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## LUBE SYSTEM

LUBE OIL USED IN THIS PACKAGE MUST BE IN ACCORDANCE WITH SOLAR SPECIFICATION ES-9-224. LUBRICANT GRADES ARE BASED ON ISO-VISCOGRADE AND SAE GRADES. FOR THIS PACKAGE, 15W-40 GALLONS (159.4 LITERS), AN ADDITIONAL 10 GALLONS (37.8 LITERS) IS REQUIRED FOR THE COOLER FILTER AND PIPING. ADDITIONAL OIL WILL BE REQUIRED TO FILL OFF-SHED OIL PIPING. LUBRICANTS SHOULD BE CHANGED AT 1500 HOURS OF OPERATION OR WHEN THE OIL REACHES A VISCOSITY OF 150 CENSAUSE IN A COLD TEST. INITIAL PIPING BEHIND LUBE OIL COOLER AND PACKAGED SEPARATED BY VALVE BE INSTALLED IN THE LUBE OIL TANK DRAIN CONNECTION #26 PRIOR TO FILLING THE TANK.

### SEE WARNING NOTE 10.2 AND TABLE 3.

THE LUBE OIL SHALL HAVE A POUR POINT WHICH IS AT LEAST 11°F (-4°C) BELOW THE MINIMUM AMBIENT TEMPERATURE TO INSURE FLOW IN EXPOSED LINES AND FITTINGS.

THE PACKAGE OIL COOLER IS NOT INTEGRAL WITH THE PACKAGE AND MUST BE LOCATED AND INSTALLED SEPARATELY. THE FOLLOWING INSTALLATION REQUIREMENTS APPLY. THESE REQUIREMENTS ARE NEW TO THE PACKAGE FRAME. REFERENCE PLANE "C" MUST BE MORE THAN 50" (1270 MM) ABOVE THE BOTTOM OF THE

COLDER OIL VOLUME:	15.5 GALLONS (59 L)
DESIGN OIL FLOW RATE:	607,000 GPM (2290 M <sup>3</sup> /HR) 10 GPM (394 LPM)
AIR FLOW RATE:	17,250 ACFM (486 M <sup>3</sup> /MIN)
MAX. AMBIENT TEMP.:	(25°F)
CHE OIL/S:	150°F (+65.5°C)

MAXIMUM OIL COOLER DESIGN PRESSURE DROP: 20 PSID (1.38 BAR)  
MAXIMUM TOTAL DESIGN PRESSURE: 200 PSID (13.79 BAR)

THE MAXIMUM TOTAL DESIGN PRESSURE DROP OF THE OIL COOLER SUPPLY AND RETURN LINES SHALL NOT EXCEED 50 PSID (3.45 BAR). AT THE DESIGN FLOW RATE AND AN OIL VISCOSITY OF 60 SUS IN COLD CLIMATES, OIL COOLER SUPPLY, RETURN AND OPTIONAL VENT LINES MUST SLOPE FROM THE OIL COOLER TO THE TURBINE PACKAGE TO FACILITATE DRAINAGE WHEN THE UNIT IS NOT OPERATING.

### SEE WARNING NOTE 10.2 AND TABLE 3.

PREVENTING FIRES MUST BE CONSIDERED TO PREVENT THE LUBE OIL COOLER FROM EXHAUSTING INTO THE ENGINE AIR INLET SYSTEM OR TO TAKE AIR IN FROM THE ENGINE EXHAUST SYSTEM, NO AIRFLOW BACKPRESSURE IS ALLOWED AT THE LUBE OIL COOLER FACE.

NOTE: NOT USED.

THE EXTERNAL OIL TANK VENT PIPING MUST BE SELF-SUPPORTING AND HAVE A MINIMUM UPWARD SLOPE OF 0.2% PER FOOT (21 MP/M) WITH NO TURNS OR RESTRICTIONS. THE VENT LINE MUST BE ROUTED TO THE FLAME ARRESTOR. THE VENT LINE MUST BE ROUTED AWAY FROM THE TURBINE EXHAUST AND OTHER A SOURCE(S) OF IGNITION. THE VENT PIPE TERMINATION SHALL AFFORD PROTECTION FROM RAIN AND SNOW BY MEANS OF A SHIELD OR BY PIPE GEOMETRY AND BE SECURED TO PREVENT ENTRY OF LARGE FOREIGN OBJECTS. SEE WARNING NOTE 10.2 AND TABLE 3.

THE OIL TANK VENT AIR/OIL SEPARATOR IS NOT INTEGRAL WITH THE PACKAGE AND MUST BE LOCATED AND INSTALLED SEPARATELY (REFERENCE NOTE 1.1 FOR SOLAR SPECIFICATIONS). THE FOLLOWING INSTALLATION REQUIREMENTS APPLY.

FILL PART THE SEPARATOR SHIP THROUGH FILL PORT TO OVERFLOWING BEFORE OPERATING. SUFFICIENT CLEARANCE FOR REMOVAL OF COVER MUST BE PROVIDED FOR PROPER MAINTENANCE OF THE SEPARATOR.

THE FLAME ARRESTOR IS REQUIRED TO PREVENT FIRE TRANSMISSION INTO THE OIL TANK. THE FLAME ARRESTOR IS NOT INTEGRAL WITH THE PACKAGE AND MUST BE LOCATED AND INSTALLED SEPARATELY. NO MORE THAN 15' (4571 MM) FROM THE VENT TERMINATION (REFERENCE NOTE 1.1) SOLAR SPECIFICATIONS).

## ELECTRICAL SYSTEMS

- 6.0 PACKAGE ELECTRICAL INSTALLATION REQUIREMENTS ARE SHOWN ON ELECTRICAL SCHEMATIC AND INTERCONNECT WIRING DIAGRAM. (REFERENCE SYSTEMS DRAWING NOTE 1.2.)
- 6.1 THE EXCITER END GENERATOR BEARING HOUSING IS ELECTRICALLY INSULATED FROM THE GENERATOR FRAME TO PREVENT SHUNT CURRENTS. ALL CONNECTIONS TO THE HOUSING SUCH AS CONDUIT AND LUBRICATING PIPING MUST CONTAIN NON-CONDUCTING SECTIONS TO MAINTAIN ELECTRICAL ISOLATION OF THE BEARING HOUSING.

- 6-2 GROUNDING ARE PROVIDED FOR SEPARATELY GROUNDING PACKAGE FRAME, CONTROL CONSOLE AND BATTERY CHARGER TO THE CUSTOMER'S GROUNDING CONDUCTOR AND IS REQUIRED. GROUNDING CONDUCTOR TO BE SIZED IN ACCORDANCE WITH REQUIREMENTS OF APPLICABLE ELECTRICAL CODES. LUG SURFACES TO BE FREE OF DIRT, GRIT, PAINT AND OIL TO ALLOW FOR CLEAN METAL-TO-METAL CONTACT. LUG ALSO SUITABLE FOR CONNECTION OF MAIN BONDING JUMPER FOR GROUNDING SYSTEMS. MAIN BONDING JUMPER TO BE SIZED IN ACCORDANCE WITH THE APPLICABLE ELECTRICAL CODE.

- 6.3 THE TURBIDIC CONTROL IS CONTAINED IN A DUST TIGHT, PAINTED STEEL CONSOLE DESIGNED TO LIMIT THE EFFECTS OF ELECTROMAGNETIC INTERFERENCE. IF SO EQUIPPED, THE CONTROL CONSOLE IS DESIGNED WITH INTERNAL FANS TO PROVIDE AIR CIRCULATION WITHIN THE CONSOLE TO THE HEAT GENERATING COMPONENTS.

- THE CONTROL CONSOLE MUST BE LOCATED IN A CLEAN, DRY ENVIRONMENT CONSISTENT WITH GOOD OPERATING PRACTICES FOR PLC AND COMPUTER SYSTEMS. ENVIRONMENTAL CONDITIONS WITHIN 32°F (0°C) TO 122°F (50°C) WITH 95% NON-CONDENSING HUMIDITY ARE REQUIRED.

- THE CONTROL CONSOLE SHOULD BE CHECKED AT REGULAR INTERVALS FOR CLEANLINESS AND CLEARED AS APPROPRIATE.
- THE EXACT LOCATIONS FOR EXTERNAL ELECTRICAL CONNECTIONS INTO THE CONTROL CONSOLE TO BE USED FOR TESTING PURPOSES ARE SHOWN IN THE FOLLOWING CONNECTION STUDS 15. SHOWN THE CONSOLE IS SUPPLIED WITH FACTORY CUTOUPS AND REMOVABLE GLASS PLATES ON TOP AND BOTTOM.
- AC AND DC CIRCUITS MUST BE RUN SEPARATELY FROM EACH OTHER TO AVOID ELECTRICAL CONTROL INTERFERENCE PROBLEMS. INTRINSICALLY SAFE CIRCUITS MUST BE SEPARATELY FROM NON-INTRINSICALLY SAFE CIRCUITS.

- 6-5 BATTERIES AND BATTERY CHARGERS ARE DEDICATED TO THE SOLAR ELECTRICAL SYSTEM AND MUST NOT BE SHARED WITH OTHER SYSTEMS OR COOLING SYSTEMS WITHOUT MILLITER APPROVAL. FROM SOLAR ELECTRICAL
- 6-6 UPON INSTALLATION OF THE VARIABLE FREQUENCY DRIVE ALPHA VENTILATION CLEARANCE OF 3" (75 MM) MUST BE MAINTAINED ON THE TOP AND BOTTOM WHEN DEVICES ARE MOUNTED VERTICALLY ADJACENT TO ONE ANOTHER.
- 6-7 AN ADDITIONAL WIRING LENGTH ALLOWANCE SHOULD BE MADE FROM SKID EDGE TO TERMINATION AT THEIR ELECTRICAL POINTS.

ENCLOSURE

- ENGINEERING AIR FLOW IS 23,000 SCFM (16  $\text{m}^3/\text{min}$ ) FOR THE VENT INLET OPENING AND 10,800 SCFM (646  $\text{m}^3/\text{min}$ ) FOR THE VENT EXHAUST OPENING. IF ADDITIONAL DUCTING OR RESTRICTION ARE ADDED AND THE PRESSURE DROP INCREASES BY MORE THAN 1 INCH OF WATER, THE EXHAUST FLOW WILL BE LIMITED TO 10,800 SCFM. INSIDE COMPARTMENT HEAT REJECTION IS APPROXIMATELY 300,000 BTU/Hr (87,650  $\text{kJ}/\text{hr}$ ).
- GENERATOR COOLING AIR FLOW IS APPROXIMATELY 13,200 SCFM (9.38  $\text{m}^3/\text{min}$ ). DURING GENERATOR STARTUP, THE COOLING AIR FLOW WILL BE LIMITED TO 13,200 SCFM. THE EXHAUST FLOW OF THE GENERATOR COMPARTMENT IS APPROXIMATELY 446,659 BTU/Hr (131,725  $\text{kJ}/\text{hr}$ ).

