

<u>28.00 PAD-MOUNTED SWITCHGEAR GENERAL</u>	
DISTRIBUTION PAD-MOUNTED SWITCHES . . . . .	28.00-01A
DISTRIBUTION PAD-MOUNTED SWITCHES . . . . .	28.00-01B
DISTRIBUTION PAD-MOUNTED SWITCHES . . . . .	28.00-01C
LOCATION OF WARNING, DANGER AND LOCID LABELS FOR PAD-MOUNTED SWITCHGEAR, LOOP COVER BOXES, AND PRIMARY METERING CABINETS . . . . .	28.00-03
<u>28.01 PME THREE-PHASE ENCLOSED SWITCHGEAR</u>	
PME THREE-PHASE PAD-MOUNTED SWITCHGEAR - SINGLE LINE DIAGRAMS . . . . .	28.01-01
TYPICAL COMPATIBLE UNITS FOR PME SWITCHGEAR . . . . .	28.01-03
PME THREE-PHASE PAD-MOUNTED SWITCHGEAR - VAULT ANCHOR BOLT PLAN . . . . .	28.01-05
GROUNDING DETAILS FOR PME SWITCHGEAR . . . . .	28.01-06
PAD-MOUNTED SWITCHGEAR - PME 600A SWITCH BAYS . . . . .	28.01-07
PAD-MOUNTED SWITCHGEAR - PME FUSE BAYS . . . . .	28.01-09
<u>28.02 SINGLE-PHASE SWITCHGEAR</u>	
PAD-MOUNTED VACUUM FAULT INTERRUPTER, 200 AMPERE, SINGLE-PHASE (FRO) . . . . .	28.02-01
<u>28.03 AUTO TRANSFER SWITCHGEAR CONTROLS</u>	
AUTO TRANSFER . . . . .	28.03-01
MICRO-AT CONTROL . . . . .	28.03-03
<u>28.06 TOTAL ENCLOSED THREE-PHASE PAD-MOUNTED SWITCHGEAR (VISTA, VFI, TRAYER)</u>	
COOPER PAD-MOUNTED SWITCHGEAR VFI . . . . .	28.06-09A
COOPER PAD-MOUNTED SWITCHGEAR VFI . . . . .	28.06-09B
COOPER PAD-MOUNTED SWITCHGEAR VFI . . . . .	28.06-09C
G&W THREE-WAY SWITCHGEAR WITH ELECTRONIC LOAD AND FAULT PROTECTION . . . . .	28.06-10
<u>28.07 VISTA SWITCHGEAR</u>	
▶ STANDARD VISTA MODEL 624 25 KV PAD-MOUNTED SWITCHGEAR . . . . .	28.07-02
▶ MODIFIED VISTA MODEL 624 25 KV PAD-MOUNTED SWITCHGEAR . . . . .	28.07-03
▶ VISTA MODEL 532 25 KV PAD-MOUNTED SWITCHGEAR . . . . .	28.07-05
▶ VISTA MODEL 532 25 KV PAD-MOUNTED SWITCHGEAR . . . . .	28.07-06
<u>28.08 PMH THREE-PHASE LIVE FRONT SWITCHGEAR</u>	
ALTERNATIVES TO LIVE FRONT SWITCHGEAR REPLACEMENT . . . . .	28.08-01
PAD-MOUNTED SWITCHGEAR - PMH 600A AIR BREAK SWITCH . . . . .	28.08-03
PAD-MOUNTED SWITCHGEAR - PMH FUSE BAYS . . . . .	28.08-05
<u>28.10 INSPECTION AND MAINTENANCE OF LIVE FRONT SWITCHGEAR</u>	
INSPECTION/PREVENTATIVE MAINTENANCE FOR LIVE FRONT AIRBREAK PAD-MOUNTED SWITCHGEAR . . . . .	28.10-01
LIVE FRONT SWITCHGEAR VISUAL INSPECTION . . . . .	28.10-03
<u>FOR MAINTENANCE ONLY DRAWINGS</u>	
THE FOR MAINTENANCE ONLY DRAWINGS LISTED BELOW ARE NOT CONTAINED IN THE PRINTED SPEC BOOK, BUT ARE AVAILABLE ONLINE	
CABLE MAKEUP IN PMH (LIVE FRONT) (FMO) . . . . .	28.08-07
PMH THREE-PHASE PAD-MOUNTED SWITCHGEAR (FMO) . . . . .	28.08-09
PMH THREE-PHASE PAD-MOUNTED SWITCHGEAR (FMO) . . . . .	28.08-11
FUSING INSTRUCTIONS FOR S & C (SM-4S) FUSE HOLDERS (FMO) . . . . .	28.08-17A
FUSING INSTRUCTIONS FOR S & C (SM-4S) FUSE HOLDERS (FMO) . . . . .	28.08-17B
FUSING INSTRUCTIONS FOR S & C (SM 4Z AND SML 4Z) FUSE HOLDERS (FMO) . . . . .	28.08-19A
FUSING INSTRUCTIONS FOR S & C (SM 4Z AND SML 4Z) FUSE HOLDERS (FMO) . . . . .	28.08-19B
FUSING INSTRUCTIONS FOR S & C (SML-20) FUSE FOR LIVE FRONT PAD-MOUNTED SWITCHGEAR (PMH) (FMO) . . . . .	28.08-21A
FUSING INSTRUCTIONS FOR S & C (SML-20) FUSE FOR LIVE FRONT PAD-MOUNTED SWITCHGEAR (PMH) (FMO) . . . . .	28.08-21B

3				
2				
1	12/6/13	KATIGBAK	GUINN	ADCOCK
0	11/17/10	CECCONI	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

SECTION 28 - SWITCHGEAR  
TABLE OF CONTENTS



UNDERGROUND DISTRIBUTION PAD-MOUNTED SWITCHGEAR STANDARDS

LIVE-FRONT PAD-MOUNTED (NO LONGER STANDARD)

PROGRESS ENERGY CAROLINAS HAS LIVE-FRONT PAD-MOUNTED SWITCHGEAR INSTALLED ON THE SYSTEM. THE MAJORITY OF THIS SWITCHGEAR IS THE S&C PMH DESIGN. A SMALL NUMBER OF THIS TYPE SWITCHGEAR MAY HAVE BEEN PURCHASED FROM EEI (NOW FEDERAL PACIFIC), MALTON (NOW ABB) AND OTHERS. THIS TYPE SWITCHGEAR IS LIVE FRONT, AIR INSULATED WITH 400 AMP LOADBREAK 25KV UNITS, 600 AMP LOADBREAK 15KV UNITS, 600 AMPS CONTINUOUS WITH 200 AMP, THREE-PHASE TAPS ON THE OTHER SIDE. ORIGINAL UNITS UTILIZED A NON-LOADBREAK, SM-4 UTILIZED A NON-LOADBREAK, SM-4 TYPE FUSE AND HOLDER. THE FUSE DESIGN WAS LATER UPGRADED TO A LOADBREAK FUSE HOLDER DESIGN, THE SM-4Z. THE LATEST MODELS UTILIZED A SML-20 FUSE HOLDER DESIGN THAT REQUIRED A SMU-20 FUSE.

SOME OF THESE UNITS MAY BE EQUIPPED WITH AUTO TRANSFER OPERATORS AND/OR DISTRIBUTION AUTOMATION OPERATORS.

REPLACEMENTS AND MAINTENANCE

PMH UNITS THAT FAIL OR NEED REPLACEMENT ARE BEING REPLACED WITH THE PME DESIGN OR WITH SPARE PMHS/REPAIRED PMHS. REPLACEMENT SELECTION IS BASED ON OUTAGE TIME ALLOWED AND FIRST COST.

DEAD-FRONT SWITCHGEAR

PME DESIGN

IN THE LATE 1990'S, PAD-MOUNTED SWITCHGEAR DESIGNS WERE SWITCHED TO THE DEAD-FRONT PME DESIGNS. THIS DESIGN IS BASICALLY THE SAME AS THE PMH EXCEPT THE 600 AMP SIDE AND THE 200 AMP TAP SIDE IS TOTALLY ENCLOSED WITH NO EXPOSED LIVE PARTS. VIEWING WINDOWS ARE PROVIDED ON THE 600 AMP SIDE TO OBSERVE THE POSITION OF THE SWITCH. ALTHOUGH THE SWITCHGEAR IS TOTALLY ENCLOSED, IT IS VENTED TO THE ATMOSPHERE. THE RATING IS 600 AMP LOADBREAK (15 AND 25KV), 600 AMP CONTINUOUS ON THE FEEDER SIDE AND 200 AMPS ON THE TAP SIDE. THE SAME SMU FUSE USED IN THE LATE MODEL PMH IS USED IN THE PME. HOWEVER, DUE TO THE DEAD-FRONT DESIGN, A DIFFERENT FUSE HOLDER IS REQUIRED. VIEWING WINDOWS ARE PROVIDED ON THE 200 AMP TAP SIDE TO CHECK FUSES FOR A "FUSE BLOWN" INDICATOR.

THE PME DESIGN USES 600 AMP DEAD-BREAK ELBOWS ON THE FEEDER SIDE AND 200 AMP LOADBREAK ELBOWS ON THE TAP SIDE. FOR THIS REASON, THE PME IS NOT A DIRECT REPLACEMENT FOR THE PMH. THE PME PAD SIZE IS DIFFERENT, AND ALL THE CABLES HAVE TO BE SPLICED TO REACH THE HIGHER MOUNTED BUSHINGS.

LIKE THE PMH, SOME UNITS MAY BE EQUIPPED WITH MOTOR OPERATED AUTOMATIC TRANSFER PACKAGES.

THE STANDARD PME DESIGN IS PRODUCED WITH MILD STEEL COMPONENTS WITH THE EXCEPTION OF COASTAL UNITS THAT HAVE A CABINET MADE FROM STAINLESS STEEL. INTERNAL COMPONENTS ARE THE STANDARD MILD STEEL. THIS DESIGN CONTAINS EXTRA VIEWING WINDOWS ON THE 200 AMP TAP SIDE TO CHECK THE ALIGNMENT OF FUSE HOLDERS IN THE CLOSED POSITION.

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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DISTRIBUTION PAD-MOUNTED SWITCHES



**CAR** DWG. 28.00-01A

DEAD-FRONT SWITCHGEAR (CONT'D)

VISTA DESIGN

THE VISTA DESIGN IS A TOTAL DEAD-FRONT, SEALED STAINLESS STEEL TANK DESIGN THAT IS SUBMERSIBLE. THE INSULATION MEDIUM IS SF6 GAS. THESE UNITS MAY BE INSTALLED IN A VAULT BELOW GRADE, OR PLACED ON A PAD WITHIN A CABINET MADE OF STAINLESS STEEL.

THE STANDARD 25 KV VISTA UNITS HAVE MANUALLY OPERATED 600 AMP SWITCHES THAT ARE LOADBREAK (IN SF6 GAS). THE SWITCH OPERATORS HAVE A CLOSED, OPEN AND GROUND POSITION. A VIEWING WINDOW IS PROVIDED TO OBSERVE THE SWITCHES IN EACH POSITION. THE 200 AMP TAP SIDE IS EQUIPPED WITH VACUUM BOTTLES THAT ARE ELECTRONICALLY CONTROLLED. THE VACUUM BOTTLES ARE PRE-SET TO THE DESIRED EQUIVALENT FUSE CURVE USING A LAPTOP COMPUTER WITH SOFTWARE PROVIDED BY THE MANUFACTURER.

AN OPTION THAT MIGHT BE FOUND ON SOME OF THE VISTA UNITS IS THE SOLAR VOLTAIC POWERED VOLTAGE INDICATORS. THESE DISPLAYS HAVE FLASHING LIGHTNING BOLTS WHEN THE CIRCUIT IS ENERGIZED. THE DISPLAY ALSO CONTAINS PORTS THAT CAN BE USED TO CHECK PHASING.

VFI SWITCHGEAR

THE VFI SWITCHGEAR IS A TOTALLY ENCLOSED, OIL FILLED, MILD STEEL OR STAINLESS STEEL TANK SWITCHGEAR THAT CAN BE CONFIGURED AS A PAD-MOUNTED RECLOSER (NORMALLY SET FOR ONE SHOT) OR IN A CONFIGURATION SIMILAR TO A PME. IT CAN BE FITTED WITH A PACKAGE TO PROVIDE SOURCE TRANSFER CAPABILITY. SWITCHING ON THE 600 AMP SIDE IS DONE WITH VACUUM BOTTLES INSULATED WITH OIL. A VISIBLE OPENING POINT IS PROVIDED BY A MECHANICAL BLADE THAT IS LINKED TO OPEN ONLY AFTER THE LOAD IS INTERRUPTED BY THE VACUUM BOTTLE. THE VISIBLE OPEN IS VIEWED THROUGH A VIEWING WINDOW. TRIP SETTINGS TO MATCH FUSE CURVES ARE SET DIRECTLY ON THE ELECTRONIC CONTROL PANEL. THIS PAD-MOUNTED RECLOSER TYPE IS USED IN 600 AMP AND 200 AMP APPLICATIONS. THEY MAY BE CONFIGURED WITH 600 AMP APPARATUS BUSHING ON THE SOURCE SIDE AND 600 AMP APPARATUS BUSHINGS OR 200 AMP BUSHING WELLS ON THE FEED SIDE. A 200 AMP, SINGLE-PHASE DESIGN IS USED IN THE CAROLINAS.

IF THE VFI IS CONFIGURED AS A PME, VACUUM BOTTLES ARE USED TO PROVIDE LOADBREAK CAPABILITY ON THE 600 AMP SIDE. THE SAME DESIGN 600 AMP VACUUM BOTTLES ARE USED ON THE 200 AMP TAPS TO PROVIDE FAULT INTERRUPTING. TRIP SETTING TO MATCH FUSE CURVES ARE SET DIRECTLY ON THE ELECTRONIC CONTROL PANEL FOR EACH 200 AMP TAP.

SUBMERSIBLE SWITCHGEAR

SUBMERSIBLE SWITCHGEAR IS COVERED IN THE NETWORK, VAULTS AND TRANCLOSURES SECTION OF THIS MANUAL.

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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DISTRIBUTION PAD-MOUNTED SWITCHES



**CAR** DWG.  
28.00-01B

THE PURPOSE OF THIS DRAWING IS TO PROVIDE STANDARD OPERATING CAPABILITIES OF MANUAL DISTRIBUTION LINE SWITCHES. THE SAFETY MANUAL SHOULD BE FOLLOWED FOR ALL SWITCHING SAFETY PROCEDURES. THE SUBSTATION EQUIPMENT OPERATIONS MANUAL SHOULD BE FOLLOWED WHEN MAKING OR BREAKING A FEEDER TIE. LOAD CHECKS MAY BE REQUIRED TO AVOID EXCEEDING THE RATINGS OF THESE SWITCHES. FOR OVERHEAD SWITCHES, SEE SECTION 08.

PME AND PMH SWITCHGEAR, SWITCHED COMPARTMENT: THESE SWITCHES HAVE LOAD BREAK INTERRUPTERS AND CAN PICK UP LOAD, MAKE A FEEDER TIE, DROP LOAD, AND OPEN A FEEDER TIE.

NOTE: THE 15KV UNITS ARE RATED 600 AMPS LOADBREAK AND THE 25KV UNITS ARE RATED 400 AMPS LOADBREAK.

SINGLE-PHASE SWITCHING: PICKING UP OR DROPPING A LARGE AMOUNT OF LOAD WITH SINGLE-PHASE SWITCHES CAN OPERATE THE FEEDER GROUND RELAYS. EVALUATE TURNING GROUND RELAYS OFF BASED ON AMOUNT OF LOAD TO BE TRANSFERRED AND THE GROUND RELAY SETTINGS. WHEN PICKING UP OR DROPPING THREE-PHASE LOAD, ALL PHASES SHOULD BE OPENED OR CLOSED WITHOUT DELAY BETWEEN PHASES. THREE-PHASE SERVICE SHOULD NOT BE PROVIDED FROM PHASES OF DIFFERENT FEEDERS EXCEPT FOR A SHORT PERIOD DURING SWITCHING. CONSULT THE DISTRIBUTION CONSTRUCTION SPECIFICATIONS OR DISTRIBUTION ENGINEERING MANUAL FOR FERRORESONANCE INFORMATION.

600 AMP ELBOWS: THESE ELBOWS ARE TO BE OPERATED DE-ENERGIZED ONLY.

PAD-MOUNTED LIVE FRONT SWITCHGEAR (PMH) , 200 AMP FUSED COMPARTMENT WITH LOAD BREAK FITTINGS: THESE SWITCHES CAN PICK UP LOAD, MAKE A LINE TIE, DROP LOAD, AND OPEN A LINE TIE.

PAD-MOUNTED LIVE FRONT SWITCHGEAR (PMH) , 200 AMP FUSED COMPARTMENT WITHOUT LOAD BREAK FITTINGS: THESE SWITCHES CAN PICK UP LOAD AND MAKE A LINE TIE. WHEN USED WITH A LOAD BUSTER TOOL, THESE SWITCHES CAN BE USED TO DROP LOAD, AND OPEN A LINE TIE.

PAD-MOUNTED DEAD FRONT SWITCHGEAR (PME) , 200 AMP FUSED COMPARTMENT: THE FUSE COMPARTMENT HAS NO LOAD BREAK OR LOAD MAKE CAPABILITY. USE 200 AMP LOAD BREAK ELBOWS.

200 AMP LOAD BREAK ELBOWS: THESE ELBOWS CAN BE USED TO PICK UP LOAD, MAKE A LINE TIE, DROP LOAD, AND OPEN A LINE TIE. THESE ELBOWS SHOULD BE OPERATED ENERGIZED ONLY WHEN PROTECTED BY A DEVICE WITH A TRIP RATING OF 200 AMPS OR LESS.

SWITCHGEAR BUSHINGS:

INSULATING CAPS MUST BE INSTALLED ON ALL OPEN SWITCHGEAR BUSHINGS. THE ELECTROSTATIC GROUNDING WIRE ON THE INSULATING CAP MUST BE INSTALLED TO THE GROUND WIRE PRIOR TO INSTALLATION OF THE INSULATING CAP.

