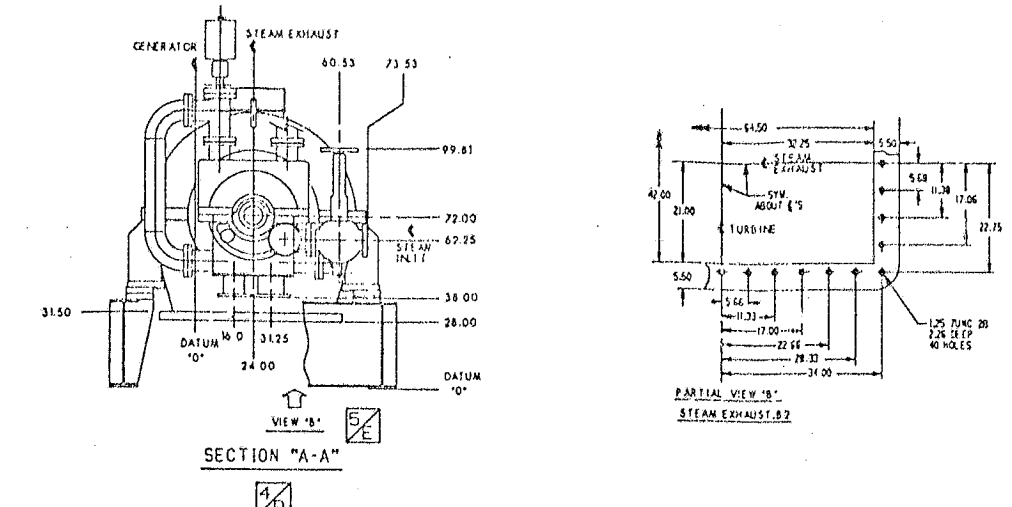


CADD'S DRAWING NO MANUAL CHANGES ALLOWED

2555800-01

Part Name EM-25 STEAM TURBINE LONGITUDINAL SECTION		Drawing No. 119E939	Rev. 01
Project Name EM-25 STEAM TURBINE		Date 11/1/83	
Project No. 119E939		Scale 1/2" = 1'-0"	
Project Manager J. H. HARRIS		Project Engineer J. H. HARRIS	
Project Designer J. H. HARRIS		Project Checker J. H. HARRIS	
Project Approver J. H. HARRIS		Project Reviewer J. H. HARRIS	

REV	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	11/11/78
2	REVISIONS	
3	REVISIONS	
4	REVISIONS	



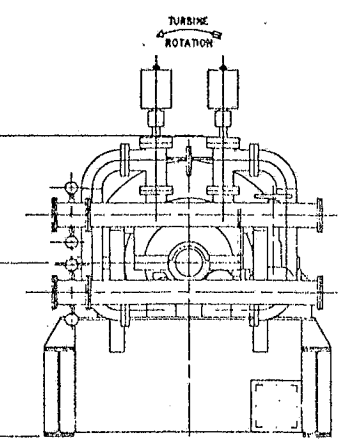
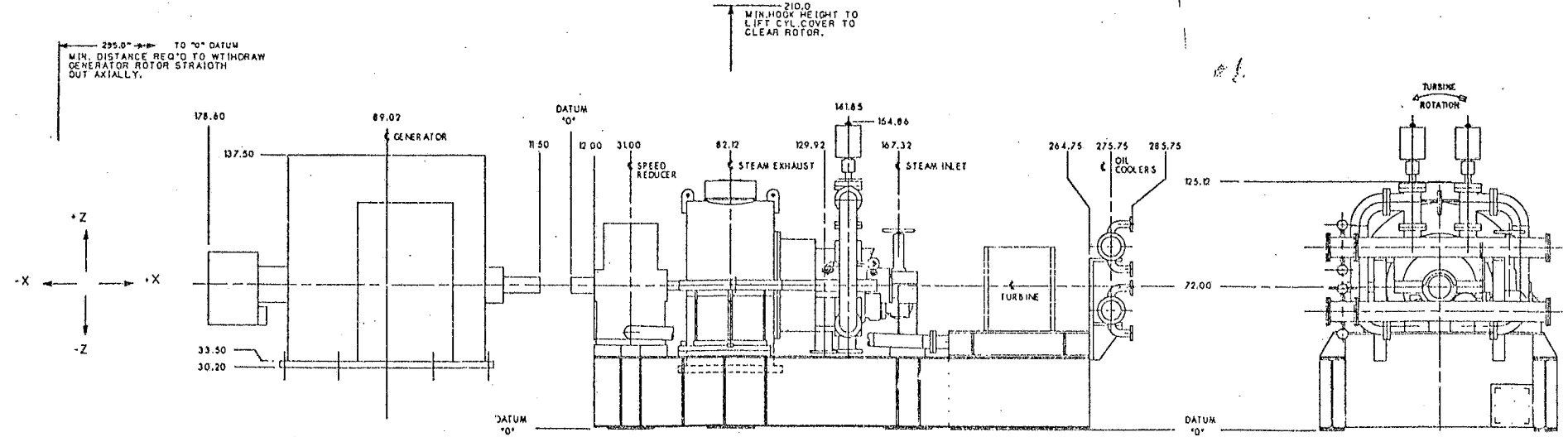
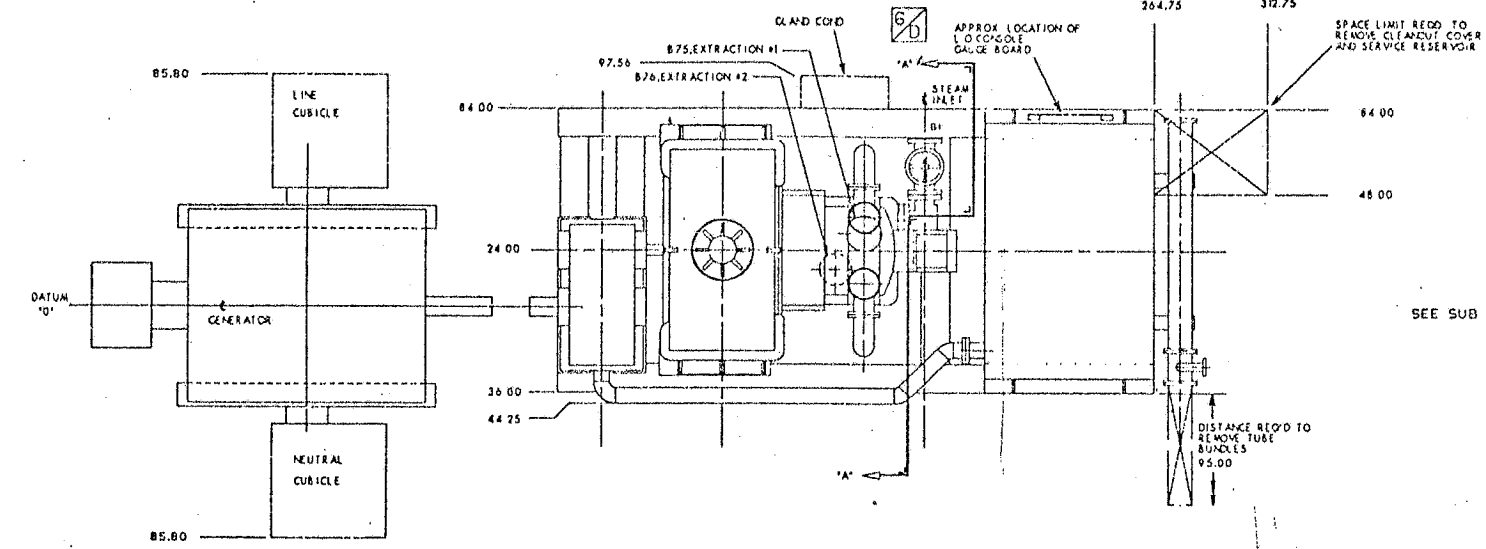
CONNS	SIZE	DESCRIPTION
B1	8.00-100"	STEAM INLET
B75	8.00-300"	EXTRACTION #1
B76	8.00-150"	EXTRACTION #2
B2	42.00 X 64.50	STEAM EXHAUST-SEE VIEW 'B'

SHIPPING AND INSTALLATION WEIGHTS		MAINTENANCE WEIGHTS (LBS)	
TURBINE	31000	TURBINE ROTOR	2983
SPEED REDUCER	9700	TURBINE CYLINDER COVER	14000
BEARING	15600	SPEED REDUCER COVER	1500
T & T VALVE	1600	GENERATOR ROTOR	12600
TOTAL	67300	GEN STATOR AND ROTOR	31000
GENERATOR	44000		

THERMAL EXPANSIONS						
FLEXIBILITY OF PURCHASERS PIPING TO ACCOMMODATE MOVEMENT OF TURBINE CONNS FROM COLD TO POSITION AT OPERATING TEMPERATURE						
CONNS	EXPANSION					
	STEADY STATE		TRANSIENT			
	X	Y	X	Y	Z	
B1	.260	.250	-.035	.310	.250	-.035
B75	.070	.020	-.000	.120	.020	-.000
B76	.040	-.020	-.000	.085	-.020	-.000
B2	0	0	-.005	0	0	-.015

LAYDOWN AREA		
	LENGTH	WIDTH
CYL. CVR	113.00	118.00
ROTOR	120.00	53.00
GEN CVR	120.00	100.00

- NOTES**
- ALL DIMENSIONS $\pm .25$ IN ANY DIRECTION.
 - FOR FOUNDATION DETAILS SEE DWG. 3073069
 - FOR OTHER PURCHASER CONNS. SEE DWG. TBA
 - FOR ADDITIONAL INSTRUCTIONS REFER TO OUTLINE SUPPLEMENT DESIGN NOTES DWG. 1A13230
 - FOR ADDITIONAL INSTRUCTIONS REFER TO OUTLINE SUPPLEMENT DESIGN NOTES DWG. 1A13230
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 - FOR ADDITIONAL INSTRUCTIONS REFER TO OUTLINE SUPPLEMENT DESIGN NOTES DWG. 1A13230



