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MOD-OA 200 kW WIND TURBINE GENERATOR ENGINEERING DRAWING REPORT

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SUMMARY

This report provides engineering drawings which document the design of the MOD-0A 200 kW wind turbine generator installed at Clayton, NM. The MOD-0A wind turbine was designed and built by the NASA Lewis Research Center for the U.S. Department of Energy as part of the Federal Wind Energy Program. The objective of the MOD-0A project is to obtain early operation and performance data and experience with horizontal-axis wind turbines in utility environments. The first MOD-0A wind turbine was released to the Town of Clayton Light and Water Plant for utility operation in March 1978.

This report contains the engineering drawings for all mechanical and electrical systems excert the blades. Included are drawings for the hub, pitch change mechanism, drive train, nacelle equipment, yaw drive system, tower, foundation, electrical power system, and the control and safety systems.

INTRODUCTION

HISTORY AND BACKGROUND

Wind energy systems have been utilized for centuries as a source of power for a variety of applications. Some of the more recent applications included sailing ships for transpotrtation and wind turbines (windmills) for grinding grain, pumping water, and generating electricity. In the early 1940's, a Smith-Putnam large Horizontal-Axis Wind Turbine (HAWT) was designed and built to feed power into the existing electrical network of the Central Vermont Public Service Company. This machine consisted of a two-bladed 175 foot (53.3 m) diameter rotor which was capable of producing 1.25 MW of power. In addition, Dr. U. Hütter designed and built a 100 kW Wind Turbine Generator (WTG) in West Germany in the late 1950's and gained operating experience with his machine tied to the utility network. The Hütter machine used a downwind 112 foot (34.1 m) diameter two-bladed rotor. Several of the design criteria and design features of the Smith-Putnam and Hütter WTGs were considered or incorporated into the MOD-0 and MOD-0A HAWTs.

RECENT DEVELOPMENTS

The recent national concern over the increase in energy demand and costs of fossil fuels, the dwindling supplies of domestic gas and oil, and the nation's increasing dependence upon imported oil has made it necessary to develop alternate energy sources. Wind energy conversion has long been recognized as a potentially abundant source of electrical power. Utilization of wind energy is becoming more attractive as the cost differential between wind and the more conventional fossil alternative narrows.

A Federal Wind Energy Program originated at the National Science Foundation in 1973. The objective of this program is to accelerate the development of reliable and economically viable wind energy systems and achieve early commercialization. Satisfying this objective requires advancing the technology, developing a sound industrial base, and addressing the non technological issues which could impede its development. In January 1975, the responsibility for managing the program was transferred to the Energy Research and Development Administration (ERDA). These efforts were continued by the Division of Distributed Solar Technology in the U.S. Department of Energy (DOE) after October 1, 1977.

One segment of the Federal Wind Program is the development of large horizontal-axis WTGs. In 1973, the NASA Lewis Research Center (LeRC) was asked by the National Science Foundation (and later by ERDA and DOE) to develop, and provide project management for, the designs of large, experimental, horizontal-axis WTGs and perform the necessary supporting research and technology development. Initially, a review of prior experience

in WTGs was performed. Then, analytical techniques and computer codes were developed to predict the structural dynamics of large HAWT systems such as the MOD-0A.

MOD-0 WIND TURBINE GENERATOR

As part of the federal wind program, NASA LeRC designed, built, and started testing a 100 kW wind turbine in September 1975. This experimental project, designated the MOD-0, had primary objectives of providing the engineering data and serving as a test bed for evaluating advanced wind turbine design concepts. The MOD-0 WTG was designed using available technology and "off-the-shelf" components where possible. Design, fabrication, and assembly were completed in 18 months. The MOD-0 WTG has a 125 foot (38.1 m) diameter downwind rotor which operates at 40 rpm. The rotor drives a 60 Hz synchronous alternator through a step-up gearbox at 1800 rpm. The MOD-0 project has been used to help understand the performance and the dynamic behavior of wind turbines. The MOD-0 WTG was utilized to: 1) understand the tower shadow and wind shear effects; 2) assess operational performance; 3) evaluate automatic startup and shutdown capabilities, including synchronization to a large and small utility network; and 4) test various components, such as induction generators and steel spar wind turbine blades.

MOD-0A WIND TURBINE GENERATOR

The MOD-0A 200 kW wind turbine generator is, in most respects, an uprated version of the MOD-0 100 kW WTG. The MOD-0A WTG was designed and analyzed by the NASA LeRC for the DOE. The objective of the MOD-0A Project is to conduct early testing of wind turbines in utility environments so that the machine operating performance and dynamic characteristics can be determined. Besides gaining operational experience with wind turbines interfaced with utility networks, an additional objective of the -0A project is obtaining the utility's and the public's reaction to intermediate size WTGs. The prototype MOD-0 design was simplified and made "field-worth" as it was uprated to the 200 kW size.

The purpose of this engineering drawing report is to document the design of the MOD-0A 200 kW wind turbine generator at Clayton, NM now being operated by the Town of Clayton Light and Water Plant. This machine was built to NASA drawings and specifications. Updated drawings were subsequently prepared in Westinghouse format to reflect as-built conditions on the Clayton and later machines. These latest drawings are presented here with a cross index to the original NASA drawings.

The MOD-0A wind turbine is shown in operation at the Clayton site in Figure 1. The operational history for the Clayton MOD-0A WTG during its initial phases of use is as follows:

Date	Event
• November 30, 1977	First rotation
• January 19, 1978	First 100 hours (0.36 megaseconds) of operation
• January 28, 1978	Formal dedication of wind turbine
• March 6, 1978	Turned over the operation by the utility
• May 24, 1978	1000 hours (3.6 megaseconds) of operation [94,000 kW-hr (338.GJ)]

SUPPLEMENTARY MOD-0A REPORTS

Two supplementary reports to this MOD-0A engineering drawing report provide the details[1] and an executive summary[2] of the design and analysis of the MOD-0A wind turbine generator.

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1 Andersen, T.S., Bodenschatz, C.A., Eggers, A.G., Hughes, P.S., Lampe, R.F., Lipner, M.H., and Schornhorst, J.R., "MOD-0A 200 kW Wind Turbine Generator Design and Analysis Report," DOE/NASA/0163-2, NASA CR-165128, and AESD-TME-3052, August 1980.

2 Andersen, T.S., Bodenschatz, C.A., Eggers, A.G., Hughes, P.S., Lampe, R.F., Lipner, M.H., and Schornhorst, J.R., "Executive Summary. MOD-0A 200 kW Wind Turbine Generator Design and Analysis Report," DOE/NASA/0163-1, NASA CR-165127, and AESD-TME-3051, August 1980.

Figure 1. MOD-0A 200 kW Wind Turbine Generator; Clayton, NM

DISCUSSION

The MOD-0A engineering drawings follow this discussion in numerical order (by Westinghouse drawing number). The mechanical drawings (Westinghouse drawings 1015F-- and 1017F--) are followed by the electrical drawings (1016F--). Table 1 provides a list of drawings and title in this order with cross-reference to the number and title of the NASA drawings from which the Westinghouse drawings were prepared. The NASA drawings formed the basis for assembly and installation of the MOD-0A wind turbine generators and are listed in numerical order in Table 2 with cross reference to the number and title of the corresponding Westinghouse drawings.

TABLE I

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV.	TITLE OF DRAWING
1015F01	11	CR758862	1	K	(NASA) MOD-0A 200 kW WIND TURBINE GENERATOR ASSEMBLY
		CR758863	1	G	(NASA) MOD-0A 200 kW WIND TURBINE GENERATOR ASSEMBLY
					(W) ASSEMBLY MOD-0A 200 kW WIND TURBINE GENERATOR
1015F02	1	CD758836	1	A	(NASA) HUB FORGING
					(W) HUB PITCH FORGING MOD-0A 200 kW WIND TURBINE GENERATOR
1015F03	4	CR758864	1	D	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB
		CD758875	1	C	(NASA) SUB-ASSEMBLY BEARING & GEAR ADJUSTMENT
					(W) PITCH CONTROL HUB ASS'Y MOD-0A 200 kW WIND TURB. GEN.
1015F04	1	CF758865	1	B	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 1
					(W) HUB PITCH DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR
1015F05	1	CD758866	1	A	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 2
					(W) BLADE SPINDLE SLEEVE MOD-0A 200 kW WIND TURBINE GEN.
1015F06	1	CD758867	1	D	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 3
					(W) BLADE SPINDLE HOUSING MOD-0A 200 kW WIND TURBINE GEN.
1015F07	1	CD758868	1	C	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 4
					(W) DRIVE SHAFT BEARING RETAINER MOD-0A 200 kW WTG
1015F08	1	CD758869	1	B	(NASA) ASS'Y-GEAR TYPE PITCH CONTROL HUB-DETAILS 5 THRU 11
					(W) HUB PITCH DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F09	1	CD758870	1	B	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 12
					(W) HUB PITCH DRIVE SHAFT MOD-0A 200 kW WIND TURBINE GEN.
1015F10	1	CD758872	1	C	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 15
					(W) HUB PITCH BEVEL PINION GEAR MOD-0A 200 kW WTG
1015F11	1	CD758873	1	C	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 16
					(W) HUB PITCH BEVEL GEAR SECTOR MOD-0A 200 kW WTG

*All Westinghouse Drawings are Revision - (i.e., Unrevised)

TABLE 1 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1015F12	1	CF758874	1	C	(NASA) ASS'Y-GEAR TYPE PITCH CONTROL HUB-DETAILS 17 THRU 25 (W) HUB PITCH DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F13	1	NONE	-	-	(W) GENERAL OUTLINE MOD-0A 200 kW WIND TURINBE GENERATOR
1015F14	6	CR758877	1	E	(NASA) BEDPLATE (W) BEDPLATE MOD-0A 200 kW WIND TURBINE GENERATOR
1015F15	3	CR758878	1	D	(NASA) FWD CENTER SHROUD (W) FORWARD CENTER SHROUD MOD-0A 200 kW WIND TURBINE GEN.
1015F16	4	CR758879	1	E	(NASA) REAR CENTER SHROUD (W) REAR CENTER SHROUD MOD-0A 200 kW WIND TURB. GENERATOR
1015F17	1	CF758880	1	A	(NASA) NOSE CONE (W) NOSE CONE MOD-0A 200 kW WIND TURBINE GENERATOR
1015F18	1	CF758881	1	C	(NASA) PROP CONE (W) PROP CONE (SPINNER) MOD-0A 200 kW WIND TURBINE GEN.
1015F19	1	CD758882	1	B	(NASA) PROP HUB & CONE COVER PLATE (W) BLADE OPENING COVERS MOD-0A 200 kW WIND TURBINE GEN.
1015F20	1	CD758883	1	-	(NASA) CONE SUPPORT DETAILS (W) CONE SUPPORT DETAILS MOD-0A 200 kW WIND TURBINE GEN.
1015F21	1	CD758884	1	A	(NASA) FRONT HUB SUPPORT (W) MOUNTING PANEL-PROP CONE MOD-0A 200 kW WIND TURB. GEN.
1015F22	1	CD758885	1	-	(NASA) REAR HUB SUPPORT (W) SUPPORT-PROP CONE MOD-0A 200 kW WIND TURBINE GENERATOR
1015F23	2	CF758886	1	C	(NASA) WALKWAYS (W) WALKWAYS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F24	1	CF758887	1	A	(NASA) ADJ. GENERATOR BOTTOM PLATE (W) BOTTOM PLATE-GENERATOR ADJUSTMENT MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE 1 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1015F25	1	CF758888	1	A	(NASA) ADJ. GEN. TOP & LOCK BAR (W) GENERATOR ADJUSTMENT DETAILS
1015F26	1	CF758889	1	C	(NASA) DETAILS (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F27	1	CF758890	1	C	(NASA) MAIN DRIVE SHAFT (W) MAIN DRIVE SHAFT MOD-0A 200 kW WIND TURBINE GENERATOR
1015F28	1	CD758892	1	-	(NASA) BRAKE SUPPORT (W) BRAKE SUPPORT MOD-0A 200 kW WIND TURBINE GENERATOR.
1015F29	1	CD758895	1	-	(NASA) PULLEY DRIVE SHAFT (W) PULLEY DRIVE SHAFT MOD-0A 200 kW WIND TURB. GENERATOR
1015F30	2	CR758896	1	E	(NASA) MAIN YAW BRG SUPPORT (W) MAIN YAW BRG SUPPORT MOD-0A 200 kW WIND TURBINE GEN.
1015F31	1	CF758897	1	A	(NASA) YAW DRIVE BRG HOUSING (W) YAW DRIVE BRG HOUSING MOD-0A 200 kW WIND TURBINE GEN.
1015F32	1	CF758898	1	-	(NASA) YAW DRIVE SHAFT (W) YAW DRIVE SHAFT MOD-0A 200 kW WIND TURBINE GENERATOR
1015F33	1	CF758899	1	-	(NASA) YAW BRG RETAINER & SEAL (W) YAW-BRG RETAINERS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F34	1	CD758900	1	A	(NASA) INTER. YAW DRIVE SHAFT (W) INTERMEDIATE YAW DRIVE SHAFT MOD-0A 200 kW WTG
1015F35	1	CD758901	1	B	(NASA) YAW DRIVE MOUNTING (W) YAW DRIVE MOUNTING PLATE MOD-0A 200 kW WIND TUR. GEN.
1015F36	1	CD758902	1	C	(NASA) SHEAR KEY & THRUST BUTTON (W) SHEAR KEY & THRUST BUTTON MOD-0A 200 kW WIND TUR. GEN.
1015F37	1	CC758903	1	B	(NASA) MAIN SLIP RING SUPPORT HORIZ. (W) MAIN SLIP RING SUPPORT (HORIZ.) MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE I (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR
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WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1015F38	2	CF758904	1	C	(NASA) BREAK PRESS. SYST. (W) PiPing SCHEMATIC & PANEL LAYOUT BREAK CHAMBER & PRESSURIZING SYSTEM MOD-0A 200 kW WIND TURBINE GENERATOR
1015F39	1	CC758905	1	-	(NASA) LIFTING BOOM
		CC758907	1	-	(NASA) "U" BOLT - BOTTLE HOLD DOWN
		CC758931	1	A	(NASA) WWD SPEED MOUNTING BRK'D (W) LIFTING BOOM, U-BOLT & WIND SPEED & DIRECTIONAL MOUNT. BRACKET MOD-0A 200 kW WIND TURBINE GENERATOR
1015F40	1	CD758906	1	-	(NASA) HYD PACK SUPPORT BED (W) HYDRAULIC PACKAGE SUPPORT BED MOD-0A 200 kW WTG
1015F41	1	CD758909	1	B	(NASA) LIFTING BEAM & SLING ASSEMBLY (W) LIFTING BEAM & SLING ASSEMBLY MOD-0A 200 kW WTG
1015F42	1	CD758908	1	A	(NASA) HYD PACK FAN SHROUD (W) HYDRAULIC PACKAGE FAN SHROUD MOD-0A 200 kW WTG
1015F43	3	CR758975	1	A	(NASA) SENSOR LOCATION (PLAN VIEW)
		CR758976	1	C	(NASA) SENSOR LOCATION (ELEVATION VIEW) (W) SENSOR LOCATIONS & CONDUIT ROUTING MOD-0A 200 kW WTG
1015F44	1	CF758910	1	B	(NASA) DETAILS (W) HIGH SPEED BRADE DETAILS MOD-0A 200 kW WIND TURB. GEN.
1015F45	1	CF758912	1	A	(NASA) ROTARY COUPLING SUPPORT (W) DEUBLIN CPLG SUPPORT BRACKET MOD-0A 200 kW WTG
1015F46	1	CD758913	1	B	(NASA) LADDER (W) LADDER WELDED ASSEMBLY MOD-0A 200 kW WIND TURB. GEN.
1015F47	1	CF758914	1	-	(NASA) REAR PROP CONE SUPPORTS (W) REAR PROP CONE SUPPORT MOD-0A 200 kW WIND TURBINE GEN.
1015F48	1	CD758915	1	A	(NASA) HYD SUPPLY CLAMP & SUPPORTS (W) HYDRAULIC SUPPLY CLAMP &SUPPORT MOD-0A 200 kW WTG

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TABLE 1 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1015F49	2	CF758916	1	C	(NASA) CO AXIAL FLOW LINE ASSEMBLY (W) CO AXIAL FLOW LINE - ASSEMBLY & DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR
1015F50	1	CD758919	1	A	(NASA) SPINNER RAIN GUARD (W) SPINNER RAIN GUARD MOD-0A 200 kW WIND TURBINE GENERATOR
1015F51	1	CF758920	1	A	(NASA) SLIP RING ANTI-ROTATION SUPPORT & BRKT. (W) SLIP RING ANTI-ROTATION SUPPORT & BRKT. MOD-0A 200 kW WIND TURBINE GENERATOR
1015F52	3	CF758921 CF758922 CF758923	1 1 1	A A -	(NASA) HYDRAULIC PUMP PACKAGE ASSEMBLY (W) HYDRAULIC PUMP PACKAGE ASSY MOD-0A 200 kW WTG
1015F53	2	CF758924	1	-	(NASA) DETAILS (W) HYDRAULIC PUMP PACKAGE ASSY MOD-0A 200 kW WTG
1015F54	1	CR758926	1	-	(NASA) DETAILS (W) HYDRAULIC PUMP DETAILS MOD-0A 200 kW WIND TURB. GEN.
1015F55	4	CR758926	1	B	(NASA) ACTUATOR ASSEMBLY (W) ACTUATOR ASSEMBLY MOD-0A 200 kW WIND TURB. GEN.
1015F56	1	CF758927	1	A	(NASA) DETAILS (W) ACTUATOR ASSY DETAILS MOD-0A 200 kW WIND TURB. GEN.
1015F57	1	CF758928	1	A	(NASA) DETAILS (W) ACTUATOR ASSY DETAILS MOD-0A 200 kW WIND TURB. GEN.
1015F58	1	CF758929 CP758929	1	B -	(NASA) HYDRAULIC SCHEMATIC DIAGRAM (NASA) OPERATIONAL REQUIREMENTS & PARTS LIST (W) CONTROL SCHEMATIC DIAGRAM MOD-0A 200 kW WTG
1015F59	1	CF758930	1	B	(NASA) INTERFACE-METAL BLADE TO PITCH CONTROL HUB (W) INTERFACE-BLADE TO HUB MOD-0A 200 kW WIND TURBINE GEN.
1015F60	1	None			(NASA) NONE (W) DETAILS MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE 1 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR
CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1015F61	1	CD758932	1	A	(NASA) UPPER BRAKE SUPPORT (W) UPPER BRAKE SUPPORT MOD-0A 200 kW WIND TURBINE GEN.
1015F62	1	CD758933	1	-	(NASA) TURNTABLE BEARING & GEAR ASSY (W) TURNTABLE BRG & GEAR ASSY MOD-0A 200 kW WIND TURB. GEN.
1015F63	1	CD758934	1	C	(NASA) LIFTING BEAM (W) LIFTING BEAM DETAILS MOD-0A 200 kW WIND TURBINE GEN.
1015F64	1	CF758936	1	A	(NASA) EXTERIOR FINISH-FIBERGLAS HOUSING (W) EXTERIOR FINISH-FIBERGLAS HOUSING MOD-0A 200 kW WTG
1015F65	1	CB758490 CC758937	1 1	A B	(NASA) BUTTRES RING RETAINER (NASA) TRANSFORMER BRACKETS (W) TRANSFORMER ANTI-ROTATION BRACKET & BUTTRES RING RETAINER DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F66	1	CD758938	1	-	(NASA) OUTPUT SHAFT CONFIGURATION FOR DOUBLE REDUCTION WORM GEAR UNIT (W) DOUBLE REDUCTION WORM GEAR UNIT YAW DRIVE MOD-0A 200 kW WIND TURBINE GENERATOR
1015F67	1	CF758939	1	A	(NASA) TOWER SLIP RING ANTI-ROTATION ASSEMBLY (W) TOWER SLIP RING ANTI-ROTATION ASSY MOD-0A 200 kW WTG
1015F68	1	CC758871 CC758945	1 1	A A	(NASA) DETAILS (NASA) BUTTRES RING (W) DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR
1015F69	1	CF758946	1	B	(NASA) MOD 0A WIND TURBINE GENERATOR SITE PLAN & GENERAL ASSY (W) SITE PLAN & GENERAL ASSY MOD-0A 200 kW WIND TURBINE GEN.
1015F70	4	CF758948 CF758949 CF758950	1 1 1	B A A	(NASA) STRUCTURAL-TOWER ELEVATION & DETAILS (NASA) STRUCTURAL-TOWER PLANS & DETAILS (NASA) STRUCTURAL-TOWER DETAILS (W) TOWER ELEVATIONS, PLAN & DETAILS MOD-0A 200 kW WTG
1015F71	2	CF758952	1	-	(NASA) STRUCTURAL-ASSEMBLY STAND PLAN & DETAILS (W) ASSY STAND PLAN & DETAILS MOD-0A 200 kW WIND TURB. GEN.

* All Westinghouse Drawings are Revision -

TABLE 1 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR
CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1015F72	1	CD758957	1	B	(NASA SPEED INCREASER-DIMENSIONAL REQUIREMENTS (W) SPECIAL SPEED INCREASER MOD-0A 200 kW WIND TURBINE
1015F73	1	CC758972	1	A	(NASA) GEAR BOX SLIP RING ASSEMBLY (W) GEAR BOX SLIP RING ASSEMBLY-ELECTRICAL MOD-0A 200 kW WIND TURBINE GENERATOR
1015F74	1	CF758973	1	A	(NASA) TOWER SLIP RING ASSY-ELECTRICAL (W) TOWER SLIP RING ASSY (ELEC) MOD-0A 200 kW WTG
1015F75	1	CF758974	1	B	(NASA) TOWER SLIP RING ASSY-ELECTRICAL (W) TOWER SLIP RING ASSY (ELEC) MOD-0A 200 kW WTG
1015F76	2	CF758981	1	B	(NASA) ELECTRICAL-EQUIPMENT LAYOUT, LIGHTING, GROUNDING & DETAILS (W) ELECTRTICAL-EQUIPMENT LAYOUT, LIGHTING, GROUNDING & DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F77	2	CF758982	1	B	(NASA) ELECTRICAL-POWER CONTROL & INSTRUMENTATION TERMINAL BOXES & DETAILS (W) ELECTRICAL-POWER CONTROL & INSTRUMENTATION TERMINAL BOXES & DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F78	1	CD758999	1	-	(NASA) INTERMEDIATE SHAFT (W) HIGH SPEED SHAFT ASSEMBLY MOD-0A 200 kW WIND TURB. GEN.
1015F79	1	CF758973 CF758974	1 1	A B	(NASA) TOWER SLIP RING ASSY-ELECTRICAL (NASA) TOWER SLIP RING ASSY-ELECTRICAL (W) TOWER SLIP RING ASSY MOD-0A 200 kW WIND TURBINE GEN.
1015F80	3	CF759019 CF760485	1 1	G A	(NASA) HYDRAULIC SCHEMATIC YAW BRAKE (NASA) HYDRAULIC SYSTEM PANEL YAW BRAKE (W) YAW BRAKE HYDAULIC SYSTEM PANEL & SCHEMATIC MOD-0A 200 kW WIND TURBINE GENERATOR
1015F81	1	CC759020 CC760504	1 1	- B	(NASA) SPACERS YAW COUPLINGS (NASA) HUB SEAL HOLDER (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR

* All Westinghouse Drawings are Revision -

TABLE 1 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1015F82	1	CF759021	1	-	(NASA) PULLY BEARING SUPPORT (W) PULLEY BEARING SUPPORT MOD-0A 200 kW WIND TURB. GEN.
1015F83	1	CD759023	1	A	(NASA) DETAILS FOR HYDRAULIC ACTUATOR (W) DETAILS FOR HYDRAULIC ACTUATOR MOD-0A 200 kW WTG
1015F84	1	CF759024	1	A	(NASA) DETAILS FOR PUMP PACKAGE (W) PUMP PACKAGE DETAILS MOD-0A 200 kW WIND TURBINE GEN.
1015F85	2	CF760271	1	A	(NASA) STRUCTURAL-ASSY STAND PLAN & DETAILS (W) ASSY STAND PLAN & DETAILS MOD-0A 200 kW WIND TURB. GEN.
1015F86	2	CF760300	1	-	(NASA) STRUCTURAL-TOWER & ASSY STAND-FOUNDATIONS & DETAILS-CLAYTON N.M. (W) TOWER & ASSY STAND FOUNDATION & DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F87	1	CC760476	1	-	(NASA) GREASE & PRESSURE FITTINGS (W) GREASE & PRESSURE FITTINGS MOD-0A 200 kW WTG
1015F88	1	CD760477	1	-	(NASA) HUB COUNTER WEIGHTS (W) HUB COUNTER WEIGHTS MOD-0A 200 kW WIND TURBINE GEN.
1015F89	1	CF760478	1	-	(NASA) DETAILS (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F90	1	CF760484	1	A	(NASA) HYDRAULIC SYSTEM PANEL YAW BRAKE (W) HYDRAULICS COMPONENTS MTG PANEL MOD-0A 200 kW WTG
1015F91	1	CF760484	1	A	(NASA) HYDRAULIC SYSTEM PANEL YAW BRAKE (W) HYDRAULIC SYSTEM PANEL YAW BRAKE-STRUCTURAL SUPPORT MOD-0A 200 kW WIND TURBINE GENERATOR
1015F92	1	CD760486	1	A	(NASA) AIR BOTTLE GAGE BRACKET (W) AIR BOTTLE GAGE BRACKET DETAILS MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

Table 1 (Cont'd)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV.	TITLE OF DRAWING
1015F93	1	CC759000	1	A	(NASA) FLUID COUPLER ADAPTER
		CC760487	1	-	(NASA) GEAR ALT. LOW SPEED SHAFT
					(W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1015F94	1	CC760488	1	A	(NASA) DUBLIN MOUNT
		CC760500	1	-	(NASA) SLIP RING COVER
					(W) DUBLIN MOUNT & SLIP RING DUST COVER MOD-0A 200 kW WTG
1015F95	2	CF760506	1	-	(NASA) ELECTRICAL-LOW SPEED SHAFT STRAIN GAGE LOCATION CONNECTION DIAGRAM & INSTALLATION
		CF760520	1	-	(NASA) ELECTRICAL-LOW SPEED SHAFT STRAIN GAGE LOCATION
					(W) ELECTRICAL-LOW SPEED SHAFT STRAIN GAGE LOCATION MOD-0A 200 kW WIND TURBINE GENERATOR
1015F96	1	CF760491	1	-	(NASA) YAW BRAKE ASSEMBLY
					(W) YAW BRAKE ASSY MOD-0A 200 kW WIND TURBINE GENERATOR
1015F97	1	CD760492	1	-	(NASA) YAW BRAKE DETAILS
					(W) YAW BRAKE DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR
1015F98	1	CD760493	1	-	(NASA) YAW BRAKE DETAILS
					(W) YAW BRAKE DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR
1015F99	1	CC760512	1	-	(NASA) FIXTURE FOR SEAL INSTALLATION
		CD760513	1	-	(NASA) SEAL INSTALLATION INSTRUCTIONS
					(W) FIXTURES FOR SEAL INSTALLATION MOD-0A 200 kW WTG
1017F02	1	NONE			(NASA) NONE
					(W) GENERATOR TACH MOUNT ASSY WITH KEYS & DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1017F03	2	NONE			(NASA) NONE
					(W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR

*All Westinghouse Drawings are Revision -

TABLE 1 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1017F04	1	NONE			(NASA) NONE (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
1017F05	1	NONE			(NASA) NONE (W) HYDRAULIC FITTINGS MOD-0A 200 kW WIND TURBINE GENERATOR
1016F01	4	CF758968	1	C	(NASA) ELECTRICAL-INSTRUMENTATION SENSOR WIRING LIST
		CF758969	1	E	(NASA) ELECTRICAL-INSTRUMENTATION SENSOR WIRING LIST
		CF758970	1	C	(NASA) ELECTRICAL-INSTRUMENTATION SENSOR WIRING LIST (W) INSTRUMENTATION SENSOR WIRING LIST MOD-0A 200 kW WTG
1016F02	1	CF758971	1	E	(NASA) ELECTRICAL-POWER ONE LINE CONNECTION DIAGRAM & SCHEDULE OF DWG. (W) POWER ONE LINE CONNECTION DIAGRAM SCHEDULE OF DWG'S MOD-0A 200 kW WIND TURBINE
1016F03	1	CF758977	1	C	(NASA) ELECTRICAL-AUXILIARY ELECTRONIC PACKAGE CONNECTION & INTERCONNECTION DIAGRAM (W) AUXILIARY ELECTRONIC PACKAGE CONNECTION & INTERCONNECTION DIAGRAM MOD-0A 200 kW WIND TURBINE
1016F04	2	CF758978	1	D	(NASA) ELECTRICAL-SENSOR IDENTIFICATION LIST (CLAYTON) (W) SENSOR IDENTIFICATION LIST MOD-0A 200 kW WIND TURBINE
1016F05	1	CF758979	1	F	(NASA) ELECTRICAL-CABLE INTERCONNECTION (W) ELECTRICAL-CABLE INTERCONNECTION MOD-0A 200 kW WTG
1016F06	1	CF758980	1	-	(NASA) ELECTRICAL-INSTRUMENTATION INTERCONNECTION DIAGRAM PHASE I TEST (W) INSTRUMENTATION INTERCONNECTION DIAGRAM LERC-ERB CH 22 PHASE I TEST MOD-0A 200 kW WIND TURBINE GENERATOR
1016F07	1	CF758983	1	C	(NASA) ELECTRICAL-GEAR BOX SLIP RING CONNECTION DIAGRAM (W) GEAR BOX SLIP RING CONNECTION DIAGRAM MOD-0A 200 kW WTG
1016F08	1	CF758984	1	G	(NASA) ELECTRICAL-TOWER SLIP RING CONNECTION DIAGRAM (W) TOWER SLP RING CONNECTION DIAGRAM MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE 1 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1016F09	1	CF758985	1	A	(NASA) ELECTRICAL-STATIC SHAFT TEST INTERCONNECTION DIAGRAM PHASE I TEST (W) STATIC SHAFT TEST INTERCONNECTION DIAGRAM LERC-ERB CW 22 PHASE I TEST MOD-0A 200 kW WIND TURBINE GENERATOR
1016F10	1	CF759025	1	C	(NASA) ELECTRICAL-TOWER SENSOR LOCATION PLAN, DETAILS, PIN LAYOUT & ELECTRICAL CONNECTION DIAGRAM (W) TOWER SENSOR LOCATION PLAN DETAILS, PIN LAYOUT & ELECTRICAL CONNECTION DIAG. MOD-0A 200 kW WIND TURBINE
1016F11	2	CF759026	1	E	(NASA) ELECTRICAL SAFETY SHUTDOWN-ELEMENTARY DIAGRAM (W) ELECTRICAL SAFETY SHUTDOWN-ELEMENTARY DIAGRAM MOD-0A 200 kW WIND TURBINE GENERATOR
1016F12	2	CF759027	1	F	(NASA) ELECTRICAL-CONTROL ELEMENTARY DIAGRAM (W) CONTROL ELEMENTARY DIAGRAM MOD-0A 200 kW WTG
1016F13	1	CF759028	1	D	(NASA) ELECTRICAL-YAW CONTROLLER CONNECTION DIAGRAM (W) YAW CONTROLLER CONNECTION DIAGRAM MOD-0A 200 kW WTG
1016F14	1	CF759029	1	A	(NASA) ELECTRICAL-MICRO PROCESSOR FLOW DIAGRAM (W) MICRO PROCESSOR FLOW DIAGRAM MOD-0A 200 kW WTG
1016F15	1	CF759030	1	C	(NASA) ELECTRICAL-CONNECTION DIAGRAM FOR PITCH CONTROLLER (W) ELECTRICAL CONNECTION DIAGRAM PITCH CONTROLLER MOD-0A 200 kW WIND TURBINE GENERATOR
1016F16	1	CF759031	1	E	(NASA) ELECTRICAL-MICRO PROCESSOR BLOCK DIAGRAM (W) MICROPROCESSOR BLOCK DIAGRAM MOD-0A 200 kW WTG
1016F17	1	CF759032	1	E	(NASA) ELECTRICAL-SUPERVISORY CONTROLLER INTERCONNECTION CENTRAL & REMOTE (W) SUPERVISORY CONTROLLER INTERCONNECT CENTRAL & REMOTES STATIONS & DETAIL "A" MOD-0A 200 kW WIND TURBINE GENERATOR
1016F18	2	CF759033	1	E	(NASA) ELECTRICAL-PITCH CONTROLLER SCHEMATIC (W) PITCH CONTROLLER SCHEMATIC MOD-0A 200 kW WIND TURBIN

* All Westinghouse Drawings are Revision -

TABLE 1 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR
CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV.	TITLE OF DRAWING
1016F19	2	CF759034	1	F	(NASA) ELECTRICAL-CONTROL PANEL LAYOUTS & RELAY PANEL CONNECTION DIGRAMS (W) CONTROL PANEL LAYOUTS & RELAY PANEL CONNECTION DIAGRAMS MOD-0A 200 kW WTG
1016F20	7	CF759035	1	C	(NASA) ELECTRICAL-480 V SWITCHGEAR ONE LINE DIAGRAM
		CF759036	1	E	(NASA) ELECTRICAL-480 V SWITCHGEAR-ELEMENTARY 3 LINE DIAGRAM
		CF759037	1	F	(NASA) ELECTRICAL-480 V SWITCHGEAR-UNIT NO. 1 CONNECTION DIA.
		CF759038	1	E	(NASA) ELECTRICAL-480 V SWITCHGEAR-UNIT NO. 2 CONNECTION DIA.
		CF759039	1	F	(NASA) ELECTRICAL-480 V SWITCHGEAR-UNIT NO. 3 CONNECTION DIA. (W) 480 V SWITCHGEAR WIRING DIAGRAM UNIT NOS. 1, 2 & 3 MOD-0A 200 kW WTG
1016F21	3	CF759040	1	D	(NASA) ELECTRICAL-CONNECTION DIAGRAM FOR TERMINAL BOXES 2B & 3B
		CF759041	1	E	(NASA) ELECTRICAL-CONNECTION DIAGRAM FOR TERMINAL BOXES 2A & 2B
		CF759042	1	D	(NASA) ELECTRICAL-CONNECTION DIAGRAM FOR TERMINAL BOXES NO. 4 (W) CONNECTION DIAGRAMS FOR TERMINAL BOXES, 2B, 3B, 2A, 3A & NO. 4 MOD-0A 200 kW WTG
1016F22	1	CF759043	1	F	(NASA) ELECTRICAL-ELECTRICAL CONNECTION DIAGRAM SAFETY SHUTDOWN PANEL (W) ELECTRICAL CONNECTION DIAGRAM SAFETY SHUTDOWN PANEL MOD-0A 200 kW WTG
1016F23	1	CF759044	1	E	(NASA) ELECTRICAL-YAW BRAKE ELEMENTARY & CONNECTION DIAGRAM (W) YAW BRAKE ELEMENTARY & CONNECTION DIAGRAM MOD-0A 200 kW WTG
1016F24	1	CF759045	1	C	(NASA) ELECTRICAL-MICRO PROCESSOR CIRCUIT CARD LOCATOR RACK A & RACK B (W) MICRO PROCESSOR CIRCUIT CARD LOCATION, RACK A & RACK B MOD-0A 200 kW WTG
1016F25	1	CF759047	1	D	(NASA) ELECTRICAL-YAW CONTROL PANEL LAYOUT (W) YAW CONTROL PANEL LAYOUT MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

Table 1 (Cont'd)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV.	TITLE OF DRAWING
1016F26	1	CF759048	1	D	(NASA) ELECTRICAL-CONTROL RACK ANALOG TERMINAL STRIP INTERCONNECTION (W) CONTROL RACK ANALOG TERMINAL STRIP INTERCONNECTION MOD-0A 200 kW WIND TURBINE GENERATOR
1016F27	1	CF759049	1	E	(NASA) ELECTRICAL-ELECTRICAL CONNECTION DIAGRAM AMPLIFIER PANEL (W) ELECTRICAL CONNECTION DIAGRAM AMPLIFIER PANEL MOD-0A kW WIND TURBINE GENERATOR
1016F28	4	CF760480	3	-	(NASA) ELECTRICAL-INTRUSION ALARM (W) INTRUSION ALARM SYSTEM ALARM SYSTEM & ELEC. ELEMENTARY CONNECTION DIAGRAM & INSTALLATION DETAIL MOD-0A 200 kW WTG
1016F30	1	CD760481	1	B	(NASA) ELECTRICAL-MICROPROCESSOR TIMER-CARD SCHEMATIC
		CD760482	1	-	(NASA) ELECTRICAL-MICROPROCESSOR RELAY-CARD SCHEMATIC (W) MICROPROCESSOR TIMER-CARD AND RELAY-CARD SCHEMATIC MOD-0A 200 kW WTG
1016F31	1	CF760494	1	B	(NASA) ELECTRICAL-ELAPSE TME PANEL (W) ELAPSE TIME PANEL MOD-0A 200 kW WIND TURBINE GENERATOR
1016F32	1	CF760495	1	C	(NASA) ELECTRICAL-RECLOSER & CIRCUIT BREAKER NO. 2 ELEMENTARY & WIRING DIAGRAMS (W) RECLOSER & CIRCUIT BREAKER NO. 2 ELEMENTARY & WIRING DIAGRAMS MOD-0A 200 kW WIND TURBINE GENERATOR
1016F33	1	CF760496	1	D	(NASA) ELECTRICAL-CLIMATRONICS & REFERENCE PANEL CONNECTION DIAGRAM (W) ELECTRICAL CONNECTION DIAGRAM CLIMATRONICS & REFERENCE PANEL MOD-0A 200 kW WIND TURBINE GENERATOR
1016F34	1	CF760497	1	B	(NASA) ELECTRICAL-PITCH CONTROLLER INTERNAL TERMINATIONS (W) PITCH CONTROLLER INTERNAL TERMINATIONS MOD-0A 200 kW WTG

*All Westinghouse Drawings are Revision -

Table I (Cont'd)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV.	TITLE OF DRAWING
1016F35	1	CF760546	1	-	(NASA) ELECTRICAL-SYNCHRO-D.C. CONVERTER-AEROVANE TRANSLATER SCHEMATIC (W) SYNCRO-D.C. CONVERTER AEROVANE TRANSLATOR SCHEMATIC MOD-0A 200 kW WIND TURBINE GENERATOR
1016F36	1	CF760552	1	-	(NASA) DAYTRONICS CONNECTION DIAGRAM-ELECTRICAL (W) DAYTRONICS CONNECTION DIAGRAM MOD-0A 200 kW WTG

*All Westinghouse Drawings are Revision -

TABLE 2
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CD758836	1	A	1015F02	1	(NASA) HUB FORGING (W) HUB PITCH FORGING MOD 0A-200 kW WIND TURBINE GENERATOR
CR758862	1	F	1015F01	11	(NASA) MOD-0A 200 kW WIND TURBINE GENERATOR ASSEMBLY (W) ASSEMBLY MOD-0A 200 kW WIND TURBINE GENERATOR
CR758863	1	G	1015F01	11	(NASA) MOD-0A 200 kW WIND TURBINE GENERATOR ASSEMBLY (W) ASSEMBLY MOD-0A 200 kW WIND TURBINE GENERATOR
CR758864	1	D	1015F03	4	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB (W) PITCH CONTROL HUB ASS'Y MOD-0A 200 kW WIND TURB. GEN.
CF758865	1	B	1015F04	1	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 1 (W) HUB PITCH DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR
CD75866	1	A	1015F05	1	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 2 (W) BLADE SPINDLE SLEEVE MOD-0A 200 kW WIND TURBINE GEN.
CD758867	1	D	1015F06	1	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 3 (W) BLADE SPINDLE HOUSING MOD-0A 200 kW WIND TURBINE GEN.
CD758868	1	C	1015F07	1	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 4 (W) DRIVE SHAFT BEARING RETAINER MOD-0A 200 kW WTG
CD758869	1	B	1015F08	1	(NASA) ASS'Y-GEAR TYPE PITCH CONTROL HUB-DETAILS 5 THRU 11 (W) HUB PITCH DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
CD758870	1	A	1015F09	1	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 12 (W) HUB PITCH DRIVE SHAFT MOD-0A 200 kW WIND TURBINE GEN.
CC758871	1	A	1015F68	1	(NASA) DETAILS (W) HUB PITCH DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR

*All Westinghouse Drawings are Revision - (i.e., Unrevised)

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

ASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CD758872	1	C	1015F10	1	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 15 (W) HUB PITCH BEVEL PINION GEAR MOD-0A 200 kW WTG
CD758873	1	C	1015F11	1	(NASA) ASSEMBLY-GEAR TYPE PITCH CONTROL HUB - DETAIL 16 (W) HUB PITCH BEVEL GEAR SECTOR MOD-0A 200 kW WTG.
CF758874	1	C	1015F12	1	(NASA) ASS'Y-GEAR TYPE PITCH CONTROL HUB-DETAILS 17 THRU 25 (W) HUB PITCH DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
CD758875	1	C	1015F03	4	(NASA) SUB-ASSEMBLY BEARING & GEAR ADJUSTMENT (W) PITCH CONTROL HUB ASS'Y MOD-0A 200 kW WIND TURB. GEN.
CR758877	1	E	1015F14	6	(NASA) BEDPLATE (W) BEDPLATE MOD-0A 200 kW WIND TURBINE GENERATOR
CR758878	1	D	1C15F15	3	(NASA) FWD CENTER SHROUD (W) FORWARD CENTER SHROUD MOD-0A 200 kW WIND TURBINE GEN.
CR758879	1	E	1015F16	4	(NASA) REAR CENTER SHROUD (W) REAR CENTER SHROUD MOD-0A 200 kW WIND TURB. GENERATOR
CF758880	1	A	1015F17	1	(NASA) NOSE CONE (W) NOSE CONE MOD-0A 200 kW WIND TURBINE GENERATOR
CF758881	1	C	1015F18	1	(NASA) PROP CONE (W) PROP CONE (SPINNER) MOD-0A 200 kW WIND TURBINE GEN.
CD758882	1	B	1015F19	1	(NASA) PROP HUB & CONE COVER PLATE (W) BLADE OPENING COVERS MOD-0A 200 kW WIND TURBINE GEN.
CD758883	1	-	1015F20	1	(NASA) CONE SUPPORT DETAILS (W) CONE SUPPORT DETAILS MOD-0A 200 kW WIND TURBINE GEN.
CD758884	1	A	1015F21	1	(NASA) FRONT HUB SUPPORT (W) MOUNTING PANEL-PROP CONE MOD-0A 200 kW WIND TURB. GEN.

* All Westinghouse Drawings are Revision -

Sheet 2

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

ASA LEWIS WING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CD758885	1	-	1015F22	1	(NASA) REAR HUB SUPPORT (W) SUPPORT-PROP CONE MOD-0A 200 kW WIND TURBINE GENERATOR
CF758886	1	C	1015F23	2	(NASA) WALKWAYS (W) WALKWAYS MOD-0A 200 kW WIND TURBINE GENERATOR
CF758887	1	A	1015F24	1	(NASA) ADJ. GENERATOR BOTTOM PLATE (W) BOTTOM PLATE-GENERATOR ADJUSTMENT MOD-0A 200 kW WTG
CF758888	1	A	1015F25	1	(NASA) ADJ. GEN. TOP & LOCK BAR (W) GENERATOR ADJUSTMENT DETAILS
CF758889	1	C	1015F26	1	(NASA) DETAILS (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
CF758890	1	C	1015F27	1	(NASA) MAIN DRIVE SHAFT (W) MAIN DRIVE SHAFT MOD-0A 200 kW WIND TURBINE GENERATOR
CD758892	1	-	1015F28	1	(NASA) BRAKE SUPPORT (W) BRAKE SUPPORT MOD-0A 200 kW WIND TURBINE GENERATOR.
CD758895	1	-	1015F29	1	(NASA) PULLEY DRIVE SHAFT (W) PULLEY DRIVE SHAFT MOD-0A 200 kW WIND TURB. GENERATOR
CR758896	1	E	1015F30	2	(NASA) MAIN YAW BRG SUPPORT (W) MAIN YAW BRG SUPPORT MOD-0A 200 kW WIND TURBINE GEN.
CF758897	1	A	1015F31	1	(NASA) YAW DRIVE BRG HOUSING (W) YAW DRIVE BRG HOUSING MOD-0A 200 kW WIND TURBINE GEN.
CF758898	1	-	1015F32	1	(NASA) YAW DRIVE SHAFT (W) YAW DRIVE SHAFT MOD-0A 200 kW WIND TURBINE GENERATOR
CF758899	1	-	1015F33	1	(NASA) YAW BRG RETAINER & SEAL (W) YAW-BRG RETAINERS MOD-0 200 kW WIND TURBINE GENERATOR
CD758900	1	A	1015F34	1	(NASA) INTER. YAW DRIVE SHAFT (W) INTERMEDIATE YAW DRIVE SHAFT MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR
CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

SA LEWIS ING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CD758901	1	B	1015F35	1	(NASA) YAW DRIVE MOUNTING (W) YAW DRIVE MOUNTING PLATE MOD-0A 200 kW WIND TUR. GEN.
CD758902	1	C	1015F36	1	(NASA) SHEAR KEY & THRUST BUTTON (W) SHEAR KEY & THRUST BUTTON MOD-0A 200 kW WIND TUR. GEN.
CC758903	1	B	1015F37	1	(NASA) MAIN SLIP RING SUPPORT HORIZ. (W) MAIN SLIP RING SUPPORT (HORIZ.) MOD-0A 200 kW WTG
CF758904	1	C	1015F38	2	(NASA) BREAK PRESS. SYST. (W) PIPING SCHEMATIC & PANEL LAYOUT BRAKE CHAMBER & & PRESSURIZING SYSTEM MOD-0A 200 kW WIND TURBINE GEN.
CC758905	1	-	1015F39	1	(NASA) LIFTING BOOM (W) LIFTING BOOM, U-BOLT & WIND SPEED & DIRECTIONAL MOUNT. BRACKET MOD-0A 200 kW WIND TURBINE GENERATOR
CD758906	1	-	1015F40	1	(NASA) HYD PACK SUPPORT BED (W) HYDRAULIC PACKAGE SUPPORT BED MOD-0A 200 kW WTG
CC758907	1	-	1015F39	1	(NASA) "U" BOLT - BOTTLE HOLD DOWN (W) LIFTING BOOM, U-BOLT & WIND SPEED & DIRECTIONAL MOUNT. BRACKET MOD-0A 200 kW WIND TURBINE GENERATOR
CD758908	1	A	1015F42	1	(NASA) HYD PACK FAN SHROUD (W) HYDRAULIC PACKAGE FAN SHROUD MOD-0A 200 kW WTG
CD758909	1	B	1015F41	1	(NASA) LIFTING BEAM & SLING ASSEMBLY (W) LIFTING BEAM & SLING ASSEMBLY MOD-0A 200 kW WTG
CF758910	1	B	1015F44	1	(NASA) DETAILS (W) HIGH SPEED BRADE DETAILS MOD-0A 200 kW WIND TURB. GEN.

* All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

SA LEWIS ING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF758912	1	A	1015F45	1	(NASA) ROTARY COUPLING SUPPORT (W) DEUBLIN CPLG SUPPORT BRACKET MOD-0A 200kW WTG
CD758913	1	B	1015F46	1	(NASA LADDER (W) LADDER WELDED ASSEMBLY MOD-0A 200 kW WTG
CD758914	1	-	1015F47	1	(NASA) REAR PROP CONE SUPPORTS (W) REAR PROP CONE SUPPORT MOD-0A 200 kW WTG
CD758915	1	A	1015F48	1	(NASA) HYD SUPPLY CLAMP & SUPPORTS (W) HYDRAULIC SUPPLY CLAMP & SUPPORT MOD-0A 200 kW WTG
CD758916	1	C	1015F49	1	(NASA) CO AXIAL FLOW LINE ASSEMBLY (W) CO AXIAL FLOW LINE - ASSEMBLY & DETAIL MOD-0A 200 kW WTG
CD758919	1	A	1015F50	1	(NASA) SPINNER RAIN GUARD (W) SPINNER RAIN GUARD MOD-0A 200 kW WTG
CF758920	1	A	1015F51	1	(NASA) SLIP RING ANTI-ROTATION & BRKT. (W) SLIP RING ANTI-ROTATION SUPPORT & BRT. MOD-0A 200 kW WTG
CF758921	1	A	1015F52	3	(NASA) HYDRAULIC PUMP PACKAGE ASSEMBLY (W) HYDRAULIC PUMP PACKAGE ASSY MOD-0A 200 kW WTG
CF758922	1	A	1015F52	3	(NASA) HYDRAULIC PUMP PACKAGE ASSEMBLY (W) HYDRAULIC PUMP PACKAGE ASSY MOD-0A 200 kW WTG
CF758923	1	-	1015F52	3	(NASA) HYDRAULIC PUMPO PACKAGE ASSEMBLY (W) HYDRAULIC PUMP PACKAGE ASSY MOD-0A 200 kW WTG
CF758924	1	-	1015F53	2	(NASA) DETAILS (W) HYDRAULIC PUMP PACKAGED ASSY MOD-0A 200 kW WTG

*All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF WESTINGHOUSE DRAWINGS TO NASA LEWIS RESEARCH CENTER DRAWINGS

ASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF758925	1	-	1015F54	1	(NASA) DETAILS (W) HYDRAULIC PUMP DETAILS MOD-0A 200 kW WIND TURB. GEN.
CR758926	1	B	1015F55	4	(NASA) ACTUATOR ASSEMBLY (W) ACTUATOR ASSEMBLY MOD-0A 200 kW WIND TURB. GEN.
CF758927	1	A	1015F56	1	(NASA) DETAILS (W) ACTUATOR ASSY DETAILS MOD-0A 200 kW WIND TURB. GEN.
CF758928	1	A	1015F57	1	(NASA) DETAILS (W) ACTUATOR ASSY DETAILS MOD-0A 200 kW WIND TURB. GEN.
CF758929	1	B	1015F58	1	(NASA) HYDRAULIC SCHEMATIC DIAGRAM (W) CONTROL SCHEMATIC DIAGRAM MOD-0A 200 kW WTG
CF758929	7	-	1015F58	1	(NASA) OPERATIONAL REQUIREMENTS & PARTS LIST (W) CONTROL SCHEMATIC DIAGRAM MOD-0A 200 kW WTG
CF758930	1	B	1015F59	1	(NASA) INTERFACE-METAL BLADE TO PITCH CONTROL HUB (W) INTERFACE-BLADE TO HUB MOD-0A 200 kW WIND TURBINE GEN.
CC758931	1	A	1015F39	1	(NASA) WWD SPEED MOUNTING BRK'D (W) LIFTING BOOM, U-BOLT & WIND SPEED & DIRECTIONAL MOUNT-BRACKET MOD-0A 200 kW WIND TURBINE GENERATOR
CD758932	1	A	1015F61	1	(NASA) UPPER BRAKE SUPPORT (W) UPPER BRAKE SUPPORT MOD 0A-200 KW WIND TURBINE GEN.
CD758933	1	-	1015F62	1	(NASA) TURNTABLE BEARING & GEAR ASSY. (W) TURNTABLE BRG. & GEAR ASSY MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)
LIST OF DRAWINGS FOR THE MOD-OA 200 kW WIND TURBINE GENERATOR
CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

SA LEWIS ING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CD758934	1	C	1015F63	1	(NASA) LIFTING BEAM (W) LIFTING BEAM DETAILS MOD-OA 200 kW WIND TURBINE GEN.
CF758936	1	A	1015F64	1	(NASA) EXTERIOR FINISH - FIBERGLASS HOUSING (W) EXTERIOR FINISH-FIBERGLAS HOUSING MOD-OA 200 kW WTG
CC758937	1	B	1015F65	1	(NASA) TRANSFORMER BRACKETS (W) TRANSFORMER ANTI-ROTATION BRACKET & BUTTRES RING RETAINER DETAILS MOD-OA 200 kW WIND TURBINE GENERATOR
CD758938	1	-	1015F66	1	(NASA) OUTPUT SHAFT CONFIGURATION FOR DOUBLE REDUCTION WORM GEAR UNIT (W) DOUBLE REDUCTION WORM GEAR UNIT YAW DRIVE MOD-OA 200 kW WIND TURBINE GENERATOR
CF758939	1	A	1015F67	1	(NASA) TOWER SLIP RING ANTI-ROTATION ASSEMBLY (W) TOWER SLIP RING ANTI-ROTATION ASSY MOD-OA 200 kW WTG
CC758945	1	A	1015F68	1	(NASA) BUTTRES RING (W) DETAIL MOD-OA 200 kW WIND TURBINE GENERATOR
CF758946	1	B	1015F69	1	(NASA) MOD OA WIND TURBINE GENERATOR SITE PLAN & GENERAL ASSY (W) SITE PLAN & GENERAL ASSY MOD-OA 200 kW WIND TURBINE GEN.
CF758948	1	B	1015F70	4	(NASA) STRUCTURAL-TOWER ELEVATION & DETAILS (W) TOWER ELEVATIONS, PLAN & DETAILS MOD-OA 200 kW WTG
CF758949	1	A	1015F90	4	(NASA) STRUCTURAL-TOWER PLANS & DETAILS (W) TOWER ELEVATIONS, PLAN & DETAILS MOD-OA 200 kW WTG

*All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-OA 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

ASA LEWIS WING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF758950	1	A	1015F70	4	(NASA) STRUCTURAL-TOWER DETAILS (W) TOWER ELEVATIONS, PLAN & DETAILS MOD-OA 200 kW WTG
CF758952	1	-	1015F71	2	(NASA) STRUCTURAL-ASSEMBLY STAND PLAN & DETAILS (W) ASSY STAND PLAN & DETAILS MOD-OA 200 kW WIND TURB. GEN.
CD758957	1	B	1015F72	1	(NASA) SPEED INCREASER-DIMENSIONAL REQUIREMENTS (W) SPECIAL SPEED INCREASER MOD-OA 200 kW WIND TURBINE GEN.
CF758968	1	C	1016F01	4	(NASA) ELECTRICAL-INSTRUMENTATION SENSOR WIRING LIST (W) INSTRUMENTATION SENSOR WIRING LIST MOD-OA 200 kW WTG
CF758969	1	E	1016F01	4	(NASA) ELECTRICAL-INSTRUMENTATION SENSOR WIRING LIST (W) INSTRUMENTATION SENSOR WIRING LIST MOD-OA 200 kW WTG
CF758970	1	C	1016F01	4	(NASA) ELECTRICAL-INSTRUMENTATION SENSOR WIRING LIST (W) INSTRUMENTATION SENSOR WIRING LIST MOD-OA 200 kW WTG
CF758971	1	E	1016F02	1	(NASA) ELECTRICAL-POWER ONE LINE CONNECTION DIAGRAM & SCHEDULE OF DWG. (W) POWER ONE LINE CONNECTION DIAGRAM SCHEDULE OF DWG'S MOD-OA 200 kW WIND TURBINE GENERATOR
CC758972	1	A	1015F73	1	(NASA) GEAR BOX SLIP RING ASSEMBLY (W) GEAR BOX SLIP RING ASSY-ELECTRICAL MOD-OA 200 kW WTG
CF758973	1	A	1015F74 1015F79	1	(NASA) TOWER SLIP RING ASSY-ELECTRICAL (W) TOWER SLIP RING ASSY (ELEC) MOD-OA 200 kW WTG

*All Westinghouse Drawings are Revision 1-

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS WING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF758974	1	B	1015F75 1015F79	1	(NASA) TOWER SLIP RING ASSY-ELECTRICAL (W) TOWER SLIP RING ASSY MOD-0A 200 kW WIND TURBINE GEN.
CR758975	1	A	1015F43	3	(NASA) SENSOR LOCATION (PLAN VIEW) (W) SENSOR LOCATION & CONDUIT ROUTING MOD-0A 200 kW WTG
CR758976	1	C	1015F43	3	(NASA) SENSOR LOCATION (ELEVATION VIEW) (W) ELECTRICAL SENSOR LOCATIONS MOD-0A 200 kW WTG
CF758977	1	C	1016F03	1	(NASA) ELECTRICAL-AUXILIARY ELECTRONIC PACKAGE CONNECTION & INTERCONNECTION DIAGRAM (W) AUXILIARY ELECTRONIC PACKAGE CONNECTION & INTERCONNECTION DIAGRAM MOD-0A 200 kW WIND TURBINE
CF758978	1	D	1016F04	2	(NASA) ELECTRICAL-SENSOR IDENTIFICATION LIST (CLAYTON) (W) SENSOR IDENTIFICATION LIST MOD-0A 200 kW WTG
CF758979	1	F	1016F05	1	(NASA) ELECTRICAL-CABLE INTERCONNECTION (W) ELECTRICAL-CABLE INTERCONNECTION MOD-0A 200 kW WTG
CF758980	1	-	1016F06	1	(NASA) ELECTRICAL-INSTRUMENTATION INTERCONNECTION DIAGRAM PHASE I TEST (W) INSTRUMENTATION INTERCONNECTION DIAGRAM LERC-ERB CW 22 PHASE I TEST MOD-0A 200 kW WIND TURBINE
CF758981	1	B	1015F76	2	(NASA) ELECTRICAL-EQUIPMENT LAYOUT, LIGHTING, GROUNDING & DETA (W) ELECTRICAL-EQUIPMENT LAYOUT, LIGHTING, GROUNDING DETAILS MOD-0A 200 kW WTG
CF758982	1	B	1015F77	2	(NASA) ELECTRICAL-POWER CONTROL & INSTRUMENTATION TERMINAL BOXES & DETALS (W) ELECTRICAL-POWER CONTROL & INSTRUMENTATION TERMINAL BOXES MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-OA 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

ASA LEWIS WING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF758983	1	C	1016F07	1	(NASA) ELECTRICAL-GEAR BOX SLIP RING CONNECTION DIAGRAM (W) GEAR BOX SLIP RING CONNECTION DIAGRAM MOD-OA 200 kW WTG
CF758984	1	G	1016F08	1	(NASA) ELECTRICAL-TOWER SLIP RING CONNECTION DIAGRAM (W) TOWER SLIP RING CONNECTION DIAGRAM MOD-OA 200 kW WTG
CF758985	1	A	1016F09	1	(NASA) ELECTRICAL-STATIC SHAFT TEST INTERCONNECTION DIAGRAM PHASE I TEST (W) STATIC SHAFT TEST INTERCONNECTION DIAGRAM LERC-ERB CW 22 PHASE I TEST MOD-OA 200 kW WIND TURBINE GENERATOR
CD758999	1	-	1015F78	1	(NASA) INTERMEDIATE SHAFT (W) HIGH SPEED SHAFT ASSEMBLY MOD-OA 200 kW WIND TURB. GEN.
CC759000	1	A	1015F93	1	(NASA) FLUID COUPLER ADAPTER (W) DETAILS MOD-OA 200 kW WIND TURBINE GENERATOR
CF759019	1	G	1015F80	3	(NASA) HYDRAULIC SCHEMATIC YAW BRAKE (W) YAW BRAKE HYDAULIC SYSTEM PANEL & SCHEMATIC MOD-OA 200 kW WIND TURBINER GENERATOR
CC759020	1	-	1015F81	1	(NASA) SPACERS YAW COUPLINGS (W) DETAILS MOD-OA 200 kW WIND TURBINE GENERATOR
CF759021	1	-	1015F82	1	(NASA) PULLY BEARING SUPPORT (W) PULLEY BEARING SUPPORT MOD-OA 200 kW WIND TURB. GEN.
CD759023	1	A	1015F83	1	(NASA) DETAILS FOR HYDRAULIC ACTUATOR (W) DETAILS FOR HYDRAULIC ACTUATOR MOD-OA 200 kW WTG
CF759024	1	A	1015F84	1	(NASA) DETAILS FOR PUMP PACKAGE (W) PUMP PACKAGE DETAILS MOD-OA 200 kW WIND TURBINE GEN.