- 0.2 ENCLOSURE IS EQUIPPED WITH A FIRE DETECTION/SUPPRESSION SYSTEM. THE EXTINGUISHERMAN DISCHARGE PRESSURE ACTIVATES PNEUMATICALLY RELEASED FIRE DAMPERS ON ALL VENT OPENINGS. FINE SYSTEM MANUAL RELEASE STATIONS MUST BE EASILY ACCESSIBLE IN AN EMERGENCY.

- [illegible]

- OPENINGS. TO PREVENT LEAKAGE, ENSURE THAT ALL ENCLOSURE AND FRAME OPENINGS ARE SEALED. PACKAGE DRIP PAN DRAINS NEED TO BE PLUGGED.
- CABINET SHALL BE INSTALLED WHERE MAXIMUM TEMPERATURE NOT TO EXCEED +30°F (5+°C) OR FALL BELOW 0°F (-18°C).
- TO PREVENT EXTINGUISHANT LEAKAGE ENSURE THAT ALL OPENINGS ARE SEALED.

- 8.4 ENCLOSURE IS EQUIPPED WITH AC LIGHTING SYSTEMS.

- 8.6 ENCLOSURE IS EQUIPPED WITH A COMBUSTIBLE GAS DETECTION SYSTEM.

- 8-8 ENCLOSURE IS EQUIPPED WITH BUILT-IN ENGINE REMOVAL CAPABILITY CONSISTING OF INTERNAL TROLLEYS, LOOSE SHIPPED TROLLEY BEAM EXTENSIONS AND ONE 3-TON HOIST.

## ENGINE CLEANING

- 9.0  
TIGHTEN THE CLEANUP CONNECTIONS 12 AND 122 MUST BE CAPPED, OR PLUGGED WHEN NOT IN USE. NEVER USE THE EXHAUST OF DIRT AND DEBRIS. NEVER USE THE EXHAUST FOR ANY OTHER CONNECTION. 122 FOR ON-DRAIN CLEANING ONLY, AND 121 FOR OFF-DRAIN CLEANING ONLY. USE ON-DRAIN AND ON-LINE CLEANING THE WATER/SOLVENT SOLUTIONS SUPPLY 15 TO BE REGULATED BETWEEN 65 PSIG AND 100 PSIG (3.81, 1.04 AND 6.89 X 10<sup>6</sup> N/M<sup>2</sup>) AT THE PACKAGE EXIST CONNECTION. NEVER EXCEED 100 PSIG (6.89 X 10<sup>6</sup> N/M<sup>2</sup>) AT ANY CONNECTION. ALWAYS USE THE CONNECTIONS BETWEEN 65-92 ON THE OPERATIONS AND MAINTENANCE MANUAL FOR ADDITIONAL CLEANING REQUIREMENTS AND PROCEDURES. WASH FLOW RATES AND TREATMENT QUANTITIES PER MASH CYCLE ARE SHOWN IN THE TABLE BELOW.

- 9.1 WHEN AMBIENT TEMPERATURES FALL BELOW 50°F (10°C), CONSULT SOLAR SPECIFICATION ES 9-6.2 AND THE OPERATION AND MAINTENANCE MANUAL FOR PROPER COLD WEATHER OPERATING PROCEDURES.
- 9.2 SOLAR CLEANING SOLUTIONS SHOULD NEVER BE USED FOR ON-LINE CLEANING CONNECTION 121 UNLESS A PROPERLY DESIGNED INJECTION SYSTEM IS INSTALLED.

- 9.3 THE TURBINE AIR INLET DUCT MUST BE FREE OF ALL ACCUMULATED WATER AND SOLID RESIDUE PRIOR TO STARTING THE TURBINE. INSURE THAT THE TURBINE AIR INLET DUCT AND DRAINS ARE COMPLETELY DRAINED AFTER CLEANING AND NOT TERMINATED IN A COMBUSTIBLE ENVIRONMENT. SEE NOTE 10.2 AND TABLE 3.

- ON-CRANK AIR FLOW                      ON-LINE AIR FLOW  
2,199 SCFH                                      0,708 SCFH
- A COMPACTION FLANGE INCORPORATING AN INTEGRAL QUICK DISCONNECT COUPLING IS PROVIDED WITH THE MASH CAN FOR INSTALLATION AT SIZED CONNECTIONS 121 AND 122.

## SAFETY AND MISCELLANEOUS NOTES

- 10.0 CAUTION: AIR TEMPERATURE RANGES FROM 60°F (16°C) TO 80°F (27°C). APPLICATION OF THERMAL LAGGING TO EXTERNAL PIPES, TUBES, AND FITTINGS IS RECOMMENDED FOR PERSONNEL PROTECTION.
- 10.1 LOOSE SHIPPED WITH ATTACHING HARDWARE FOR FIELD INSTALLATION.
- 10.2 WARNING: DO NOT BACK PRESSURE TO SPECIFIED VALUE IN SYSTEM OR COMPONENT EXCEEDING THE RATED PRESSURE.

- WARNING:**  
IF THE EQUIPMENT WILL BE USING COMBUSTIBLE GAS FOR SERVICE, CARE MUST BE TAKEN TO PROPERLY VENT THE EXHAUST TO A SAFE LOCATION. REFER TO TABLE 3 FOR EMISSION QUANTITY AND DURATION.

- 10.4 NOTE NOT USED.
- 10.5 SOLAR-SUPPLIED EQUIPMENT FOR EXTERNAL MOUNTING.

## TURBINE EXHAUST SYSTEM

- 1.0 GENERAL EXHAUST SYSTEM DESIGN CONSIDERATIONS:
- A. SUPPORT OF THE EXHAUST SYSTEM SHOULD PREVENT DAMAGE TO SOLID SUPPORTED COMPONENTS DUE TO THERMAL EXPANSION. SEE PACKAGE INSTALLATION SECTION OF THE NOTES FOR APPLICABLE PACKAGE LIMITS AND CRITERIA.
- B. MOUNTING BRACKETS MAY BE WELDED TO THE SHELL OF THE DUCTING. THE TYPICAL METAL THICKNESS AND TYPE IS 10 GAUGE (0.36" / 3.4 mm) THICK NOMINALLY ASTM A568/569 UNS55 ORHENSEE SHOWN IN THESE NOTES.
- C. THE EXPANSION JOINT (IF SUPPLIED) WILL NOT SUPPORT THE WEIGHT OF DUCTING OR EXHAUST. THE JOINT SHALL BE 1/2" (12.7 mm) MINIMUM THICKNESS. THE JOINT SHALL BE 45° (1.1 RADIANS) LATERAL / 1" (25.4 mm) RADIAL. A 5° DEGREE EXPANSION JOINT HAS NO APPRECIABLE SPINNING RATE.

**TABLE 3 - PACKAGE VENT AND DRAIN EMISSION INFORMATION**

EXTERNAL CONNECTIONS							
ITEM	DESCRIPTION	PORT SIZE SEE SHEET	EMISSION SUBSTANCE	EMISSION QUANTITY (SEE NOTE 5.4 AND * BELOW)	EMISSION DURATION	MAXIMUM BACK PRESSURE	VELOCITY (FT/SEC)
3	LUBE OIL TANK VENT	1/2" 150 LB ANSI RF FLANGE	AIR/OIL	(SEE NOTE 5.4 AND * BELOW)	CONTINUOUS	2" H <sub>2</sub> O	22.93
19	ENGINE EXHAUST COLLECTOR AND PIPE	1" 150 LB ANSI RF FLANGE	FUEL/WATER	5 SEE NOTE 2.13	10 SEC. AT START-UP	NO BACK PRESSURE OR BACK PRESSURE ALREADY	N/A
22	ENGINE AIR INLET DUCT DRAIN	1" 150 LB ANSI RF FLANGE	CONCENTRATE	(SEE NOTE 9.3)	MAINTENANCE	N/A	N/A
29	LUBE OIL FILTER DRAIN	1" 150 LB ANSI RF FLANGE	OIL	3 GALLON	MAINTENANCE	N/A	N/A
30	LUBE OIL TANK DRAIN	2" NPT FEMALE	OIL	(SEE NOTE 5.0)	MAINTENANCE	N/A	N/A
32	PACKAGE DRAIN PAN DRAIN	2" NPT FEMALE	OIL/WATER	-	MAINTENANCE	N/A	N/A
33	OIL DRAIN FROM DRAIN PAN GENERATOR	2" NPT FEMALE	OIL/WATER	-	MAINTENANCE	N/A	N/A
34	GAS FUEL FILTER DRAIN	1" 300 LB ANSI RF FLANGE	L1/OIL/DS	-	MAINTENANCE	N/A	N/A
35	FLAME ARRESTOR, LUBE OIL TANK VENT	6" 125 LB ANSI FF FLANGE	AIR/OIL	(SEE NOTE 5.5 AND * BELOW)	CONTINUOUS	2" H <sub>2</sub> O	22.93
38	LUBE OIL MIST SEPARATOR OUTLET	6" 150 LB ANSI FF FLANGE	AIR/OIL	(SEE NOTE 5.4 AND * BELOW)	CONTINUOUS	2" H <sub>2</sub> O	22.93

\* 0.2 MG/ACF (100% OF ALL PARTICLES GREATER THAN 3 MICRONS AND 99% OF ALL PARTICLES 3 MICRONS AND SMALLER

- 11.1 WHEN ASSEMBLING OR DISASSEMBLING THE SYSTEM, USE THE LIFTING LUGS PROVIDED TO HANDLE EACH COMPONENT INDIVIDUALLY, EMPLOY INDUSTRY ACCEPTED LIFTING TECHNIQUES WHEN LIFTING LUGS ARE NOT PROVIDED, REFER TO COMPONENT WEIGHTS AND ASSUME A GEOMETRIC CENTER OF GRAVITY. DO NOT USE THE LIFTING LUGS FOR PERMANENT MOUNTING. (SEE NOTE 11.0, PARAGRAPH B).

- 11.2 THE DRAIN CONNECTIONS SHOWN ON THE AUXILIARY COMPONENTS ARE DESIGNED TO REMOVE EXCESSIVE AMOUNTS OF RAIN OR MOISTURE FROM THE SYSTEM DURING EXTENDED SHUT DOWN PERIODS. CONNECTION TO THESE DRAINS IS OPTIONAL FOR THE CUSTOMER. RAIN AND MOISTURE IS ALSO REMOVED VIA THE EXHAUST COLLECTOR DRAIN ON THE PACKAGE.

- 11.3 ATTACHING HARDWARE KITS ARE INCLUDED FOR ALL PLANES IN SOLAR SCOPE OR THE TOWER EXHAUST INTERFACE FLANGE. (AS APPLICABLE). HARDWARE IS NOT SUPPLIED FOR ANY OTHER DOWNSTREAM CONNECTIONS. HARDWARE IS NOT SUPPLIED FOR FOUNDATION OR SUPPORT STEEL INTERFACES, UNLESS INCLUDED IN SOLAR SCOPE.

- THE STALL PRESSURE DROP ACROSS ALL ITEMS SHOWN ON THIS INSTALLATION DRAWING IS 2" H<sub>2</sub>O (51 MM). IF ADDITIONAL DUCTING OR DEVICES DONE BY OTHERS IS USED, THE PRESSURE DROP OF THE DUCTING OR DEVICE SHOULD BE SUBTRACTED FROM THE ALLOWABLE DROP ALLOCATED FOR IN THE TURBINE PERFORMANCE GUARANTEE.