CERTIFIED FOR CONSTRUCTION PURCHASER: FLUOR ENGINEERS, INC. USER: LOWELL COGENERATION COMPANY ORDER: 81401-S-0001 WECAM S.D.: 2558900-00 BY: [Signature] DATE: 11/11/78		CADD DRAWING NO MANUAL CHANGES ALLOWED DRAWING NO: 270A001 SCALE: DO NOT SCALE SPEC. TYPE: ST-10474.04		WESTINGHOUSE CANADA INC. TURBINE AND GENERATOR DIVISION, HAMILTON, CANADA EWIS TURBINE SPEED RED. & OPERATOR OUTLINE DRAWING NO: 119E907 SHEET 1 OF 1	
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STEAM			
CONN	SIZE	FUNCTION	COMMENTS
B1	6.00-600*R.F	T AND T VALVE INLET	
B2	42.00 X 64.50	EXHAUST	
B7	.75-600*R.F	GOV. VALVE CHEST DRAIN	
B8	.75-600*R.F	STEAM CHEST DRAIN	
B15	.75-600*R.F	ABOVE SEAT DRAIN (T & T VALVE)	
B16	.75-600*R.F	BELOW SEAT DRAIN (T & T VALVE)	
B24A	.38 NPT	STEAM EJECTOR BLOWDOWN	
B26	1.00-150*R.F	GLAND COND. CONDENSATE DRAIN	
B34A	2.00-150*R.F	EXH. GLAND SEALING STEAM SUPPLY	
B34H	2.00-150*R.F	INLET GLAND J.P. L/OFF	
B75	8.00-300*R.F	PROCESS EXTRACTION	
B76	8.00-150*R.F	DEAERATOR EXTRACTION	
AIR			
F3	.25 NPT	EXT. VALVE CONTROLLER AIR SUPPLY	
F18	.38 NPT	GLAND CONDENSOR AIR VENT	
F1	.25 NPT	INLET VALVE ACTUATOR AIR SUPPLY	
F4/S	.75 NPT	EXT. VALVE ACTUATOR AIR SUPPLIES	
F7	.25 NPT	HAND VALVE ACTUATOR AIR SUPPLY	
WATER			
D20	3.00-150*R.F	COOLING WATER INLET	
D21	3.00-150*R.F	COOLING WATER OUTLET	
D22	3.00-150*R.F	COOLING WATER INLET	
D23	3.00-150*R.F	COOLING WATER OUTLET	
D27	3.00-150*R.F	GLAND COND. COOLING WATER SUPPLY	
D28	3.00-150*R.F	GLAND COND. COOLING WATER DISCHARGE	
OIL			
C44	4.00-O.D	DISCHARGE FROM OIL VAPOUR EXTRACTOR	SEE DETAIL B, NOTE 2
C45	2.0 NPT	RESERVOIR DRAIN	

ELECTRICAL			
CONN	SIZE	FUNCTION	COMMENTS
E47	1.00 NPT	EMERGENCY OIL PUMP MOTOR	
E48	1.25 NPT	MAIN OIL PUMP #1	
E49	1.25 NPT	MAIN OIL PUMP #2	
E51	.75 COND	OIL VAPOUR EXTRACTOR MOTOR	
E56	.75 COND	TURNING GEAR MOTOR	
E43	1.25 COND	OIL HEATER	
E23	1.5 NPT	SPEED REDUCER VIBRATION PROBES / PROXIMITORS	
E22	1.5 NPT	SPEED REDUCER RTD'S	
E15A/B	.5 NPT	SPEED PICKUPS	
E16	1.25 NPT	TURBINE VIBRATION / AXIAL PROBES / PROXIMITORS	
E18	.75 NPT	TURBINE BEARING RTD'S INLET END	
E21	.5 NPT	TURBINE BEARING RTD'S EXHAUST END	
E12/E13	.5 COND	TRIP SOLENOID VALVES	
E14	.5 NPT	GOVERNOR SHUT DOWN PRESS SWITCH	
E30	.5 NPT	CONTROL SIGNAL TO INLET VALVE ACTUATOR	
E34	.5 NPT	CONTROL SIGNAL TO EXTRACTION VALVE ACTUATOR	
E32	.5 NPT	OLAND SEAL STEAM PRESSURE SWITCH	
E31A/B	.5 NPT	EXHAUST PRESSURE SWITCHES	
E27	.5 NPT	OLAND SEAL STEAM TEMP. SWITCH	
E28	.5 NPT	LIMIT SWITCH - T&T VALVE OPEN	
E29	.5 NPT	LIMIT SWITCHES - T&T VALVE CLOSED	
E37	.5 COND	HANDVALVE AIR SHUTOFF SOLENOID	
E26	REMOVABLE LEAD PLATE	VIBRATION PROBE - GEN DRIVE END	
E36	REMOVABLE LEAD PLATE	VIBRATION PROBE - GEN EXCITER END	
E38	REMOVABLE LEAD PLATE	EXCITER - PMG TERMINAL BOX	SEE NOTE 5
E42	REMOVABLE LEAD PLATE	GENERATOR HEATER TERMINAL BOX	
E33	REMOVABLE LEAD PLATE	GENERATOR STATOR COOLING AIR - BEARING RTD'S	
E102		NEUTRAL CUBICLE	
E101	SEE VIEW "X"	LINESIDE CUBICLE	SEE NOTE 4
E61	1.00 DIABORE	JACKING OIL PUMP MOTOR #1, GEN DRIVE END	
E62	1.00 DIABORE	JACKING OIL SYSTEM FLOW - PRESS SWITCH	
E60	1.00 DIABORE	JACKING OIL PUMP MOTOR #2, GEN EXCITER END	
E63	1.00 DIABORE	JACKING OIL SYSTEM FLOW - PRESS SWITCH	
		RUNNING SWITCH, MOP-2	
		RUNNING SWITCH, MOP-1	
		RUNNING SWITCH, EOP	
		RESEVOIR OIL LEVEL ALARM	THESE INSTRUMENTS ARE WIRED
		RESEVOIR OIL HEATER THERMOSTAT	TO TERMINALS IN A 12X8X4
E10	12X8X4	RESEVOIR OIL HEATER THERMOSTAT	JUNCTION BOX, JUNCTION BOX
	JUNCTION	HIGH DIFF PRESS SWITCH - LUBE OIL FILTERS	TO BE DRILLED, DURING FIELD
	BOX	LOW LUBE OIL PRESS SWITCH - TRIP TURBINE	INSTALLATION, TO MATCH
		LOW LUBE OIL PRESS SWITCH ALARM	CUSTOMERS CONDUIT.
		LOW LUBE OIL PRESS SWITCH-START TURBINE GEAR	
		PRESS SWITCH - START STANDBY PUMP/START EOP	
E17A	.50 NPT	SPEED INDICATOR	
E7		RTD - OIL COOLER DISCHARGE	

NOTES
1. REF. LWS01
A- S/LAV SYSTEM SCHEMATIC ... 3873029
B- LUBE OIL SCHEMATIC ... 3873039
C- OUTLINE SUPPLEMENT DESIGN NOTES ... 1A13230
D- OUTLINE ... 119E907
2. SEE DETAIL "B" FOR RECOMMENDED VAPOUR EXT. PIPING (BY OTHERS)
3. DIMENSIONAL TOLERANCE +/- .25" FOR CONNECTIONS 2.0" OR GREATER. ALL CONNECTIONS UNDER 2.0" DIMENSIONAL TOLERANCE +/- .10".
4. LINE TERMINAL CONSIST OF THREE COPPER STRIPS .94 WIDE X .25 THICK DRILLED WITH 4-.57 DIA HOLES. THE LINESIDE CUBICLE CONTAINS G.E. TRANQUELL SURGE ARRESTORS, ASEA BICC SURGE CAPACITORS, CUBICLE MUST BE GROUNDED (S UNF GROUND PAD PROVIDED)
5. EXCITER FIELD TERMINALS ARE MARKED FIVE, F2-VE. PMG TERMINALS ARE MARKED P1, P2. PMG IS FUSED WITH CARTRIDGE FUSE TO BS1362, 1 IN LONG X .25 DIA, RATING 250V 13A, KLIPPON STD TERMINALS

CADDS DRAWING NO MANUAL CHANGES ALLOWED

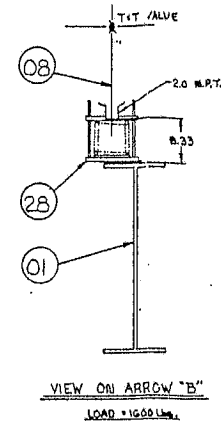
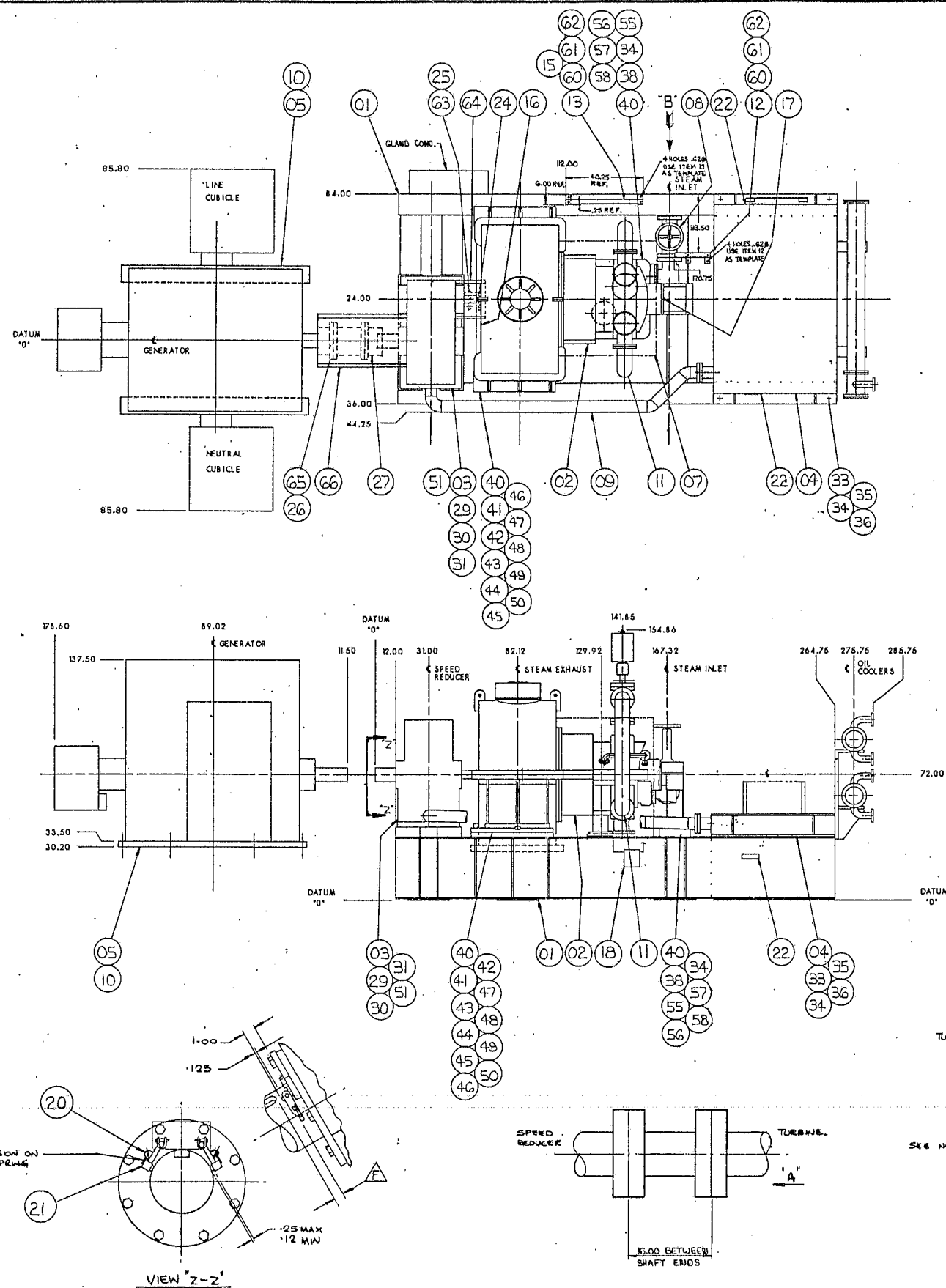
CERTIFIED FOR CONSTRUCTION
PURCHASER: FLUOR ENGINEERS, INC
USER: LOWELL COGENERATION COMPANY
ORDER #: 814101-6-0001
WECAN S.O. #: 2558900-00