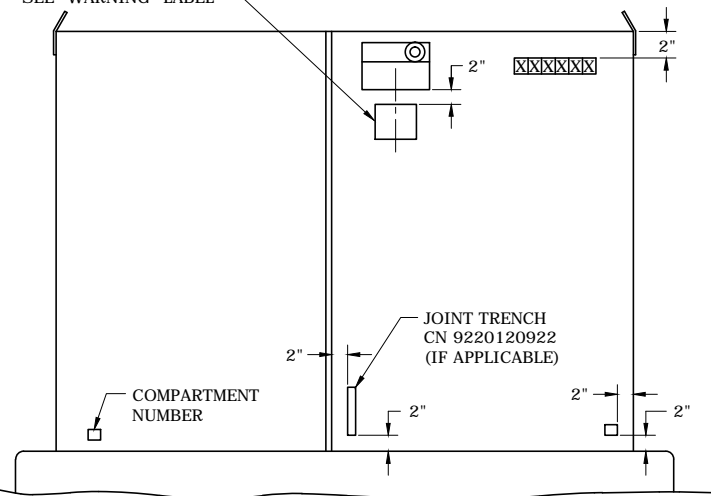
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0	10/27/10	DANNA	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DISTRIBUTION PAD-MOUNTED SWITCHES

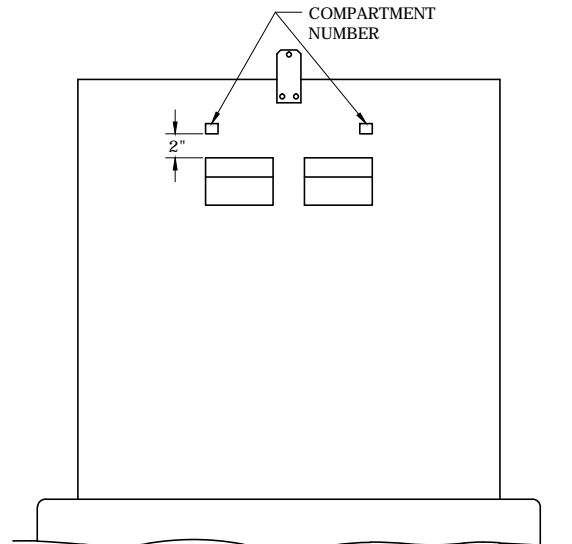


**PGN** DWG. 28.00-01C

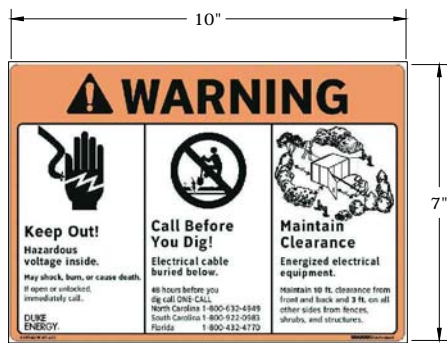
SEE "WARNING" LABEL



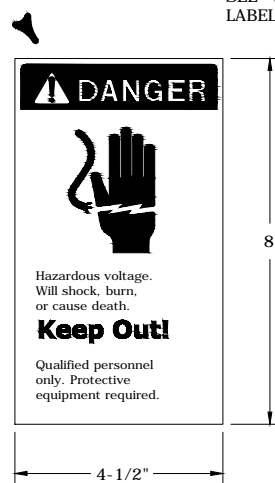
**PME SWITCHGEAR (6-12)**  
FRONT VIEW  
DOORS CLOSED



**PME SWITCHGEAR (6, 9, 10, 11 & 12 SIMILAR)**  
SIDE VIEW  
DOORS CLOSED

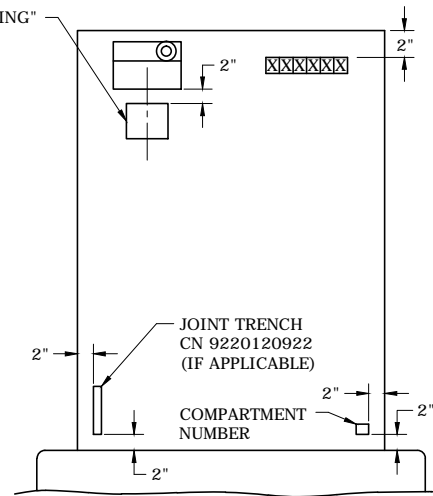


**WARNING LABEL**  
EXTERIOR MOUNTING ONLY  
CN 9220111314



**DANGER LABEL**  
INTERIOR MOUNTING ONLY  
CN 21129804

SEE "WARNING" LABEL



**PME SWITCHGEAR (4&5)**  
FRONT VIEW  
DOOR CLOSED

"WARNING" LABEL SHALL BE LOCATED ON THE OUTSIDE OF PAD-MOUNTED SWITCHGEAR, LOOP COVER BOXES, AND PRIMARY METERING CABINETS ON CENTER LINE OF DOOR HANDLE AS SHOWN.

**NOTES:**

1. SURFACE TEMPERATURE SHOULD NOT BE BELOW 50°F WHEN LABEL IS APPLIED.
2. WIPE METAL SURFACES WITH CABLE CLEANER ( CN 30525000) AND A CLEAN CLOTH BEFORE APPLYING LABEL.
3. LABELS MUST BE APPLIED CAREFULLY. ONCE THIS MATERIAL IS APPLIED, IT CANNOT BE MOVED.
4. NEW SWITCHGEAR COMES WITH A FACTORY APPLIED "WARNING" LABEL.
5. SEE DWG. 28.01-01 FOR COMPARTMENT NUMBER.
6. USE STICKON DECALS FOR COMPARTMENT NUMBER. SEE DWG. 20.01-02.

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1	10/9/13	GUINN	GUINN	ADCOCK
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

LOCATION OF WARNING, DANGER AND  
LOCID LABELS FOR PAD-MOUNTED SWITCHGEAR, LOOP  
COVER BOXES, AND PRIMARY METERING CABINETS



**CAR**

DWG.  
28.00-03

SINGLE LINE DIAGRAM THREE-PHASE UNITS	MODEL #	DIMENSIONS (INCHES)			PAD VAULT	LEGEND
		H	W	D		
	PME - 4 (750 LBS.)	50	46	62.25	PADSWGFBPME4C  SEE DWG. 24.03-04	 400 AMP LOADBREAK 600 AMP CONTINUOUS GANG OPERATED LOADBREAK SWITCH
	PME - 5 (1250 LBS.)	50	46	81.75		
	PME - 6 (2125 LBS.)	50	84	81.75	PADSWGFBPME6C  SEE DWG. 24.03-03	 600 AMP BUSHING
	PME - 9 (2225 LBS.)	50	84	81.75		 FUSED DISCONNECT
	PME - 10 (2450 LBS.)	50	84	88.25		 200 AMP BUSHING WELL
	PME - 11 (2375 LBS.)	50	84	88.25		 SWITCH OPERATOR
	* PME - 12 (2150 LBS.)	50	84	81.75		 SWITCH TRANSFER CONTROL
	* PME - 9AT (2225 LBS.)	50	84	81.75		 VOLTAGE SENSOR

\* NON STOCK. ALLOW FOUR MONTHS FOR DELIVERY

MODEL	MACRO	COMPATIBLE UNIT	CATALOG NUMBER	MACRO
PME-3SS	SGPME3SS25CM	SGPME3SS25C	12711206	THE SWITCHGEAR MACROS CONTAIN THE REQUIRED GROUNDING CUS, PAD CU, ELBOW CUS (200 AND 600 AMP), FAULT INDICATORS AND 80 FUSES (IF ALL THE ELBOWS ARE NOT NEEDED ON INITIAL INSTALLATION, THEY MUST BE DELETED FROM THE WO. IF OTHER THAN 80 AMP FUSE ARE REQUIRED, THE WO MUST BE CHANGED.
PME-4	SGPME425CM	SGPME425C	12710000	
PME-4SS	SGPME4SS25CM	SGPME4SS25C	12711305	
PME-5	SGPME525CM	SGPME525C	12710109	
PME-6	SGPME625CM	SGPME625C	12710208	
PME-6SS	SGPME6SS25CM	SGPME6SS25C	12711404	
PME-9	SGPME925CM	SGPME925C	12710307	
PME-9SS	SGPME9SS25CM	SGPME9SS25C	12711503	
PME-10	SGPME1025CM	SGPME1025C	12710604	
PME-10SS	SGPME10SS25CM	SGPME10SS25C	12711602	
PME-11	SGPME1125CM	SGPME1125C	12710703	
PME-12	SGPME1225CM	SGPME1225C	12710802	
PME-9AT	-	SGPME9AST25C	9220104157	



CONSULT MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION AND OPERATION.

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0	4/21/10	ROBESON	ROBESON	ELKINS
REVISED	BY	CK'D	APPR.	

PME THREE-PHASE PAD-MOUNTED SWITCHGEAR -  
SINGLE LINE DIAGRAMS



**CAR** DWG.  
28.01-01

SWITCHED COMPARTMENT (WITH 3 - 750)		
COMPATIBLE UNIT	CATALOG NUMBER	QUANTITY
EB750AL6DB25C	11187309	3
EB350AL6DB25C	11188307	3
TUA25RDTAP2LBC	11185501	3
ARREL18C	11232204	3
TUA25RECDEL2RC	11186806	3

} SEE NOTE 4

FUSED COMPARTMENT (WITH 3 #1/0)		
COMPATIBLE UNIT	CATALOG NUMBER	QUANTITY
TUA25BUSHINLBRC	11186509	3
EB10AL2LB25C	11186707	3
FSMU2015ES27KC	21143805	3
FSMU2025ES27KC	21143904	3
FSMU2040ES27KC	21144001	3
FSMU2050ES27KC	21144100	3
FSMU2065ES27KC	21144209	3
FSMU2080ES27KC	21144308	3
FSMU20100ES27KC	21142609	3
FSMU20125ES27KC	21142708	3
TUA25RECDEL2RC	11186806	3
TUA25PLGISLB2RC	11186905	3

IDLE SWITCH COMPARTMENT		
COMPATIBLE UNIT	CATALOG NUMBER	QUANTITY
BUSHADP6225C	11114501	3
TUA25RECDEL2RC	11186806	3

IDLE FUSE COMPARTMENT		
COMPATIBLE UNIT	CATALOG NUMBER	QUANTITY
TUA25BUSHINLBRC	11186509	3
TUA25RECDEL2RC	11186806	3

SWITCHED COMPARTMENT (WITH 3 - 1/0)		
COMPATIBLE UNIT	CATALOG NUMBER	QUANTITY
BUSHADP6225C	11114501	3
EB10AL2LB25C	11186707	3
TUA25RECDEL2RC	11186806	3
TUA25PLGISLB2RC	11186905	3

NOTES:

1. REPLACEMENT 600 AMP BUSHING ( CN 9220085131).
2. REPLACEMENT 200 AMP BUSHING WELL ( CN 9220085132).
- 3. REPLACEMENT FUSE END FITTINGS ( CU FENDPMESMU20C, CN 51635).
4. INSTALL ARRESTERS AT NORMAL OPEN POINTS AND END OF RADIAL FEEDS. OTHERWISE, INSTALL INSULATING PROTECTIVE CAP.

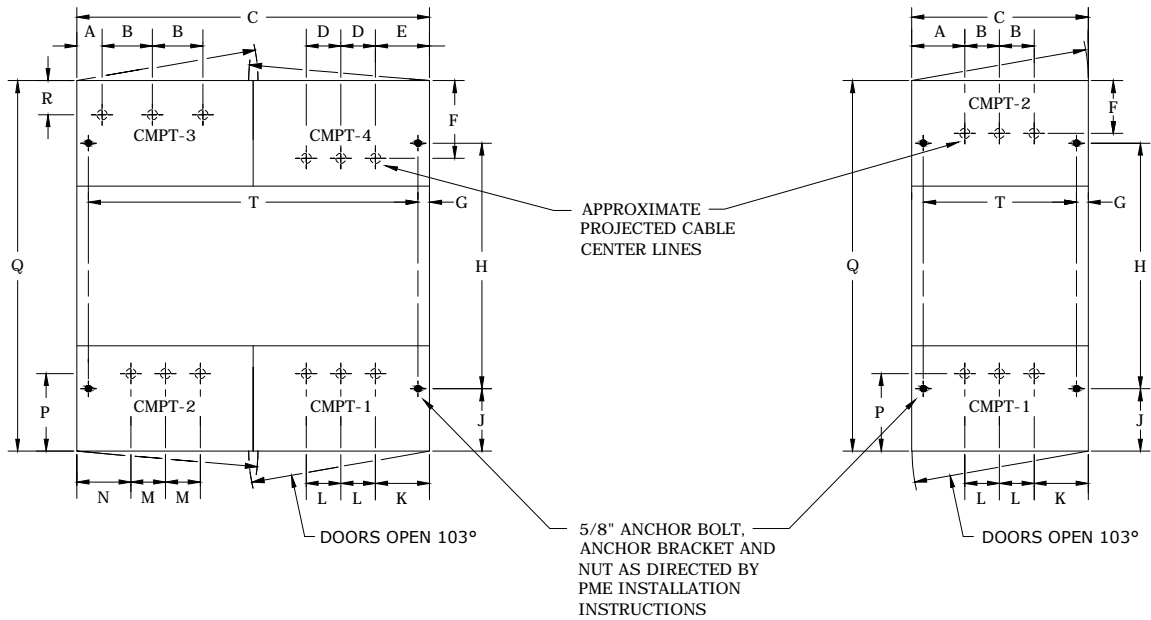
3				
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1	3/8/13	KATIGBAK	GUINN	ADCOCK
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TYPICAL COMPATIBLE UNITS  
FOR PME SWITCHGEAR



**CAR**

DWG.  
28.01-03



PME-11 SHOWN ABOVE. LAYOUT  
TYPICAL FOR SW-PME6, 9, 10, 11  
AND 12. COMPARTMENT-4  
(CMPT-4) CABLE AND CABLE  
ACCESSORIES OMITTED ON SW-PME6.

SW-PME4 SHOWN ABOVE.  
LAYOUT TYPICAL FOR  
SW-PME4 AND 5.

DIMENSIONS IN INCHES									
COMP. UNIT	A	B	C	D	E	F	G	H	J
SGPME425C	6	12	46	N/A	N/A	8-1/8	2-3/4	43	3-7/8
SGPME525C	6	12	46	N/A	N/A	8-1/8	2-3/4	52	14-7/8
SGPME625C	6	12	84	N/A	N/A	N/A	2-3/4	52	14-7/8
SGPME925C	6	12	84	12	6	8-1/8	2-3/4	52	14-7/8
SGPME1025C	12-7/8	8-1/4	84	8-1/4	12-7/8	14-1/2	2-3/4	58-1/2	14-7/8
SGPME1125C	6	12	84	8-1/4	12-7/8	18-1/2	2-3/4	58-1/2	14-7/8
SGPME1225C	6	12	84	12	6	8-1/8	2-3/4	52	14-7/8

DIMENSIONS IN INCHES								
COMP. UNIT	K	L	M	N	P	Q	R	T
SGPME425C	11-3/4	12	N/A	N/A	9-1/8	62-1/4	N/A	40-1/2
SGPME525C	16-5/8	8-1/4	N/A	N/A	19	81-3/4	N/A	40-1/2
SGPME625C	12-7/8	8-1/4	8-1/4	12-7/8	18-1/2	81-3/4	8-1/8	78-1/2
SGPME925C	12-7/8	8-1/4	8-1/4	12-7/8	18-1/2	81-3/4	8-1/8	78-1/2
SGPME1025C	12-7/8	8-1/4	8-1/4	12-7/8	14-1/2	88-1/4	14-1/2	78-1/2
SGPME1125C	12-7/8	8-1/4	8-1/4	12-7/8	18-1/2	88-1/4	8-1/8	78-1/2
SGPME1225C	6	12	8-1/4	12-7/8	18-1/2	81-3/4	8-1/8	78-1/2

**NOTES:**

1. CABLE SHOULD EXIT GROUND IN POSITIONS SHOWN. IF CABLE IS IN CONDUIT, TERMINATE CONDUIT 1" TO 2" ABOVE BOTTOM OF PAD VAULT IN CENTER PHASE POSITION.

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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

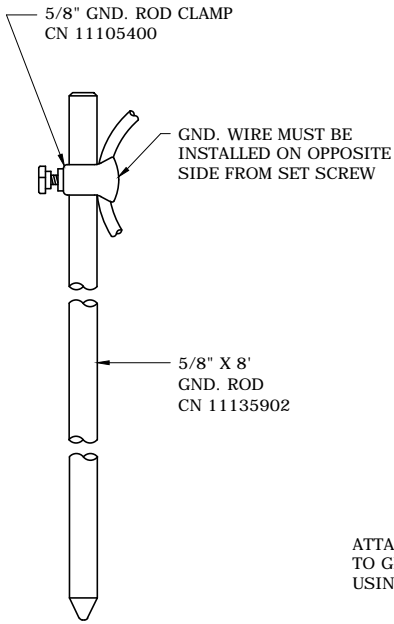
PME THREE-PHASE PAD-MOUNTED SWITCHGEAR -  
VAULT ANCHOR BOLT PLAN



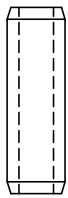
**CAR**

DWG.  
28.01-05

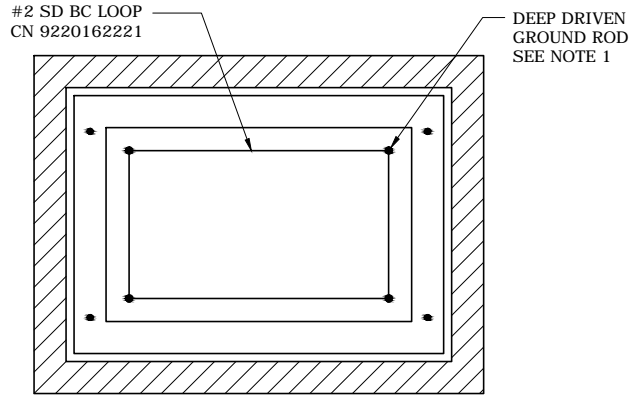




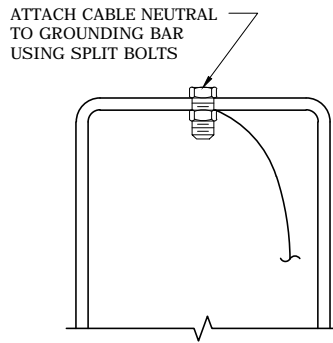
GROUND ROD



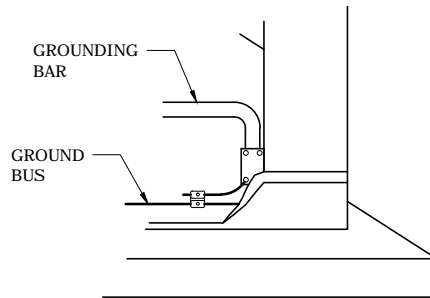
5/8" COUPLING  
CN 11131000



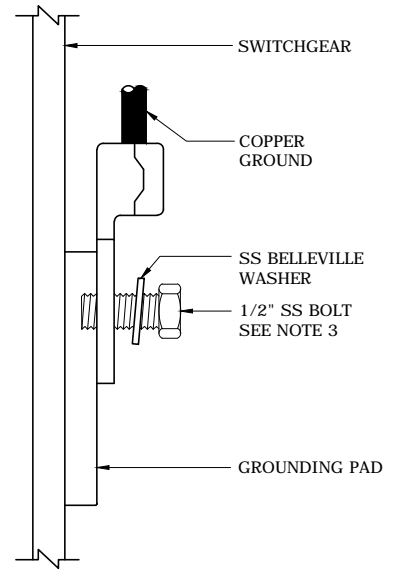
VAULT PAD



SPLIT BOLT GROUNDING DETAIL



GROUNDING DETAIL



GROUNDING LUG

CU'S REQUIRED

- GUPGE2C - WIRE AND CONNECTORS
- GUAR4C - 4-5' RODS WITH COUPLINGS

NOTES:

1. INSTALL ONE DEEP DRIVEN GROUND ROD IN THE FRONT RIGHT HAND CORNER USING 4-5' RODS.
2. RUN A LOOP OF #2 SOFT DRAWN BARE COPPER INSIDE THE VAULT PAD.
3. CONNECT THE LOOPED GROUND BUSS CONDUCTOR TO THE PAD IN EACH CORNER OF THE SWITCHGEAR USING A SHORT PIECE OF #2 SOFT DRAWN COPPER. USE THE GROUNDING LUG SHOWN AND ATTACH TO THE GROUNDING PAD WITH A 1/2" STAINLESS STEEL BOLT AND STAINLESS STEEL BELLEVILLE WASHER.
4. AT EACH CABLE LOCATION, ATTACH THE CABLE NEUTRAL TO THE GROUNDING BAR WITH A SPLIT BOLT CONNECTOR.

