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**WAUKESHA  
POWER  
SYSTEMS**

DR. RFA	10/02/03
CH. LGW	10/06/03
AP. D L TOLLEFSON	10/06/03

DTE ENERGY TECHNOLOGIES, INC.  
VGF48GLD GENERATING SET C-94542-900  
830KW 1038KVA 0.8PF  
60HZ 3PH 1248A  
480/277V 1800RPM

VGF48GLD  
GENERATING SET OUTLINE


REVISION  
—  
SEE LAST SHEET

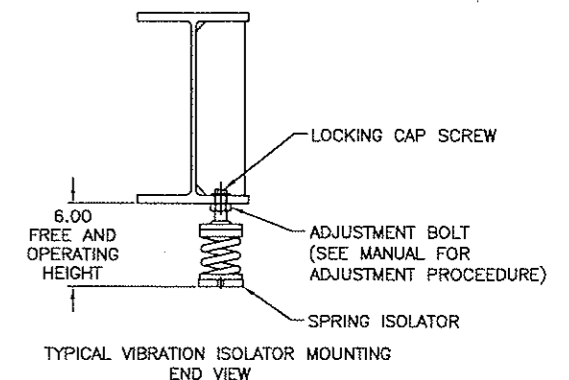
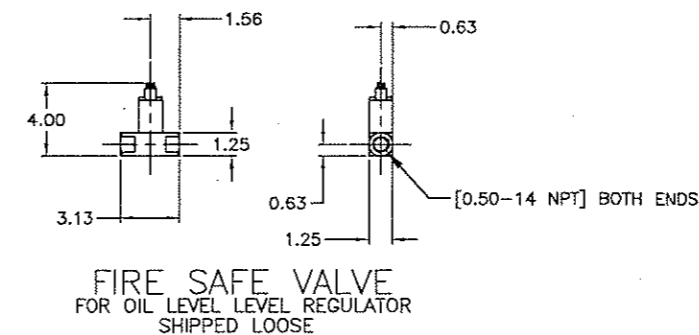
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SHEET 1 OF 2