DATE: 11/04/01
BY: [Signature]
CHECKED: [Signature]
APPROVED: [Signature]

DATE: 11/04/01
BY: [Signature]
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APPROVED: [Signature]

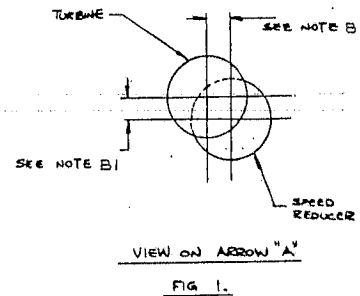
WATKINSON Canada Inc.
TURBINE AND GENERATOR DIVISION/HAMILTON, CANADA
E175 TURBINE, SPEED REDUCER & GENERATOR
PURCHASER'S CONNECTIONS

119E917 05
SHEET 2 OF 2



119E 940 01 TURBINE PACKAGE ASSY		Westinghouse Canada Limited	
DESCRIPTION		SIZE - REF. INFORMATION	IDENTIFICATION
01	DECK PLATE ASSY		3871081601
02	TURBINE ASSY		119E938001
03	SPEED REDUCER		1A1312101
04	LINE OIL RESERVOIR		1A1313101
05	GENERATOR		1A1314101
06	LAGGING COVER		3883004601
07	TIT VALVE		1A1315101
08	OIL PUMPING SPEED RED./TURBINE		119E938001
09	STEAM PIPING		119E938001
10	GAUGE BOARD		3883004601
11	AUXILIARY PANEL		3871015001
12	184 - TUBES TO PNL & GND		119E942601
13	CONDUIT W/RC EX. BNC. BKT.		333410001
14	CONDUIT W/RC INLET BNC. PED.		333410001
15	CONDUIT W/RC DECK PLATE		3871015001
16	GROUND DEVICE ASSY		3638423601
17	BRUSH		271A344001
18	WASHER LOCK		3071015001
19	KEY SPLIT	B-1/2 OF 50 x .58	1040704008
20	KEY		
21	KEY		
22	KEY		
23	TIT VALVE SUPPORT ASSY		3883004601
24	BOLT HEX HP.	1.50 - 6 UN x 3.00	3871015001
25	TAPER DOWEL	.75 - 10	2071015001
26	NUT HEX	.75 - 10	4408496012
27	BOLT HEX HP.	1.00 - 6 UN x 2.75	3871015001
28	NUT HEX	1.00 - 6 UN	4408496012
29	WASHER LOCK	1.00	4408496012
30	LINER		1A1314101
31	TAPER DOWEL	1.00 - 8	2071015001
32	BOLT HEX HP.	1.75 - 8 UN x 4.50	3871015001
33	TAPER DOWEL	1.25 - 7	2071015001
34	NUT HEX	1.25	4408496012
35	SHIMS & LINERS		4408496012
36	SHIMS & LINERS		4408496012
37	SHIMS & LINERS		4408496012
38	SHIMS & LINERS		4408496012
39	SHIMS & LINERS		4408496012
40	SHIMS & LINERS		4408496012
41	SHIMS & LINERS		4408496012
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47	SHIMS & LINERS		4408496012
48	SHIMS & LINERS		4408496012
49	SHIMS & LINERS		4408496012
50	SHIMS & LINERS		4408496012
51	SHIMS		523210001
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54	SHIMS & LINERS		782810001
55	SHIMS & LINERS		782810001
56	SHIMS & LINERS		782810001
57	SHIMS & LINERS		782810001
58	SHIMS & LINERS		782810001
59	BOLT HEX HP.	.500 - 13 UN x 2.00	3871015001
60	NUT HEX	.500 - 13	4408496012
61	WASHER LOCK	.50	4408496012
62	COUPLING H.S.		1A1312101
63	COUPLING GUARD H.S.		3871015001
64	COUPLING L.S.		1A1312101
65	COUPLING GUARD L.S.		3871015001

- NOTE:
- GR.1 IS THE ASSEMBLY FOR SHOP TEST.
GR.2 IS THE COMPLETE ASSEMBLED PACKAGE.
 - TURBINE SPEED REDUCER COLD ALIGNMENT:
1. ALIGN TURBINE AND SPEED REDUCER IN ACCORDANCE WITH INSTRUCTIONS ON THE ALIGNMENT DIAGRAM Dwg. # 3877012.
2. RECORD ALL FINAL COLD ALIGNMENT DATA ON THE ALIGNMENT DIAGRAM AND SUBMIT A COPY TO ENGINEERING 55.
3. DO NOT DOWEL SPEED REDUCER IN POSITION AFTER SETTING ALIGNMENT. DOWELS WILL BE INSTALLED IN FIELD. LOCATE AND DRILL DOWELHOLE AS PER 3877012 LEAVING ALLOWANCE FOR HEAVING AT SITE. DOWELS AND EXCESS SHIMS TO BE PRESERVED, PACKAGED AND SHIP LOOSE TO SITE.
 1. MOUNT SPEED REDUCER LOW SPEED COUPLING HUB AND FIT KEY BEFORE SHIPPING.
2. PORTION OF KEYS PROTRUSING PAST COUPLING HUB MUST BE GRIND FLUSH WITH SHAFT.
 - GENERATOR COUPLING HUB AND SPACER TO BE PACKAGED AND SHIPPED LOOSE FOR INSTALLATION AT SITE.
 - FOR ADDITIONAL INSTRUCTIONS BEFORE REMOVING UNIT FROM TEST STAND SEE SHIPPING INSTRUCTIONS ON "D" SPEC.
 - INSTALL AND ADJUST GROUNDING DEVICE AS SHOWN. ENSURE CARBON BRUSH WILL NOT RUN OVER KEY.
 - KEYS WILL BE SUPPLIED BY SPEED REDUCER & GENERATOR SUPPLIERS.
 - LOAD SPRING HANGER TO COLD SETTING - 1500 LB.
 - FIT & INSTALL HIGH & LOW SPEED CPLG. GUARDS.



Westinghouse Canada Limited	
TURBINE AND GENERATOR DIVISION, HAMILTON, CANADA	
TURBINE PACKAGE ASSY	
119E 940	2701001
119E 940	2701001
119E 940	2701001

NATURAL FREQUENCIES

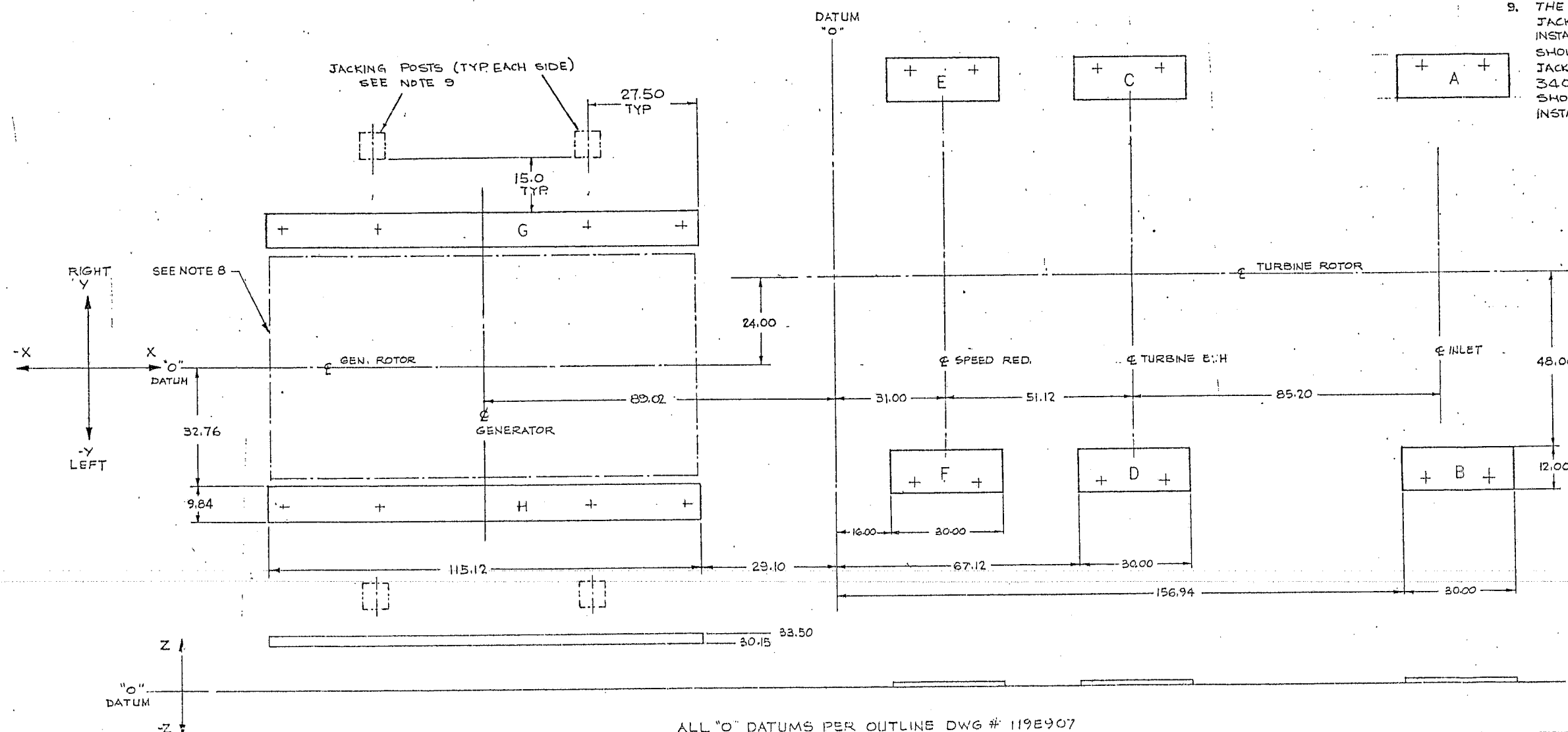
	RPM
TURBINE 1ST LATERAL	2750
GENERATOR 1ST LATERAL	2437
2ND LATERAL	4599
SPEED RED. 1ST LATERAL	GREATER THAN 8100 RPM
AXIAL	782
1ST TORSIONAL	1296
2ND TORSIONAL	3264