3				
2	9/7/12	KATIGBAK	BURLISON	ELKINS
1	7/13/11	SIMMONS	BURLISON	ELKINS
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

GROUNDING DETAILS FOR PME SWITCHGEAR



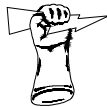
**CAR**

DWG.  
28.01-06



**NOTES:**

1. DEAD FRONT CONSTRUCTION 600A BOLTED ELBOW (T-BODY).
2. WILL NOT FIT PMH MOUNTING BOX: NEEDS 90" X 85".
3. LOOK THROUGH WINDOW, BELOW T-BODIES, FOR VISIBLE OPEN.
4. USE LARGE 3Ø FAULT INDICATOR CN 22001309 (SHOWN).
5. T-BODY IS NON LOADBREAK (MUST BE DEAD, NO CURRENT, NO VOLTAGE TO OPERATE). USE A REDUCING TAP WELL (CU TUA25RDTAP2LBC, CN 11185501) AND A LOADBREAK BUSHING INSERT (CU TUA25BUSHINLBRC, CN 11186509) TO INSTALL AN ARRESTER ON THE BACK OF THE T-BODY OR COVER WITH A DE RECEPTACLE. PROVIDES METHOD OF GROUNDING ELBOWS WHEN NEEDED.
6. CAN INSTALL ELBOW ARRESTER ON STANDARD BUSHING.
7. GROUNDS ATTACH TO GROUNDING BAR WITH BOLTED CONNECTORS.
8. CABLE CAN BE ENERGIZED WHEN SWITCH IS OPEN.
9. WHEN INSTALLED PROPERLY, THE LC SHIELD GROUND BRAID HAS TWO LEADS. USE ONE TO CONNECT TO THE CROSS BONDS AND THE OTHER TO CONNECT TO THE NEUTRAL.
10. IT IS ACCEPTABLE TO CONNECT BOTH GROUND BRAID LEADS TO THE GROUNDING BAR USING SEPARATE CONNECTORS AS A METHOD OF CROSS BONDING.
11. ARRESTERS ARE INSTALLED ONLY AT NORMAL OPEN POINTS. A THREE-PHASE SET IS TO BE INSTALLED IN EACH 600 AMP SWITCH COMPARTMENT.



USE PROPER SAFETY PROCEDURES AS OUTLINED IN ACCIDENT PREVENTION MANUAL OR SAFETY MANUAL. BEFORE WORKING ON SWITCHGEAR OR CABLE, GROUND IT.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

PAD-MOUNTED SWITCHGEAR -  
PME 600A SWITCH BAYS



**CAR**

DWG.  
28.01-07



NOTES:

1. WILL ACCEPT LOADBREAK BUSHING INSERT ( CN 11186509).
2. USE 200A LOADBREAK ELBOWS.
3. WHEN INSTALLING, BRING WIRE THROUGH GALVANIZED RING AT BOTTOM OF SWITCHGEAR. BE SURE ELBOW WILL REACH BOTH ENERGIZED AND PARKING BUSHING.
4. CAN BE STICK OPERATED.
5. USES SME-20 FUSE DOOR.
6. ELBOW AND CABLE CAN BE ENERGIZED WHILE PARKED.



USE PROPER SAFETY PROCEDURES AS OUTLINED IN ACCIDENT PREVENTION MANUAL OR SAFETY MANUAL. BEFORE WORKING ON SWITCHGEAR OR CABLE, GROUND IT.

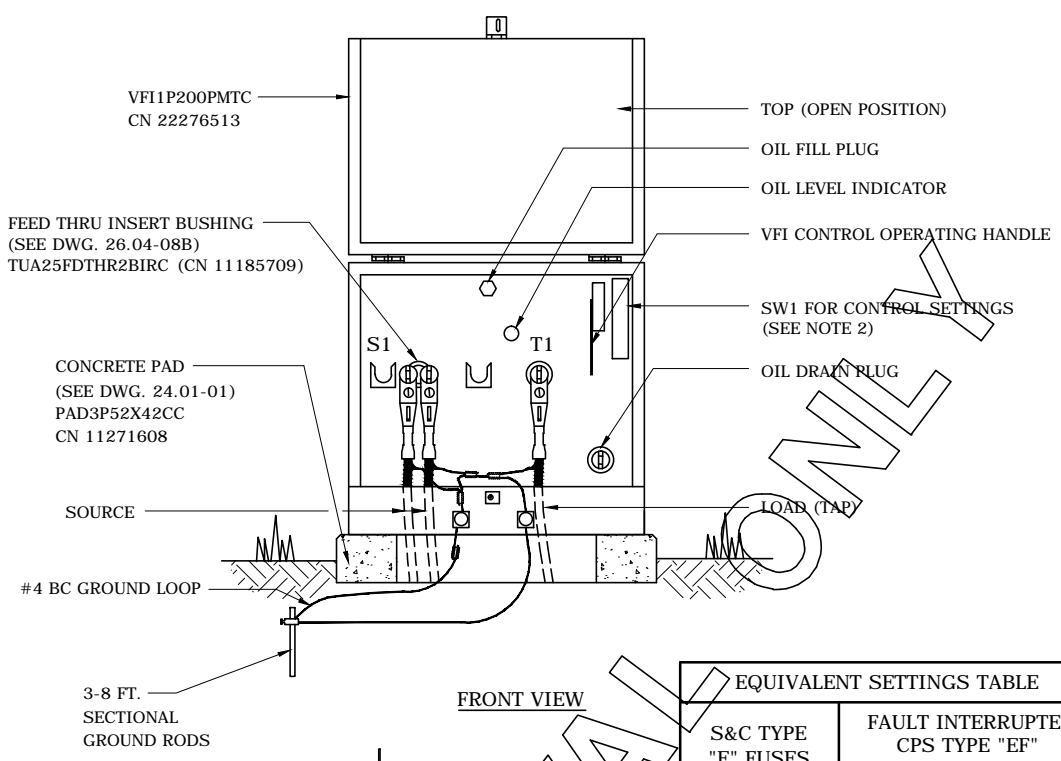
3				
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1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

PAD-MOUNTED SWITCHGEAR -  
PME FUSE BAYS



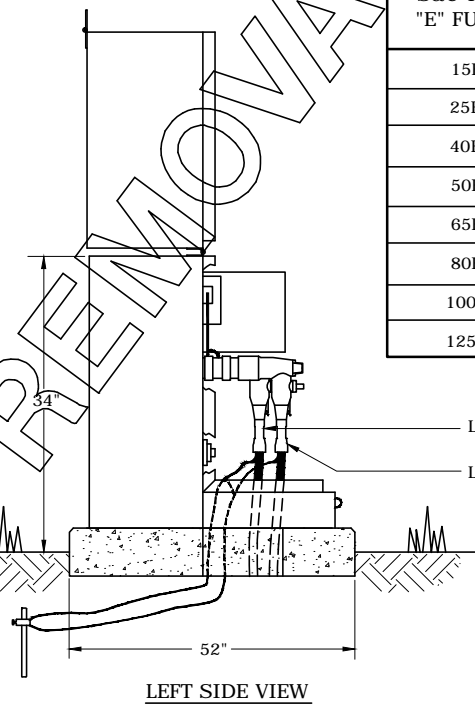
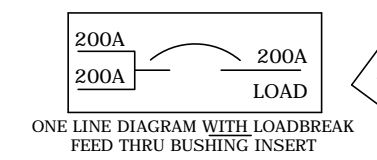
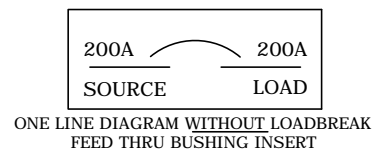
**CAR**

DWG.  
28.01-09



FRONT VIEW

EQUIVALENT SETTINGS TABLE	
S&C TYPE "E" FUSES	FAULT INTERRUPTER CPS TYPE "EF" EQUIVALENT SETTINGS
15E	40 AMPS
25E	60 AMPS
40E	100 AMPS
50E	130 AMPS
65E	160 AMPS
80E	200 AMPS
100E	260 AMPS
125E	360 AMPS




LEFT SIDE VIEW

NOTES:

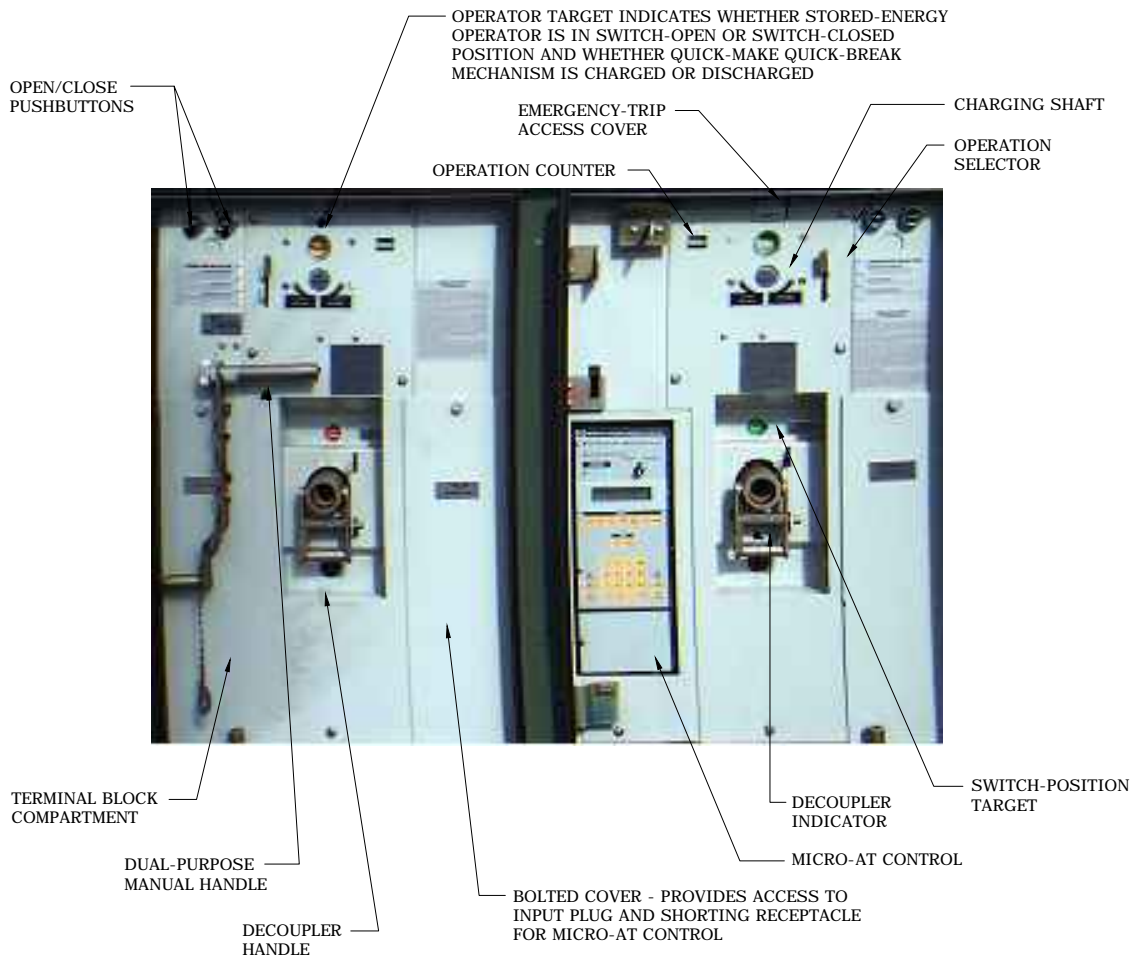
1. THE INTERNAL MECHANISMS AND BUS WORK ARE INSULATED WITH MINERAL OIL, WHICH PROVIDES ELECTRICAL INSULATION ONLY. BOTH LOAD (RATED 200A) AND FAULT (RATED 12,000A) INTERRUPTION TAKE PLACE IN SEALED VACUUM INTERRUPTERS. NO MAINTENANCE IS REQUIRED. CHECK OIL LEVEL AND ELECTRONIC CONTROL PERIODICALLY.
2. SET MINIMUM TRIP ON SW1 ON CONTROL ONLY. (SEE TABLE ABOVE FOR "E" FUSE EQUIVALENT SETTINGS TO VFI TYPE "EF" SETTINGS.)
3. BUSHING WELLS WILL ACCEPT FEED THROUGH BUSHING INSERTS FOR SOURCE AND/OR TAP.
4. SEE DWG. 24.01-04 FOR PAD DETAILS.
5. OPERATING INSTRUCTIONS: THE INTERRUPTER OPERATES EITHER MANUALLY OR AUTOMATICALLY. THE OPERATING HANDLE IS USED FOR OPEN/CLOSED AND TRIPPED OPERATIONS WHILE ON MANUAL. FOLLOW INSTRUCTIONS ON LABEL ADJACENT TO OPERATING HANDLE.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

PAD-MOUNTED VACUUM FAULT INTERRUPTER,  
200 AMPERE, SINGLE-PHASE (FRO)



**CAR** DWG. 28.02-01



**NOTES:**

1. MOUNT ON BOX CN 51352.
2. USE FACTORY SWITCH HANDLE TO OPERATE TRANSFER MANUALLY. 1/3 TURN TO RELOAD SPRING AND SLIGHT TURN TO TRIP.
3. MOTOR OPERATOR AND SOLID BLADES MUST BE IN SAME POSITION TO COUPLE.
4. CHECK WITH DISPATCHER ON POSITION OF LOCAL/REMOTE SWITCH.
5. TERMINATIONS CAN BE ENERGIZED WHEN SWITCH IS IN OPEN POSITION.
6. TO DISABLE OPERATION, PULL DOWN LOCK OUT LOG OUT MECHANISM AND PLACE LOCK.



USE PROPER SAFETY PROCEDURES AS OUTLINED IN ACCIDENT PREVENTION MANUAL OR SAFETY MANUAL. BEFORE WORKING ON SWITCHGEAR OR CABLE, GROUND IT.



REFER TO MANUFACTURER'S INSTRUCTIONS FOR SETUP. CONTROL SETTINGS TO BE SPECIFIED BY DESIGNER

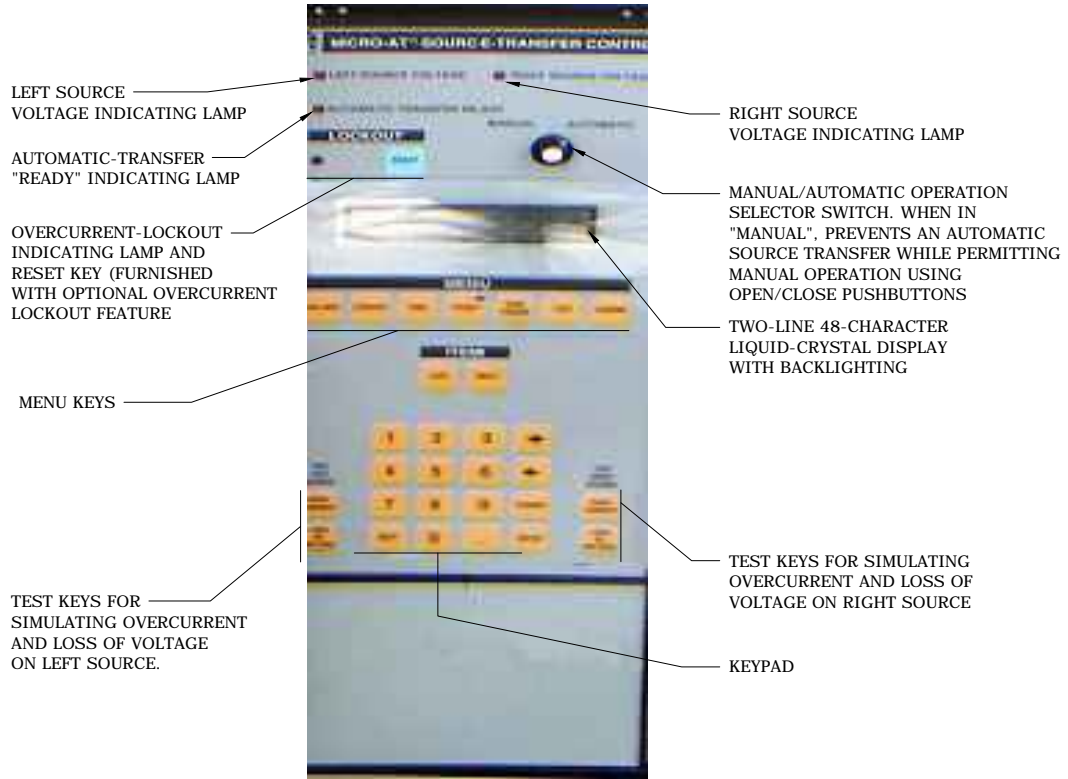
3				
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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

**AUTO TRANSFER**



**CAR**

DWG.  
28.03-01

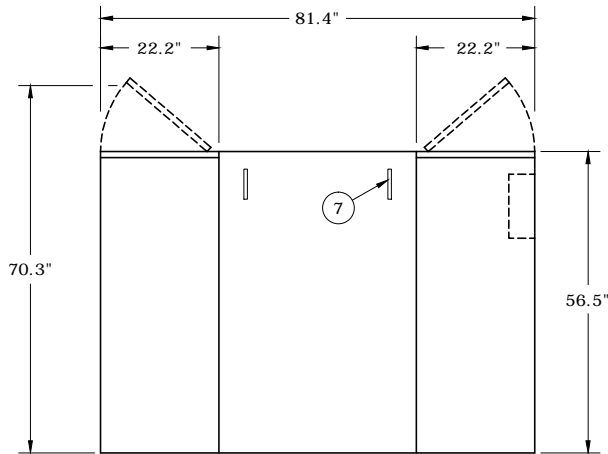
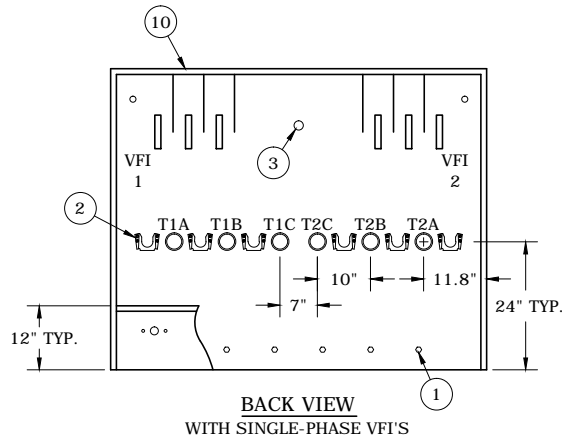
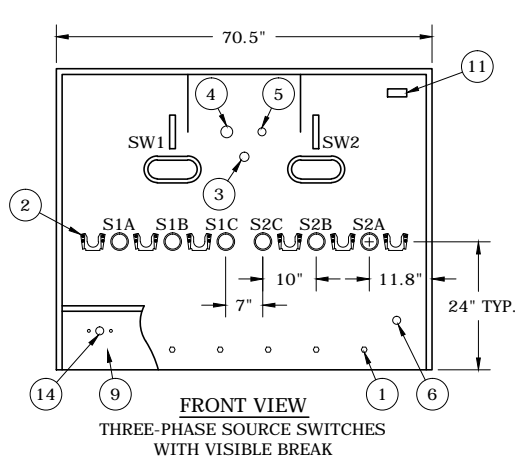