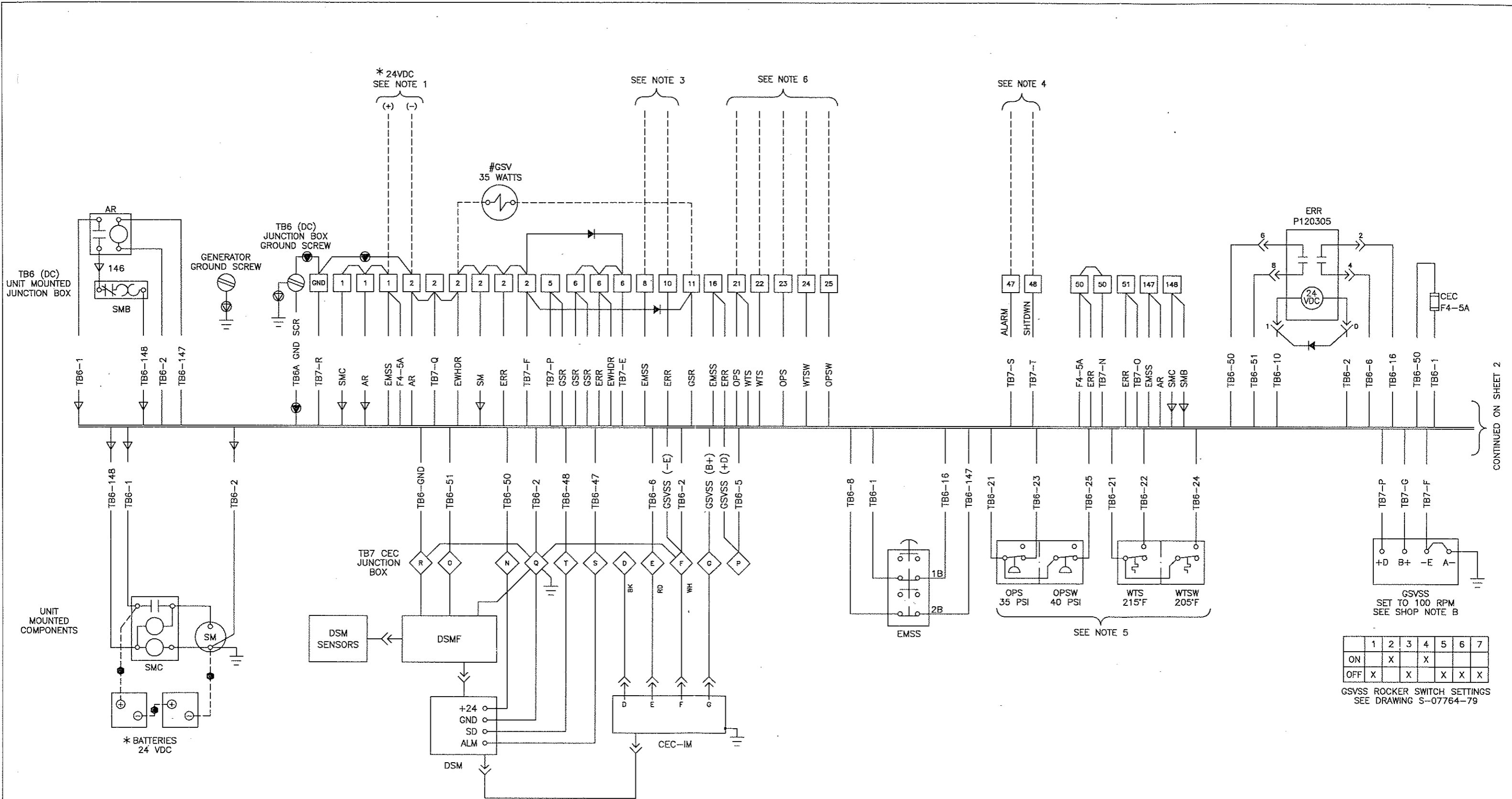
# ENGINATOR® CONNECTIONS AND EQUIPMENT

1. ELECTRIC STARTING MOTOR WITH 0.50-13 UNC THREADED STUDS
2. LUBE OIL FILL
3. LUBE OIL DRAIN 2.00-11.5 NPT
4. LUBE OIL INLET AT OIL LEVEL REGULATOR 0.50-14 NPT
5. LUBE OIL DIPSTICK
6. LUBE OIL FILTER DRAINS [M16-1.5]
7. LUBE OIL COOLER OIL DRAIN 0.50-14 NPT
8. GAS FUEL INLET - MATES WITH 2.00 ANSI CLASS 125 RAISED FACE FLANGE
9. GAS REGULATOR BALANCE LINE CONNECTION 0.38-18 NPT (MALE)
10. RADIATOR PRESSURE CAP - JACKET WATER CIRCUIT (7 PSI)
11. RADIATOR PRESSURE CAP - AUXILIARY WATER CIRCUIT (7 PSI)
12. RADIATOR CORE GUARD/DUCT ADAPTER
13. RADIATOR DRAINS 0.50 NPT (FEMALE) 3 PLACES
14. RADIATOR FILL (2 PLACES) 1.50-11.5 NPT
15. JACKET COOLANT AIR BLEED 0.50-14 NPTF MALE
16. AUXILIARY COOLANT AIR BLEED 0.25-18 NPT
17. OIL COOLER AIR VENT 0.25-18 NPT
18. OIL COOLER WATER DRAIN 0.25-18 NPT
19. EXHAUST OUTLET - MATES WITH 10.00 ANSI CLASS 125 FLANGE. EXHAUST SYSTEM BEYOND THIS POINT MUST SUPPORT ITS OWN WEIGHT AND THERMAL EXPANSION. MOUNTING THE UNIT ON SPRING ISOLATORS WILL REQUIRE ADDITIONAL FLEX CAPABILITIES. + MAXIMUM DISTORTION DUE TO CUSTOMERS PIPING (SEE S8242 EXHAUST SYSTEM INSTALLATION GUIDELINES)
20. UNIT JUNCTION BOX TB6 (DC) LOWER, TB6A (AC) UPPER  $\phi$ 0.50-1.25 KNOCKOUTS EACH END
21. ENGINE JUNCTION BOX TB7
22. GENERATOR JUNCTION BOX TB3 (POWER LEAD AND AUXILIARY CONNECTIONS)
23. REAR FACE OF ENGINE FLYWHEEL HOUSING
24. ENGINE IGNITION MODULE (CEC-IM)
25. DETONATION SENSING MODULE FILTER (DSMF)
26. DETONATION SENSING MODULE (DSM)
27. ENGINE INSTRUMENT PANEL INCLUDES:  
OIL PRESSURE GAUGE  
JACKET WATER TEMPERATURE GAUGE  
INTAKE MANIFOLD PRESSURE GAUGE  
INTAKE MANIFOLD TEMPERATURE GAUGE  
EMERGENCY STOP SWITCH
28. GENERATOR GROUNDING POINT 0.38-16 UNC
29. GOVERNOR (WOODWARD EG3P)
30. MAGNETIC PICK-UP
31. MANUAL SHUTDOWN LEVER
32. AIR CLEANER
33. WIDE FLANGE STEEL BEAM 14 X 48#/FT. ASTM 36 DESIGNED FOR MOUNTING ON SPRING ISOLATORS.
34. UNIT MOUNTING HOLES (10)  $\phi$ 0.56 (5 EACH SIDE)
35. UNIT LIFTING HOLES (4)  $\phi$ 6.25 (2 EACH SIDE)