* All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

ASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF759025	1	C	1016F10	1	(NASA) ELECTRICAL-TOWER SENSOR LOCATION PLAN, DETAILS, PIN LAYOUT & ELECTRICAL CONNECTION DIAGRAM (W) TOWER SENSOR LOCATION PLAN DETAILS, PIN LAYOUT & ELECTRICAL CONNECTION DIAG. MOD-0A 200 kW WTG
CF759026	1	E	1016F11	2	(NASA) ELECTRICAL SAFETY SHUTDOWN-ELEMENTARY DIAGRAM (W) ELECTRICAL SAFETY SHUTDOWN-ELEMENTARY DIAGRAM MOD-0A 200 kW WIND TURBINE GENERATOR
CF759027	1	F	1016F12	2	(NASA) ELECTRICAL-CONTROL ELEMENTARY DIAGRAM (W) CONTROL ELEMENTARY DIAGRAM MOD-0A 200 kW WTG
CF759028	1	D	1016F13	1	(NASA) ELECTRICAL-YAW CONTROLLER CONNECTION DIAGRAM (W) YAW CONTROLLER CONNECTION DIAGRAM MOD-0A 200 kW WTG
CF759029	1	A	1016F14	1	(NASA) ELECTRICAL-MICROPROCESSOR FLOW DIAGRAM (W) MICROPROCESSOR FLOW DIAGRAM MOD-0A 200 kW WTG
CF759030	1	C	1016F15	1	(NASA) ELECTRICAL-CONNECTION DIAGRAM FOR PITCH CONTROLLER (W) ELECTRICAL CONNECTION DIAGRAM PITCH CONTROLLER MOD-0A 200 kW WIND TURBINE GENERATOR
CF759031	1	E	1016F16	1	(NASA) ELECTRICAL-MICROPROCESSOR BLOCK DIAGRAM (W) MICROPROCESSOR BLOCK DIAGRAM MOD-0A 200 kW WTG
CF759032	1	E	1016F17	1	(NASA) ELECTRICAL-SUPERVISORY CONTROLLER INTERCONNECTION CENTRAL & REMOTE (W) SUPERVISORY CONTROLLER INTERCONNECT CENTRAL & REMOTES STATIONS & DETAIL "A" MOD-0A 200 kW WIND TURBINE GENERATOR
CF759033	1	E	1016F18	2	(NASA) ELECTRICAL-PITCH CONTROLLER SCHEMATIC (W) PITCH CONTROLLER SCHEMATIC MOD-0A 200 kW WTG

* All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF759034	1	F	1016F19	2	(NASA) ELECTRICAL-CONTROL PANEL LAYOUTS & RELAY PANEL CONNECTION DIAGRAMS (W) CONTROL PANEL LAYOUTS & RELAY PANEL CONNECTION DIAGRAMS MOD-0A 200 kW WIND TURBINE GENERATOR
CF759035	1	C	1016F20	7	(NASA) ELECTRICAL-480 V SWITCHGEAR ONE LINE DIAGRAM (W) 480 V SWITCHGEAR WIRING DIAGRAM UNIT NOS. 1, 2 & 3 MOD-0A 200 kW WIND TURBINE GENERATOR
CF759036	1	E	1016F20	7	(W) 480 V SWITCHGEAR WIRING DIAGRAM UNIT NOS. 1, 2 & 3 MOD-0A 200 kW WIND TURBINE GENERATOR
CF759037	1	F	1016F20	7	(W) 480 V SWITCHGEAR WIRING DIAGRAM UNIT NOS. 1, 2, & 3 MOD-0A 200 kW WIND TURBINE GENERATOR
CF759038	1	E	1016F20	7	(W) 480 V SWITCHGEAR WIRING DIAGRAM UNIT NOS. 1, 2, & 3 MOD-0A 200 kW WIND TURBINE GENERATOR

*All Westinghouse Drawings are Revision -

TABLE 2 (Cont'd.)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS DWING NUMBER	NUMBER OF SHTS.	* REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF759039	1	F	1016F20	7	(W) 480 V SWITCHGEAR WIRING DIAGRAM UNIT NOS. 1, 2, & 3 MOD-0A 200 kW WIND TURBINE GENERATOR
CF759040	1	D	1016F21	3	(NASA) ELECTRICAL-CONNECTION DGM.FOR TERMINAL BOXES 2B & 3B (W) CONNECTION DIAGRAMS FOR TERMINAL BOXES, 2B, 3B, 2A, 3A & NO. 4 MOD-0A 200 kW WIND TURBINE GENERATOR
CF759041	1	E	1016F21	3	(NASA) ELECTRICAL-CONNECTION DGM.FOR TERMINAL BOXES 2A & 2B (W) CONNECTION DIAGRAMS FOR TERMINAL BOXES, 2B, 3B, 2A, 3A & NO. 4 MOD-0A 200 kW WIND TURBINE GENERATOR
CF759042	1	D	1016F21	3	(NASA) ELECTRICAL-CONNECTION DIAGRAM FOR TERMINAL BOXES NO. 4 (W) CONNECTION DIAGRAMS FOR TERMINAL BOXES, 2B, 3B, 2A, 3A & NO. 4 MOD-0A 200 kW WIND TURBINE GENERATOR
CF759043	1	F	1016F22	1	(NASA) ELECTRICAL-ELECTRICAL CONNECTION DIAGRAM SAFETY SHUTDOWN PANEL (W) ELECTRICAL CONNECTION DIAGRAM SAFETY SHUTDOWN PANEL MOD-0A 200 kW WIND TURBINE GENERATOR
CF759044	1	E	1016F23	1	(NASA) ELECTRICAL-YAW BRAKE ELEMENTARY & CONNECTION DIAGRAM (W) YAW BRAKE ELEMENTARY & CONNECTION DGM. MOD-0A 200 kW WTG
CF759045	1	C	1016F24	1	(NASA) ELECTRICAL-MICROPROCESSOR CIRCUIT CARD LOCATOR RACK A & RACK B (W) MICROPROCESSOR CIRCUIT CARD LOCATION, RACK A & RACK B MOD-0A 200 kW WIND TURBINE GENEPATOR

*All Westinghouse Drawings are Revision -

Table 2 (Cont'd)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF759047	1	D	1016F25	1	(NASA) ELECTRICAL-YAW CONTROL PANEL LAYOUT (W) YAW CONTROL PANEL LAYOUT MOD-0A 200 kW WTG
CF759048	1	D	1016F26	1	(NASA) ELECTRICAL-CONTROL RACK ANALOG TERMINAL STRIP INTERCONNECTION (W) CONTROL RACK ANALOG TERMINAL STRIP INTERCONNECTION MOD-0A 200 kW WIND TURBINE GENERATOR
CF759049	1	E	1016F27	1	(NASA) ELECTRICAL-ELECTRICAL CONNECTION DIAGRAM AMPLIFIER PANEL (W) ELECTRICAL CONNECTION DIAGRAM AMPLIFIER PANEL MOD-0A 200 kW WIND TURBINE GENERATOR
CF760271	1	A	1015F85	2	(NASA) STRUCTURAL-ASSY STAND PLAN & DETAILS (W) ASSY STAND PLAN & DETAILS MOD-0A 200 kW WIND TURB. GEN.
CF760300	1	-	1015F86	2	(NASA) STRUCTURAL-TOWER & ASSY STAND-FOUNDATIONS & DETAILS-CLAYTON N.M. (W) TOWER & ASSY STAND FOUNDATION & DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
CC760476	1	-	1015F87	1	(NASA) GREASE & PRESSURE FITTINGS (W) GREASE & PRESSURE FITTINGS MOD-0A 200 kW WTG
CD760477	1	-	1015F88	1	(NASA) HUB COUNTER WEIGHTS (W) HUB COUNTER WEIGHTS MOD-0A 200 kW WIND TURBINE GEN.
CF760478	1	-	1015F89	1	(NASA) DETAILS (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
CF760480	3	-	1016F28	4	(NASA) ELECTRICAL-INTRUSION ALARM (W) INTRUSION ALARM SYSTEM ALARM SYSTEM & ELEC. ELEMENTARY CONNECTION DIAGRAM & INSTALLATION DETAIL MOD-0A 200 kW WTG
CD760481	1	B	1016F30	1	(NASA) ELECTRICAL-MICROPROCESSOR TIMER-CARD SCHEMATIC (W) MICROPROCESSOR TIMER CARD-SCHEMATIC MOD-0A 200 kW WTG

*All Westinghouse Drawings are Revision -

Table 2 (Cont'd)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CD760482	1	B	1016F30	1	(NASA) ELECTRICAL-MICROPROCESSOR RELAY-CARD SCHEMATIC (W) MICROPROCESSOR RELAY CARD SCHEMATIC MOD-0A 200 kW WTG
CF760484	1	A	1015F90	1	(NASA) HYDRAULIC SYSTEM PANEL YAW BRAKE (W) HYDRAULICS COMPONENTS MTG PANEL MOD-0A 200 kW WTG
CF760484	1	A	1015F91	1	(NASA) HYDRAULIC SYSTEM PANEL YAW BRAKE (W) HYDRAULIC SYSTEM PANEL YAW BRAKE-STRUCTURAL SUPPORT MOD-0A 200 kW WIND TURBINE GENERATOR
CF760485	1	A	1015F80	3	(NASA) HYDRAULIC SYSTEM PANEL YAW BRAKE (W) YAW BRAKE HYDRAULIC SYSTEM PANEL & SCHEMATIC MOD-0A 200 kW WIND TURBINE GENERATOR
CD760486	1	A	1015F92	1	(NASA) AIR BOTTLE GAGE BRACKET (W) AIR BOTTLE GAGE BRACKET DETAILS MOD-0A 200 kW WTG
CC760487	1	A	1015F93	1	(NASA) GEAR ALT. LOW SPEED SHAFT (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
CC760488	1	A	1015F94	1	(NASA) DUBLIN MOUNT (W) DUBLIN MOUNT & SLIP RING DUST COVER MOD-0A 200 kW WTG
CB760490	1	A	1015F65	1	(NASA) BUTTRES RING RETAINER (W) TRANSFORMER ANTI-ROTATION BRACKET & BUTTRES RING RETAINER DETAILS MOD-0A 200 kW WTG
CF760491	1	-	1015F96	1	(NASA) YAW BRAKE ASSEMBLY (W) YAW BRAKE ASSY MOD-0A 200 kW WIND TURBINE GENERATOR
CD760492	1	-	1015F97	1	(NASA) YAW BRAKE DETAILS (W) YAW BRAKE DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR
CD760493	1	-	1015F98	1	(NASA) YAW BRAKE DETAILS (W) YAW BRAKE DETAIL MOD-0A 200 kW WIND TURBINE GENERATOR

*All Westinghouse Drawings are Revision -

Table 2 (Cont'd)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CF760494	1	B	1016F31	1	(NASA) ELECTRICAL-ELAPSE TME PANEL (W) ELAPSE TIME PANEL MOD-0A 200 kW WIND TURBINE GENERATOR
CF760495	1	C	1016F32	1	(NASA) ELECTRICAL-RECLOSER & CIRCUIT BREAKER NO. 2 ELEMENTARY & WIRING DIAGRAMS (W) RECLOSER & CIRCUIT BREAKER NO. 2 ELEMENTARY & WIRING DIAGRAMS MOD-0A 200 kW WIND TURBINE GENERATOR
CF760496	1	D	1016F33	1	(NASA) ELECTRICAL-CLIMATRONICS & REFERENCE PANEL CONNECTION DIAGRAM (W) ELECTRICAL CONNECTION DIAGRAM CLIMATRONICS & REFERENCE PANEL MOD-0A 200 kW WIND TURBINE GENERATOR
CF760497	1	B	1016F34	1	(NASA) ELECTRICAL-PITCH CONTROLLER INTERNAL TERMINATIONS (W) PITCH CONTROLLER INTERNAL TERMINATIONS MOD-0A 200 WTG
CC760500	1	-	1015F94	1	(NASA) SLIP RING COVER (W) DUBLIN MOUNT & SLIP RING DUST COVER MOD-0A 200 kW WTG
CC760504	1	B	1015F81	1	(NASA) HUB SEAL HOLDER (W) DETAILS MOD-0A 200 kW WIND TURBINE GENERATOR
CF760506	1	-	1015F95	2	(NASA) ELECTRICAL-LOW SPEED SHAFT STRAIN GAGE LOCATION CONNECTION DIAGRAM & INSTALLATION (W) ELECTRICAL-LOW SPEED SHAFT STRAIN GAGE LOCATION MOD-0A 200 kW WIND TURBINE GENERATOR
CC760512	1	-	1015F99	1	(NASA) FIXTURE FOR SEAL INSTALLATION (W) FIXTURES FOR SEAL INSTALLATION MOD-0A 200 kW WTG

All Westinghouse Drawings are Revision -

Table 2 (Cont'd)

LIST OF DRAWINGS FOR THE MOD-0A 200 kW WIND TURBINE GENERATOR

CORRELATION OF NASA LEWIS RESEARCH CENTER DRAWINGS TO WESTINGHOUSE DRAWINGS

NASA LEWIS DRAWING NUMBER	NUMBER OF SHTS.	*REV	WESTINGHOUSE DRAWING NUMBER	NUMBER OF SHTS.	TITLE OF DRAWING
CD760513	1	-	1015F99	1	(NASA) SEAL INSTALLATION INSTRUCTIONS (W) FIXTURES FOR SEAL INSTALLATION MOD-0A 200 kW WTG
CF760520	1	-	1015F95	2	(NASA) ELECTRICAL-LOW SPEED SHAFT STRAIN GAGE LOCATION (W) ELECTRICAL-LOW SPEED SHAFT STRAIN GAGE LOCATION MOD-0A 200 kW WIND TURBINE GENERATOR
CF760546	1	-	1016F35	1	(NASA) ELECTRICAL-SYNCHRO-D.C. CONVERTER-AEROVANE TRANSLATER SCHEMATIC (W) SYNCRO-D.C. CONVERTER AEROVANE TRANSLATOR SCHEMATIC MOD-0A 200 kW WIND TURBINE GENERATOR
CF760552	1	-	1016F36	1	(NASA) DAYTRONICS CONNECTION DIAGRAM-ELECTRICAL (W) DAYTRONICS CONNECTION DIAGRAM MOD-0A 200 kW WTG

*All Westinghouse Drawings are Revision -

Sheet 17

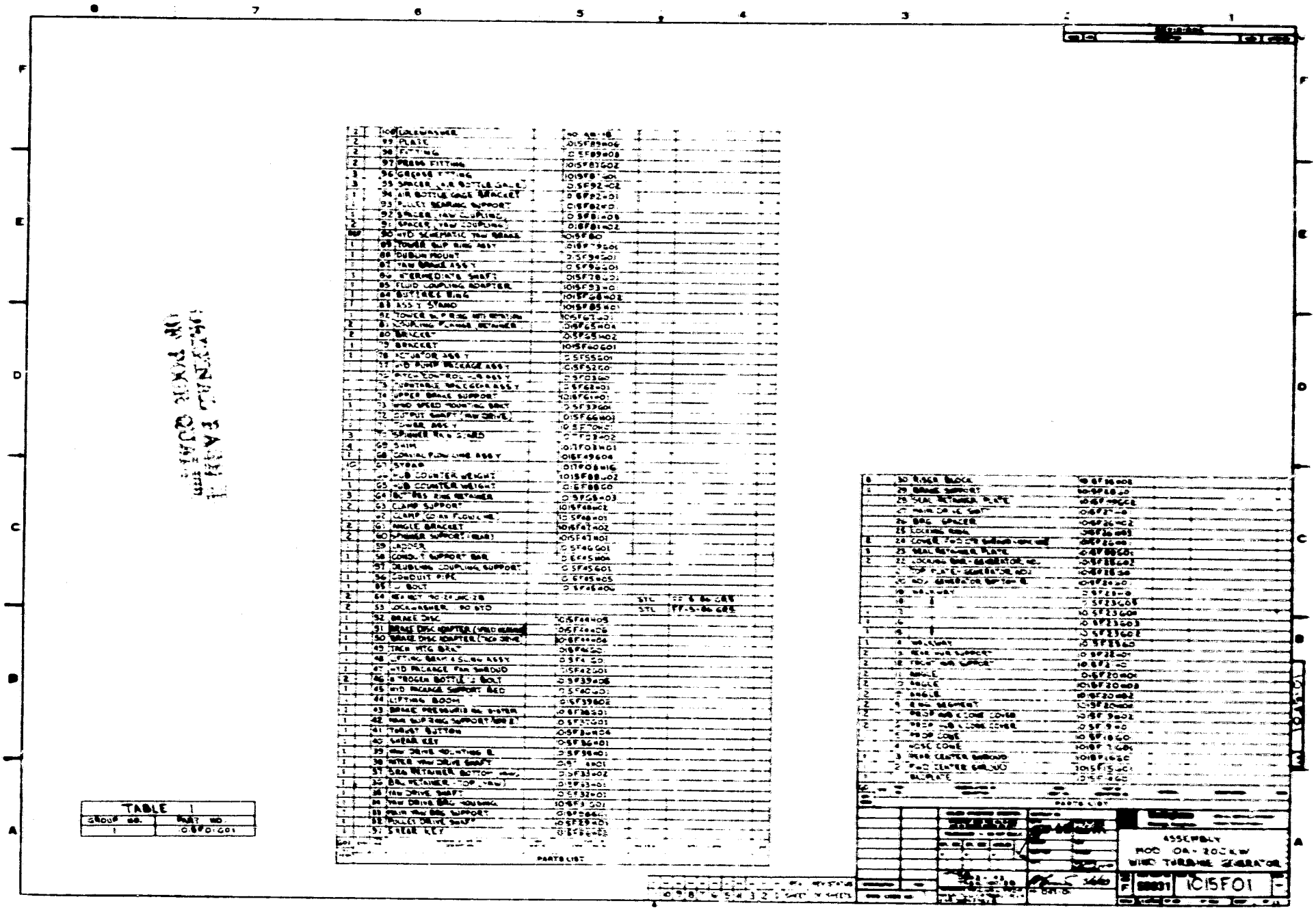


TABLE 1	
GROUP NO.	PART NO.
1	015F01G01

ITEM	QTY	DESCRIPTION	PART NO.
1	2	[illegible]	[illegible]
2	2	99 PLATE	015F89H06
3	2	98 FITTING	015F89H08
4	2	97 PRESS FITTING	015F81G02
5	3	96 GREASE FITTING	015F8[illegible]
6	3	95 SPACER (AIR BOTTLE GAGE)	015F92H02
7	1	94 AIR BOTTLE GAGE BRACKET	015F92H01
8	1	93 PILLOW BEARING SUPPORT	015F82H01
9	1	92 SPACER (YAW COUPLING)	015F81H03
10	2	91 SPACER (YAW COUPLING)	015F81H02
REF		90 HYD SCHEMATIC (YAW BRAKE)	015F80
11	1	89 TORQUE ARM ASSY	015F79G01
12	1	88 DUBLIN MOUNT	015F94G01
13	1	87 YAW BRAKE ASSY	015F96G01
14	1	86 INTERMEDIATE SHAFT	015F78H03
15	1	85 FLUID COUPLING ADAPTER	015F93H01
16	1	84 BUTTRESS NUT	015F96H02
17	1	83 ASSY STAND	015F85H01
18	1	82 TOWER & PARK BRAKE ASSY	015F67H01
19	2	81 BEARING FLANGE RETAINER	015F65H04
20	2	80 BRACKET	015F95H02
21	1	79 BRACKET	015F40G01
22	1	78 ACTUATOR ASSY	015F55G01
23	1	77 HYD PUMP MOUNTING ASSY	015F52G01
24	1	76 PITCH CONTROL HUB ASSY	015F03H01
25	1	75 PORTABLE WELDING ASSY	015F68H01
26	1	74 UPPER BRAKE SUPPORT	015F61H01
27	1	73 WIND SPEED INDICATOR ASSY	015F33G01
28	1	72 OUTPUT SHAFT (YAW DRIVE)	015F66H01
29	1	[illegible] ASSY	015F70H01
30	3	70 SPINNER BASE ASSY	015F03H02
31	4	69 SHIM	015F03H03
32	1	68 CONICAL FLOW LINE ASSY	015F49G04
33	10	67 STRAP	015F03H04
34	1	66 HUB COUNTER WEIGHT	015F88H02
35	1	65 HUB COUNTER WEIGHT	015F88G01
36	3	64 BEARING RING RETAINER	015F68-03
37	2	63 CLAMP SUPPORT	015F48H02
38	2	62 CLAMP (GAGE FLOW LINE)	015F48H01
39	2	61 ANGLE BRACKET	015F47H02
40	2	60 SPINNER SUPPORT (REAR)	015F47H01
41	1	59 LADDER	015F46G01
42	1	58 CONDUIT SUPPORT BAR	015F45H04
43	1	57 DUBLIN COUPLING SUPPORT	015F45G01
44	1	56 CONDUIT PIPE	015F45H05
45	1	55 U BOLT	015F45H06
46	2	54 HEX NUT 3/4-10 UNC-2B	STL FF 6-86 GRE
47	2	53 LOCKWASHER .90 STD	STL FF-5-86 GRE
48	1	52 BRAKE DISC	015F44H05
49	1	51 BRAKE DISC ADAPTER (YAW BRAKE)	015F44H06
50	1	50 BRAKE DISC ADAPTER (YAW DRIVE)	015F44H04
51	1	49 TACH MTG BRKT	015F42G02
52	1	48 LIFTING BRKT & SLING ASSY	015F4 G0
53	2	47 HYD PACKAGE (YAW BRAKE)	015F42G01
54	2	46 8 "BOGEN BOTTLE" BOLT	015F39H06
55	1	45 HYD PACKAGE SUPPORT ASSY	015F40G01
56	1	44 LIFTING BOOM	015F39H05
57	1	43 BRAKE PRESSURE REGULATOR	015F38G01
58	1	42 YAW BRAKE SUPPORT ASSY	015F37G01
59	1	41 THRUST BUTTON	015F34H04
60	1	40 GEAR KEY	015F86H01
61	1	39 YAW DRIVE MOUNTING PL	015F36H01
62	1	38 INTER YAW DRIVE SHAFT	015F [illegible]
63	1	37 SEAL RETAINER BOTTOM (YAW)	015F33H02
64	1	36 SEAL RETAINER TOP (YAW)	015F33H01
65	1	35 YAW DRIVE SHAFT	015F32H01
66	1	34 YAW DRIVE GEAR HOUSING	015F [illegible] G01
67	1	33 MAIN YAW GEAR SUPPORT	015F [illegible]
68	1	32 PINION DRIVE SHAFT	015F29H01
69	1	31 GEAR KEY	015F [illegible]

PARTS LIST

ITEM	QTY	DESCRIPTION	PART NO.
1	30	BASE BLOCK	015F96H05
2	29	BRAKE SUPPORT	015F96H04
3	28	SEAL RETAINER PLATE	015F96G01
4		[illegible] SHAFT	015F [illegible]
5		26 BRG SPACER	015F36H02
6		25 LOCKING BRG	015F36H03
7		24 CONE [illegible]	015F [illegible]
8		23 SEAL RETAINER PLATE	015F [illegible]
9		22 LOCKING BAR - GENERATOR HD.	015F [illegible]
10		[illegible] PLATE - GENERATOR HD.	015F [illegible]
11		[illegible] HD. GENERATOR BOTTOM	015F [illegible]
12		18 [illegible]	015F [illegible]
13		18	015F23G05
14		17	015F23G04
15		16	015F23G03
16		15	015F23G02
17		14 [illegible]	015F23G01
18		13 [illegible]	015F [illegible]
19		12 [illegible]	015F [illegible]
20		11 [illegible]	015F20H04
21		10 [illegible]	015F20H03
22		9 [illegible]	015F20H02
23		8 [illegible]	015F [illegible]
24		7 [illegible]	015F [illegible]
25		6 [illegible]	015F [illegible]
26		5 [illegible]	015F [illegible]
27		4 NOSE CONE	015F [illegible]
28		3 REAR CENTER SHROUD	015F [illegible]
29		2 FWD CENTER SHROUD	015F [illegible]
30		BALANCE	015F [illegible]

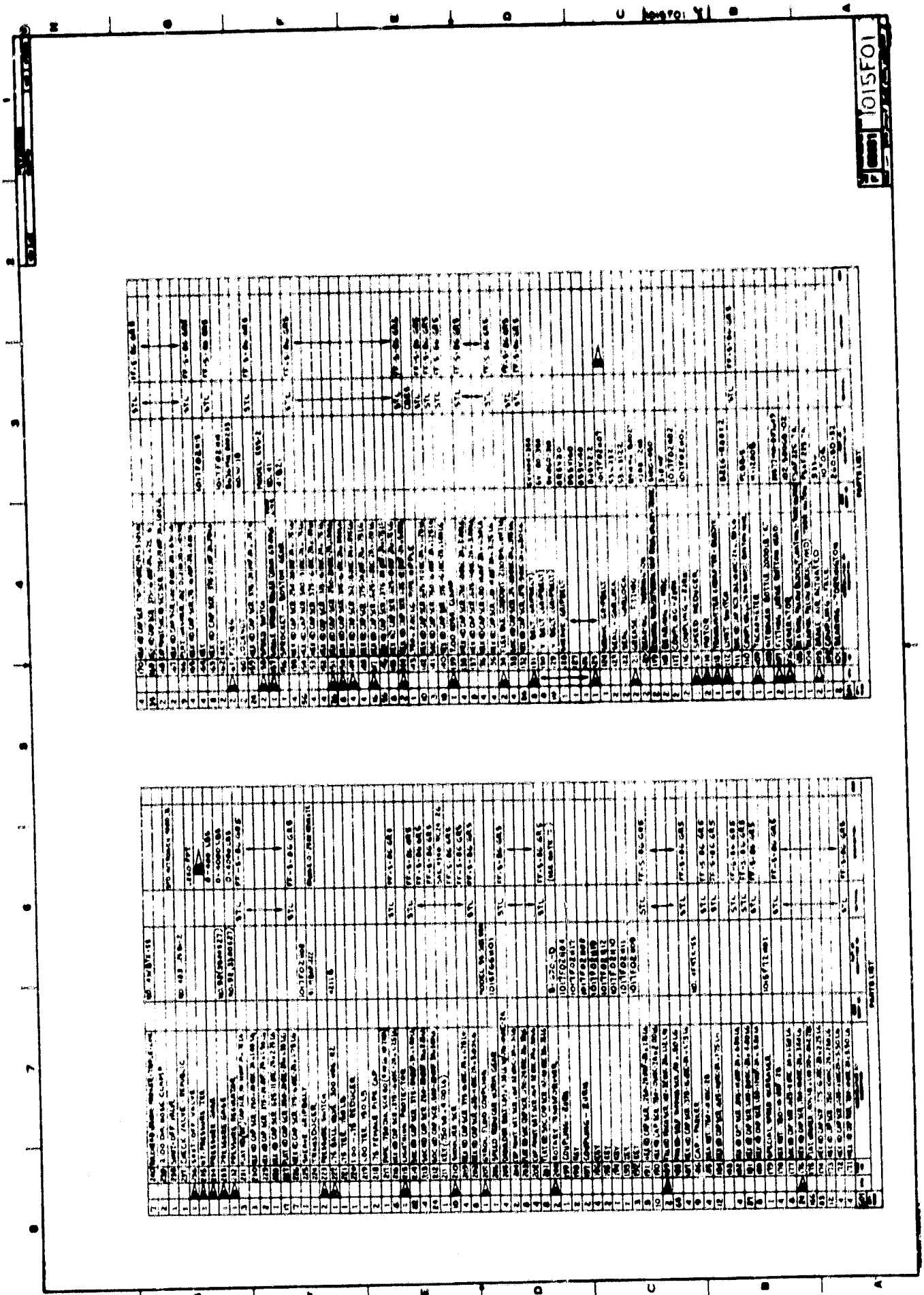
PARTS LIST

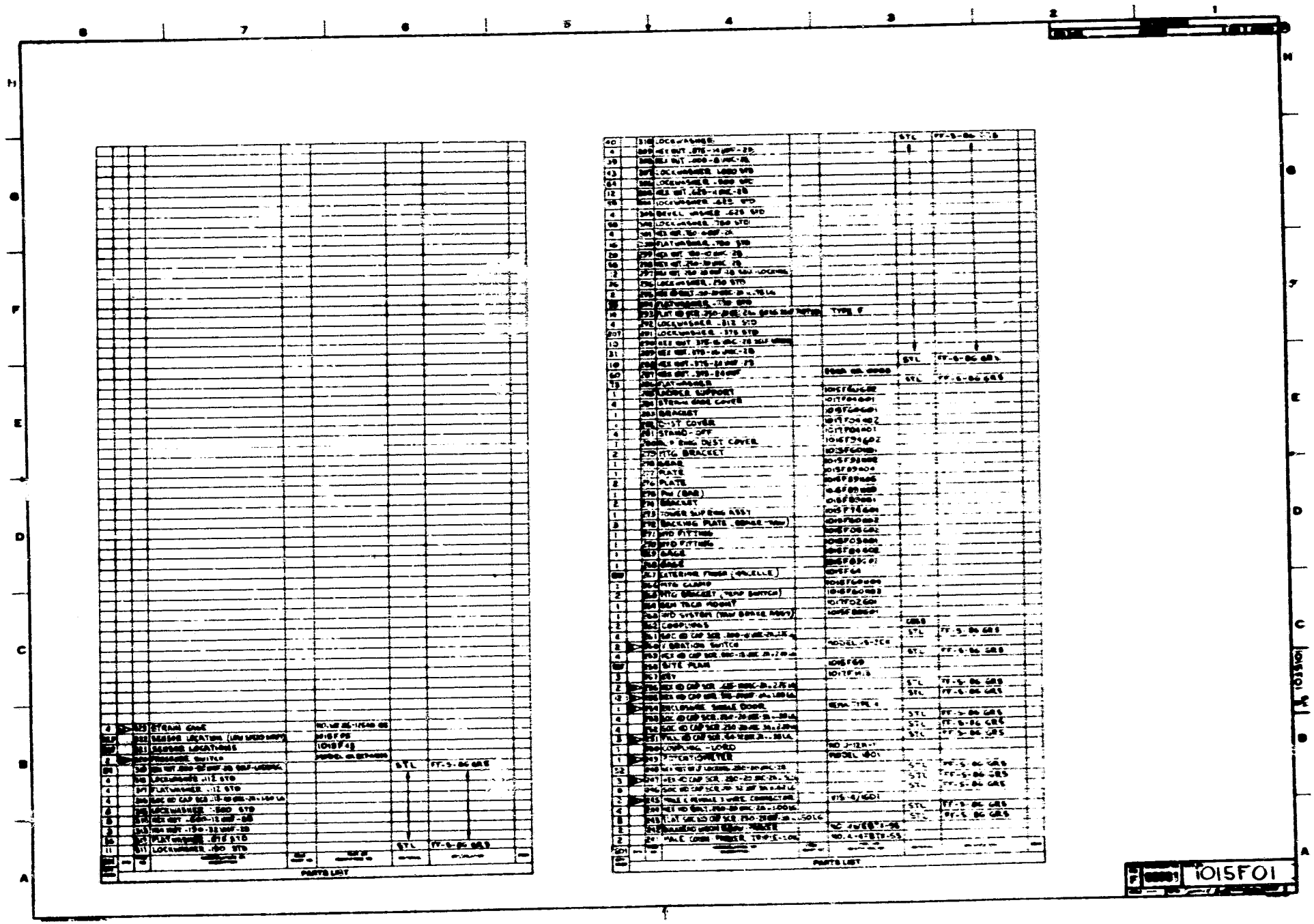
ASSEMBLY
ROC 0A-20 KW
WIND TURBINE GENERATOR

SIZE F | 80031 | 1C15F01 | -

SCALE

SHEET

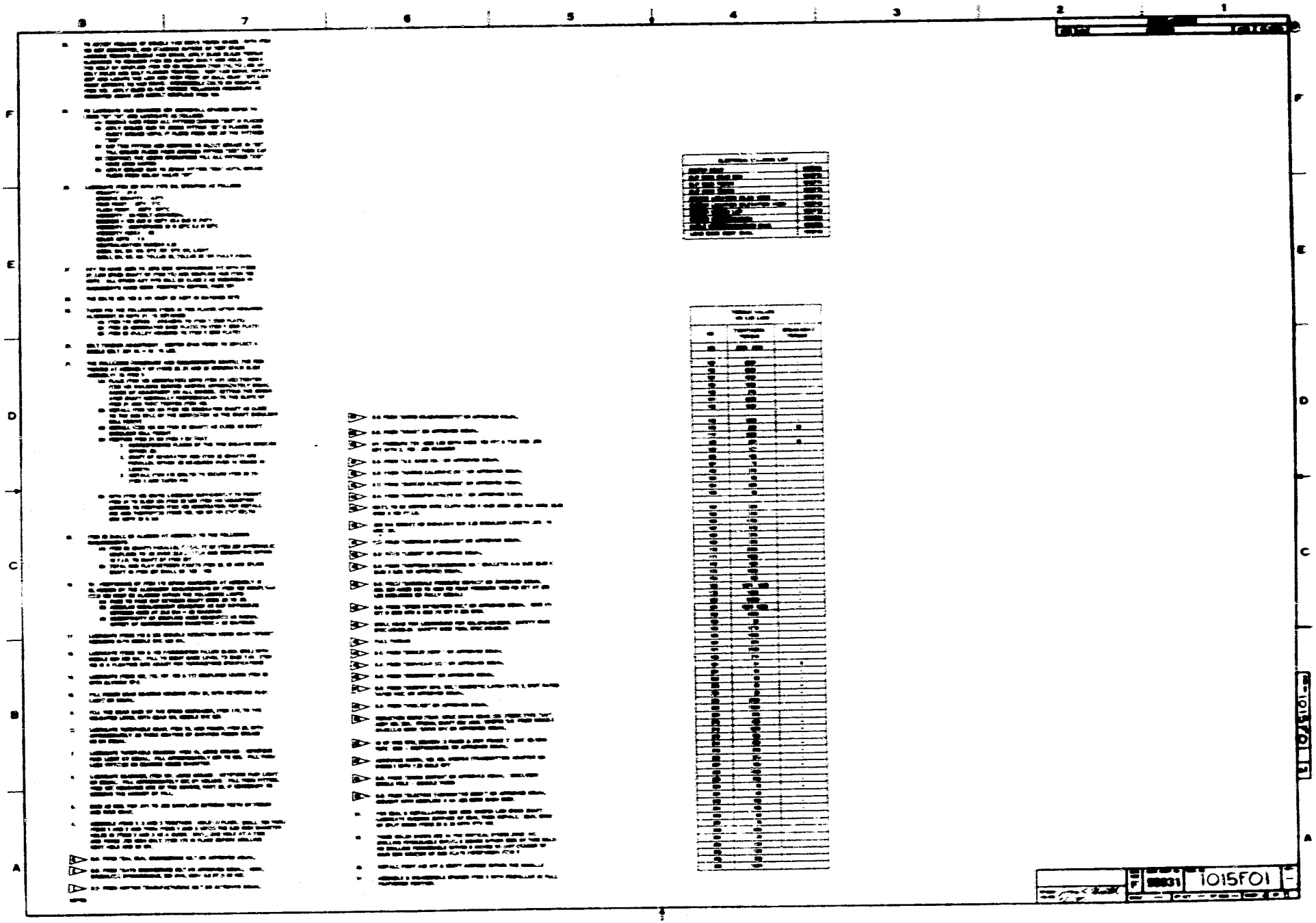

1015F01

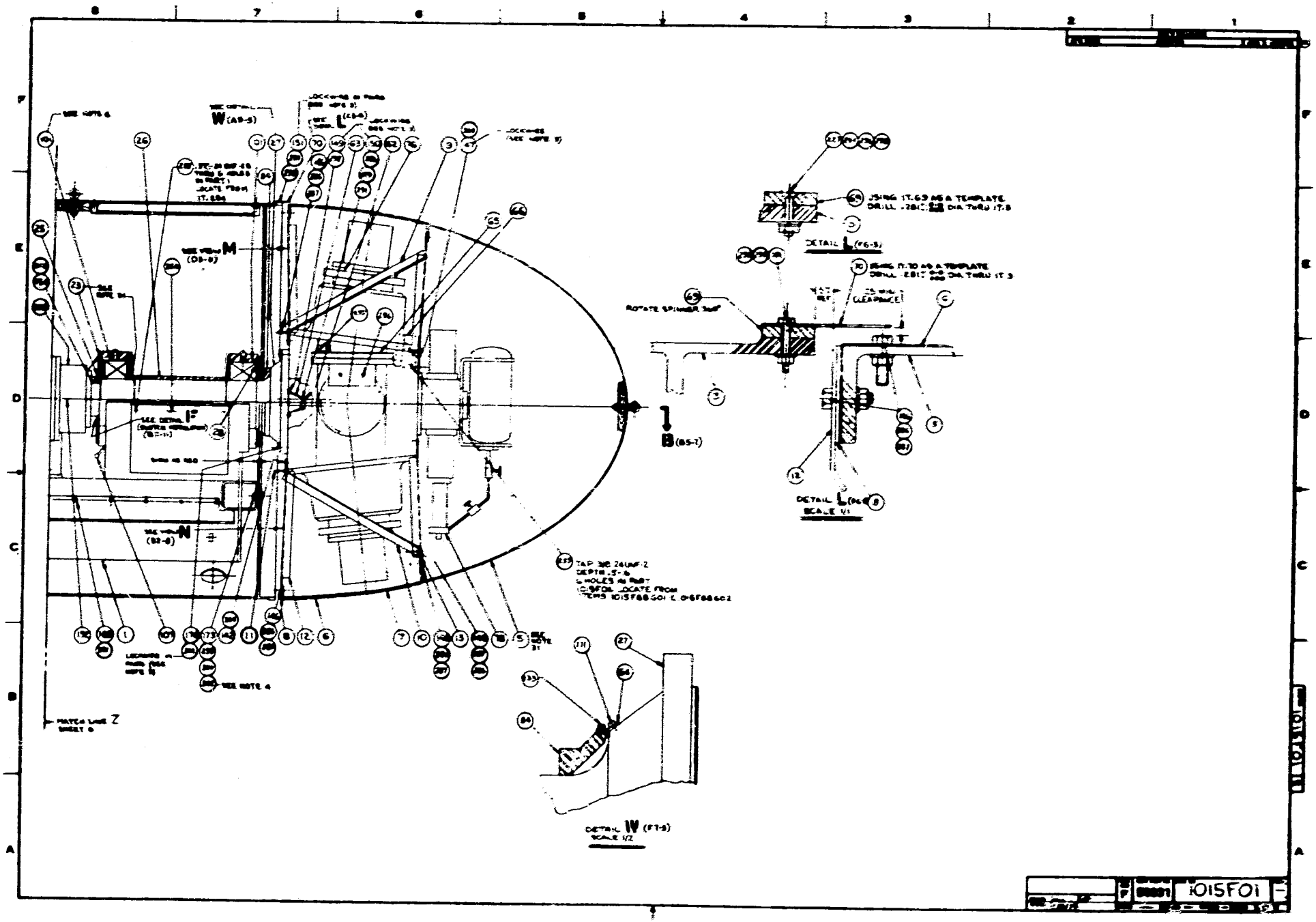


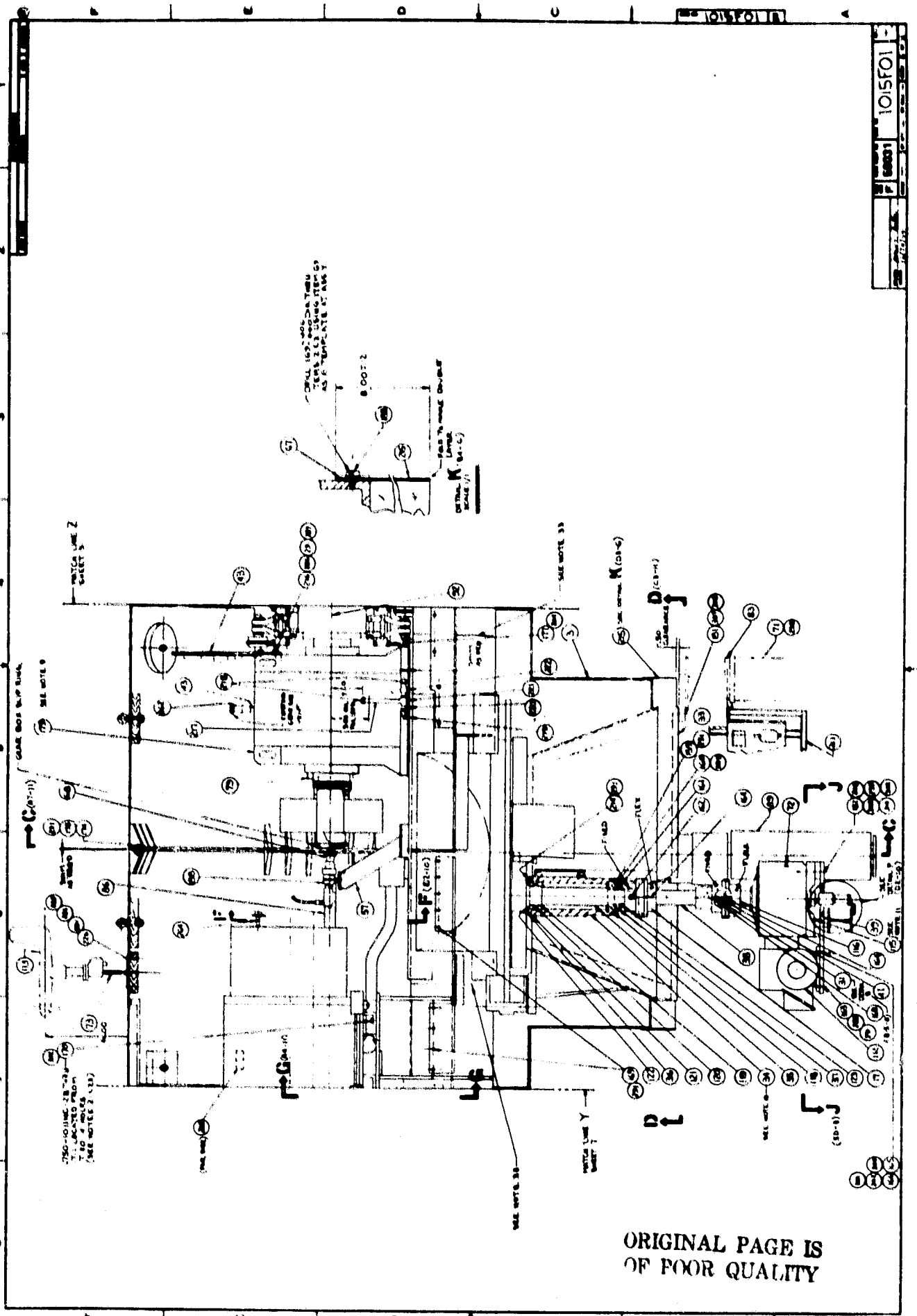
PARTS LIST

PARTS LIST

1015F01




DETAIL L (F6-5)
SCALE 1/1
DETAIL IV (F7-5)
SCALE 1/2
B (B5-7)
W (A8-5)
M (D8-8)
N (B2-8)
Z
1015F01



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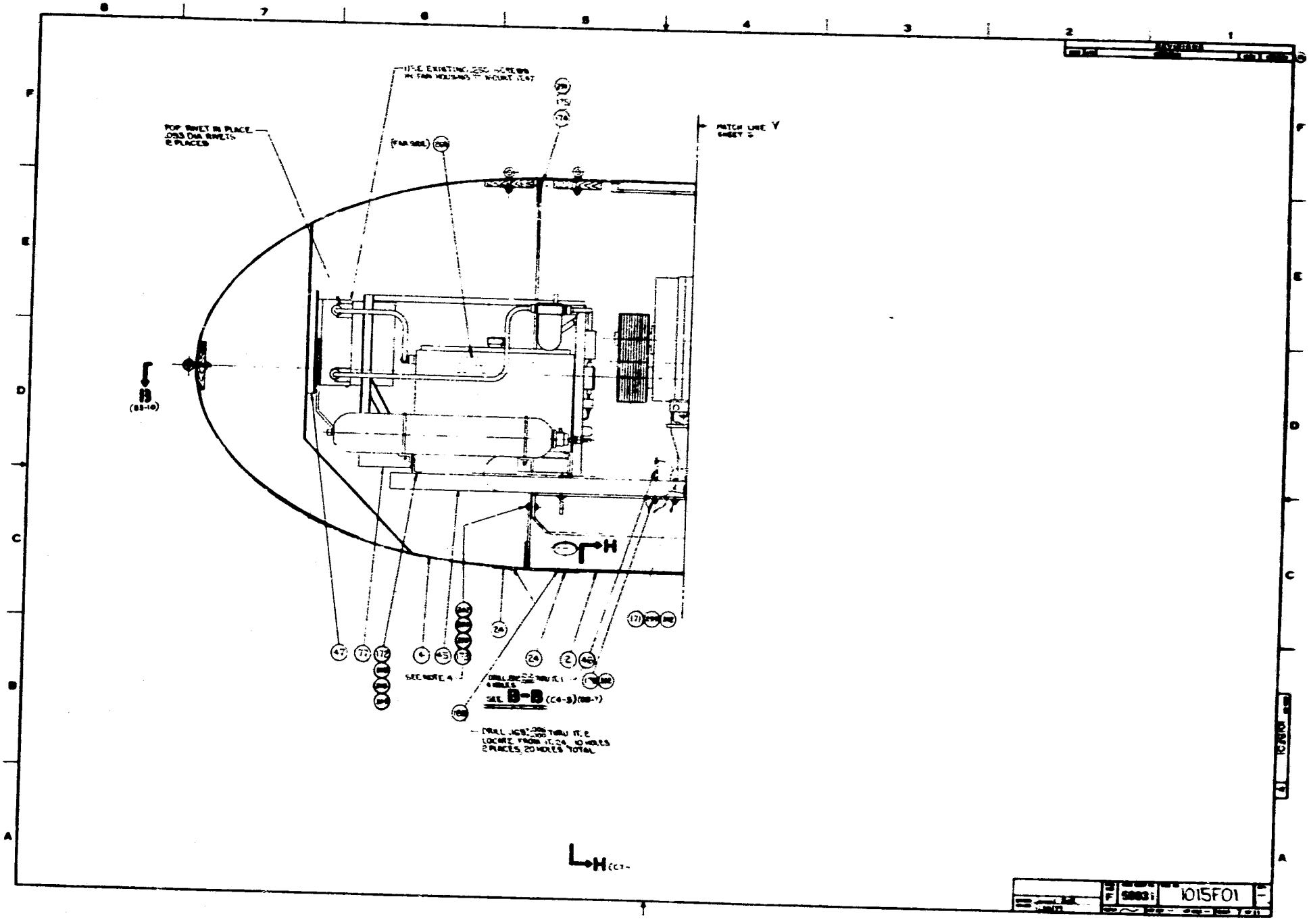
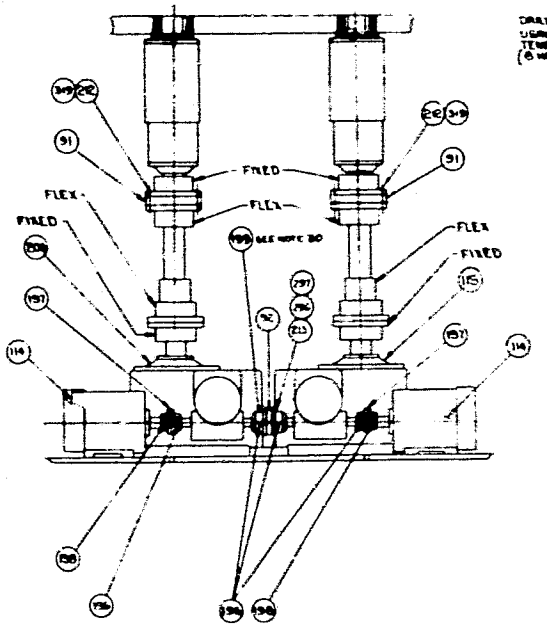
OF POOR QUALITY

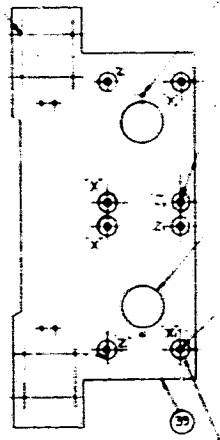

POP RIVET IN PLACE
.053 DIA RIVETS
6 PLACES
MATCH LINE 'Y'
SHEET 5
SEE NOTE 4
SEC B-B
DRILL
LOCATE FROM
6 HOLES
2 PLACES, 20 HOLES TOTAL

1015F01



H-H (15-7)

DRILL .437 +.005 -.000 THRU USING ITEM 45 AS A TEMPLATE. 8 PLACES (8 HOLES TOTAL)



.750-24UNEF-2B THRU USING ITEMS 73 & 200 AS A TEMPLATE. 1 HOLE, 2 PLACES AT ASSEMBLY.

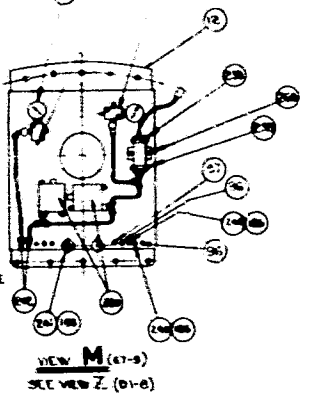
DRILL 1.000 +.035 -.000 DIA THRU ITS 35 (FLANGE OF SUPPORTING BEAM) 2 HOLES MARKED "Z". SET OVER SUPPORT BEAM IN 3 PLACES (2 HOLES MARKED "Z" TO BE LOCATED AT ASSY.

7.000" ±.035 DIA HOLE THRU USING ITEMS 114, 73 & 206 AS A TEMPLATE. 2 HOLES (AT ASSY.)

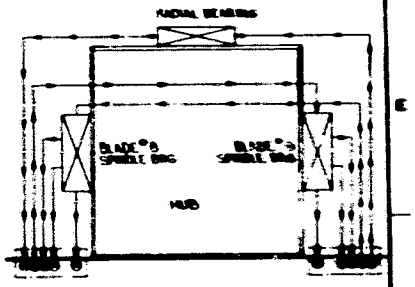
1.000 DIA REAM TIGHT FIT WITH ITEM 205 USING ITEMS 73 & 206 AS TEMPLATE. THRU ITEMS 116, 206, 35 (FLANGE OF SUPPORTING BEAM IN TOWER (2 HOLES MARKED "A" SET OVER SUPPORT BEAM) 8 HOLES MARKED "A" TO BE LOCATED AT ASSEMBLY.

J-J (67-6)

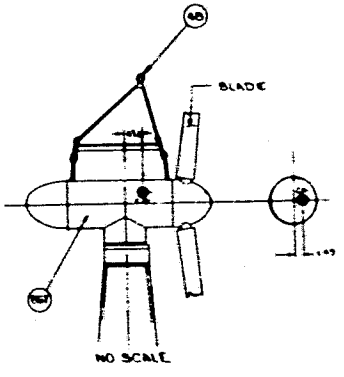
DRILL 17/42 LOCATE FROM PARTS SHOWN & SCREW IN PLACE

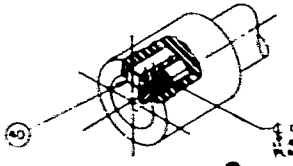


VIEW M (67-9)
SEE VIEW Z (01-8)

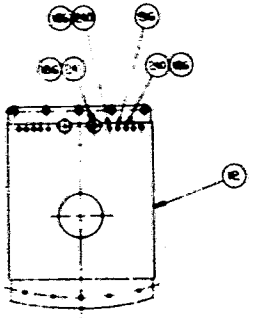


VIEW Z (03-8)(02-8)
HUB LUBRICATION SYSTEM

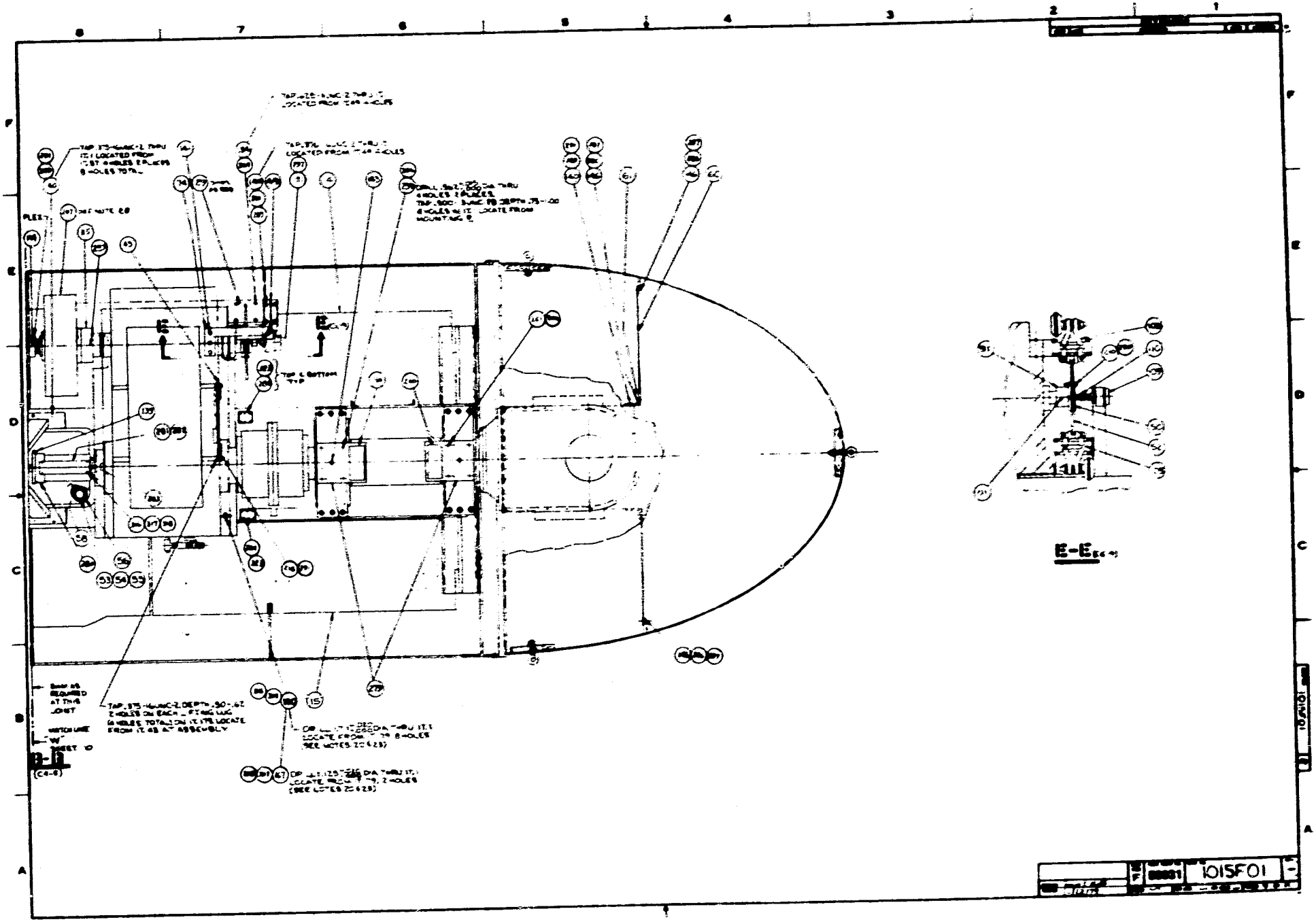




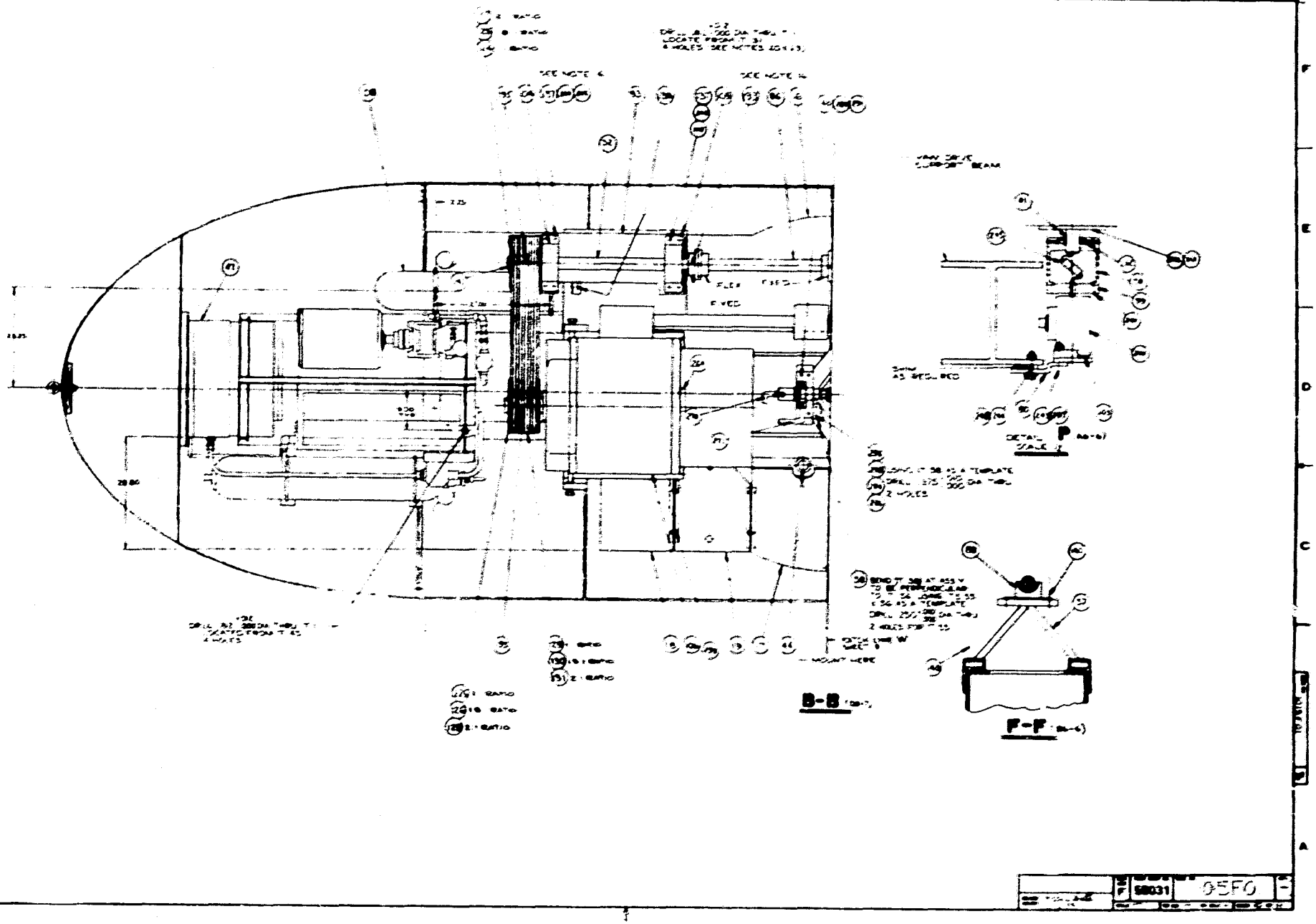
DETAIL S (AC-6)
NO SCALE

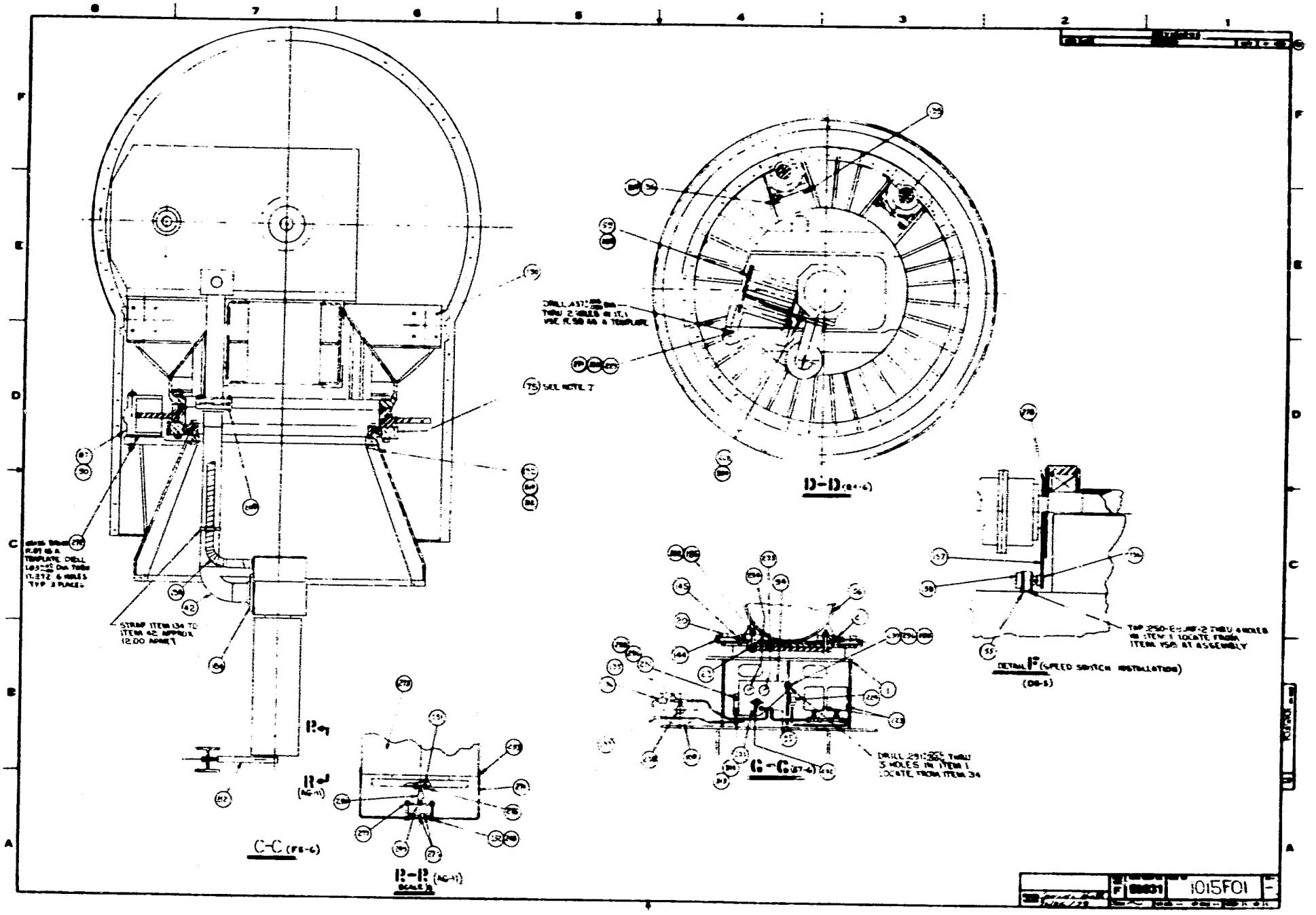


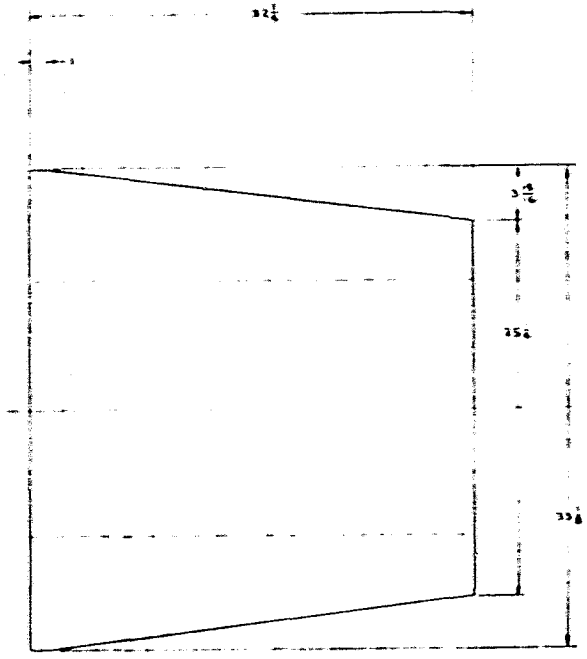
VIEW N (CA-5)
SEE VIEW Z (01-8)