- INDIVIDUAL COMPONENTS OF THE TUBING KAMMOJI SYSTEM ARE DESIGNED TO WITHSTAND A WINDLOAD OF 120 MI/HR (193 KM/HR) OR EQUIVALENT SEISMIC OR LATERAL ACCELERATION. ASSEMBLIES OF INDIVIDUAL COMPONENTS CANNOT BE CONSIDERED TO BE STRUCTURALLY ADEQUATE TO THE SAME LOADS WITHOUT ADDITIONAL ENGINEERING.

- 11.6 BARE METAL EXHAUST SURFACES TYPICALLY OPERATE AROUND 900°F (482°C). PERSONNEL PROTECTION IS RECOMMENDED AND CARE MUST BE TAKEN IN THE LOCATION OF HOT EXHAUST SURFACES. DO NOT LOCATE EXHAUST COMPONENTS ON OR NEAR FLAMMABLE SURFACES

- 11.7 THE ALLOWABLE FLANGE LOADS ON THE EXHAUST SILENCER, (IF SUPPLIED) ARE 2000 LBS (0.92 KN) AXIAL, 750 LBS (3.3 KN) SHEAR AND 5400 LBS-FT (35.5 KN-M) MOMENT. CARE SHOULD BE TAKEN TO ENSURE THAT THE STACK DESIGN DOES NOT EXCEED THESE LOADS.

## TURBINE AIR INLET SYSTEM

- 12.0. A MINIMUM HEIGHT OF CLEAR AREA IS REQUIRED TO SERVICE THE FILTER ELEMENTS AND TO ENSURE PROPER AIRFLOW TO THE TURBINE. DO NOT BLOCK DOWN SWINGS OR ACCESS MEANS.
- 12.1. MOUNTING BRACKETS MAY BE SELECTED TO THE SHELL OR THE DUCTING. THE TYPICAL RETAIL THICKNESS STATED IN THESE NOTES, OR ON METAL OR FILTERS, EXHAUSTIVE COLORED OR SILENCERS, WELDING ON THESE DEVICES MAY RESULT IN FIRE OR DAMAGE TO THE DEVICE.
- 12.2. WHEN ASSEMBLING OR DISASSEMBLING THE SYSTEM, USE THE LIFTING LUGS PROVIDED TO MANOEUVRE EACH COMPONENT AND DOLL, TO COMPRESS, INSTEAD OF THE FILTER ELEMENTS WHEN LIFTING LUGS ARE PROVIDED. THE LIFTING LUGS FOR PERMANENT MOUNTING. (SEE NOTE 12.1.)

- 12.4 ATTACHING HARDWARE KITS ARE INCLUDED FOR ALL FLANGES IN SOLAR SUPPLIED COMPONENTS OR THE WITH APPROXIMATELY 100 BOLTED CONNECTIONS PER DUCT. ALL ASSEMBLY AND ATTACHING HARDWARE IS SUPPLIED IN KIT FORM WITH THE DUCTING.

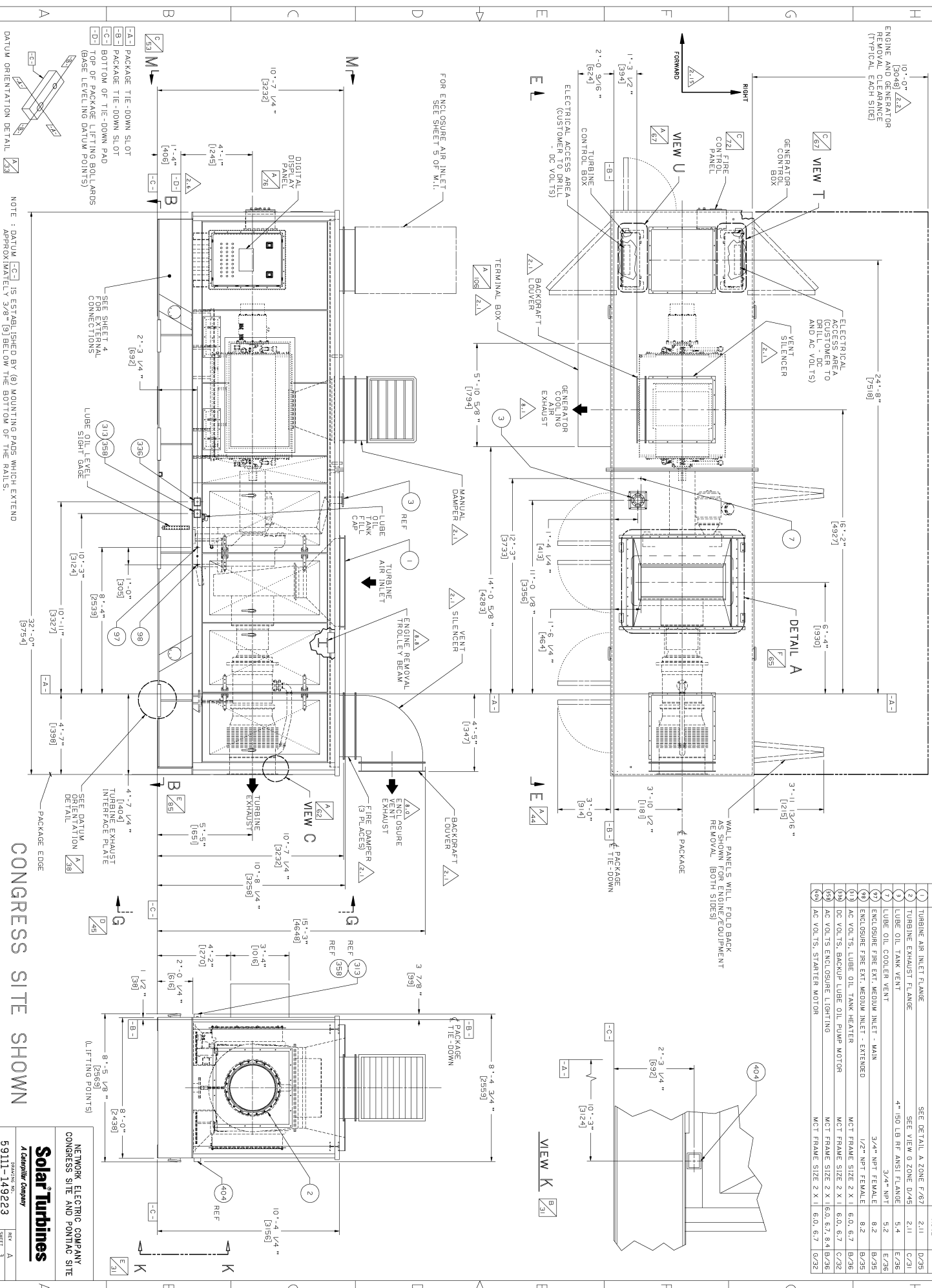
- 12.5 THE TOTAL PRESSURE DROP ACROSS ALL ITEMS SHOWN ON THIS INSTALLATION DRAWING IS 2.5"  $H_2O$  (63 MM). IF ADDITIONAL DUCTING OR DEVICES SHOWN BY OTHERS IS USED, THE PRESSURE DROP OF THAT DUCTING SHOULD BE SUBTRACTED FROM THE ALLOWABLE PRESSURE DROP IN THE TUBING PERFORMANCE GUARANTEE.

- 12.6 INDIVIDUAL COMPONENTS OF THE TUBING JETTING SYSTEM ARE DESIGNED TO WITHSTAND A MINIMUM OF 120 MI/HR (193 KM/HR) OR EQUIVALENT SEISMIC OR LATERAL ACCELERATION. ASSEMBLIES OF INDIVIDUAL COMPONENTS CANNOT BE CONSIDERED TO BE STRUCTURALLY ADEQUATE TO THE SAME LOADS WITHOUT ADDITIONAL ENGINEERING.

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TABLE 1 - EXTERNAL CONNECTIONS

ITEM	DESCRIPTION	REFERENCE ZONE
(1)	TURBINE AIR INLET FLANGE	SEE DETAIL, A ZONE F/62
(2)	TURBINE EXHAUST FLANGE	SEE VIEW O ZONE D/45
(3)	LUBE OIL TANK VENT	4" 150 LB RTF ANSI FLANGE
(4)	LUBE OIL COOLER VENT	3/4" NPT FEMALE
(5)	ENCLOSURE FIRE EXT. MEDIUM INLET - MAIN	8.2
(6)	ENCLOSURE FIRE EXT. MEDIUM INLET - EXTENDED	1/2" NPT FEMALE
(7)	LUBE OIL TANK HEATER	MCT FRAME SIZE 2 X 1
(8)	DC VOLTS BACKUP LUBE OIL PUMP MOTOR	MCT FRAME SIZE 2 X 1
(9)	DC VOLTS BACKUP LIGHTING	MCT FRAME SIZE 2 X 1
(10)	DC VOLTS STARTER MOTOR	MCT FRAME SIZE 2 X 1

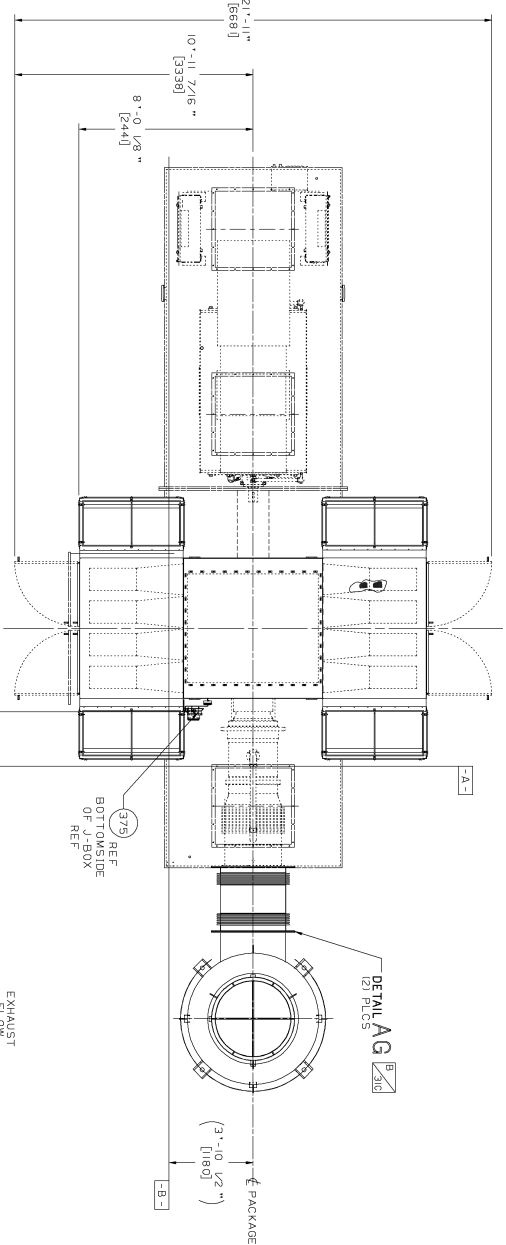


CONGRESS SITE SHOWN

NOTE : DATUM -C- IS ESTABLISHED BY (8) MOUNTING PADS WHICH EXTEND APPROXIMATELY 3/8" [9] BELOW THE BOTTOM OF THE RAILS.