# ENGINATOR® NOTES

- A. REFERENCE DIMENSIONS: **X** - FRONT UNIT MOUNTING HOLES  
**Y** - BOTTOM OF UNIT BASE  
**Z** - CENTERLINE OF ENGINE (END VIEW)
- B. ADJUST ISOLATORS TO OBTAIN LEVEL MOUNTING
- C. ALL CONNECTIONS TO UNIT MUST BE FLEXIBLE
- D. GROUND UNIT - SIZE PER LOCAL ELECTRICAL CODE
- E. LUBE OIL CAPACITY - 113 GALLONS
- F. COOLANT CAPACITY:  
JACKET CIRCUIT - 121.1 GALLONS  
AUXILIARY CIRCUIT - 62.8 GALLONS
- G. UNIT WEIGHT:  
DRY - 29,375 LBS.  
WET - 31,750 LBS.
- H. DUE TO SHIMMING ALL VERTICAL DIMENSIONS CAN VARY +0.25/-0
- J. ALL GAS VENTED OR DISCHARGED FROM UNIT SHOULD BE PIPED TO A SAFE AREA TO MEET APPLICABLE CODES.
- K. ALL DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
- L.  UNIT WET CENTER OF GRAVITY (APPROX.)





CONTINUED ON SHEET 2

GSVSS ROCKER SWITCH SETTINGS  
SEE DRAWING S-07764-79

	1	2	3	4	5	6	7
ON		X		X			
OFF	X		X		X	X	X

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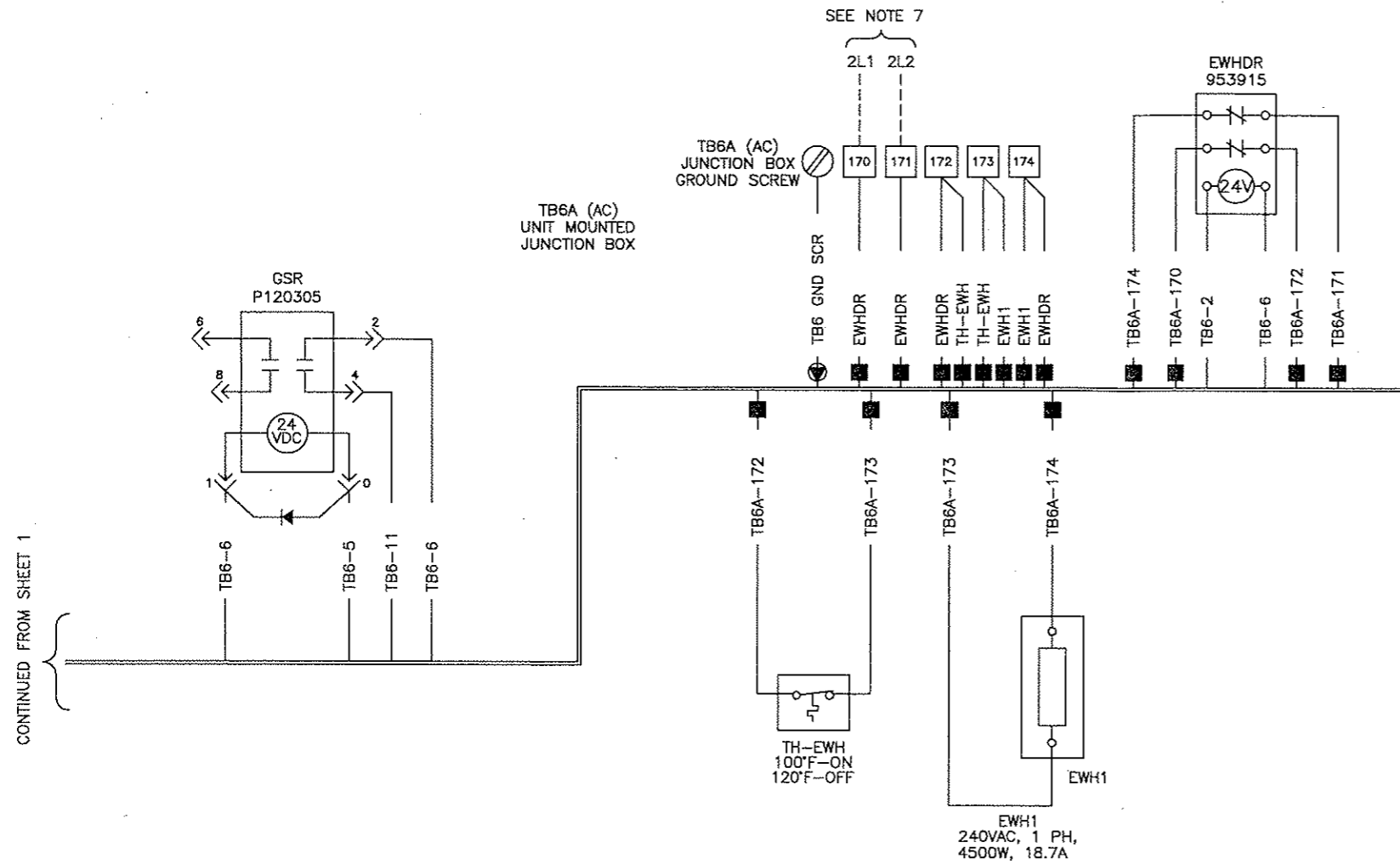
**UNIT WIRING AND CUSTOMER CONNECTIONS**