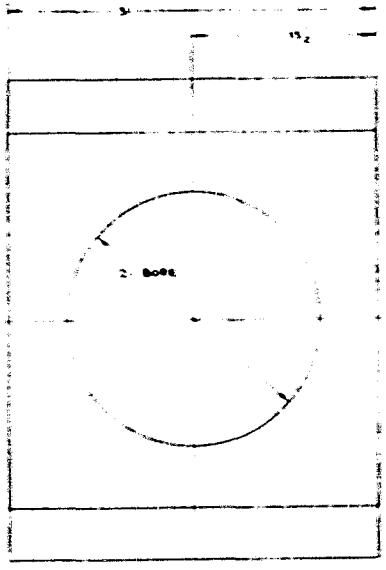


E-E


B-B
F-F
58031
95F0


SEE NOTE 7
D-D (6-1-6)
C-C (F8-6)
P-P (AC-1)
G-G (B7-6)
DETAIL F (SPEED SWITCH INSTALLATION)
(D8-5)
1015F01



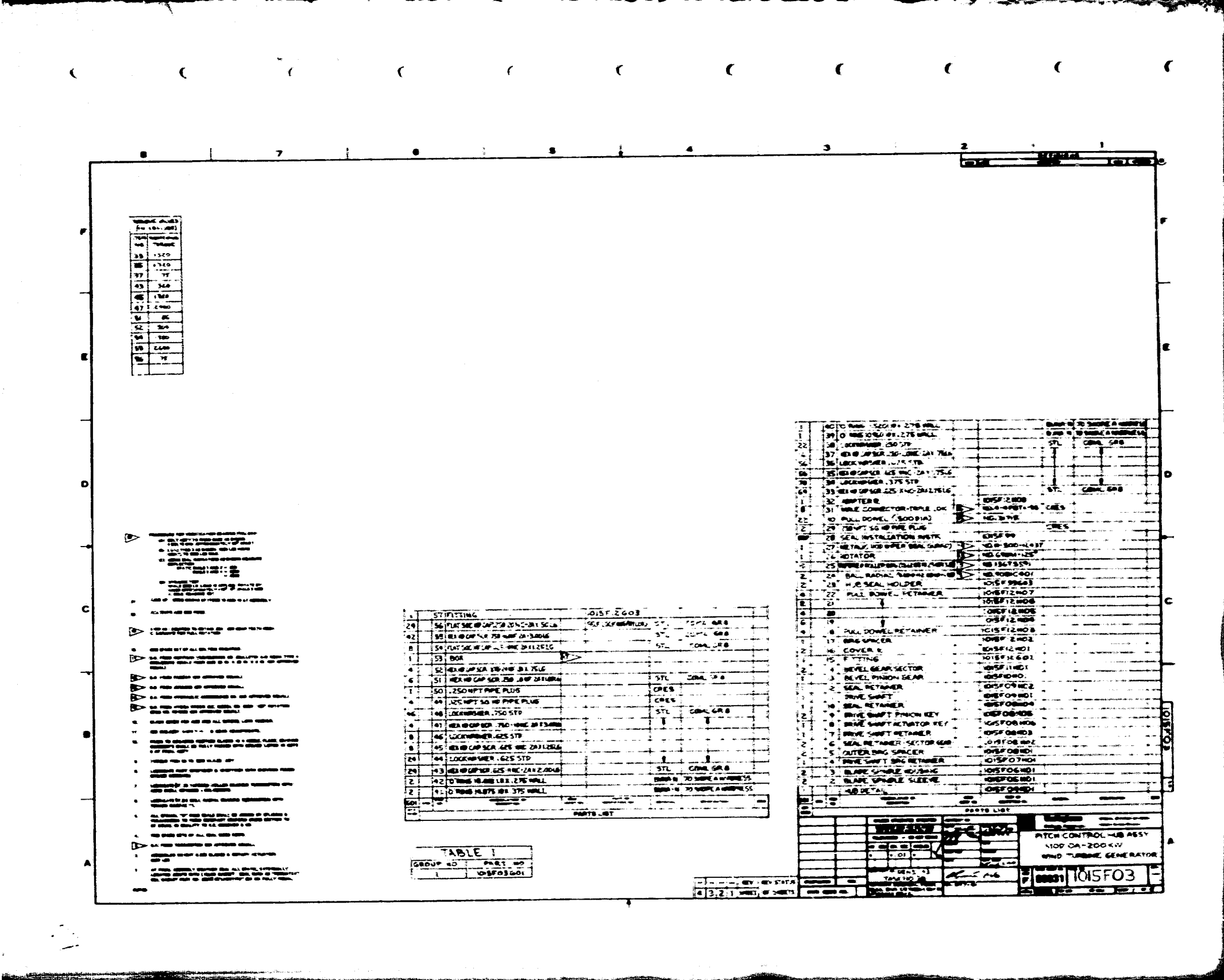


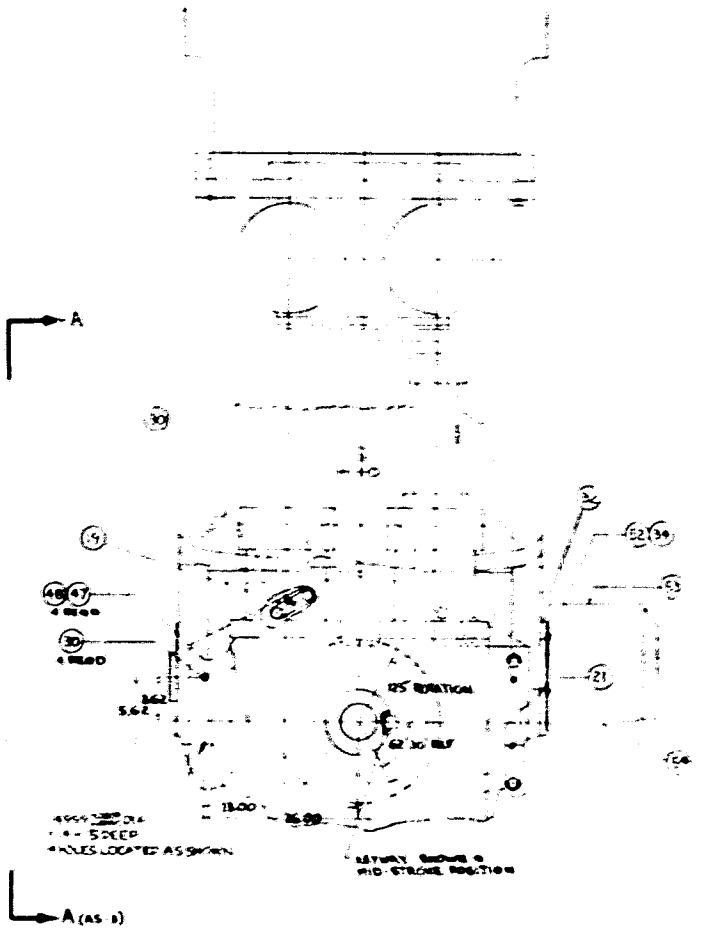
PARTS LIST

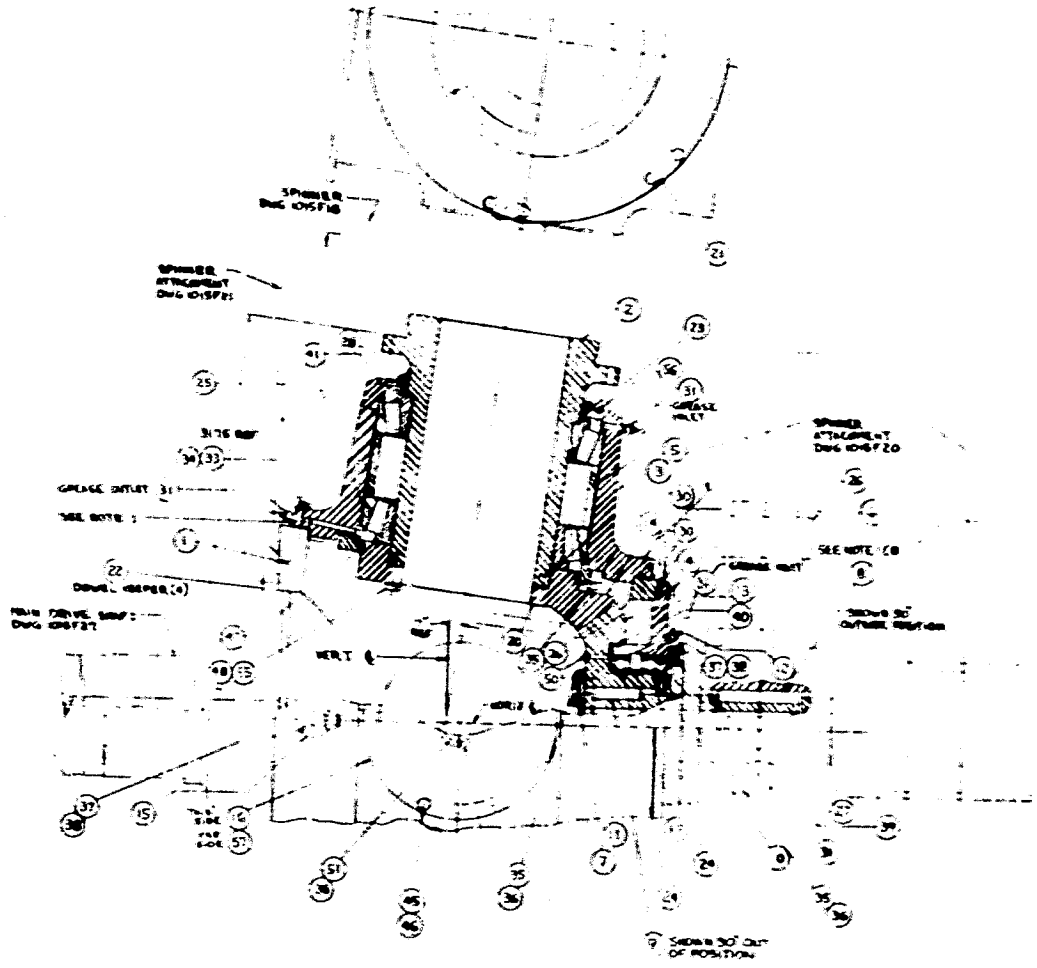
H.B. PITCH FORGING
MOD OA-200 KW
WIND TURBINE GENERATOR

STL

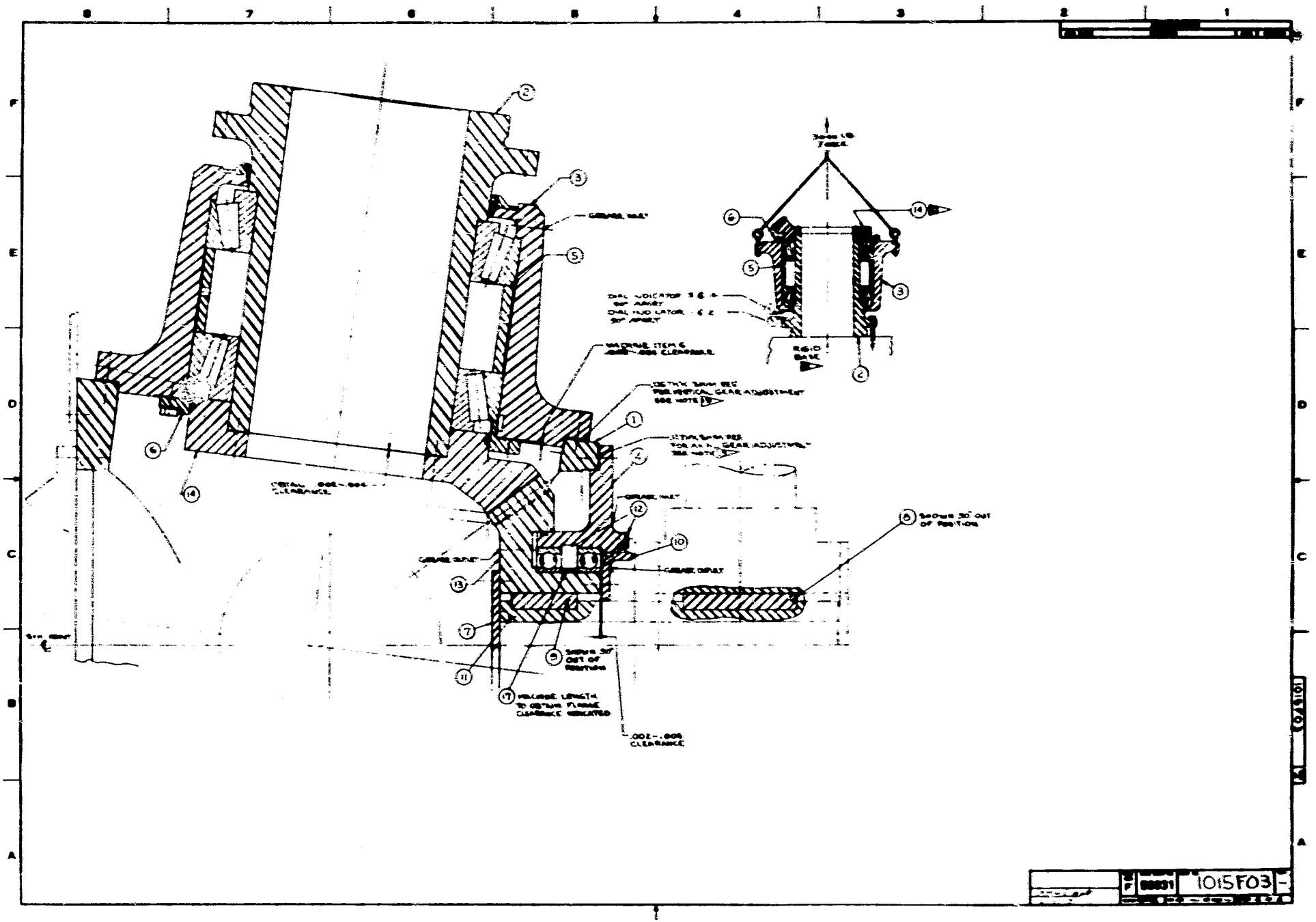
1015F02

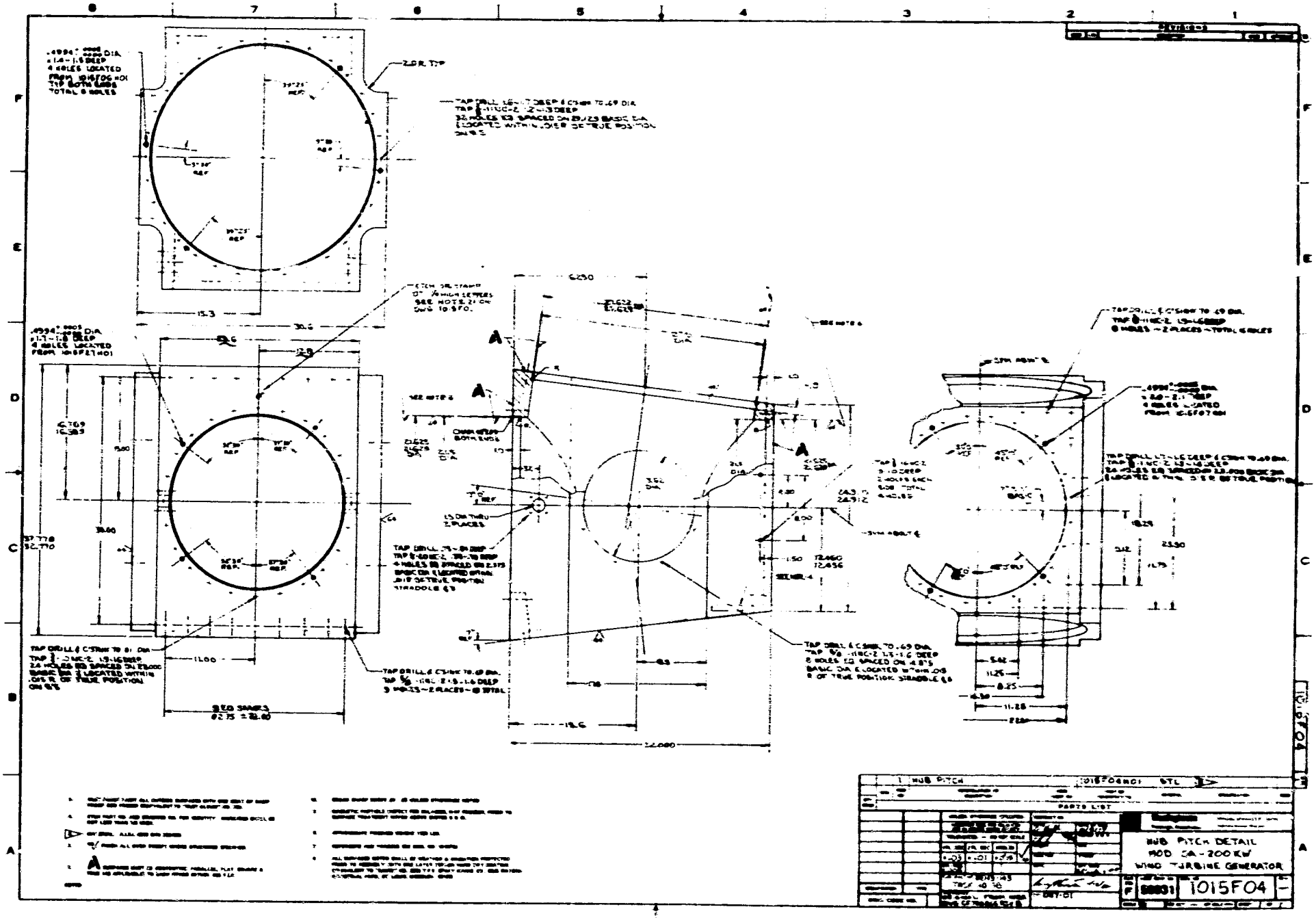


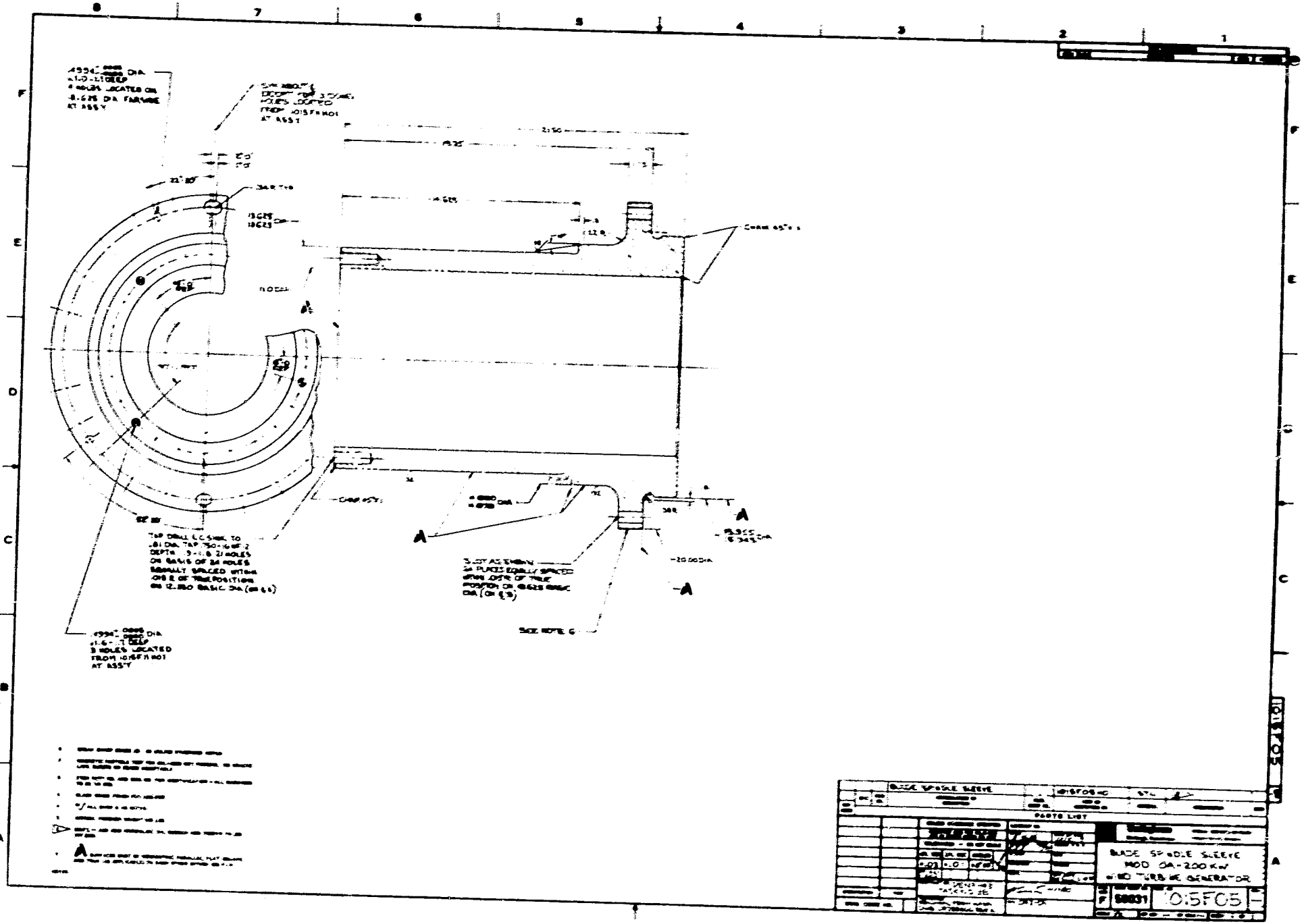

A
A (AS D)
125 STATION
MID-STROKE POSITION

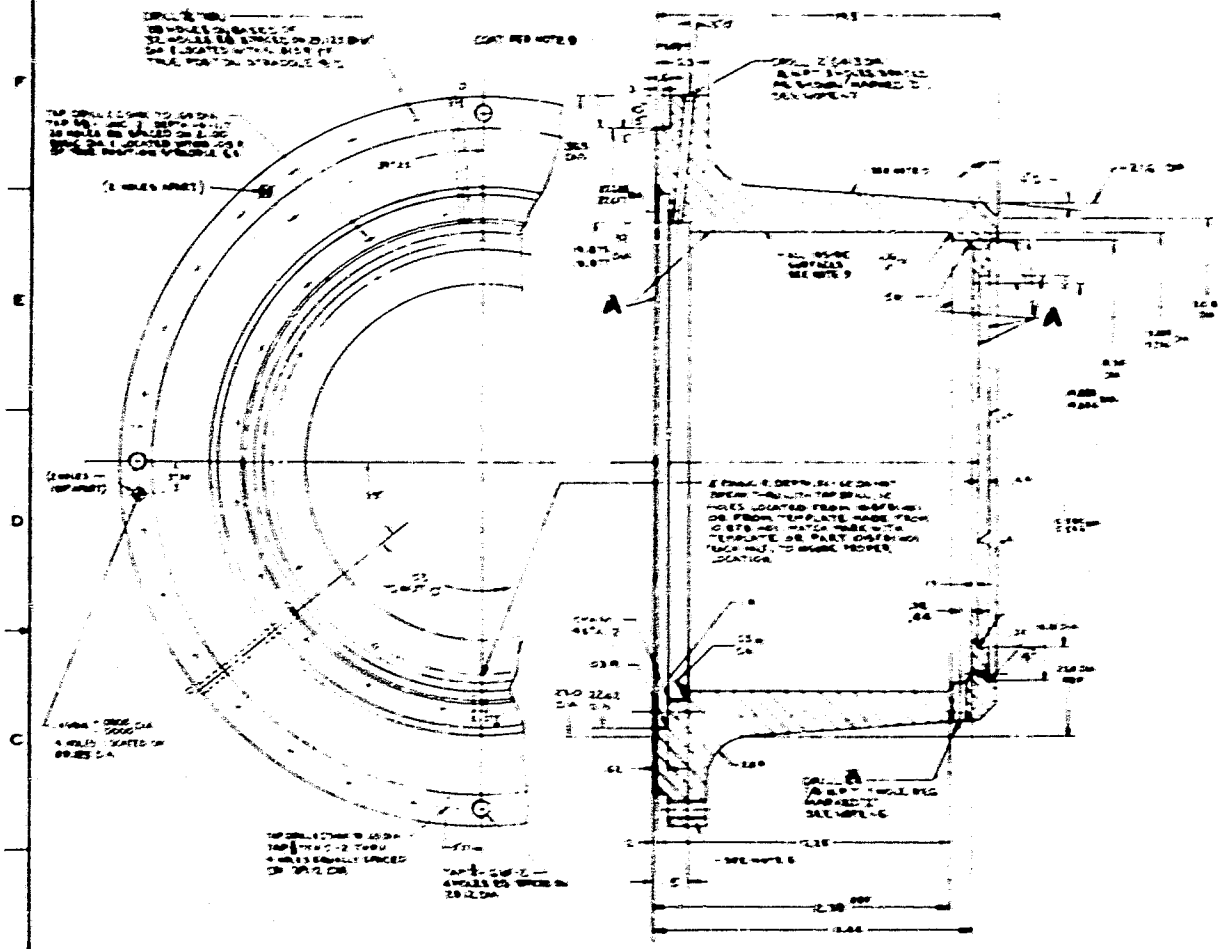


VIEW A-A


8
7
6
5
4
3
2
1
F
E
D
C
B
A
1015F03


HUB PITCH
PARTS LIST
HUB PITCH DETAIL
MOD 5A-200 KW
WIND TURBINE GENERATOR
1015F04

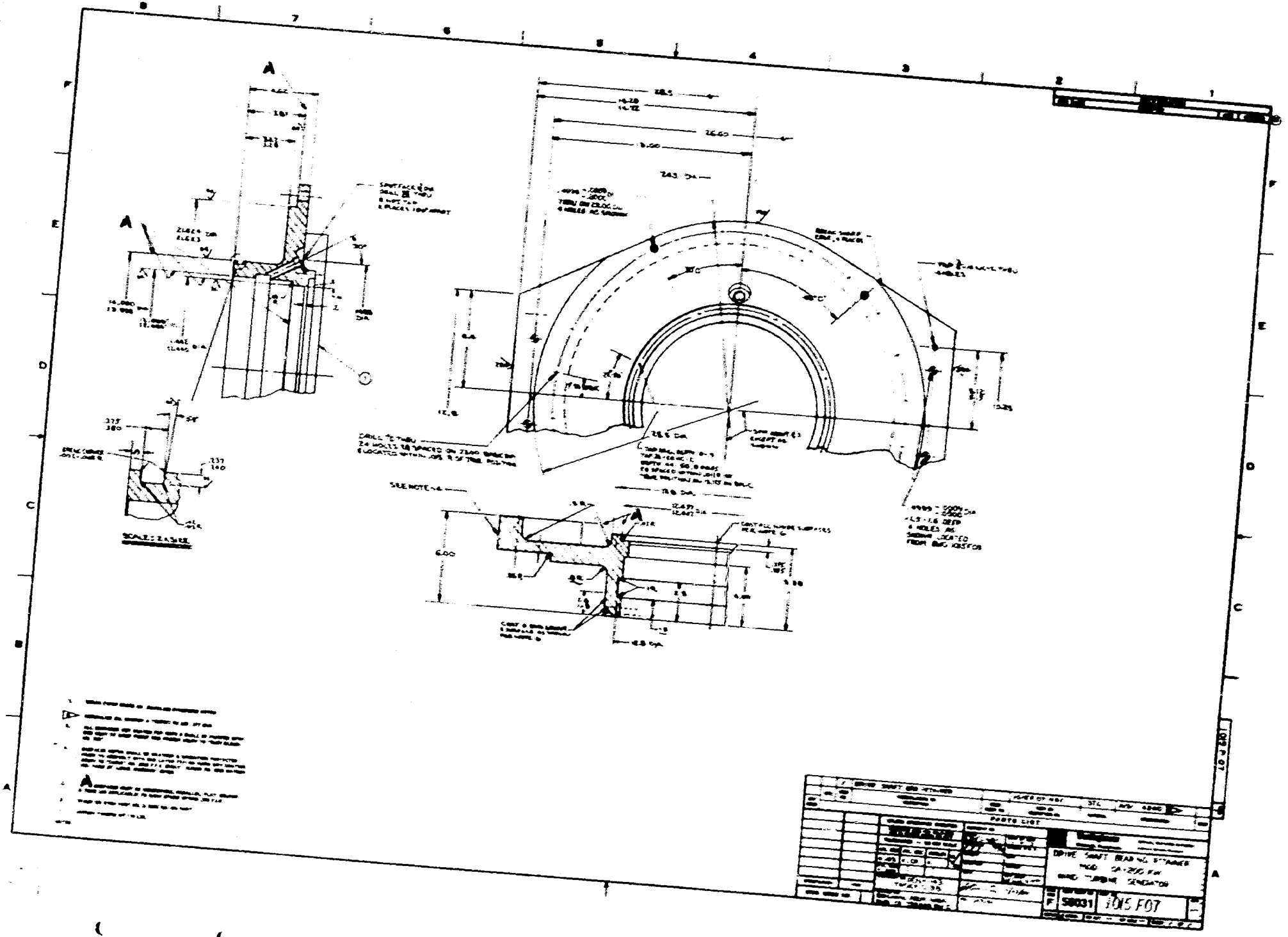

BLADE SPINDLE SLEEVE
MOD 0A-200 KW
WIND TURBINE GENERATOR
10 5F05

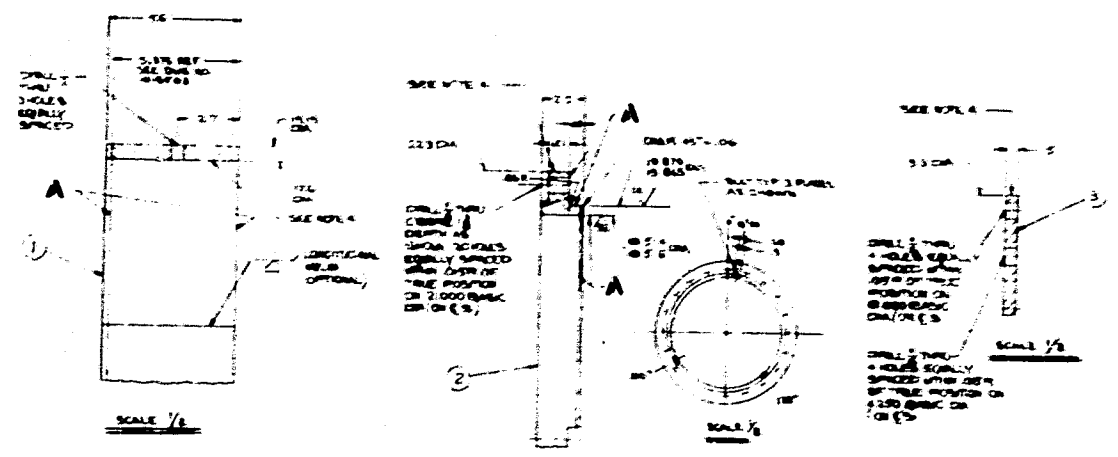


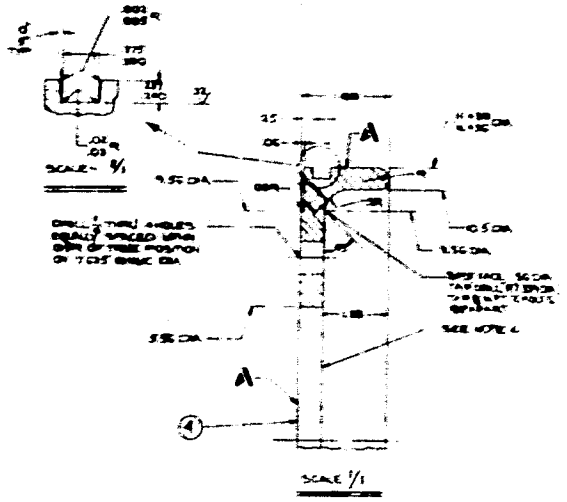
PARTS LIST

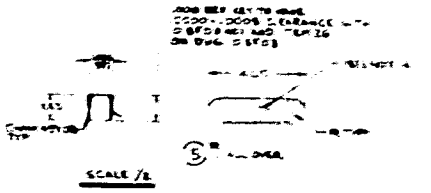
BLADE SPINDLE HOUSING

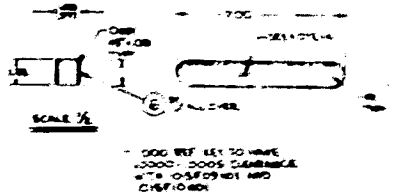
A015F06

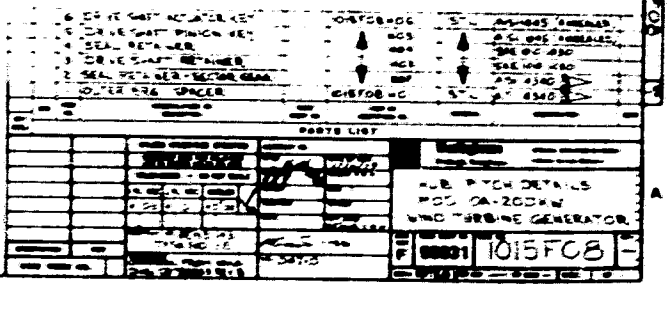


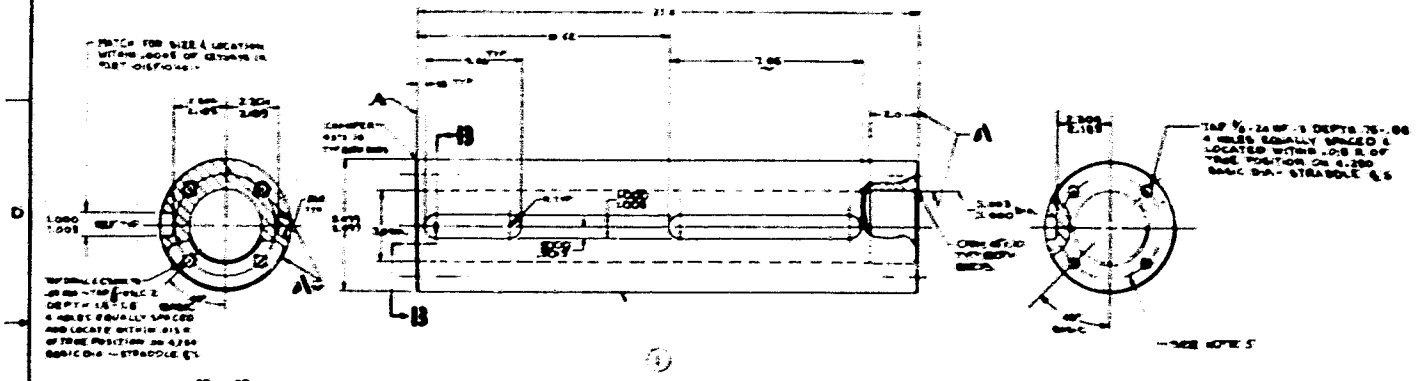










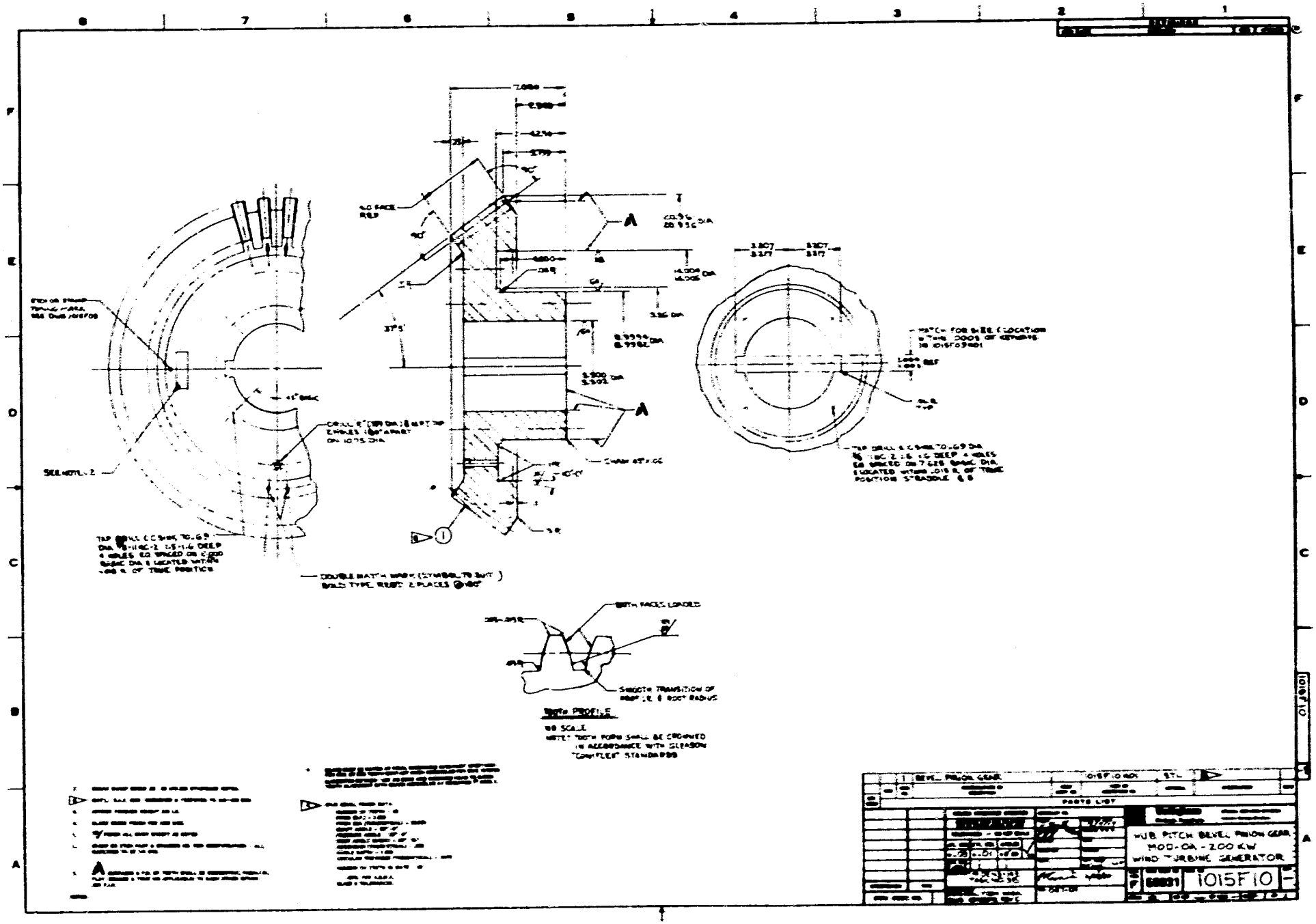


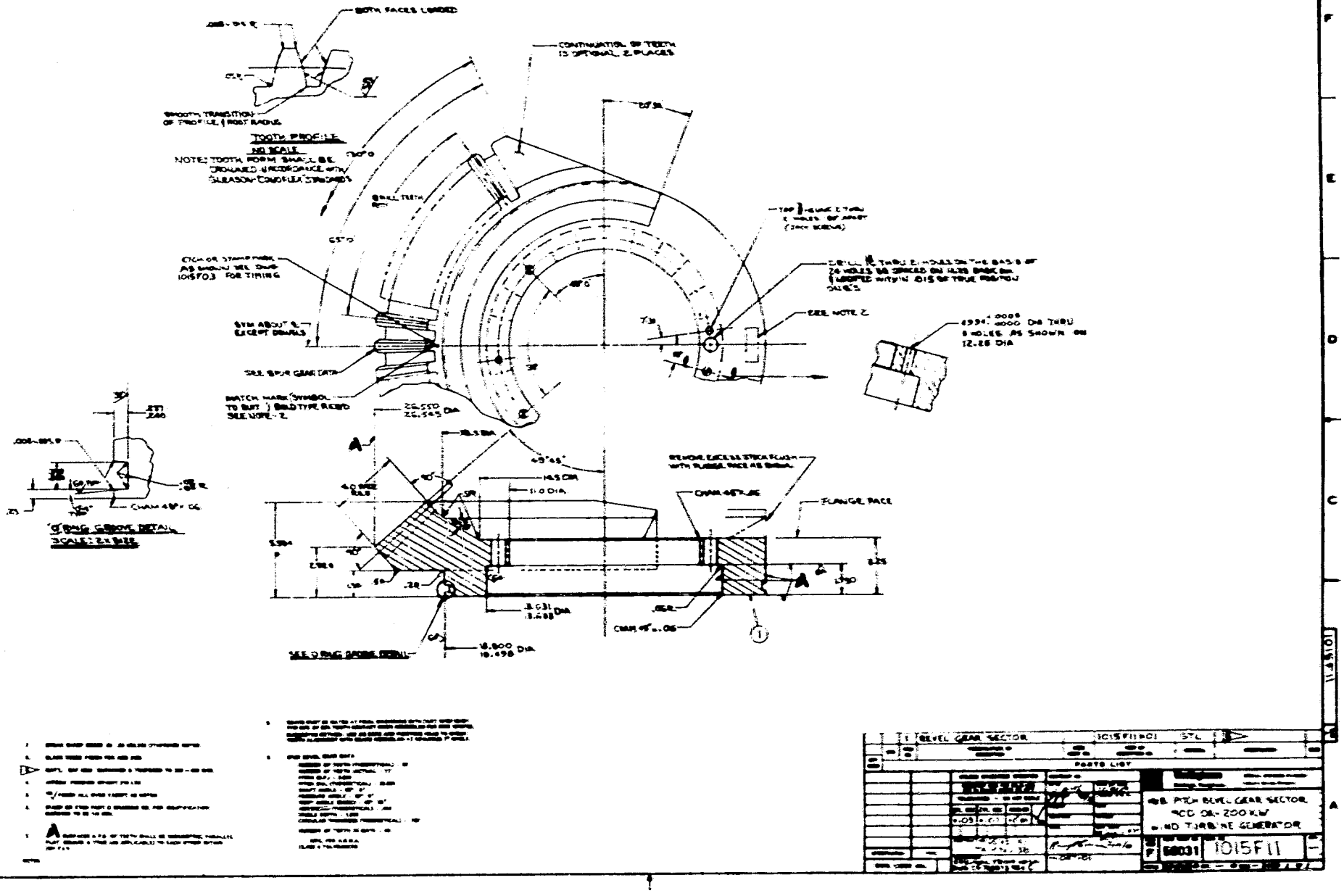
B-B

1	DRIVE SHAFT						
	PARTS LIST						

HUB PITCH DRIVE SHAFT
MOD OA-200KW
WIND TURBINE GENERATOR

F 98031 5F09


HUB PITCH BEVEL PINION GEAR
MOD-0A - 200 KW
WIND TURBINE GENERATOR
1015F10

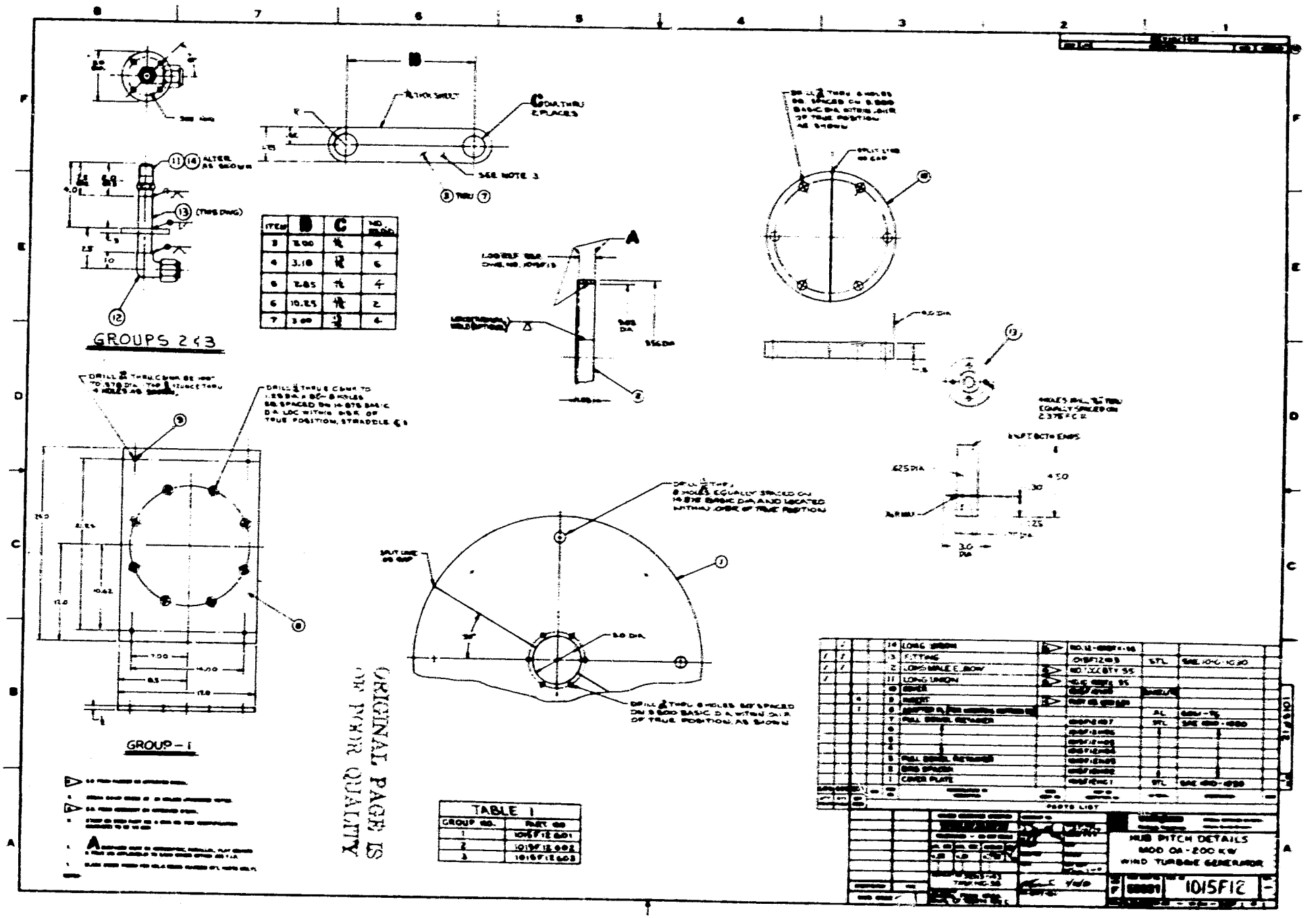


1	BEVEL GEAR SECTOR	1015F11-01	STL	1	
ITEM	PARTS LIST				

48 PITCH BEVEL GEAR SECTOR
400 OR 200 KW
WIND TURBINE GENERATOR

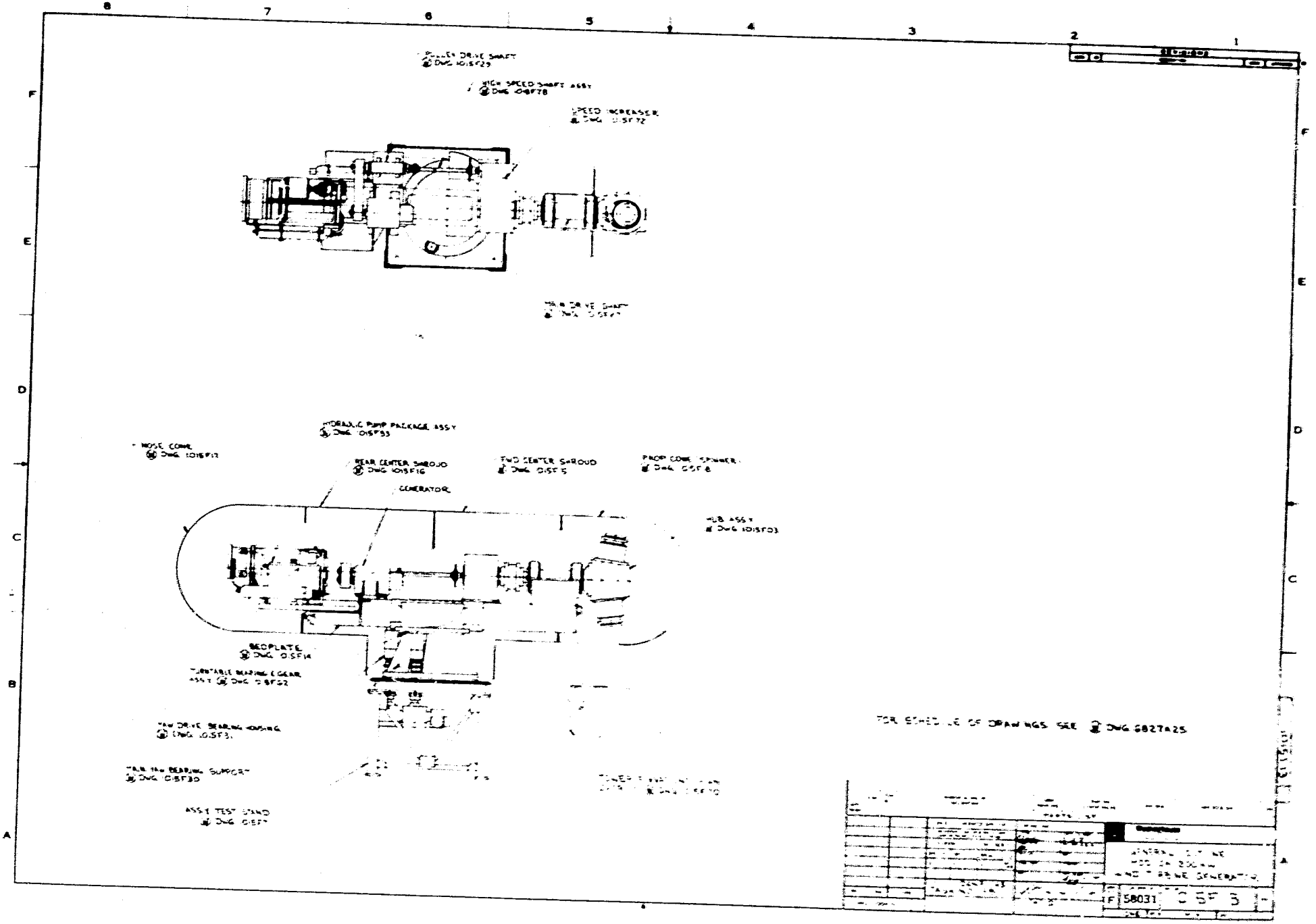
SIZE	DWG NO	REV
B	1015F11	

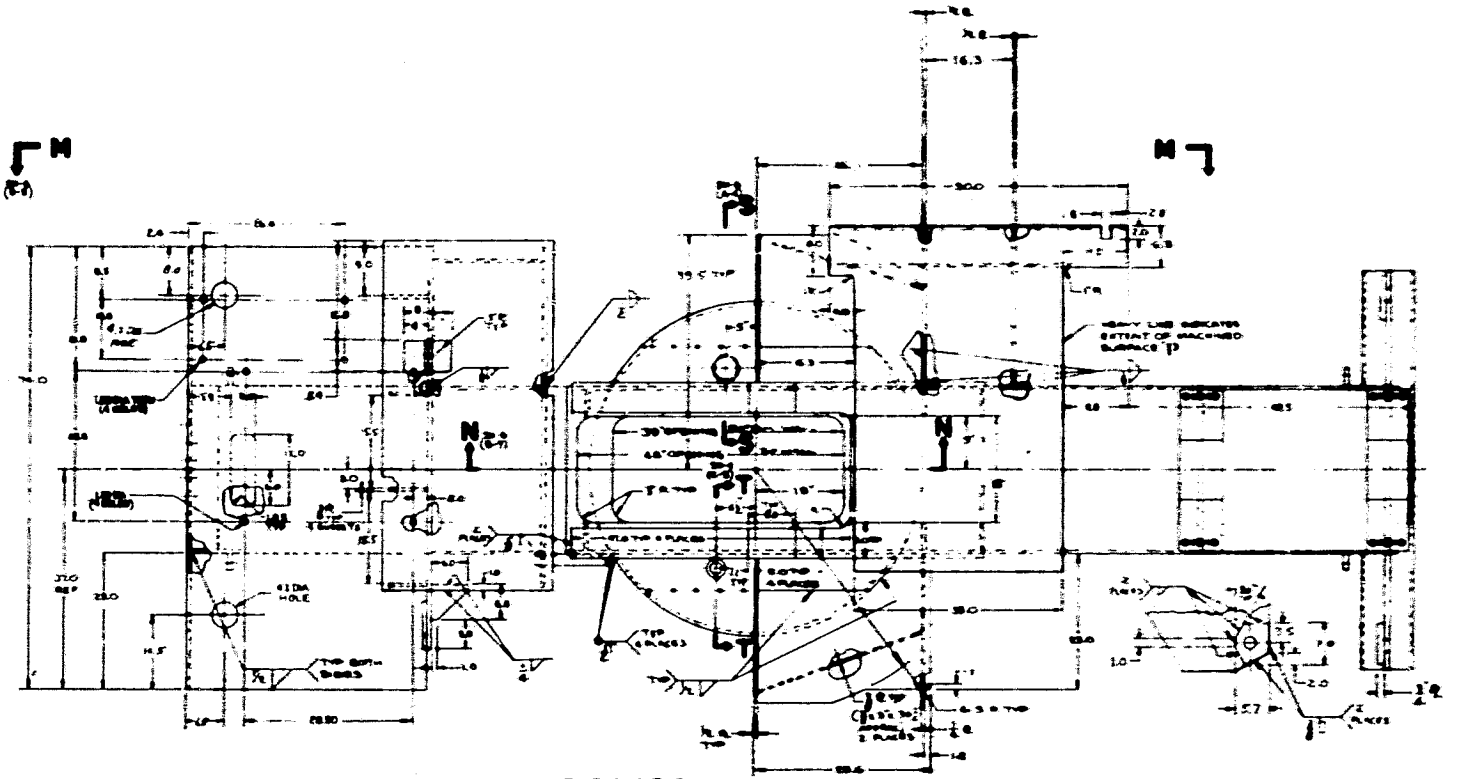
SCALE 1:4 WEIGHT 11.4 LBS 01



ITEM	B	C	NO. REQD.
3	2.00	⅝	4
4	3.18	⅝	6
5	2.85	⅝	4
6	10.25	⅝	2
7	3.00	⅝	4

TABLE I	
GROUP NO.	PART NO.
1	1015F12-001
2	1015F12-002
3	1015F12-003

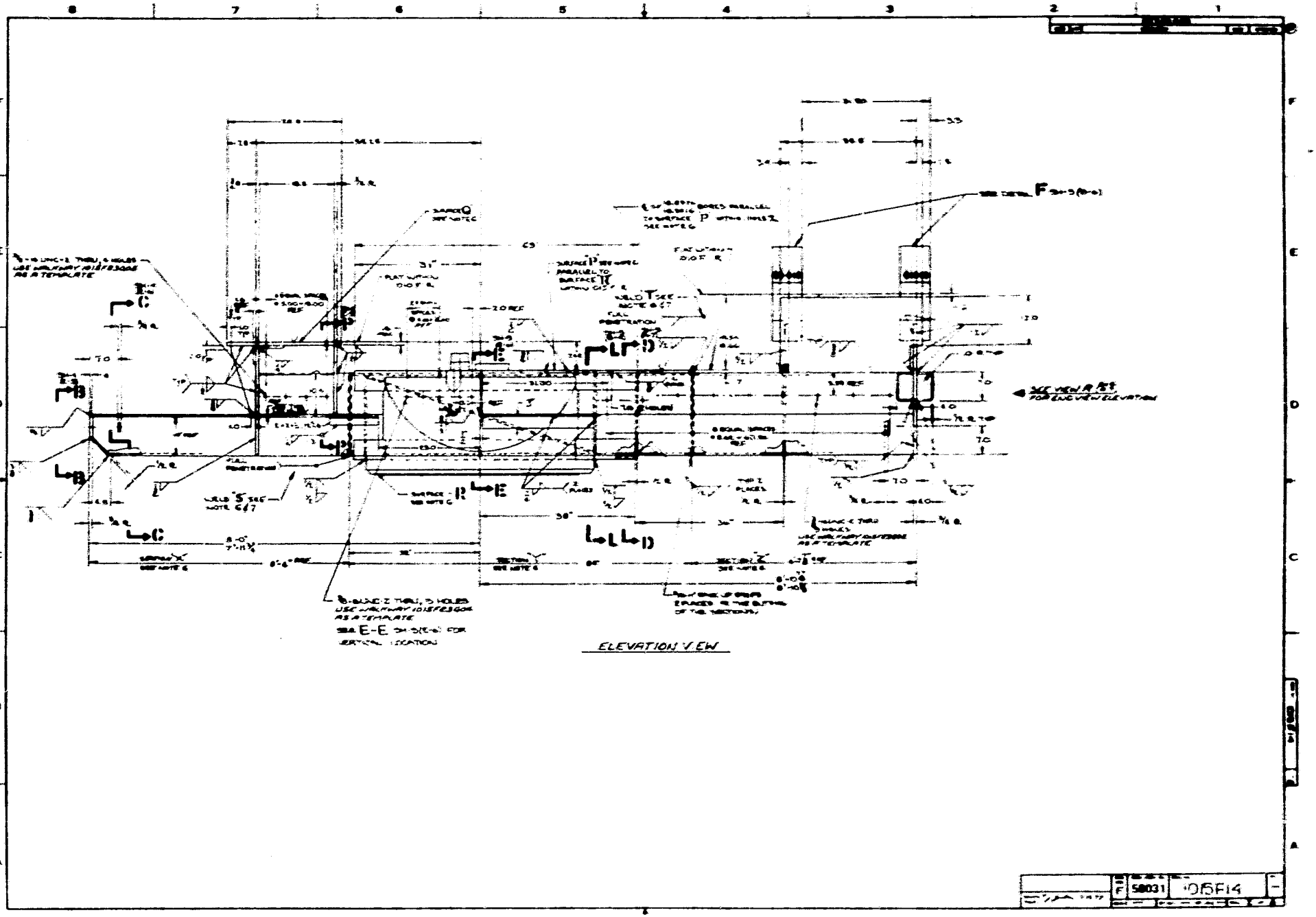

8
7
6
5
4
3
2
1
F
E
D
C
B
A
HIGH SPEED SHAFT ASSY
DWG 108F78
SPEED INCREASER
DWG 105F72
HYDRAULIC PUMP PACKAGE ASSY
DWG 105F53
NOSE CONE
DWG 105F17
REAR CENTER SHROUD
DWG 105F16
FWD CENTER SHROUD
DWG 105F5
PROP CONE SPINNER
DWG 05F8
GENERATOR
HUB ASSY
DWG 105F03
BEDPLATE
DWG 05F14
DWG 05F3).
DWG 05F30
DWG 05F7
FOR SHEET LAYOUT OF DRAWINGS SEE DWG 6827A25
58031
05F 3



PLAN VIEW

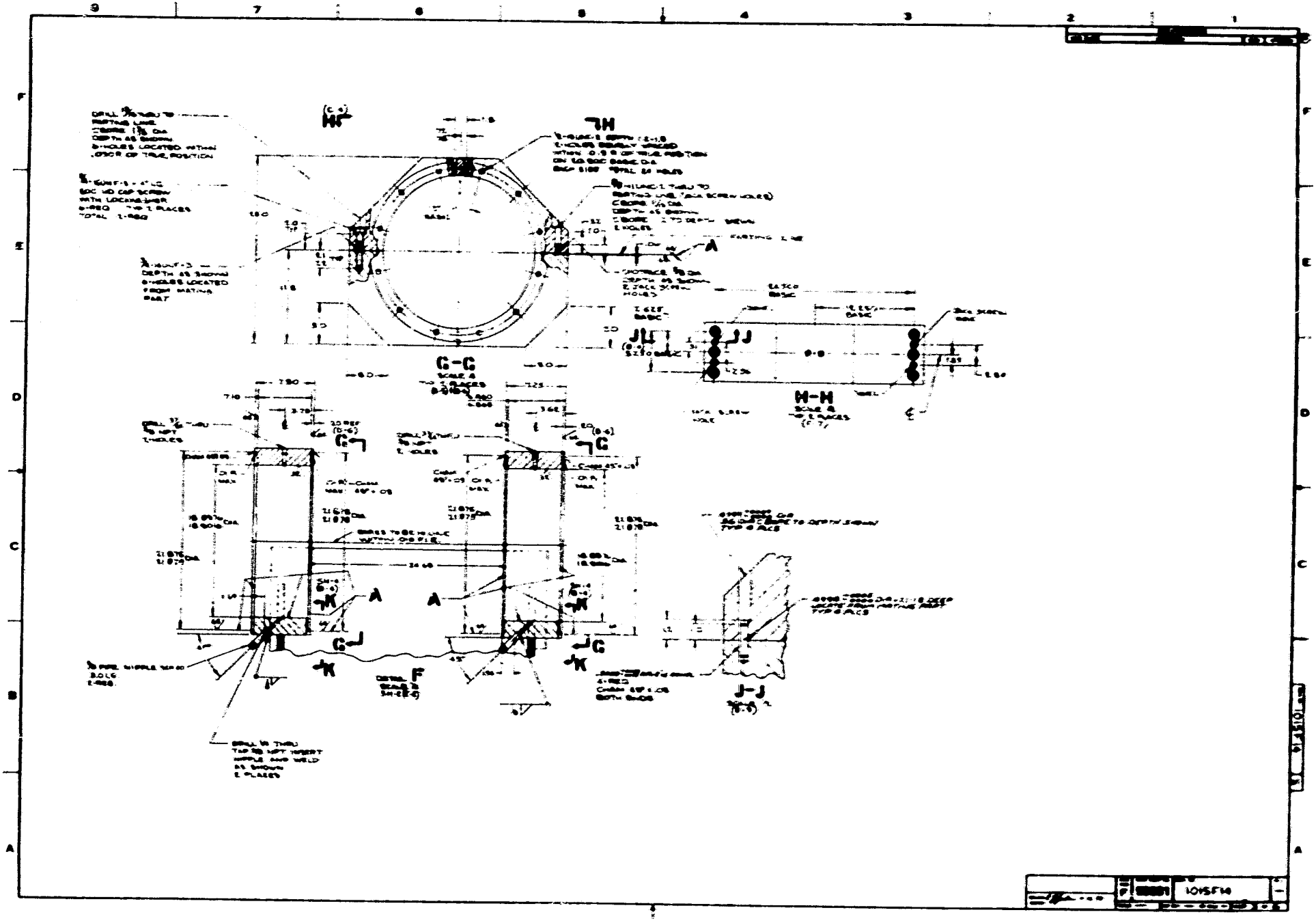
BEDPLATE
MOD OA 800kW
WIND TURBINE GENERATOR

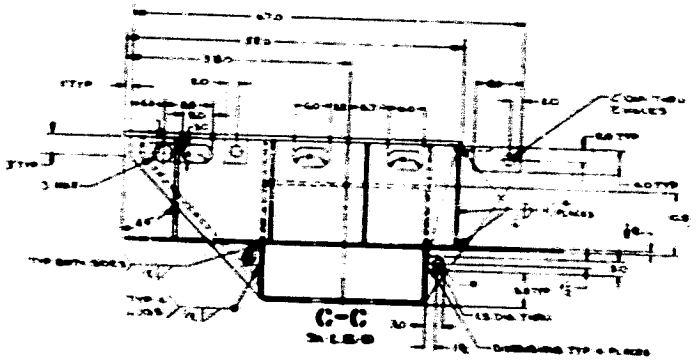
101SF14

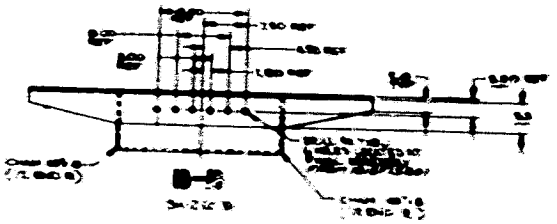


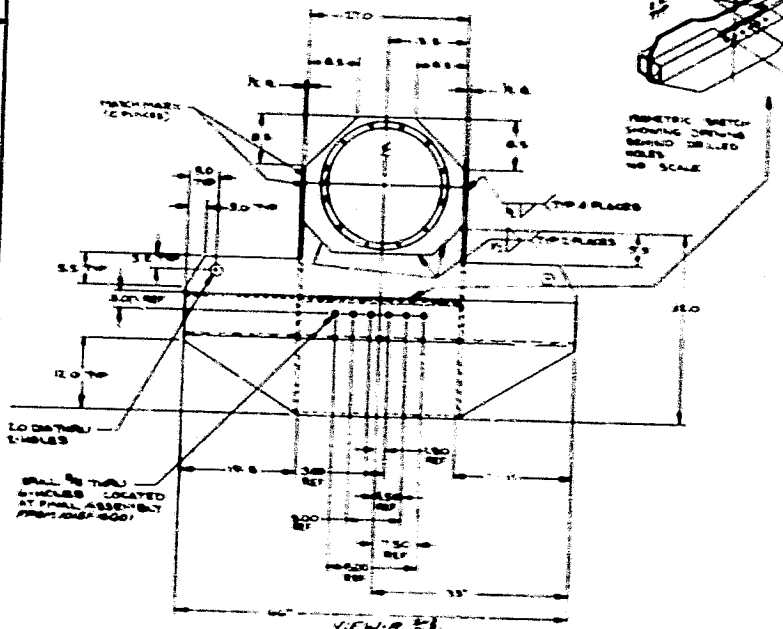
ELEVATION VIEW

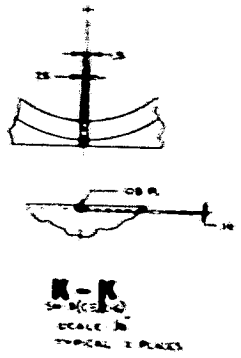
	F 58031	10F14

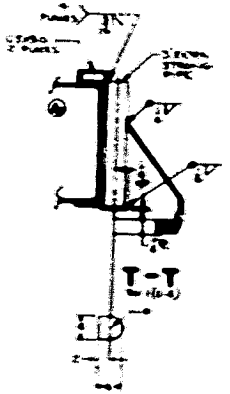

G-G
H-H
J-J
A
F

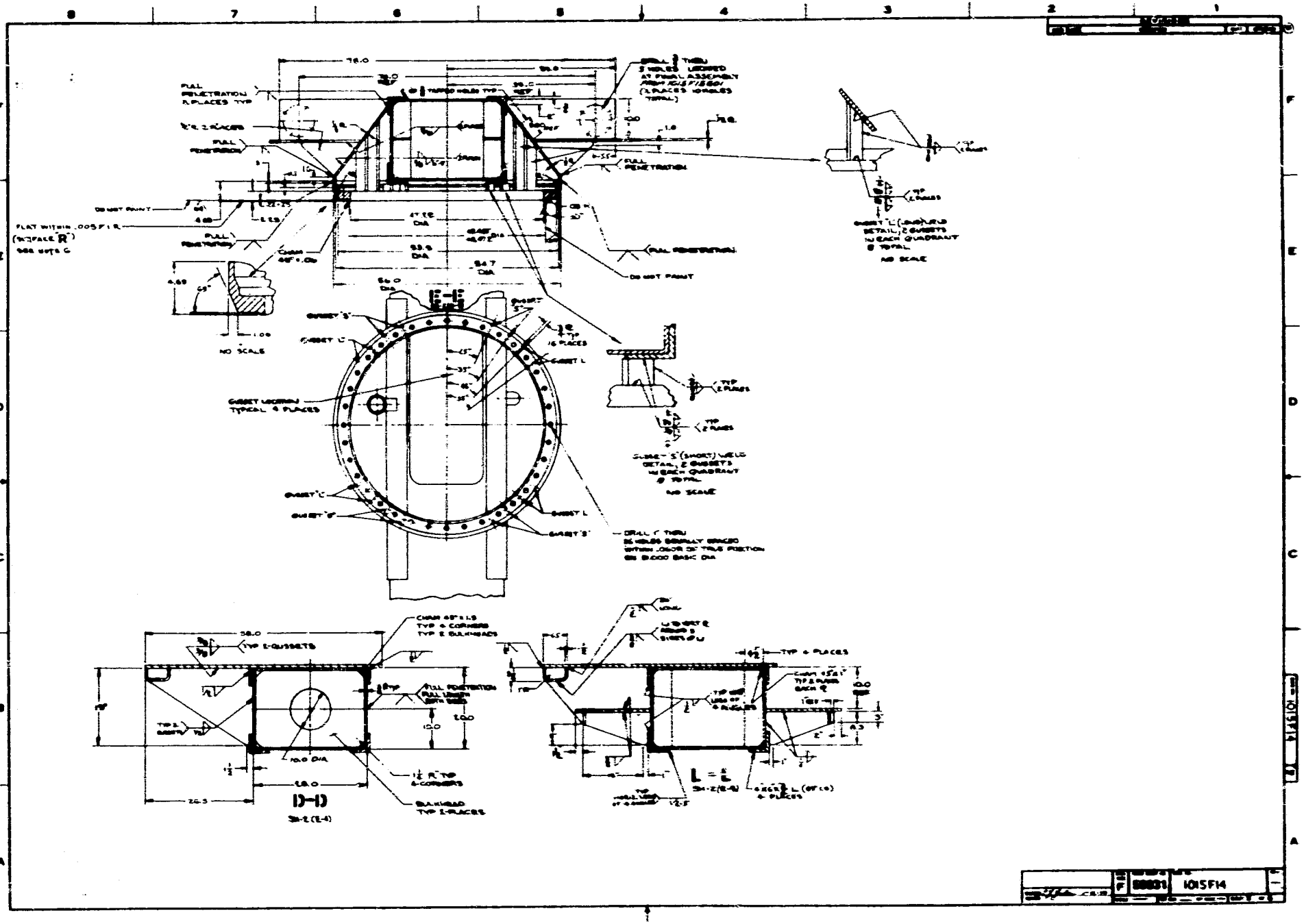

C-C

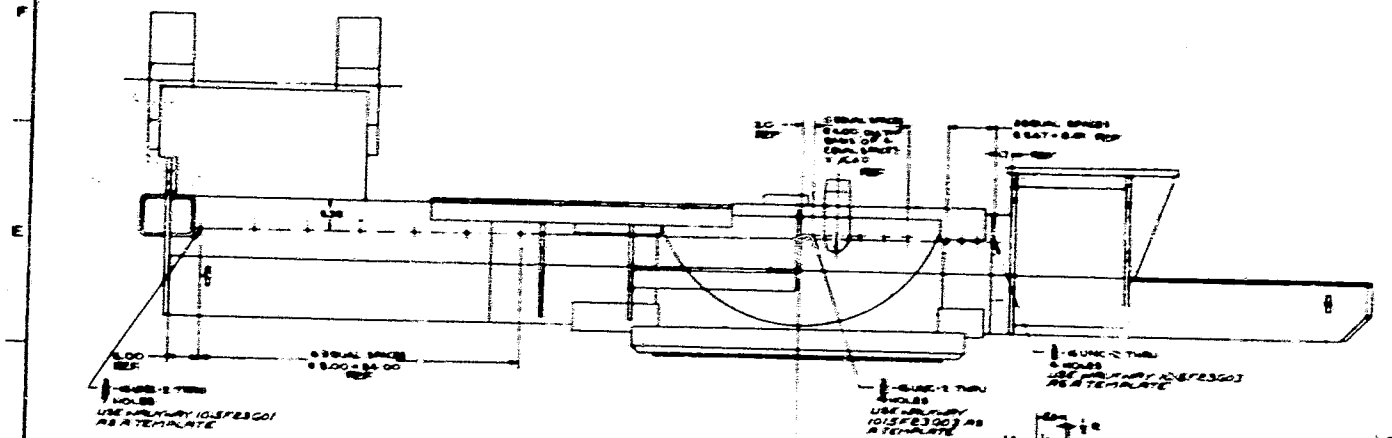

B-B


VIEW A-A
SHOWN ELEVATION

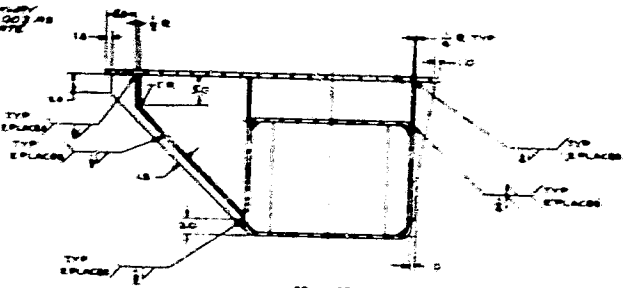

K-K
SCALE
TYPICAL 2 PLACES


T-T

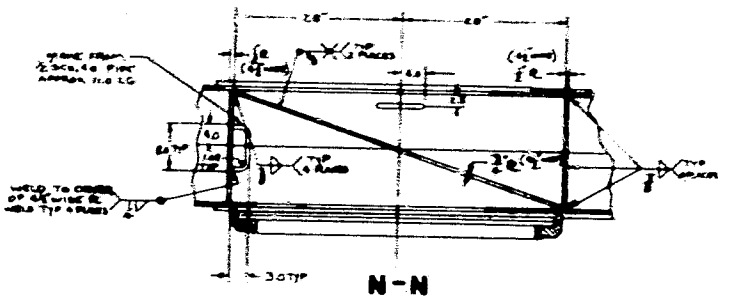

D-D
NO SCALE
DRILL (THRU)
DO NOT PAINT
FULL PENETRATION
FLAT WITHIN .005 F.I.R.
(SURFACE R)
NO SCALE
GUSSET L (SHORT) WELD DETAIL, 2 GUSSETS IN EACH QUADRANT
8 TOTAL
NO SCALE
GUSSET S (SHORT) WELD DETAIL, 2 GUSSETS IN EACH QUADRANT
8 TOTAL
NO SCALE
CHAMFER
TYP 4 PLACES
TYP 2 PLACES
16 PLACES
TYP 4 CORNERS
TYP 8 BULKHEADS
TYP 8 GUSSETS
BULKHEAD
TYP 2 PLACES
L = L/2
4 EQUAL L (OPT'L)
4 PLACES