NETWORK ELECTRIC COMPANY CONGRESS SITE AND PONTIAC SITE	
<b>Solar Turbines</b> <i>A Caterpillar Company</i>	
DRAWING NO. 59111-149223	REV. A SHEET 3





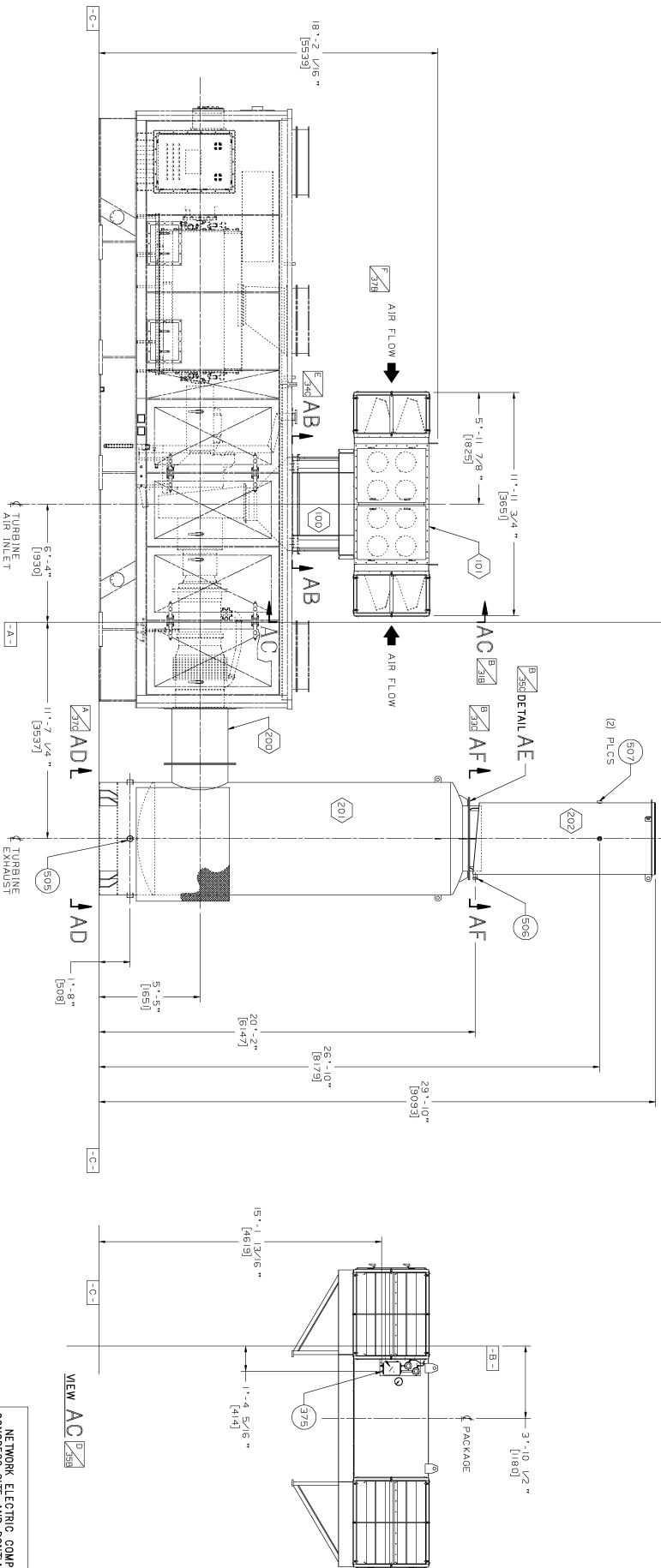
INLET SYSTEM					
	DESCRIPTION	PART NUMBER	NOTES	EST. UNIT WEIGHT LBS / KGS	
100	SILENCER	IPG-55283-100		700	
101	AIR CLEANER	IPG-6009-100		2,100	950

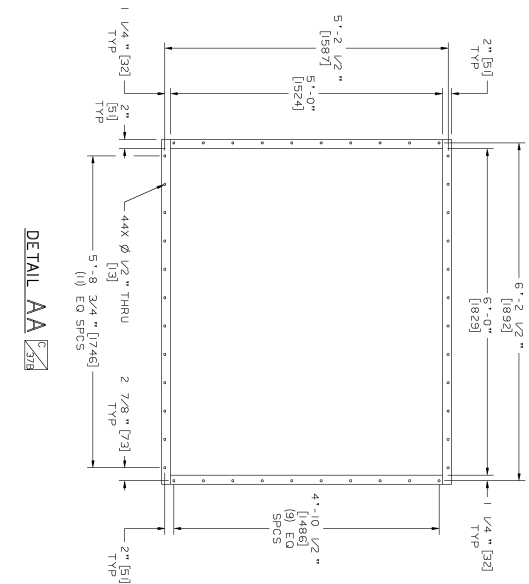
  

EXHAUST SYSTEM					
	DESCRIPTION	PART NUMBER	NOTES	EST. UNIT WEIGHT LBS / KGS	
200	EXHAUST DUCT	AX-5624-200		345	157
201	EXHAUST SILENCER	IPG-5540-100		14,100	6409
202	RAIN STACK	AX-5621-300		1,225	557

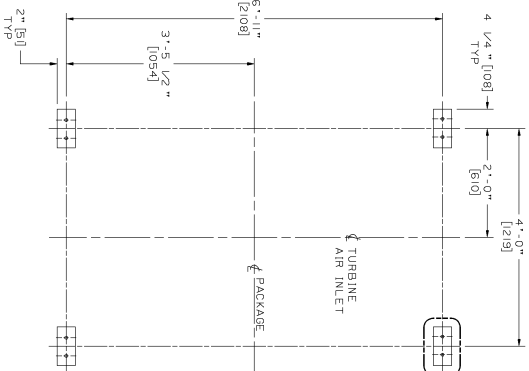
  

EXTERNAL CONNECTIONS - TABLE I					
ITEM	DESCRIPTION	NOTES	ZONE		
375	D.C. JUNCTION BOX, 1/2" NPT CONNECTION		C/31B		
505	EXHAUST SILENCER DRAIN, 1" NPT		B/34B		
506	EXHAUST RAIN STACK DRAIN, 2" NPT		D/34B		
507	EXHAUST EMISSIONS TEST PORTS, 2" NPT HALF COUPLINGS		E/35B		

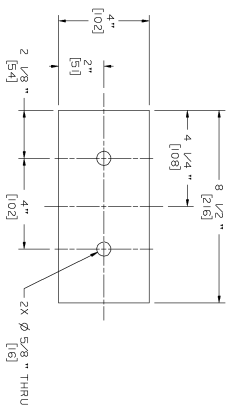





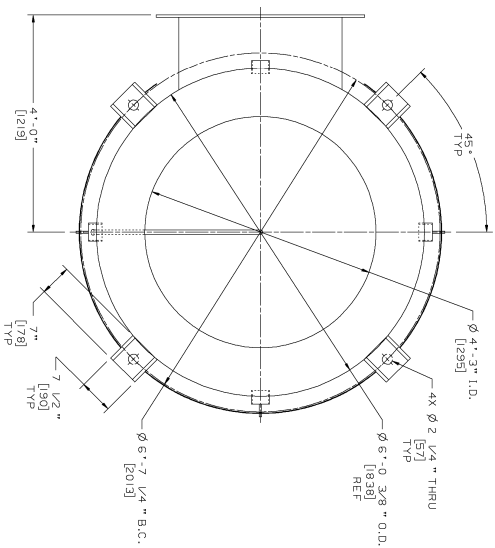
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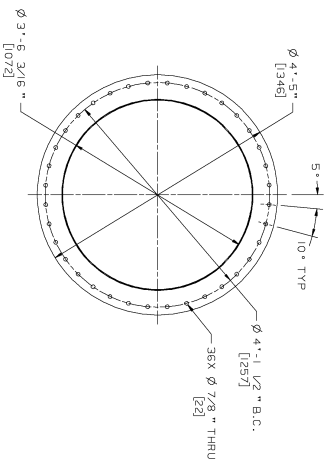
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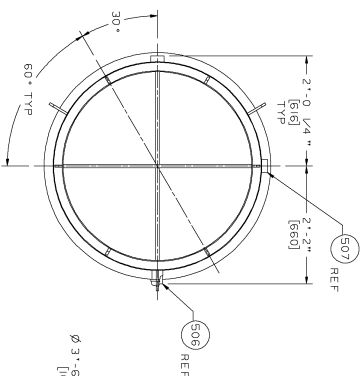
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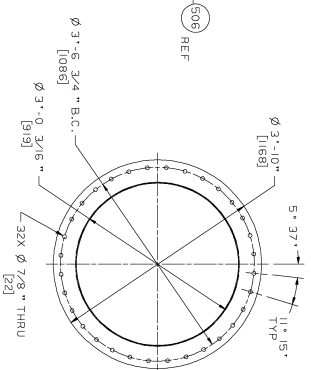
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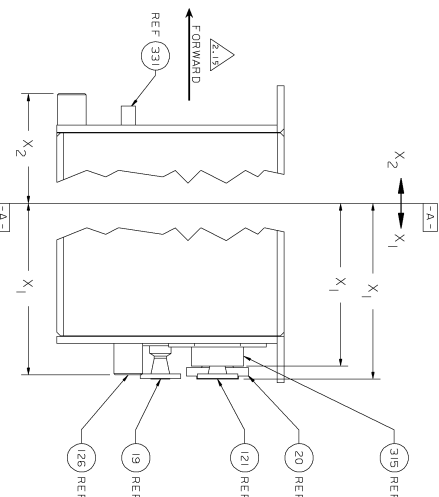
NETWORK ELECTRIC COMPANY  
CONGRESS SITE AND PONTIAC SITE