LOADS APPLIED TO FOUNDATION

	AXIS	A	B	C	D	E	F	G	H
WEIGHT SEE NOTES	Z	17025	17025	8450	8450	8940	14425	22000	22000
LOAD DUE TO DESIGN TORQUE	Z	-520	+520	-520	+520	+4900	-4900	-6400	+6400
LOAD DUE TO GEN. L-L SHORT CIRCUIT	Z	—	—	±8650	±8650	±17300	±17300	±68600	±68600
ALLOWANCE FOR VARIABLE IMPACT & DYNAMIC EFFECT SEE NOTE 4	Y	±34700	±34700	±20000	±20000	—	—	—	—
	Z	±75100	±75100	±87500	±87500	±23400	±23400	±92800	±92800
SEISMIC LOADS BASED ON LATERAL ACCELERATION OF 15g	Y	±2580	±2580	±1770	±1770	±1120	±1120	±3300	±3300
	Z	±1735	±1735	±1875	±1875	±1055	±1055	±3600	±3600

NOTES:

- UNLESS OTHERWISE STATED ALL LOADS IN LBS.
- SOLEPLATE REACTIONS MUST BE MODIFIED IN ACCORDANCE WITH LOADS & MOMENTS DUE TO PIPING, CONDENSER ETC.
- REFER TO TURBINE OUTLINE SUPPLEMENT DESIGN NOTES FOR ADDITIONAL FOUNDATION DESIGN GUIDELINES.
- THESE LOADS ARE DUE TO A DISTRESS CONDITION WHICH MAY RESULT IN MACHINE DAMAGE.
- INCLUDES WEIGHT OF OIL IN RESERVOIR.
- TURBINE SPEED : 6750 R.P.M.
GENERATOR SPEED : 1800 R.P.M.
- DESIGN OF FOUNDATION STRUCTURE SHOULD AVOID RESONANT FREQUENCIES 40-50% OF EQUIPMENT OPERATING SPEEDS, EQUIPMENT NATURAL FREQUENCIES AND TWO TIMES OPERATING SPEEDS.
- THE FOUNDATION BETWEEN THE GENERATOR SOLE PLATES SHOULD BE DESIGNED TO SUPPORT VERTICAL JACKING LOADS APPLIED DURING EQUIPMENT INSTALLATION, MAX. VERTICAL JACKING LOAD = 25000 LBS.
- THE GENERATOR FOUNDATION SHOULD HAVE SUITABLE JACKING POSTS TO FACILITATE LATERAL JACKING DURING INSTALLATION AND FINAL ALIGNMENT. JACKING POSTS SHOULD PROJECT 12.0 ABOVE THE GENERATOR FOUNDATION. JACKING POSTS AND FOUNDATION SHOULD BE DESIGNED FOR 34000 LBS. JACKING LOAD. THE JACKING POSTS SHOULD BE DESIGNED FOR REMOVAL AFTER UNIT IS INSTALLED AND RUNNING.



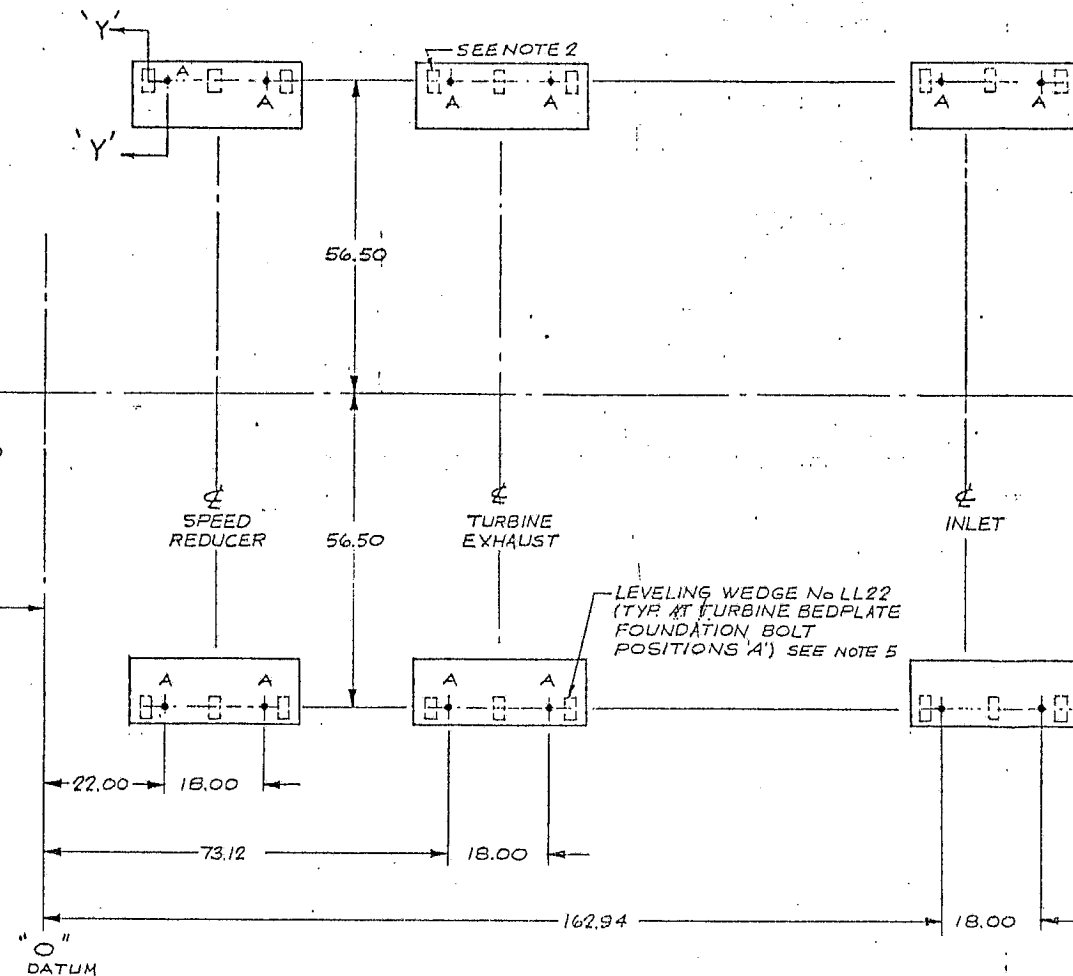
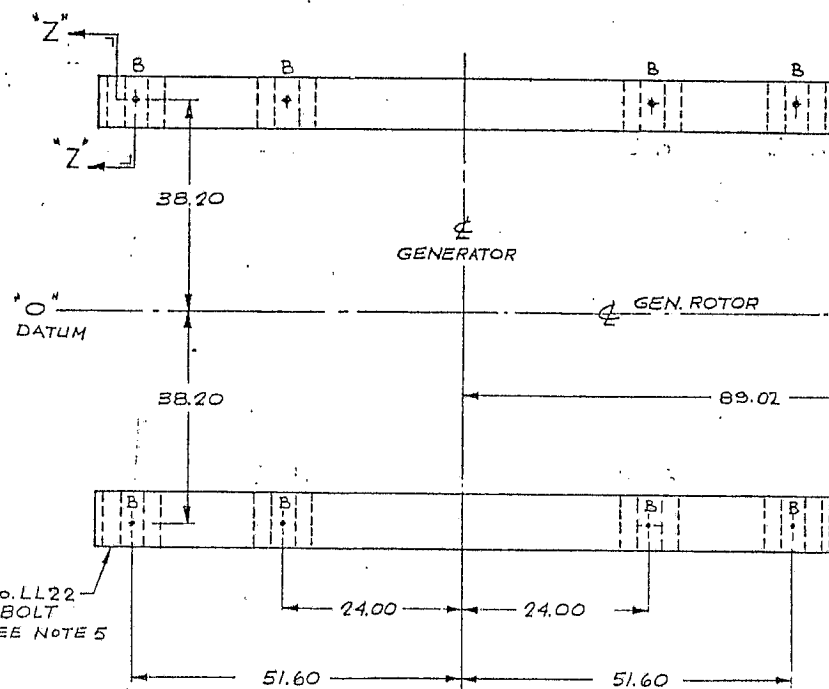
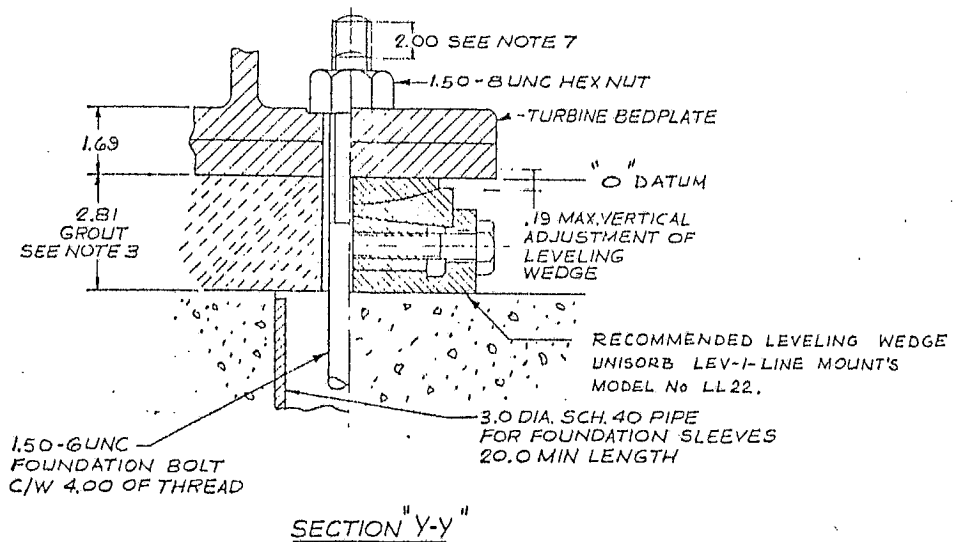
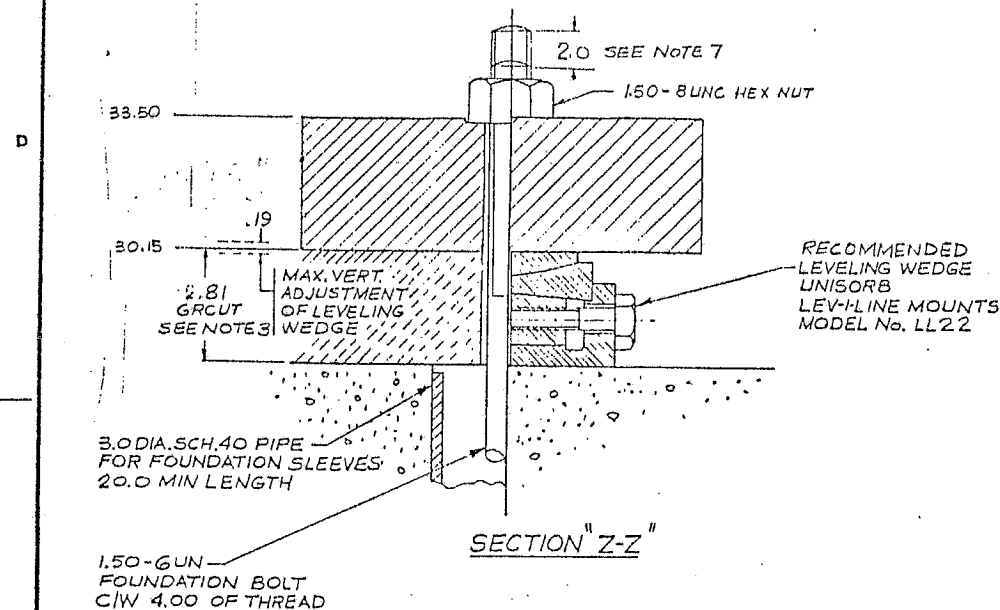
ALL "O" DATUMS PER OUTLINE DWG # 119E907