M-M

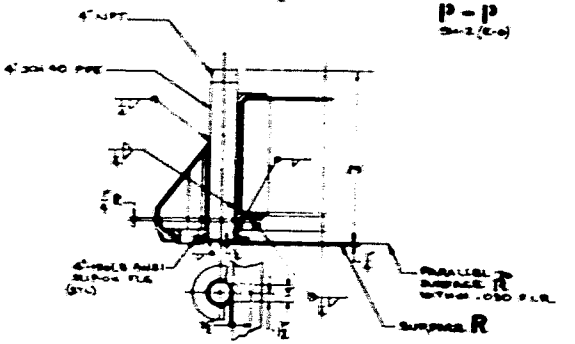


P-P



N-N

TYPICAL 2 PLACES



S-S

	F	58031	015F14

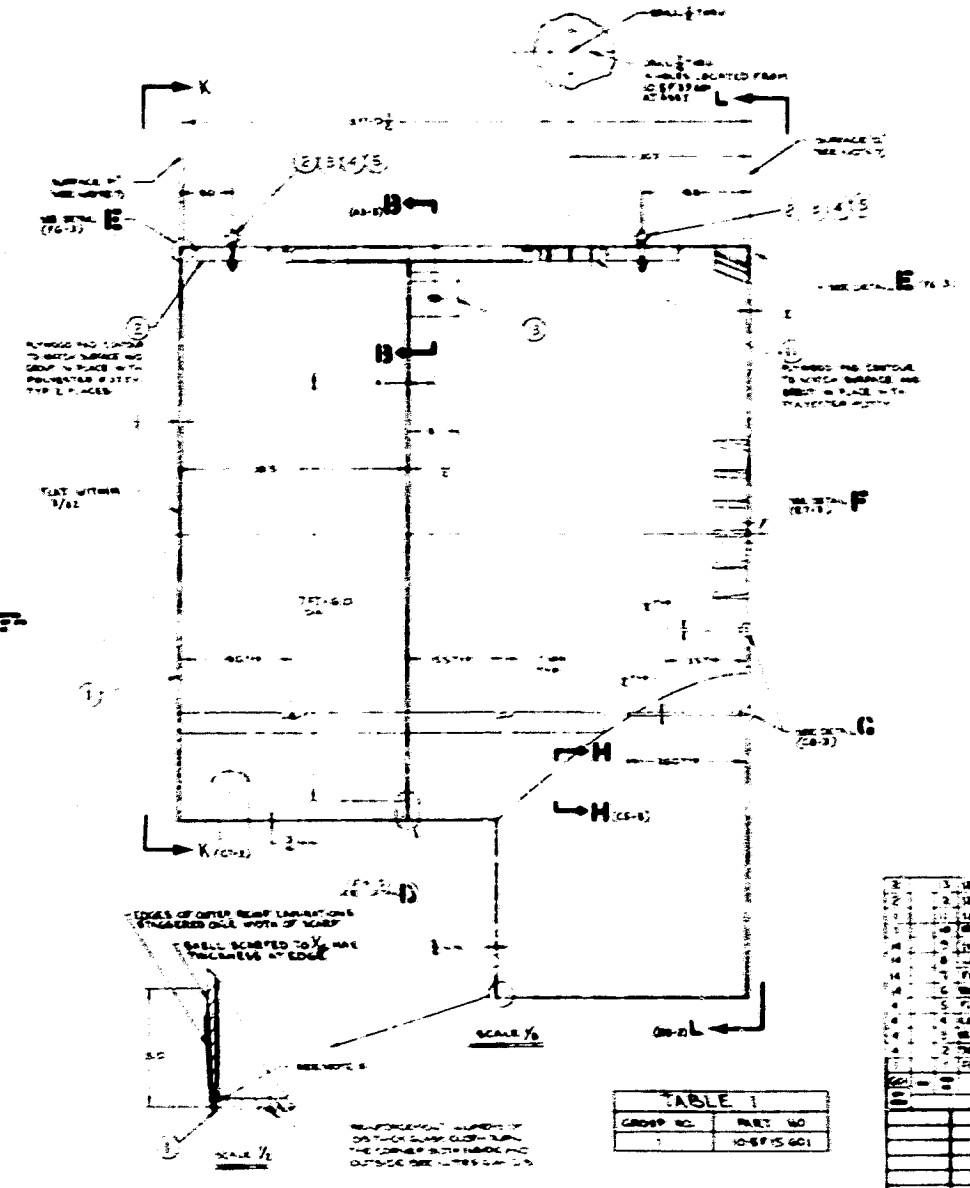


TABLE 1	
GROUP NO.	PART NO.
1	1015F15 G01

PARTS LIST					
3	12.00-8.00 x 1.00 THK RING				PLYWOOD
2	12.00 DIA x 1.00 THK RING				PLYWOOD
1	18.00 DIA x 1.00 THK RING				PLYWOOD
QTY	PART NO.	DESCRIPTION	MATERIAL		
8		LOCKWASHER .750 STD	STL	CORR. RES	
7		FLAT WASHER .750 STD	STL	CORR. RES	
6		[illegible]			
5		FLAT WASHER .750 STD	STL	CORR. RES	
4		LOCKWASHER .750 STD	STL	CORR. RES	
3		[illegible]			
2		[illegible]			
1		FORWARD CENTER SHROUD			

REV	REV STATUS
3 2 1	SHEET OF SHEETS

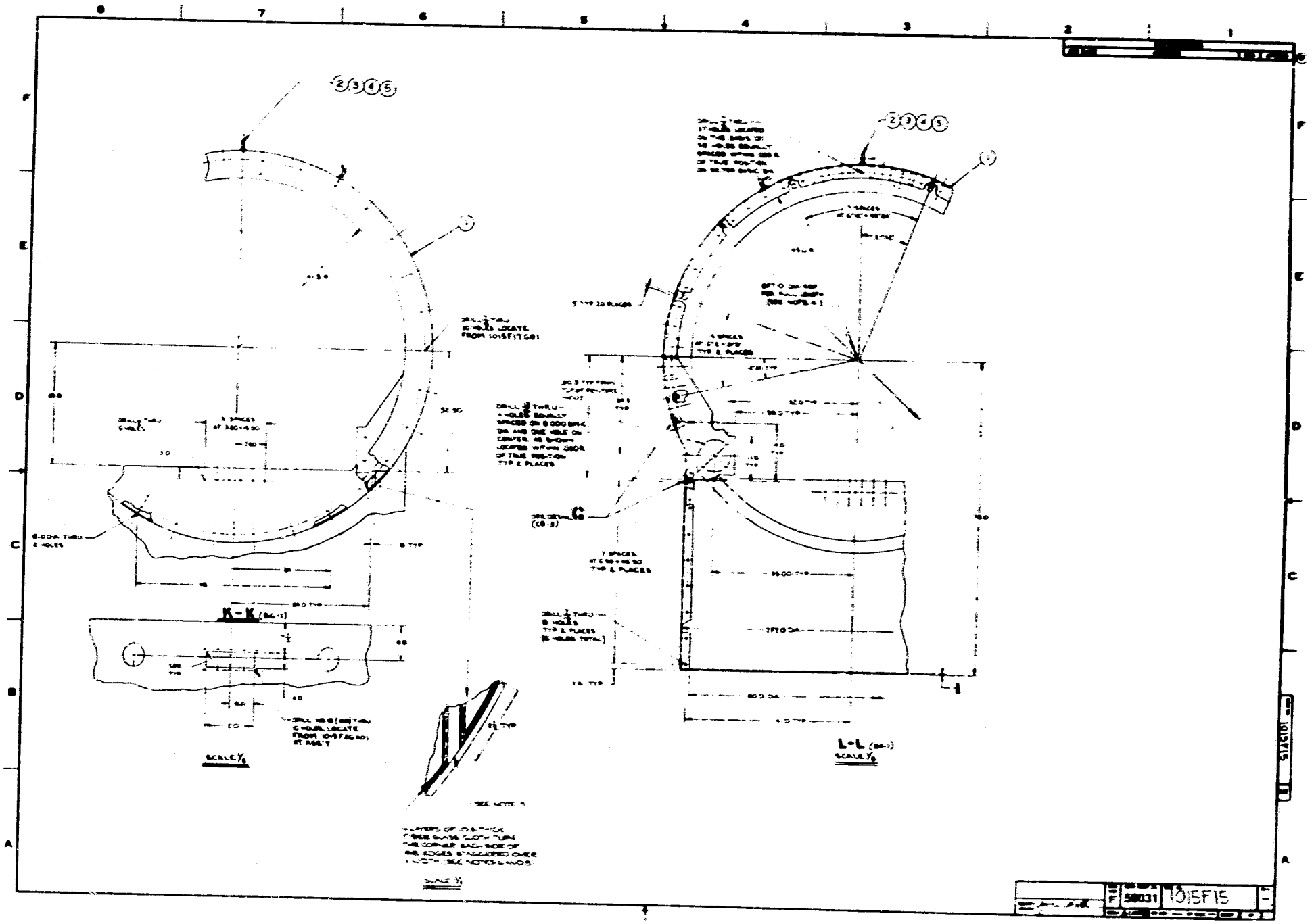
DRAWN	
CHECKED	
ENGR APPROVAL	
MFG APPROVAL	
DATE	04-01

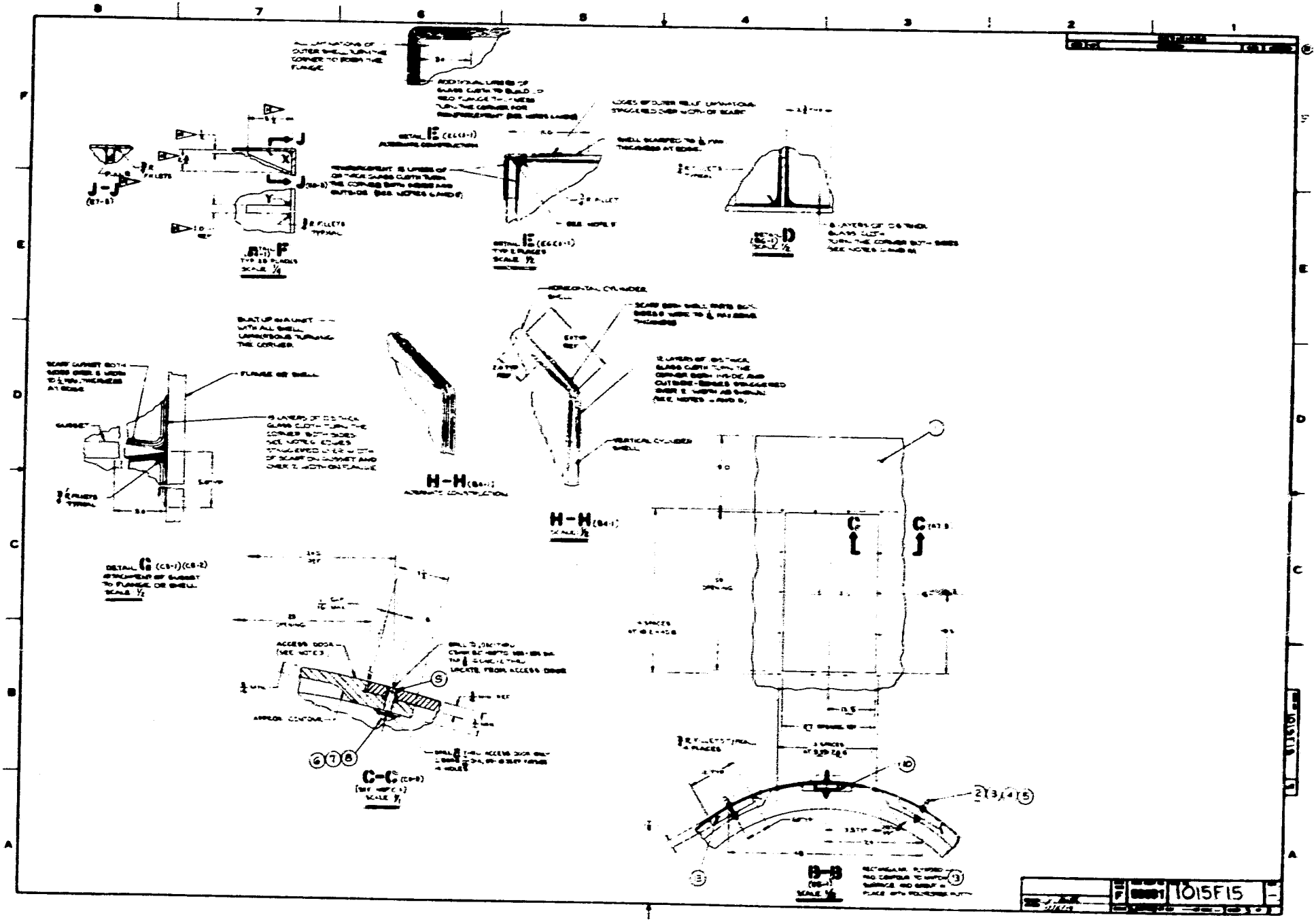
FORWARD CENTER SHROUD
1000 OR-200KW
WIND TURBINE GENERATOR

SIZE	CODE IDENT NO.	DRAWING NO.
D	00031	1015F15

SCALE 1/2

SCALE 1/6


K-K
L-L
SCALE
SEE NOTE 3
F 58031 10 15 F 15


J-J
F
E
D
H-H
C-C
B-B
C
C

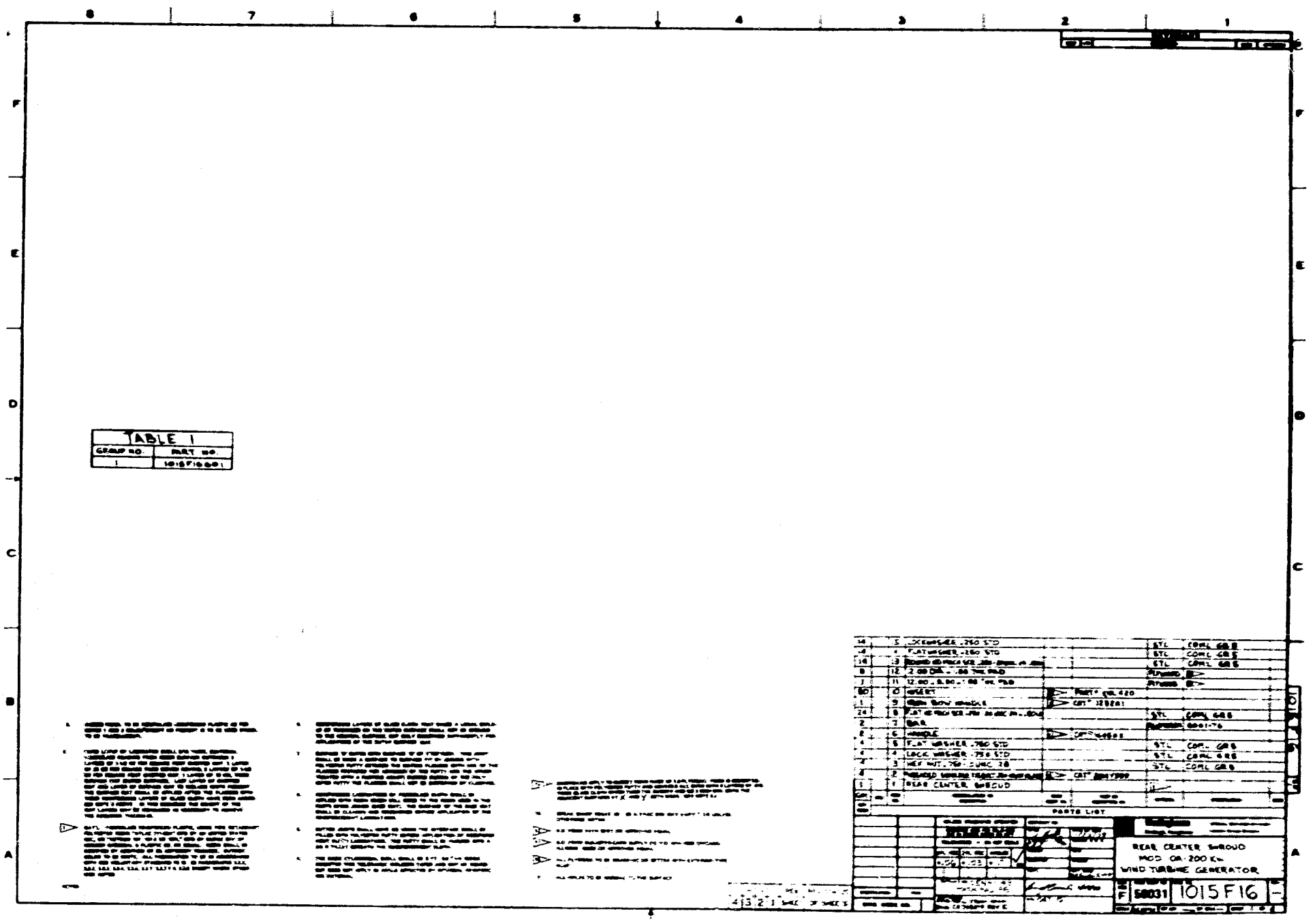
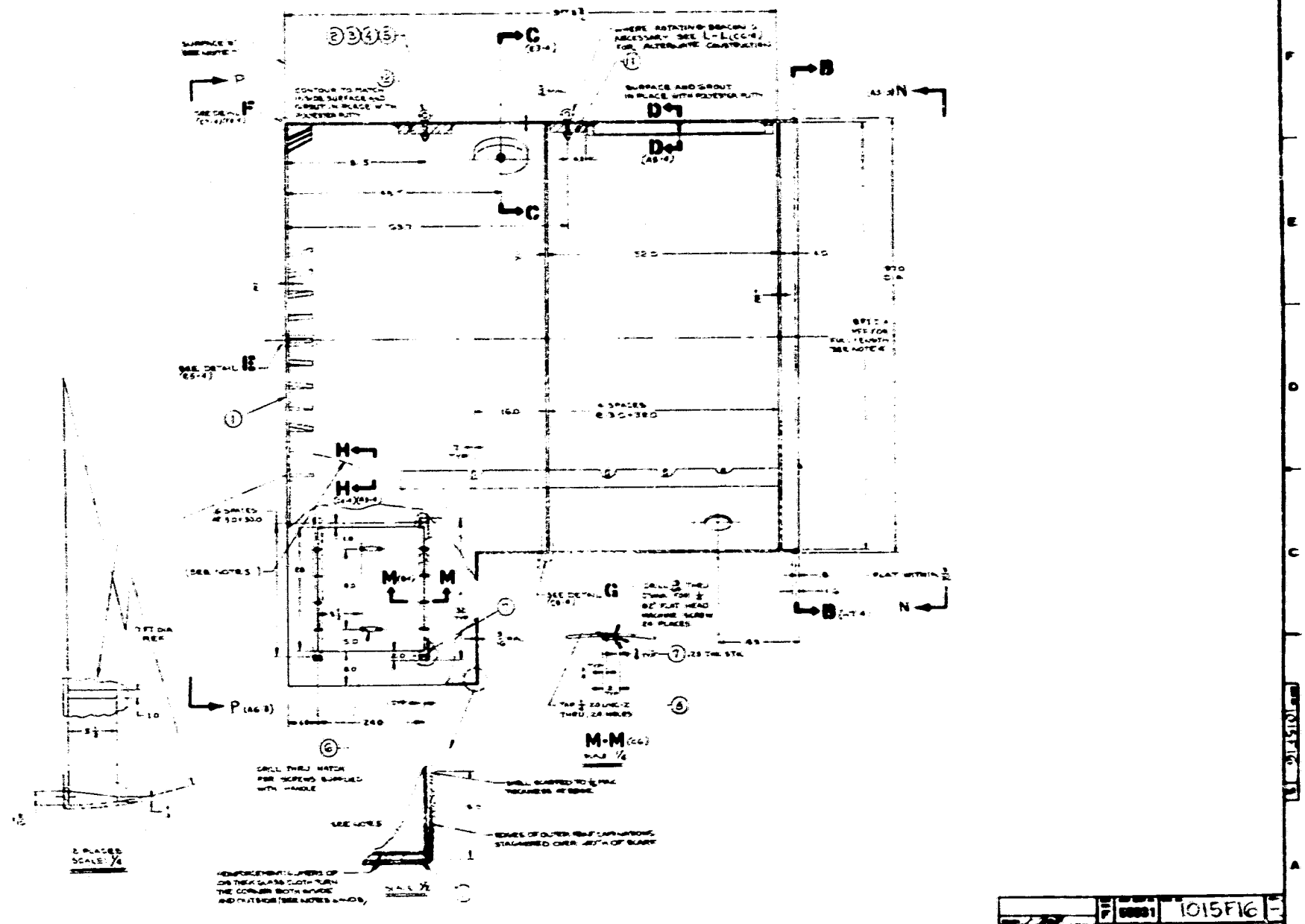
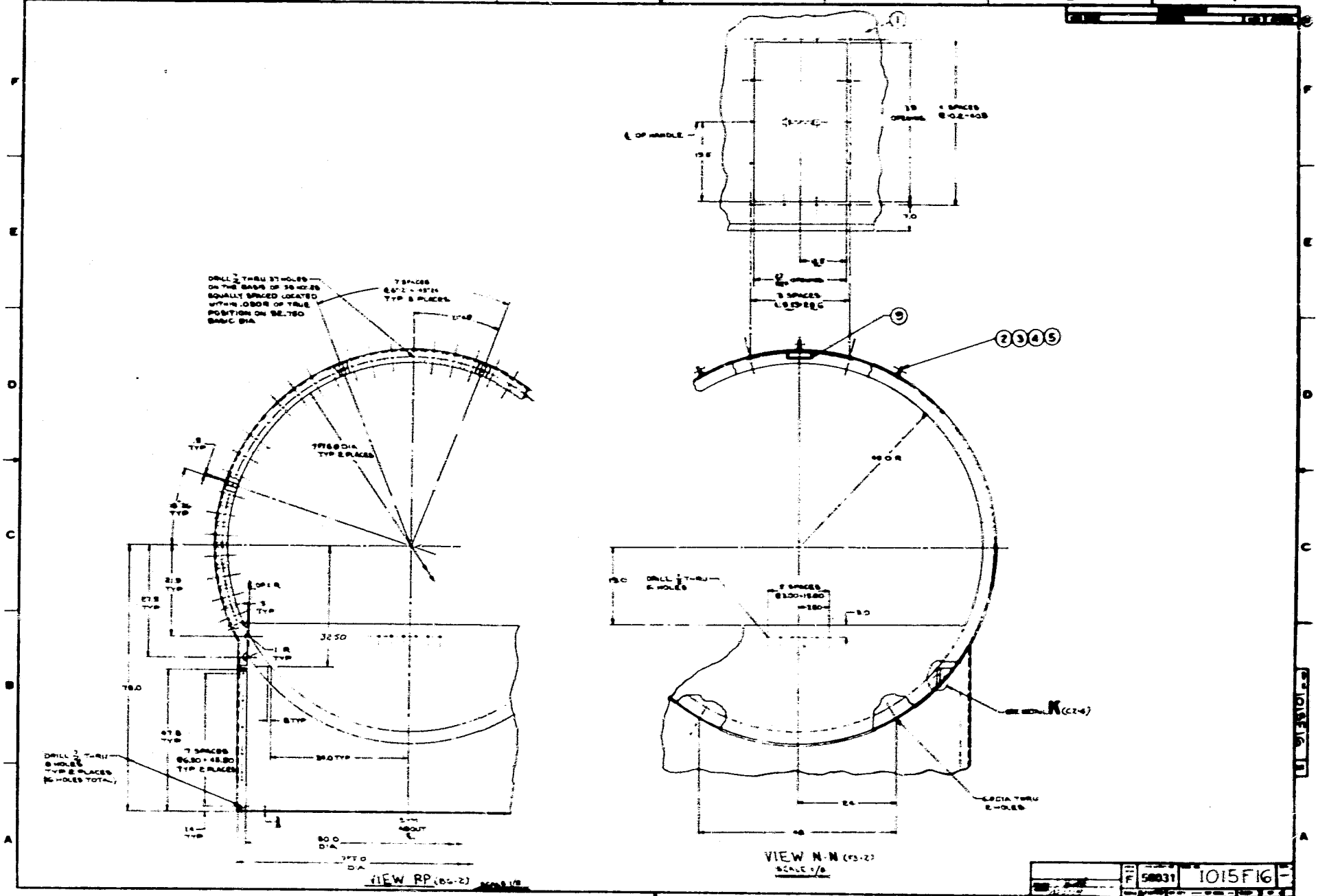
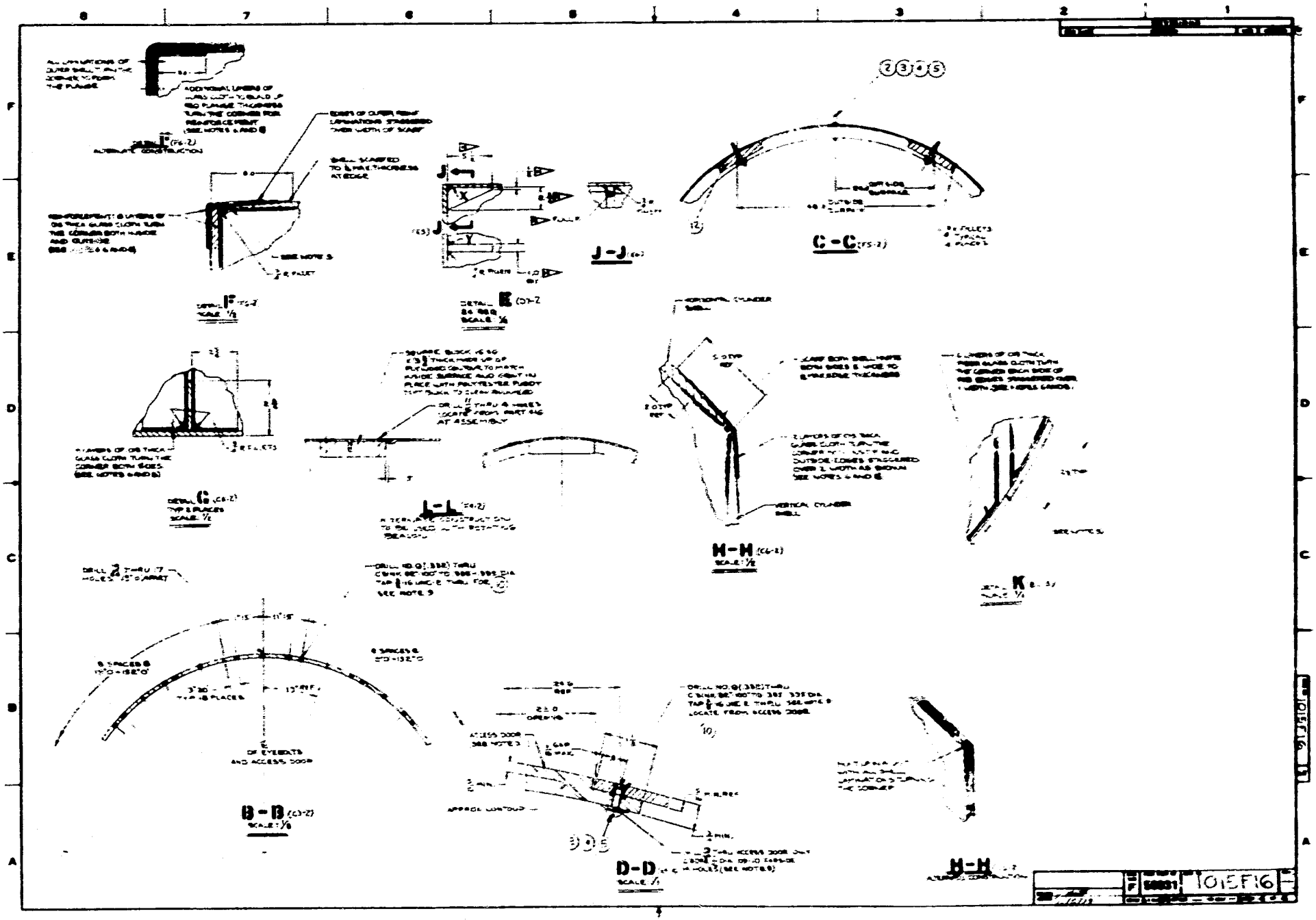
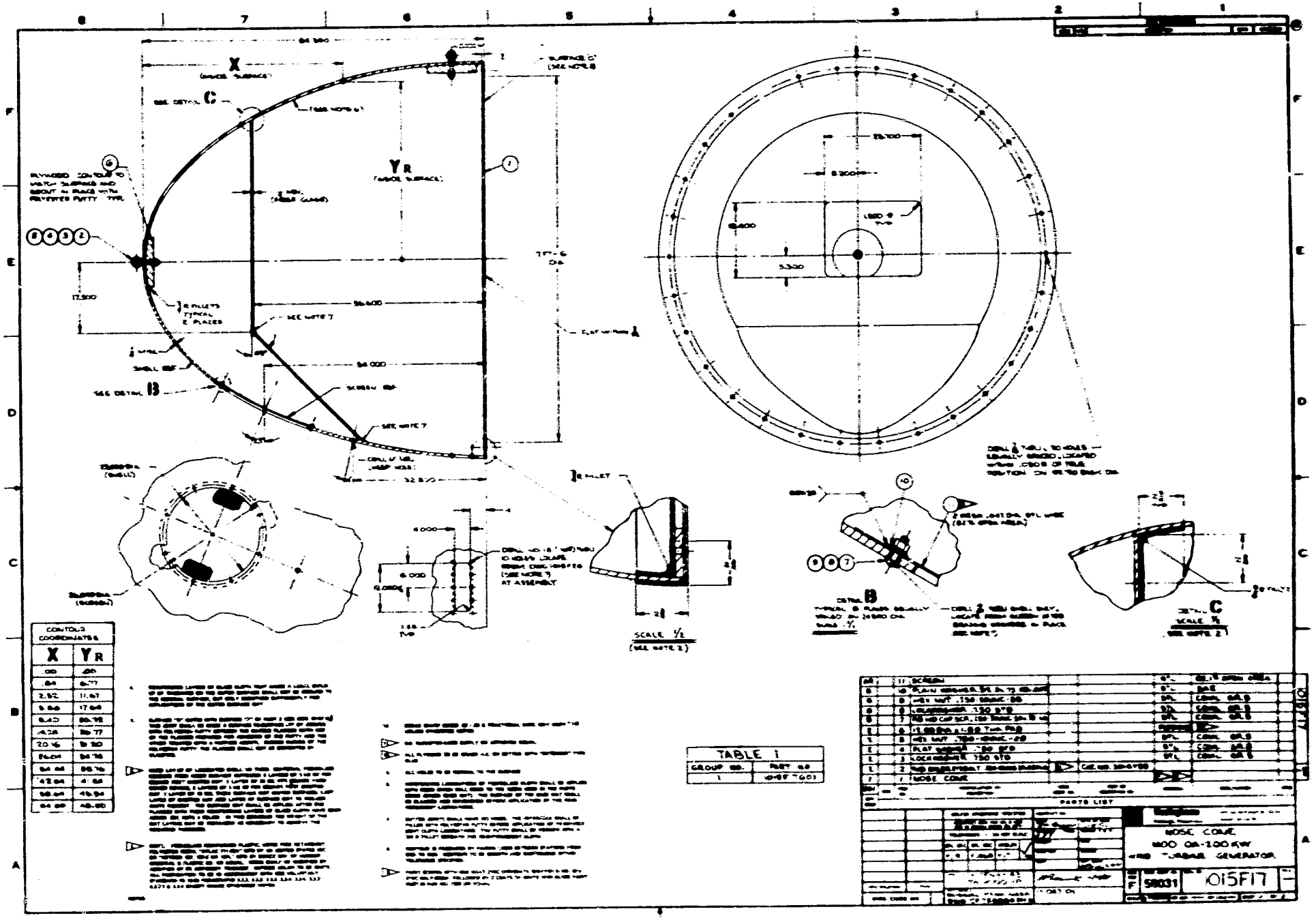


TABLE 1
GROUP NO.
PART NO.
1
1015F16G001
PARTS LIST
REAR CENTER SHROUD
MOD OA 200 KW
WIND TURBINE GENERATOR
F 58031
1015F16


1015F16


VIEW RP (B6-2)
VIEW N-N (F8-2)
SCALE 1/8
3250
80.0 DIA
3FT 0 DIA
DRILL 3 THRU 37 HOLES ON THE BASIS OF 36 HOLES EQUALLY SPACED LOCATED WITHIN .080Ø OF TRUE POSITION ON Ø2.750 BASIC DIA
DRILL 3 THRU 8 HOLES TYP 2 PLACES (16 HOLES TOTAL)
7 SPACES Ø6.50 = 45.80 TYP 2 PLACES
7 SPACES Ø13.00 = 91.60
4 SPACES Ø10.62 = 42.48
5 SPACES Ø10.62 = 53.10
DRILL 3 THRU 8 HOLES
7 SPACES Ø13.00 = 91.60
SEE DETAIL K (C2-4)
SEE DETAIL A THRU E HOLES
F 58031 1015F16


C-C
J-J
H-H
B-B
D-D
H-H
10 OF 16



CONTOUR COORDINATES	
X	Y R
.000	.000
.844	0.777
2.592	11.167
5.166	17.668
8.410	24.178
10.126	27.177
20.196	34.320
24.004	34.778
34.644	38.776
42.264	41.168
50.644	43.934
64.689	46.880

TABLE 1	
GROUP NO.	PART NO.
1	49E9760-001

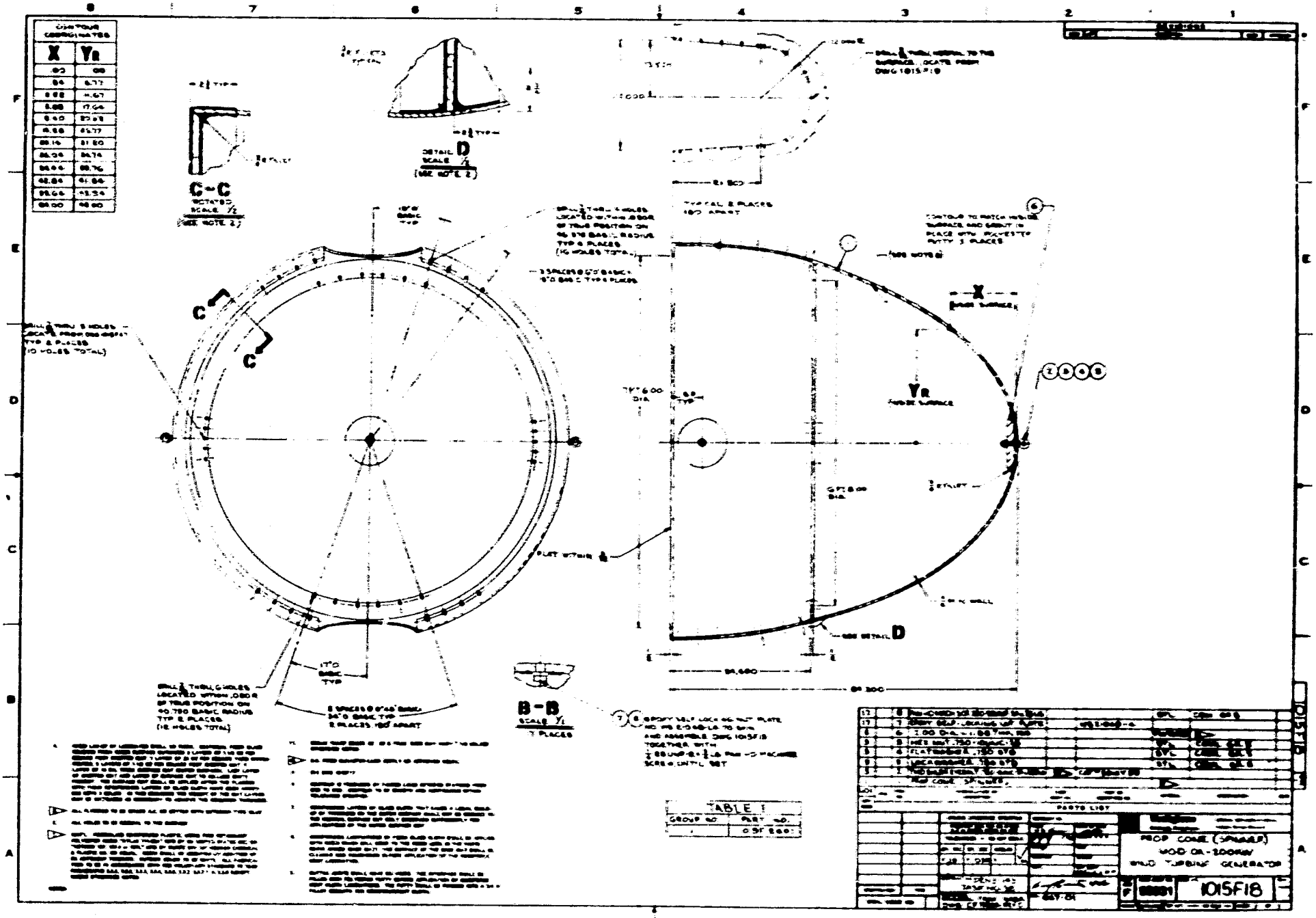
ITEM	QTY	DESCRIPTION	MATERIAL
11		SCREEN	
10		PLAIN WASHER	
9		HEX NUT	
8			
7			
6			
5		HEX NUT	
4		FLAT WASHER	
3		LOCKWASHER	
2			
1		NOSE CONE	

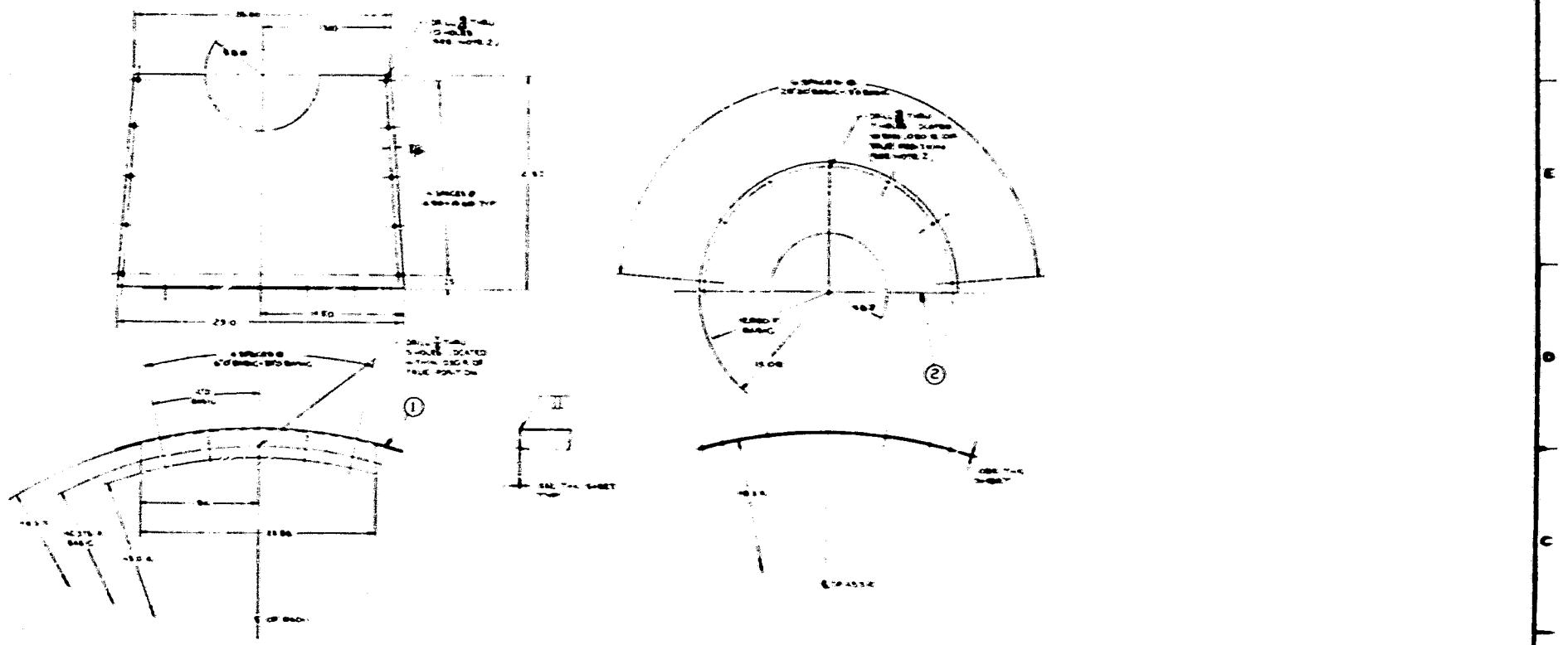
PARTS LIST

NOSE CONE
WOO GA-200 KW
WIND TURBINE GENERATOR

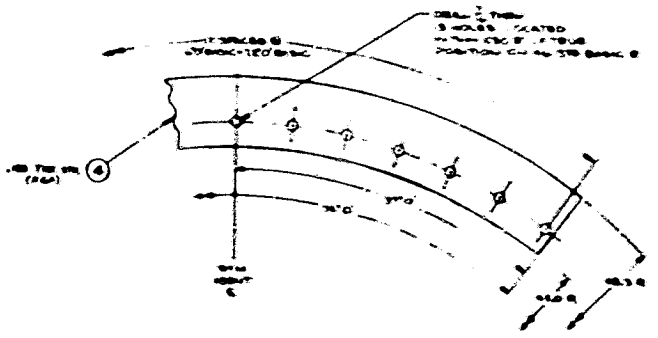
SIZE	CODE IDENT NO.	DWG NO.	REV
F	58031	1015F17	

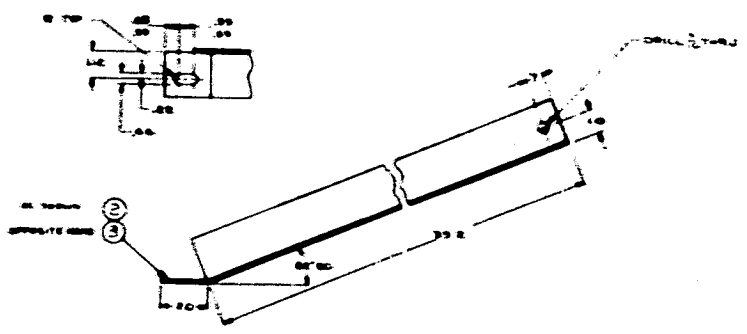
SCALE 1/2 WEIGHT
SHEET 1 OF 1

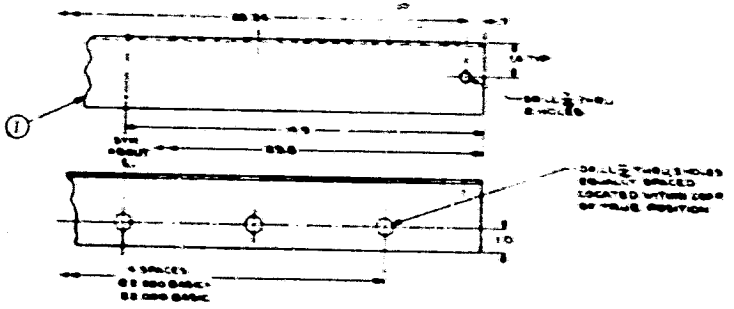

C-C
SCALE 1/2
D
SCALE 1/1
B-B
SCALE 1/1
Yn
TABLE I
GROUP NO
PART NO.
PROP CONE (SPINNER)
MOD OA-200KW
WIND TURBINE GENERATOR
1015F18



F	98831	1015 F19





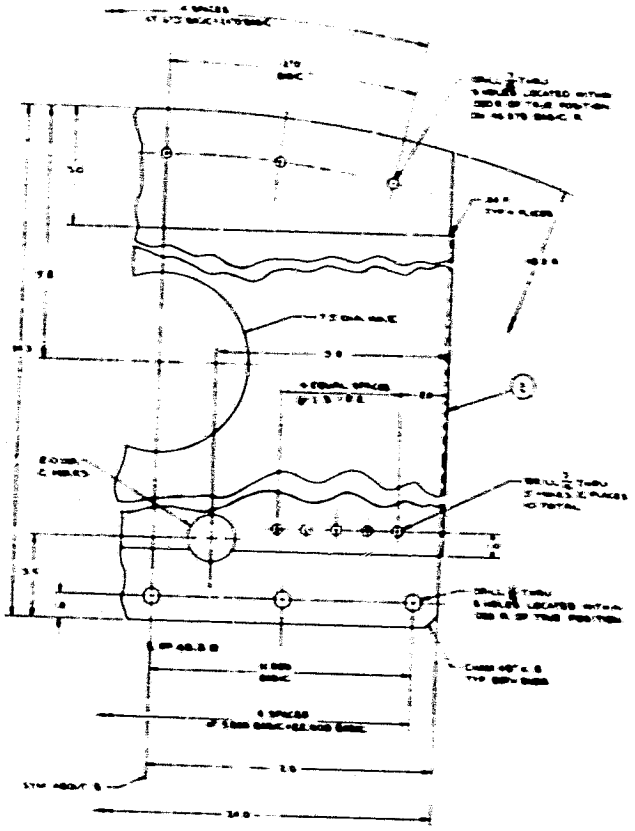


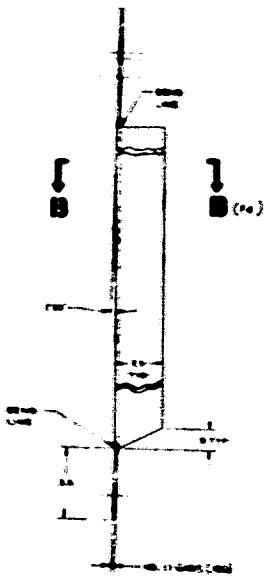
0	ISSUED FOR CONSTRUCTION			
1				
2				
1				

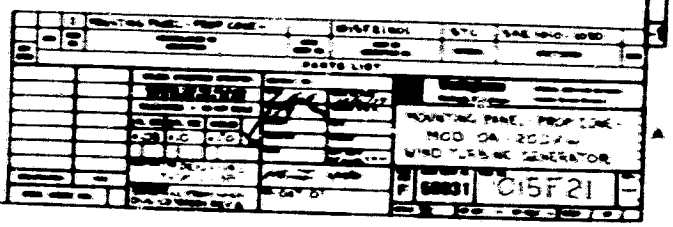
PARTS LIST

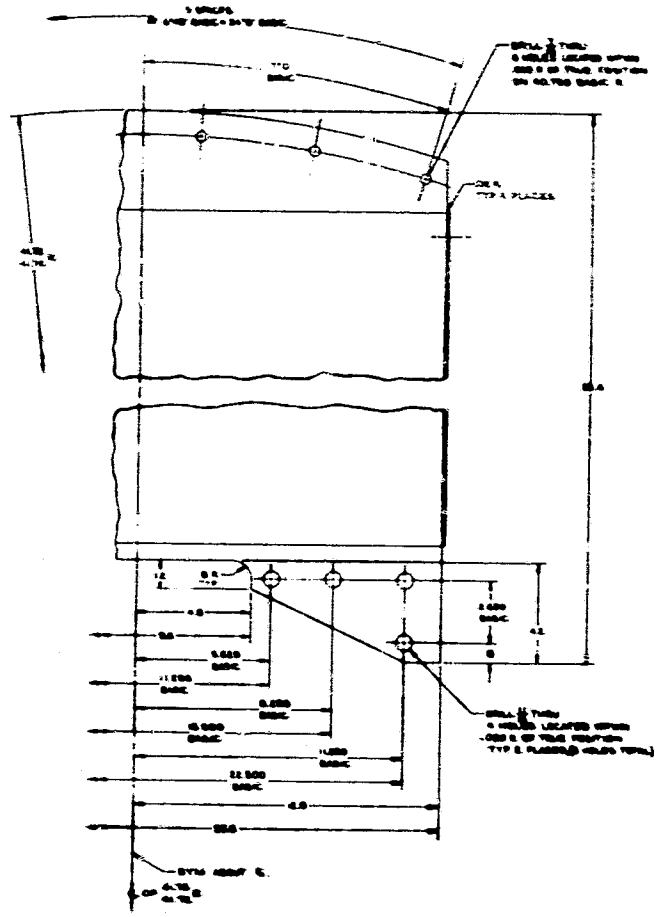
CORE SUPPORT DETAILS

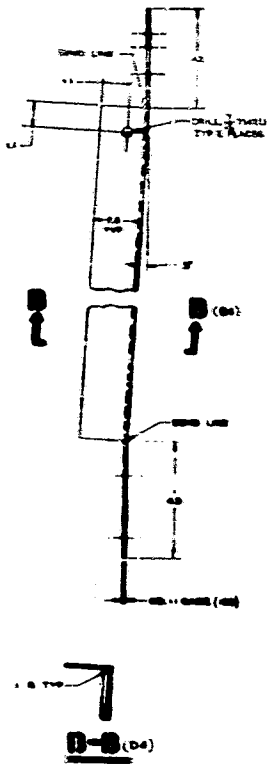
1015F20

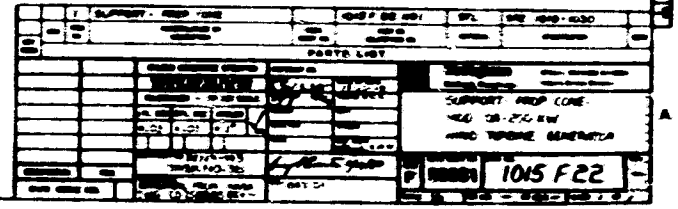


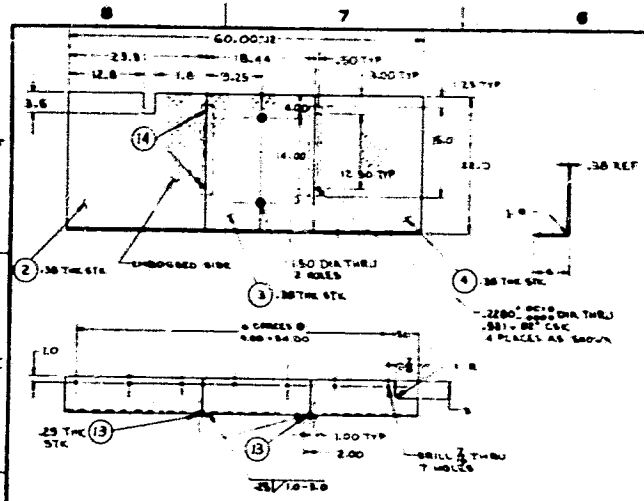




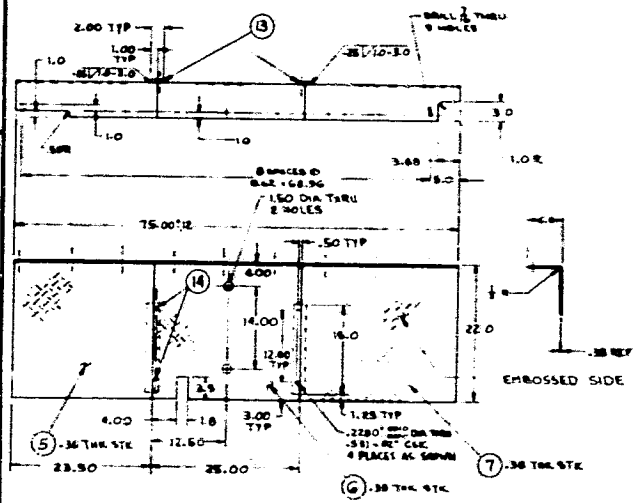




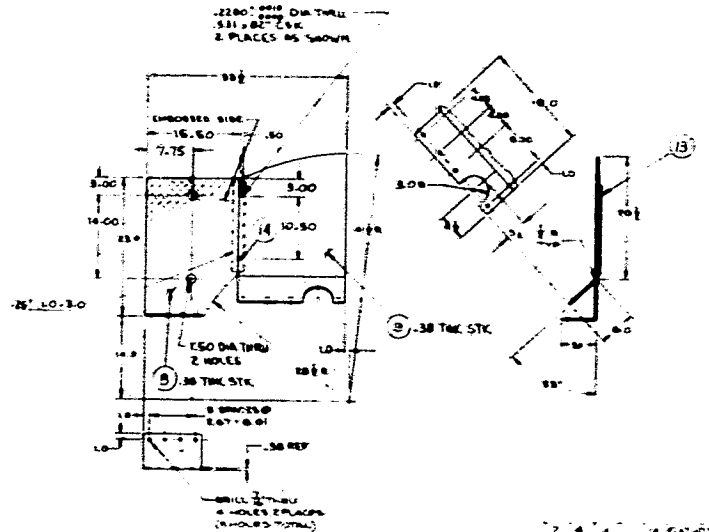

PARTS LIST
1015 F22



GROUP-1



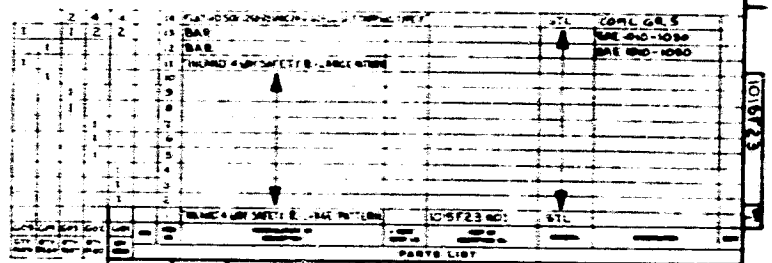
GROUP-2



GROUP-3

TABLE 1

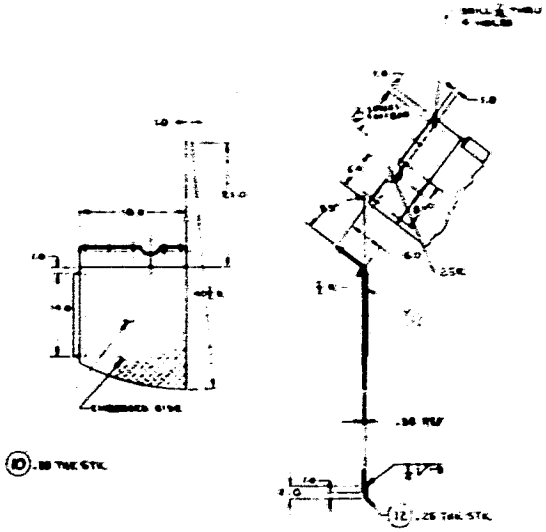
GROUP NO.	PART NO
1	1015F23G01
2	1015F23G02
3	1015F23G03
4	1015F23G04
5	1015F23G05



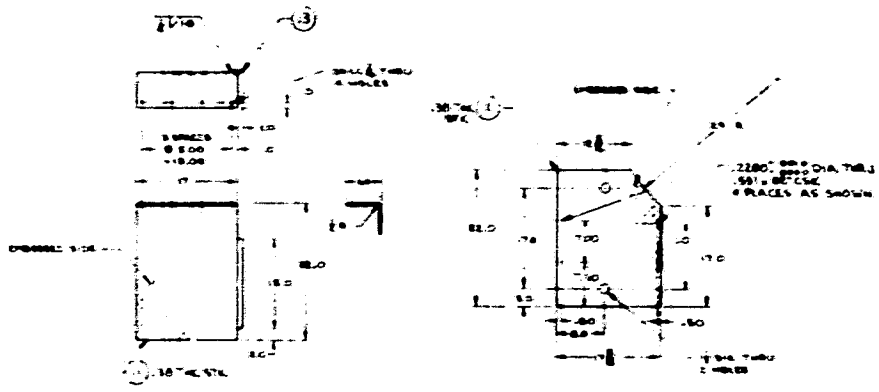
PARTS LIST

ALWAYS
MOD OA-200 KW
WIND TURBINE GENERATOR

F 58031 1015F23



GROUP-4



GROUP-5

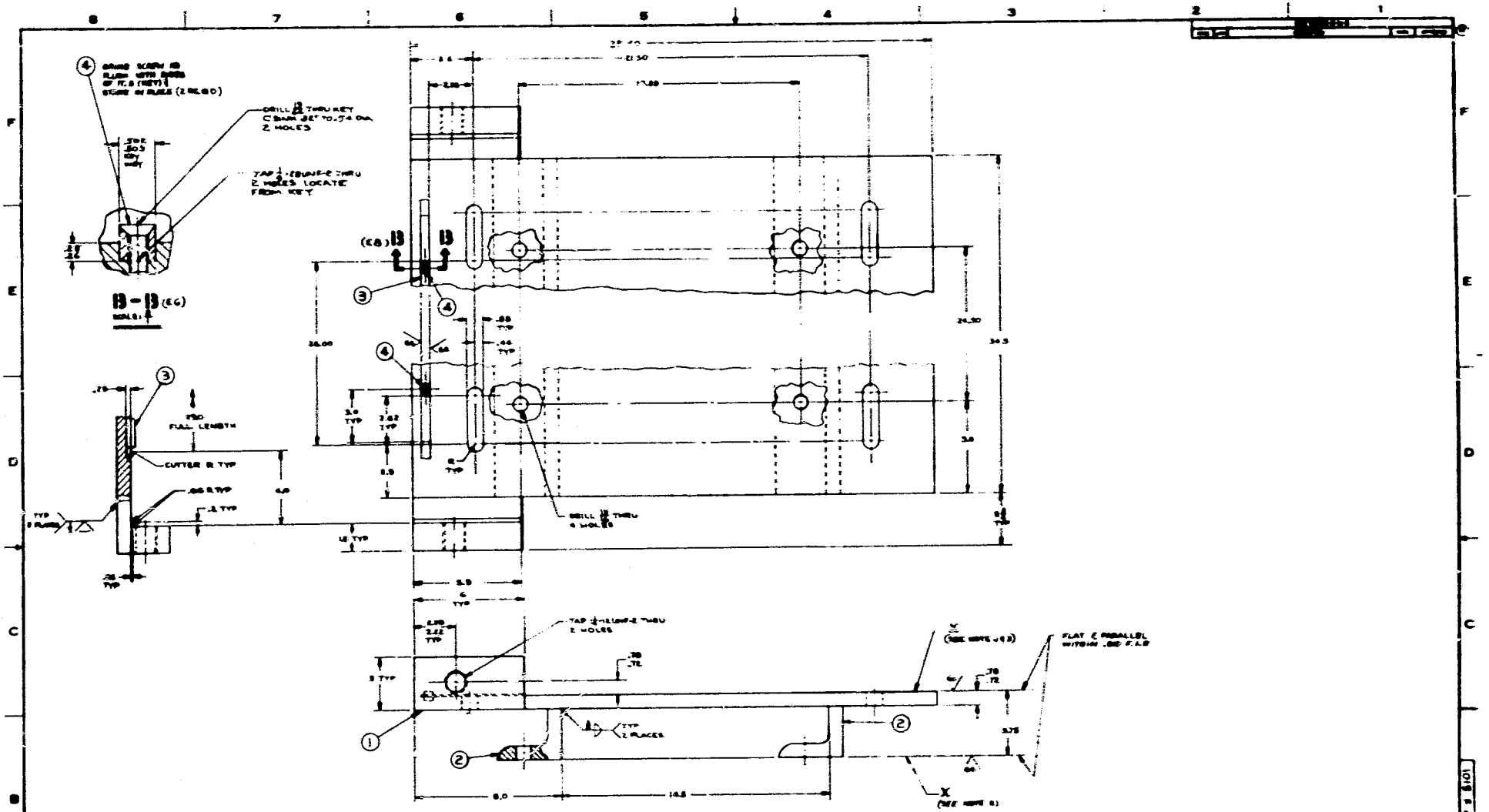
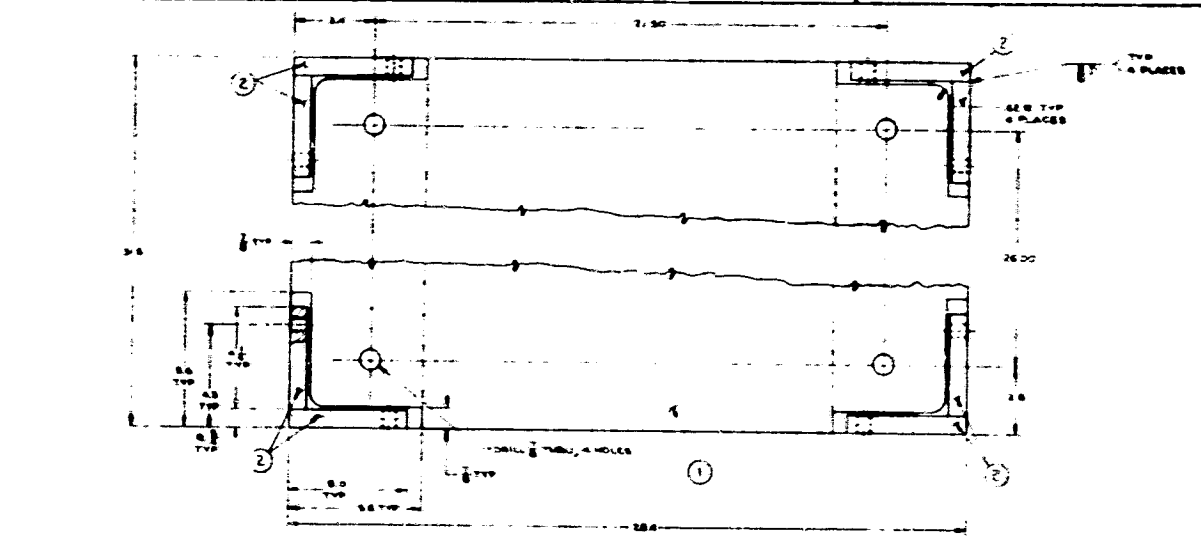