REVISION -  
 SEE LAST SHEET  
**PCB2003S**  
 SHEET 1 OF 4

CUSTOMER NOTES

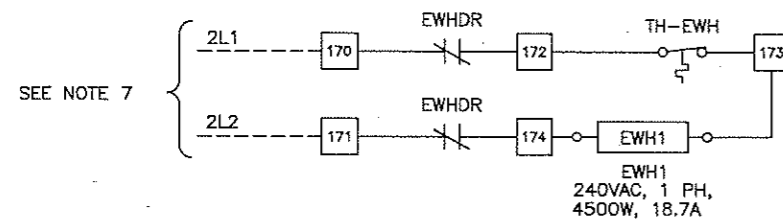
- # COMPONENT SUPPLIED AS A LOOSE PART.
  - \* COMPONENT NOT SUPPLIED BY WAUKESHA.
- SEE PD007B FOR COMPONENT ABBREVIATIONS.

1. DC POWER SUPPLY MUST BE CAPABLE OF FURNISHING 21.6-30.0 VDC WITH RIPPLE OF LESS THAN 2 VOLTS PEAK TO PEAK.
2. TYPICAL COMPONENT CURRENT DRAW WHEN ENGINE IS RUNNING:  
 DEC IGNITION - 6 AMP MAX  
 GSV - 1.46 AMPS  
 DSM - 0.5 AMPS  
 DSMF - 1.0 AMPS
3. EACH "K" CONTACT MUST HAVE A 10 AMP RATING AT 24 VDC. THE TOTAL CONTACT PLUS WIRE RESISTANCE MUST NOT EXCEED 2 OHMS AT 104 °F (40°C)
4. ALARM OUTPUT: USE FOR REMOTE INDICATION OF DSM ALARM CONDITIONS. SHUTDOWN OUTPUT: CONNECT TO CUSTOMER CONTROL TO SHUTDOWN UNIT. OUTPUTS ARE SINKING DEVICES. OUTPUT COMPLETES PATH TO GROUND TO INDICATE A FAULT CONDITION. SEE DSM MANUAL, FORM 6278. OUTPUT RATING: 1A, 50VDC, DC ONLY.
5. PROVIDE AN EIGHT SECOND DELAY FOR SAFETY SWITCHES AFTER CRANK TERMINATION TO ALLOW ENGINE TO STABILIZE. SEE DRAWING PS100.
6. TO CUSTOMER'S CONTROL - SWITCH CONTACTS RATED 2A AT 28VDC, 125 VAC RESISTIVE.
7. WIRE THRU A FUSED DISCONNECT SWITCH. CONNECT TO A 240VAC, 1 PHASE, 60 HZ POWER SUPPLY AVAILABLE WHEN ENGINE IS NOT RUNNING. WIRE MARKED "2L2" SHOULD BE COMMON OR GROUND SIDE OF POWER SOURCE IF POSSIBLE.
8. ALL DEVICES SHOWN IN DRY NON-OPERATING STATE.



CONTINUED FROM SHEET 1

ENGINE JACKET WATER HEATER AC SCHEMATIC



SEE NOTE 7

SHOP NOTES

- A. SEE PCA1752A FOR WIRE PART NUMBERS
- B. GSVSS WIRING:
  - REMOVE JUMPER BETWEEN TB7-N AND TB7-O.
  - REMOVE JUMPER BETWEEN TB7-O AND TB7-P.
  - JUMPER GSVSS TERMINALS A AND E
  - CONNECT GSVSS TERMINAL E TO TB7-F.
  - SET GSVSS TO 100 RPM

WIRE SIZES ARE MINIMUM RECOMMENDED FOR TYPICAL 6M (19 FT) TO 9M (29 FT) INTERCONNECT DISTANCE. IF LONGER, WIRE SIZE MAY BE INCREASED. CONSULT FACTORY.

ALL UNMARKED WIRES TO BE: 20 AWG - PANEL  
14 AWG - ENGINE

- SHIELDED CABLE (NOT SUPPLIED BY WPS)
- 20 AWG (MIN) SHIELDED
- 16 AWG (MIN) SHIELDED
- 14 AWG (MIN) SHIELDED
- 20 AWG (MIN) SHIELDED TYPE K
- CUSTOMER WIRING, SIZE PER ELECTRIC CODE
- CONNECTOR SUPPLIED BY WAUKESHA
- HARNESS SUPPLIED BY WAUKESHA, INSTALLED BY CUSTOMER
- HARNESS SUPPLIED AND INSTALLED BY WAUKESHA
- 8 AWG (MIN)
- 10 AWG (MIN)
- 10 AWG (MIN) GREEN
- 12 AWG (MIN)
- 14 AWG (MIN)
- 14 AWG (MIN) GREEN
- 18 AWG (MIN)
- 20 AWG (MIN)
- BATTERY CABLES SIZED PER SKA4236 OR PSA733A