**Solar Turbines**

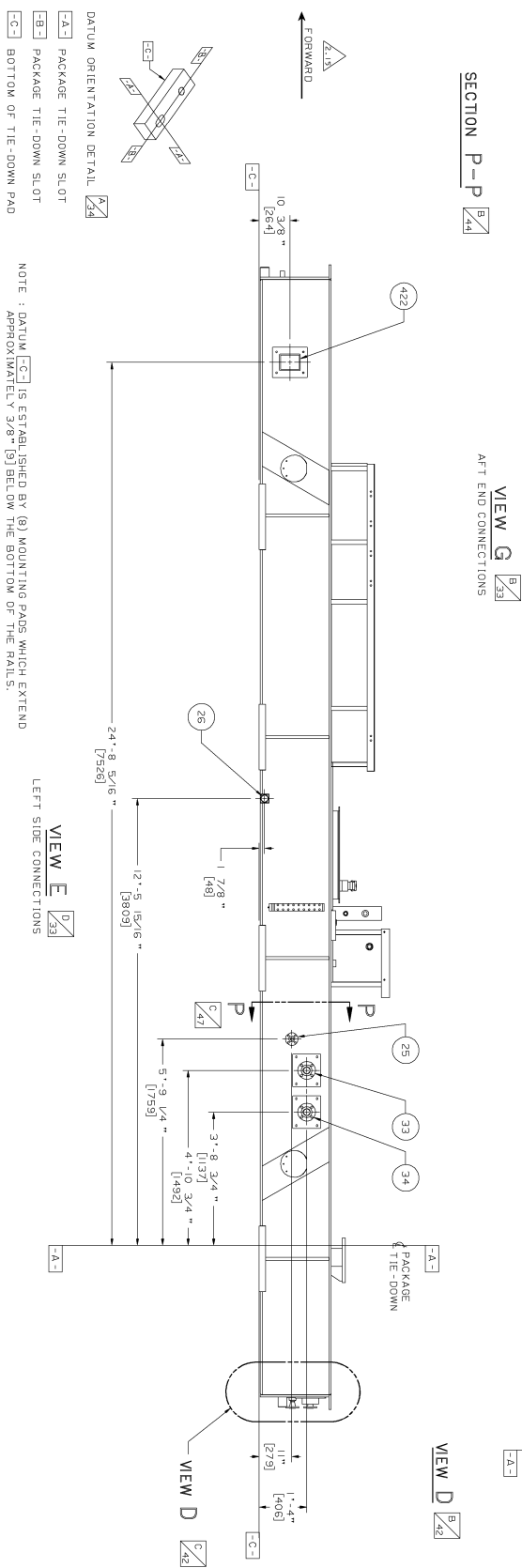
A Campbell Company

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SHEET 3C



ITEM	DESCRIPTION	REFERENCE NOTE	VIEW D	ZONE
(19)	ENGINE EXHAUST COLLECTOR AND COMBUSTOR DRAIN	2.13, 10.2	X <sub>1</sub> 4'-5.5/28"	H/45
(20)	NATURAL GAS FUEL INLET	9.0	X <sub>2</sub> 4'-6.5/28"	F/45
(21)	ENGINE AIR INLET DUCT DRAIN	3.3, 10.2	4'-8.5/28" (1387)	H/45
(22)	LUBE OIL FILTER DRAIN			C/44
(23)	LUBE OIL TANK DRAIN	2"-NPT FEMALE		B/45
(24)	PILOT VALVE'S AIR/GAS VENT	4.2, 10.2	4'-5.5/28" (1387)	F/45
(25)	LUBE OIL TO COOLER	2"-150 LB ANSI RF FLANGE		C/43
(26)	LUBE OIL FROM COOLER	2"-150 LB ANSI RF FLANGE		C/43
(27)	ON LINE CLEANING FLUID INLET	2"-150 LB ANSI RF FLANGE	4'-7.5/28" (1387)	C/43
(28)	ON GRAIN CLEANING FLUID INLET	1"-150 LB ANSI RF FLANGE	9.0, 9.2, 9.4	C/43
(29)	ON GRAIN CLEANING FLUID INLET	2"-NPT FEMALE	4'-6.5/28" (1387)	C/43
(30)	AC W/TS, HRC/POST, LUBE OIL PUMP MOTOR	MCT FRAME SIZE 4X1	4'-5.5/28" (1387)	C/43
(31)	GROUND, PACKAGE FRAME	SEE SECTION F-F, ZONE B65		C/47
(32)	GENERATION CONTROL BOX	MCT FRAME SIZE 4X1		E/47
(33)	TURBINE CONTROL BOX	MCT FRAME SIZE 4X1		C/47
(34)	REMOTE PROPANE SUPPLY TO TORCH	1"-300 LB ANSI RF FLANGE	4'-5.5/28" (1387)	C/45





1

	X <sup>2</sup>
-4	3/11
8	336]

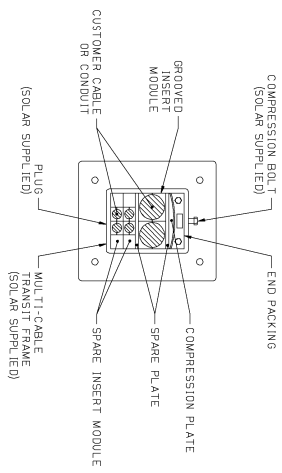


AC	
EQ1	

A

REV

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### TYPICAL INSTALLATION OF CONDUIT MCT FILLER BLOCKS

HARDWARE SUPPLIED BY  
OTHERS UNLESS  
OTHERWISE NOTED

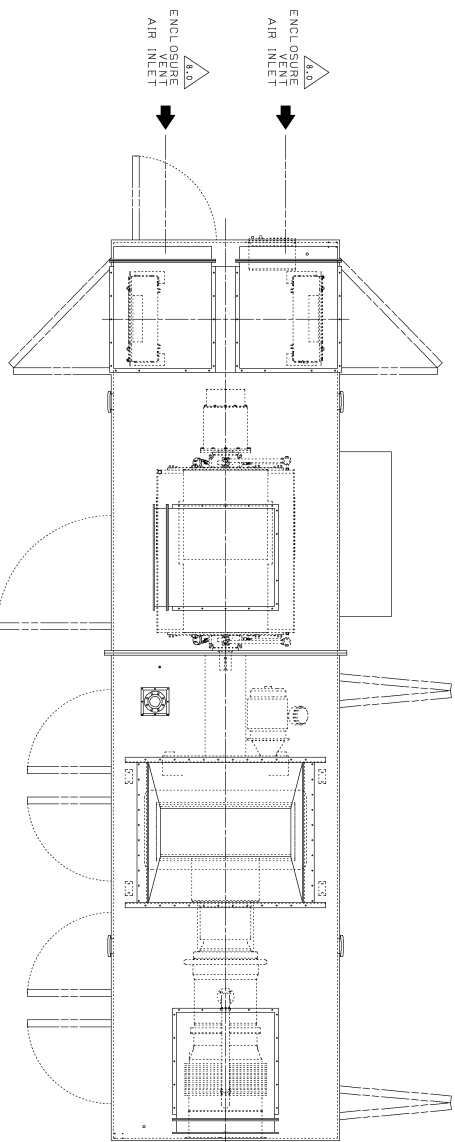
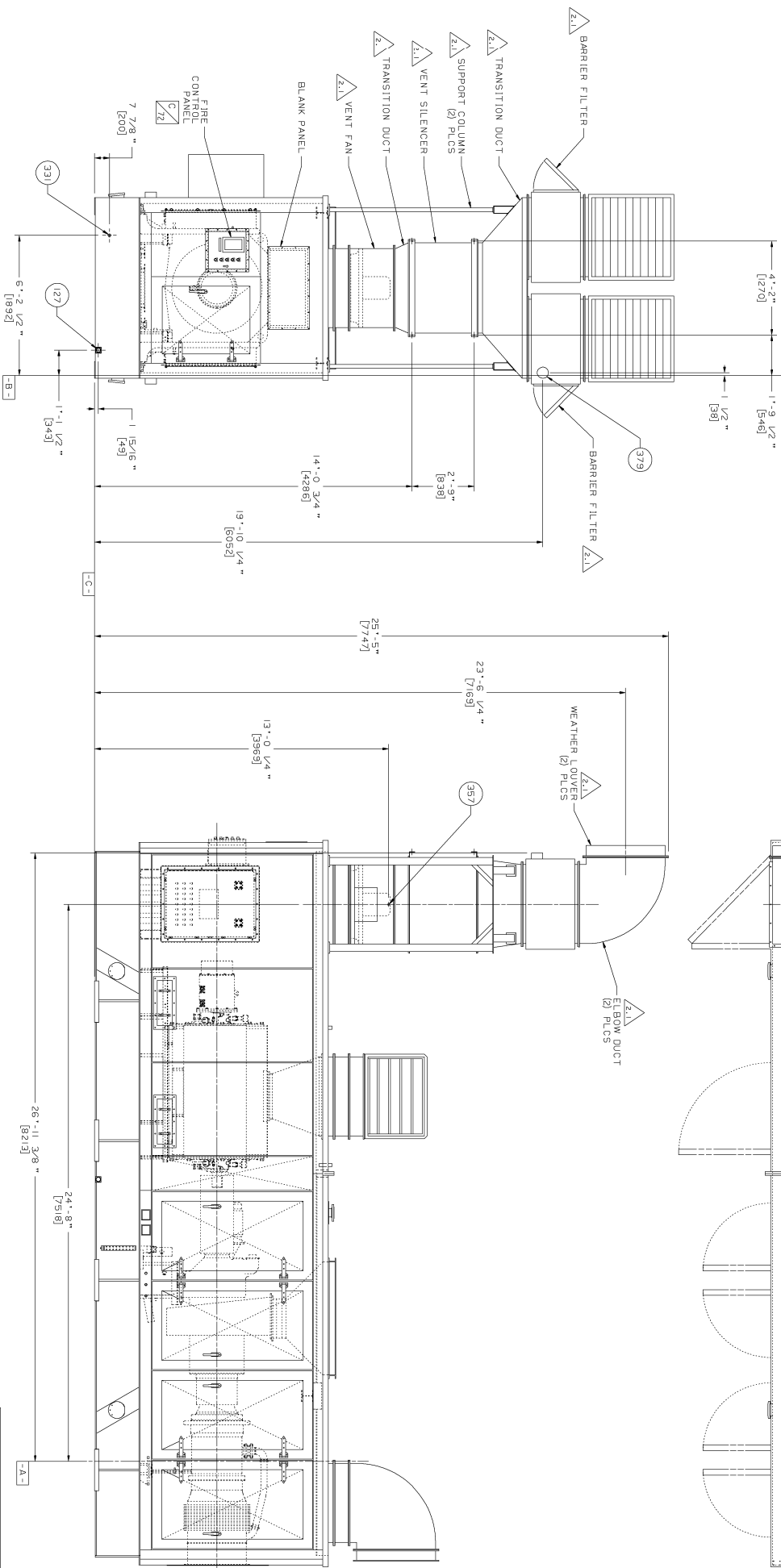


TABLE 1 (CONTINUED) - EXTERNAL CONNECTIONS

ITEM	DESCRIPTION	REFERENCE NOTE	NEW D		ZONE
			X <sub>1</sub>	X <sub>2</sub>	
(2)	OLI. DRAIN FROM DRIP PAN GENERATOR	2" MPF FEMALE	27'-4 3/4"	A/57	
(31)	GROUND, PACKAGE FRAME	1/2" x 1/2" x 1/4" LG	8.36	A/57	
(39)	AC VOLTS ENCLOSURE VENT FAN	1/2" NPT FEMALE CONDUIT		D/55	
(37)	DC VOLTS, ENCLOSURE VENT FAN PRESSURE SWITCH			E/56	