PURCHASER : FLUOR ENGINEERS, INC.
USER : LOWELL COGENERATION COMPANY
ORDER # : 614101-6-0001
WECAN S.O. # : 2558900-00

THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF WESTINGHOUSE CANADA INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF WESTINGHOUSE CANADA INC.	
DRAWN BY: AAE	Westinghouse Canada Inc.
LAYOUT BY: AAE	TURBINE AND GENERATOR DIVISION, HAMILTON, CANADA
DATE: 11/11/82	TURBINE GENERATOR FOUNDATION LOADING
ISSUE DATE: 11/11/82	3873D69
1ST FRAME	SHT 1 OF 2

NOTES:

1. LEVELING WEDGES TO BE GROUTED IN PLACE. ROUGH CONCRETE TO BE ALTERED BY CHIPPING LOCALLY IF NECESSARY TO OBTAIN SUITABLE GROUT CLEARANCE. DO NOT CHIP CONCRETE UNDERNEATH LEVELING WEDGES.
2. ERECTION CONTRACTOR TO POSITION LEVELING WEDGES AT LOCATIONS SHOWN.
3. LEVELING WEDGES SET AT MIDPOINT OF VERTICAL ADJUSTMENT.
4. FOUNDATION WASHERS, BOLTS, NUTS & SLEEVES ARE NOT SUPPLIED BY WESTINGHOUSE CANADA INC.
5. LEVELING WEDGES SUPPLIED BY PURCHASER.
6. GROUTING TO BE PERFORMED BY INSTALLER.
7. ADD 2.0 IN. THREAD LENGTH TO FOUNDATION BOLT FOR INSTALLATION PURPOSES. FOUNDATION BOLTS WILL BE TRIMMED TO REQUIRED LENGTH AFTER UNIT IS INSTALLED.

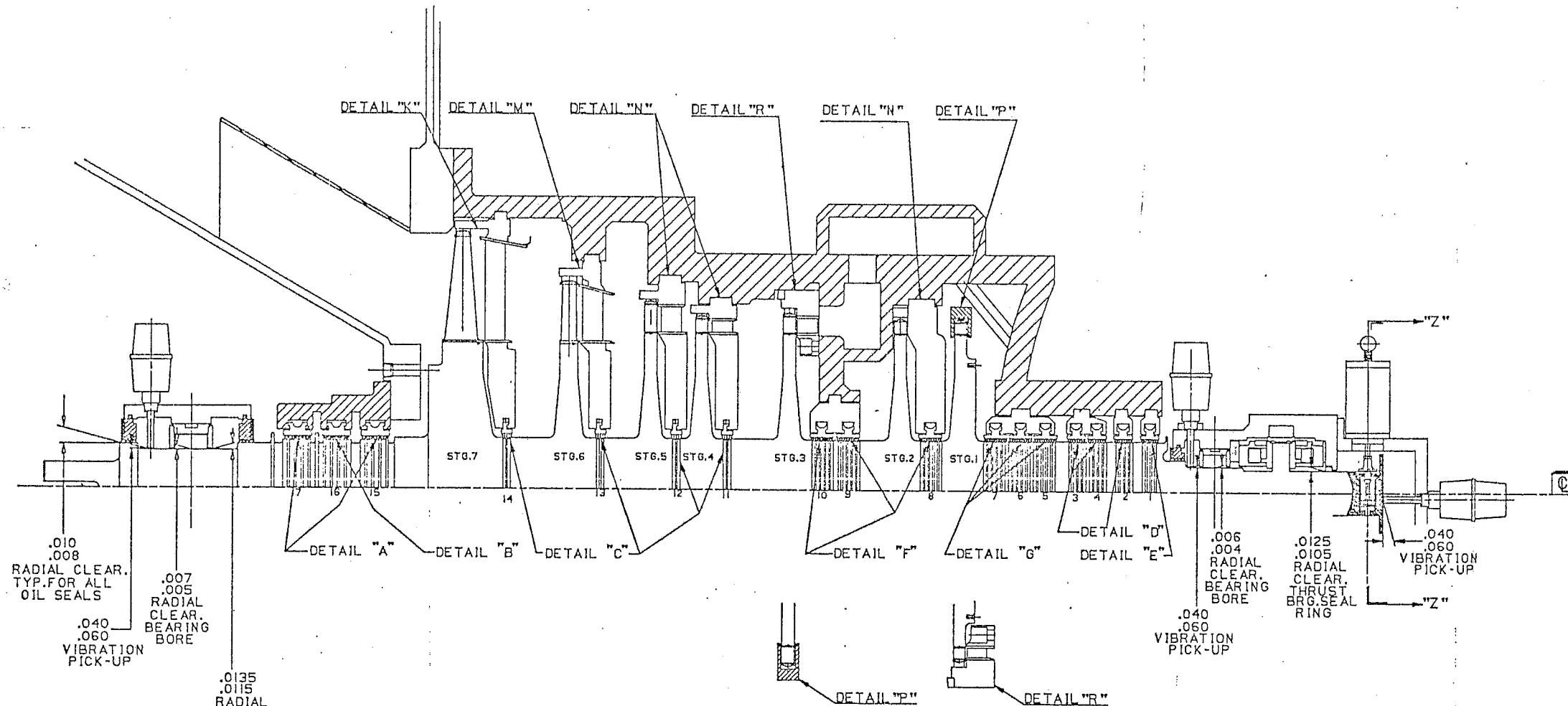


ALL "O" DATUMS PER OUTLINE DWG. No. 119E907

NO.	DATE	CHANGE
1	2558900-80	
2		DIM 58.43 WAS 53.50
3		2D SECT 'Z-Z' REVISED
4		DATUM DIM 33.50 WAS 30.15
5		DIM 30.15-ADDED
6		FDN. BOLT & NUT WAS 10-BUNC
7		NOTE 'B'-REMOVED & ADDED TO DIM 1 SEE DIM 1 ALSO.
8		DIM 83.02 WAS 68.43
9		SEE 547.1
10		10/11/81
11		10/11/81
12		10/11/81
13		10/11/81
14		10/11/81
15		10/11/81
16		10/11/81
17		10/11/81
18		10/11/81
19		10/11/81
20		10/11/81

PURCHASER: FLUOR ENGINEERS INC.
 USER: LOWELL COGENERATION COMPANY
 ORDER #: 814101-6-0001
 WECAN S.O.#: 2558900-00

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DRAWN BY: AAE	Westinghouse Canada Inc.
CHECKED BY: SUPV	TURBINE AND GENERATOR DIVISION, HAMILTON, CANADA.
DESIGNED BY: 2117.22	TURBINE & GENERATOR FOUNDATION DETAILS
DATE: 10/11/81	DRAWING NO: 3873D69
SCALE: N.T.S.	SHT 2 OF 2



NOTES:

1. AXIAL CLEARANCES

- SET ROTOR IN CYLINDER BASE TO "K" DIM. (STG.2). ALL AXIAL CLEARANCES ARE TO BE AS SHOWN ON THIS PRG.
 - RECORD ACTUAL "K" DIM. (STG.7 DIAPHRAGM HALF MAY BE REMOVED TO USE A HOLDING FIXTURE)
 - MAINTAINING ACTUAL "K" DIM. MACHINE INLET NOZZLE BLOCK (DWG. 3881D88) TO GIVE CLEARANCE "U" (DETAIL "R").
 - SET ROTOR IN CYLINDER COVER TO "K" DIM. (STG.2). (STG.7 DIAPHRAGM HALF MAY BE REMOVED TO USE A HOLDING FIXTURE).
 - MAINTAINING ACTUAL "K" DIM. MACHINE EXTRACTION NOZZLE BLOCK (DWG. 6336C16) TO GIVE CLEARANCE "U" (DETAIL "R").
 - SET ROTOR IN CYLINDER BASE TO ACTUAL "K" DIMS. ESTABLISH THRUST BEARING END PLAY PER NOTE 5. MAINTAINING ACTUAL "K" DIMS. SET THRUST BEARING CLEARANCE AS SHOWN ON THIS DWG. THE ROTOR IS NOW SET IN THE OPERATING POSITION (AXIAL). ALL AXIAL CLEARANCES ARE TO BE AS SHOWN ON THIS DWG.
 - TOLERANCE ON AXIAL CLEARANCES IS $\pm .005$ UNLESS OTHERWISE SPECIFIED.
- WITH THE ROTOR INSTALLED IN THE BEARINGS ADJUST THE BEARING BRACKETS AS FOLLOWS:
 - ADJUST HEIGHT OF THE EXHAUST END BEARING BRACKET SO THAT THE ROTOR IS CONCENTRIC WITH THE MID-POINT OF THE EXH GLAND HOUSING.
 - ADJUST HEIGHT OF THE INLET END BEARING BRACKET SO THAT THE STAGE 1 SHROUD IS CONCENTRIC WITH THE RADIAL SEALS.
 - SET INLET GLANDS CONCENTRIC WITH THE ROTOR.
 - SET DIAPHRAGMS (STGS. 2, 4 & 6) CONCENTRIC WITH THE ROTOR.
 - SET DIAPHRAGMS (STGS. 3 & 7) .005 LOW TO ROTOR. MACHINE ALL RADIAL CRUSHING PINS TO REQ D DIA TO OBTAIN CLEARANCE SHOWN ON DIAPH. AND NOZZLE BLOCK MAB 3866D72.
 - TOLERANCE ON RADIAL CLEARANCES IS $\pm .002$ UNLESS SHOWN OTHERWISE.
- WHEN UNIT IS COMPLETELY ASSEMBLED AND AT OPERATING POSITION (THRUST BEARING AS SHOWN):
 - MEASURE "G" DIM. AT VERTICAL CENTERLINE AND STAMP (.38 HIGH LETTERS) AT VERTICAL CENTERLINE AS SHOWN.
 - MEASURE "L" DIM. AT JOINT ON R.H. SIDE OF UNIT AND STAMP (.38 HIGH LETTERS) ON VERTICAL SURFACE OF CYLINDER BASE AS SHOWN.
 - RECORD DIMENSIONS IN TABLE 5.

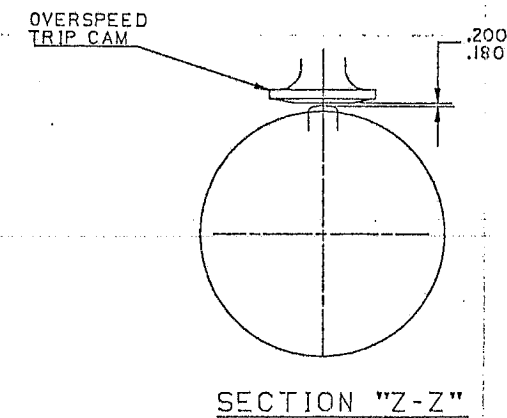
2. RADIAL CLEARANCES

- SET EXHAUST GLAND CASE FLUSH WITH CYLINDER HORIZONTAL JOINT.