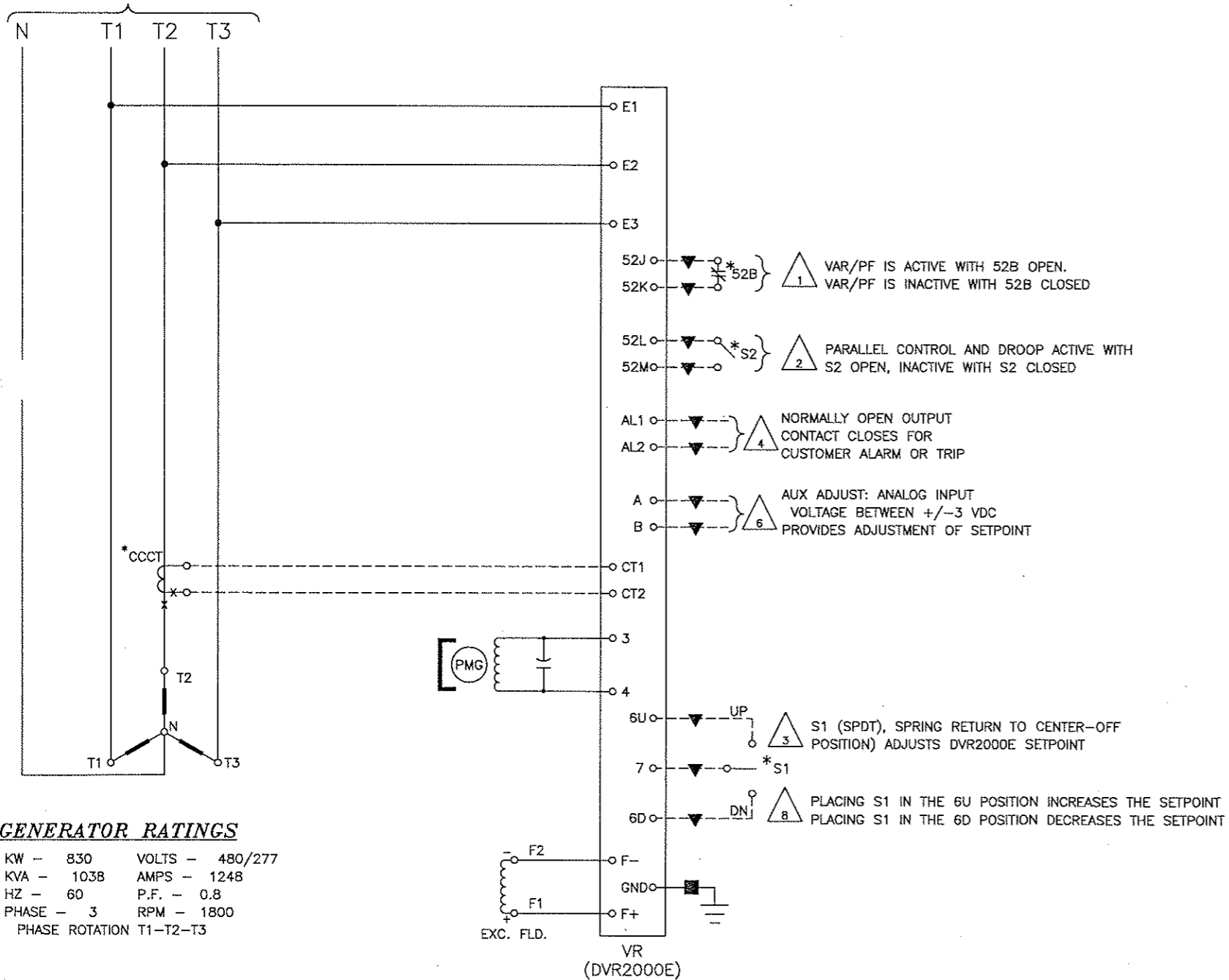
SEE DOCUMENT PD007B FOR COMPONENT ABBREVIATIONS



DESCRIPTION OF OPERATION

- TO START ENERGIZE CONTACTS K1 AND K2 AT THE SAME TIME
- TO CRANK:
- CLOSE CONTACT K1
  - USE CRANK TERMINATION SWITCH TO CAUSE K1 TO OPEN WHEN ENGINE STARTS.
  - AFTER ENGINE STARTS, KEEP K1 OPEN UNTIL ENGINE STOPS ROTATING.
- TO RUN:
- CLOSE CONTACT K2
  - CONTROL ENGINE SPEED AND LOAD WITH GOVERNOR SYSTEM.
- TO STOP:
- OPEN CONTACT K2.
- EMSS:
- MAINTAINED CONTACT PUSHBUTTON
  - PUSH TO PREVENT STARTING AND RUNNING
  - PULL (NORMAL POSITION) TO ALLOW STARTING AND RUNNING