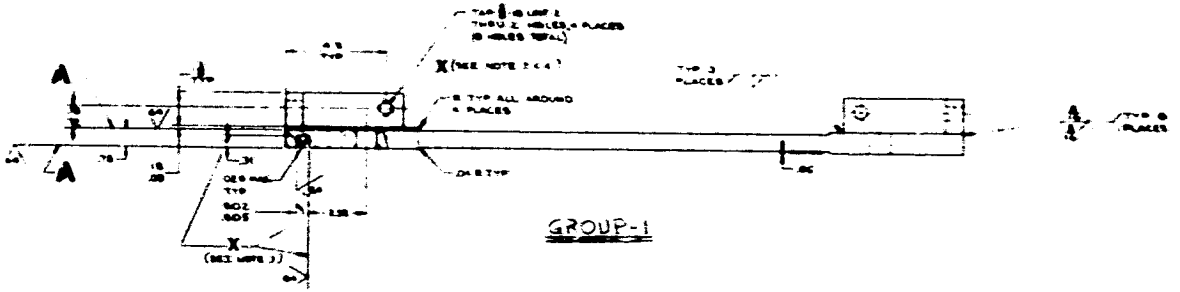
TABLE 1	
GROUP NO.	PART NO.
1	015F2401

PARTS LIST				
2	4	300A FLAT HD CAP SCR .250-.20UNC-3A LOCTITE	STL	
1	3	KEY .500 × .500 × 2.50 × .5	STL	
2	2	ANGLE 5.00 × 3.50 × .750	STL	
1	1	BOTTOM PLATE	STL	

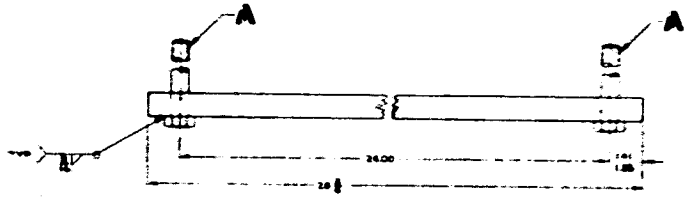
BOTTOM PLATE-GENERATOR ADJUSTMENT
RDD 10A-200 KW
WIND TURBINE GENERATOR

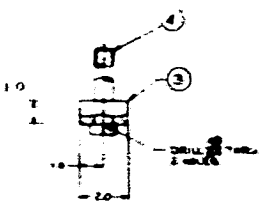
F 58031 10W5F24





GROUP-1





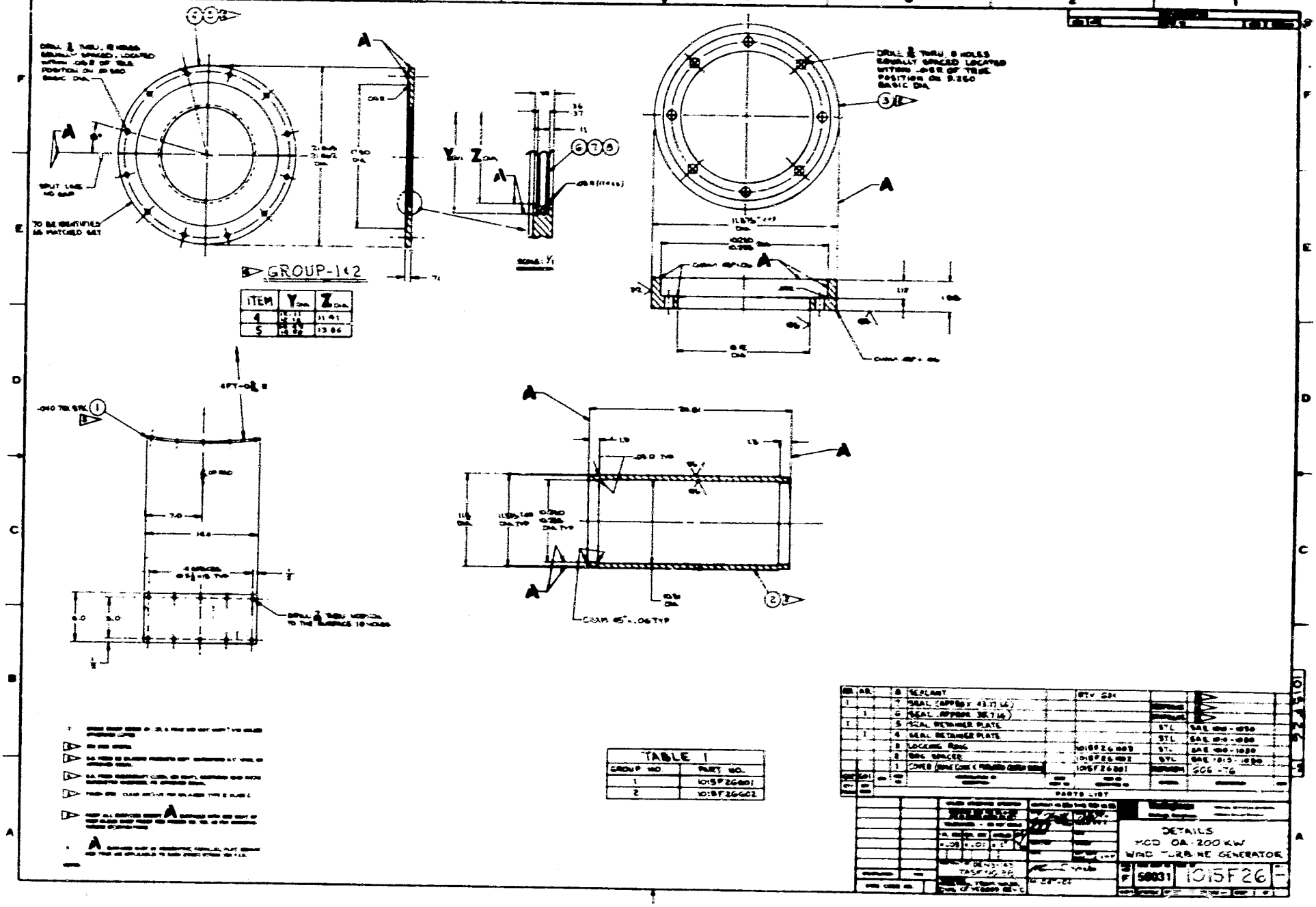
GROUP-2

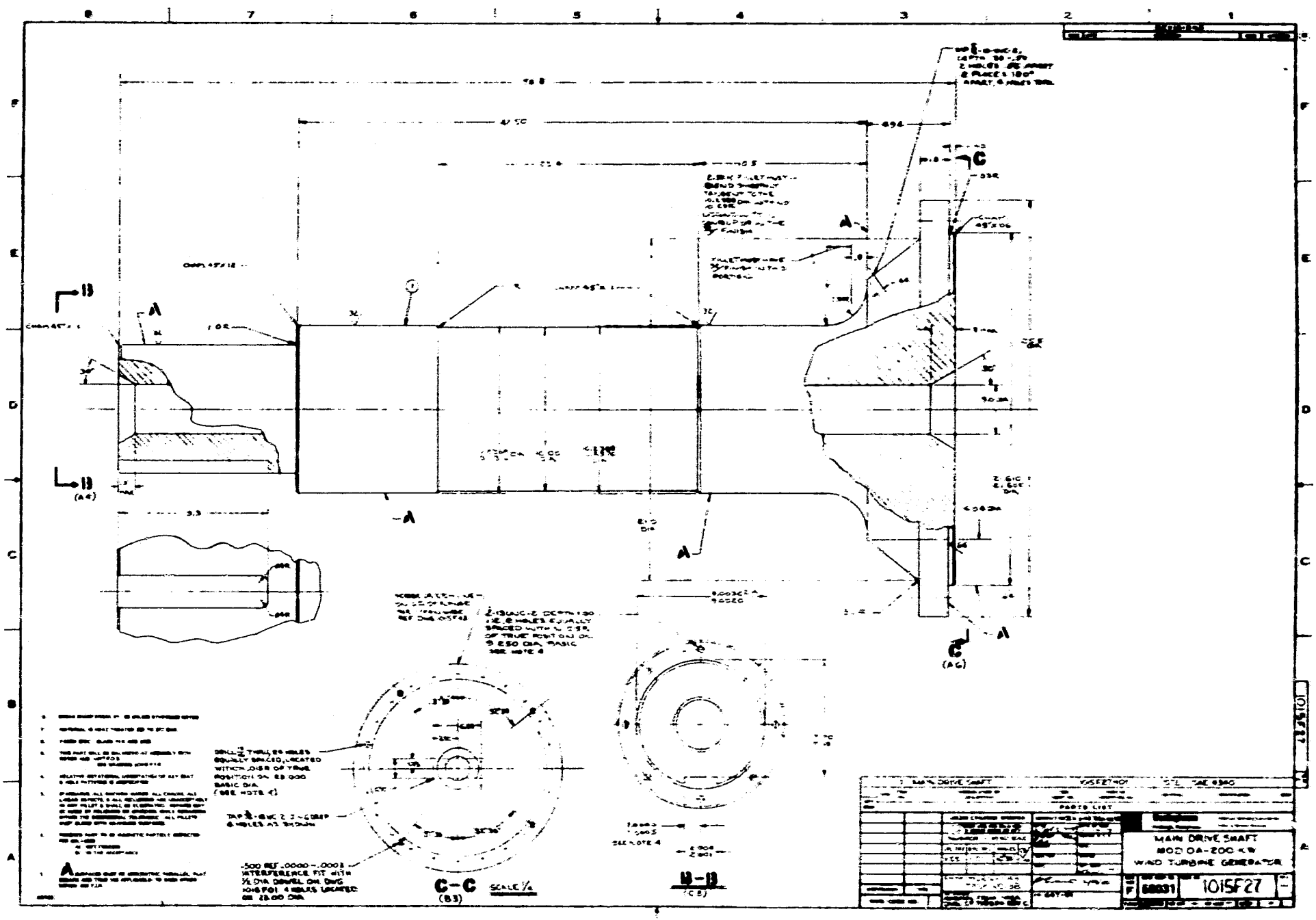
TABLE 1	
GROUP NO.	PART NO.
2	1015F2560[illegible]

PARTS LIST				
4				
3	CEILING BAR	1		
2	SIDE BAR	2		
1	TOP PLATE	1		

GENERATOR ADJUSTMENT ARMS
MOD CA-200 KW
WIND TURBINE GENERATOR

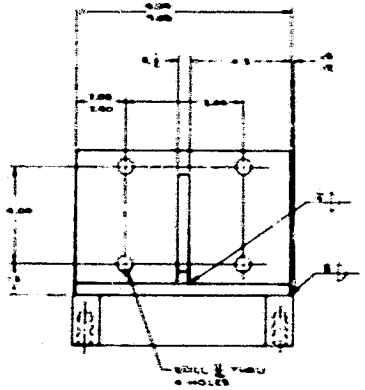
SIZE F | 00001 | 1015F25 | -

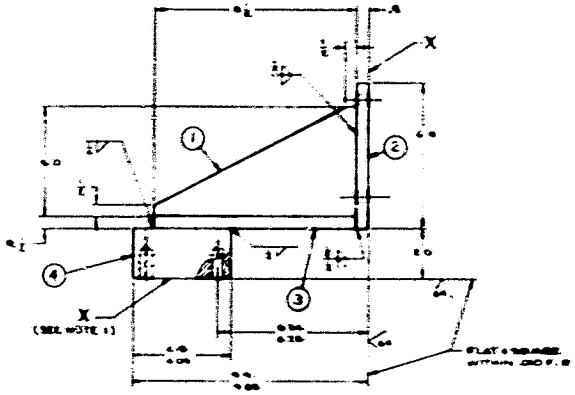

GROUP-1 & 2
ITEM
TABLE 1
GROUP NO
PART NO.
DETAILS
MOD OA-200 KW
WIND TURBINE GENERATOR
50031
1015F26



MAIN DRIVE SHAFT
MOD 0A-200 KW
WIND TURBINE GENERATOR

68031 1015F27





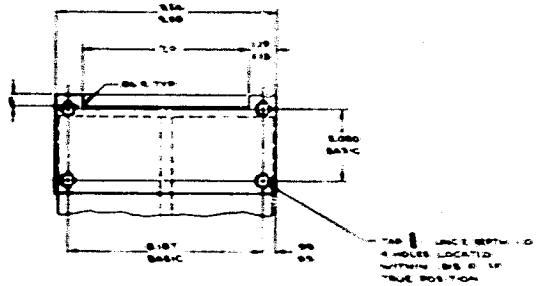


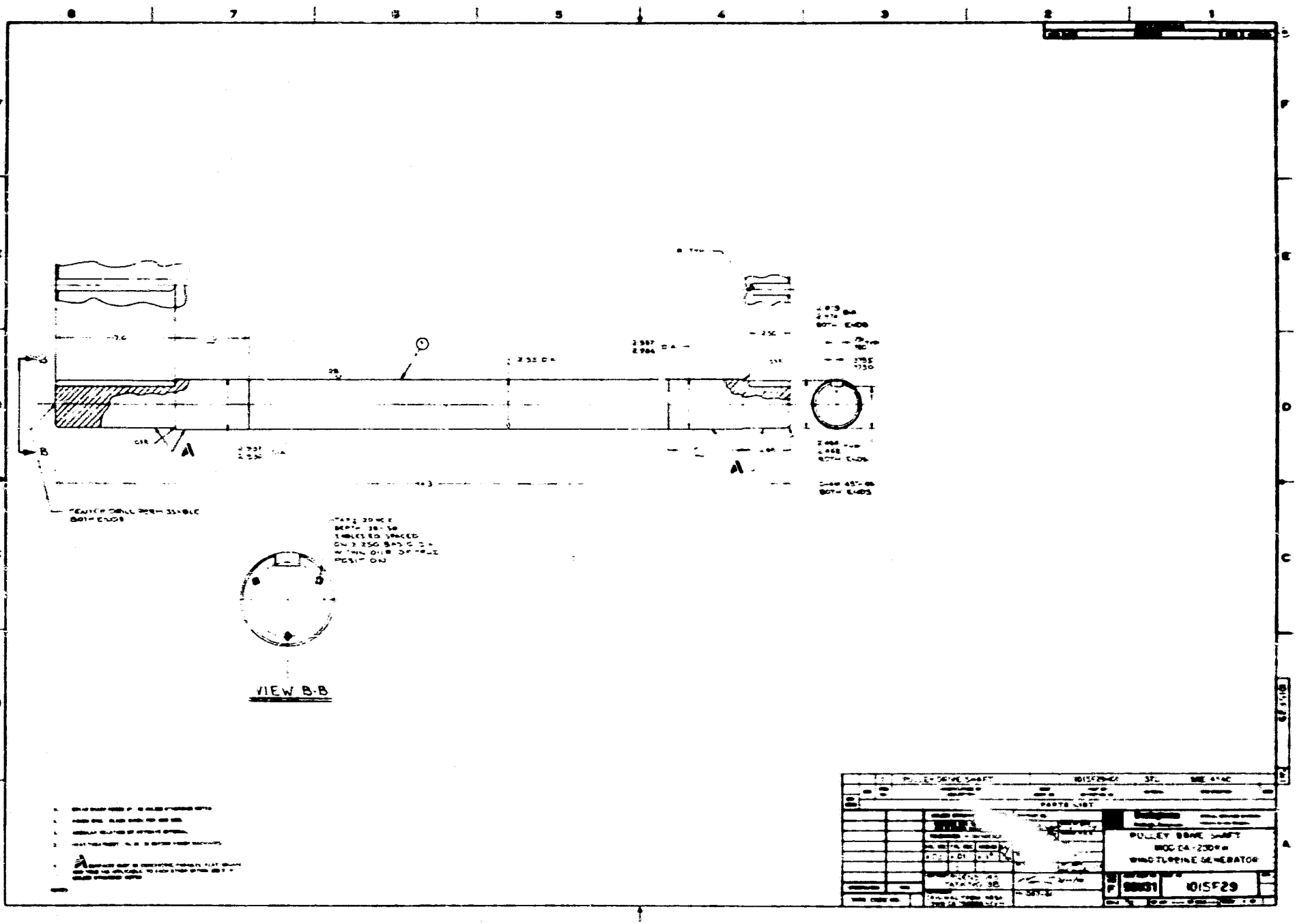
TABLE I	
GROUP NO.	PART NO
1	0.5P28G01

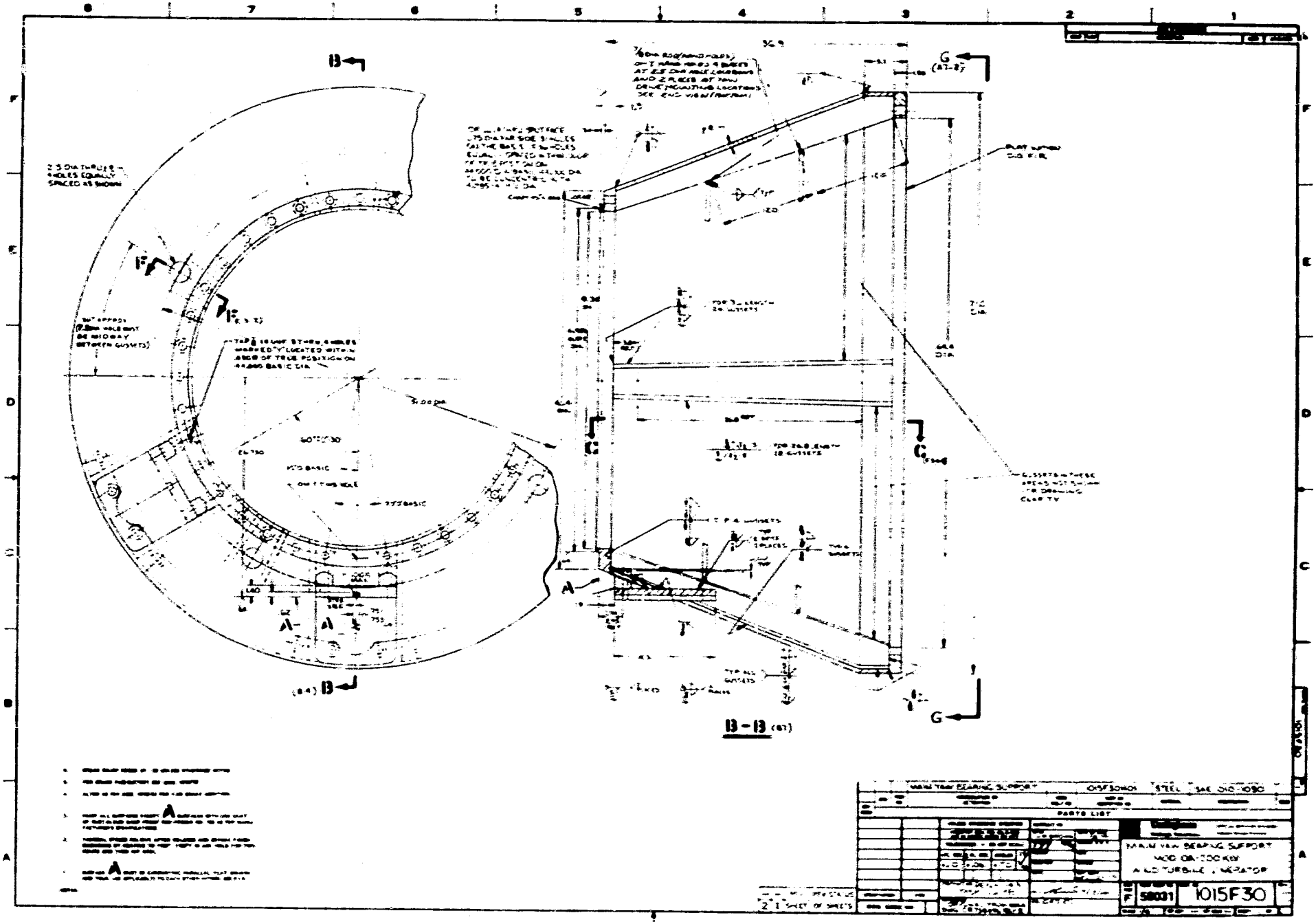
1	4	FOOT		STL	SAE 4140-1030
1	3	BASE			
1	2	BACK			
1	1	R.B		STL	SAE 4140-1030
QTY	ITEM NO.	PARTS LIST			

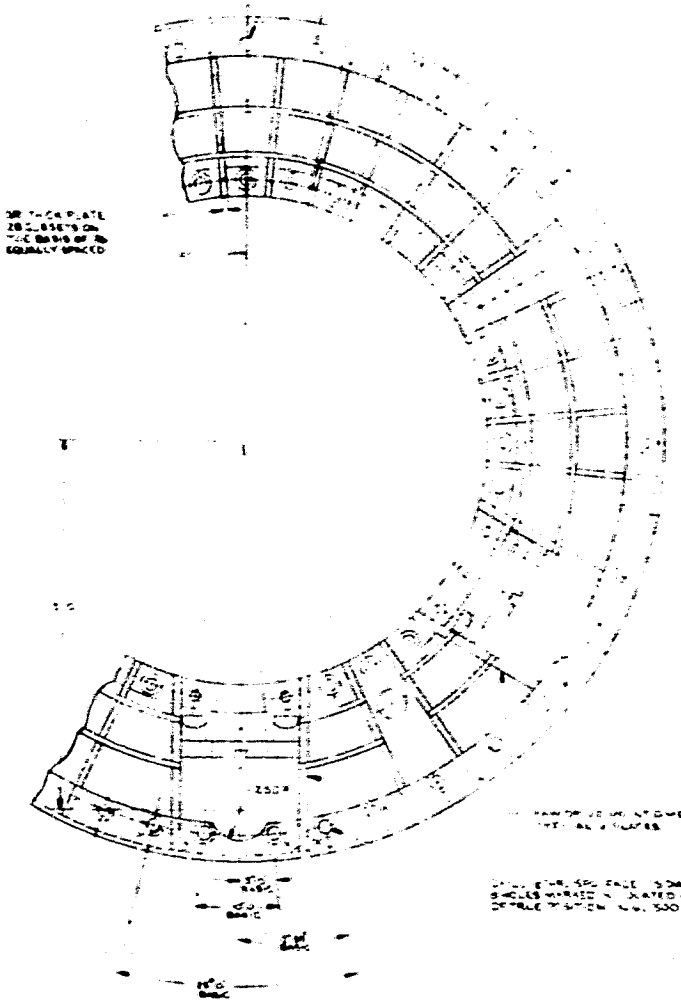
BRAKE SUPPORT
MOD 0A - 200 KW
WIND TURBINE GENERATOR

SIZE	DRAWING NO.	REV
F	50031	015 F 28

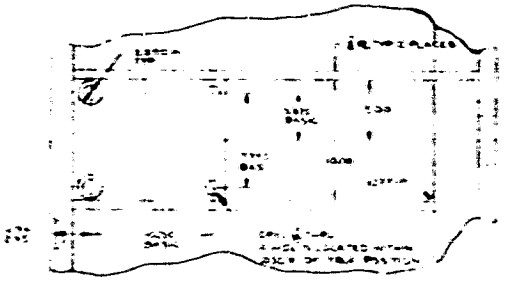
SCALE 1/2 WEIGHT 67.5 LBS SHEET 1 OF 1


VIEW B-B


B-B (61)
PARTS LIST
MAIN FAN BEARING SUPPORT
MOD OR-100 KW
AIR TURBINE GENERATOR
SIZE
58031
1015F30

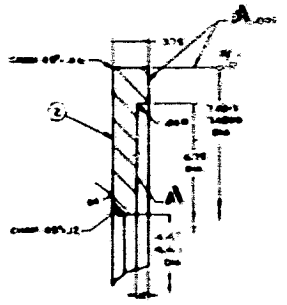


G-G

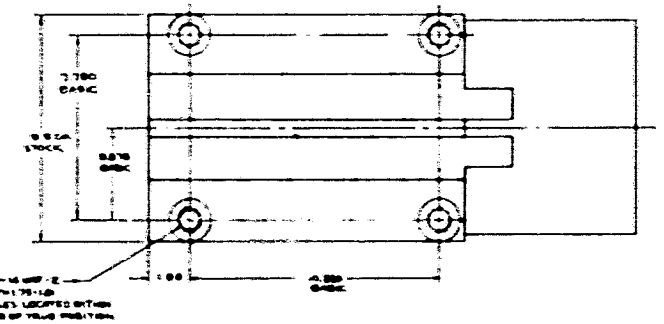


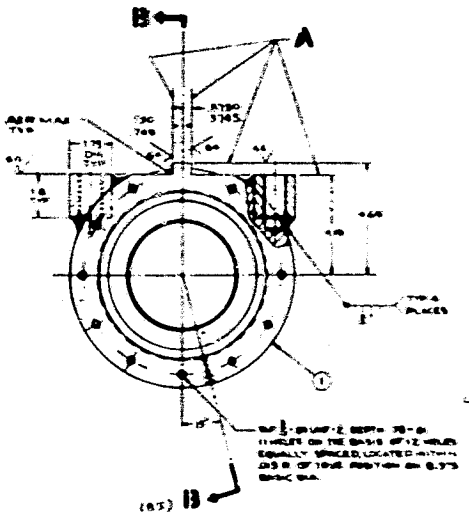
F-F

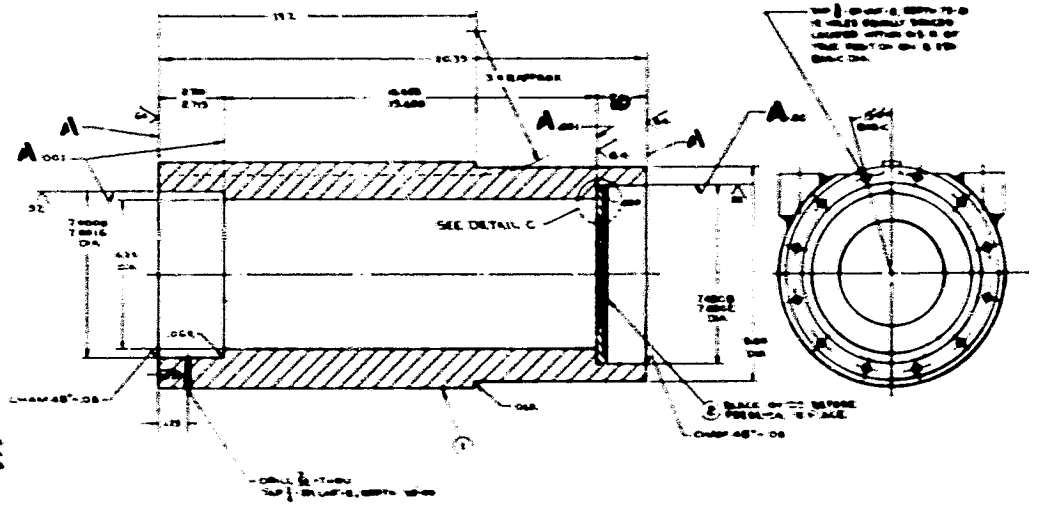
1015F30



ENLARGED DETAIL C
SCALE 2/1







B-B (60)

ORIGINAL PAGE IS
OF POOR QUALITY

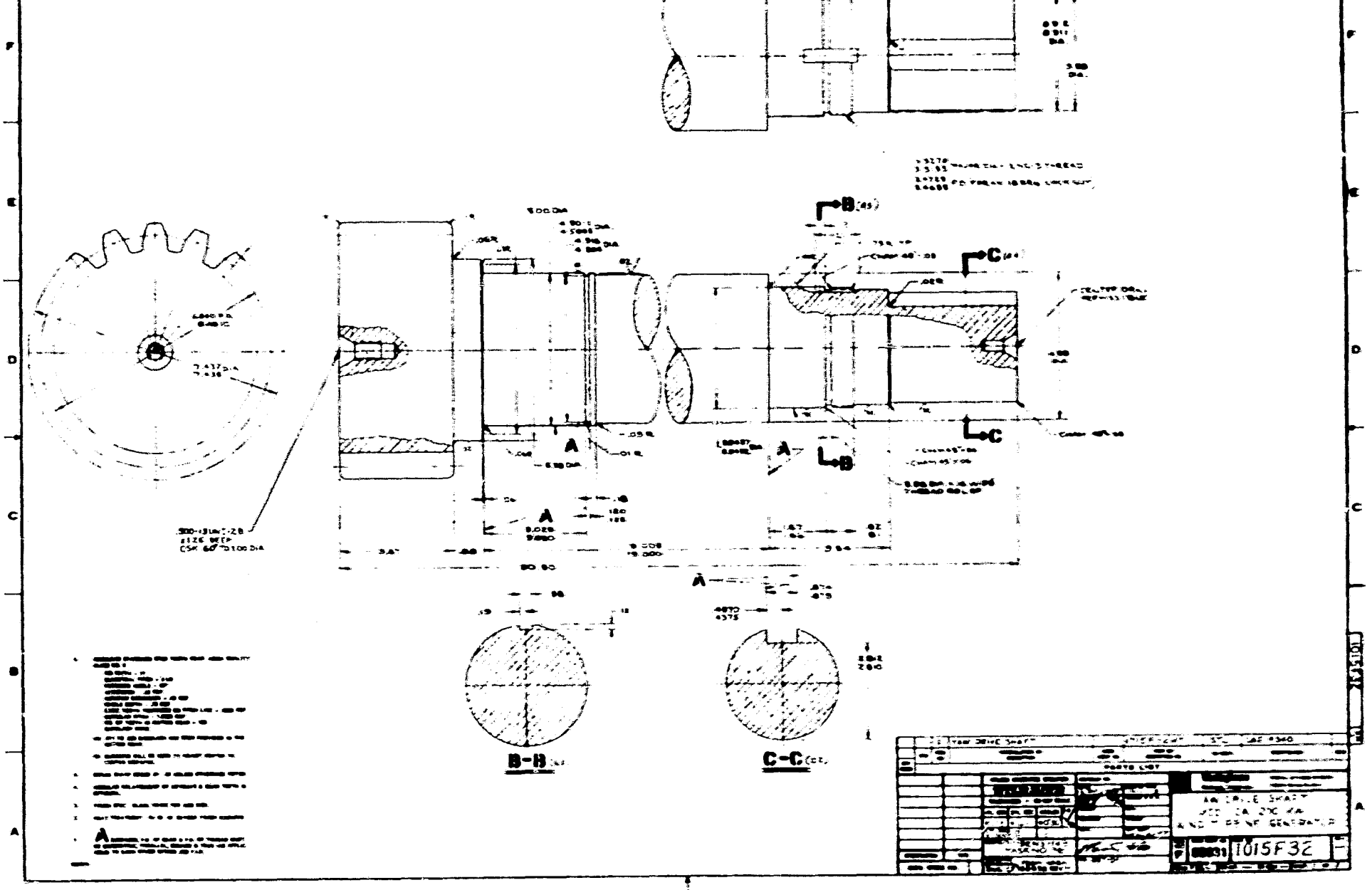
TABLE 1

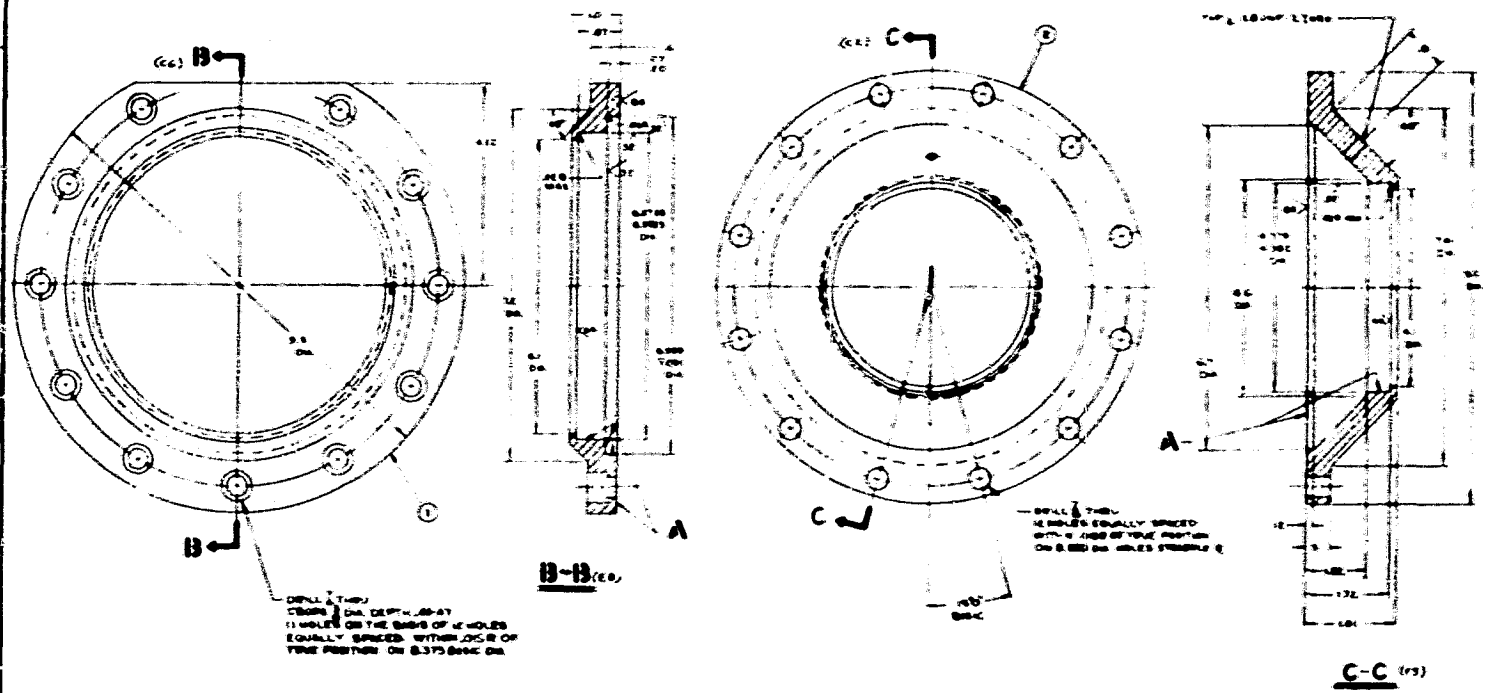
GROUP NO	PART NO
1	C(6F) 601

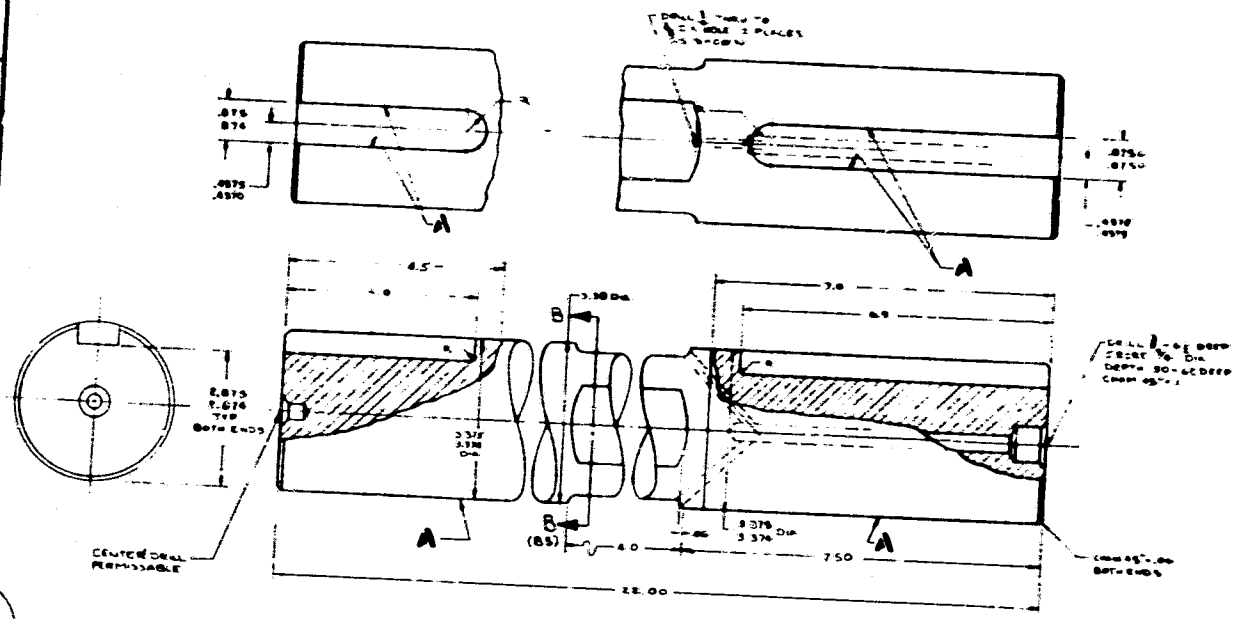
PARTS LIST

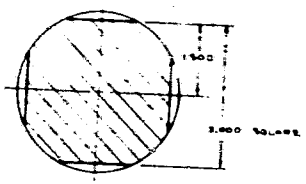
YAW DRIVE BRG HOUSING
MOD OA-200 KW
WIND TURBINE GENERATOR

SIZE 88031 1015 F31


B-B
C-C
1015F32


B
B
B-B
C
C
C-C
A





SECTION B-B (C6)

[illegible]

INTERMEDIATE YAW DRIVE SHAFT	1015 F34 -01	STL	SAE 4340

PARTS LIST

.03 .01

RENS-H3
TASK NO. 38

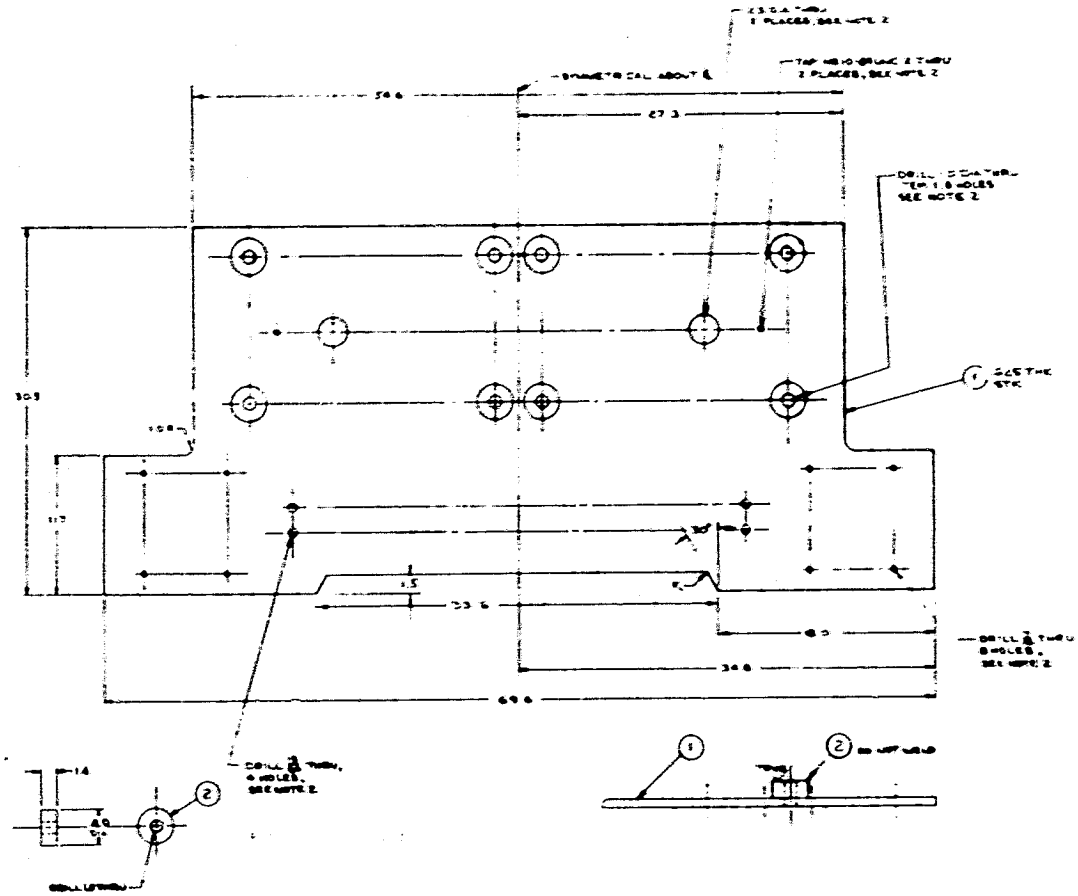
047-01

INTERMEDIATE YAW DRIVE SHAFT
MOD OA-200 KW
WIND TURBINE GENERATOR

F 1015 F34

1015 F 34

C-2



2	RISER BLOCK	10MSF35H02	STL	SAE 1010-1030
1	MOUNTING PLATE	10MSF35H01	STL	SAE 1010-1030

PARTS LIST

YAW DRIVE MTG PLATE
MOD OA-250 KW
WIND TURBINE GENERATOR

F 58031 10MSF35 -

SCALE 1:5 WEIGHT 36.6 SHEET 1 OF 1

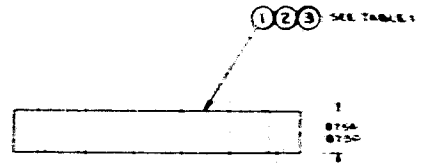
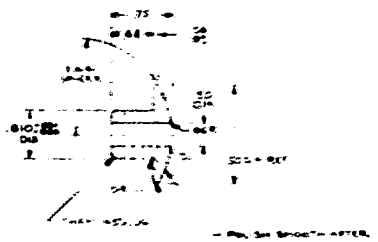


TABLE 1

ITEM NO.	B	C	D	E	F	G
1	60	5	.50	5.00	4(27)	6
2	.25	11	.50	9.80	.312	12
3	.25	4	.50	5.50	M(25)	2

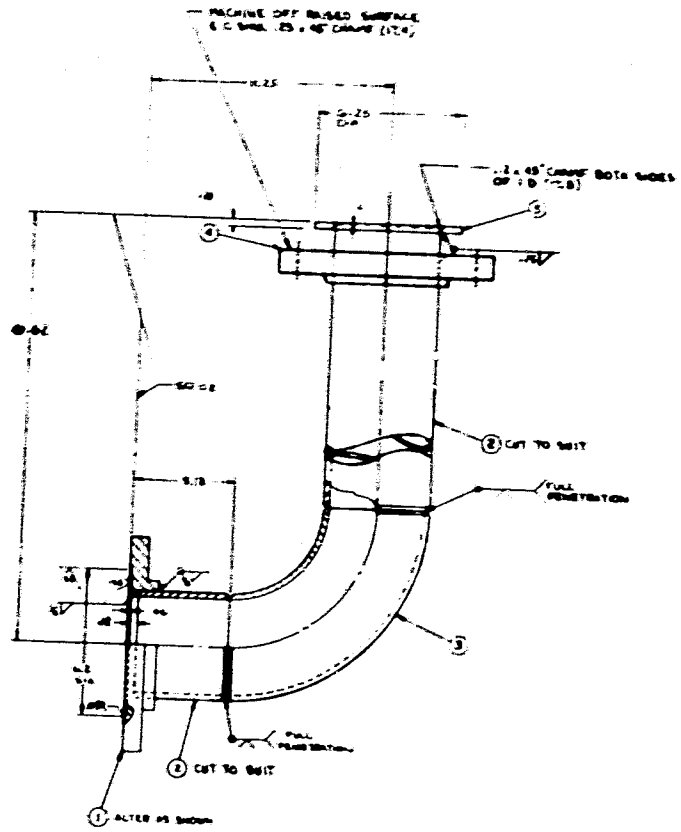


ITEM	QTY	PART NO.	DESCRIPTION	MATL
4			THRUST BUTTON	STL
3			SHEAR KEY	ALL
2			SHEAR KEY	STL
1			SHEAR KEY	ALL

PARTS LIST

SHEAR KEY & THRUST BUTTON
WOC 0A - 250 KW
WIND TURBINE GENERATOR

SIZE F | 88031 | 1015F36

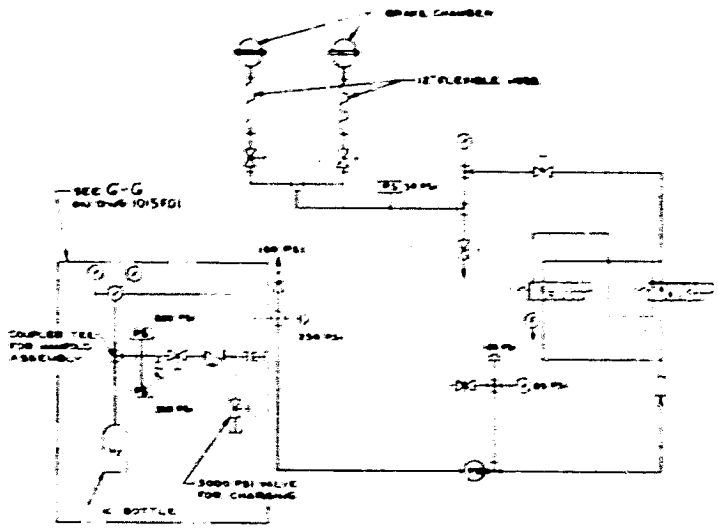


GROUP - I

GROUP NO.	PART NO.
1	1015F37-01

MAIN SLIP RING SUPPORT ASSEMBLY
MOD OA - 200 KW
WIND TURBINE GENERATOR

SIZE A | 1015 F37 | REV



PIPING SCHEMATIC
SCALE: NO SCALE

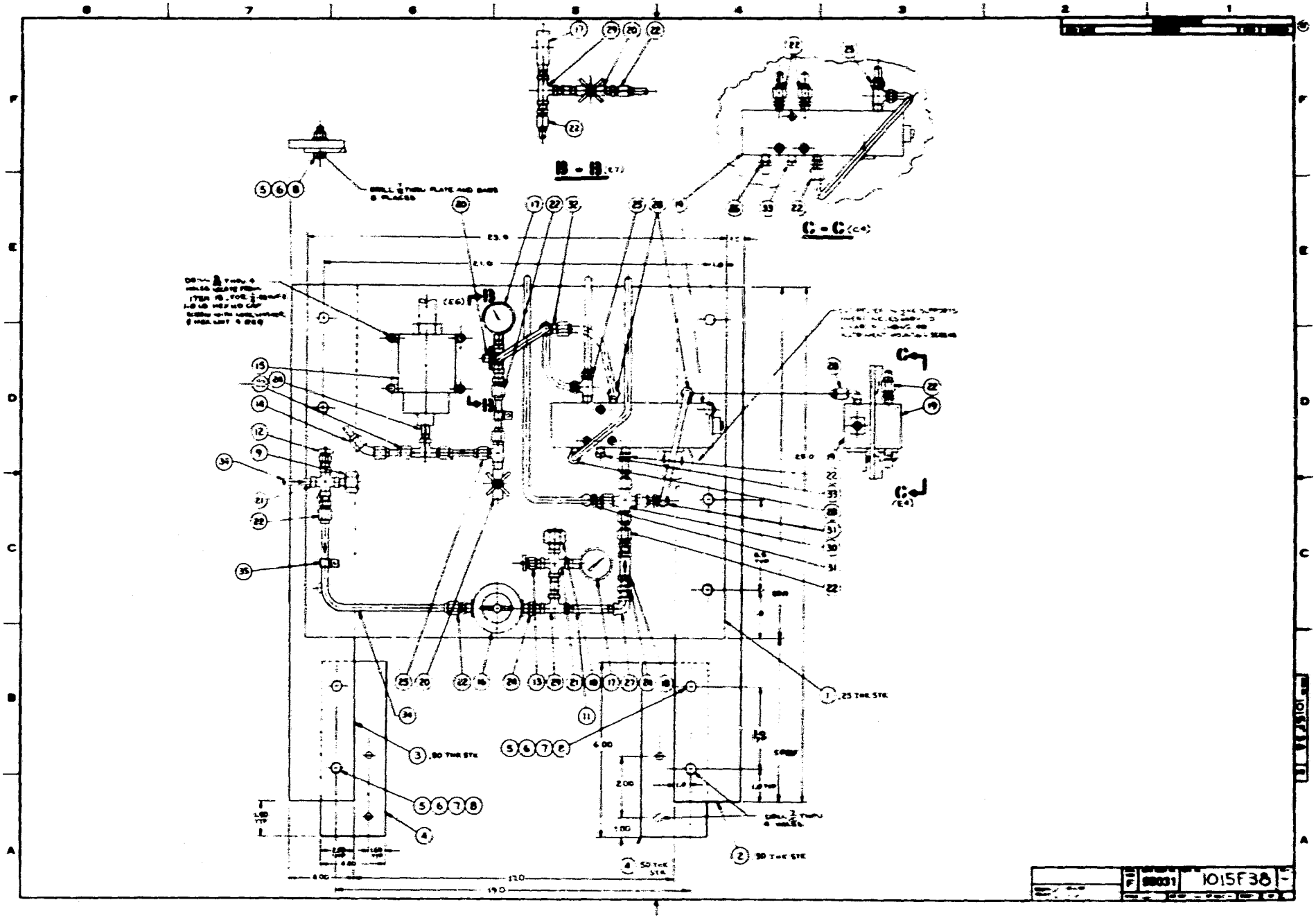
TABLE 1	
GROUP NO.	PART NO.
1	1015F38G01

2	35	CLAMP	[illegible]		
[illegible]	34	TUBE 1.500 - .035 WALL		CRES	
2	33	SQUARE HD PLUG	[illegible]		
[illegible]	32	[illegible] TEE	[illegible]		.375 T
2	31	UNION ELBOW	[illegible]		.375 T
[illegible]	30	UNION CROSS	[illegible]		.375 T
2	29	FEMALE PIPE TEE	[illegible]		[illegible]
3	28	MALE ELBOW	[illegible]		[illegible]
[illegible]	27	FEMALE PIPE ELBOW	[illegible]		
[illegible]	26	COMBINATION [illegible] FILTER	[illegible]		
3	25	MALE RUN TEE	[illegible]		[illegible] .375 T
4	24	PIPE NIPPLE	[illegible]		
[illegible]	23	FEMALE BRANCH TEE	[illegible]		
8	22	MALE CONNECTOR	[illegible]		
2	21	FEMALE PIPE CROSS	[illegible]		
3	20	SHUT OFF VALVE	[illegible]		
2	19	SOLENOID VALVE	[illegible]		[illegible]
[illegible]	18	CHECK VALVE	[illegible]		
2	17	PRESSURE GAGE	[illegible]		
[illegible]	16	PRESSURE REGULATOR	[illegible]		
[illegible]	15	PRESSURE SWITCH	[illegible]		
[illegible]	14	MALE 45° ELBOW [illegible]	[illegible]		
[illegible]	13	RELIEF VALVE	[illegible]		
[illegible]	12	RELIEF VALVE	[illegible]		
[illegible]	11	[illegible]		CRES	[illegible]
	10	BURST DISC			
[illegible]	9	BURST DISC			
12	8	HEX NUT .375 [illegible]		STL	[illegible]
8	7	FLAT WASHER .375 STD		STL	[illegible]
12	6	LOCKWASHER .375 STC		STL	[illegible]
12	5	HEX HD BOLT .375 [illegible]		STL	[illegible]
2	4	BAR	1015F38[illegible]	[illegible]	[illegible]-T6
[illegible]	3	BAR	1015F38[illegible]	[illegible]	[illegible]-T6
[illegible]	2	BAR	1015F38[illegible]	[illegible]	[illegible]-T6
[illegible]	1	MTG PLATE	1015F38[illegible]	[illegible]	[illegible]-T6

PARTS LIST

PIPING SCHEMATIC & PANEL LAYOUT
BRAKE DAMPER & PRESSURIZING SYSTEM
MOD OA - 200 kW
WIND TURBINE GENERATOR

F [illegible] 1015F38


B - B
C - C
1015F38

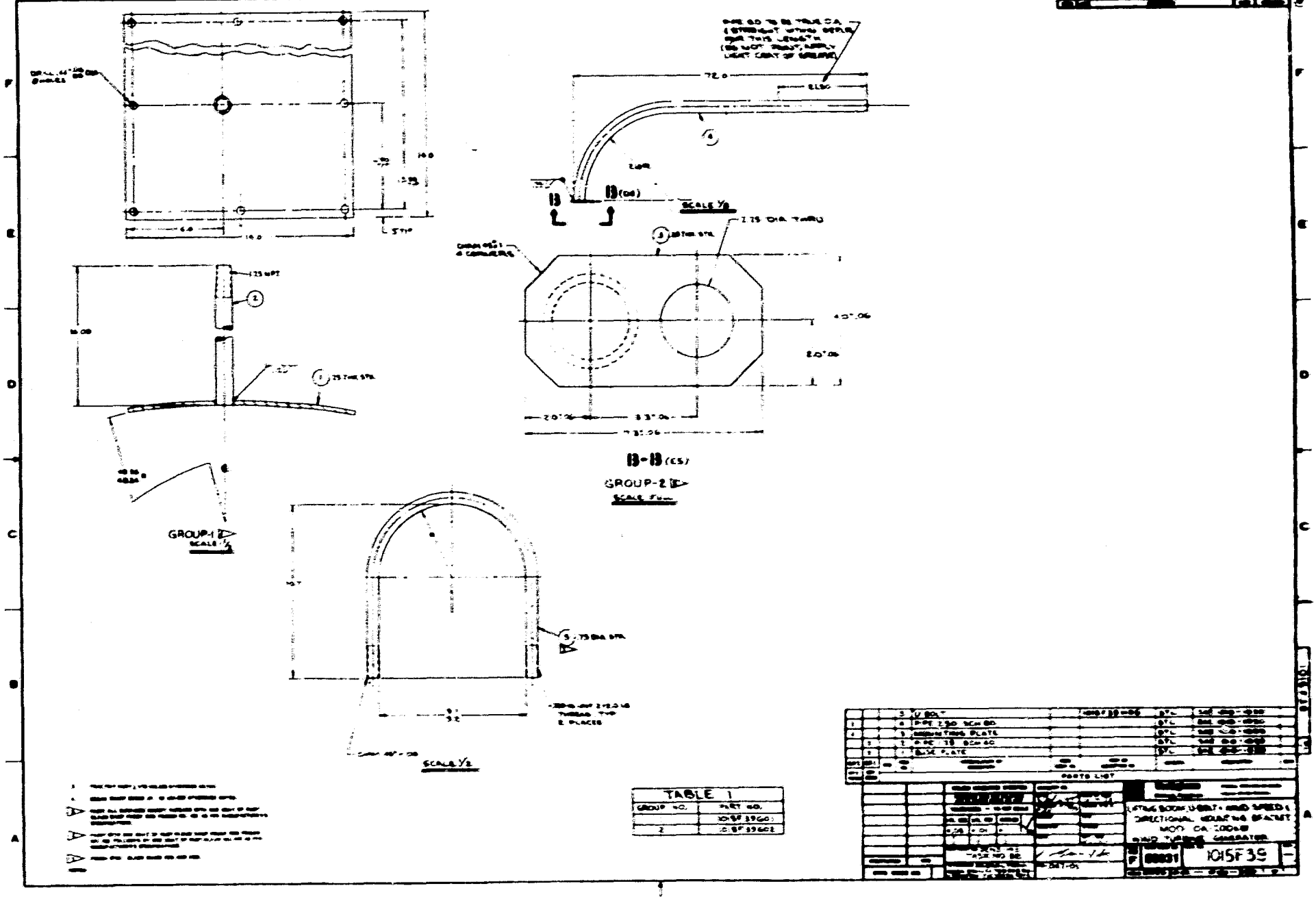
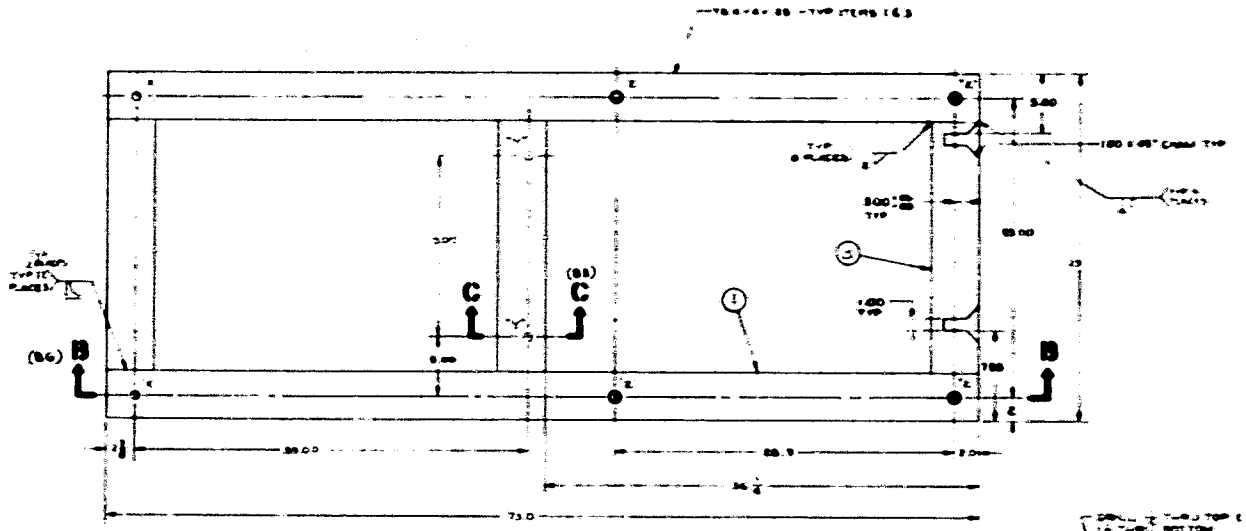
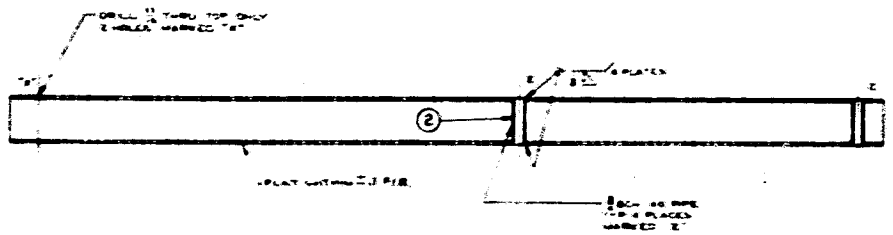


TABLE 1	
GROUP NO.	PART NO.
	101SF3960
2	101SF3960A

PARTS LIST						
1	1	4	PIPE 2.50 SCH 80			
2	1	3	MOUNTING PLATE			
3	1	2	PIPE 1.25 SCH 80			
4	1	1	BASE PLATE			

LIFTING BOOM U-BOLT - HAND SPEED DIRECTIONAL MOUNTING BRACKET MOD. CA 2000-B AND VARIOUS CRANKSTER				
P 00001	101SF39			





B - B (06)

C - C (06)

GROUP 1

TABLE 1	
GROUP NO.	PART NO.
1	1015F40-001

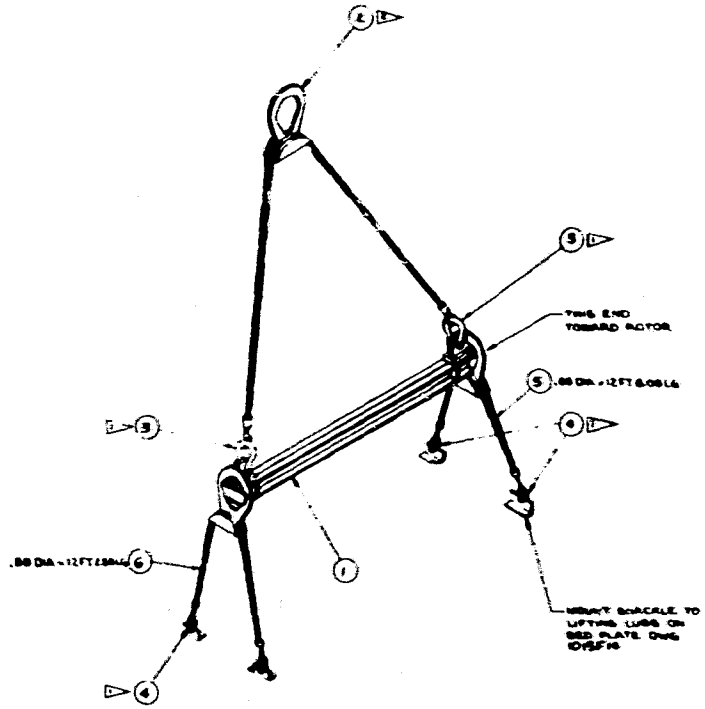
3	3	SPACER			STL	SAE 1018 - .036
4	2	PIPE			STL	SAE 1018 - .058
5	1	BASE			STL	SEE 60 450