VIEW M-M

## FORWARD END CONNECTIONS

PONTIAC SITE SHOWN

NETWORK ELECTRIC COMPANY  
CONGRESS SITE AND PONTIAC SITE

CONGRESS BILL AND FORTINO BILL

**Solar Turbines<sup>®</sup>**  
*A Caterpillar Company*

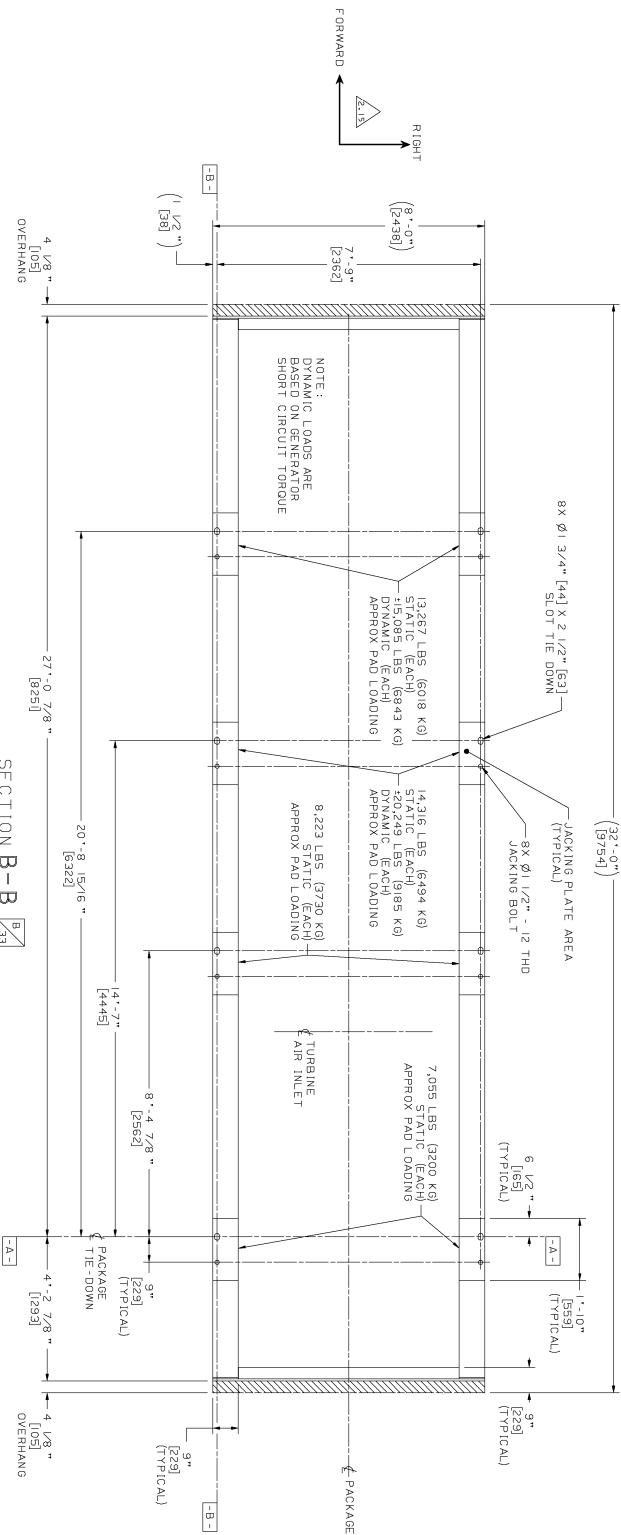
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DRAWING NO. 59111-149223

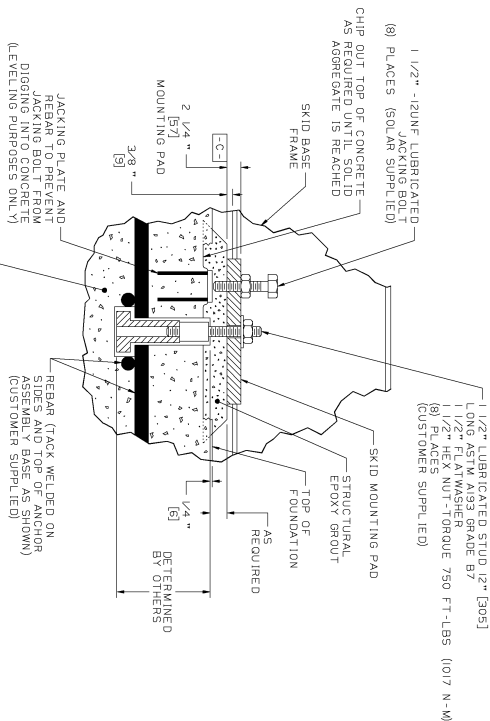
REV	A
SHEET	5A







SECTION B-B  
EXTERNAL FOUNDATION PLAN  
WEIGHTS SHOWN INCLUDE LUBE OIL  
AND ENCLOSURE



NOTE: SEE GROUT VENDOR INFORMATION SHEETS FOR FULL DETAILS AND HOW TO BUILD GROUT DAM

SUGGESTED BOL-T-DOWN WITH GROUT BETWEEN FOUNDATION AND SKID FOR CONCRETE FOUNDATION (8) PLACES  
NOTE: DATUM [C-1] IS ESTABLISHED BY (8) MOUNTING PADS WHICH EXTEND APPROXIMATELY 5/8" [8] BELOW THE BOTTOM OF THE RAILS.

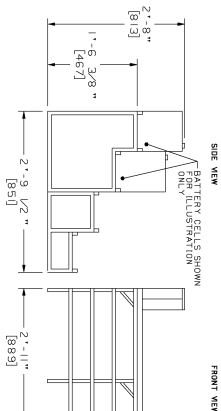
NETWORK ELECTRIC COMPANY  
CONGRESS SITE AND PONTIAC SITE

Solar Turbines

59111-149223

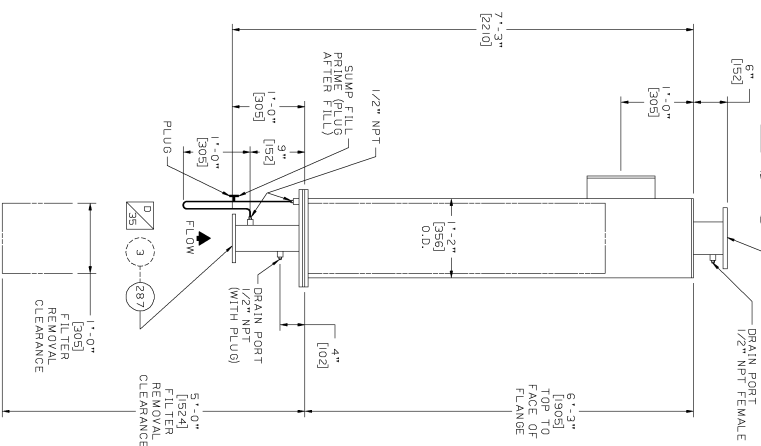
REV A  
SHEET 8

ITEM	DESCRIPTION	REFERENCE NOTE	ZONE
(20)	FLAME ARRESTOR, LUBE OIL TANK VENT	5.5, 10.2	B/-94
(21)	LUBE OIL MIST SEPARATOR INLET	4" 150 LB ANSI FF FLANGE	C/92
(29)	LUBE OIL MIST SEPARATOR OUTLET	6" 150 LB ANSI FF FLANGE	F/92



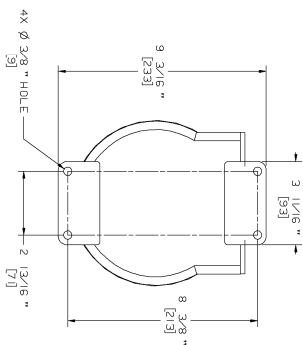
**120 VDC BATTERY RACK ASSY.**  
APPROXIMATE WEIGHT: 160 LBS [73 KG]  
APPROXIMATE TOTAL WEIGHT W/BATTERIES: 920 LBS [417 KG]

APPROXIMATE TOTAL WEIGHT W/BATTERIES: 920 LBS [417 KG]

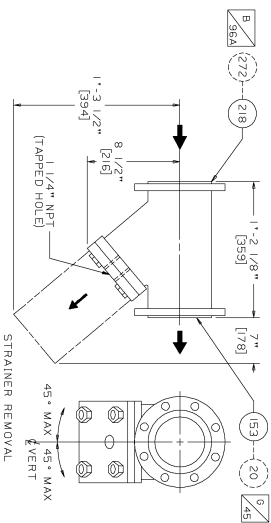


**LUBE OIL MIST SEPARATOR**  
APPROXIMATE WEIGHT: 360 LBS [163 KG]

APPROXIMATE WEIGHT: 360 LBS [163 KG]



**FLOW METER TRANSMITTER**   
APPROXIMATE WEIGHT: 12 LBS [5 KG]



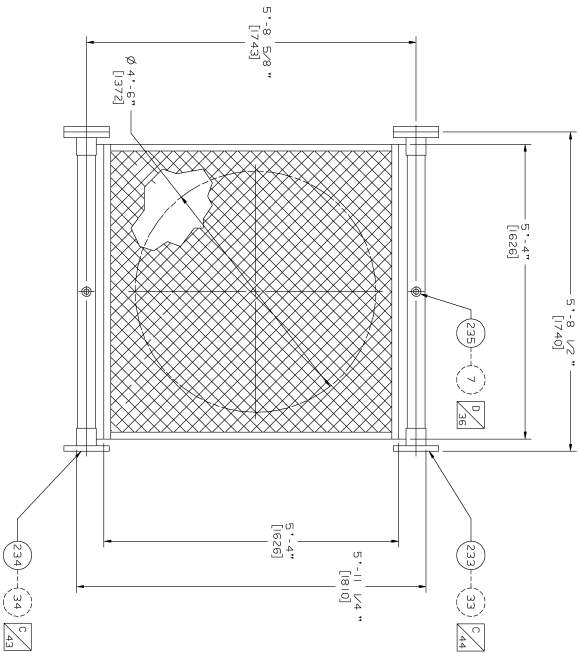
## FLOW METER

MASS FLOW AND DENSITY SENSOR  
APPROXIMATE WEIGHT: 64 LBS [29 KG]

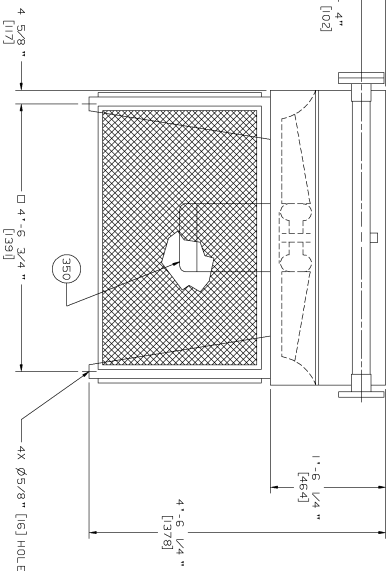
# Solar<sup>®</sup> Turbines

NETWORK ELECTRIC COMPANY  
CONGRESS SITE AND PONTIAC SITE

TABLE 1 (CONTINUED) - EXTERNAL CONNECTIONS			
ITEM	DESCRIPTION	REFERENCE NOTE	ZONE
623	LUBE OIL COOLER OIL INLET	2" ISO LB ANSI RF FLANGE	D/23B
624	LUBE OIL COOLER OIL OUTLET	2" ISO LB ANSI RF FLANGE	D/23B
629	OIL COOLER VENT RETURN TO TANK	1/2" FEMALE NPT	D/24B
630	AC VOLTS, LUBE OIL COOLER MOTOR	CONDUIT ENTRY 1" DIA KNOCKOUT	B/24B