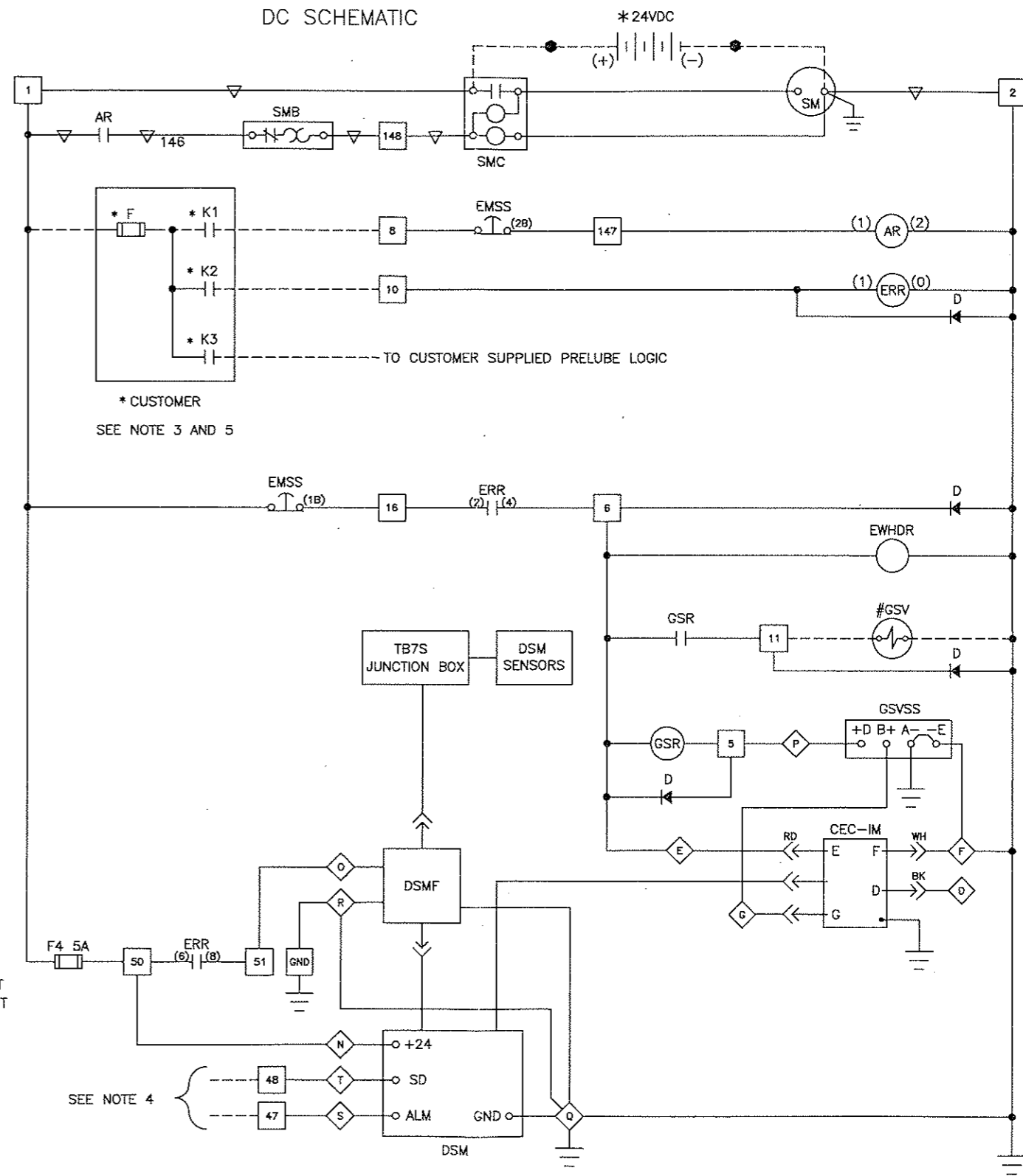
CONTINUED ON SHEET 4



GENERATOR RATINGS

KW - 830    VOLTS - 480/277  
 KVA - 1038    AMPS - 1248  
 HZ - 60    P.F. - 0.8  
 PHASE - 3    RPM - 1800  
 PHASE ROTATION T1-T2-T3