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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

MICRO-AT CONTROL

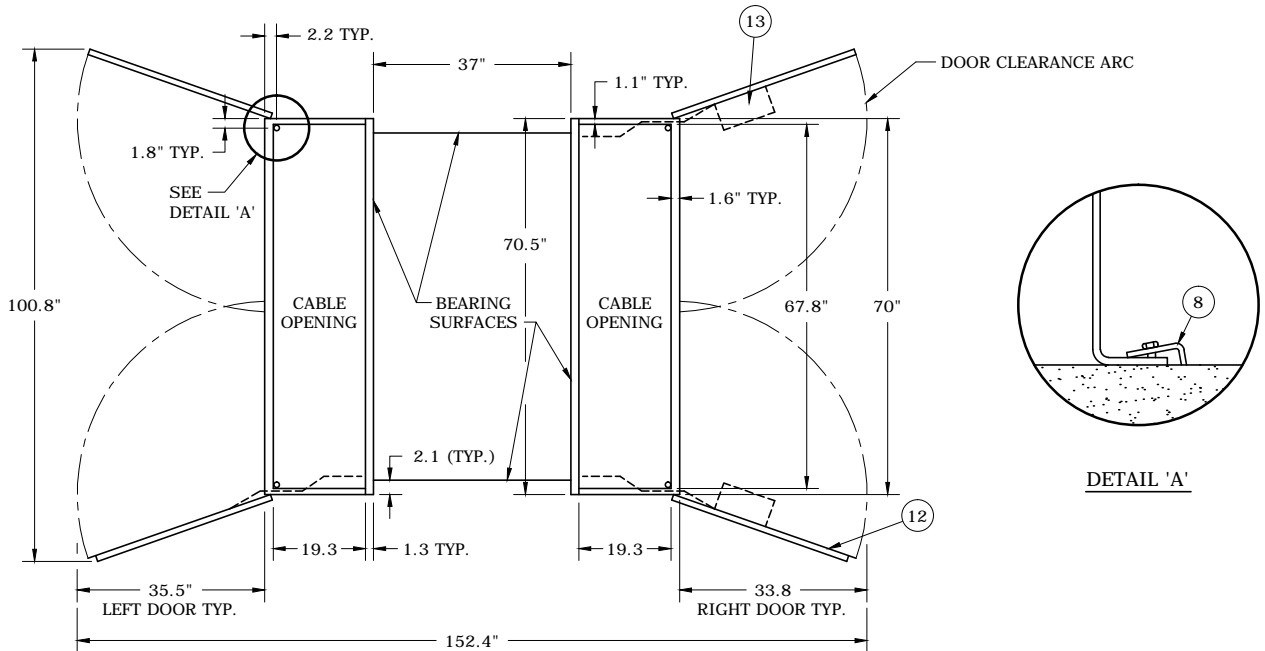


**PGN** DWG. 28.03-03



ITEM NO.	QUANTITY	DESCRIPTION
1	12	GROUND NUT, SS, 1/2-13 UNC
2	12	STANDOFF BRACKET
3	2	OIL SIGHT GAUGE
4	1	1" OIL FILL PLUG
5	1	PRESSURE RELIEF VALVE
6	1	1" OIL DRAIN PLUG WITH 3/8" SAMPLER
7	4	RECESSED LIFTING LUG
8	4	MOUNTING CLEAT
9	2	REMOVABLE SILL
10	1	BOLTED TOP COVER
11	1	NAMEPLATE
12	2	ONE-LINE DIAGRAM
13	2	CONTROL BOX
14	12	COVERED PROVISION FOR FAULT INDICATOR - 6 PER SILL

SIDE VIEW



BOTTOM VIEW

NOTES:

1. SEE DWGS 28.06-09B AND 28.06-09C FOR NOTES.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

COOPER PAD-MOUNTED SWITCHGEAR

VFI



CAR DWG. 28.06-09A

APPLICATION:

VFI-5, 9 AND PST (POWER SOURCE TRANSFER) ARE NON-STANDARD EQUIPMENT. CONSULT DISTRIBUTION STANDARDS FOR RECOMMENDATIONS.

INSTALLATION NOTES:

1. APPROXIMATE WEIGHT OF MILD STEEL COOPER VFI-9 IS 4500 LBS.
2. LIDS OF SOURCE AND TAP COMPARTMENTS MAY BE RAISED TO FACILITATE CABLE INSTALLATION.
3. INSTALL SIX SINGLE-PHASE FAULT INDICATORS ( CN 72) ON SOURCE SIDE.
4. SOURCE SIDE OF VFI-9 HAS 600 AMP BUSHINGS.
5. INSTALL STUD HAND TIGHT, THEN 1/4 TURN WITH WRENCH.
6. USE T-BODY (CN 11187309) TO TERMINATE BULK FEEDER CABLE.
7. INSTALL REDUCING TAP WELL (CN 11185501) AND BUSHING INSERT (CN 11186509) ON EACH T-BODY FOR TESTING AND GROUNDING. INSTALL 200 AMP LOAD BREAK INSULATED CAP ( CN 11186806) OR ELBOW ARRESTER AS INDICATED ON WORK REQUEST.
8. USE BUSHING ADAPTER (CN 11114501) AND ELBOW (CN 11186707) TO TERMINATE #1/0 CABLE ON SOURCE SIDE.
9. INSTALL BUSHING ADAPTER AND 200 AMP INSULATED CAP TO COVER UNUSED 600 AMP BUSHINGS.
10. TAP SIDE OF VFI-9 HAS 200 AMP BUSHING WELLS.
11. INSTALL BUSHING INSERT IN EACH BUSHING WELL.
12. USE ELBOW TO TERMINATE #1/0 CABLE ON TAP SIDE.
13. INSTALL 200 AMP INSULATED CAP TO COVER UNUSED BUSHING INSERTS.
14. THE VFI CONTROL IS POWERED BY INTERNAL CT'S. NO EXTERNAL POWER SOURCE IS REQUIRED.
15. APPLY STICK-ON COMPARTMENT LABELS PER THE ONE-LINE DIAGRAM.
16. WORKORDER PREPARER TO SET BREAKER BASED ON COORDINATION STUDY.

CONTROL SETTINGS:

1. STANDARD VFI-9 CONTROL COMES WITH EF TCC CARDS FOR PHASE AND GROUND.

GROUNDING:

A 1/2"-13" STAINLESS STEEL GROUND NUT IS PROVIDED FOR EACH BUSHING. BOND THE #2 BC GROUND WIRE TO THE TANK IN AT LEAST TWO LOCATIONS IN EACH COMPARTMENT. BOND ONE END OF EACH GROUND BRAID TO THE GROUND WIRE. CROSS BOND EACH GROUND BRAID USING THE OTHER END. GROUND THE CONCENTRIC NEUTRALS FROM EACH CABLE TO THE GROUND WIRE. IF THE CONCENTRIC NEUTRALS WILL NOT REACH, EXTEND THEM USING #4 CU MINIMUM FOR #1/0 CABLES AND SMALLER, #2 CU MINIMUM FOR #4/0 CABLES AND LARGER. FOR EASE OF OPERATION, SPIRAL THE GROUND BRAID OR CONCENTRIC NEUTRAL AROUND THE CABLE FROM THE BELOW THE ELBOW TO LEVEL WITH WITH THE GROUND WIRE.

3				
2				
1				
O	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

COOPER PAD-MOUNTED SWITCHGEAR

VFI



**CAR** DWG.  
28.06-09B

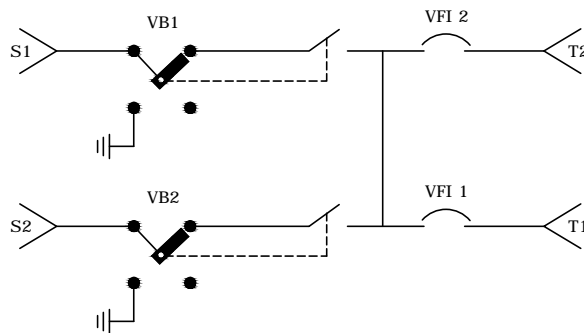


OPERATION NOTES:

1. CHECK OIL LEVEL GAUGE TO ENSURE PROPER OIL LEVEL. DO NOT OPERATE SWITCHGEAR WITH LOW OIL LEVEL.
2. DE-ENERGIZE SOURCE BUSHINGS BEFORE PLACING THE VISIBLE BREAK ACCESSORY SWITCH (VB1 OR VB2) INTO THE GROUND POSITION.
3. SOURCE'S YELLOW HANDLE (SW1 OR SW2) READS OPEN AND CLOSED.
4. WINDOWS TO VIEW VISIBLE BREAK ARE IN SOURCE COMPARTMENT. USE A FLASHLIGHT.
5. SOURCE SWITCH IS INTERLOCKED WITH VISIBLE BREAK SWITCH.
6. SOURCE SWITCH MUST BE OPENED BEFORE VISIBLE BREAK CAN BE OPENED.
7. VISIBLE BREAK MUST BE CLOSED BEFORE SOURCE SWITCH CAN BE CLOSED.
8. CABLE AND ELBOWS CAN BE ENERGIZED WHILE VISIBLE BREAK IS OPEN.
9. DO NOT ROTATE VISIBLE BREAK SWITCH CLOCKWISE FROM CLOSED POSITION. THIS WILL OPEN THE SOURCE SWITCH.
10. TAP'S YELLOW HANDLE (VFI1 OF VFI2) READS OPEN, TRIPPED, AND CLOSED.
11. TRIPPED BREAKER MUST BE OPENED TO COCK MECHANISM BEFORE CLOSING.
12. IF A FAULT IS PRESENT WHEN THE BREAKER IS CLOSED. THE TRIP FREE MECHANISM WILL PREVENT THE MECHANISM FROM BEING HELD IN THE CLOSED POSITION.
13. USE AN INSULATED STICK TO OPERATE SWITCHES. ATTEMPTING TO MOVE ONE OF THE YELLOW HANDLES BY HAND MAY RESULT IN INJURY.

MAINTENANCE:

1. VFI IS OIL INSULATED.
2. PERFORM A VISUAL INSPECTION AROUND THE SWITCHGEAR FOR POSSIBLE OIL LEAKS.
3. CHECK FLUID LEVEL USING OIL SIGHT GAUGE.



VFI-9  
ONE-LINE DIAGRAM

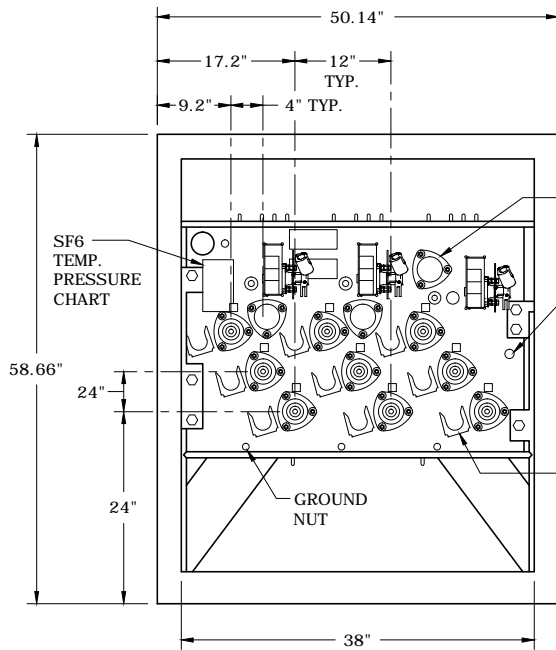
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REVISED	BY	CK'D	APPR.	

COOPER PAD-MOUNTED SWITCHGEAR

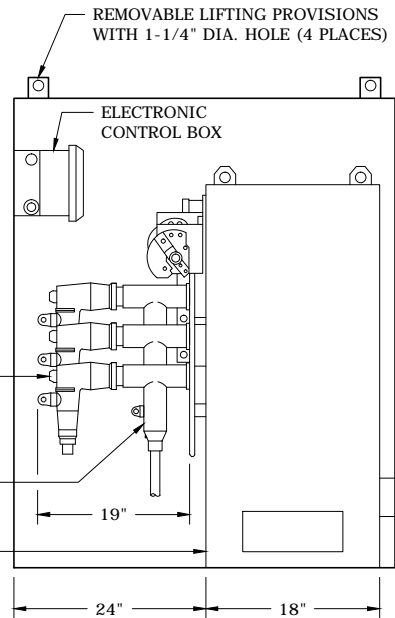
VFI



**CAR** DWG.  
28.06-09C



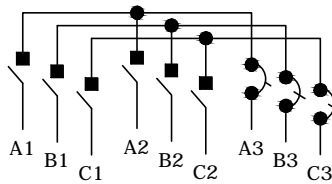
FRONT VIEW



SIDE VIEW

SWITCHGEAR  
 CU SGGW63WVT25C  
 CN 9220189607

VAULT PAD  
 CU PADSWGFBGWCWS  
 CN 9220189325



THREE LINE DIAGRAM

NOTES:

1. USE VAULT PAD CU PADSWGFBGWCWS (SEE DWG. 24.03-08) WITH THIS SWITCHGEAR.
2. THE SWITCH IS SET UP AS APPROVED BUT NOT STOCKED. THE UNIT SET UP FOR PURCHASE HAS 600 AMP APPARATUS BUSHINGS ON THE FEED AND SUPPLY SIDE WITH A 30-600 AMP TRIP COIL. THE SWITCH MAY BE SPECIAL ORDERED WITH 200 AMP BUSHING WELLS ON THE FEED AND SUPPLY SIDE WITH A 15-300 AMP TRIP COIL. IF 200 BUSHING WELLS AND 15-300 TRIP COIL IS DESIRED, IT MUST BE STATED ON THE PURCHASE REQUEST.
3. 600 AMP T-BODIES USED TO CONNECT SWITCH ARE NON-LOADBREAK (NO VOLTAGE AND NO CURRENT).
4. ELBOW ARRESTERS CAN BE INSTALLED ON BACK OF 600 AMP T-BODY AS REQUIRED IN GEAR WITH A NORMAL OPEN SWITCH. NO ARRESTERS REQUIRED WHEN THERE IS NO OPEN SWITCH.
5. CROSS BOND EACH SET OF THREE-PHASE CABLES, AND CONNECT TO A #2 BARE COPPER GROUND LOOP THAT IS CONNECTED TO A DEEP DRIVEN GROUND ROD. CONNECT SWITCH GROUNDING PAD TO THE GROUND LOOP USING A #2 BARE COPPER JUMPER.
6. IF FAULT INDICATORS ARE REQUIRED, USE LARGE THREE-PHASE FAULT INDICATOR ( CN 22001309).
7. THE INTERNAL BODY OF THE SWITCHGEAR MUST BE PLACED AT THE EDGE OF THE OPENING IN THE PAD TO ENSURE THERE IS NO RESTRICTION OF THE ELBOWS WHEN THEY ARE PLACED ON THE APPARATUS BUSHINGS.
8. COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS FOR THE SWITCHGEAR ARE INCLUDED IN THE PROGRESS ENERGY OPERATIONS MANUAL.
9. ARRESTER INSTALLATION: WHEN A SWITCHGEAR HAS A NORMALLY OPEN SWITCH, ARRESTERS ARE TO BE INSTALLED ON THE CABLE CONNECTED TO THE OPEN SWITCH AND ON ONE ADDITIONAL 600 AMP WAY (TOTAL 6 ARRESTERS). WHEN A SWITCHGEAR HAS ONLY NORMALLY CLOSED SWITCHES, NO ARRESTERS ARE REQUIRED. ARRESTERS ARE ONLY REQUIRED WHERE AN OPEN SWITCH EXISTS.

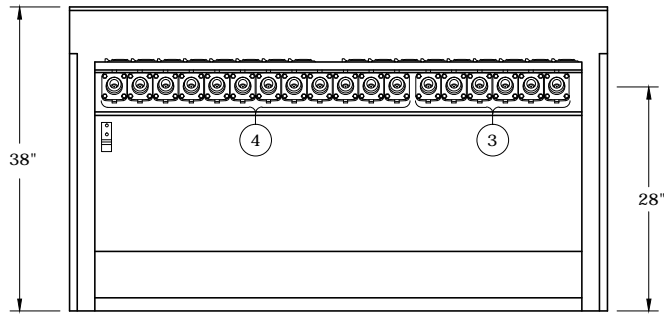
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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

G&W THREE-WAY SWITCHGEAR WITH  
 ELECTRONIC LOAD AND FAULT PROTECTION



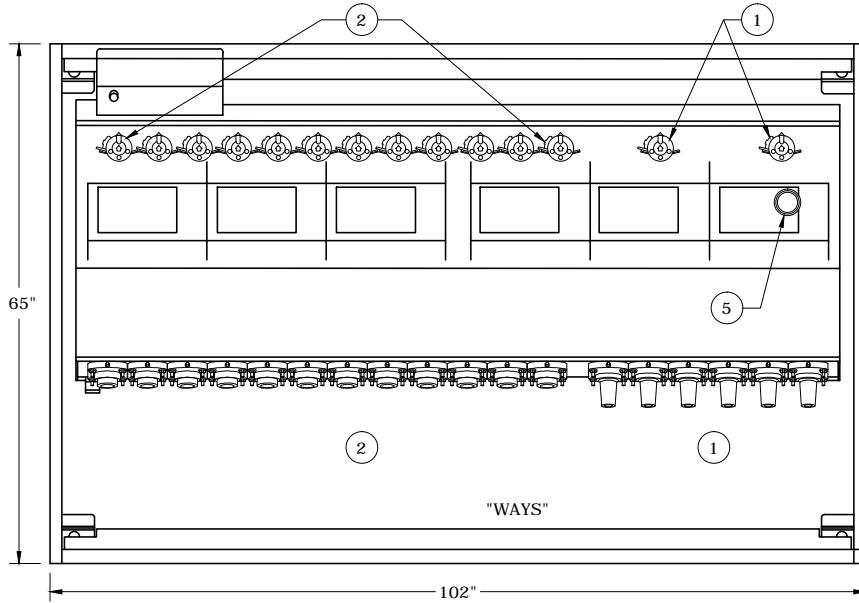
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 28.06-10



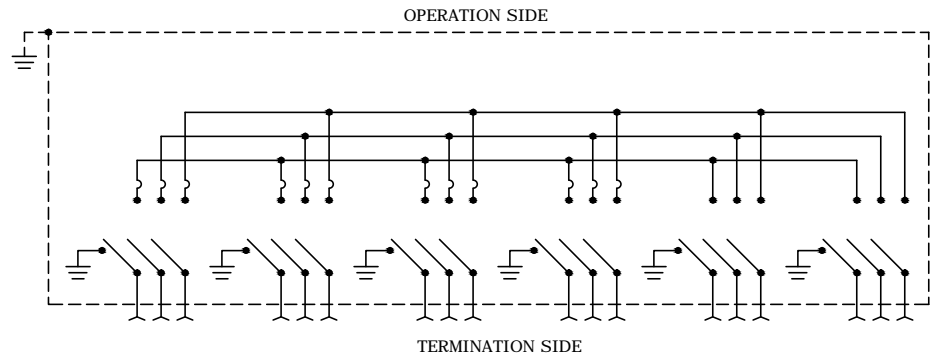
SECTIONAL OPEN TERMINATION VIEW

ITEM NUMBER	ITEM DESCRIPTION
1	600 AMP THREE-PHASE LOAD INTERRUPTER SWITCH WITH GROUND POSITION
2	200 AMP SINGLE-PHASE MANUAL FAULT INTERRUPTER WITH 3 POSITION SWITCH (CLOSED-OPEN-GROUND).
3	600 AMP BUSHING FOR LOAD INTERRUPTER SWITCH
4	200 AMP BUSHING WELLS FOR VFI FAULT INTERRUPTER
5	SF-6 GAUGE



MODEL 624  
CN 9220263524

SECTIONAL OPEN TOP VIEW



TERMINATION SIDE 3-LINE DIAGRAM

NOTES:

- ON 600 SWITCHED WAY, USE 600A BOLTED ELBOW (T-BODY).
- T-BODY IS NON-LOADBREAK: NO VOLTAGE AND NO CURRENT.
- THE SOLID BLADE SWITCH HAS THREE-POSITIONS: OPEN, CLOSED AND GROUND.
- LOOK THROUGH WINDOW FOR VISUAL POSITIONS OF SWITCH LOCATED ON OPERATION SIDE OF SWITCHGEAR.
- TANK CONTAINS SF-6 GAS, CHECK GAUGE BEFORE OPERATION.
- CROSS BOND EACH SET OF THREE-PHASE CABLES AND CONNECT TO A #2 BARE COPPER GROUND LOOP THAT IS CONNECTED TO A DEEP DRIVEN GROUND ROD. CONNECT SWITCH GROUNDING PAD TO THE GROUND LOOP USING A #2 BARE COPPER JUMPER.
- ARRESTER INSTALLATION: WHEN A SWITCHGEAR HAS A NORMALLY OPEN SWITCH, ARRESTERS ARE TO BE INSTALLED ON THE CABLE CONNECTED TO THE OPEN SWITCH AND ON ONE ADDITIONAL 600 AMP WAY (TOTAL 6 ARRESTERS). WHEN A SWITCHGEAR HAS ONLY NORMALLY CLOSED SWITCHES NO ARRESTERS ARE REQUIRED. ARRESTERS ARE ONLY REQUIRED WHERE AN OPEN SWITCH EXISTS.