AIR FLOW  
↓



**AIR TO OIL LUBE OIL COOLER**

APPROXIMATE WEIGHT : 1400 LBS [635 KG]

LOOSE SHIPPED ITEM

P/N 1024568-6

NETWORK ELECTRIC COMPANY  
CONGRESS SITE AND PONTIAC SITE

**Solar Turbines**

A Campbell Company

59111-149223

REV A

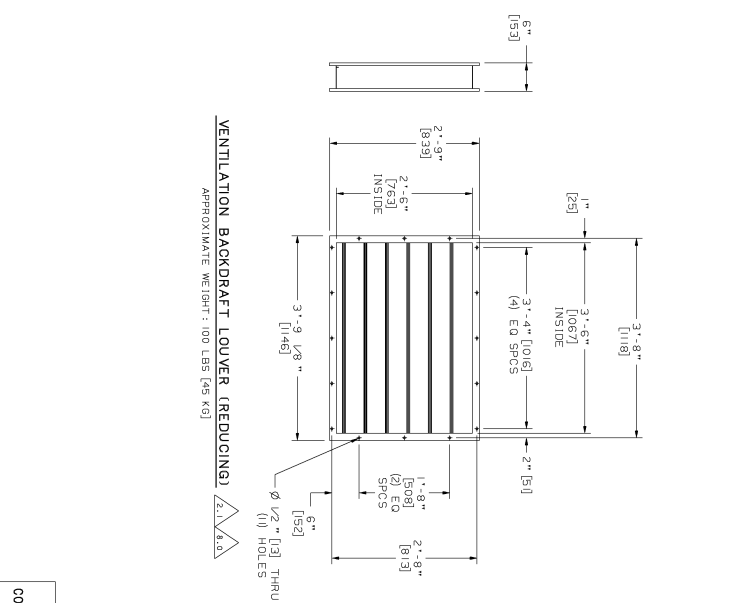
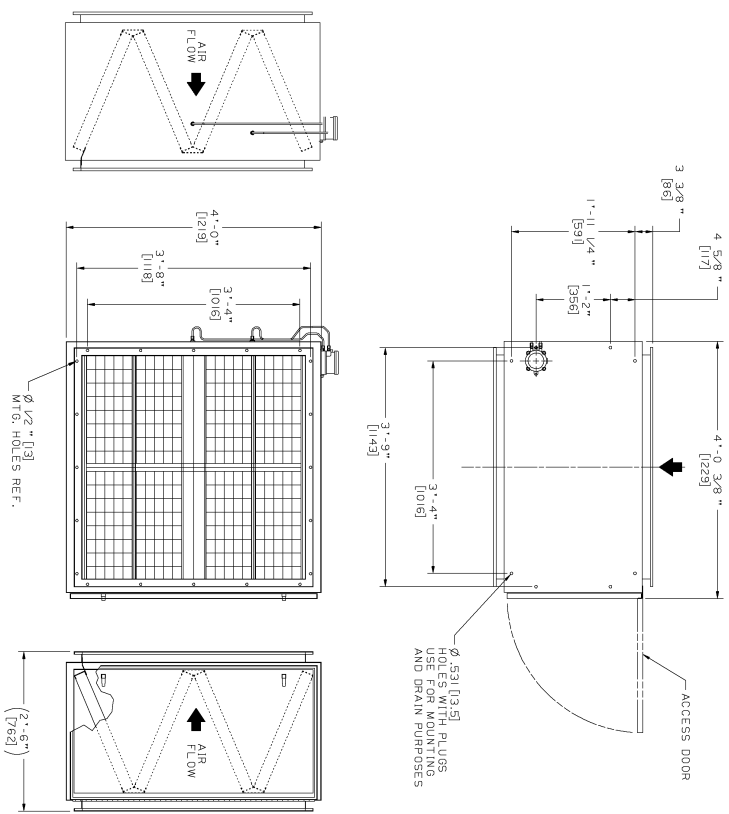
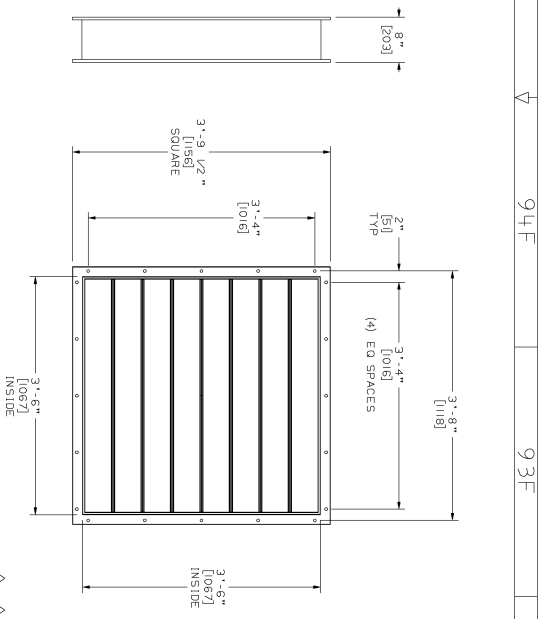
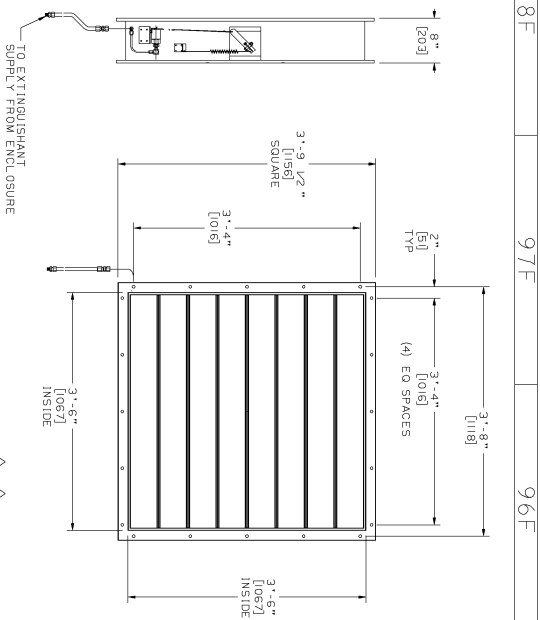
SHEET 98











**ENCLOSURE VENTILATION FILTER**

APPROXIMATE WEIGHT : 200 LBS [91 KG]

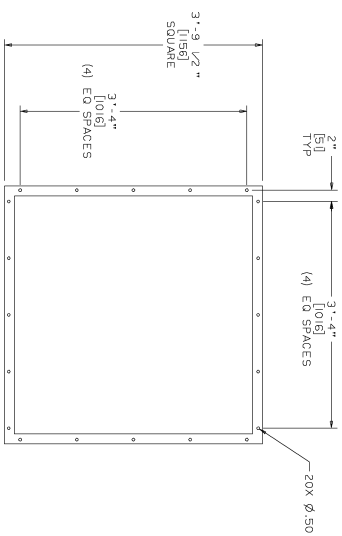
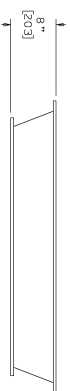
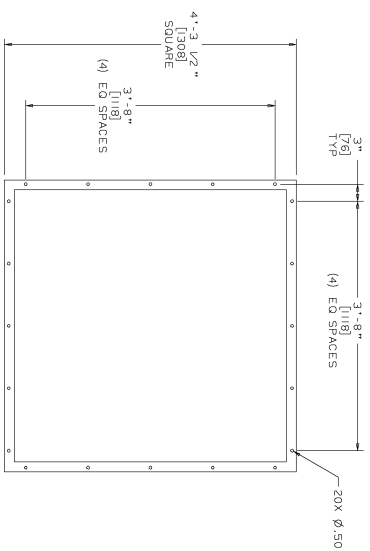
NOTE : (2) FILTER BOXES ARE SUPPLIED. ONLY (1) HAS DELTA-P SWITCH



**VENTILATION BACKDRAFT LOUVER (REDUCING)**

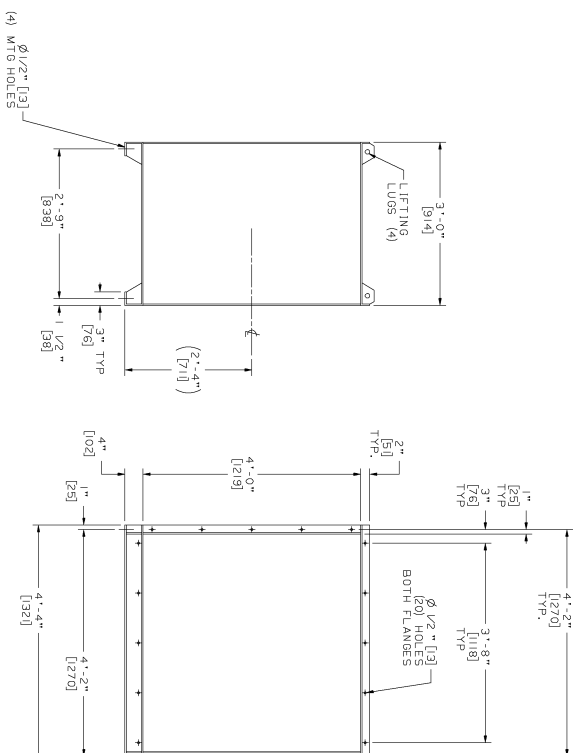
APPROXIMATE WEIGHT: 100 LBS [45 kg]





## TRANSITION DUCT

APPROXIMATE WEIGHT: 40 LBS [18 KG]



**ENCLOSURE VENT SILENCER**

APPROX. WT. 700 LBS [318]