PARTS LIST

HYDRAULIC PACKAGE SUPPORT SLD
1400 OA-800 KW
WIND TURBINE GENERATOR

97	99031	1015F40

1015F40



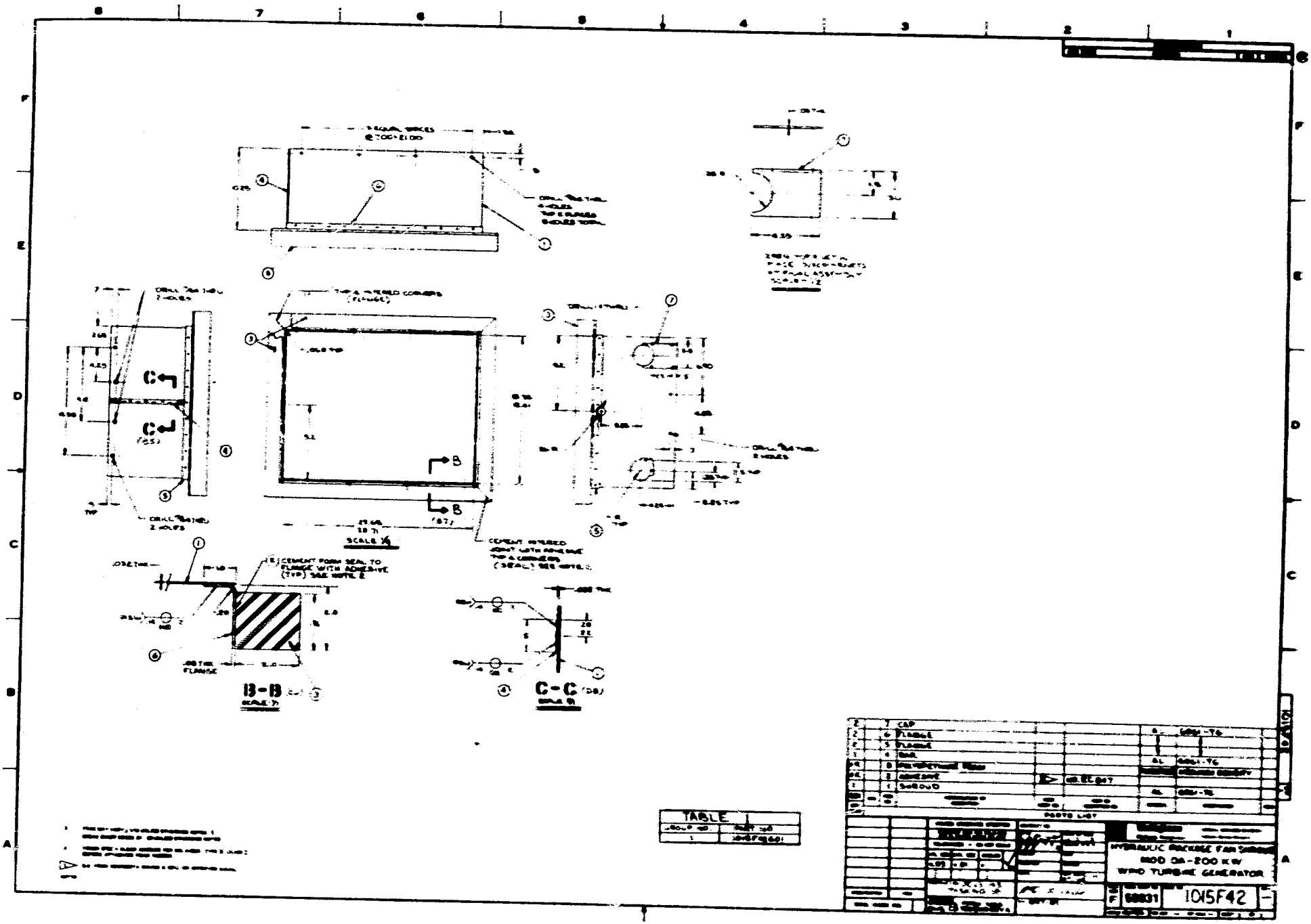
GROUP 1

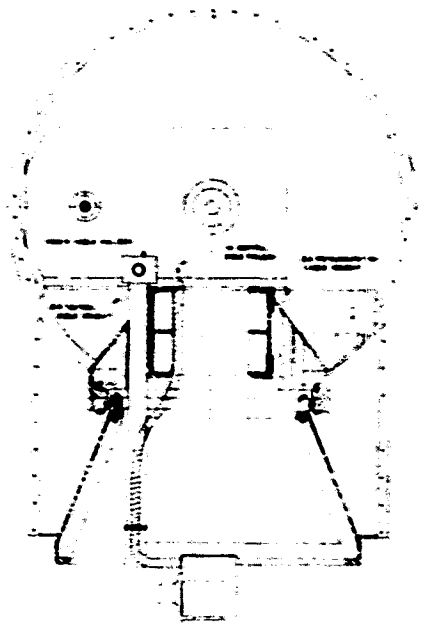
TABLE 1	
GROUP NO.	PART NO.
1	1015F41G01

1	6	DOUBLE WIRE ROPE			
1	5	DOUBLE WIRE ROPE ASSY			
0	4				
2	3				
1	2				
1	1	LIFTING BEAM			

LIFTING BEAM & SLING ASSY
MOD 0A - 200 KW
WIND TURBINE GENERATOR

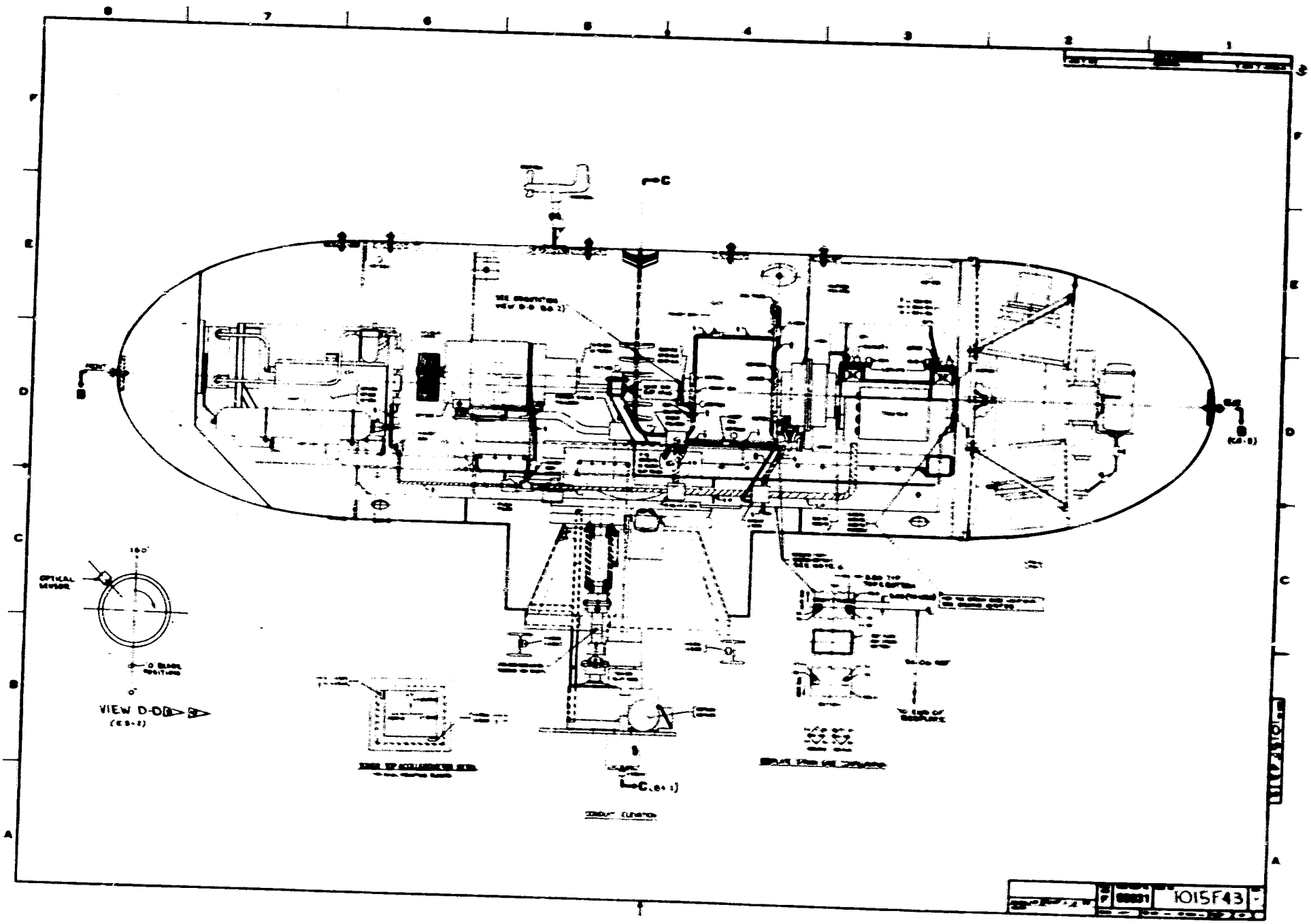
1015F41

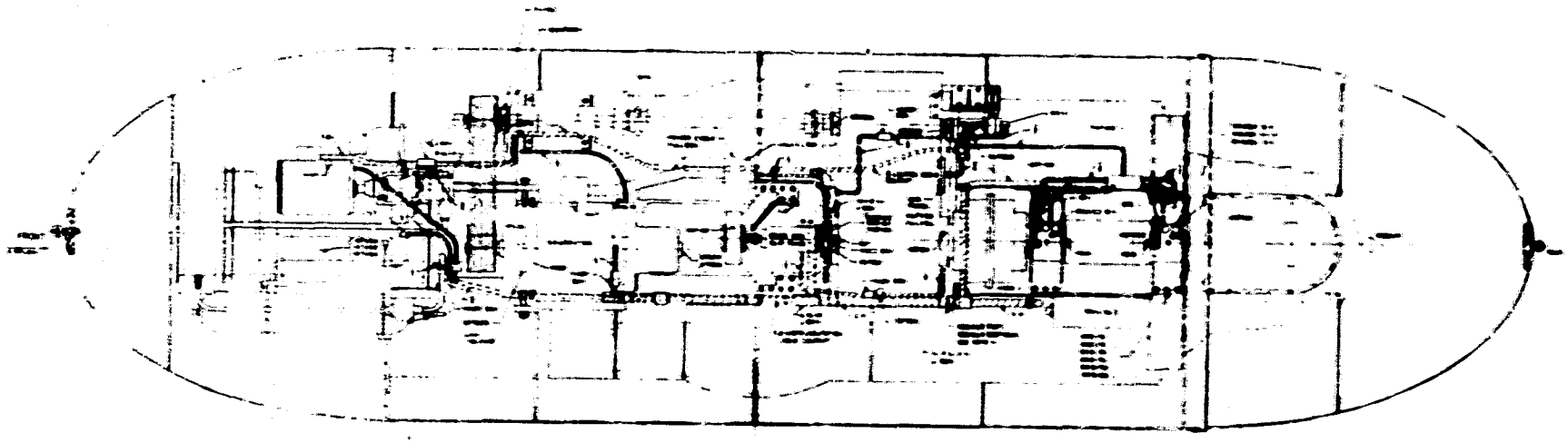

B-B
C-C
TABLE



C–C (SCALE)

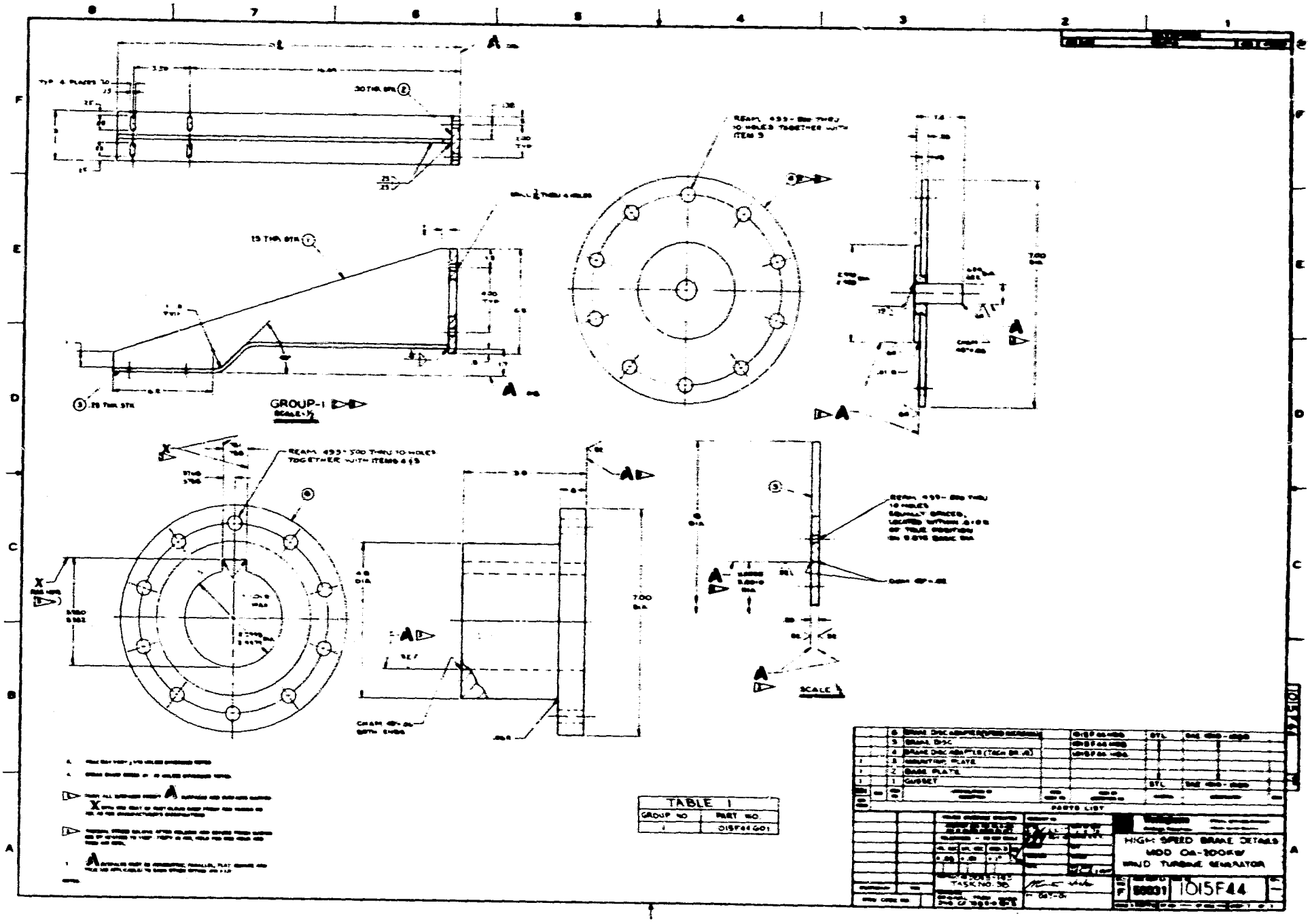
1015F43

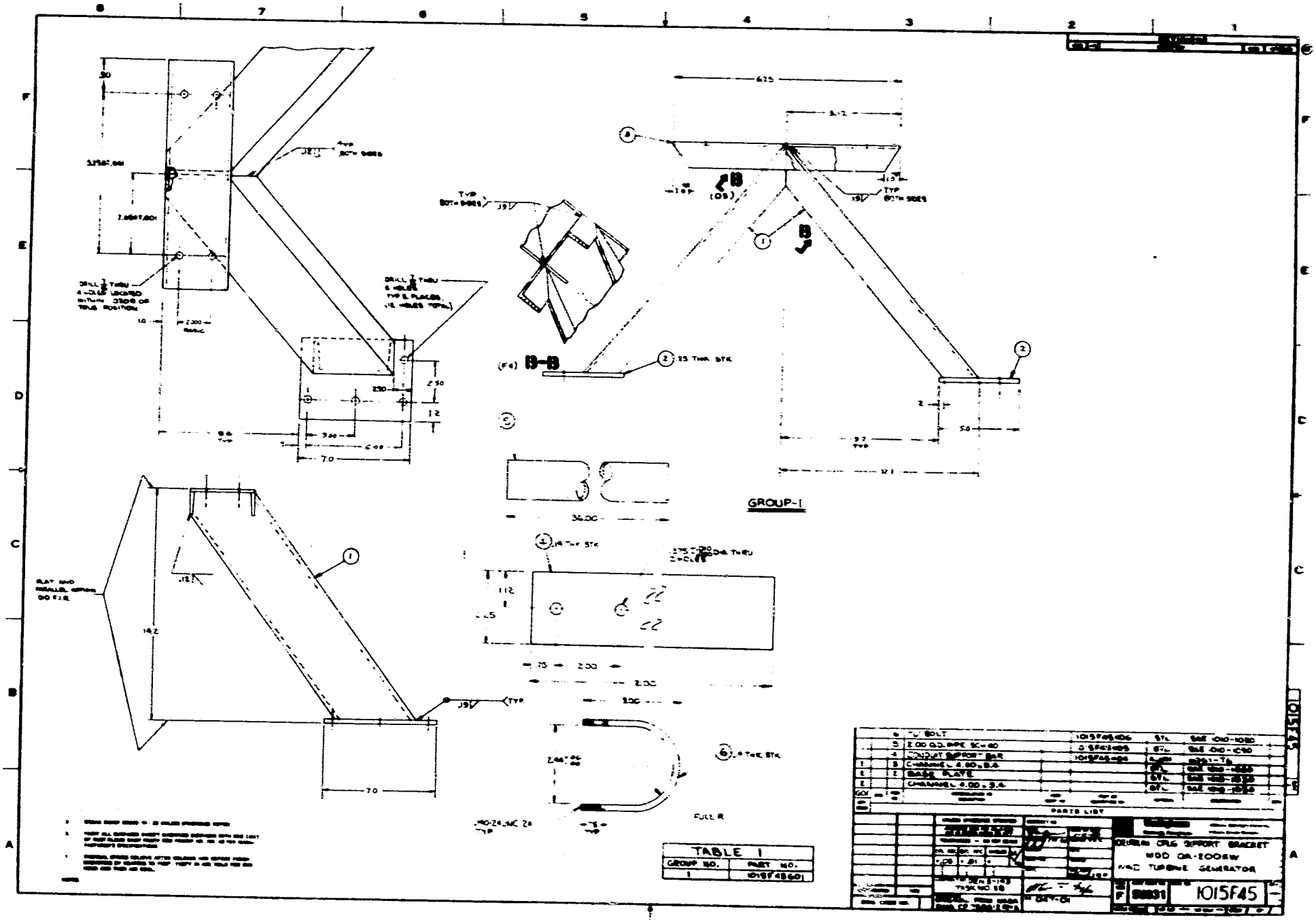

VIEW D-D
1015F43

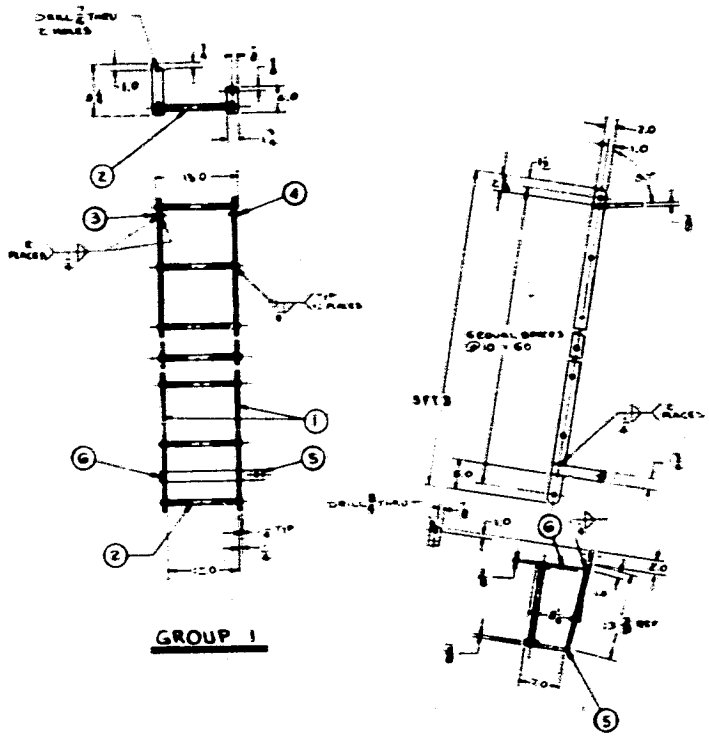


B-B (Sht 2)

1015F43


GROUP-1
SCALE
TABLE 1
GROUP NO
PART NO
1015F44G01
PARTS LIST
HIGH SPEED BRAKE DETAILS
MOD OA-200KW
WIND TURBINE GENERATOR
TASK NO. 50
F 99031
1015F44


GROUP-1
TABLE 1
GROUP NO. | PART NO.
1 | 1015F45G01
PARTS LIST
DRIVEN DRG SUPPORT BRACKET
MOD DR-200EW
WIND TURBINE GENERATOR
SIZE F
DWG NO 1015F45
SCALE
SHEET



GROUP 1

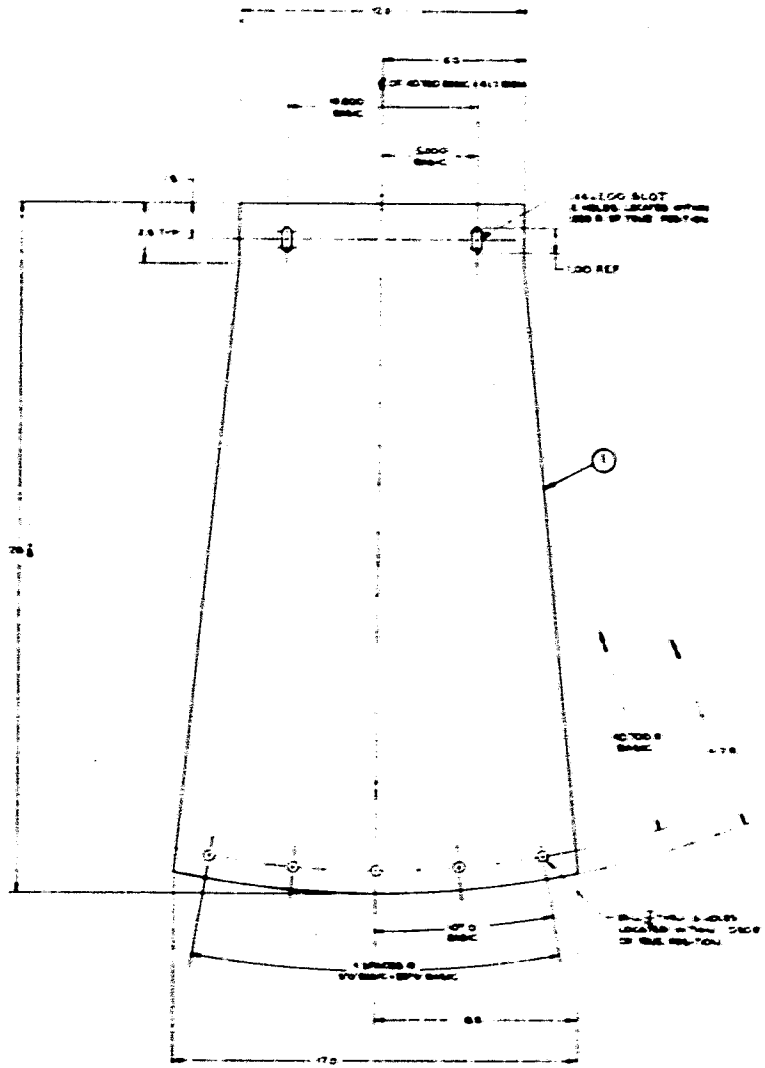
TABLE 1	
GROUP NO.	PART NO.
1	1015F46 601

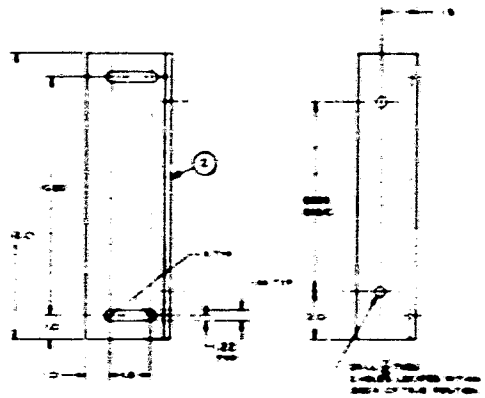
PARTS LIST					
	6	CURVE BRACE		STL	
	5	BACK BRACE			
	4	MOUNTING PLATE			
	3	MOUNTING PLATE			
	2	TUBING - 2.0 OD x .120 WALL		STL	
	1	SIDE BAR			
QTY	NO				

JACOBS WELDED ASS'Y
MOD 0A-200 KW
WIND TURBINE GENERATOR

SIZE	CODE IDENT NO.	DRAWING NO.	REV
F	88831	1015F46	-

SCALE - | SHEET - OF -

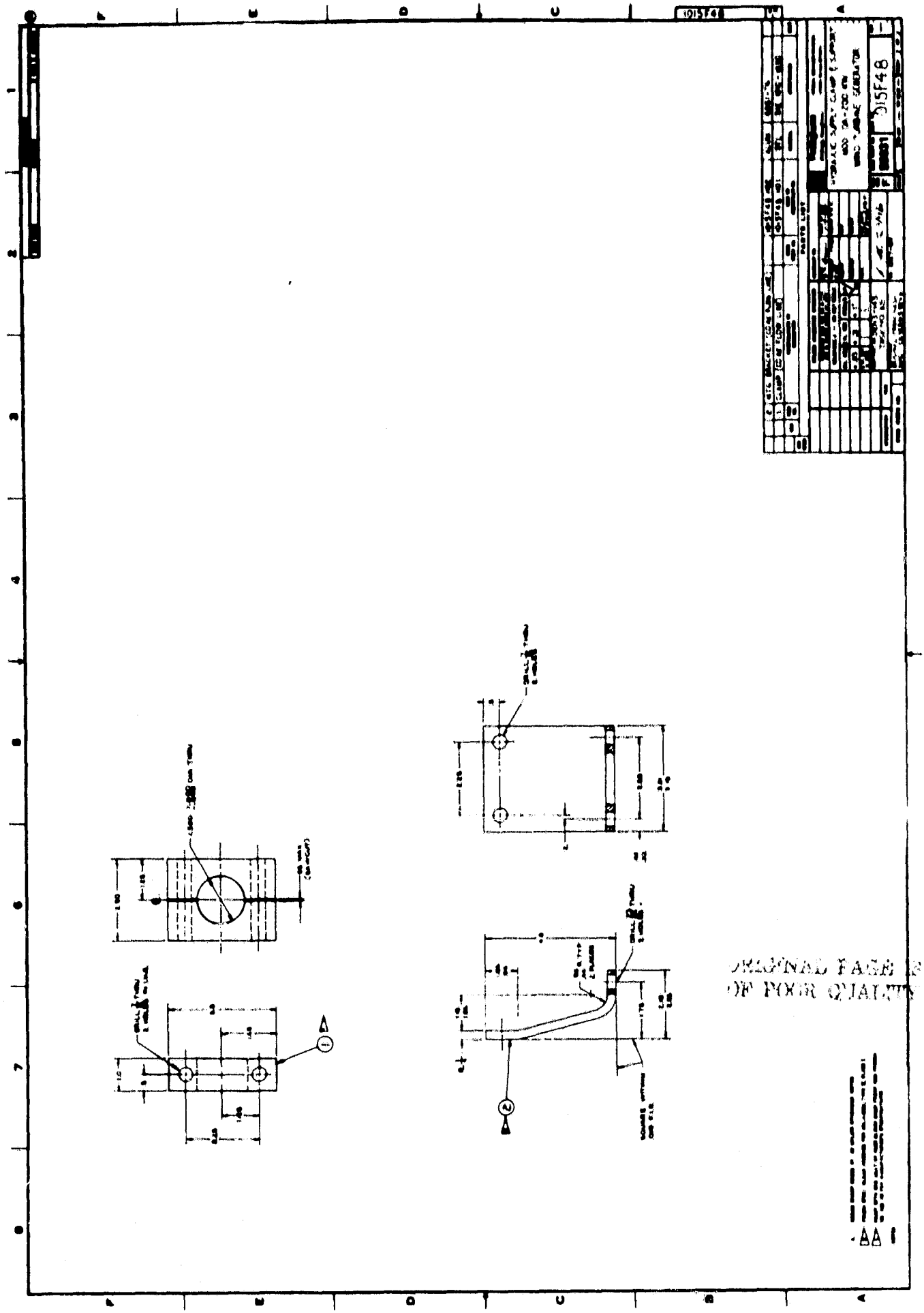




2					
1					

REAR PROP CONE SUPPORT
HOD DA 500KW
WIND TURBINE GENERATOR

F	98031	1015F47



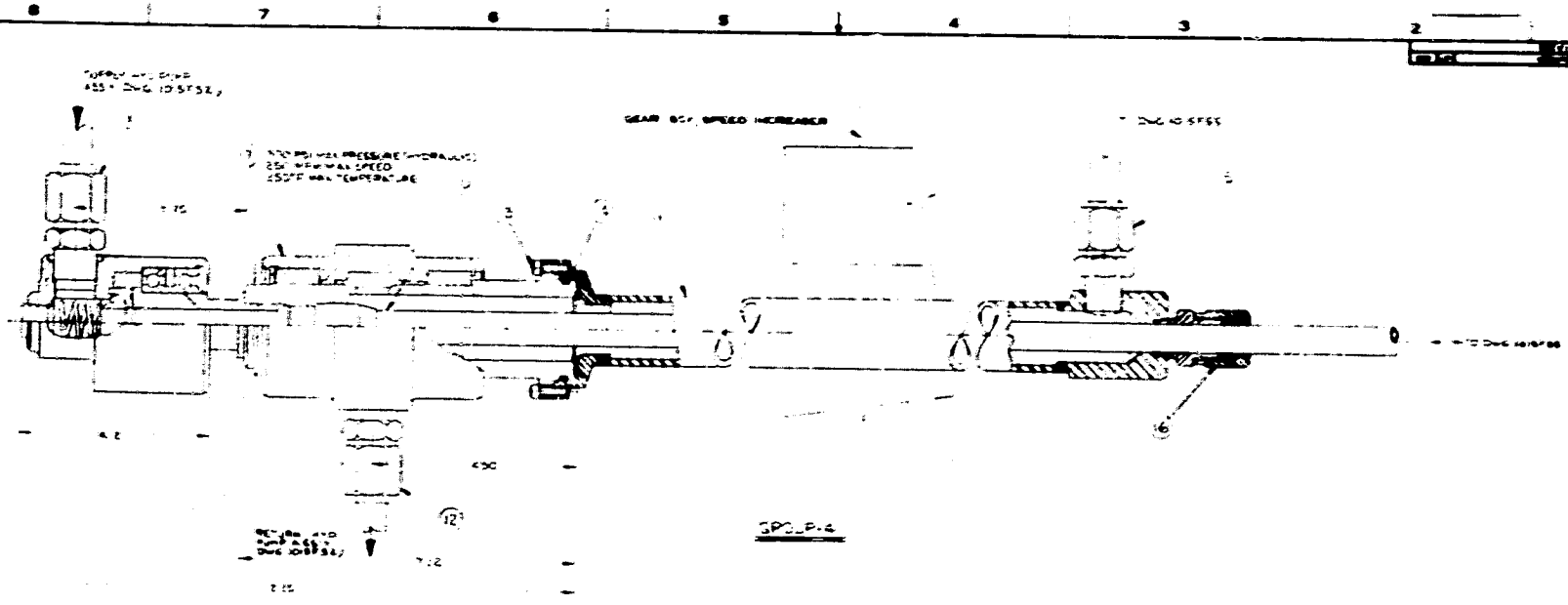


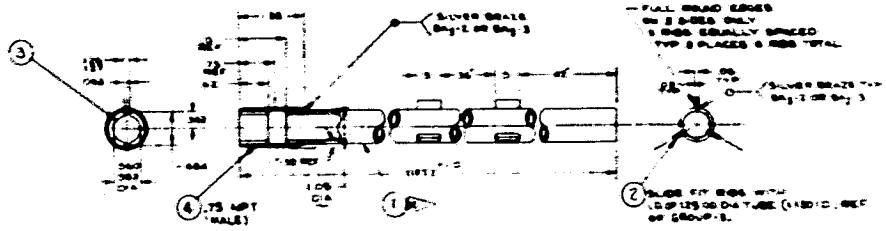
TABLE I	
GROUP NO	PART NO
1	
2	
3	
4	

1			
2			
3			
4			
5	OUTER TUBE		
6	INNER TUBE		
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

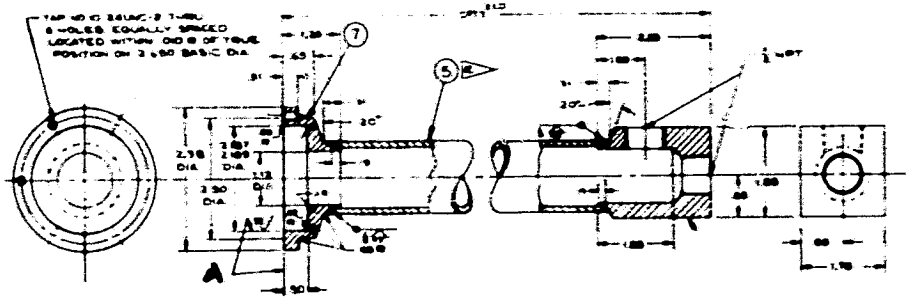
PARTS LIST

COAXIAL FLOW VALVE ASSY (DETAIL)
MOD-2A 200KW
WIND TURBINE GENERATOR

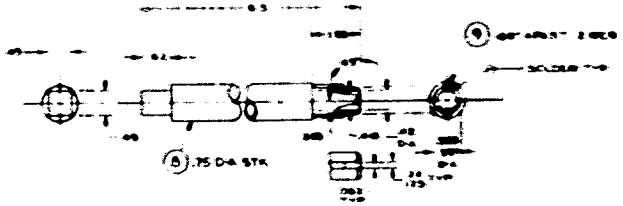
1015F49



GROUP-1

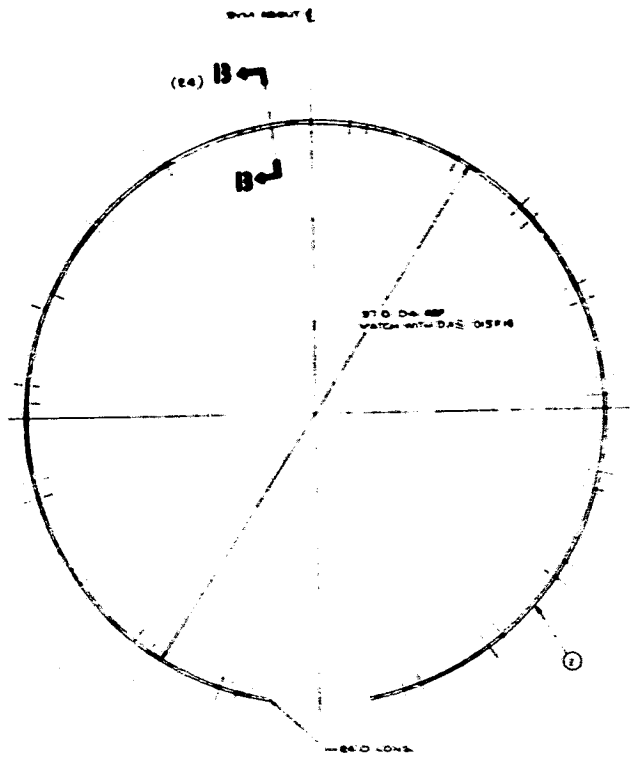


GROUP-2



GROUP-3

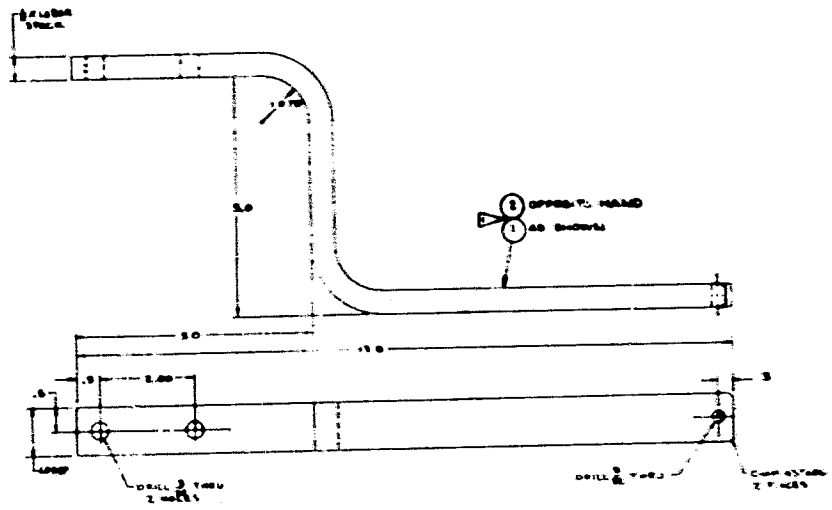
		8801	1015F49

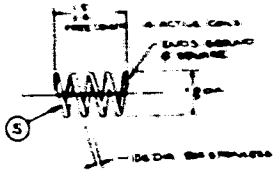


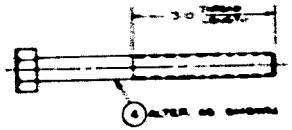
B - B

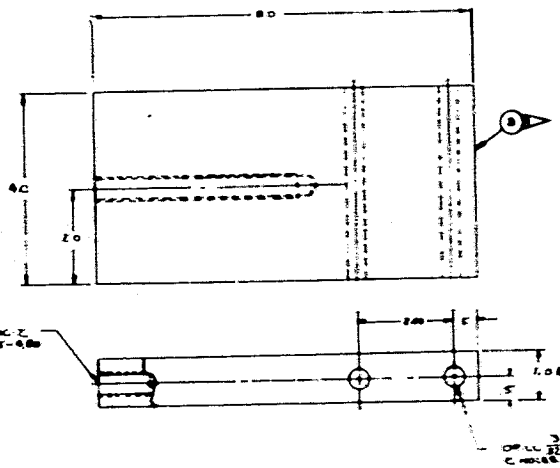
SPINNER RAIN GUARD
MOD DA-800 KW
WIND TURBINE GENERATOR

1015F50









DWG NO	10151 51

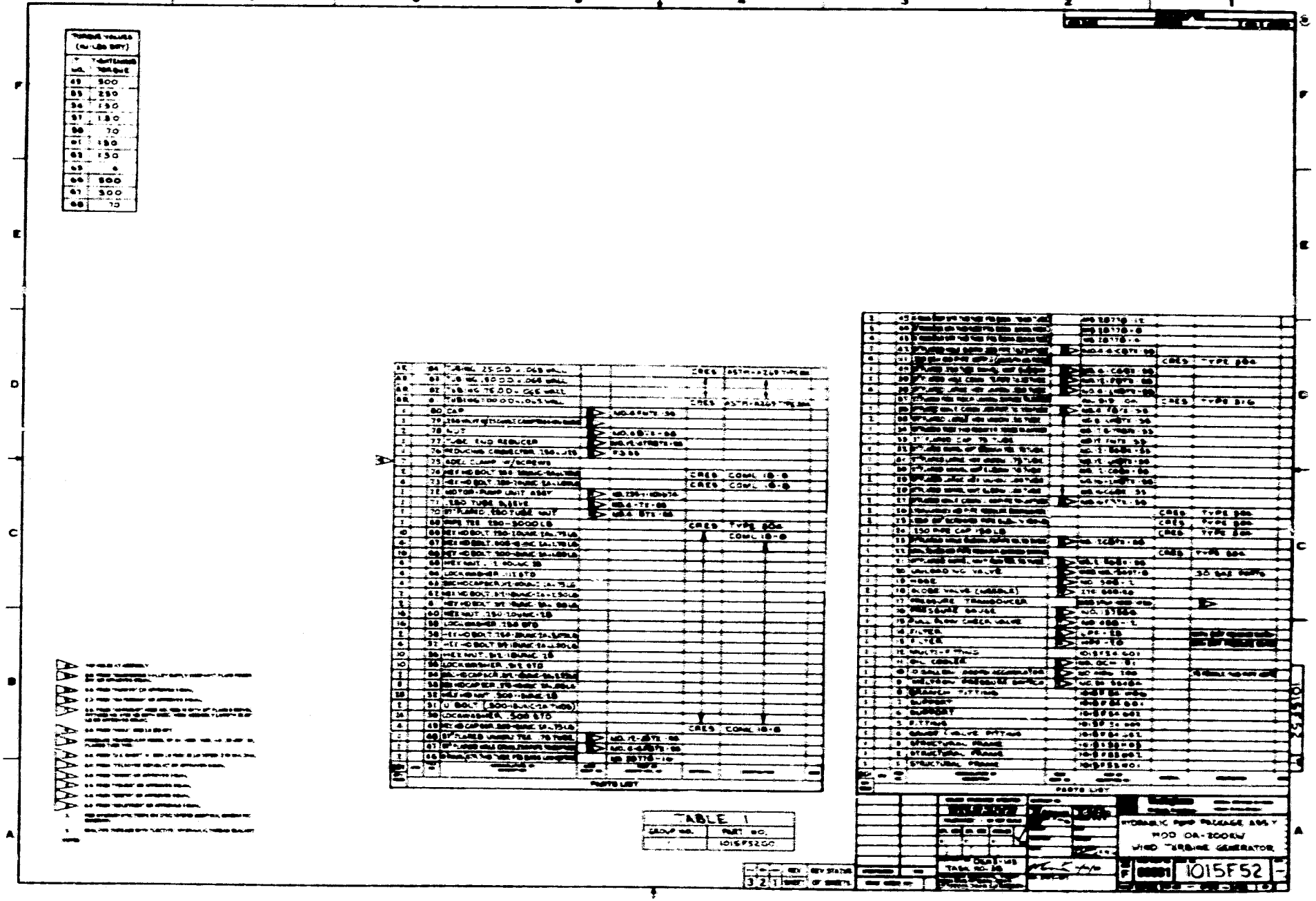
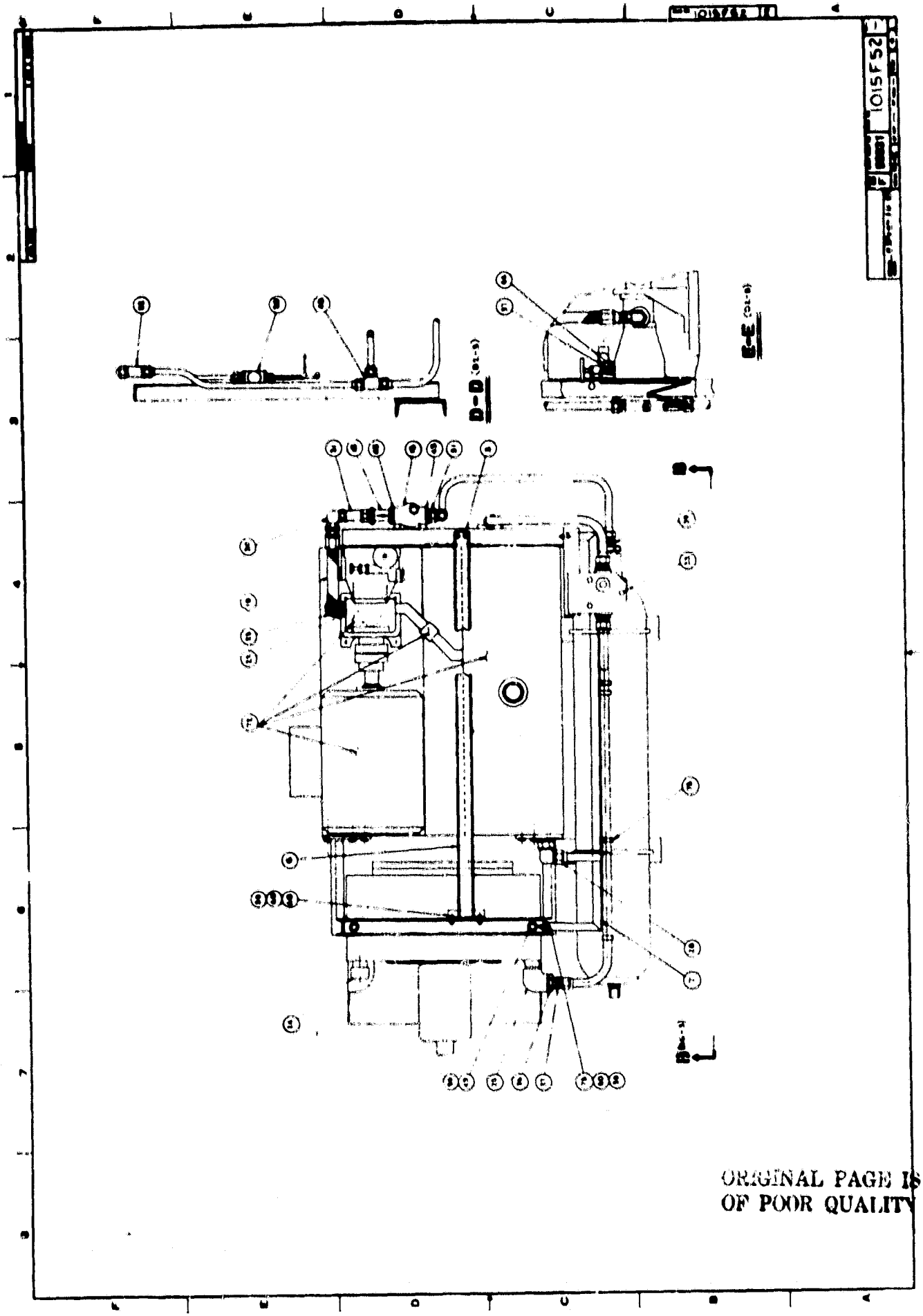
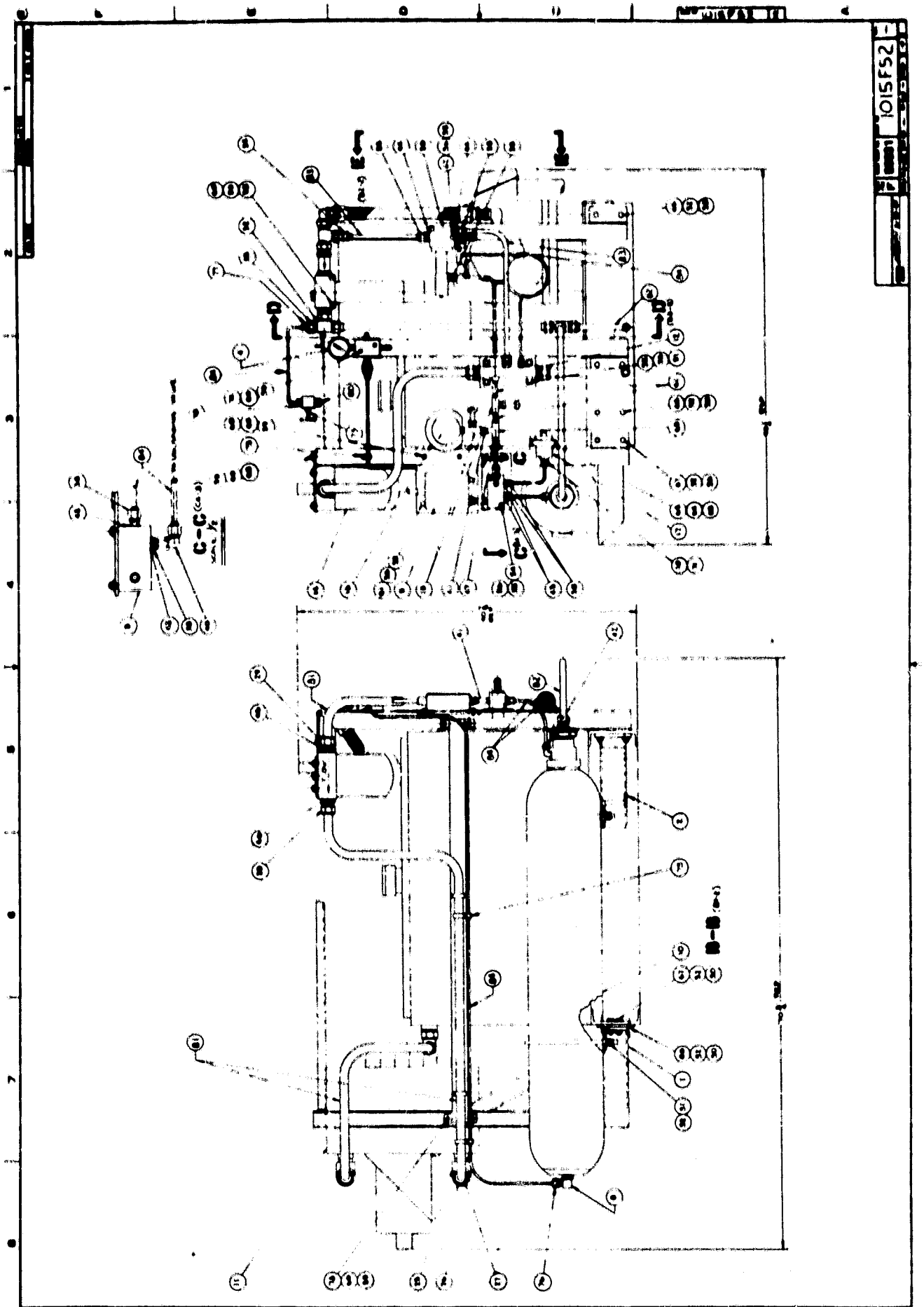
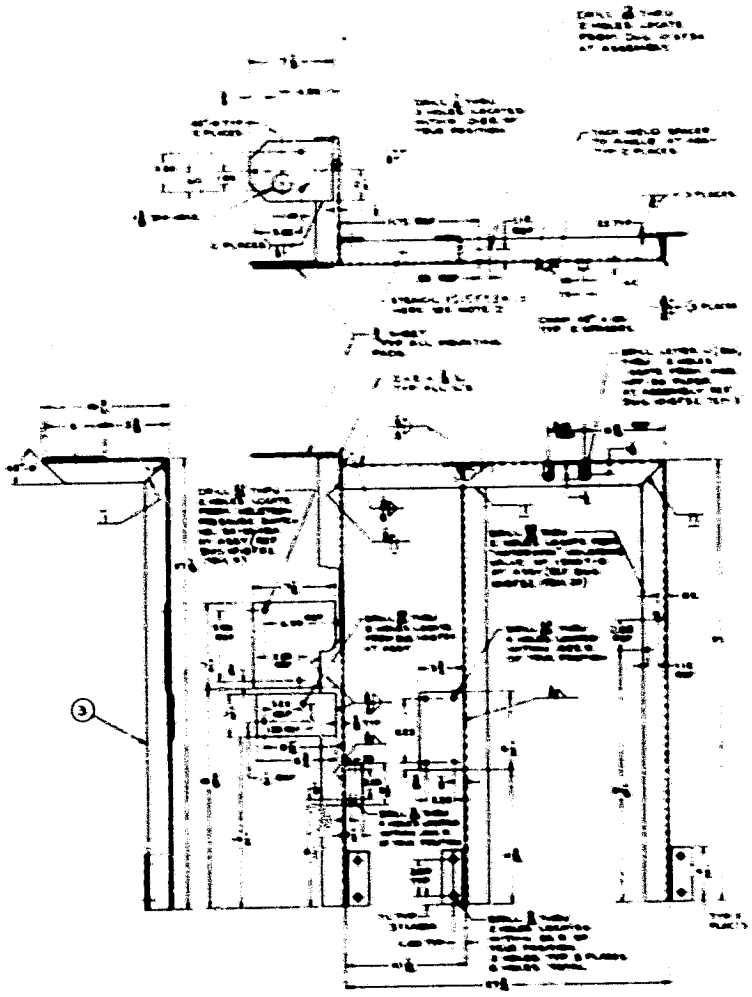


TABLE 1

GROUP NO.	PART NO.
1	1015F52GO



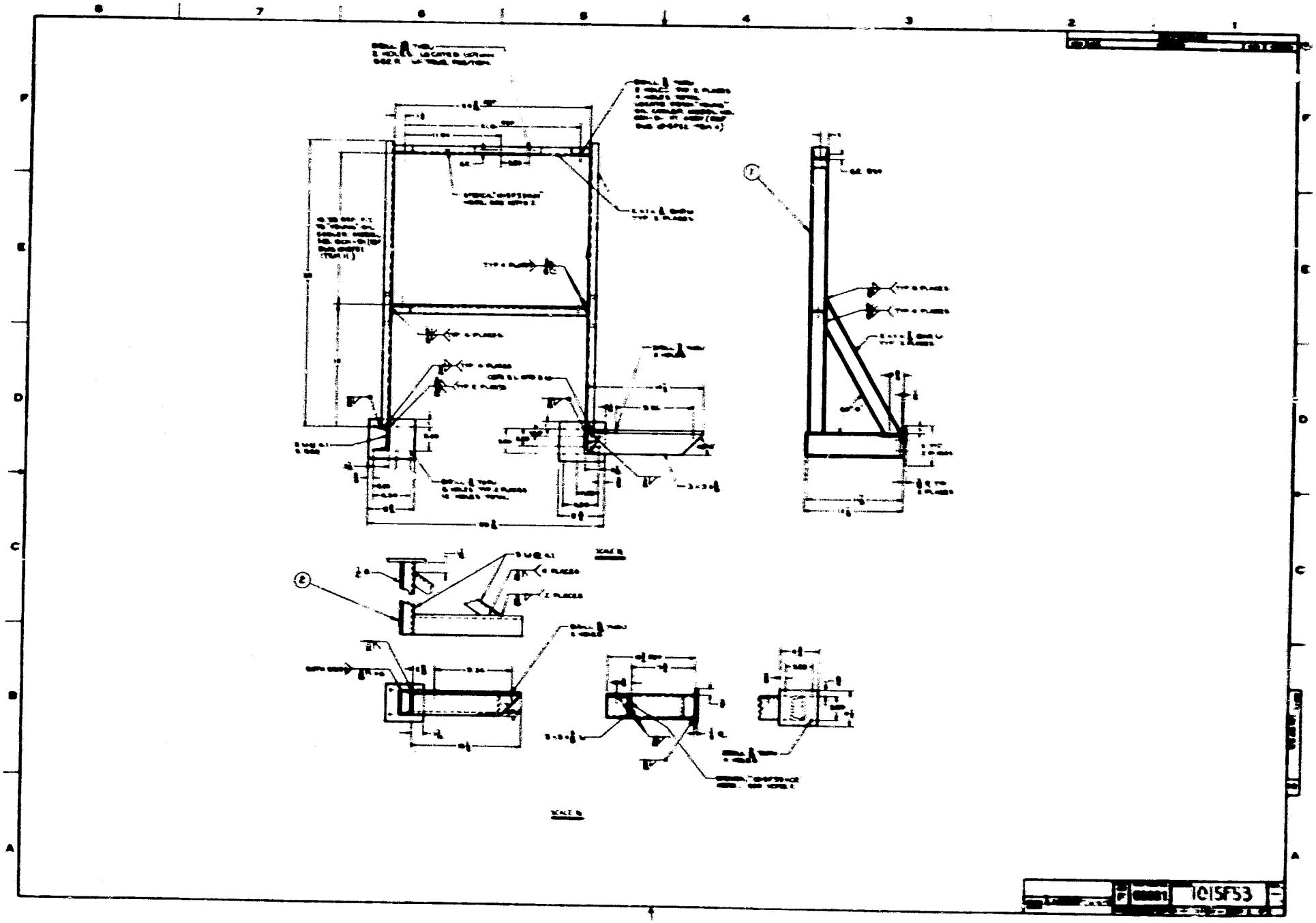




SCALE A

PHOTO LIST

1015F53



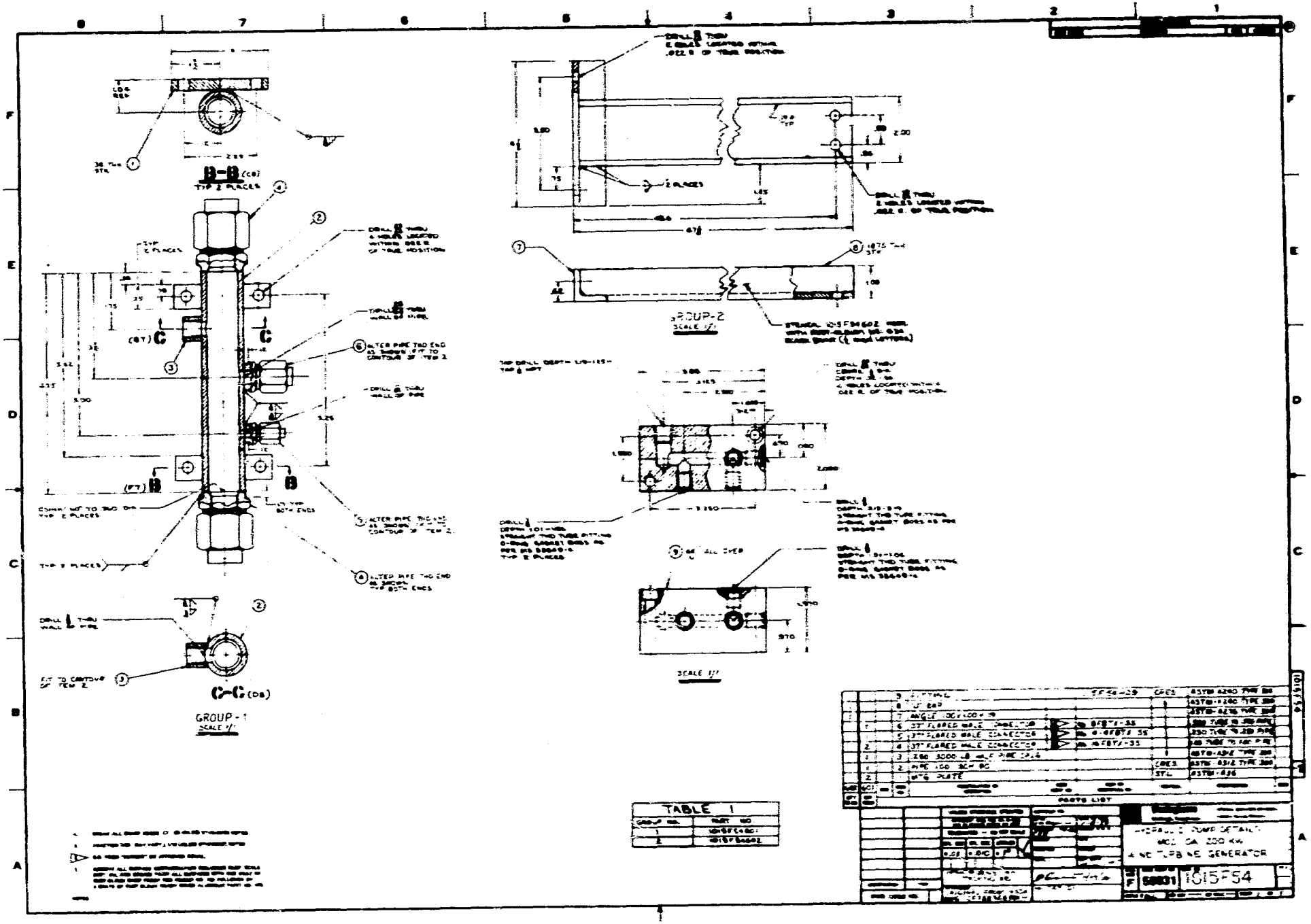
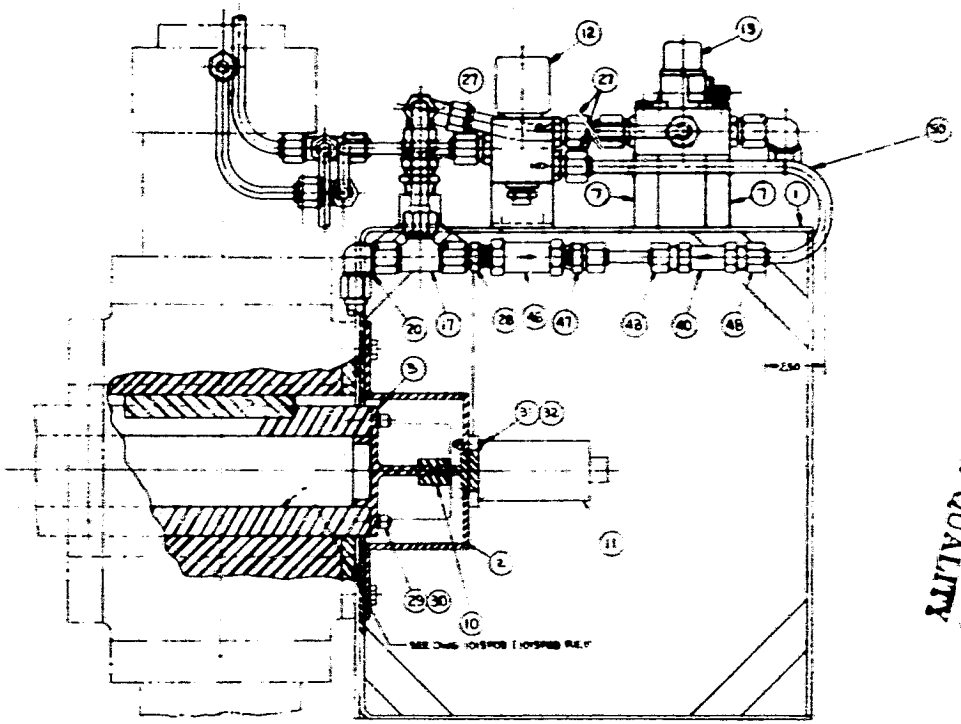


TABLE 1	
GROUP NO.	PART NO.
1	[illegible]
2	[illegible]

PARTS LIST

HYDRAULIC PUMP DETAILS
MOD GA 200 KW
4 NC TURBINE GENERATOR

F 60831 1015F54



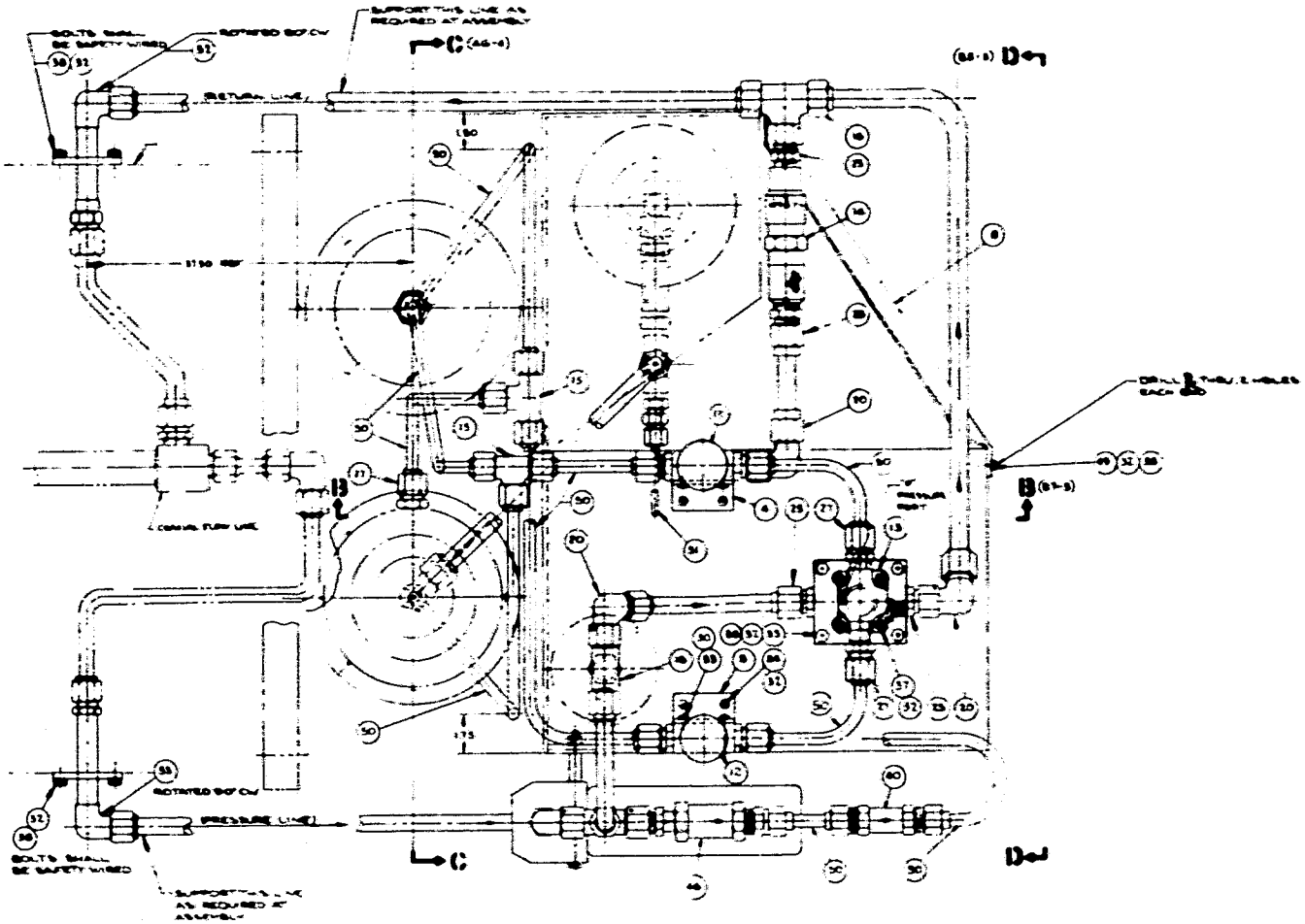
ELEVATION VIEW

TABLE I	
GROUP NO.	PART NO.
1	10ISF5563

4	3	2	1	SHEET OF SHEETS

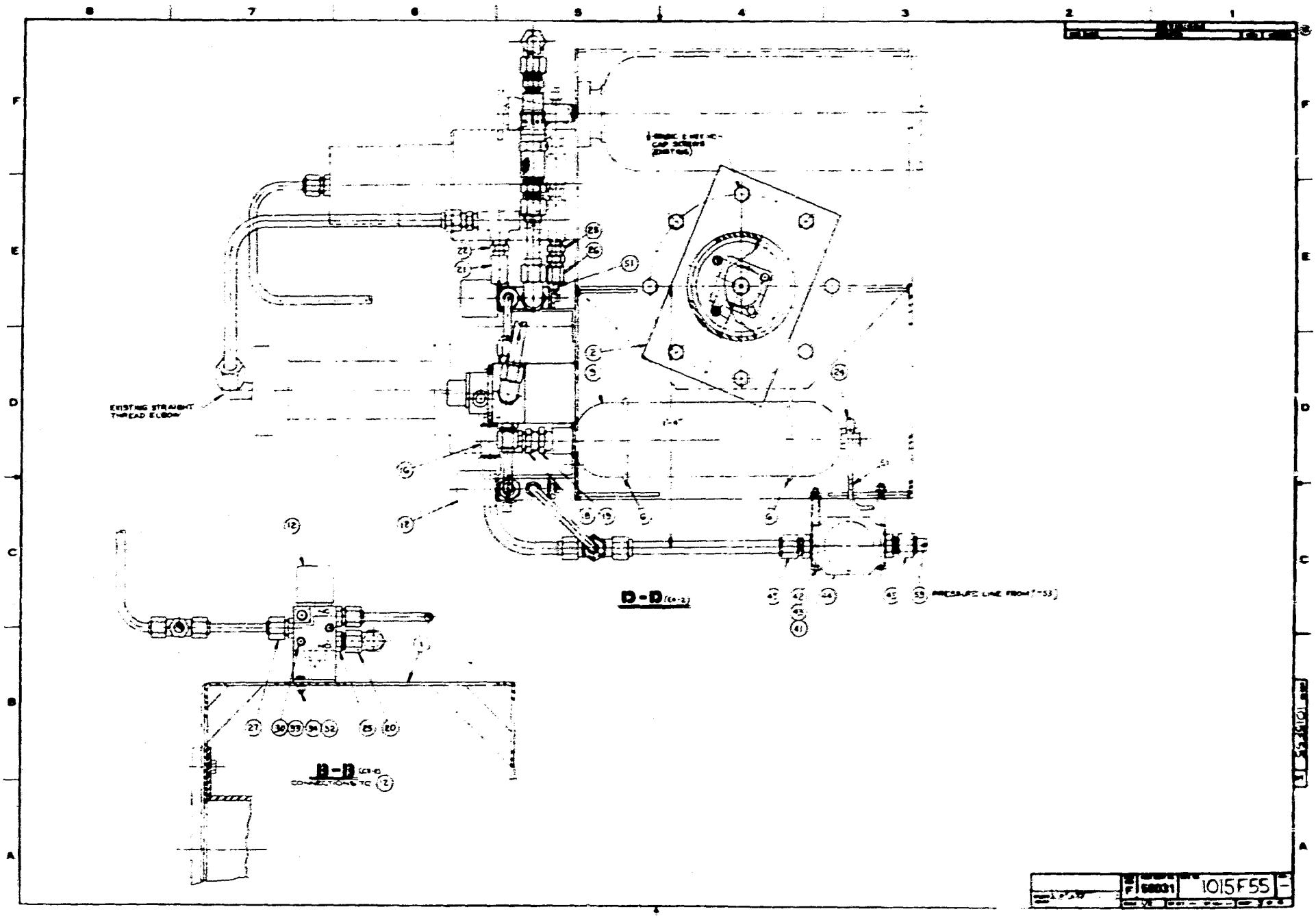
ACTUATOR ASSEMBLY
FOR GE - 200 KW
VAWT TURBINE GENERATOR

