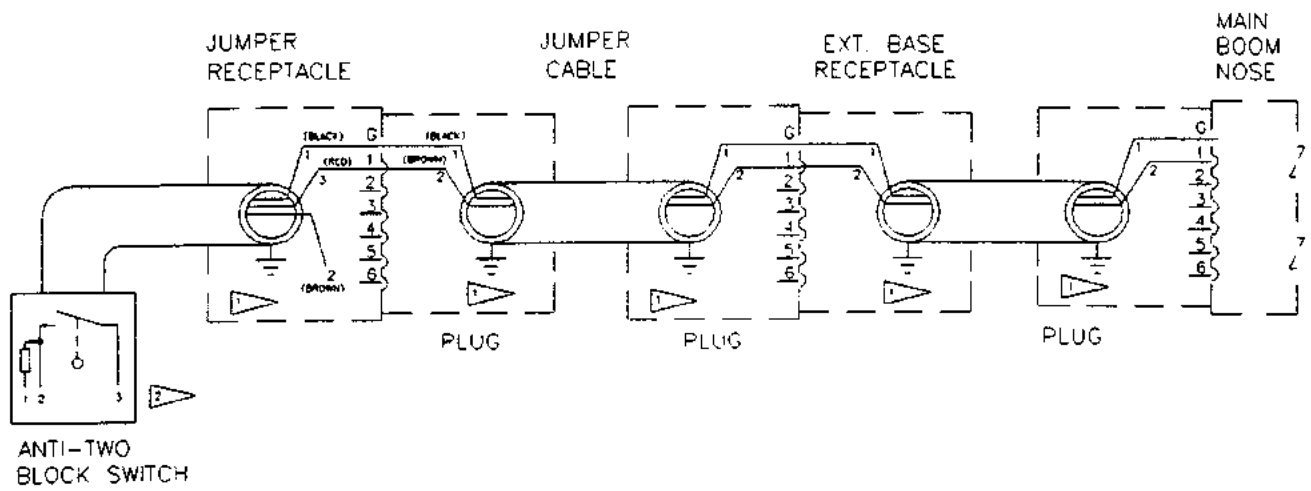
**THIS PAGE  
INTENTIONALLY  
LEFT BLANK.**



TELE EXTENSION  
LMI INSTALLATION

NOTES:

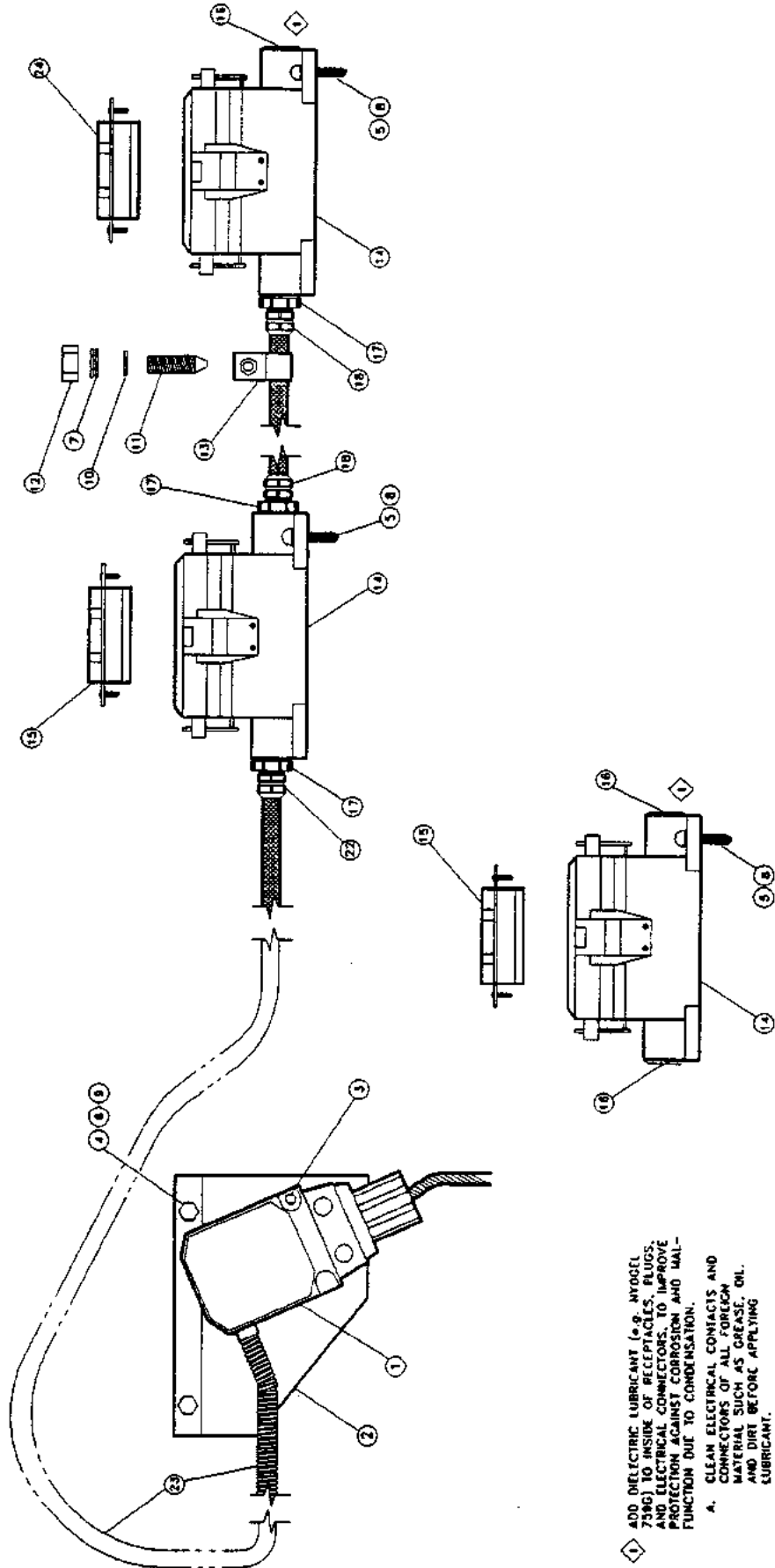
- △ 8 PIN PLUG REMOVED FROM 8 PIN RECEPTACLE ON MAIN BOOM HOSE AND INSTALLED IN 9 PIN RECEPTACLE ON JOB BASE
- △ ADD DIELECTRIC LUBRICANT (e.g. NYOGEL 7596) TO INSIDE OF RECEPTACLES, PLUGS, AND ELECTRICAL CONNECTORS, TO IMPROVE PROTECTION AGAINST CORROSION AND MAL-FUNCTION DUE TO CONDENSATION.
  - A. CLEAN ELECTRICAL CONTACTS AND CONNECTORS OF ALL FOREIGN MATERIAL SUCH AS GREASE, OIL, AND DIRT BEFORE APPLYING LUBRICANT.
  - B. APPLY A GENEROUS AMOUNT OF LUBRICANT ON THE ELECTRICAL CONTACTS AND CONNECTORS BEFORE MOUNTING.
  - C. AFTER MATING CONTACTS AND CONNECTORS, CLEAN OFF THE EXCESS SQUEEZED OUT.
- △ CUT 478 SWITCH CABLE AND CONDUIT TO DESIRED LENGTH.



TELE. EXTENSION WIRING DIAGRAM

NOTE:

- 1 OUTER SHIELD GROUNDED AT STRAIN RELIEF CONNECTOR
- 2 SWITCH PREWIRED AND POTTED



TELE EXTENSION INSTALLATION

GROVE

NO.	PART NO.	QTY	DESCRIPTION	NO.	PART NO.	QTY	DESCRIPTION
1	9-333-102238	1	SWITCH, #2B W/O CRIMP				
2	9-333-101450	1	PLATE				
3	7-110-151205	2	CAPSCREW 5/16" - 18 NC X 1 1/2"				
4	7-112-150650	2	BOLT, HEX 5/16"-18 NC X 3/4" - GRD 2				
5	7-111-100410	4	SCREW, MACH 10-24 NC X 1/2" - GRD 1				
6	7-950-150050	4	LOCKWASHER 5/16" MED				
7	7-950-140050	5	LOCKWASHER 1/4" REG				
8	7-950-100050	4	LOCKWASHER #10 REG				
9	7-950-150141	4	WASHER 5/16" NARROW				
10	7-950-140141	5	WASHER 1/4" NARROW				
11	7-866-142140	5	STUD 1/4"-20 X 7/8"				
12	7-660-140000	5	NUT, HEX 1/4"-20 NC - GRD A				
13	7-300-000101	5	CLAMP 1/2"				
14	9-333-101425	3	RECEPTACLE - 6 PIN				
15	9-333-101459	2	INSERT, MALE - 6 PIN				
16	9-333-101443	4	PLUG, HOLE				
17	9-333-102057	3	REDUCER PG16-9				
18	9-333-101995	3	STRAIN RELIEF BLACK INSERT - PG9				
19	9-333-101742	1	CABLE, ELEC. 2 X 0.5 S.S.				
20	9-333-101769	1	CABLE, JUMPER				
21	9-333-101770	1	CABLE, JUMPER				
22	9-333-102233	1	STRAIN RELIEF YELLOW INSERT - PG9				
23	9-333-102235	1	CONDUIT 10 FEET				
24	9-333-101426	1	INSERT, FEMALE - 6 PIN				