ENCLOSURE VENT SILENCER MAY BE ROTATED AT 90  
INCREMENTS FOR MOUNTING SUPPORT

INCREMENTS FOR MOUNTING SUPPORT

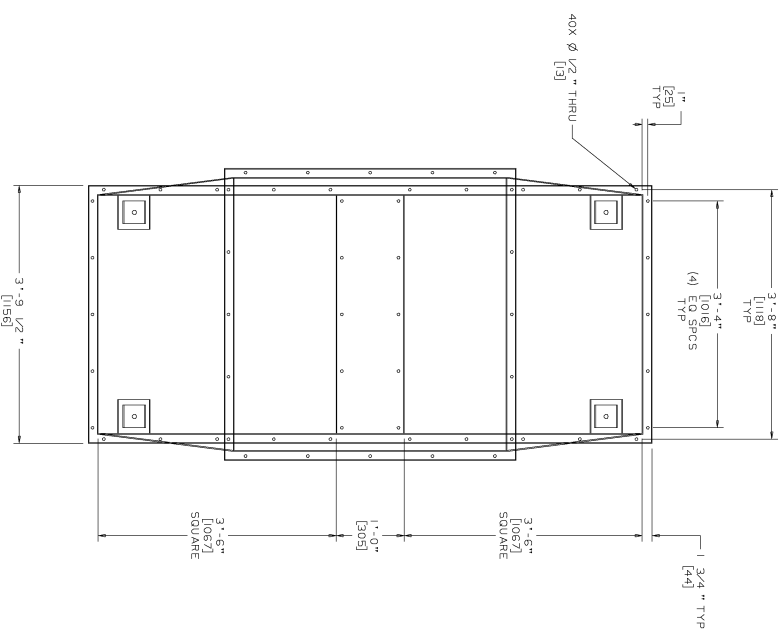
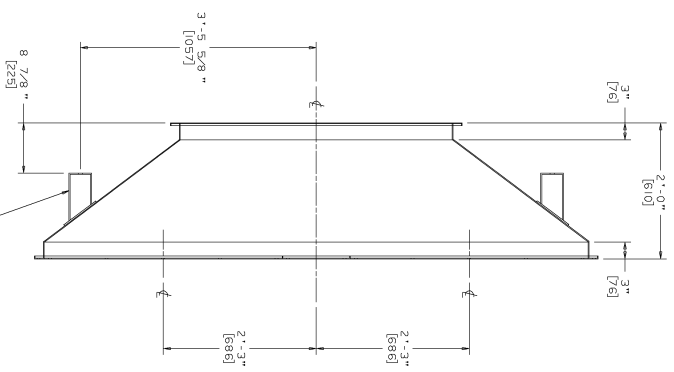
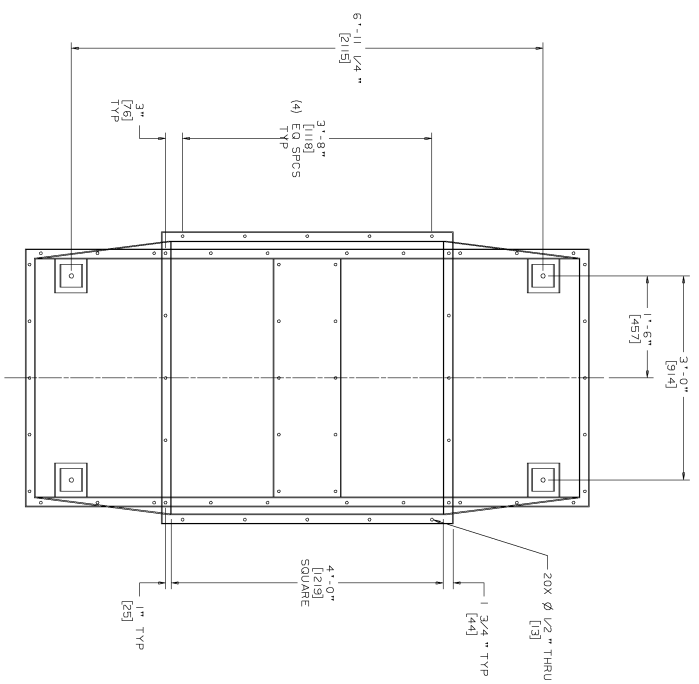
NETWORK ELECTRIC COMPANY  
CONGRESS SITE AND PONTIAC SITE

# Solar Turbines

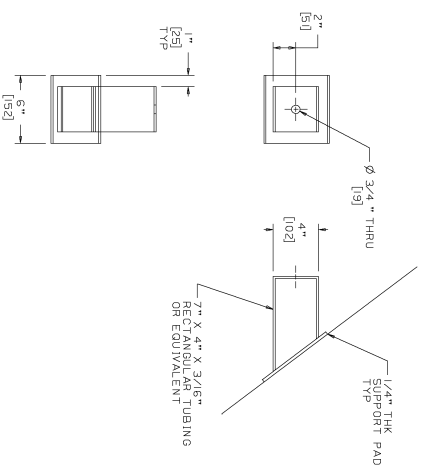
**A Caterpillar Company**

DRAWING NO.  
59111-149223

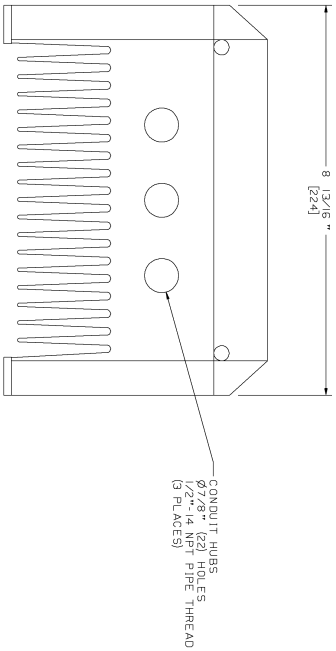
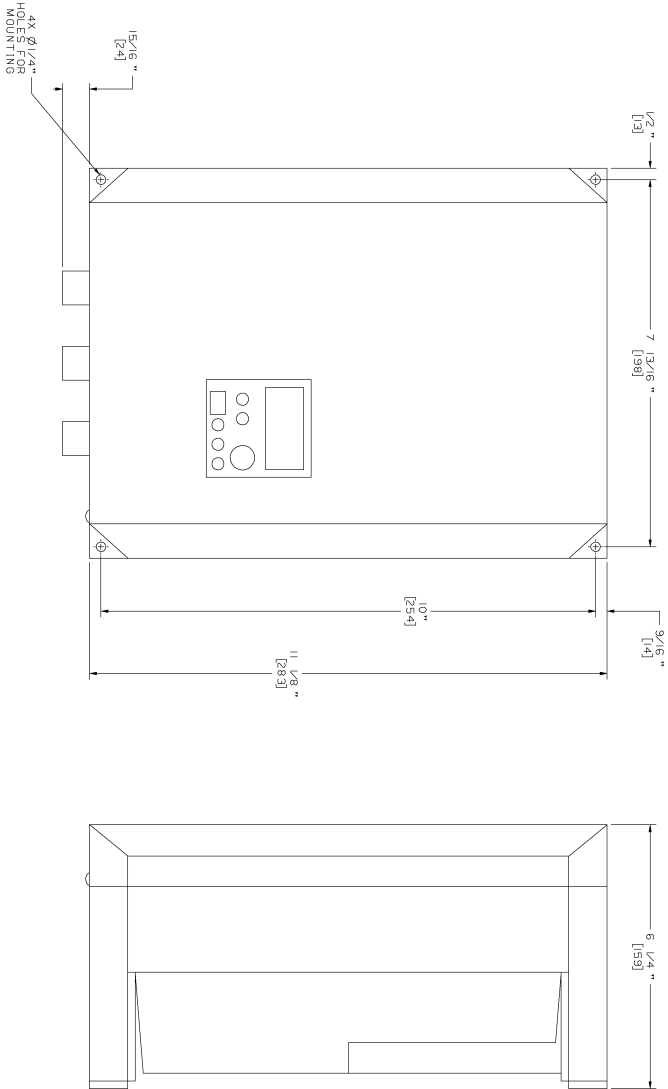
REV	A
SHEET	9G



## VENT TRANSITION DUCT



DETAIL A  
(4) SUPPORTS  
TYP

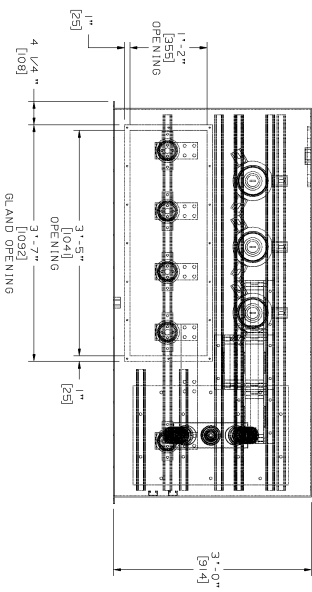


**VARIABLE FREQUENCY DRIVE**  
APPROXIMATE WEIGHT: 12 LBS [6 KG]  
LOOSE SHIPPED ITEM  
P/N 1023825-2

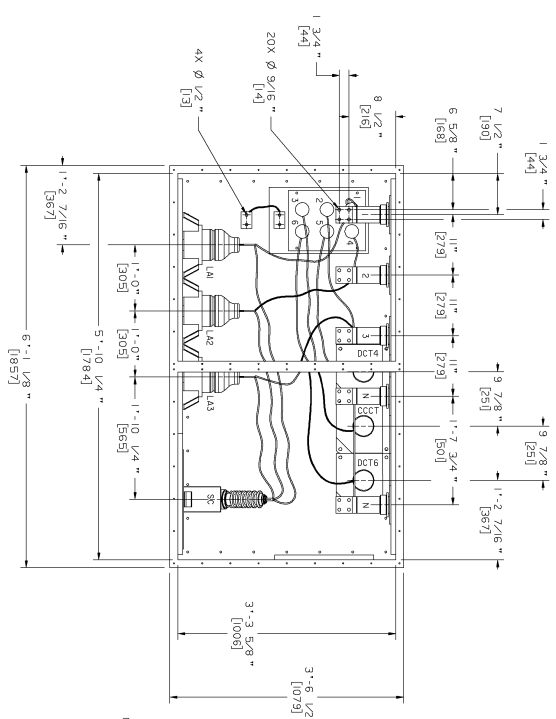
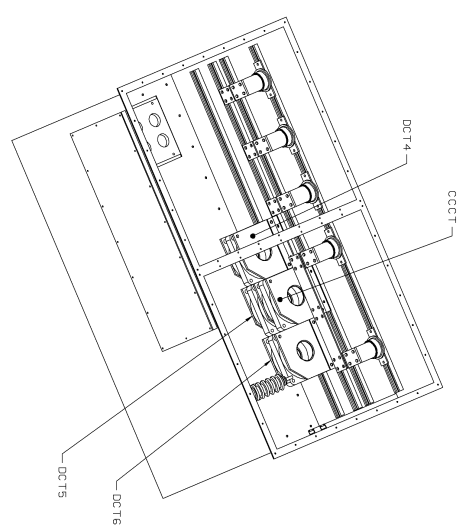
NETWORK ELECTRIC COMPANY CONGRESS SITE AND PONTIAC SITE	
<b>Solar Turbines</b>	
A Cambridge Company	
59111-149223	REV A
SHEET 9.2	



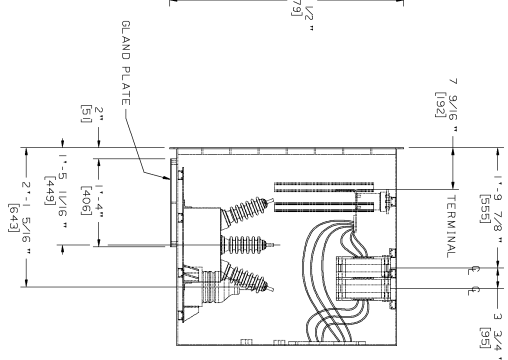




TOP VIEW



FRONT VIEW



SIDE VIEW

VIEW H  
POWER LEAD  
CONNECTIONS



NETWORK ELECTRIC COMPANY  
CONGRESS SITE AND PONTIAC SITE

**Solar Turbines**

59111-149223

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## GOVERNMENT TOOL



THIS FIGURE IS USED TO TRANSMIT RELATIVE POSITIONS DUE TO THERMAL GROWTH ONLY AND IS NOT INTENDED TO SHOW EXACT PACKAGE CONFIGURATION

# FAR FOOT GENERATOR

THIS FIGURE IS USED TO TRANSMIT RELATIVE POSITIONS DUE TO THERMAL GROWTH ONLY AND IS NOT INTENDED TO SHOW EXACT PACKAGE CONFIGURATION