DC SCHEMATIC



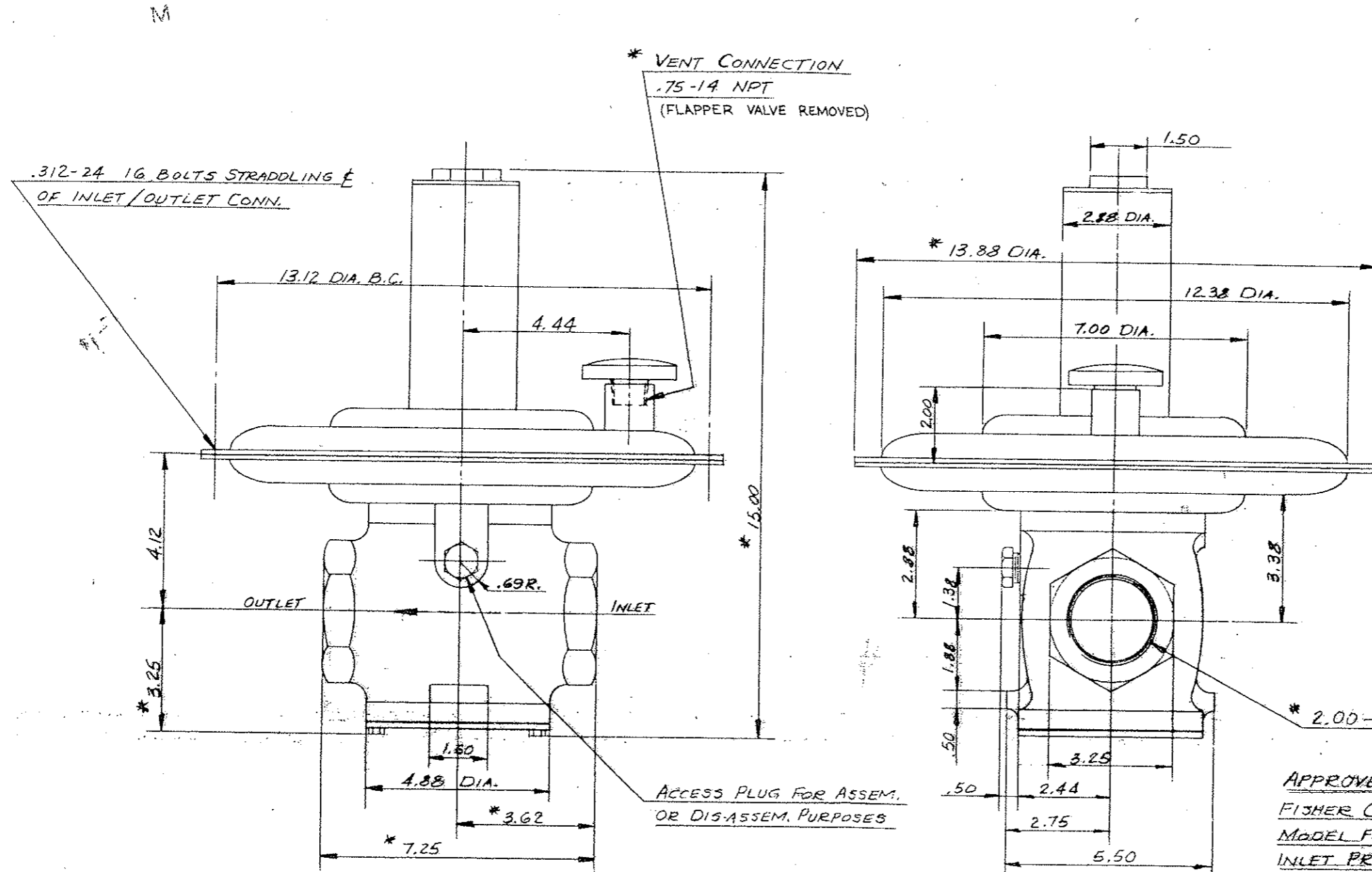


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181960Z

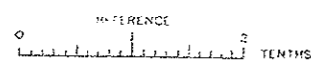
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ALL DIM. EXCEPT THOSE  
 W/\* ARE SCALED AND SHOULD  
 NOT BE USED FOR INSPECTION  
 PURPOSES.

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UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES. TWO-PLACE MACHINE DIMENSION ±.03. THREE PLACE MACHINE DIMENSIONS ±.010. ANGLES ±0° 30'. BREAK SHARP CORNERS .010-.030. SHEET METAL FABRICATION TOLERANCES PER 4-5069. CONCENTRICITY (T.I.R.) OF ANY TWO MACHINED DIAMETERS AROUND A COMMON AXIS SHALL BE WITHIN 1/2 THE SUM OF THE TOTAL TOLERANCE ON THOSE DIAMETERS.