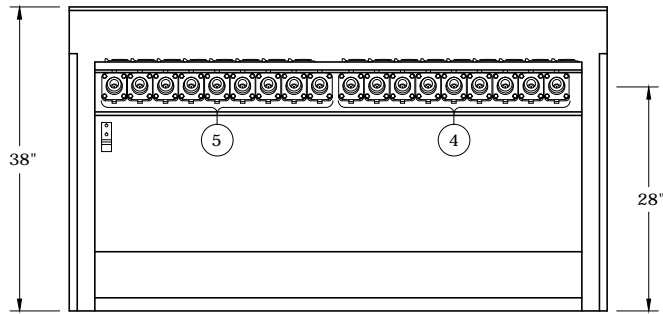
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STANDARD VISTA MODEL 624  
25 KV PAD-MOUNTED SWITCHGEAR



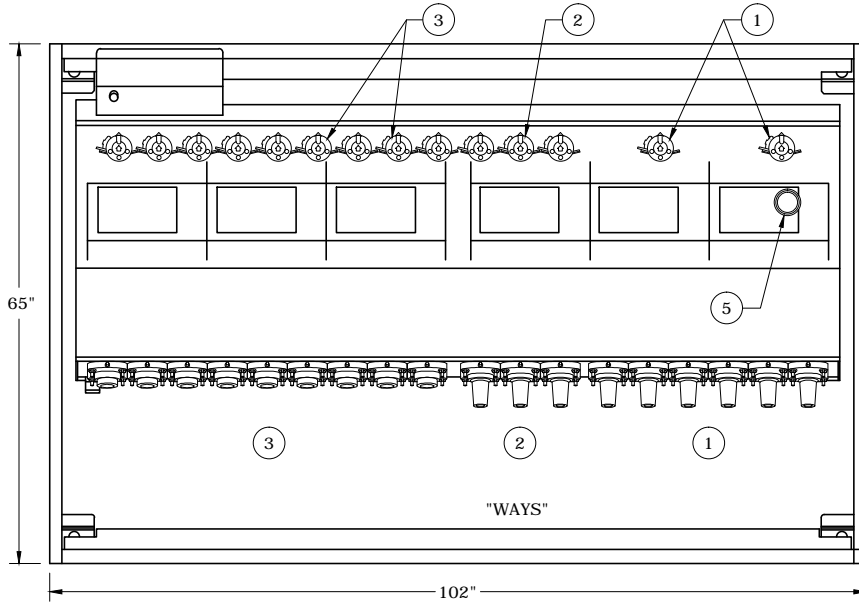
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28.07-02



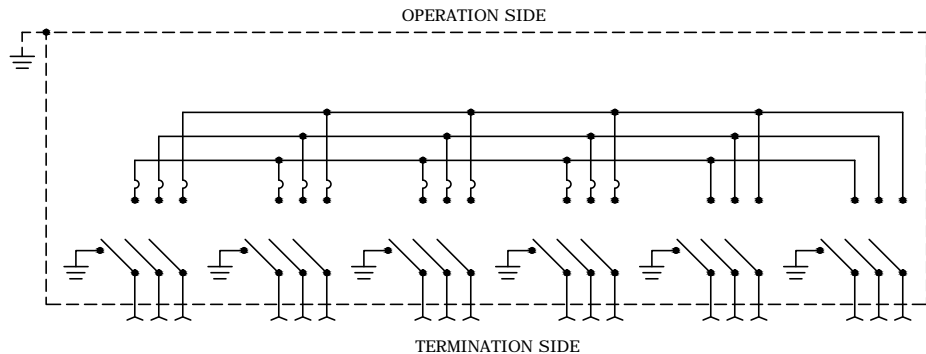
SECTIONAL OPEN TERMINATION VIEW

ITEM NUMBER	ITEM DESCRIPTION
1	600 AMP THREE-PHASE LOAD INTERRUPTER SWITCH WITH GROUND POSITION
2	600 AMP TAP. EACH PHASE INDIVIDUALLY VFI PROTECTED (CLOSED-OPEN-GROUND)
3	200 AMP SINGLE-PHASE MANUAL FAULT INTERRUPTER WITH 3 POSITION SWITCH (CLOSED-OPEN-GROUND).
4	600 AMP BUSHING FOR LOAD INTERRUPTER SWITCH
5	200 AMP BUSHING WELLS FOR VFI FAULT INTERRUPTER
6	SF-6 GAUGE



MODEL 624  
CN 9220109823  
CU SGVISTA624SS25C

SECTIONAL OPEN TOP VIEW



TERMINATION SIDE 3-LINE DIAGRAM

NOTES:

- ON 600 SWITCHED WAY, USE 600A BOLTED ELBOW (T-BODY).
- T-BODY IS NON-LOADBREAK: NO VOLTAGE AND NO CURRENT.
- THE SOLID BLADE SWITCH HAS THREE-POSITIONS: OPEN, CLOSED AND GROUND.
- LOOK THROUGH WINDOW FOR VISUAL POSITIONS OF SWITCH LOCATED ON OPERATION SIDE OF SWITCHGEAR.
- TANK CONTAINS SF-6 GAS, CHECK GAUGE BEFORE OPERATION.
- CROSS BOND EACH SET OF THREE-PHASE CABLES AND CONNECT TO A #2 BARE COPPER GROUND LOOP THAT IS CONNECTED TO A DEEP DRIVEN GROUND ROD. CONNECT SWITCH GROUNDING PAD TO THE GROUND LOOP USING A #2 BARE COPPER JUMPER.
- ARRESTER INSTALLATION: WHEN A SWITCHGEAR HAS A NORMALLY OPEN SWITCH, ARRESTERS ARE TO BE INSTALLED ON THE CABLE CONNECTED TO THE OPEN SWITCH AND ON ONE ADDITIONAL 600 AMP WAY (TOTAL 6 ARRESTERS). WHEN A SWITCHGEAR HAS ONLY NORMALLY CLOSED SWITCHES NO ARRESTERS ARE REQUIRED. ARRESTERS ARE ONLY REQUIRED WHERE AN OPEN SWITCH EXISTS.

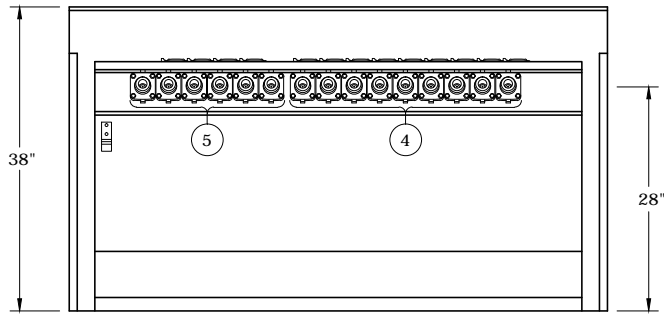
3				
2				
1				
0	12/6/13	ROBESON	GUINN	ADCOCK
REVISED	BY	CK'D	APPR.	

MODIFIED VISTA MODEL 624  
25 KV PAD-MOUNTED SWITCHGEAR



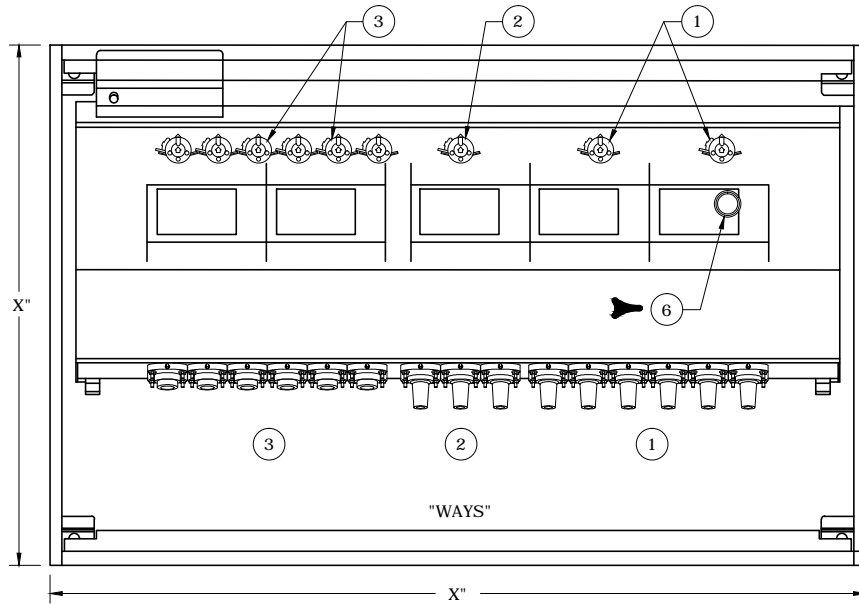
CAR

DWG.  
28.07-03



SECTIONAL OPEN TERMINATION VIEW

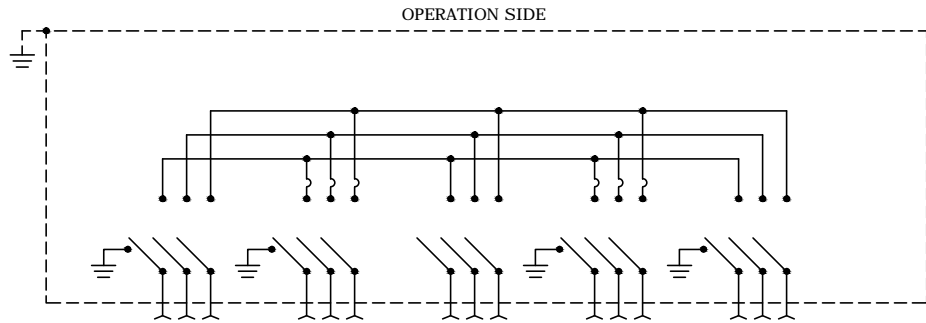
ITEM NUMBER	ITEM DESCRIPTION
1	600 AMP THREE-PHASE LOAD INTERRUPTER SWITCH WITH GROUND POSITION
2	MANUAL TIE SWITCH
3	200 AMP SINGLE-PHASE MANUAL FAULT INTERRUPTER WITH 3 POSITION SWITCH (CLOSED-OPEN-GROUND).
4	600 AMP BUSHING FOR LOAD INTERRUPTER AND TIE SWITCH
5	200 AMP BUSHING WELLS FOR VFI FAULT INTERRUPTER
6	SF-6 GAUGE



MODEL 532  
 CN 9220275783  
 CU SGVISTA53225C

SECTIONAL OPEN TOP VIEW

PAD VAULT FOR VISTA 532  
 CN 9220276324  
 CU PADSWGFBBCVST5C



TERMINATION SIDE 3-LINE DIAGRAM

NOTES:

- ON 600A SWITCHED WAY, USE 600A BOLTED ELBOW (T-BODY).
- T-BODY IS NON-LOADBREAK: NO VOLTAGE AND NO CURRENT.
- THE SOLID BLADE SWITCH HAS THREE-POSITIONS: OPEN, CLOSED AND GROUND.
- LOOK THROUGH WINDOW FOR VISUAL POSITIONS OF SWITCH LOCATED ON OPERATION SIDE OF SWITCHGEAR.
- TANK CONTAINS SF-6 GAS, CHECK GAUGE BEFORE OPERATION.
- CROSS BOND EACH SET OF THREE-PHASE CABLES AND CONNECT TO A #2 BARE COPPER GROUND LOOP THAT IS CONNECTED TO A DEEP DRIVEN GROUND ROD. CONNECT SWITCH GROUNDING PAD TO THE GROUND LOOP USING A #2 BARE COPPER JUMPER.
- ARRESTER INSTALLATION: WHEN A SWITCHGEAR HAS A NORMALLY OPEN SWITCH, ARRESTERS ARE TO BE INSTALLED ON THE CABLE CONNECTED TO THE OPEN SWITCH AND ON ONE ADDITIONAL 600 AMP WAY (TOTAL 6 ARRESTERS). WHEN A SWITCHGEAR HAS ONLY NORMALLY CLOSED SWITCHES NO ARRESTERS ARE REQUIRED. ARRESTERS ARE ONLY REQUIRED WHERE AN OPEN SWITCH EXISTS.

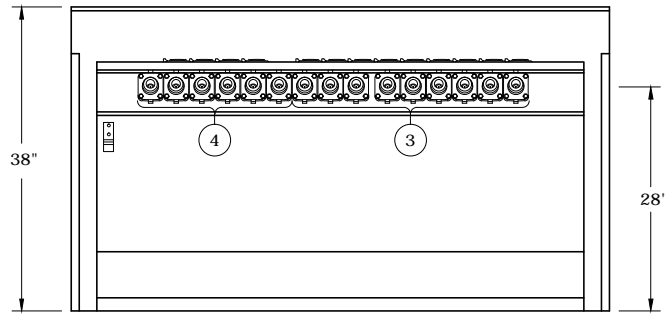


DEC	DEM	DEP	DEF
		X	

28.07-05

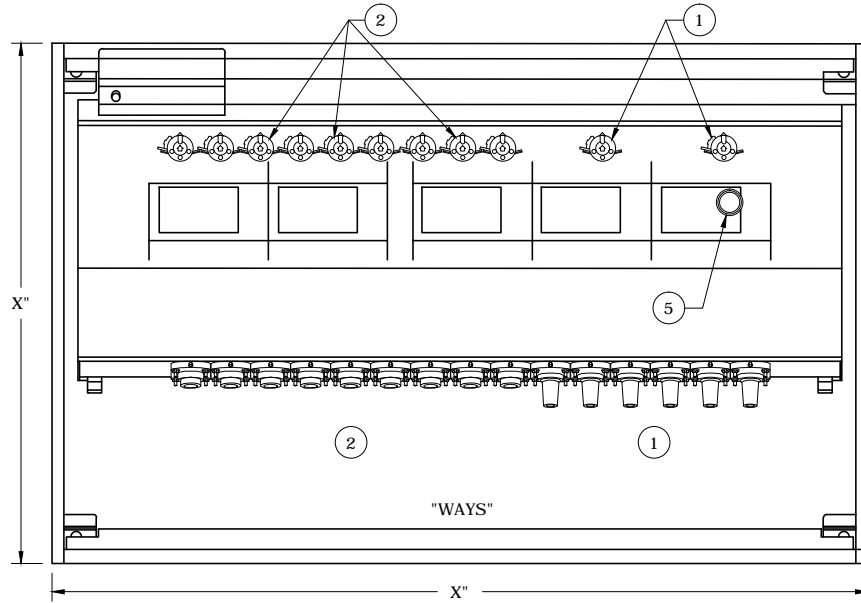
3				
2				
1	1/30/15	ROBESON	EANES	ADCOCK
0	12/6/13	ROBESON	GUINN	ADCOCK
REVISED	BY	CK'D	APPR.	

VISTA MODEL 532 25 KV PAD-MOUNTED SWITCHGEAR



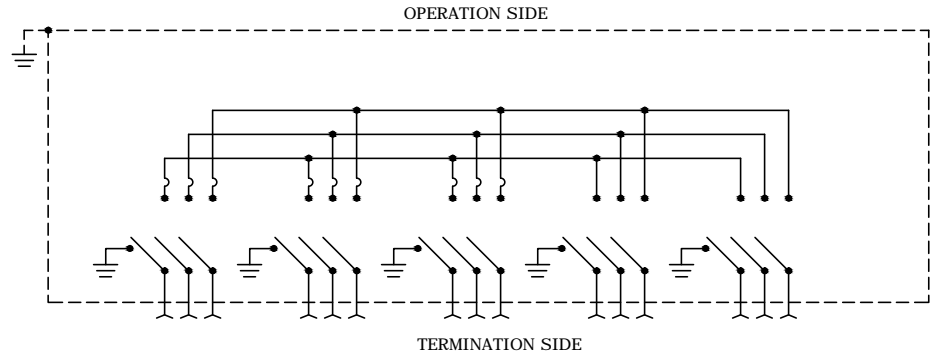
SECTIONAL OPEN TERMINATION VIEW

ITEM NUMBER	ITEM DESCRIPTION
1	600 AMP THREE-PHASE LOAD INTERRUPTER SWITCH WITH GROUND POSITION
2	200 AMP SINGLE-PHASE MANUAL FAULT INTERRUPTER WITH 3 POSITION SWITCH (CLOSED-OPEN-GROUND).
3	600 AMP BUSHING FOR LOAD INTERRUPTER
4	200 AMP BUSHING WELLS FOR VFI FAULT INTERRUPTER
5	SF-6 GAUGE



MODEL 523  
ITEM # 9220256279  
CU SGVISTA52325C

SECTIONAL OPEN TOP VIEW



TERMINATION SIDE 3-LINE DIAGRAM

NOTES:

- ON 600 SWITCHED WAY, USE 600A BOLTED ELBOW (T-BODY).
- T-BODY IS NON-LOADBREAK: NO VOLTAGE AND NO CURRENT.
- THE SOLID BLADE SWITCH HAS THREE-POSITIONS: OPEN, CLOSED AND GROUND.
- LOOK THROUGH WINDOW FOR VISUAL POSITIONS OF SWITCH LOCATED ON OPERATION SIDE OF SWITCHGEAR.
- TANK CONTAINS SF-6 GAS, CHECK GAUGE BEFORE OPERATION.
- CROSS BOND EACH SET OF THREE-PHASE CABLES AND CONNECT TO A #2 BARE COPPER GROUND LOOP THAT IS CONNECTED TO A DEEP DRIVEN GROUND ROD. CONNECT SWITCH GROUNDING PAD TO THE GROUND LOOP USING A #2 BARE COPPER JUMPER.
- ARRESTER INSTALLATION: WHEN A SWITCHGEAR HAS A NORMALLY OPEN SWITCH, ARRESTERS ARE TO BE INSTALLED ON THE CABLE CONNECTED TO THE OPEN SWITCH AND ON ONE ADDITIONAL 600 AMP WAY (TOTAL 6 ARRESTERS). WHEN A SWITCHGEAR HAS ONLY NORMALLY CLOSED SWITCHES NO ARRESTERS ARE REQUIRED. ARRESTERS ARE ONLY REQUIRED WHERE AN OPEN SWITCH EXISTS.