SIZE	CODE IDENT NO.	DRAWING NO.
F	68991	10ISF55

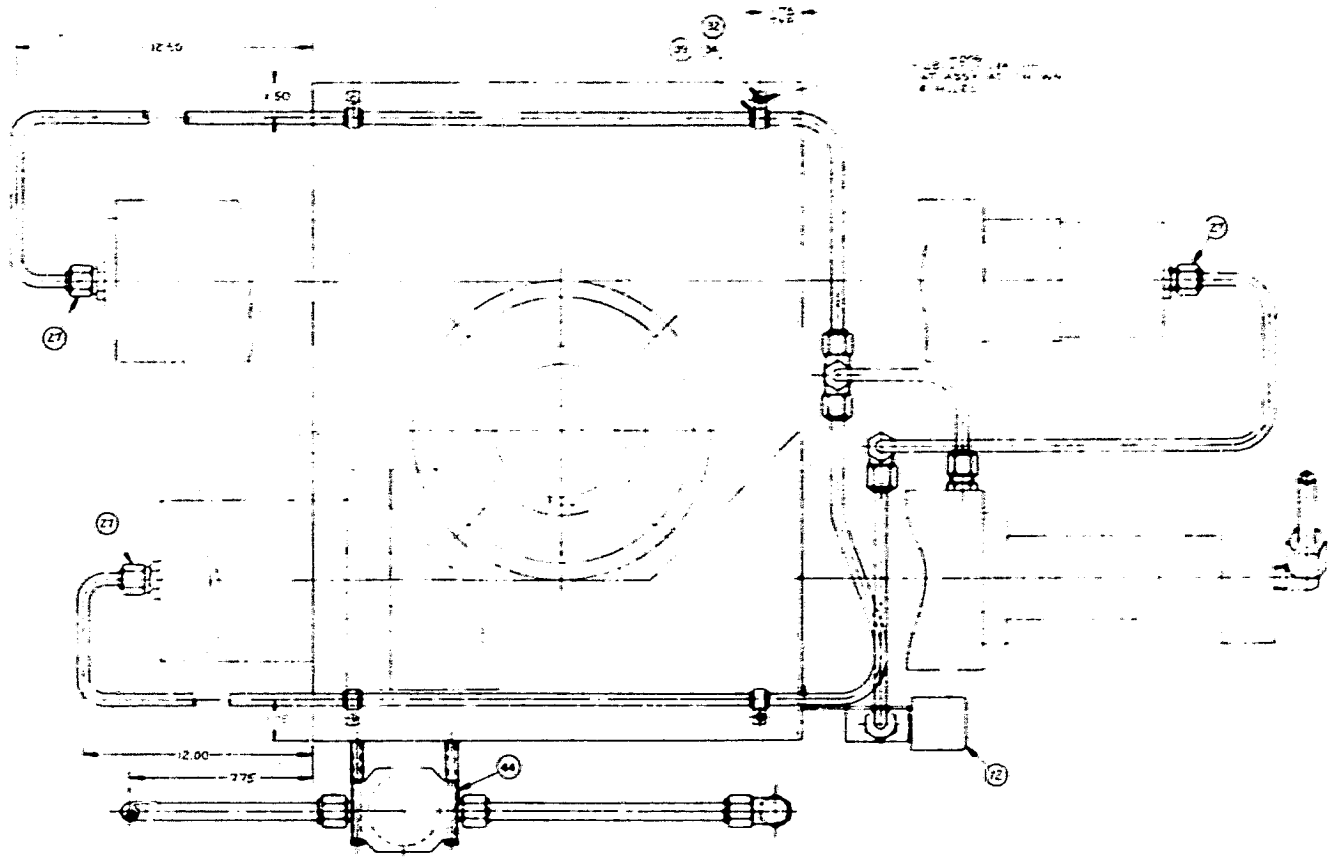


PLAN VIEW

1015F55

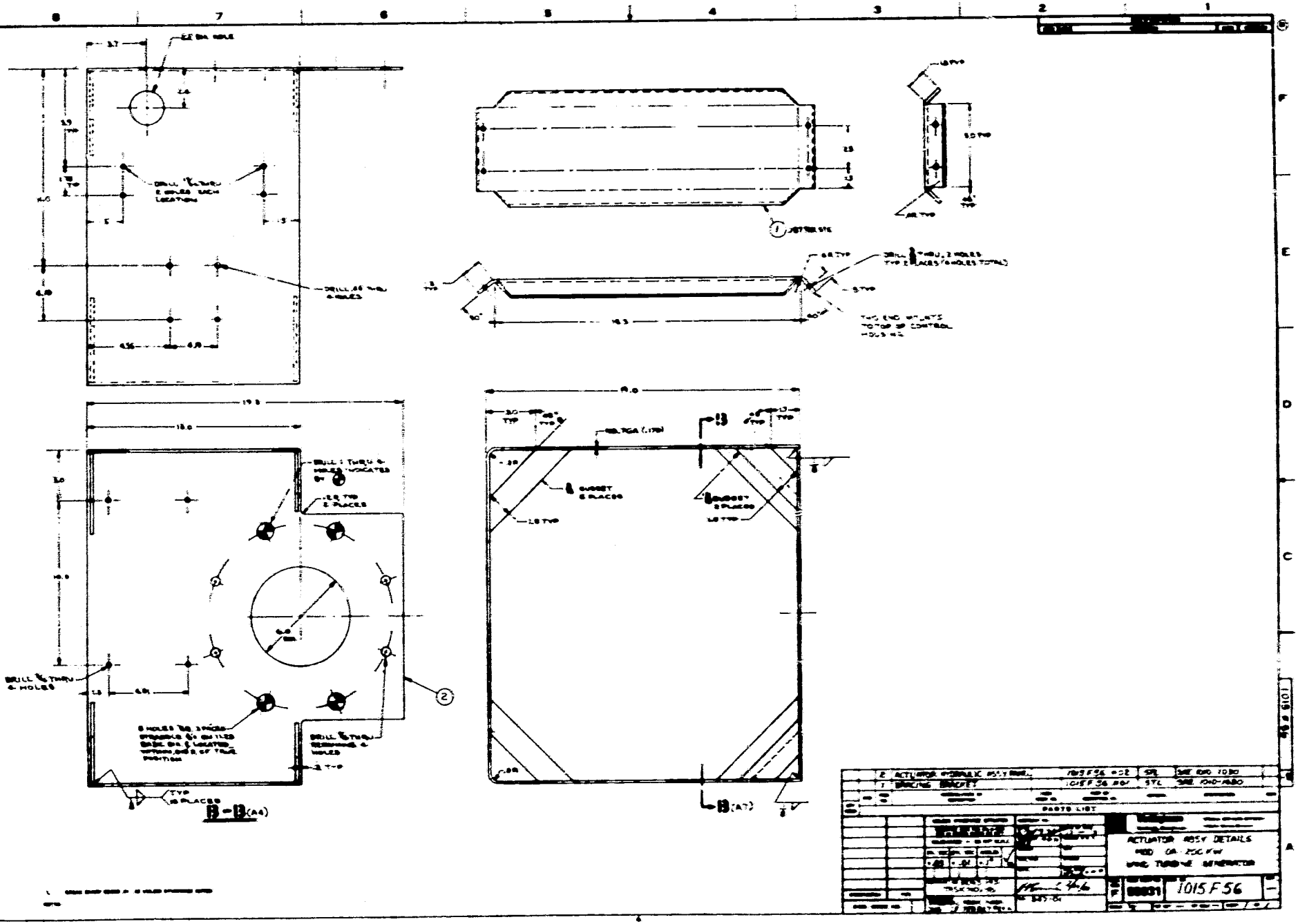


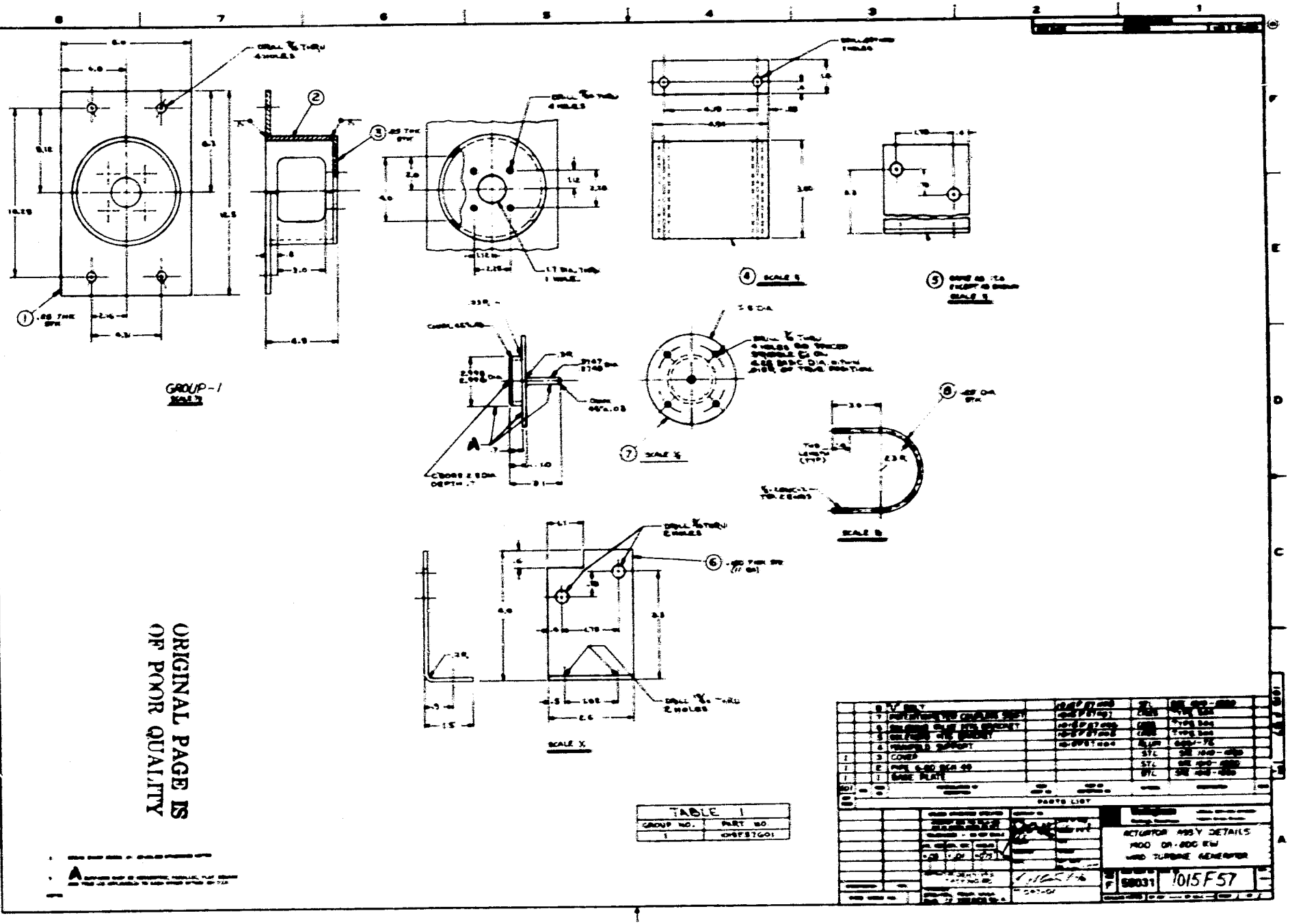
1015F55



C-C

	58031	101SF55


B-B(A4)
B(A1)
ACTUATOR ASSY DETAILS
1015F56



ORIGINAL PAGE IS
OF POOR QUALITY

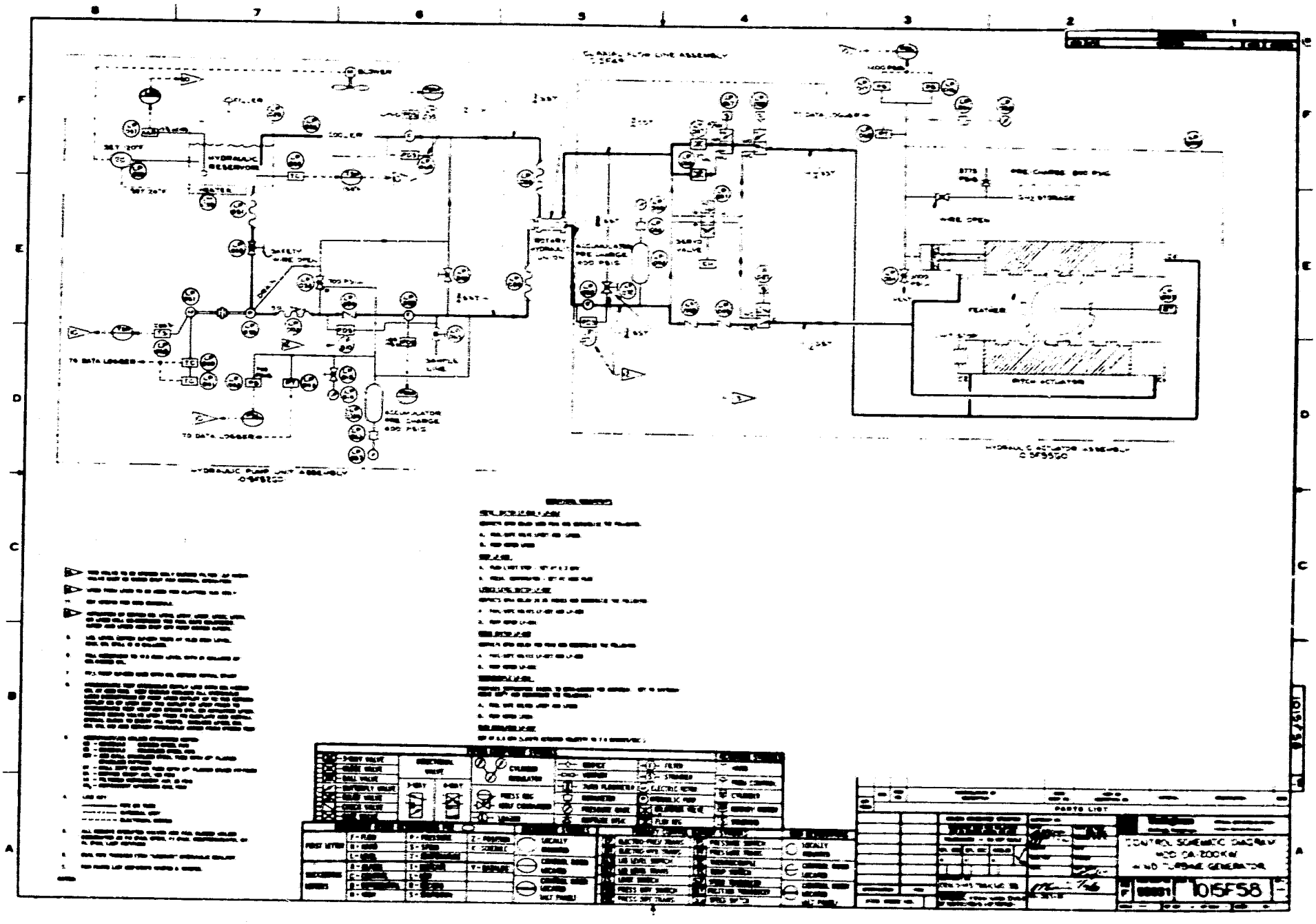
TABLE 1	
GROUP NO.	PART NO.
1	10915T601

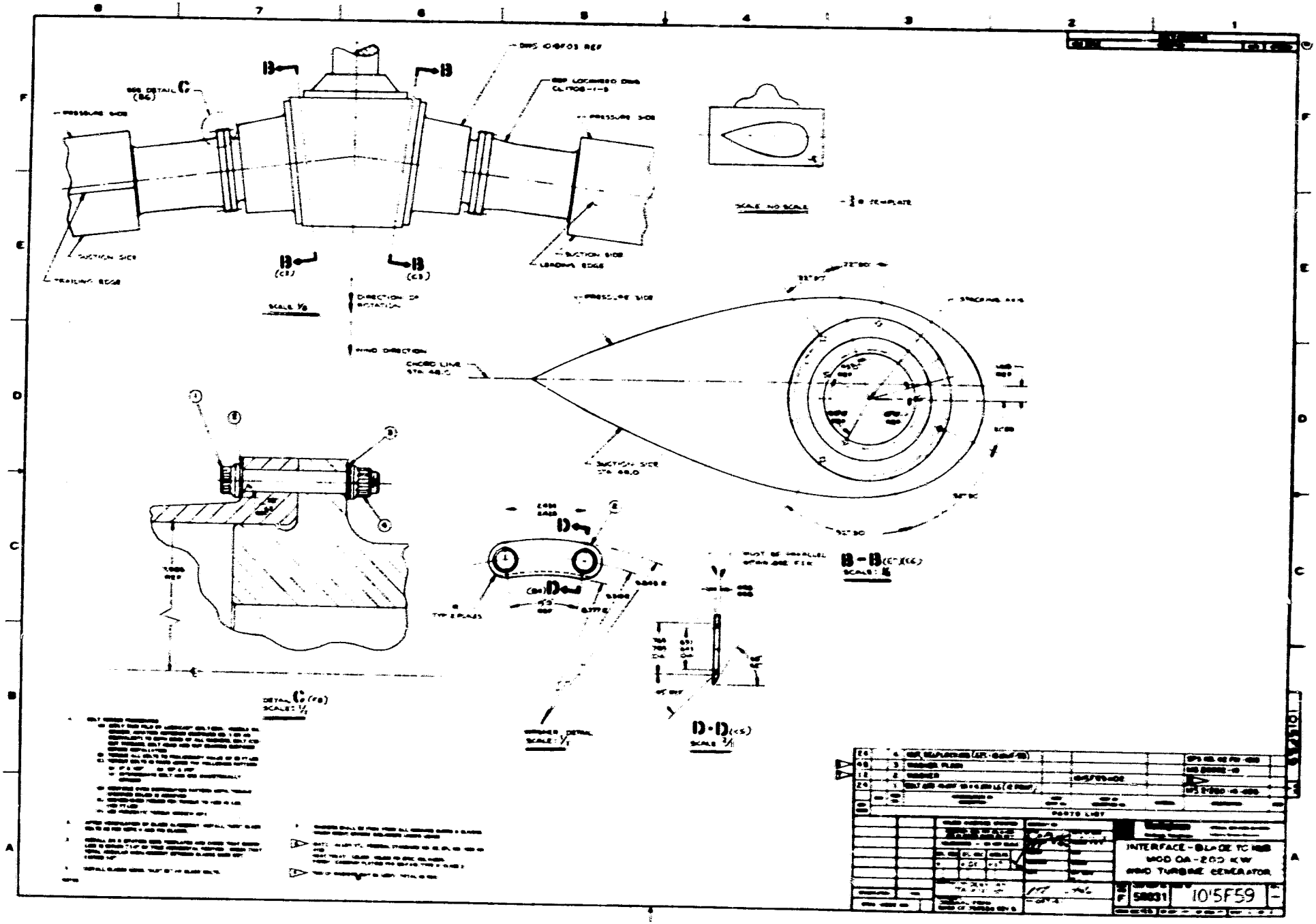
ITEM	QTY	PART NO.	DESCRIPTION	MATERIAL
8	1			
7				
6				
5				
4				
3			COVER	STL
2				STL
1	1		BASE PLATE	STL

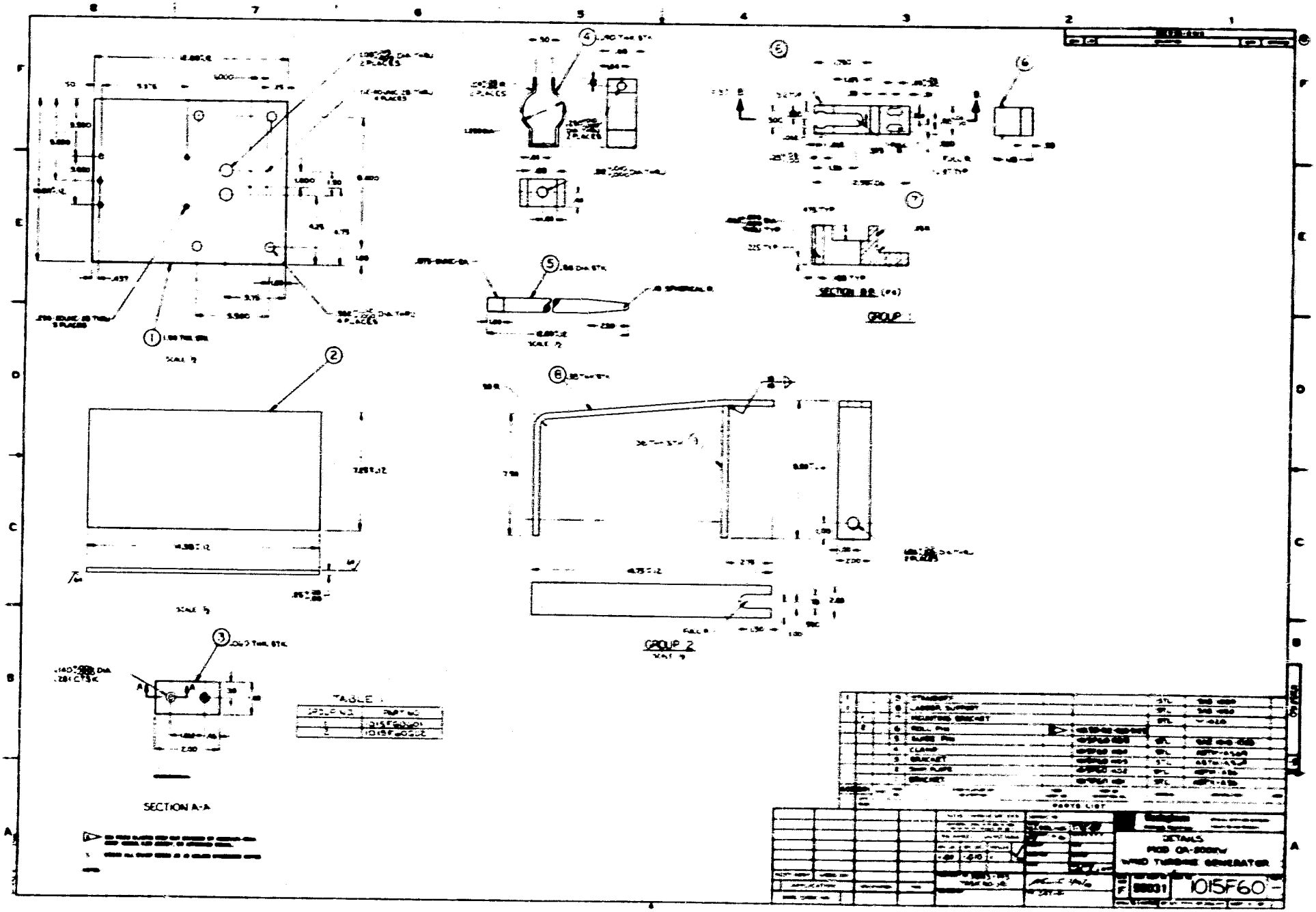
PARTS LIST

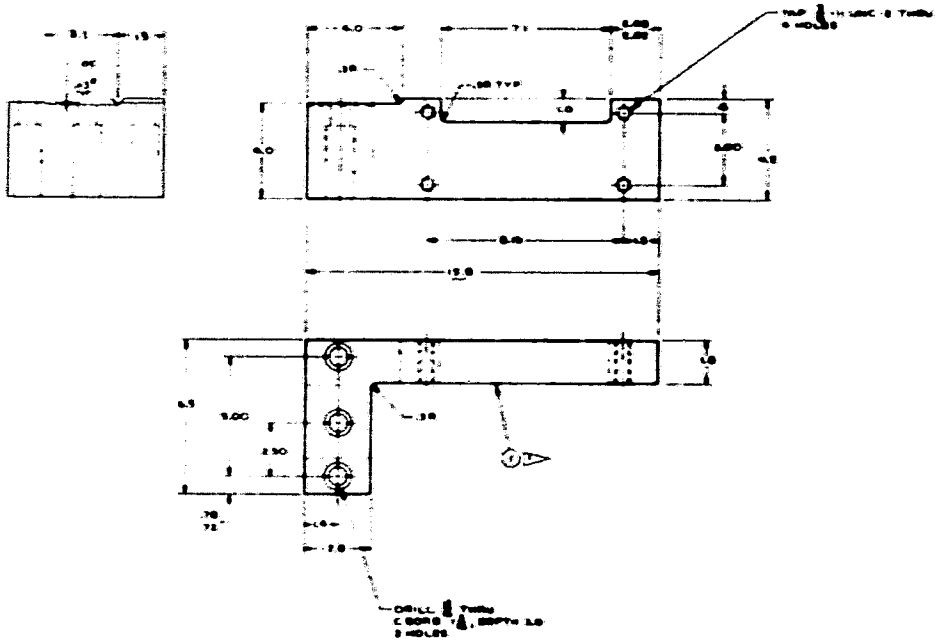
ACTUATOR 499 V DETAILS
MOD DR-8000 EW
WIND TURBINE GENERATOR

SIZE A | 98031 | 10915F57


HYDRAULIC RESERVOIR
HYDRAULIC PUMP UNIT ASSEMBLY
HYDRAULIC ACTUATOR ASSEMBLY
PARTS LIST
CONTROL SCHEMATIC DIAGRAM
10 SF 58


INTERFACE - BLADE TO HUB
MOD 0A-200 KW
WIND TURBINE GENERATOR
SB031
10'5F59

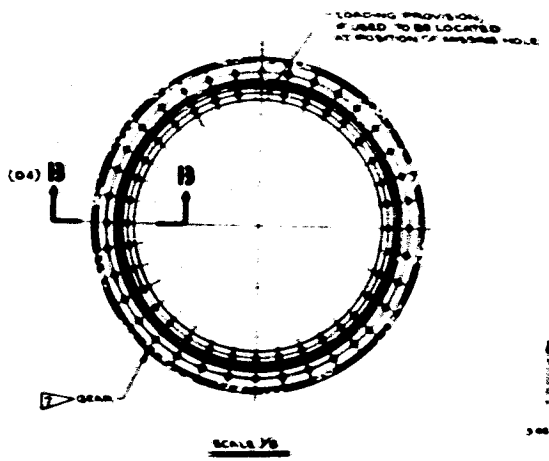

GROUP 1
GROUP 2
SECTION A-A
SECTION BB (PG)
TABLE 1
DETAILS
PGB GA-2000W
WIND TURBINE GENERATOR
1015F60



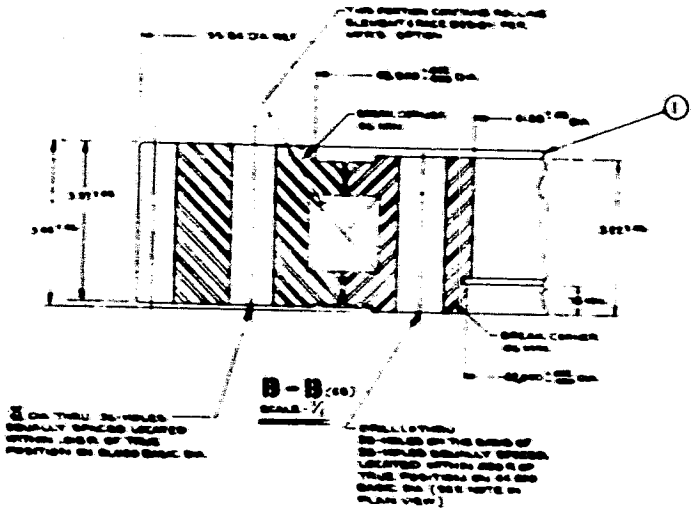
	UPPER BRACE SUPPORT		STL	SAE 6130-4130	
	PARTS LIST				

UPPER BRACE SUPPORT
MOD CA - 20C KW
WIND TURBINE GENERATOR

F 99031 1015F61

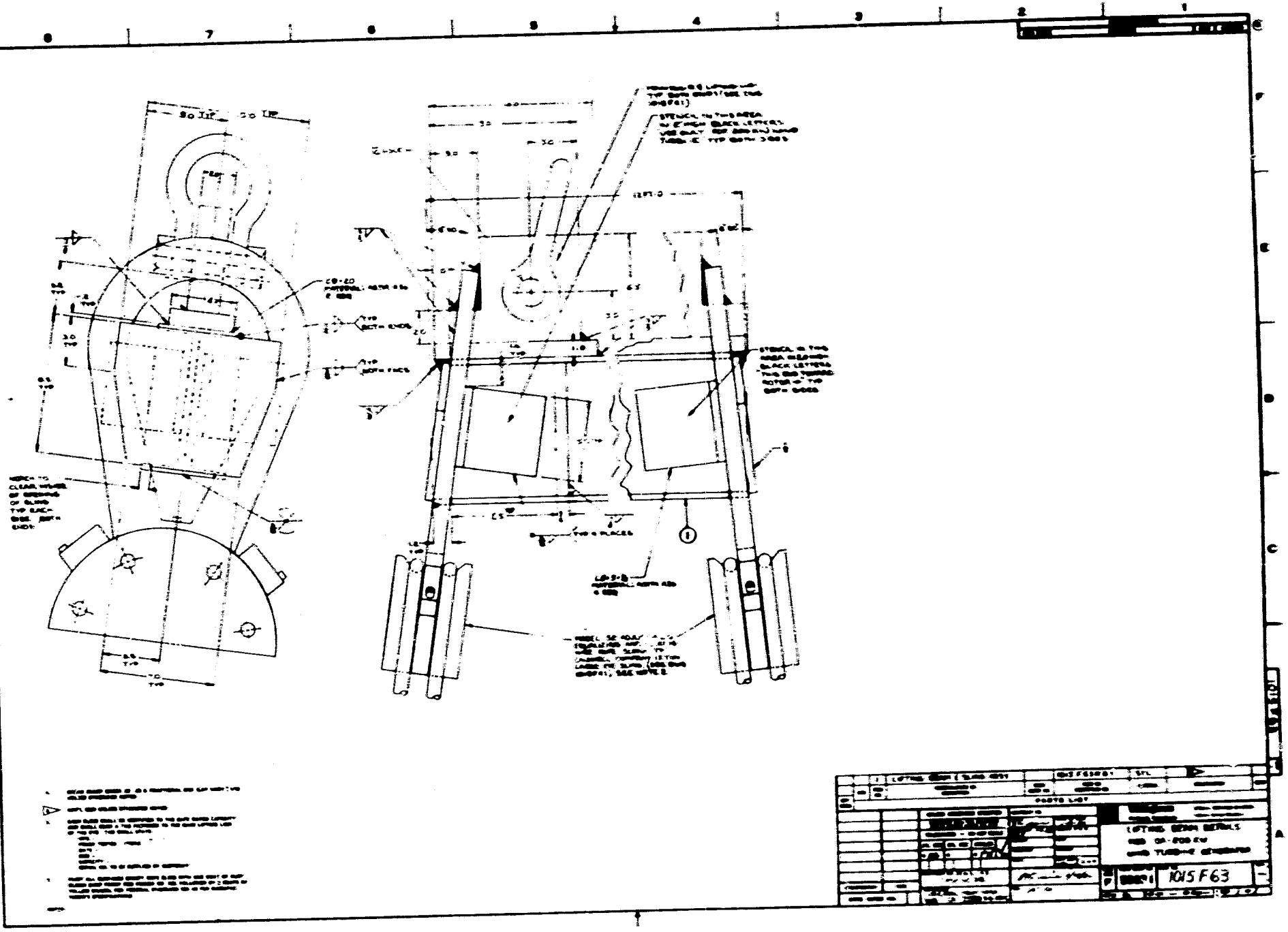


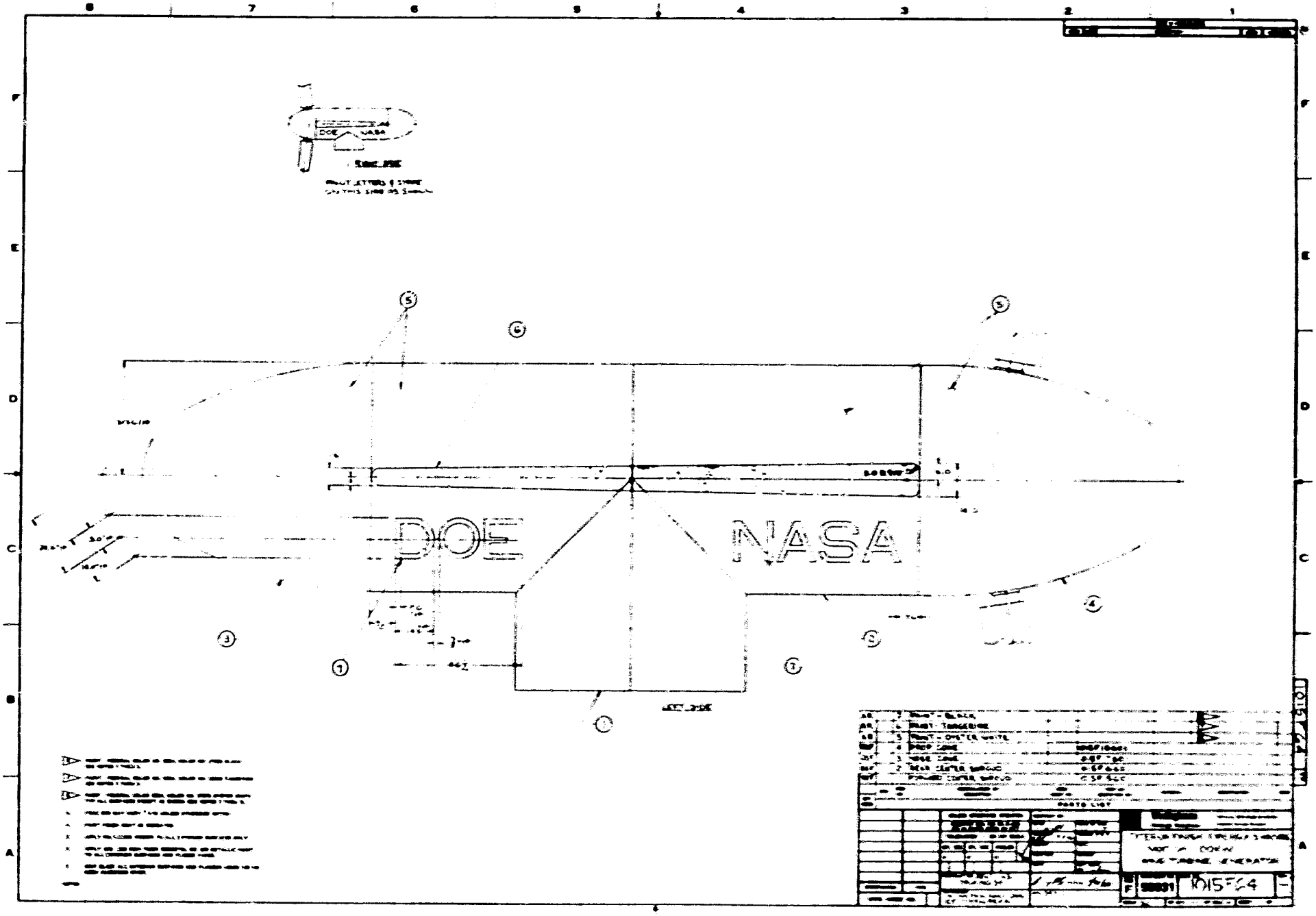
SCALE 3/8

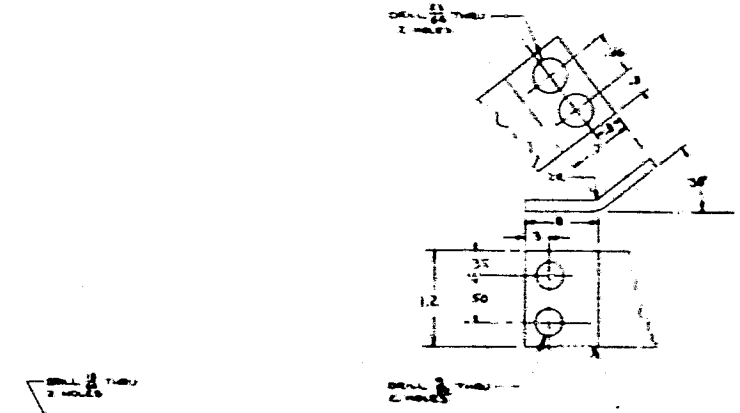


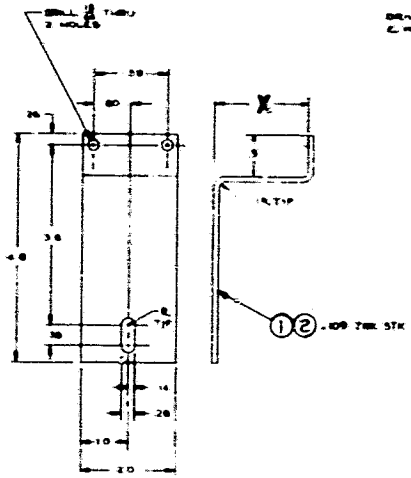
B - B (60)
SCALE - 1/1

1005F62

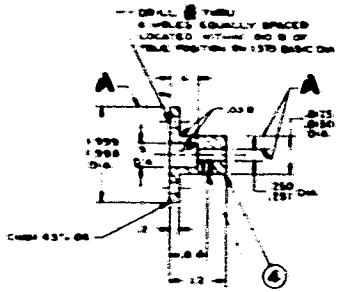



DOE
NASA





ITEM NO.	X
1	3.0
2	10



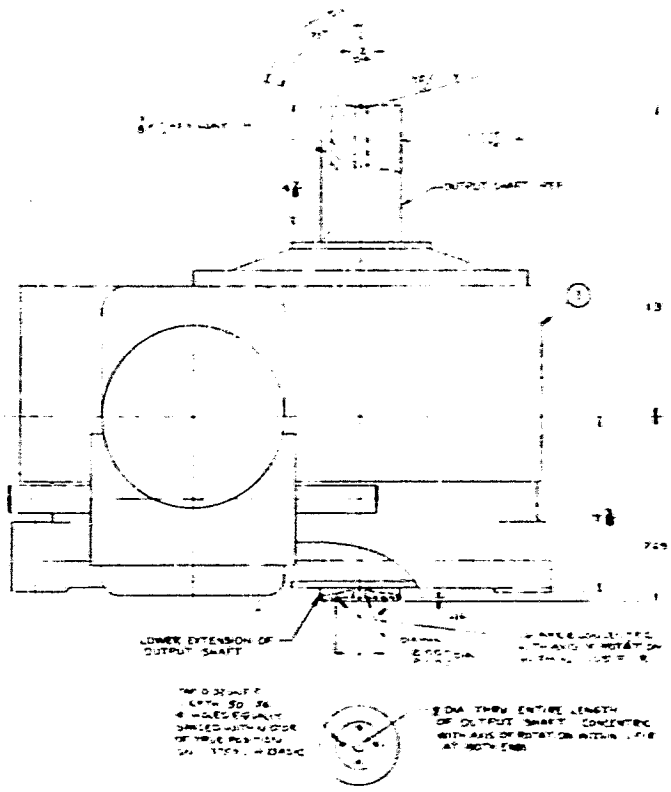
PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
4			COUPLING FLANGE (Not Shown)	
3			BRACKET	
2			BRACKET	
1			BRACKET	CRES

TRANSDUCER ANTI-ROTATION BRACKET
& BUTTRESS RING SEGMENT DETAILS
5400 DIA - 8500 KEY
WIND TURBINE GENERATOR

SIZE B | 00031 | 1015F65

SCALE 1/2 | WEIGHT | SHEET 1 OF 1



PARTS LIST

DOUBLE REDUCTION WORM GEAR UNIT FAN DRIVE MOD DA-100 KW WIND TURBINE GENERATOR

68031 J15F66

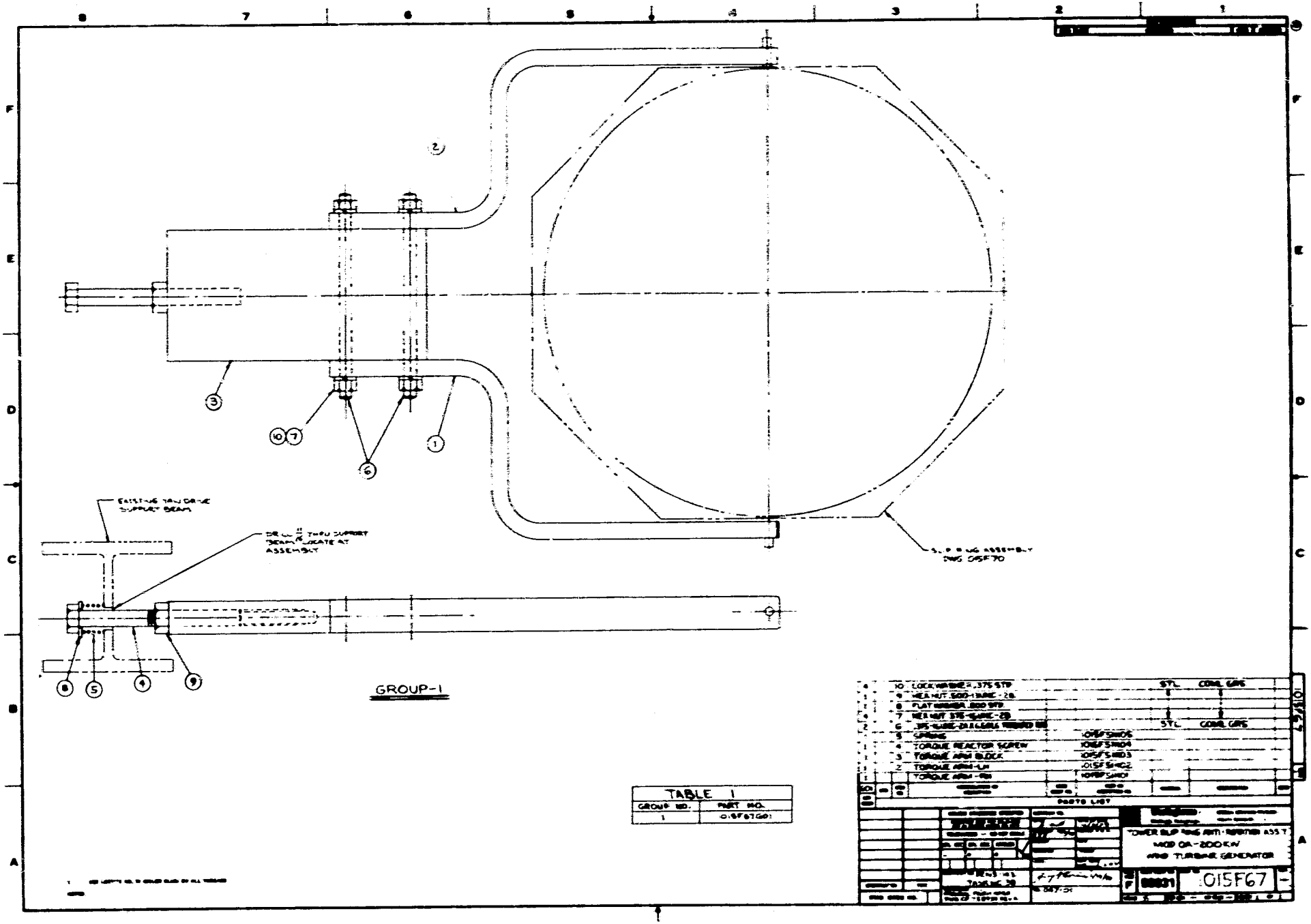


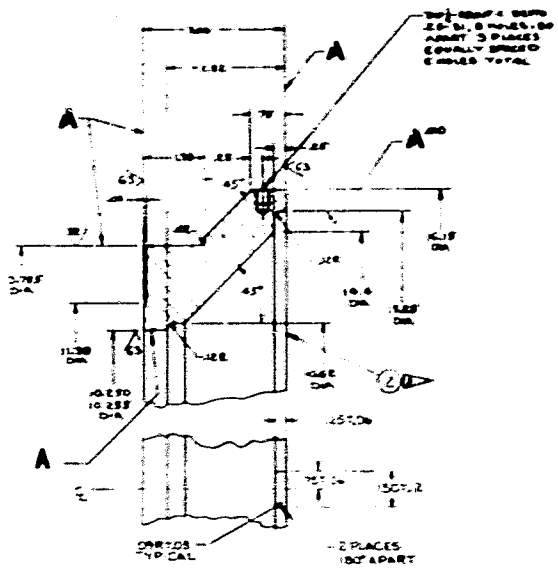
TABLE 1	
GROUP NO.	PART NO.
1	015F67G01

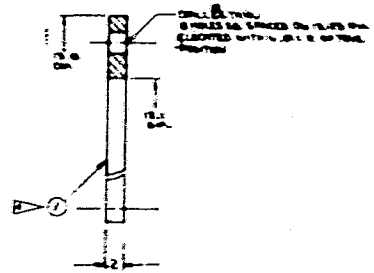
10	LOCK WASHER - .375 STD		STL	COML GRS
9	HEX NUT .500-13UNC-2B			
8	FLAT WASHER .500 STD			
7	HEX NUT .375-16UNC-2B		STL	COML GRS
6	.375-16UNC-2A X 4.50 LONG THREADED ROD			
5	CLEVIS	015F5M05		
4	TORQUE REACTOR SCREW	015F5M04		
3	TORQUE ARM BLOCK	015F5M03		
2	TORQUE ARM-LH	015F5M02		
1	TORQUE ARM-RH	015F5M01		
QTY	PART NO.		MATL	

PARTS LIST

"POWER SLIP RING ASSY - TORQUE ARM ASS'Y
MOD OA-2000 KW
WIND TURBINE GENERATOR

CAGE 88031 015F67



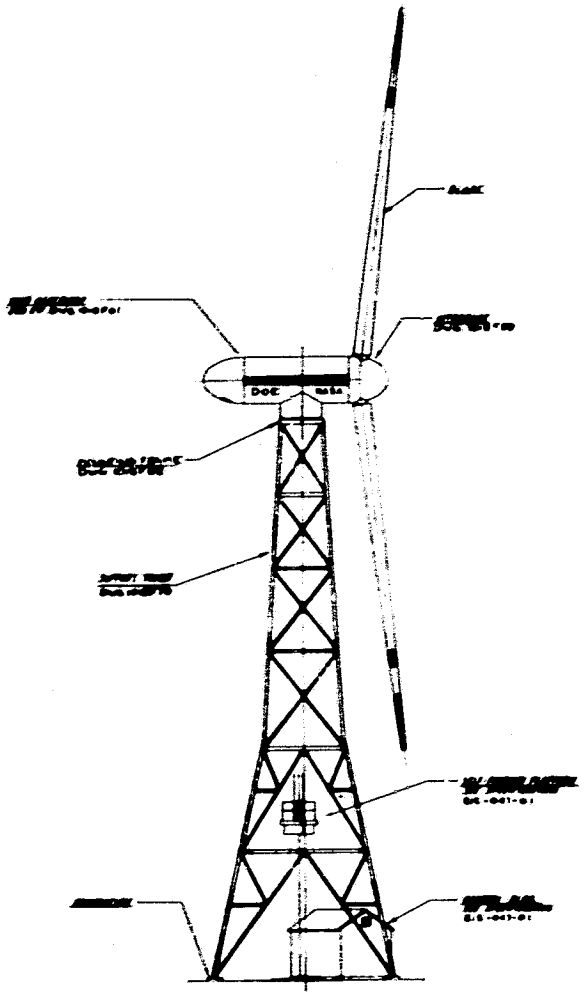


2	BUTTRESS RING			STL	SAE 1020-1025
1	SEAL RETAINER			STL	SAE 1020-1025

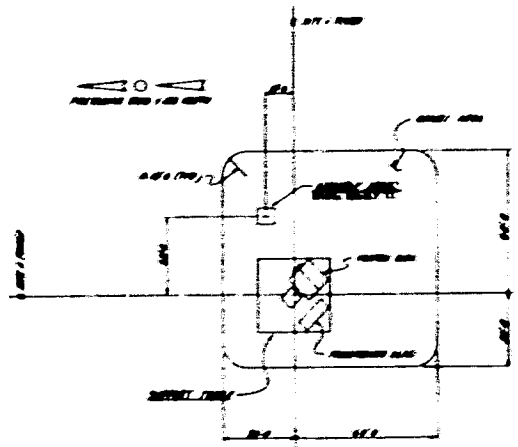
PARTS LIST

DETAIL
MOD OA - 200 KW
WIND TURBINE GENERATOR

1015 F68



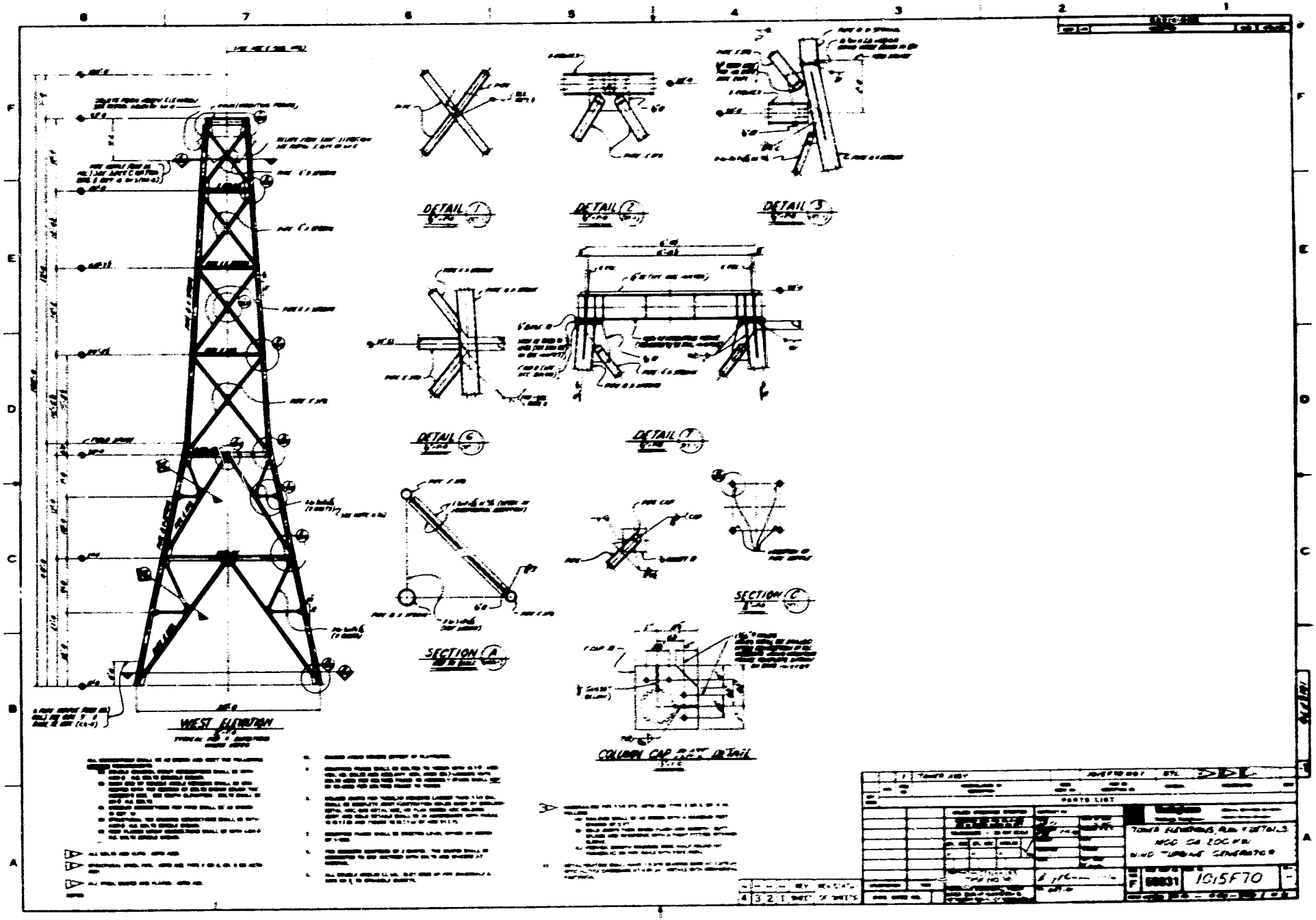
ELEVATION



SITE PLAN

SITE PLAN & GENERAL ASSY
MOD OA 200 KW
WIND TURBINE GENERATOR

SIZE 03031 1015F69


DETAIL 1
DETAIL 2
DETAIL 3
DETAIL 6
DETAIL 7
SECTION A
SECTION C
WEST ELEVATION
COLUMN CAP PLATE DETAIL
PARTS LIST
TOWER ELEVATIONS, SECTIONS AND DETAILS
FOR 50 KW WIND TURBINE GENERATOR
SIZE
F
00031
1015F70

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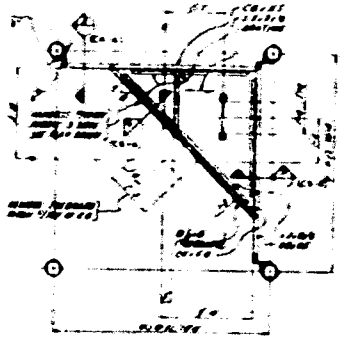
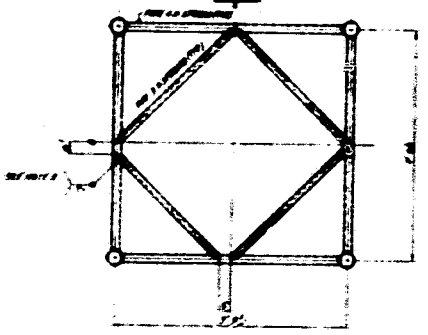
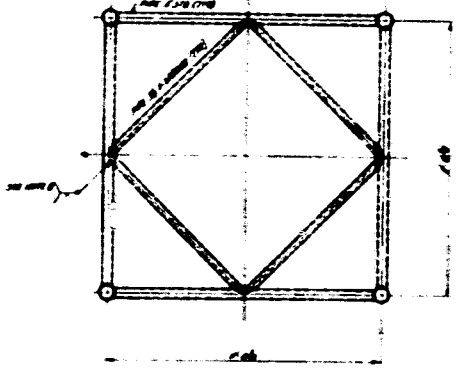