- ESTABLISH THRUST BRG. END PLAY AS FOLLOWS: APPLY AN AXIAL LOAD (EQUIVALENT TO 25 LB/SQ. IN. OF BRG. AREA) IN ONE DIRECTION TO SEAT THE THRUST BRG. SHOES, LEVELLING PLATES AND BASE RING ASSEMBLY. RELEASE THE AXIAL LOAD AND MEASURE THE RESULTANT CHANGE IN AXIAL POSITION. REPEAT UNTIL A CONSISTANT POSITION ($\pm .002$) IS ESTABLISHED WHEN THE LOAD IS RELEASED. THIS CONSISTANT POSITION (WITH NO AXIAL LOAD) BECOMES THE DATUM FOR MEASURING END PLAY. REPEAT ABOVE PROCEDURES IN THE OPPOSITE DIRECTION AND ESTABLISH THE SPECIFIED END PLAY VALUE WHICH IS BASED ON NO LOAD TO EITHER BEARING. RECORD THRUST BEARING END PLAY IN TABLE 4.

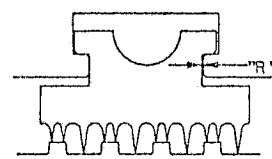
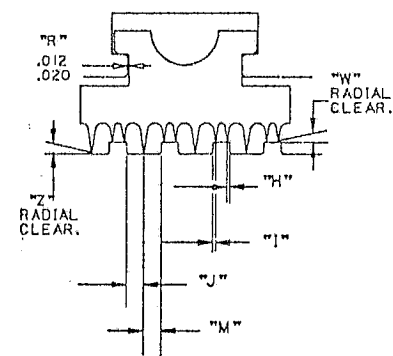
- RECORD THE FINAL NOZZLE BLOCK MACHINING DIMENSION "N" IN TABLE 3.

- ALL DIMENSIONS ARE IN INCHES.

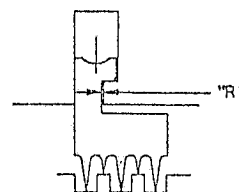


ROTOR DEFLECTION DATA	
LOCATION	DEFLECTION
INLET BRG.	0.0
INLET GLANDS (OUTER)	0.001
INLET GLANDS (INNER)	0.002
INLET GLANDS (INNER - INNER)	0.003
STG. 1 (ROTOR)	0.003
STG. 2 (DIAPH)	0.0033
STG. 3 "	0.004
STG. 4 "	0.004
STG. 5 "	0.004
STG. 6 "	0.004
STG. 7 "	0.004
EXH. GLANDS (MID-POINT)	0.003
EXH. BRG.	0.0

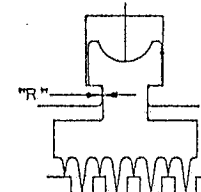
10. 2558900-01 0.3 SEC CHANCE	3855D44 ST. 1065.00 LAYERS 0 TO 4 1st FRAME 6 H 25	THE INFORMATION CONTAINED HEREON WHICH IS THE PROPERTY OF WESTINGHOUSE CANADA INC. MUST BE MAINTAINED IN CONFIDENCE AND NO PORTION OF THIS DRAWING MAY BE REPRODUCED OR USED WITHOUT THE EXPRESS PERMISSION OF THE COMPANY.	DRAFTSPERSON H. WESTEDT DESIGN 1/1/64 833/1 833/1 833/1	Westinghouse Canada Inc. TURBINE AND GENERATOR DIVISION, HAMILTON, CANADA	ROTOR CLEARANCE	INCH THIRD ANGLE PROJECTION FOR IMPLIED TOLERANCES SEE N.T.S. SHT 1 OF 9	3877D27 1



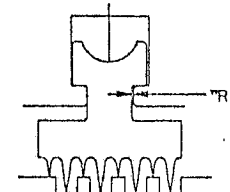
DETAIL "B"
(EXH.END GLANDS)
SAME AS DETAIL "A" EXCEPT AS SHOWN.



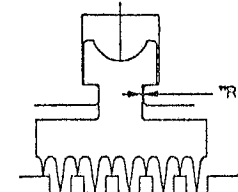
DETAIL "C"
(STAGES 4-7)
SAME AS DETAIL "G" EXCEPT AS SHOWN.



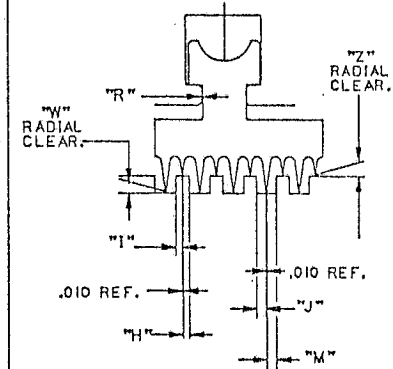
DETAIL "D"
(INL.END GLAND)
SAME AS DETAIL "G" EXCEPT AS
SHOWN.



DETAIL "E"
(INLET END GLAND)
SAME AS DETAIL "G" EXCEPT AS SHOWN.



DETAIL "F"
(STG.2 & EXTR.GLAND)
SAME AS DETAIL "G" EXCEPT AS
SHOWN.



DETAIL "G"
(INLEND GLAND)

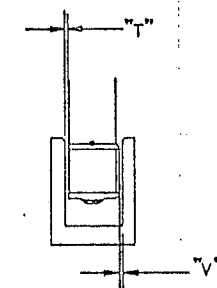
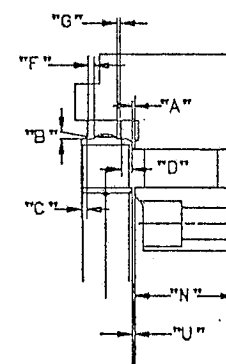
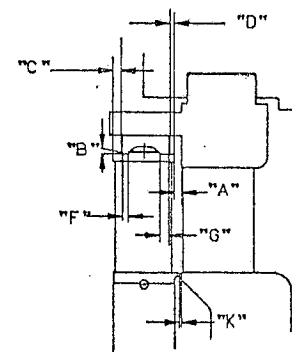
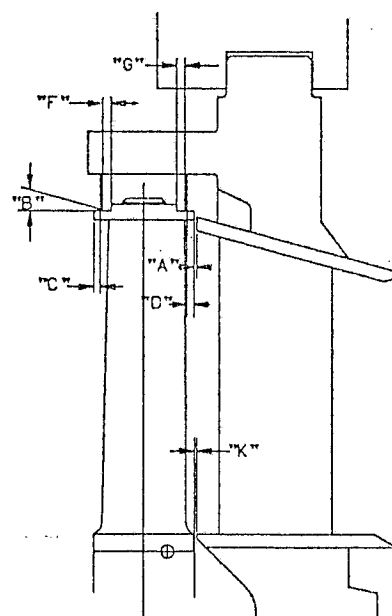
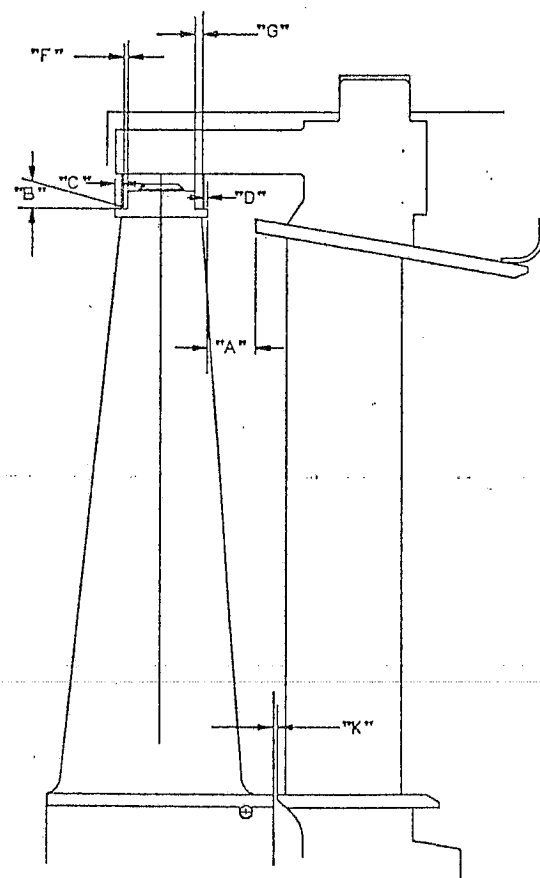


TABLE 1

STG.	STAGE AXIAL CLEARANCES																		STAGE RADIAL CLEARANCES		
	"A"			"C" ±.010			"D" ±.010			"F" ±.010			"G" ±.010			"K"			"B"		
	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD
1	.031			.096			.129			.091			.089			"U"	SEE TABLE 3		.031		
2	.031			.142			.192			.112			.089			.031			.031		
3	.031			.096			.129			.092			.088			"U"	SEE TABLE 3		.031		
4	.081 ±.020			.111			.099			.131			.134			.031			.031		
5	.090 ±.020			.120			.090			.123			.142			.040			.031		
6	.050 ±.020			.059			.139			.161			.081			.045			.031		
7	1.023 ±.020			.091			.032			.066			.126			.060			.031		

TABLE 2

SEAL	STEAM SEAL AXIAL CLEARANCES															STEAM SEAL RAIAL CLEARANCES					
	"H"			"I"			"J"			"M"			"R"			"W"			"Z"		
	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD	ENG.	SHOP	FIELD
1	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
2	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
3	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
4	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
5	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
6	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
7	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
8	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
9	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
10	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
11	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
12	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
13	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
14	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
15	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
16	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		
17	.065			.065			.112			.112			.012/.020			.011/.009			.011/.009		

TABLE 4

	RADIAL CLEARANCES				ORIFICE DIAMETERS		
	ENG.	SHOP	FIELD		ENG.	SHOP	FIELD
INLET BEARING BORE	.0038/.0022			INLET BEARING	—		
EXHAUST BEARING BORE	.007/.005			EXHAUST BEARING	—		
				THRUST CONTR.RINGS	.66		
EXHAUST BEARING OIL SEAL - TURB.SIDE	.0325/.0300						
EXHAUST BEARING OIL SEAL - G'BOX SIDE	.0325/.0300						
INL. JNL.BEARING OIL SEAL - TURB.SIDE	.0322/.0297						
INL. JNL.BEARING OIL SEAL - THRUST SIDE	.0322/.0297						
THRUST BEARING SEAL CLEARANCE	.0125/.0105						
INLET BEARING PEDESTAL OIL SEAL	.010/.008						
EXHAUST BRG.BKT. OIL SEAL - TURB.SIDE	.010/.008						
EXHAUST BRG.BKT. OIL SEAL - G'BOX SIDE	.010/.008						
THRUST BEARING ENDPLAY	.018/.012						

TABLE 3

STG.	"N"		"U"			"T"			"V"		
	SHOP	FIELD	ENG	SHOP	FIELD	ENG	SHOP	FIELD	ENG	SHOP	FIELD
1			.031			.087			.087		
3			.031			.067			.067		

1

2558900-01

CHANGE

DATE

3855044

ST. 10665.00

LAYERS 0 & 12

DATE

3855044

ST. 10665.00

LAYERS 0 & 12

DATE

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DRAWN BY

H. WESTEDT

DESIGN

DATE

10/1/83

ISSUE DATE

10/1/83

TEST FRAME

WESTINGHOUSE CANADA INC.