3				
2				
1	3/31/16	ROBESON	EANES	ADCOCK
0	12/6/13	ROBESON	GUINN	ADCOCK
REVISED	BY	CK'D	APPR.	

VISTA MODEL 523 25 KV PAD-MOUNTED SWITCHGEAR

DEC	DEM	DEP	DEF
		X	

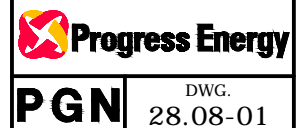
28.07-06

ALTERNATIVES TO LIVE FRONT SWITCHGEAR REPLACEMENT

1. REVIEW OUTAGE AND INFRARED DATA TO IDENTIFY CRITICAL COMPONENTS.
2. REVIEW S&C PMH SERVICE PUBLICATION.
3. LIGHTNING ARRESTERS
  - A. REMOVE OR REPLACE LIGHTNING ARRESTERS THAT HAVE ISOLATORS.
  - B. REMOVE LIGHTNING ARRESTERS FROM SWITCHGEAR THAT IS NOT A NORMAL OPENING POINT.
  - C. FOR SWITCHGEAR THAT CANNOT BE DE-ENERGIZED WITHOUT A CUSTOMER OUTAGE, CUT AND REMOVE ARRESTER LEAD FROM SWITCHGEAR THAT IS NOT A NORMAL OPENING POINT.
  - D. REPLACE LIGHTNING ARRESTERS IN SWITCHGEAR THAT IS A NORMAL OPENING POINT.
  - E. FOR SWITCHGEAR THAT CANNOT BE DE-ENERGIZED WITHOUT A CUSTOMER OUTAGE, CUT AND REMOVE ARRESTER LEAD FROM SWITCHGEAR THAT IS A NORMAL OPENING POINT. INSTALL SCOUT ARRESTERS IN LIEU OF ARRESTERS IN THIS SWITCHGEAR.
    - I. SCOUT ARRESTER LOCATIONS.
      1. INSTALL AN ELBOW ARRESTER IN THE FIRST PAD-MOUNTED TRANSFORMER FROM EACH EACH FUSE OF SWITCHGEAR.
      2. INSTALL LINE ARRESTERS AND ASSOCIATED GROUND RODS ON FIRST PRIMARY POLE ON EACH SIDE OF EACH FEEDER RISER POLE.
4. TERMINATORS
  - A. REPLACE TERMINATORS TOUCHING BARRIER BOARDS. CABLE SPLICE MAY BE REQUIRED TO PROPERLY POSITION TERMINATOR.
  - B. REPLACE TERMINATORS WITH VISIBLE TRACKING.
  - C. REPLACE TERMINATORS WITH AUDIBLE TRACKING.
  - D. REPLACE TERMINATORS WITH SPLIT SHEDS, SURFACE CRACKING, OR OTHER VISIBLE DAMAGE.
  - E. REPLACE TERMINATORS WITH ORGANIC GROWTH.
  - F. REMOVE, BRUSH AND REINSTALL HEATING SPADES.
5. FUSES
  - A. IF FUSES ARE SEALED IN PLASTIC AND DRY, OK TO USE.
  - B. IF FUSES ARE NOT SEALED IN PLASTIC OR WET, SCRAP.
6. FUSE HOLDERS
  - A. REPLACE FUSE HOLDERS THAT ARE NO LONGER TRANSPARENT.
  - B. REPLACE FUSE HOLDERS THAT NO LONGER HAVE A SMOOTH FINISH ON FIBERGLASS TUBE.
  - C. REPLACE FUSE HOLDERS WITH RUSTED END FITTINGS.
7. BARRIER BOARDS
  - A. REPLACE MISSING BARRIER BOARDS.
  - B. POSITION BARRIER BOARDS PROPERLY.
  - C. VERIFY FRONT BARRIER BOARDS ARE LEFT IN 'VERTICAL' (NOT 'SLIDE') POSITION .
  - D. REPLACE DISCOLORED AND DAMAGED BARRIER BOARDS.
8. SWITCHGEAR
  - A. REMOVE VEGETATION FROM INSIDE SWITCHGEAR.
  - B. REMOVE OR PRUNE VEGETATION TOUCHING OUTSIDE OF SWITCHGEAR.
  - C. REMOVE OR PRUNE VEGETATION INTERFERING WITH SAFE OPERATION OF SWITCHGEAR.
  - D. REMOVE DEBRIS FROM TOP OF SWITCHGEAR.
  - E. ADD FIRE ANT KILLER INSIDE SWITCHGEAR.
  - F. INSTALL ADDITIONAL VENTILATION IN SWEATING SWITCHGEAR.
  - G. REPLACE SWITCHGEAR WITH SOOT FROM PREVIOUS FAULT.
  - H. REPLACE SWITCHGEAR WITH ORGANIC GROWTH ON INSULATORS.
  - I. REPLACE SWITCHGEAR WITH VISIBLE DAMAGE TO INSULATORS.
  - J. REPLACE SWITCHGEAR WITH DETERIORATED OR DAMAGED ARC CHUTES ON SWITCH SIDE.
  - K. REPLACE SWITCHGEAR WITH CABINET RUST THROUGH.

3				
2				
1	8/27/12	ROBESON	BURLISON	ELKINS
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

ALTERNATIVES TO LIVE  
FRONT SWITCHGEAR REPLACEMENT





NOTES:

1. LIVE FRONT CONSTRUCTION.
2. TORQUE BOLTS WITH BELLEVILLE WASHERS AT 40 FOOT-POUNDS.
3. USE LARGE FAULT INDICATORS.
4. TRAIN CABLE SO TERMINATOR DOES NOT TOUCH (RED) BARRIER BOARD.
5. TERMINATION CAN BE ENERGIZED WHEN SWITCH IS IN OPEN POSITION.
6. FITS MOUNTING BOX CN 51352.
7. BARRIER BOARDS SHALL BE LEFT IN VERTICAL POSITION BEFORE CLOSING/ LOCKING DOORS.



USE PROPER SAFETY PROCEDURES AS OUTLINED IN ACCIDENT PREVENTION MANUAL OR SAFETY MANUAL. BEFORE WORKING ON SWITCHGEAR OR CABLE, GROUND IT.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

PAD-MOUNTED SWITCHGEAR - PMH  
600A AIR BREAK SWITCH



**CAR**

DWG.  
28.08-03

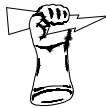


MOVE ALL BARRIER BOARDS  
TO VERTICAL POSITION BEFORE  
CLOSING/ LOCKING DOORS.



NOTES:

1. LIVE FRONT CONSTRUCTION.
2. TORQUE BOLTS WITH BELLEVILLE WASHERS AT 40 FOOT-POUNDS.
3. TRAIN CABLES SO TERMINATOR DOES NOT TOUCH (RED) BARRIER BOARD.
4. CAN USE S&C FUSE SML-20 OR SML-4Z DEPENDING ON FUSE HOLDER. UNITS PURCHASED SINCE AUGUST 1998 REQUIRE SML-20 FUSE.
5. TERMINATOR CAN BE ENERGIZED WHEN SWITCH IS IN OPEN POSITION.
6. BARRIER BOARDS SHALL BE LEFT IN VERTICAL POSITION BEFORE CLOSING/ LOCKING DOORS.



USE PROPER SAFETY PROCEDURES AS OUTLINED  
IN ACCIDENT PREVENTION MANUAL OR SAFETY  
MANUAL.  
BEFORE WORKING ON SWITCHGEAR OR CABLE,  
GROUND IT.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

PAD-MOUNTED SWITCHGEAR - PMH  
FUSE BAYS



**CAR**

DWG.  
28.08-05

THE FOLLOWING PREVENTATIVE MAINTENANCE IS RECOMMENDED FOR LONG LIFE AND INCREASED RELIABILITY OF THE LIVE FRONT AIR-BREAK PAD-MOUNTED SWITCHGEAR:

**CAUTION:** BEFORE PROCEEDING MAKE CERTAIN THAT THE PAD-MOUNTED GEAR IS COMPLETELY DE-ENERGIZED AND PROPERLY GROUNDED IN ACCORDANCE WITH THE SAFETY MANUAL.

1. EXERCISE THE MINI-RUPTER SWITCHES BY OPENING AND CLOSING THEM AT LEAST 2 TIMES.
2. INSPECTION OF MINI-RUPTER SWITCH CONTACTS. AFTER OPERATION OF THE MINI-RUPTER, INSPECT THE SWITCH BLADES AND ROTATING HINGE CONTACTS FOR GALLING. IF GALLED, CLEAN THESE COMPONENTS WITH A CLEAN DRY CLOTH. DRESS GALLED AREAS SMOOTH WITH A FINE FILE. IF THE CONTACT SURFACES ARE SEVERELY GALLED OR WORN THEY SHOULD BE REPLACED AND OTHER COMPONENTS (JAW CONTACTS, ARC COMPRESSOR, CONTACT COVER ASSEMBLY AND TERMINAL ASSEMBLIES) SHOULD BE INSPECTED FOR POSSIBLE REPLACEMENT. AFTER DRESSING, LUBRICATE THE BLADES AND CONTACTS WITH A FILM OF VASELINE OR CONTACT DISTRIBUTION STANDARDS (NYE RHEOLUBE 368). AVOID EXCESSIVE LUBRICATION. DO NOT USE ANY SOLVENTS ON MINI-RUPTER ARC COMPRESSOR.
3. TOUCH UP ENCLOSURE PAINT FINISH WHERE NECESSARY. AEROSOL PAINT KITS ARE AVAILABLE FROM S&C ELECTRIC COMPANY. THE RED-OXIDE PRIMER IS CN 30245302 AND THE OLIVE GREEN (MUNSELL 7GY3.29/1.5) FINISH IS CN 30246300.
4. CLEANING OF INSULATORS AND BARRIERS AT INTERVALS BASED ON ENVIRONMENTAL CONDITION. THE EXPERIENCE OF THE SUPPLIERS SHOW THAT PAD-MOUNTED GEAR IN "NORMAL" ENVIRONMENTS NEED CLEANING ONLY RARELY - AT INTERVALS TYPICALLY LONGER THAN TEN YEARS. WHEN THE NEED FOR PREVENTIVE MAINTENANCE CLEANING ARISES, THE PAD-MOUNTED GEAR SHOULD BE TAKEN OUT OF SERVICE AND CLEANED BY HAND. CLEANING USING PRESSURE SPRAY ABRASIVES OF ANY TYPE IS NOT RECOMMENDED. MILD SOAP AND WATER OR A MINERAL SPIRITS SOLVENT SHOULD BE USED TO CLEAN BARRIERS AND INSULATORS. IF USING MINERAL SPIRITS MAKE SURE THERE IS ADEQUATE VENTILATION MAKING SURE NONE GETS ON THE MINI-RUPTER ARC COMPRESSOR. DRY ALL CLEANED PARTS WITH A CLEAN CLOTH.
5. ANY FOLIAGE, SUCH AS GRASS OR WEEDS, SHOULD BE REMOVED FROM INSIDE THE GEAR.
6. FUSES  
ENSURE THE FUSES ARE COMPLETELY CLOSED SO THAT THEY CAN BREAK LOAD AS DESIGNED.
7. CABLE TERMINATOR/ENERGIZED PARTS CLEARANCES  
THE TERMINATORS SHOULD COME DIRECTLY TO THE SWITCH TERMINALS AND SHOULD NOT BE BENT. THE TERMINATOR SKIRTS SHOULD HAVE A MINIMUM CLEARANCE OF 1-1/4" TO THE BARRIERS. OTHER ENERGIZED PARTS SHOULD HAVE A MINIMUM CLEARANCE OF 2-1/4" TO THE BARRIER.
8. CHECK FOR TRACKING ON THE BARRIERS  
IF EVIDENCE OF TRACKING EXIST, DETERMINE CAUSE AND CORRECT. IF DAMAGE TO BARRIERS IS EXTENSIVE, REPLACE.
9. BARRIER BOARDS SHALL BE LEFT IN THE VERTICAL POSITION (NOT IN THE 'SLIDE' POSITION) BEFORE CLOSING/ LOCKING DOORS.
10. BARRIERS  
LOCK BARRIERS IN PLACE.
11. CHECK SAFETY MECHANISMS/FEATURES: (IE. BOLT LOCKING HASP, HINGES, ETC.)

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

INSPECTION/PREVENTATIVE MAINTENANCE FOR  
LIVE FRONT AIRBREAK PAD-MOUNTED SWITCHGEAR



**CAR**

DWG.  
28.10-01

LIVE FRONT SWITCHGEAR INSPECTION

1. BARRIER BOARDS
  - A. INTACT
  - B. HARDWARE NOT LOOSE
  - C. BOARDS ARE NOT WICKING (GETTING MOISTURE INSIDE BOARDS) OR COMING APART
  - D. CHECK INDIVIDUAL PHASE DIVIDER BARRIERS
  - E. LOOK FOR TRACKING OF ELECTRICITY ALONG BARRIERS/BOARDS
2. CHECK FOR CONTAMINATION
  - A. SEE HEAVY WHITE POWER RESIDUE ON PIECES OF EQUIPMENT
3. CHECK FOR PROPER CABLE TRAINING
4. NEUTRALS AND GROUNDS ATTACHED/CORRODED
5. ANY APPARENT HARDWARE PROBLEMS
6. CHECK INSULATORS ON SWITCH CAM
  - A. NOT CONTAMINATED
  - B. NOT CHIPPED, CRACKED, OR DAMAGED
7. CHECK ARRESTERS
  - A. NO ARRESTERS WITH ISOLATORS
  - B. WIRE CONNECTED
  - C. PORCELAIN
    - I. CRACKED
    - II. BROKEN
  - D. POLYMER
    - I. NOT CONTAMINATED
    - II. NOT DAMAGED
8. CHECK FOR LATCH OPERATING PROPERLY
9. CHECK FOR PADLOCKS ON ALL DOORS AND SWITCH HANDLES
10. CHECK THAT SWITCH BLADES ARE NOT BURNED OR DISCOLORED (OPEN POSITION ONLY)
11. CHECK THAT ARC CHUTES ARE NOT BURNED, CONTAMINATED OR PRESENCE OF OZONE (CHALKY WHITE) DETERIORATION
12. LOOK FOR TRACKING OF TERMINATIONS
13. CHECK FOR PROPER SPACING BETWEEN TERMINATORS AND BARRIER BOARDS
  - A. 15 KV
    - I. 1 INCH FROM ENERGIZED PARTS TO BARRIERS
    - II. 1/2 INCH FROM TERMINATOR SKIRTS TO BARRIERS
    - III. 6 INCHES FROM ENERGIZED PARTS TO ELECTRICAL GROUND OR FROM PHASE TO PHASE COMPONENTS
  - B. 25 KV
    - I. 2-1/4 INCHES FROM ENERGIZED PARTS TO BARRIERS
    - II. 1-1/4 INCHES FROM TERMINATOR SKIRTS TO BARRIERS
    - III. 7-1/2 INCHES FROM ENERGIZED PARTS TO ELECTRICAL GROUND OR FROM PHASE TO PHASE COMPONENTS
14. CHECK PAD AND SWITCH FOR ENCLOSURE INTEGRITY
15. CHECK FOR LEVEL PAD
16. CHECK FOR PLANT AND ANIMAL INTRUSION
17. CHECK FOR PROPER WORKING CLEARANCES FOR SWITCHES AND FUSES
  - A. SIDES - 3 FEET
  - B. FRONT AND BACK - 10 FEET
18. CHECK FOR WARNING LABELS INSIDE AND OUTSIDE. APPLY NEW LABELS AS NEEDED ON EXTERIOR OR INTERIOR DOOR.
19. CHECK FOR SEVERE RUSTING ON EXTERIOR OF CABINET (HINGES, PENTA LATCH, SWITCH HANDLE ACCESS DOORS)
20. RECORD MANUFACTURER, MANUFACTURE DATE AND SERIAL NUMBER.
21. RECORD FUSES WHICH REQUIRE LOAD BUSTER TOOL
22. LEAVE ALL BARRIERS IN VERTICAL (NOT 'SLIDE') POSITION BEFORE CLOSING/ LOCKING DOORS.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

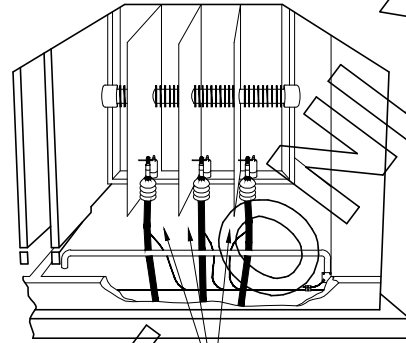
LIVE FRONT SWITCHGEAR VISUAL INSPECTION



**PGN**

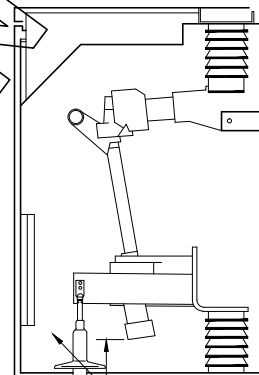
DWG.  
28.10-03

POSITION CABLE BEFORE IT IS CUT AND TERMINATED SO THAT IT IS NOT PULLING ON OR SUPPORTED BY THE CONNECTORS ON THE SWITCHGEAR. DO NOT USE PRYBARS OR BOLTS TO FORCE THE CABLE INTO ALIGNMENT WITH THE CONNECTORS.



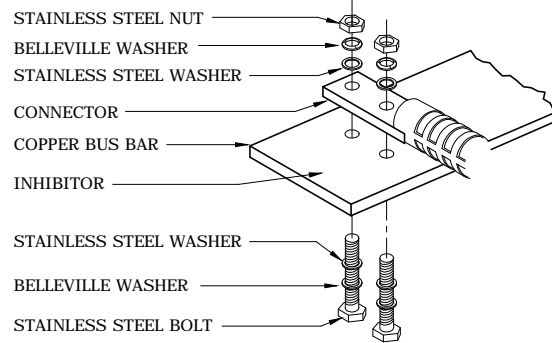
VERIFY CLEARANCES

ROUTE CABLE SO THAT IT DOES NOT COME IN CONTACT WITH THE DIVIDING BARRIERS. MAINTAIN PROPER CLEARANCE BETWEEN ENERGIZED PARTS AND GROUNDS.



VERIFY CLEARANCES

USE PROPER CONNECTION TECHNIQUES. TORQUE TO 40 FT LB.