MODELS V6F FIBER	REFERENCE DRAWINGS CC 222	MATERIAL AS PURCHASED (SEE NOTE)	HEAT TREATMENT
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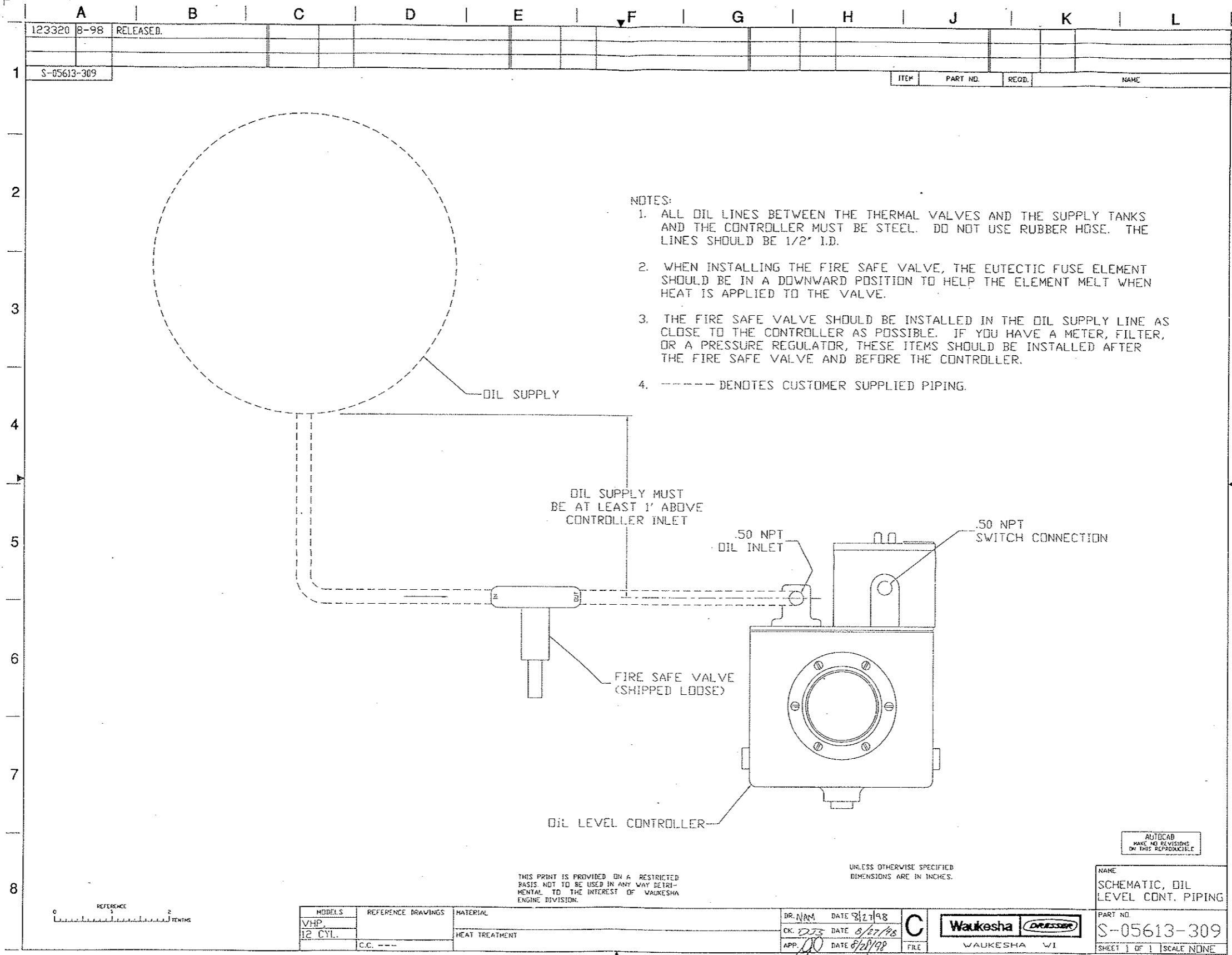
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 CK BDK DATE 1-13-94  
 APP JLS DATE 1-13-94



NAME  
REGULATOR  
GAS

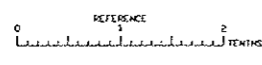
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SHEET 1 OF 1



- NOTES:
1. ALL OIL LINES BETWEEN THE THERMAL VALVES AND THE SUPPLY TANKS AND THE CONTROLLER MUST BE STEEL. DO NOT USE RUBBER HOSE. THE LINES SHOULD BE 1/2" I.D.
  2. WHEN INSTALLING THE FIRE SAFE VALVE, THE EUTECTIC FUSE ELEMENT SHOULD BE IN A DOWNWARD POSITION TO HELP THE ELEMENT MELT WHEN HEAT IS APPLIED TO THE VALVE.
  3. THE FIRE SAFE VALVE SHOULD BE INSTALLED IN THE OIL SUPPLY LINE AS CLOSE TO THE CONTROLLER AS POSSIBLE. IF YOU HAVE A METER, FILTER, OR A PRESSURE REGULATOR, THESE ITEMS SHOULD BE INSTALLED AFTER THE FIRE SAFE VALVE AND BEFORE THE CONTROLLER.
  4. ----- DENOTES CUSTOMER SUPPLIED PIPING.

123320	8-98	RELEASED.											
S-05613-309													
ITEM		PART NO.		RECD.		NAME							



MODELS	REFERENCE DRAWINGS	MATERIAL
VHP		
12 CYL.		
C.C. ---		HEAT TREATMENT

DR. NAM	DATE 8/27/98
CK. DJS	DATE 8/27/98
APP. [Signature]	DATE 8/27/98



NAME	
SCHEMATIC, OIL LEVEL CONT. PIPING	
PART NO.	
S-05613-309	
SHEET 1 OF 1 SCALE NONE	

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