TURBINE AND GENERATOR DIVISION, HAMILTON, CANADA

INCH

THIRD ANGLE

PROJECTION

FOR UNLIMITED TOLERANCES SEE SCALE

N.T.S.

SHT 3 OF 3

DRAWING NO.

3877D27

SUB

1

CUSTOMER WESTINGHOUSE CANADA INC.
CUSTOMER ORDER NO. 100-56882
LUBRIN ORDER NO. 000000
INPUT 6211 RPM, OUTPUT 1000 RPM, 8110 0.2420
ALMA MECH. RATING, SF 1.0 12.30 HP
SERVICE RATING, SF 1.47 18.80 HP
RECOMM'D LUBE OIL GRADE 150W 550 AT 100°F
RECO'D. WATER FLOW 1000 GPM AT 100°F IF MAX. TEMP.
UNITS LESS LUBE SYSTEM
REQ'D. OIL FLOW 20 GPM AT 100°F & 150°F
HEAT REJECTION RATE 500,000 BTU/H

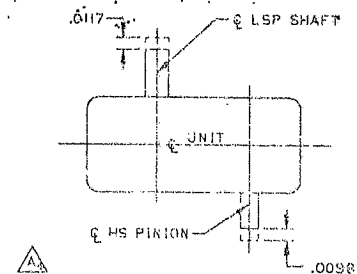
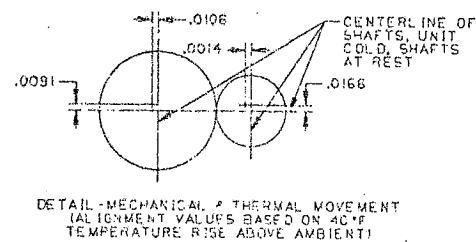
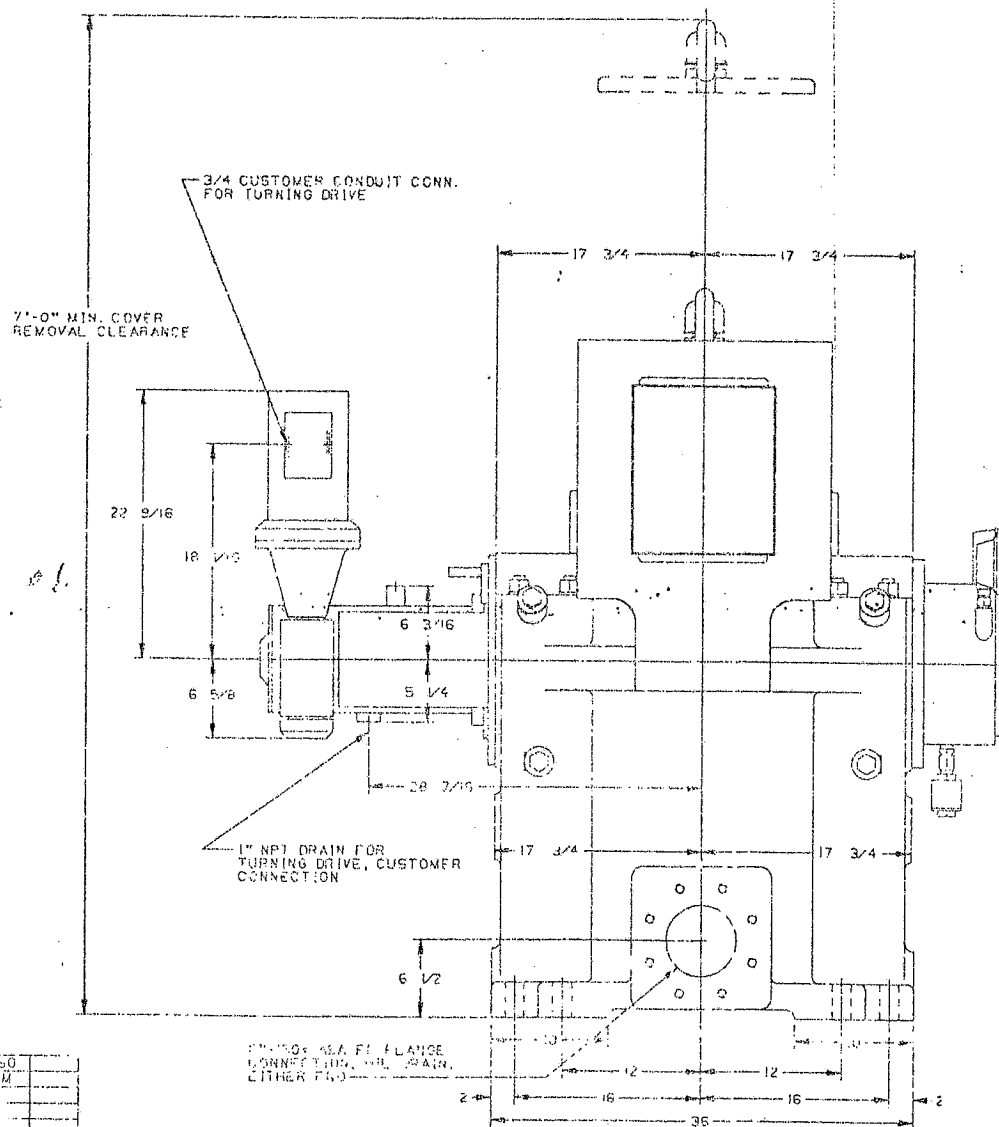
CERTIFIED True & Correct
DATE November 11 1987

1. INTERCONNECTING PIPING FURNISHED BY CUSTOMER MUST BE CHEMICALLY CLEARED AND INHIBITED BEFORE OPERATION.
2. VIBRATION PROBE - BENTLY-NEVADA 7200 SERIES,
0.5 METER LEAD, MODEL NO. 21508-02-12-05-02,
FOUR PROBES, ONE EACH BEARING
3. EXTENSION CABLE - BENTLY-NEVADA 7200 SERIES,
4.5 METER LENGTH, MODEL NO. 21747-045-00.
4. PROXIMETER - BENTLY-NEVADA 7200 SERIES,
5 METER EFFECTIVE CABLE LENGTH, MODEL NO. 18745-03.
5. EXTENSION CABLES AND RYO LEADS TO BE RUN IN RIGID CONDUIT FROM SERVICE HEAD TO JUNCTION BOX BY LUFKIN.
6. IMBEDDED RIGID - MINCO NO 034HP3536, PLATINUM ELEMENT,
RESISTANCE - TWO OHMS AT 0° C, STAINLESS STEEL OVERBraid,
FOUR FEP RADIAL BEARING, TWO PER THRUST BEARING, 6-TOTAL