FOR MAINTENANCE ONLY

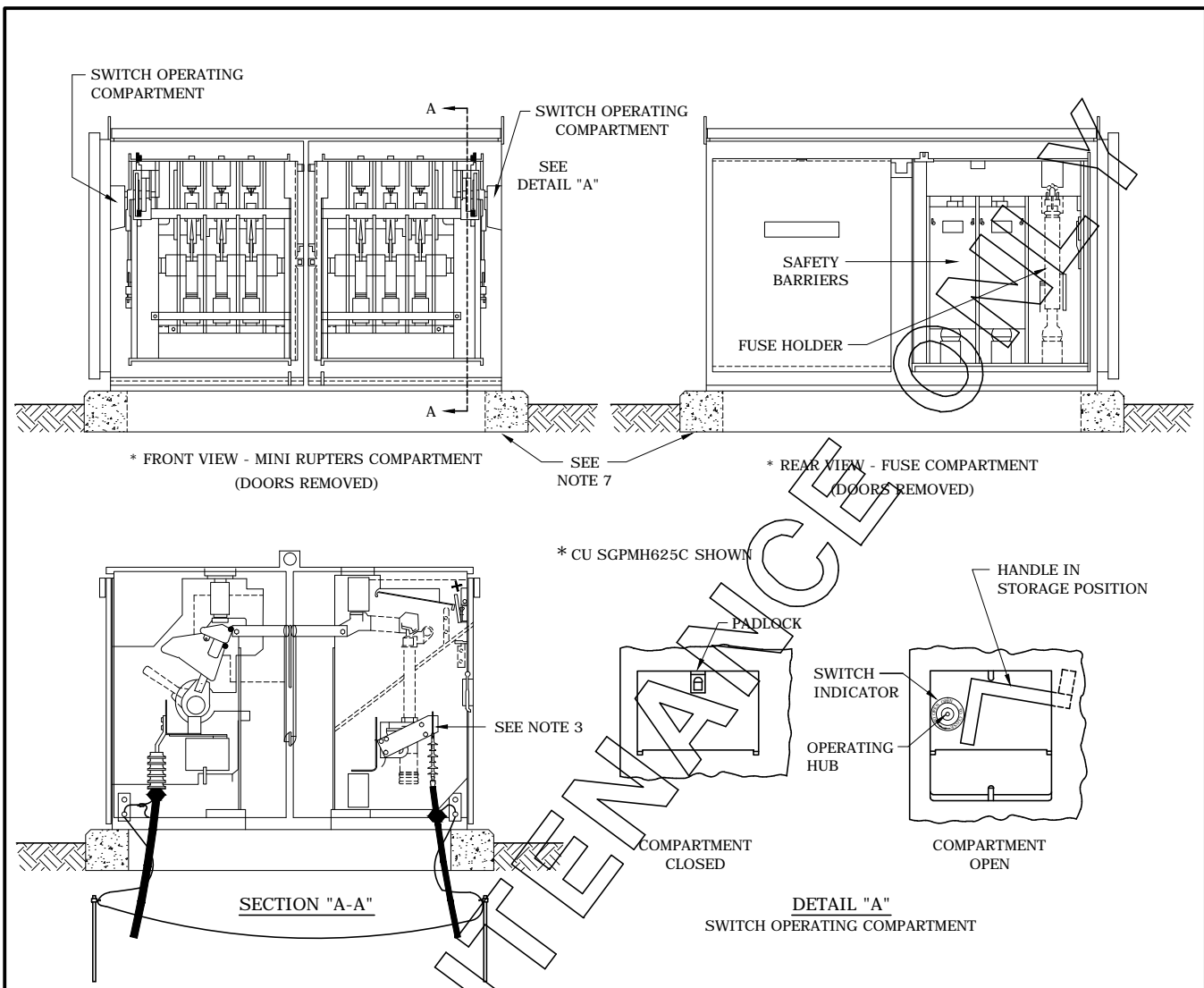
3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

CABLE MAKEUP  
IN PMH (LIVE FRONT) (FMO)



PGN

DWG.  
28.08-07



OPERATION OF SWITCHGEAR

- (A) THREE-PHASE SWITCH OPERATION SAME FOR MARK II AND MARK III SWITCHGEAR. SEE DETAIL "A".
- (B) FUSE DISCONNECTS.
  - 1. MARK II - LOADBREAKING IS ACCOMPLISHED BY USE OF A S&C "LOADBUSTER" TOOL.
  - 2. MARK III - LOADBREAKING IS ACCOMPLISHED BY USE OF A STANDARD HOOKSTICK.

NOTES:

1. REFER TO DWG. 28.00-01C FOR DETAILS ON AVAILABLE SWITCH MODELS, SML-4Z FUSES, AND BASE MOUNT LIGHTNING ARRESTERS. REFER TO DWG. 28.08-21B FOR DETAILS ON AVAILABLE SMU-20 FUSE UNITS.
2. A MINIMUM OF 10' CLEARANCE MUST BE MAINTAINED ON THE FUSED SIDE OF THE UNIT TO PERMIT OPERATION OF THE "LOADBUSTER" TOOL OR HOOKSTICK. A MINIMUM OF 4' MUST BE MAINTAINED FOR ALL DOOR OPENINGS.
3. FOR CABLE TERMINATIONS, USE MODULAR TERMINATIONS. IN ALL FUSED COMPARTMENTS, THE GROUNDING BAR (THE BAR ATTACHED TO THE FUSE HOLDER) SHALL BE ABOVE OR AT LEAST EVEN WITH THE TOP SKIRT OF THE TERMINATOR. 6-1/2" CLEARANCE SHALL BE MAINTAINED FOR 125KV BIL RATING BETWEEN THE GROUNDING BAR AND THE CONCENTRIC NEUTRAL AT THE BASE OF THE TERMINATOR. THE PIN TERMINAL SHIPPED WITH TERMINATOR IS TO BE USED, NOT A SPADE TERMINAL.
4. INSTALL A SWITCH NUMBER ON THE UPPER RIGHT-HAND CORNER OF EACH OPENING SIDE OF THE UNIT.
5. EACH UNIT WILL BE SHIPPED WITH END FITTINGS AND SILENCERS. FUSES AND ARRESTERS MUST BE ORDERED SEPARATELY.
6. PROVISIONS FOR BASE MOUNT LIGHTNING ARRESTERS ARE PROVIDED AT EACH LINE SWITCH TERMINAL OF THE SWITCHGEAR.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

PMH THREE-PHASE PAD-MOUNTED SWITCHGEAR

(FMO)



**CAR**

DWG.  
28.08-09

SINGLE LINE DIAGRAM THREE-PHASE UNITS	MODEL #	DIMENSIONS (INCHES)			LEGEND
		H	W	D	
	PMH - 3 (950 LBS.)	55	43	57	 400 AMP GANG OPERATED LOADBREAK SWITCH   600 AMP TERMINAL   FUSED DISCONNECT   200 AMP TERMINAL   SWITCH OPERATOR   SWITCH TRANSFER CONTROL   VOLTAGE SENSOR
	PMH - 4 (675 LBS.)	55	43	57	
	PMH - 5 (1150 LBS.)	55	43	65	
	PMH - 6 (1975 LBS.)	55	82	77	
	PMH - 8 (1900 LBS.)	55	82	77	
	* PMH - 9 (2050 LBS.)	55	82	77	
	PMH - 10 (2275 LBS.)	55	82	77	
	* PMH - 11 (2175 LBS.)	55	82	77	
	PMH - 12 (1950 LBS.)	55	82	77	
	PMH - 9AT (2050 LBS.)	55	82	77	

SML-4Z FUSES	CN	COMPATIBLE UNIT
15E	21141809	FSM415ES23KC
25E	21141908	FSM425ES23KC
40E	21142005	FSM440ES23KC
50E	21142104	FSM450ES23KC
65E	21142203	FSM465ES23KC
80E	21142302	FSM480ES23KC
100E	21142401	FSM4100ES23KC
125E	21142500	FSM4125ES23KC
FUSE HOLDER	CN	COMPATIBLE UNIT
SML-4Z (MARK II)	11130903	FHLDRMRK2SM4ZC
SML-4Z (MARK III)	11129905	FHLDRMRK3MLZ4C
ARRESTER	CN	COMPATIBLE UNIT
10 KV	11231404	ARRBM10C
18 KV	11231602	ARRBM18C

\* LISTED AS A STOCK ITEM IN COMPANY MATERIAL CATALOG.  
ALL OTHER MODELS LISTED AS A NON STOCK ITEM. (SEE TABLE BELOW)

NOT FOR NEW CONSTRUCTION		
MODEL #	CN	COMP. UNIT
PMH - 3	12710406	SGPMH325C
PMH - 4	51480	SGPMH425C
PMH - 5	51482	SGPMH525C
PMH - 6	51481	SGPMH625C
PMH - 8	12710505	SGPMH825C
PMH - 9	51601	SGPMH925C
PMH - 10	51602	SGPMH1025C
PMH - 11	51603	SGPMH1125C
PMH - 12	51634	SGPMH1225C
PMH - 9AT	12711008	SGPMH9AST25C

NOTES:

1. SEE DWG. 28.08-21B FOR SMU-20 FUSE UNIT CATALOG NUMBERS. DO NOT INTERCHANGE SML-4Z WITH SMU-20 FUSES. SWITCHGEAR PURCHASED SINCE 1998 WILL USE SMU-20 FUSES.

3				
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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

PMH THREE-PHASE PAD-MOUNTED  
SWITCHGEAR (FMO)



**CAR** DWG.  
28.08-11

FUSE OPERATION FOR ALL PMH LIVE FRONT SWITCH GEAR (SM-4S, SM-4Z, SML-4Z AND SML-20 FUSE HOLDERS)

1. FOLLOW ALL SAFETY (SAFETY MANUAL) AND SWITCHING & TAGGING PROCEDURES.
2. A GRAPPLER TOOL (CN 76331506) WITH AN APPROVED INSULATED STICK SHALL BE USED TO OPEN AND CLOSE FUSE DOOR.
3. WHEN REMOVING FUSE DOOR FROM SWITCH GEAR:
  - UPPER AND LOWER SWITCH ASSEMBLY MUST BE CONSIDERED ENERGIZED.
  - GRAPPLER TOOL WITH INSULATED STICK SHALL BE USED TO REMOVE AND INSTALL FUSE DOOR ASSEMBLY.

FUSING (REF. DWG. 28.08-21B)

- STEP 1 LOOSEN THE TWO SCREWS WHICH SECURE LOWER END FITTING TO FERRULE OF FUSE HOLDER. (SEE FIG. 1)
- STEP 2 LOOSEN CLAMP BOLT AND PRY CLAMP APART SLIGHTLY. (SEE FIG. 2)
- STEP 3 UNSCREW AND REMOVE SNUFFLER. A BAR OR WRENCH HANDLE CAN BE USED TO LOOSEN SNUFFLER. (SEE FIG. 3)
- STEP 4 UNSCREW AND WITHDRAW HOLDER CAP, SPRING, AND CABLE ASSEMBLY. (SEE FIG. 4)
- STEP 5 SCREW REFILL UNIT OF CORRECT AMPERE RATING HAND TIGHT ONTO END OF SPRING AND CABLE ASSEMBLY. DO NOT USE A WRENCH. TO SEE THAT KNURLED COLLAR AT OTHER END OF REFILL UNIT IS TIGHT AGAINST SHOULDER OF REFILL UNIT FERRULE. (SEE FIG. 5)
- STEP 6 INSERT THIS COMBINATION INTO FUSE HOLDER AND SCREW HOLDER CAP DOWN TIGHT. THE FINAL 1/4 TURN SHOULD BE MADE WITH WITH A WRENCH. (SEE FIG. 6)
- STEP 7 CAREFULLY DRAW REFILL PULL CORD (WHICH COMES WITH FUSE) OUT THROUGH FUSE HOLDER, AGAINST SPRING TENSION, UNTIL CONTACT FINGERS OF FUSE HOLDERS LATCH BEHIND KNURLED COLLAR OF REFILL UNIT. RELEASE PULL CORD SLOWLY, PERMITTING COLLAR TO REST ON SPRING CONTACT FINGERS. REMOVE AND DISCARD PULL CORD. (SEE FIG. 7)
- STEP 8 REPLACE SNUFFLER, SCREWING IN FIRMLY. FINAL 1/4 TURN SHOULD BE MADE WITH A BAR OR WRENCH HANDLE. (SEE FIG. 3)
- STEP 9 TIGHTEN CLAMP BOLT. (SEE FIG. 2)
- STEP 10 TIGHTEN TWO SCREWS WHICH SECURE LOWER END AND FITTING TO LOWER FERRULE OF FUSE HOLDER. (SEE FIG. 1)

REFUSING BLOWN FUSES (REF. DWG. 28.08-21B)

- STEP 1 LOOSEN THE TWO SCREWS WHICH SECURE LOWER END FITTING TO FERRULE OF FUSE HOLDER. (SEE FIG. 1)
- STEP 2 LOOSEN CLAMP BOLT AND PRY CLAMP APART SLIGHTLY. (SEE FIG. 2)
- STEP 3 UNSCREW AND REMOVE SNUFFLER. A BAR OR WRENCH HANDLE CAN BE USED TO LOOSEN SNUFFLER. (SEE FIG. 3)
- STEP 4 REMOVE AND DISCARD BLOWN REFILL UNIT
- STEP 5 UNSCREW AND WITHDRAW HOLDER CAP TO WHICH IS ATTACHED THE SPRING AND CABLE ASSEMBLY. (SEE FIG. 4)
- STEP 6 UNSCREW AND DISCARD THE ARCING TERMINAL OF THE BLOWN REFILL UNIT ATTACHED TO THE SPRING AND CABLE ASSEMBLY. WIPE CLEAN ALL CONTACT SURFACES WITH CLEAN CLOTH. (IF THE SPRING ASSEMBLY IS DAMAGED, INSTALL A NEW SM4S FUSE HOLDER AND RETURN DAMAGED FUSE HOLDER TO THE MATERIAL SALVAGE SHOP).
- STEP 7 AFTER A FAULT, THE INTERIOR OF THE GLASS-EPOXY TUBE OF THE FUSE HOLDER SHOULD BE WIPED TO REMOVE ANY DUST AND METALLIC PARTICLES THAT MAY BE PRESENT. THE SILENCER SHOULD BE INVERTED TO DISCARD DEBRIS AND CAREFULLY INSPECTED BEFORE REUSING. IF INTERNAL PARTS OF SILENCER ARE BADLY BURNED AS A RESULT OF AN EXTREMELY HIGH FAULT, INSTALL A NEW FUSE HOLDER AND SCRAP DAMAGED FUSE HOLDER.
- STEP 8 REASSEMBLE FUSE HOLDER AS DESCRIBED IN STEPS 5 THROUGH 10 UNDER FUSING.

REFUSING UNBLOWN FUSES (REF. DWG. 28.08-21B)

- STEP 1 LOOSEN THE TWO SCREWS WHICH SECURE LOWER END FITTING TO FERRULE OF FUSE HOLDER. (SEE FIG. 1)
- STEP 2 LOOSEN CLAMP BOLT AND PRY CLAMP APART SLIGHTLY. (SEE FIG. 2)
- STEP 3 UNSCREW AND REMOVE SNUFFLER. A BAR OR WRENCH HANDLE CAN BE USED TO LOOSEN SNUFFLER. (SEE FIG. 3)
- STEP 4 INSERT A CORD OR WIRE THROUGH SMALL HOLE IN THE PROJECTING THREAD PORTION OF REFILL UNIT FERRULE. PULL REFILL UNIT OUTWARD ABOUT 1/8".
- STEP 5 UNSCREW AND REMOVE KNURLED COLLAR FROM REFILL UNIT AND ALLOW REFILL UNIT TO SLIDE SLOWLY BACK INTO FUSE HOLDER.
- STEP 6 UNSCREW AND WITHDRAW HOLDER CAP, SPRING, AND CABLE ASSEMBLY AND REFILL UNIT. UNSCREW REFILL UNIT FROM SPRING AND CABLE ASSEMBLY. REPLACE WITH REFILL UNIT OF CORRECT AMPERE RATING, AND REASSEMBLE AS DESCRIBED IN STEPS 5 THROUGH 10 UNDER FUSING.

NOTES:

1. LOADBUSTER TOOL MUST BE USED TO OPEN ALL SM-4S FUSE HOLDERS.

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

FUSING INSTRUCTIONS FOR  
S & C (SM-4S) FUSE HOLDERS (FMO)



**CAR** DWG.  
28.08-17A

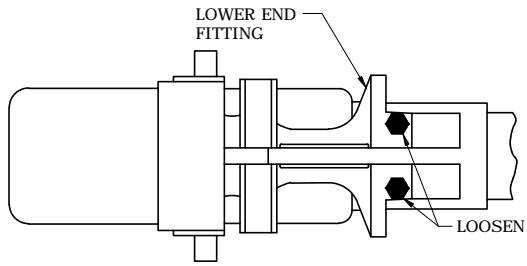
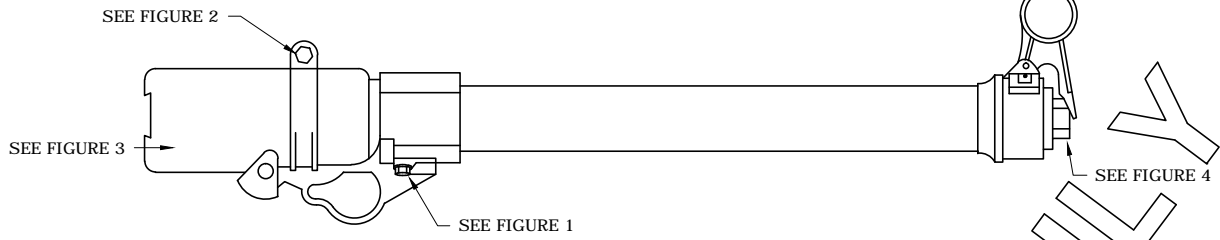


FIGURE 1

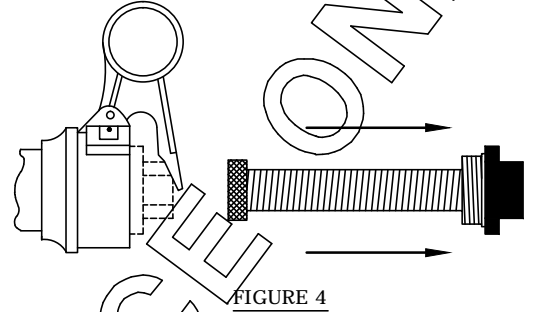


FIGURE 4

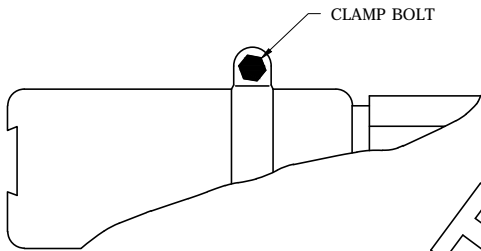


FIGURE 2

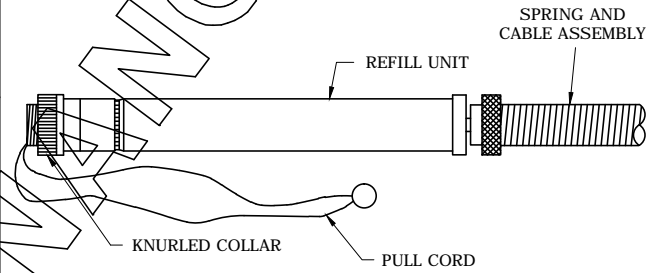


FIGURE 5

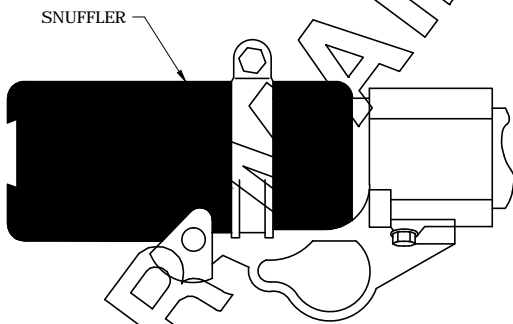


FIGURE 3

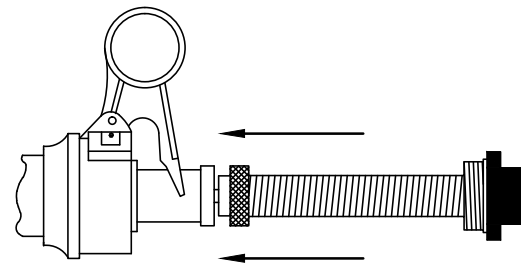


FIGURE 6

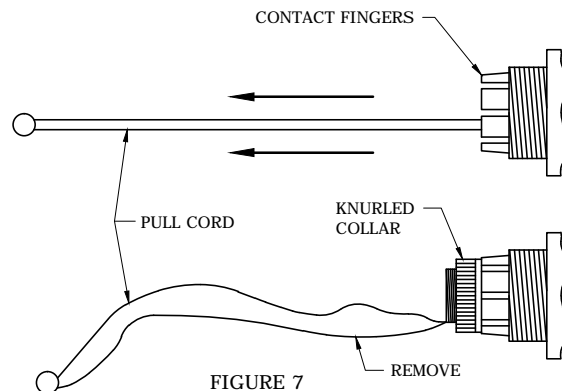


FIGURE 7

3				
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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

FUSING INSTRUCTIONS FOR  
S & C (SM-4S) FUSE HOLDERS (FMO)



PGN DWG. 28.08-17B



FUSE OPERATION FOR ALL PMH LIVE FRONT SWITCH GEAR (SM-4S, SM-4Z, SML-4Z AND SML-20 FUSE HOLDERS)

1. FOLLOW ALL SAFETY (SAFETY MANUAL) AND SWITCHING & TAGGING PROCEDURES.
2. A GRAPPLER TOOL (CN 76331506) WITH AN APPROVED INSULATED STICK SHALL BE USED TO OPEN AND CLOSE FUSE DOOR. SHALL BE USED TO OPEN AND CLOSE FUSE DOOR.
3. WHEN REMOVING FUSE DOOR FROM SWITCH GEAR:
  - UPPER AND LOWER SWITCH ASSEMBLY MUST BE CONSIDERED ENERGIZED.
  - GRAPPLER TOOL WITH INSULATED STICK SHALL BE USED TO REMOVE AND INSTALL FUSE DOOR ASSEMBLY.

FUSING (SEE DWG. 28.08-19B)

- STEP 1 UNSCREW AND REMOVE SILENCER. A BAR OR WRENCH HANDLE CAN BE USED TO LOOSEN SILENCER. (SEE FIG. 1)
- STEP 2 UNSCREW AND WITHDRAW HOLDER CAP, SPRING, AND CABLE ASSEMBLY. (SEE FIG. 2)
- STEP 3 SCREW REFILL UNIT OF CORRECT AMPERE RATING HAND TIGHT ONTO END OF SPRING AND CABLE ASSEMBLY. DO NOT USE A WRENCH. CHECK TO SEE THAT KNURLED COLLAR AT OTHER END OF REFILL UNIT IS TIGHT AGAINST SHOULDER OF REFILL UNIT FERRULE. (SEE FIG. 3)
- STEP 4 INSERT THIS COMBINATION INTO FUSE HOLDER AND SCREW HOLDER/CAP DOWN TIGHT. THE FINAL 1/4 TURN SHOULD BE MADE WITH A WRENCH. (SEE FIG. 4)
- STEP 5 CAREFULLY DRAW REFILL PULL CORD (WHICH COMES WITH FUSE) OUT THROUGH FUSE HOLDER, AGAINST SPRING TENSION, UNTIL CONTACT FINGERS OF FUSE HOLDERS LATCH BEHIND KNURLED COLLAR OF REFILL UNIT. RELEASE PULL CORD SLOWLY, PERMITTING COLLAR TO REST ON SPRING CONTACT FINGER. REMOVE AND DISCARD PULL CORD. (SEE FIG. 5)
- STEP 6 REPLACE SILENCER, SCREWING IN FIRMLY. FINAL 1/4 TURN SHOULD BE MADE WITH A BAR OR WRENCH HANDLE. (SEE FIG. 1)

REFUSING BLOWN FUSES (REF. DWG. 28.08-19B)

- STEP 1 UNSCREW AND REMOVE SILENCER. A BAR OR WRENCH HANDLE CAN BE USED TO LOOSEN SILENCER. (SEE FIG. 1)
- STEP 2 REMOVE AND DISCARD BLOWN REFILL UNIT.
- STEP 3 UNSCREW AND WITHDRAW HOLDER CAP TO WHICH IS ATTACHED THE SPRING AND CABLE ASSEMBLY. (SEE FIG. 2)
- STEP 4 UNSCREW AND DISCARD THE ARCING TERMINAL OF THE BLOWN REFILL UNIT ATTACHED TO THE SPRING AND CABLE ASSEMBLY. WIPE CLEAN ALL CONTACT SURFACES WITH CLEAN CLOTH. (IF THE SPRING ASSEMBLY IS DAMAGED, INSTALL A NEW FUSE HOLDER AND RETURN DAMAGED FUSE HOLDER TO THE MATERIAL SALVAGE SHOP).
- STEP 5 AFTER A FAULT, THE INTERIOR OF THE GLASS-EPOXY TUBE OF THE FUSE HOLDER SHOULD BE WIPED TO REMOVE ANY DUST AND METALLIC PARTICLES THAT MAY BE PRESENT. THE SILENCER SHOULD BE INVERTED TO DISCARD DEBRIS AND CAREFULLY INSPECTED BEFORE REUSING. IF INTERNAL PARTS OF SILENCER ARE BADLY BURNED AS A RESULT OF AN EXTREMELY HIGH FAULT, INSTALL A NEW FUSE HOLDER AND SCRAP DAMAGED FUSE HOLDER.
- STEP 6 REASSEMBLE FUSE HOLDER AS DESCRIBED IN STEPS 3 THROUGH 6 UNDER FUSING.

REFUSING UNBLOWN FUSES (SEE DWG. 28.08-19B)

- STEP 1 UNSCREW AND REMOVE SILENCER. A BAR OR WRENCH HANDLE CAN BE USED TO LOOSEN SILENCER. (SEE FIG. 1)
- STEP 2 INSERT A CORD OR WIRE THROUGH SMALL HOLE IN THE PROJECTING THREAD PORTION OF REFILL UNIT FERRULE. PULL REFILL UNIT OUTWARD ABOUT 1/8".
- STEP 3 UNSCREW AND REMOVE KNURLED COLLAR FROM REFILL UNIT AND ALLOW REFILL UNIT TO SLIDE SLOWLY BACK INTO FUSE HOLDER.
- STEP 4 UNSCREW AND WITHDRAW HOLDER CAP, SPRING, AND CABLE ASSEMBLY AND REFILL UNIT.

UNSCREW REFILL UNIT FROM SPRING AND CABLE ASSEMBLY. REPLACE WITH REFILL UNIT OF CORRECT AMPERE RATING, AND REASSEMBLE AS DESCRIBED IN STEPS 3 THROUGH 6 UNDER FUSING.

NOTE: SML-4Z FUSE DOORS ASSEMBLIES ARE NOT INTERCHANGEABLE WITH SML-2 OR SME-20 FUSE DOOR ASSEMBLIES.

REPLACEMENT CATALOG NUMBER FOR SML-4Z: CN 11129905

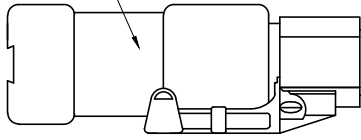
3				
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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

FUSING INSTRUCTIONS FOR  
S & C (SM 4Z AND SML 4Z) FUSE HOLDERS  
(FMO)

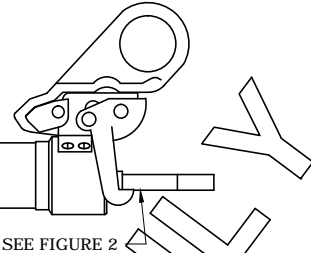


**CAR** DWG.  
28.08-19A

SEE FIGURE 1



SEE FIGURE 2



**SML-4Z FUSE HOLDER**  
 CU FHLD RMRK3MLZ4C  
 CN 11129905

SILENCER

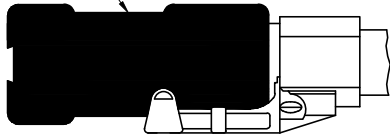


FIGURE 1

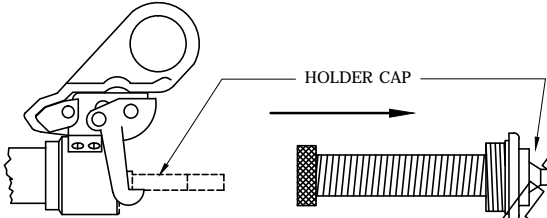


FIGURE 2

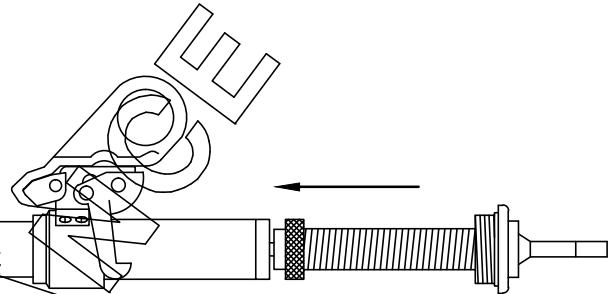


FIGURE 4

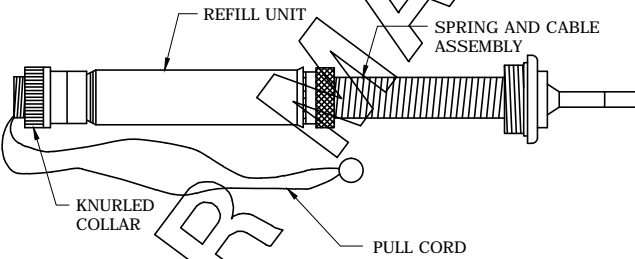


FIGURE 3

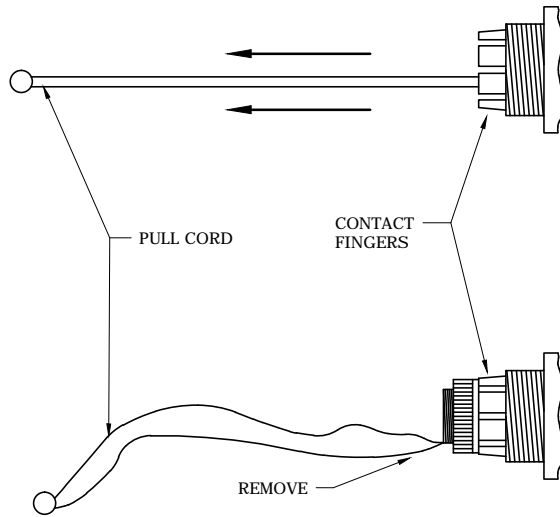


FIGURE 5

FOR MAINTENANCE ONLY

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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

FUSING INSTRUCTIONS FOR  
 S & C (SM-4Z AND SML-4Z) FUSE HOLDERS  
 (FMO)



**CAR** DWG. 28.08-19B

FUSE OPERATION FOR ALL PMH LIVE FRONT SWITCH GEAR (SM-4S, SM-4Z, SML-4Z AND SML-20 FUSE HOLDERS)

1. FOLLOW ALL SAFETY (SAFETY MANUAL) AND SWITCHING & TAGGING PROCEDURES.
2. A GRAPPLER TOOL (CN 76331506) WITH AN APPROVED INSULATED STICK SHALL BE USED TO OPEN AND CLOSE FUSE DOOR.
3. WHEN REMOVING FUSE DOOR FROM SWITCH GEAR:
  - UPPER AND LOWER SWITCH ASSEMBLY MUST BE CONSIDERED ENERGIZED.
  - GRAPPLER TOOL WITH INSULATED STICK SHALL BE USED TO REMOVE AND INSTALL FUSE DOOR ASSEMBLY.

FUSING

STEP 1 THE LOWER END FITTING MUST BE ATTACHED FIRST. UNSCREW AND DISCARD THE RED CAP LOCATED ON THE LOWER END OF THE FUSE. NEXT, SLIP THE LOWER END FITTING OVER THE UPPER END OF THE FUSE AND SLIDE IT DOWN UNTIL THE LOCATING SLOT IS ALIGNED WITH THE LOCATING PIN ON THE LOWER FERRULE. SEAT THE LOWER END FITTING AGAINST THE SHOULDER OF THE LOWER FERRULE. THEN THREAD THE SILENCER ONTO THE LOWER END FITTING AND SCREW IT ON FIRMLY. THE FINAL FRACTIONAL TURN SHOULD BE MADE WITH A BAR OR WRENCH HANDLE.

STEP 2 SLIP THE UPPER END FITTING OVER THE FUSE. ALIGN THE LOCATING PIN (INSIDE THE UPPER END FITTING) WITH THE LOCATING SLOT IN THE FUSE AND SEAT THE UPPER END FITTING FIRMLY AGAINST THE UPPER END OF THE FUSE. TIGHTEN THE CLAMP SCREW FIRMLY.

REFUSING

WHEN THE FUSE OPERATES, THE FUSE UNIT DOES NOT SWING OPEN BUT THE BLOWN-FUSE INDICATOR MOVES TO THE EXTENDED POSITION, PROVIDING VISUAL EVIDENCE THAT THE FUSE IS BLOWN. MOVE THE FUSE UNIT TO THE OPEN POSITION AND THEN REMOVE IT FROM THE MOUNTING.

LOOSEN THE UPPER-END FITTING CLAMP SCREW, AND PRY THE CLAMP APART SLIGHTLY USING A SCREWDRIVER. SLIDE THE UPPER END FITTING OFF THE UPPER END OF THE FUSE. THEN UNSCREW AND REMOVE THE SILENCER. SLIDE THE LOWER END FITTING OFF THE UPPER END OF THE FUSE.

NEXT, ATTACH THE END FITTINGS AND SILENCER TO A NEW FUSE, FOLLOWING THE ILLUSTRATIONS ON DWG. 28.08-21B. A BLOWN FUSE CANNOT BE SALVAGED. DISCARD IT.

NOTES:

1. SEE DWG. 28.08-21B FOR ILLUSTRATIONS.
2. S & C SMU-20 FUSES HAVE SILVER OR NICKEL-CHROME FUSIBLE ELEMENTS THAT ARE NONDAMAGEABLE; CONSEQUENTLY, THERE IS NO NEED TO REPLACE UNBLOWN COMPANION FUSES ON SUSPICION OF DAMAGE FOLLOWING A FUSE OPERATION.
3. REUSE SILENCER, UPPER AND LOWER END FITTINGS IF NOT SEVERELY PITTED OR DAMAGED.
4. FUSE FITTING (CN 10309300) INCLUDES UPPER END FITTING, LOWER END FITTING AND SILENCER.

REPLACEMENT CATALOG NUMBERS FOR SML-20 FUSE DOOR ASSEMBLY: CN 10309300

FOR MOUNTING ONLY

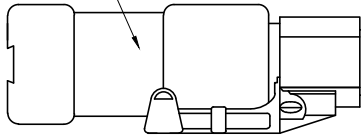
3				
2				
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0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

FUSING INSTRUCTIONS FOR  
S & C (SML-20) FUSE FOR LIVE FRONT  
PAD-MOUNTED SWITCHGEAR (PMH) (FMO)

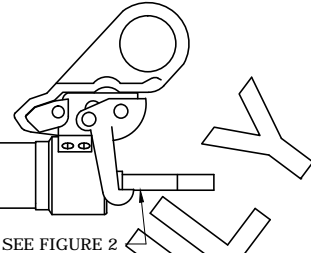


**CAR** DWG.  
28.08-21A

SEE FIGURE 1



SEE FIGURE 2



**SML-4Z FUSE HOLDER**  
 CU FHLD RMRK3MLZ4C  
 CN 11129905

SILENCER

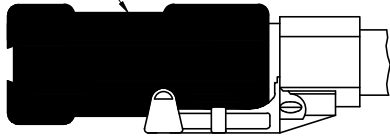


FIGURE 1

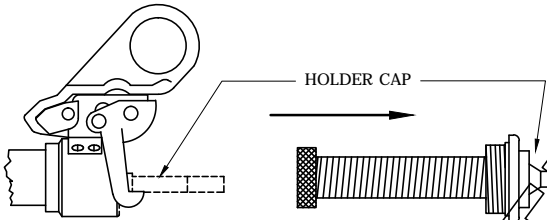


FIGURE 2

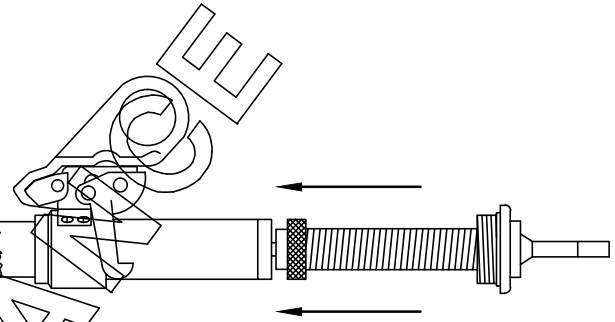


FIGURE 4

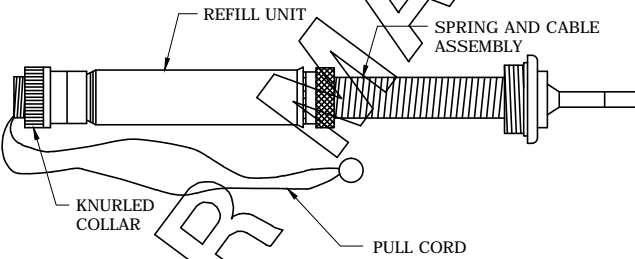


FIGURE 3

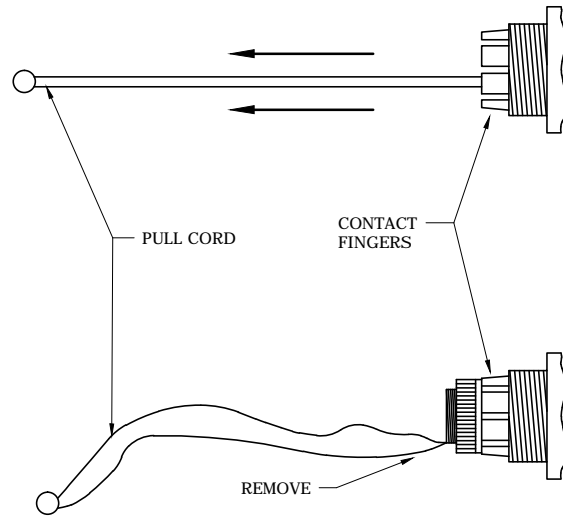


FIGURE 5

FOR MAINTENANCE ONLY

3				
2				
1				
0	6/17/10	ROBESON	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

FUSING INSTRUCTIONS FOR  
 S & C (SM-4Z AND SML-4Z) FUSE HOLDERS  
 (FMO)



**CAR** DWG.  
 28.08-19B