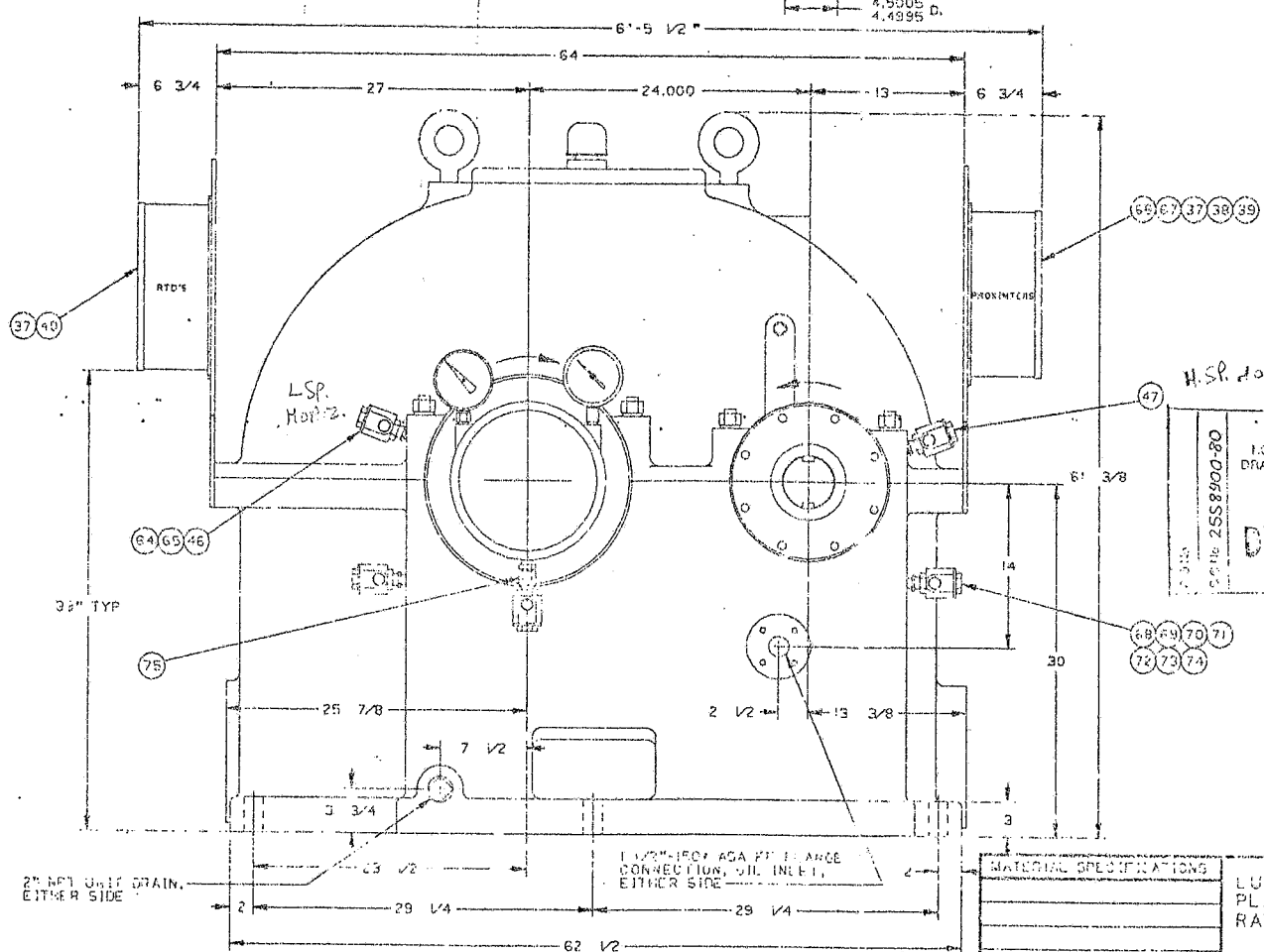
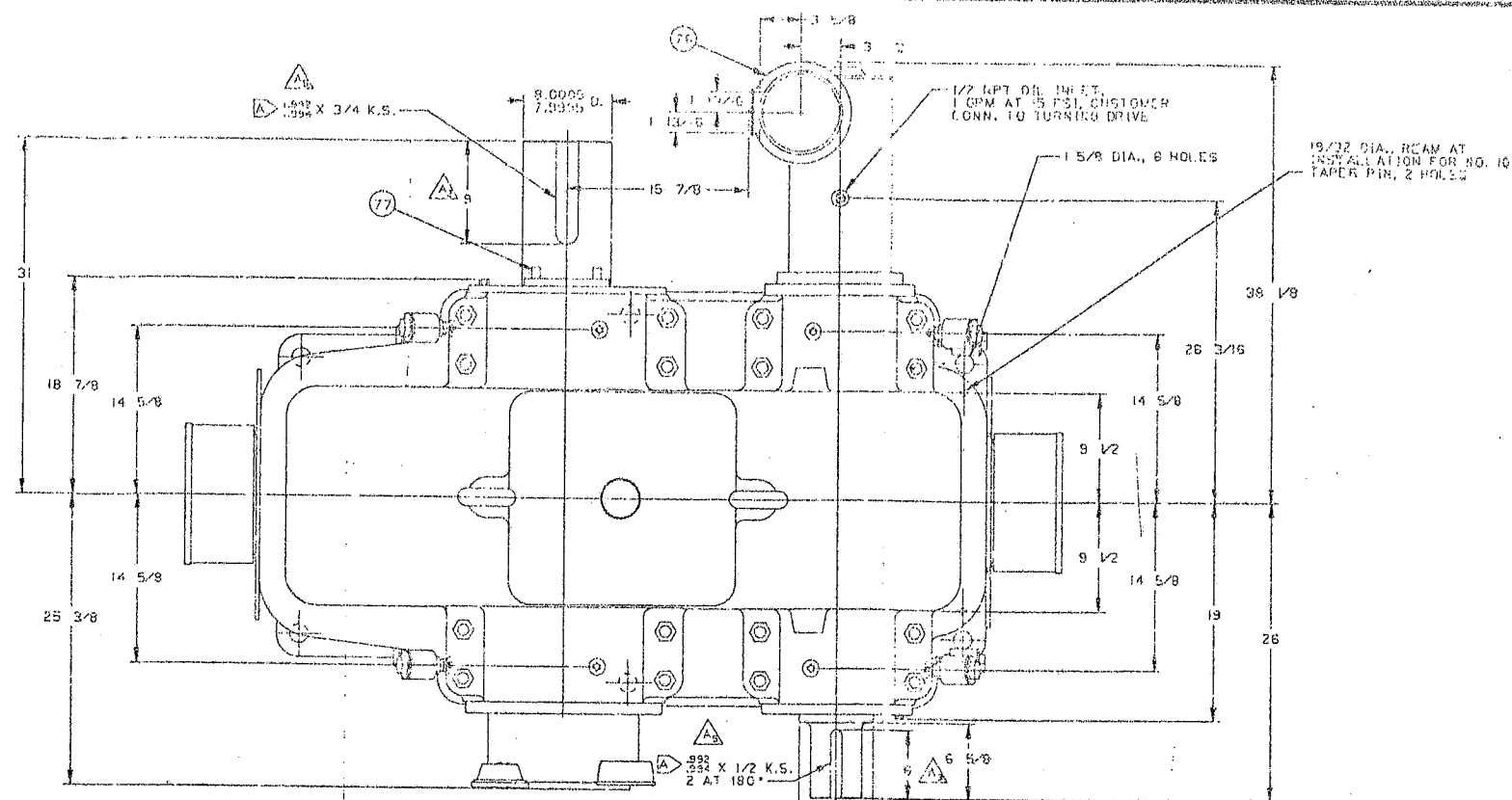
WE CAN P.O. BOX 146-56832

12. CUSTOMER CONSULT CONN. FOR JUNCTION BOXES
TO BE SIZED AND LOCATED AT INSTALLATION

13. KEYWAY TOLERANCES PER WESTINGHOUSE CANADA DWG 1A04761.



DETAIL-AXIAL THERMAL GROWTH
(ALIGNMENT VALUES BASED ON 60°F
TEMPERATURE RISE ABOVE AMBIENT)



HSP 208-1

WESTINGHOUSE CANADA INC.
NOTE - WINCH DRAWINGS ASSIGNED WEGAN
DRAWING NUMBER FOR FLUID PUMPSET ONLY
APPROVED: LA 5/3/25 JCH
DISTRIBUTION: 113

DWG NO 3877D56

WEGAN INSTRUCTIONS - MOUNTING

NOV 28 1947

NATIONAL SPECIFICATIONS

LUFKIN N2404C SPEED REDUCER
PLAN, INSTALLATION, L-R UNIT
RATIO 3.743:1, C'CW ROTATION

DRAWN BY CURT DATE 9-17-87 CHECKED BOYD

TRADES BY _____ DATE _____ SCALE 1:1250
LUFKIN INDUSTRIES, INC.

REV.

~~SECRET~~

~~CONFIDENTIAL~~

CUSTOMER _____
 CUSTOMER ORDER NO. _____
 LUFKIN ORDER NO. _____
 PRELIMINARY ☐
 CERTIFIED FOR CONSTRUCTION ☐
 BY _____ DATE _____

THIS DRAWING AND ALL INFORMATION
THEREON IS CONFIDENTIAL AND IS THE
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[illegible]

PERTAINS TO / A. TO USED ON

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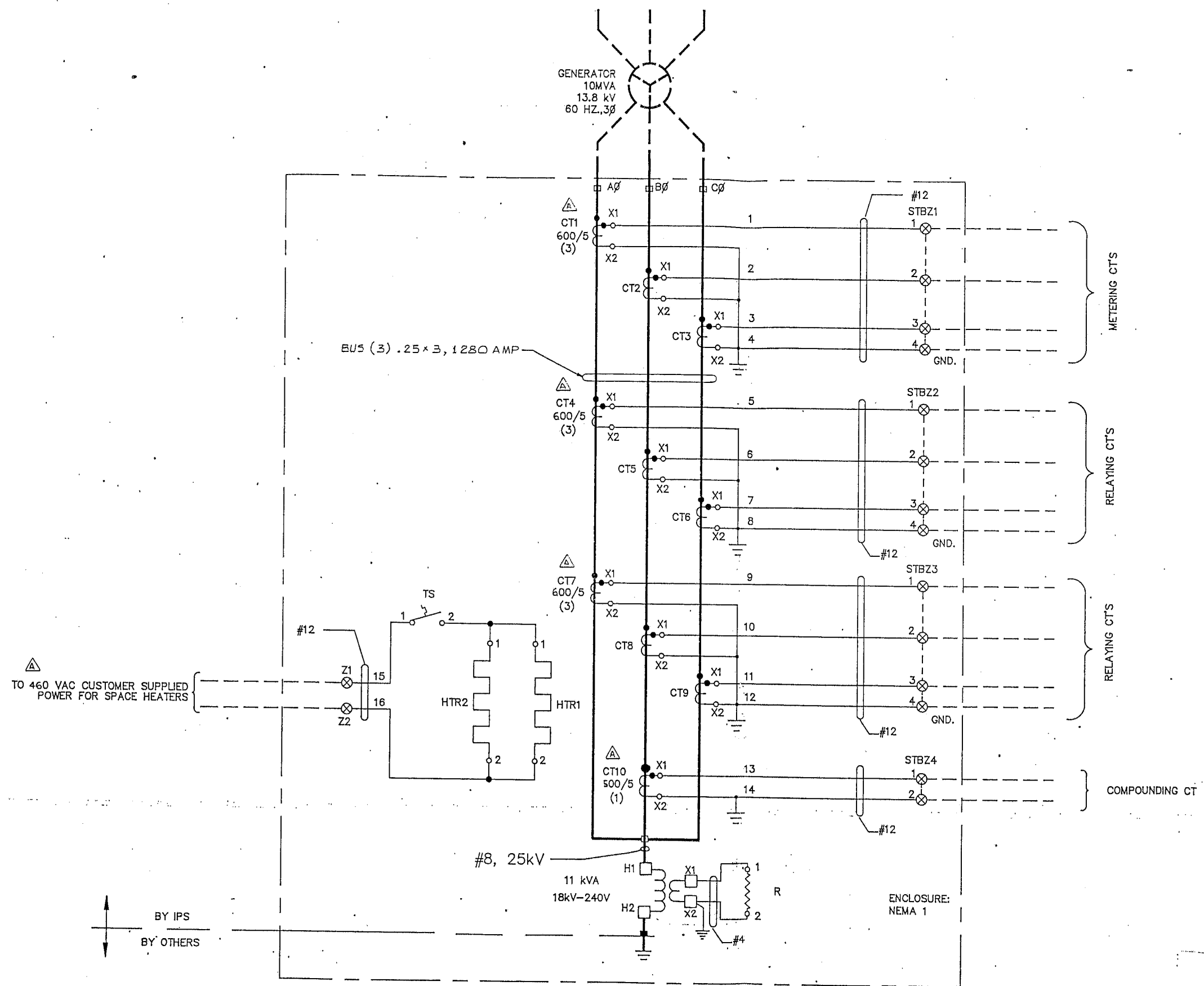
1. The first step in the process of identifying a problem is to define the problem clearly. This involves identifying the symptoms of the problem and determining the scope of the problem. Once the problem has been defined, the next step is to identify the causes of the problem. This involves identifying the factors that are contributing to the problem and determining the underlying causes. Once the causes have been identified, the next step is to develop a plan of action. This involves identifying the steps that need to be taken to solve the problem and determining the resources that will be needed to implement the plan. Finally, the last step in the process is to implement the plan and monitor the results. This involves putting the plan into action and tracking the progress of the solution. Once the problem has been solved, the final step is to evaluate the results and determine if the solution was effective. This involves comparing the results of the solution to the original problem and determining if the problem has been resolved.

SUPPLEMENT

SUPERSEDED BY

LEGEND:

HTR SPACE HEATER, 500W
TS THERMOSTAT SWITCH



BY IPS
BY OTHERS

REVISION A REVISED PER CUSTOMER NOTES DATE APPRV. APPLICATION		MATERIAL: FINISH: NEXT ASSY. USED ON		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/64 ± .01 ± 30° .XXX ± .005		APPROVALS DRAWN JAB CHECKED J. J. J. 1-25-88 APPROVAL J. J. J. 1-25-88 RELEASED J. J. J. 2-2-88		TITLE THREE LINE DIAGRAM GENERATOR NEUTRAL CUBICLE 13.8kV, 3Ø, 60Hz, 10MVA S.O. #188500		Integrated Power Systems HOUSTON, TEXAS U.S.A. SIZE CODE IDENT. NO. DRAWING NO. D 1885C001 006-004323	
DO NOT SCALE DRAWING		SCALE:		SHEET 1 OF 1							