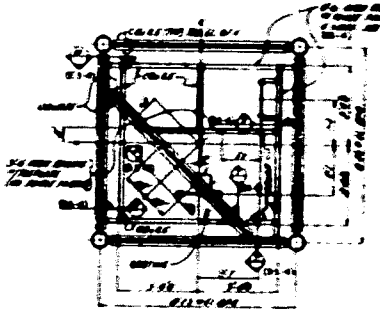
PLAN AT ELEVATION 74'-0



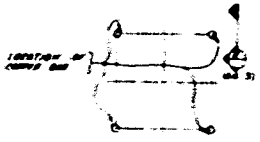
PLAN AT ELEVATION 68'-7½



PLAN AT ELEVATION 54-5½

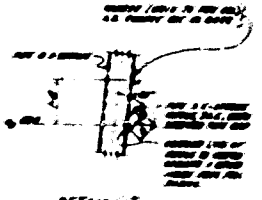


PLAN AT ELEVATION 81'-0

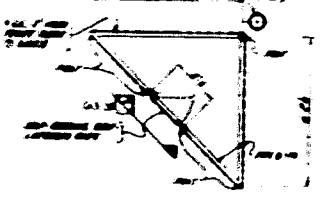


SECTION D

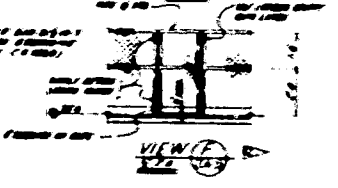
VIEW E



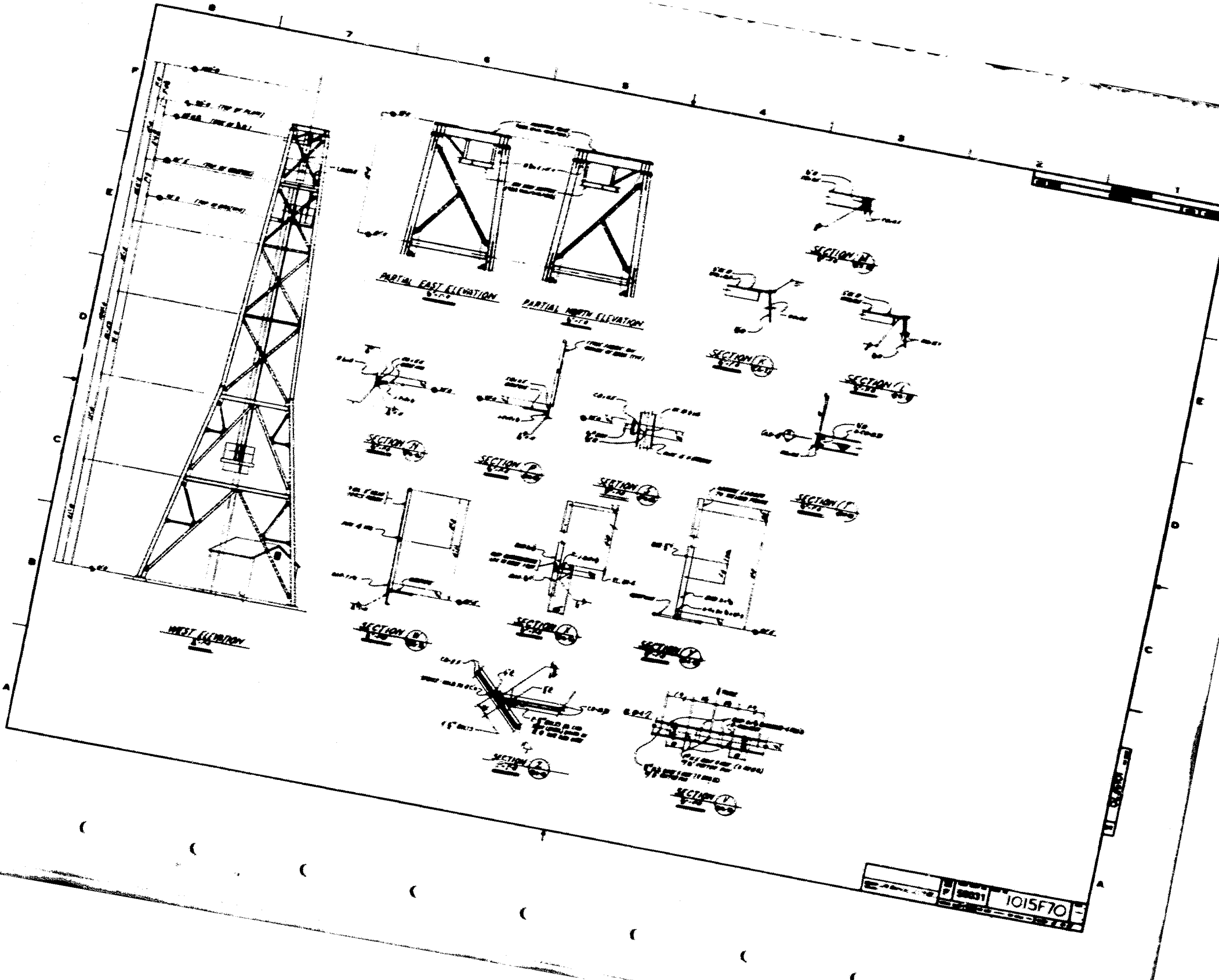
DETAIL 13

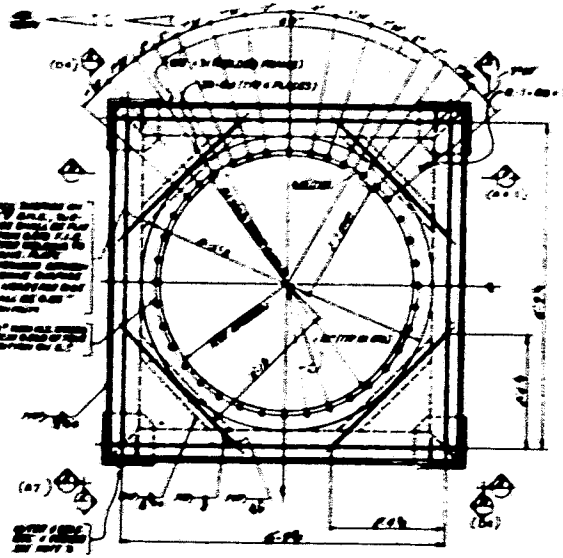


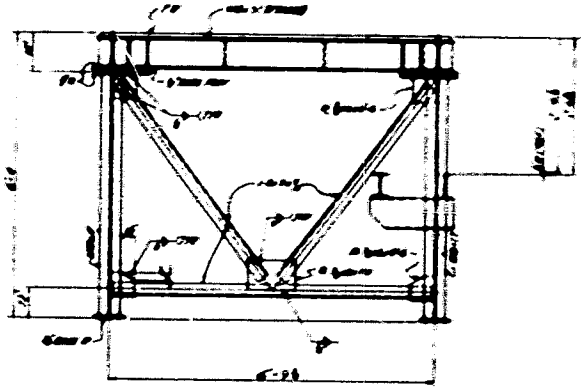
HANDRAIL PLAN

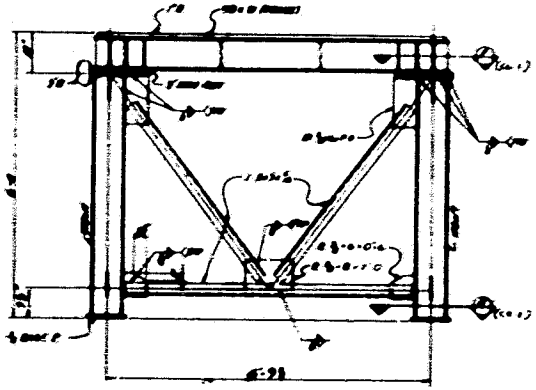


VIEW F

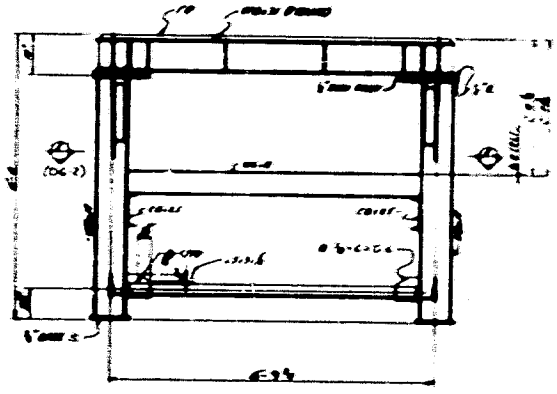

PARTIAL EAST ELEVATION
PARTIAL NORTH ELEVATION
WEST ELEVATION
1015F70







VIEW A



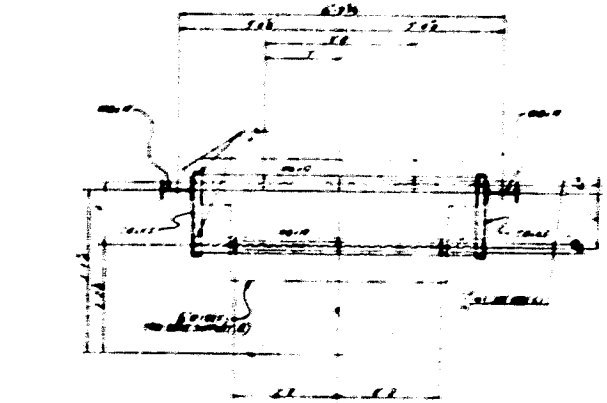
SECTION

1	ASSY STAND	1015 F71 B01	SPL	

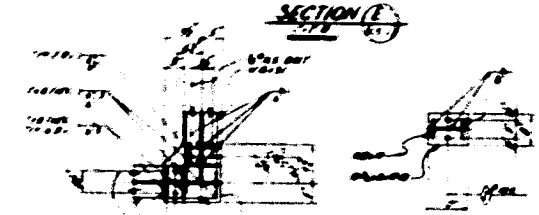
PARTS LIST

ASSY STAND PLAN & DETAILS
MOD 0A - 200 KW
WIND TURBINE GENERATOR

2	1	087-01	1015 F71

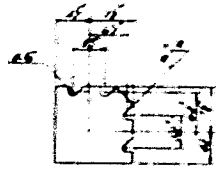


SECTION E

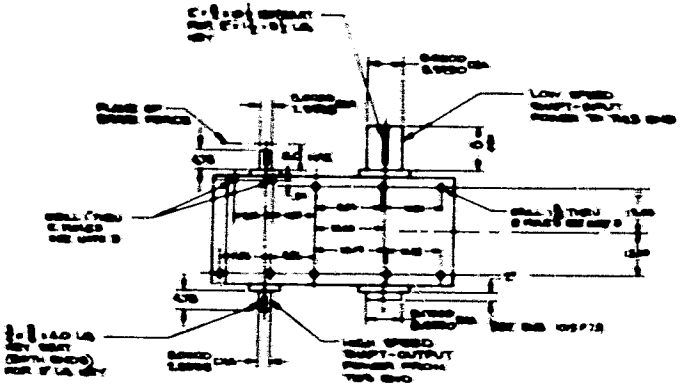


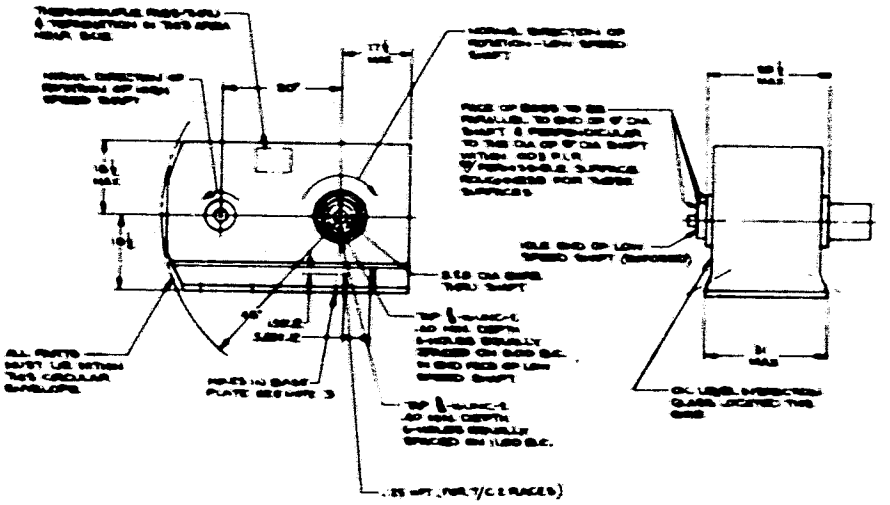
SECTION F

SECTION G

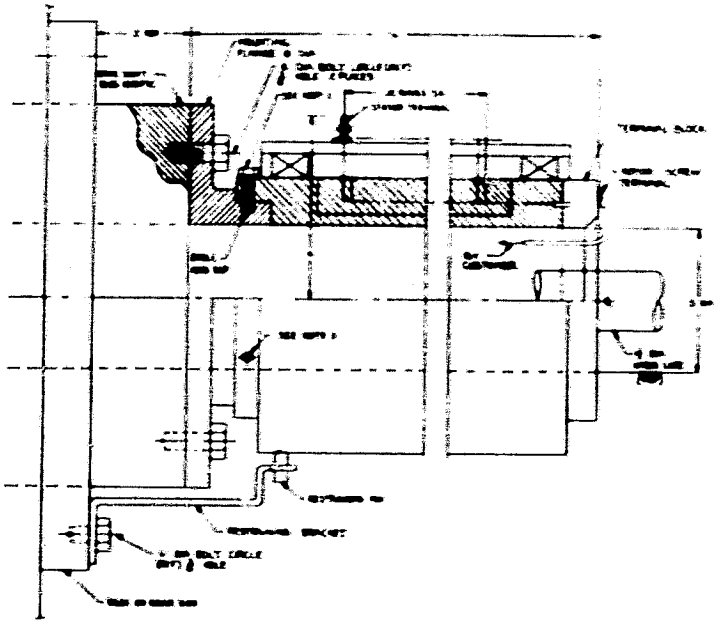


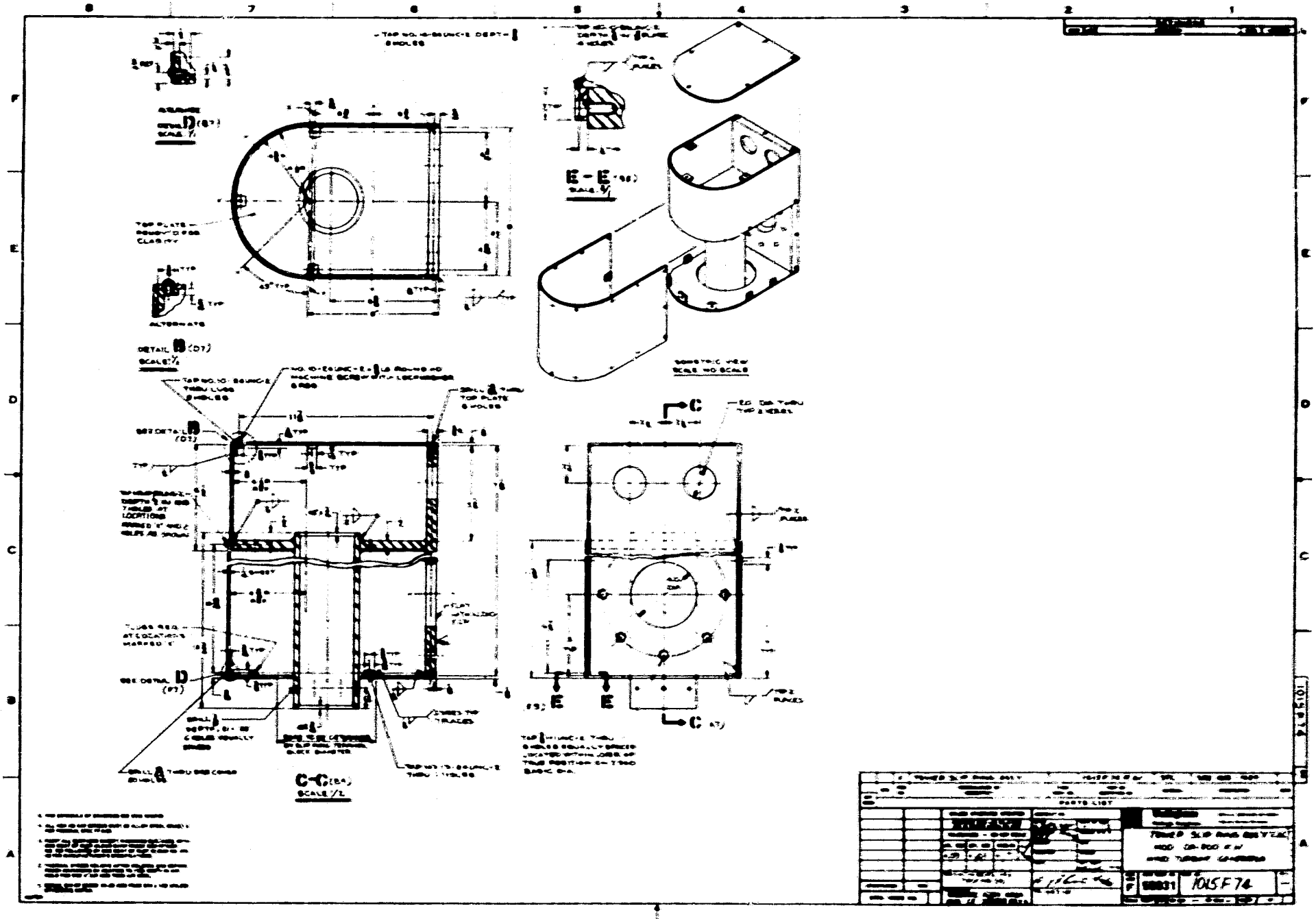
SHIM DETAIL

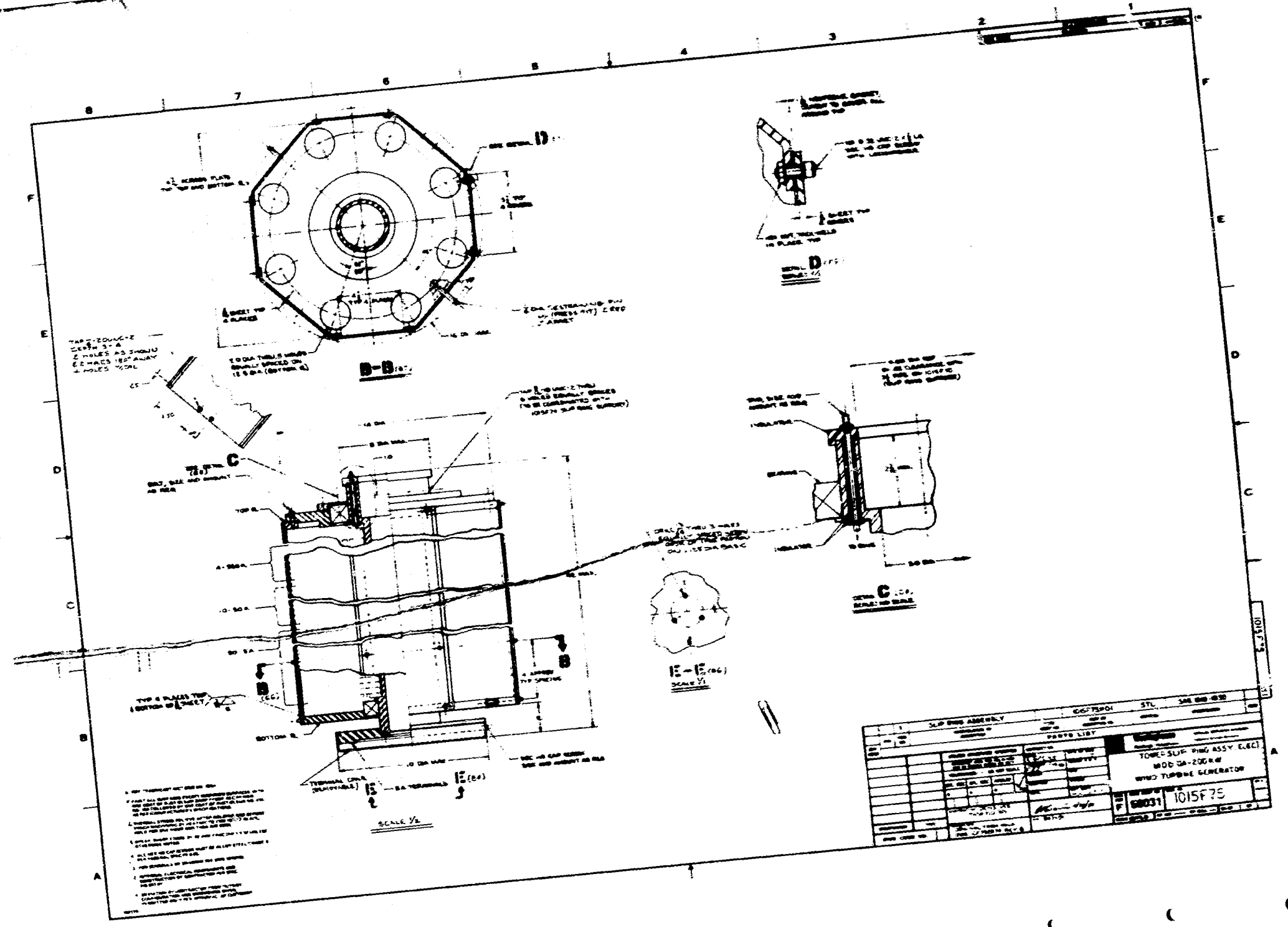


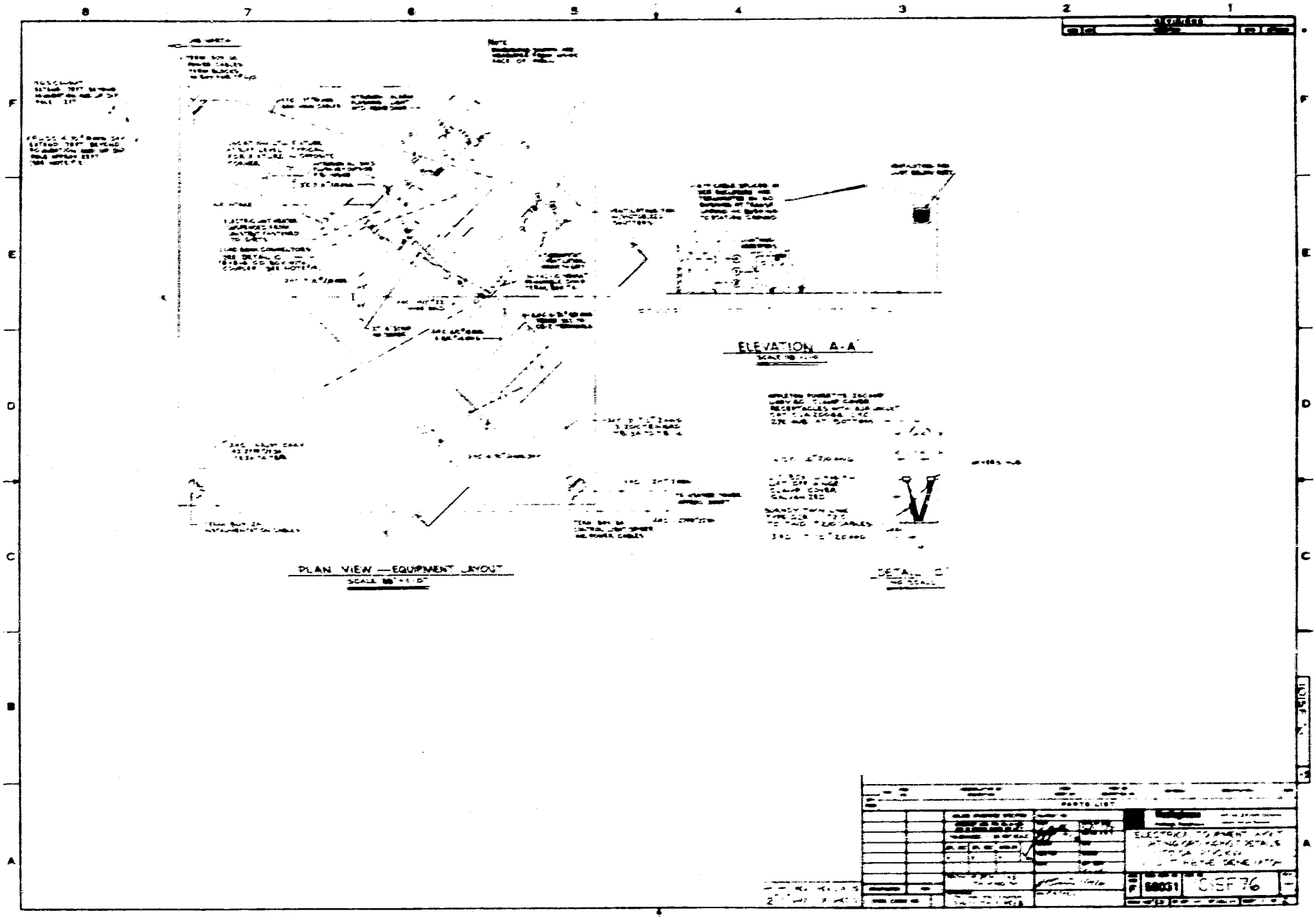


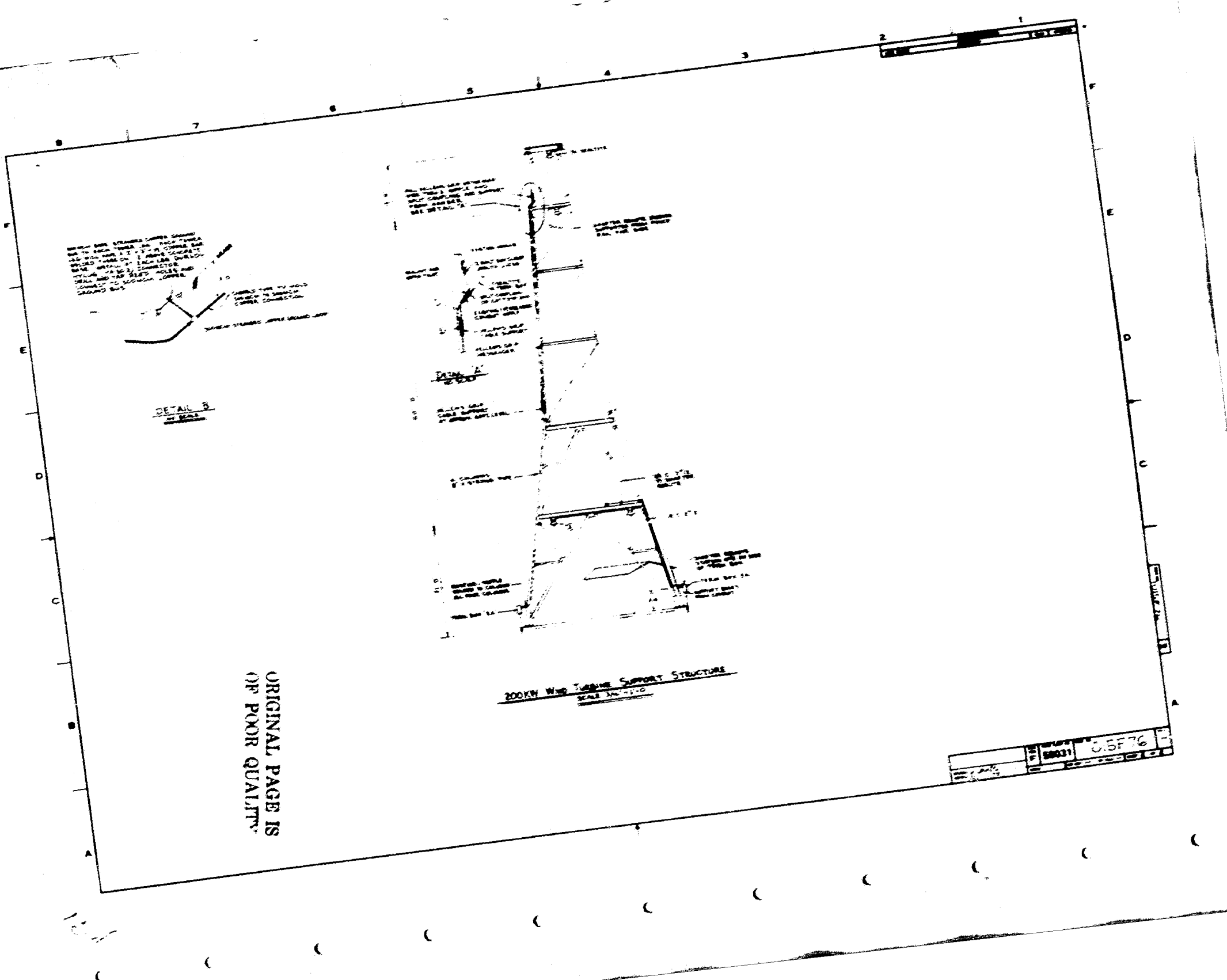
1015F72	

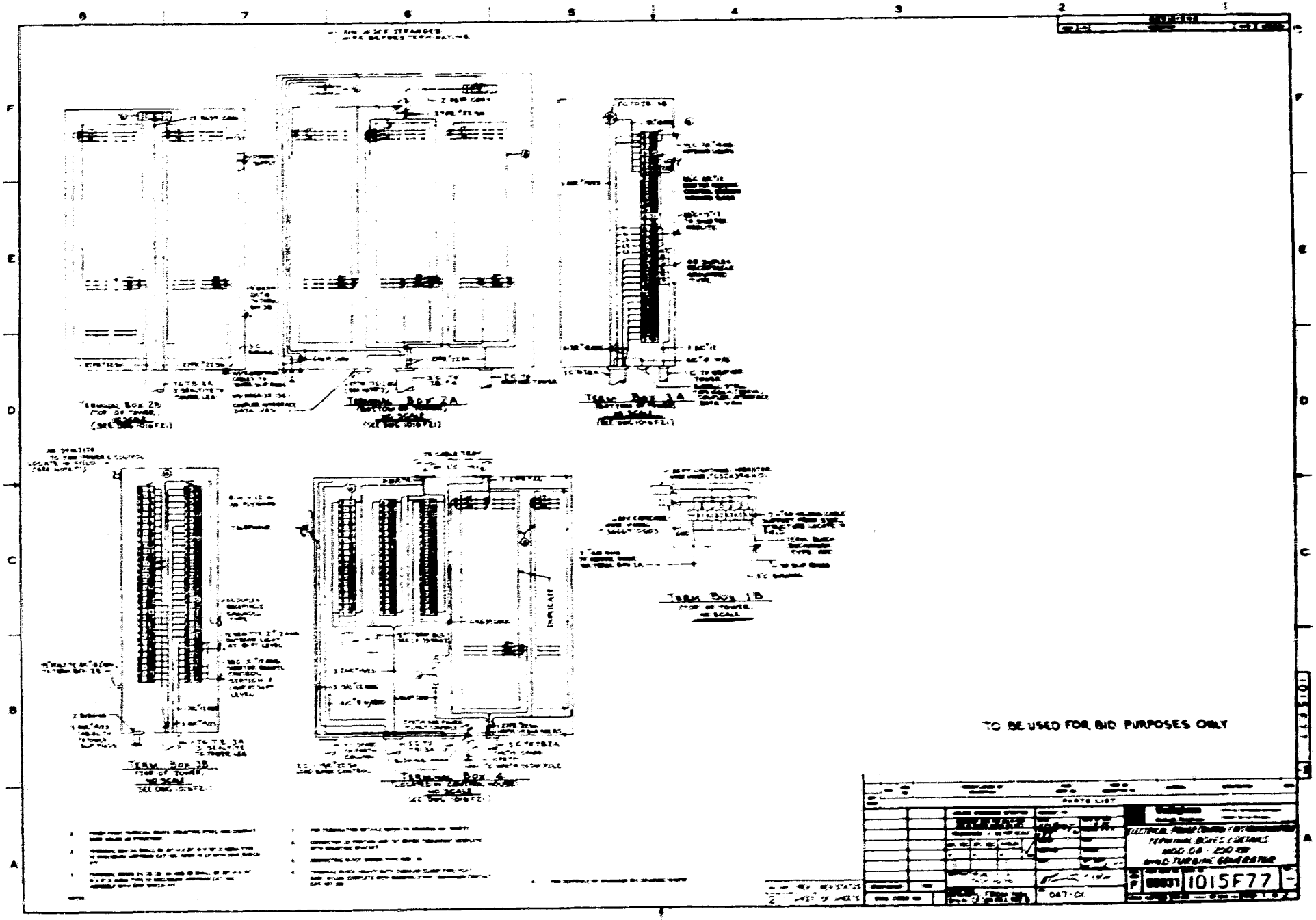



E - E
C - C
SCALE 1/2

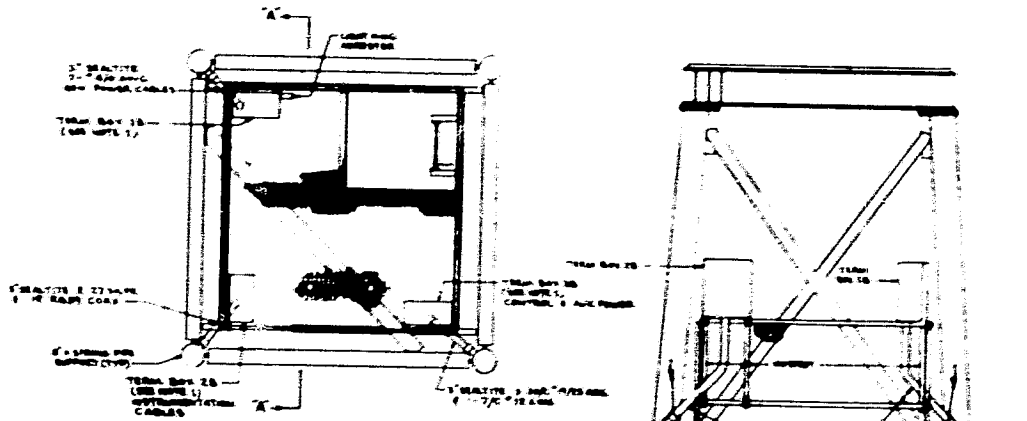

SLIP RING ASSEMBLY
TORQUE SLIP RING ASSY (LEC)
MOD 5A-200kW
WIND TURBINE GENERATOR
F 68031
1015F75


ELEVATION A-A
PLAN VIEW — EQUIPMENT LAYOUT



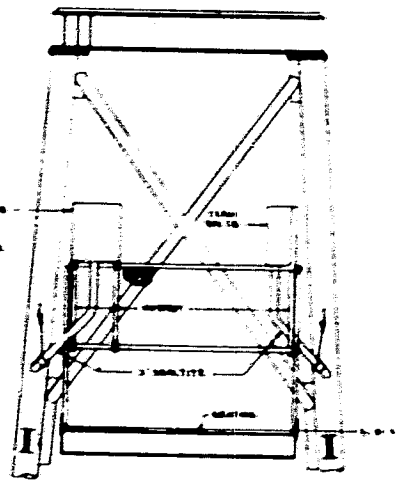


TO BE USED FOR BID PURPOSES ONLY



PLAN AT ELEVATION 81'-0"

SCALE 3/4"-1'-0"



SECTION A-A

SCALE 3/4"-1'-0"

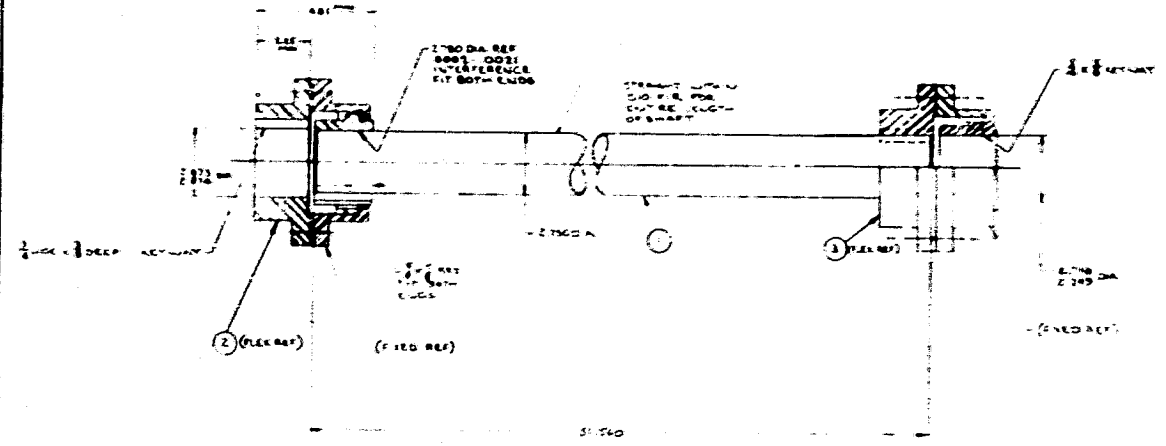


TABLE I	
COUPLING NO	PART NO
1	1015F78 NO.

3	FLEX COUPLING	10 TFOI FLEX	
2	TURN COUPLING	10 TFOI TYPE	
1	SHAFT	ST'L	SAE 4140-4130
NO.	PARTS LIST		

HIGH SPEED SHAFT ASSEMBLY
MOD DARRIEUS
WIND TURBINE GENERATOR

SIZE A | CODE IDENT NO 99021 | DWG NO 1015F78 | REV -

SCALE 1/2 | WEIGHT | SHEET 1 OF 1

-041-01

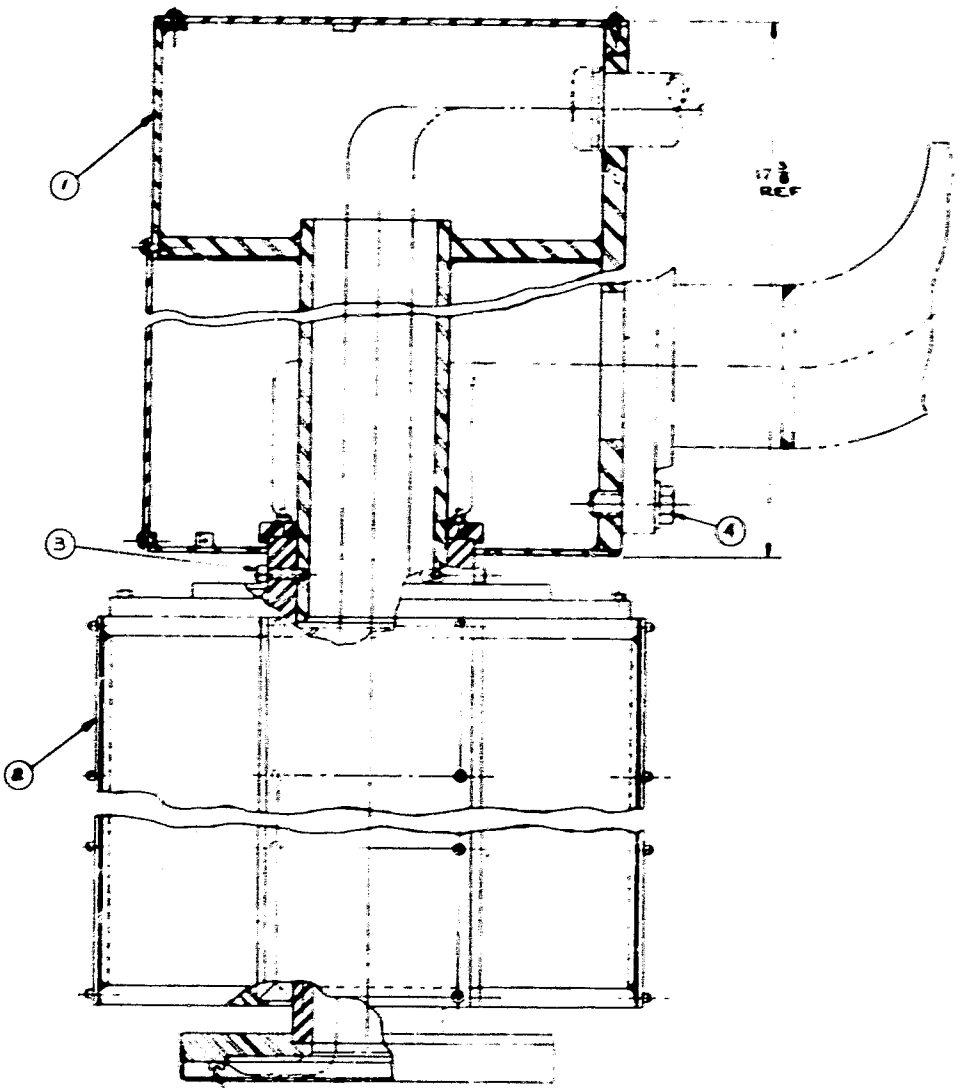
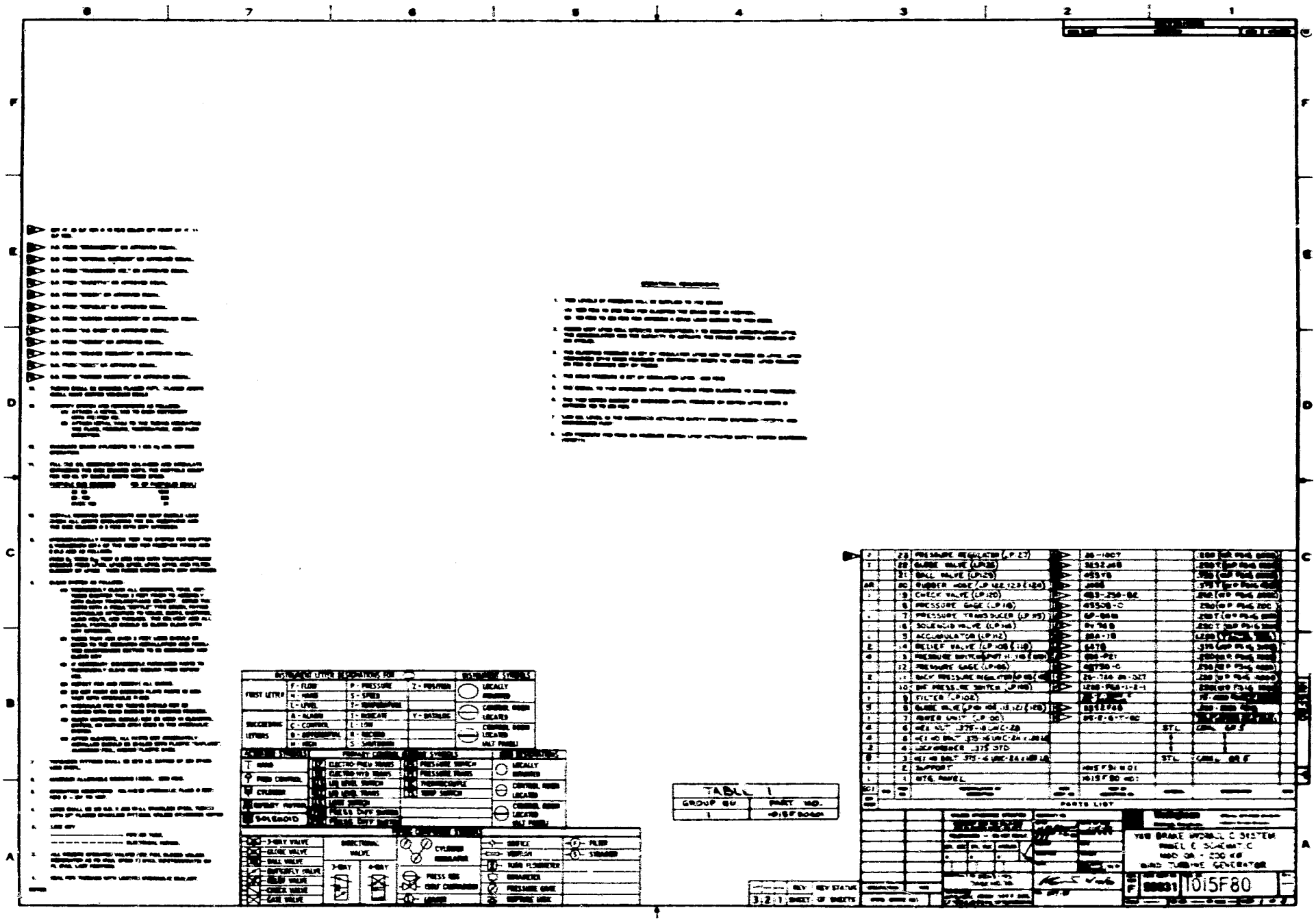


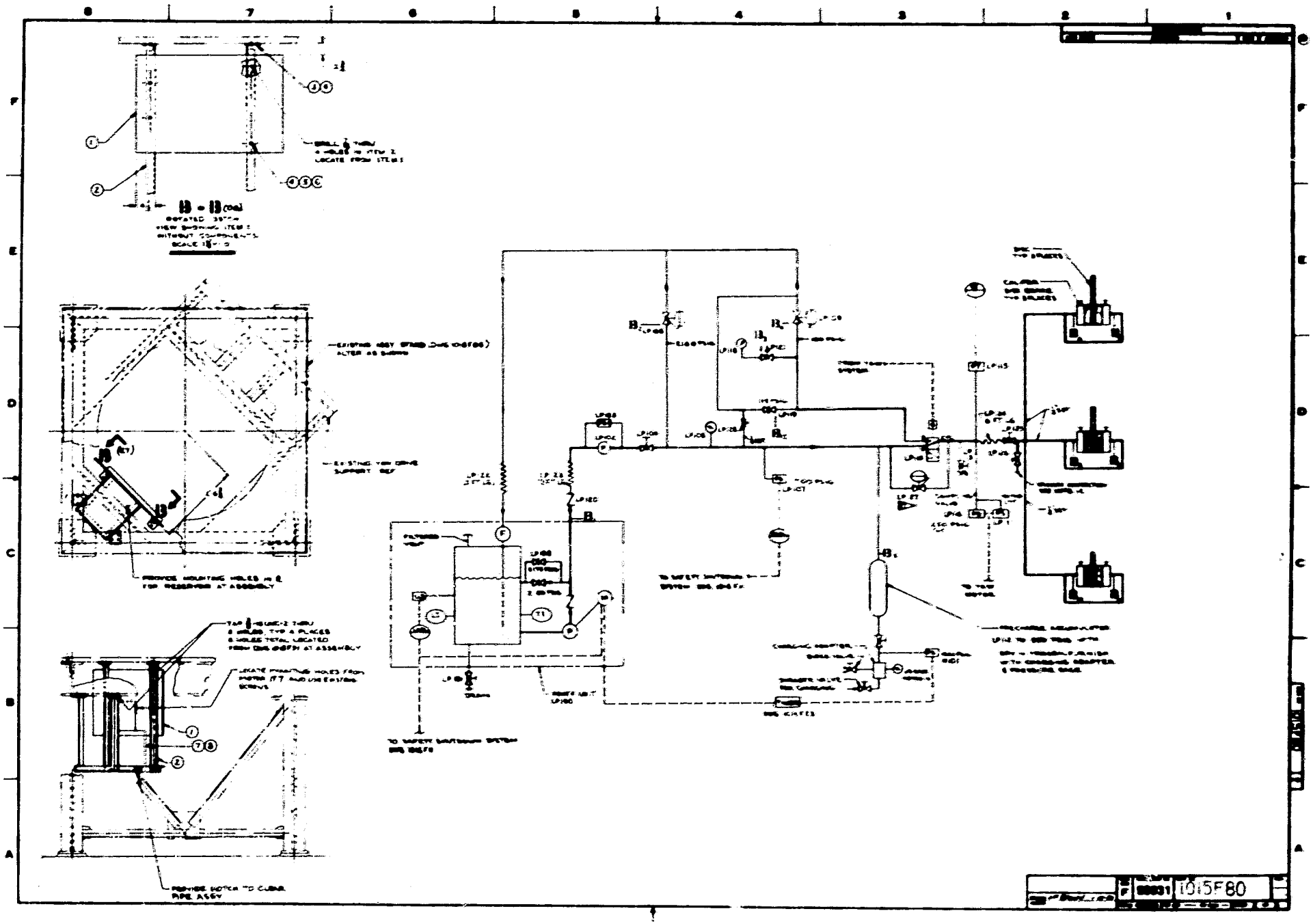
TABLE 1	
SACP NO	PART NO
	10587950

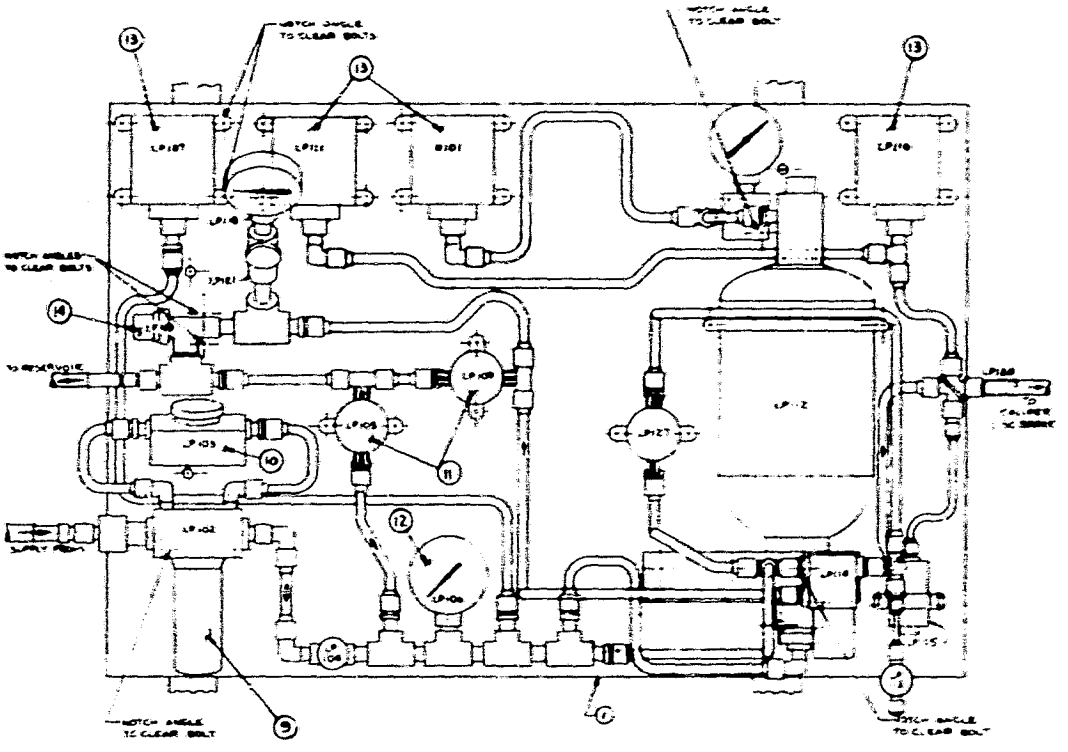
PARTS LIST

TOWER S.P. RING ASSY
400 CA 200 KW
A.C. TURBINE GENERATOR

F 58031 1015F79

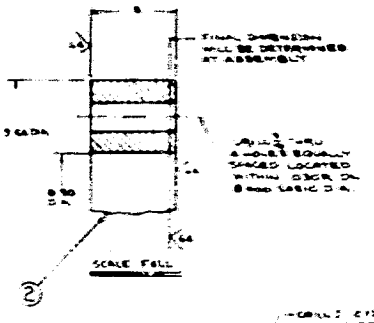



8
7
6
5
4
3
2
1
F
E
D
C
B
A
10 5F80

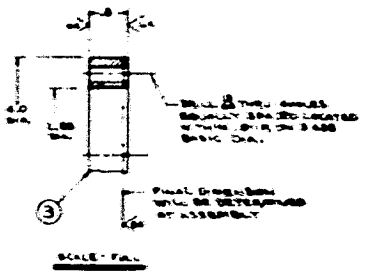


PANEL ASSEMBLY
SCALE 1/2

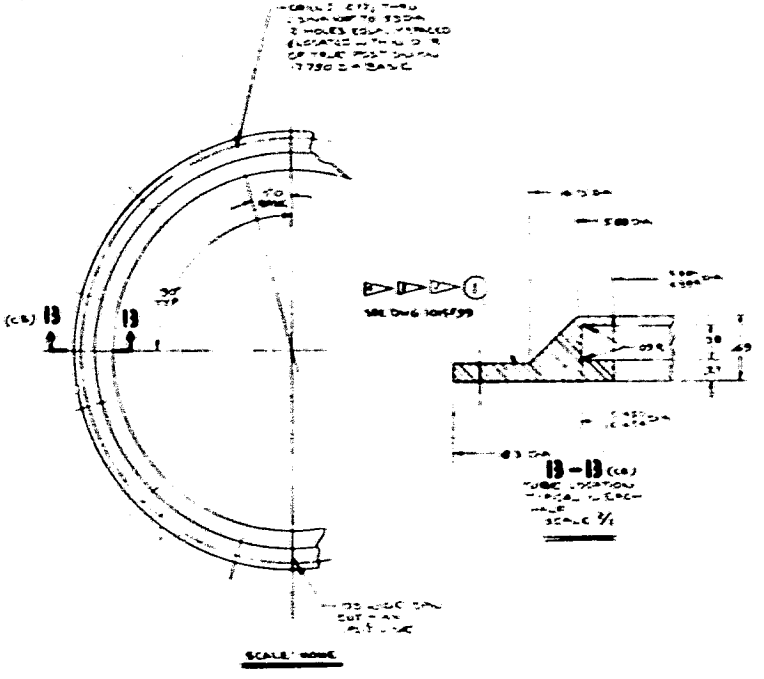
1015F80



SCALE: FULL



SCALE: FULL



SCALE: NONE

B-B (CCW)

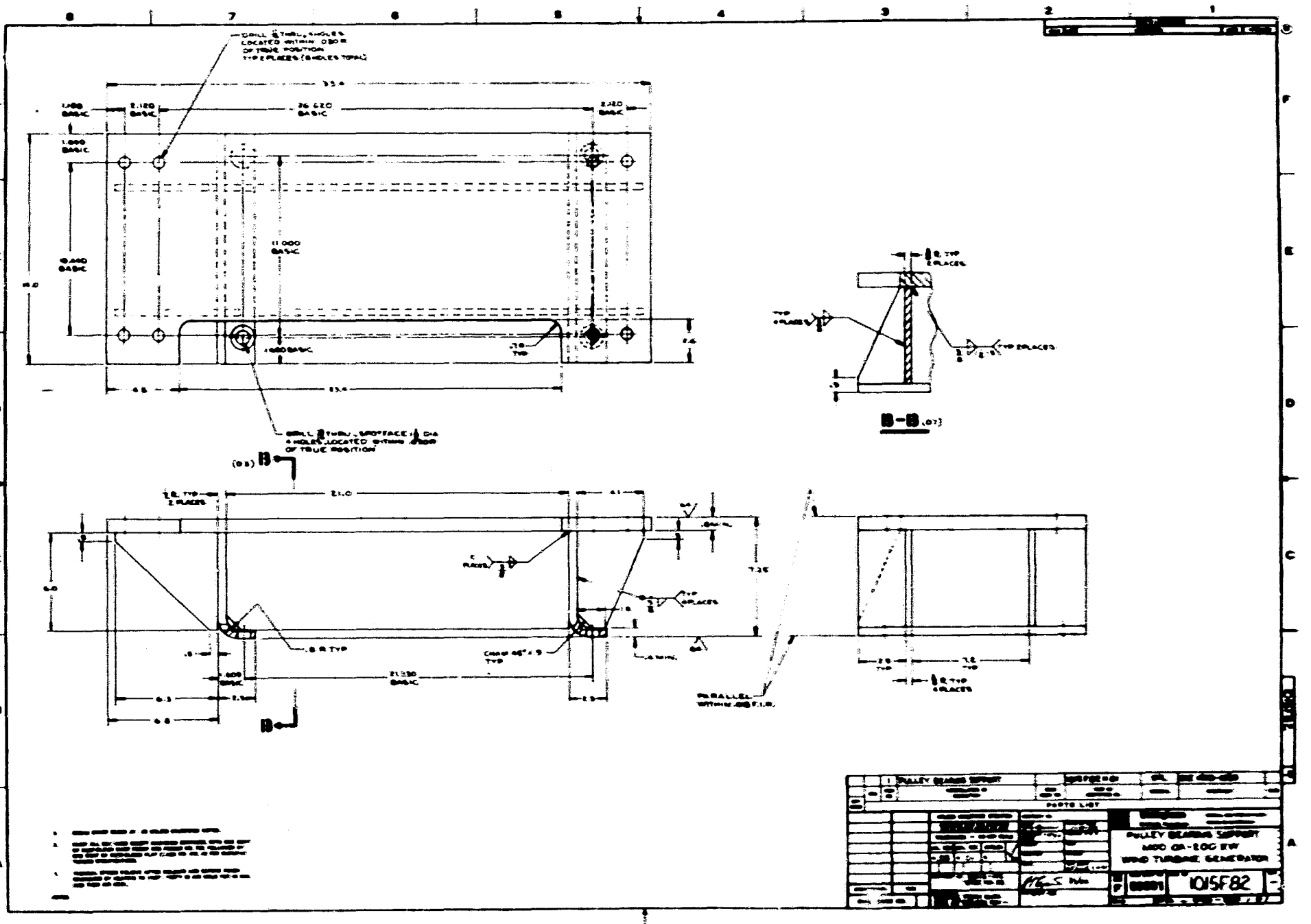
SCALE: 3/1

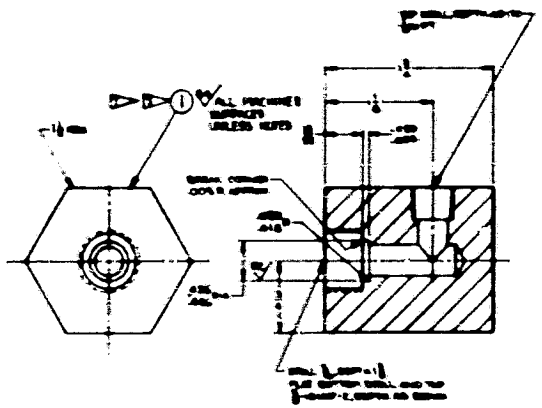
3	SPACER TUBE COUPLING		STL	
2	SPACER TUBE COUPLING		STL	
1	MAIN SEAL HOUSING		STL	

PARTS LIST

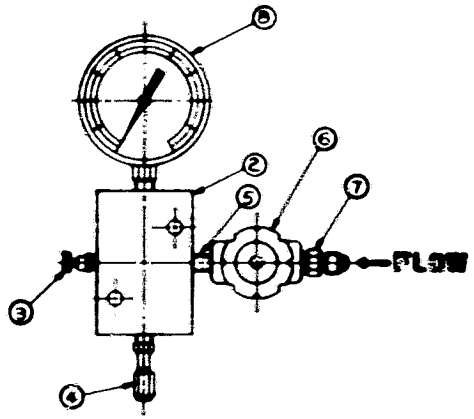
DETAILS
MOD 0A - 200 KW
WIND TURBINE GENERATOR

F	58031	1C15F81


B-B (.07)
PULLEY BEARING SUPPORT
MOD 0A-100 FW
WIND TURBINE GENERATOR
1015F82



SCALE ½



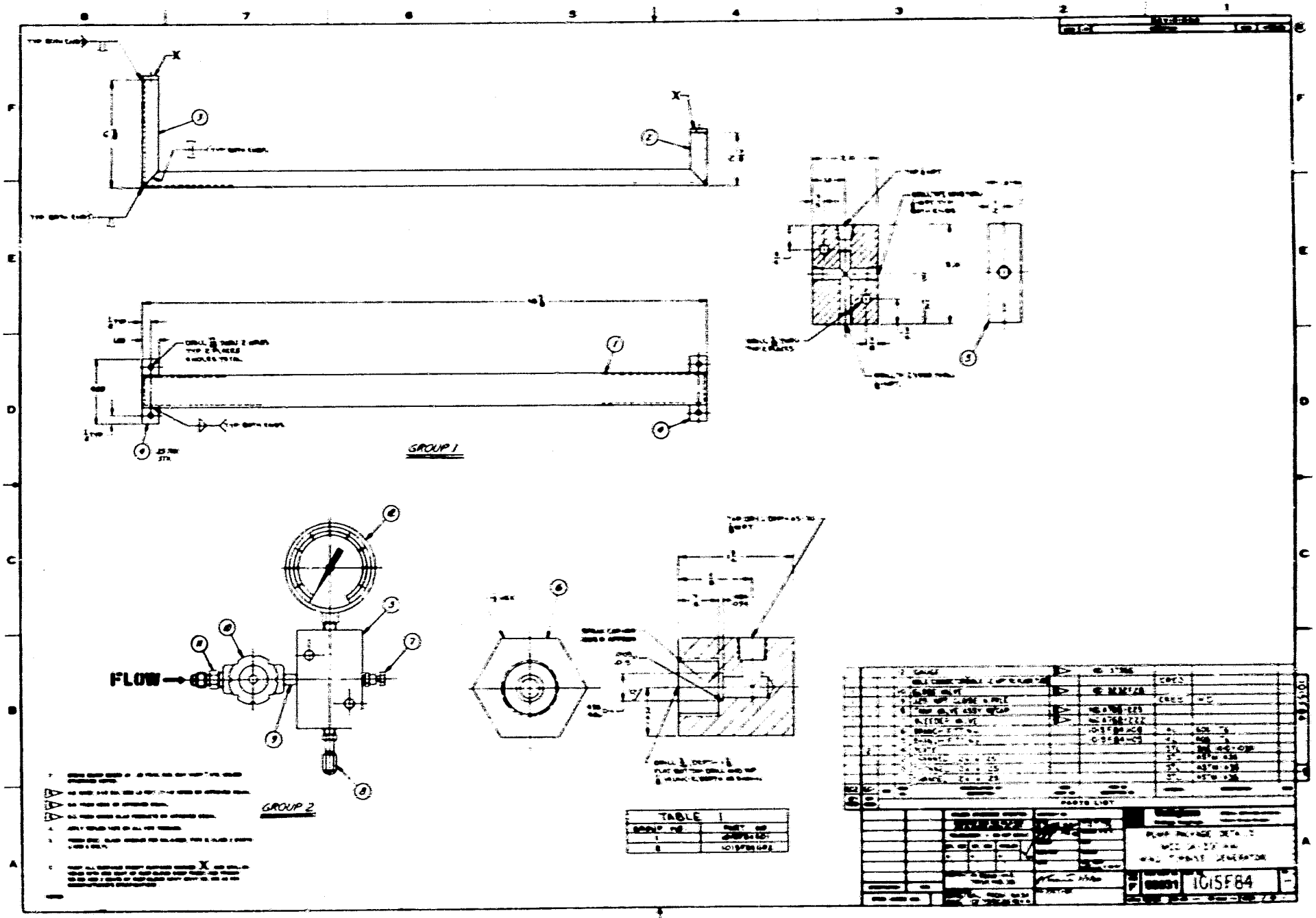
GROUP-I

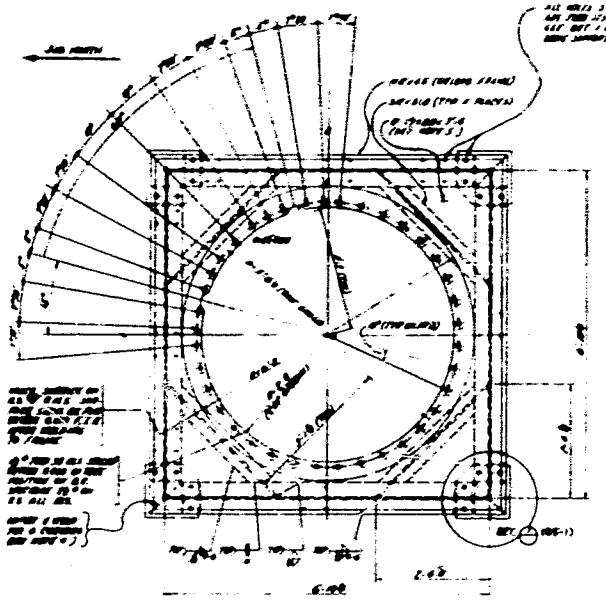
SCALE ½

TABLE I	
ITEM NO.	PART NO.

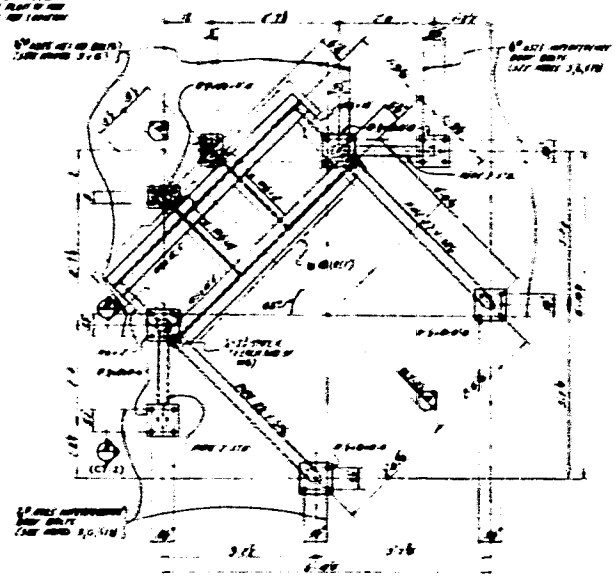
ITEM	QTY	DESCRIPTION	MATERIAL
8	1	GAUGE	
7	1		CRES
6	1		
5	1		CRES
4	1		
3	1	BLEEDER VALVE	
2	1		
1	1		

PARTS LIST

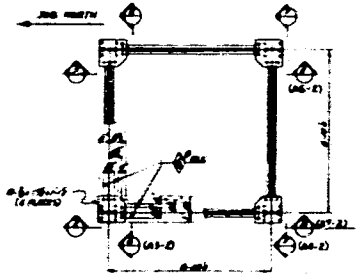

FLOW
GROUP 1
GROUP 2
TABLE 1



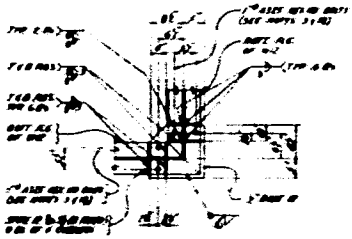
PLAN OF MOUNTING FRAME



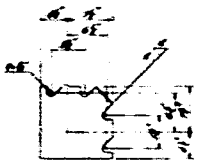
PLAN OF YAW DRIVE SUPPORT



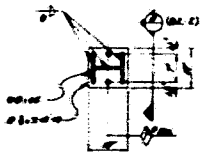
PLAN OF ASSEMBLY STAND



DETAIL



SHIM DETAIL



SECTION

1	ASSY STAND		1015F85-01	STL	

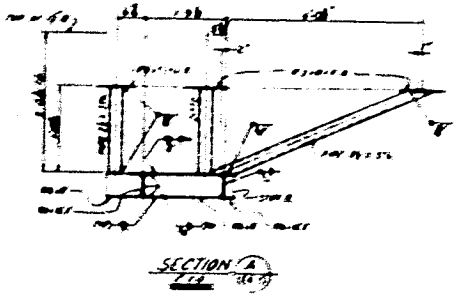
PARTS LIST

ASSY STAND PLAN & DETAILS
400 OR-250 KW
WIND TURBINE GENERATOR

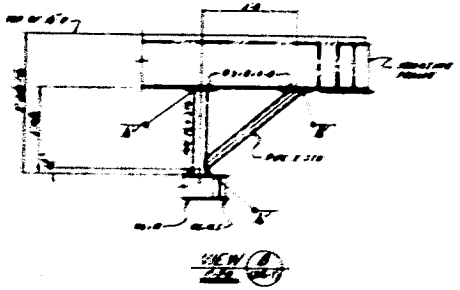
F	08031	1015F85	

2	1	SHEET OF SHEETS

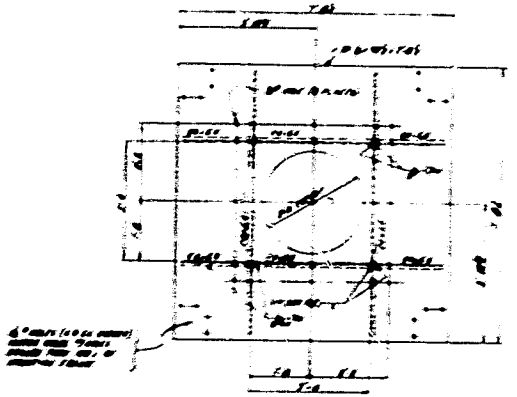
REV. REV STATUS



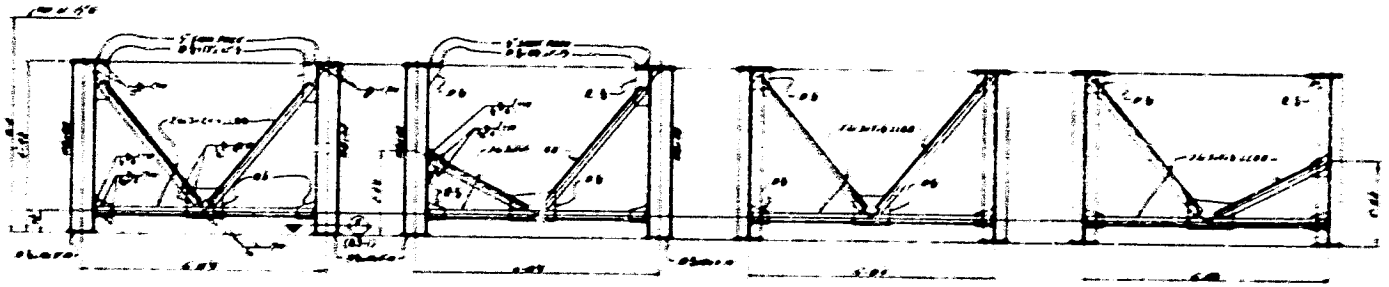
SECTION A



VIEW B



MOUNTING FRAME TEMPLATE

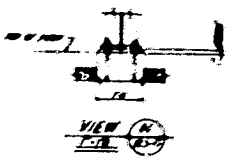


VIEW D

SECTION C

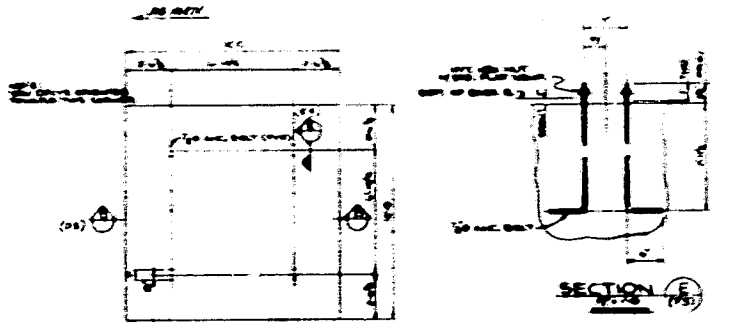
VIEW F

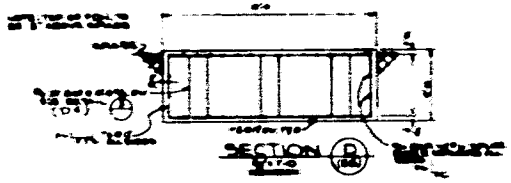
SECTION G

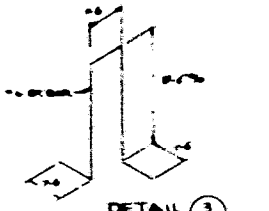


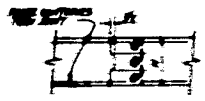
VIEW H

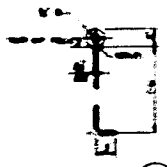
	00031	1015F85

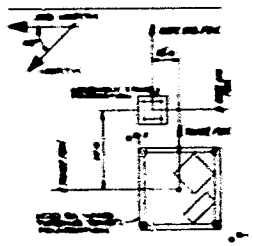


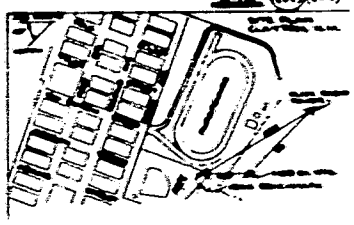




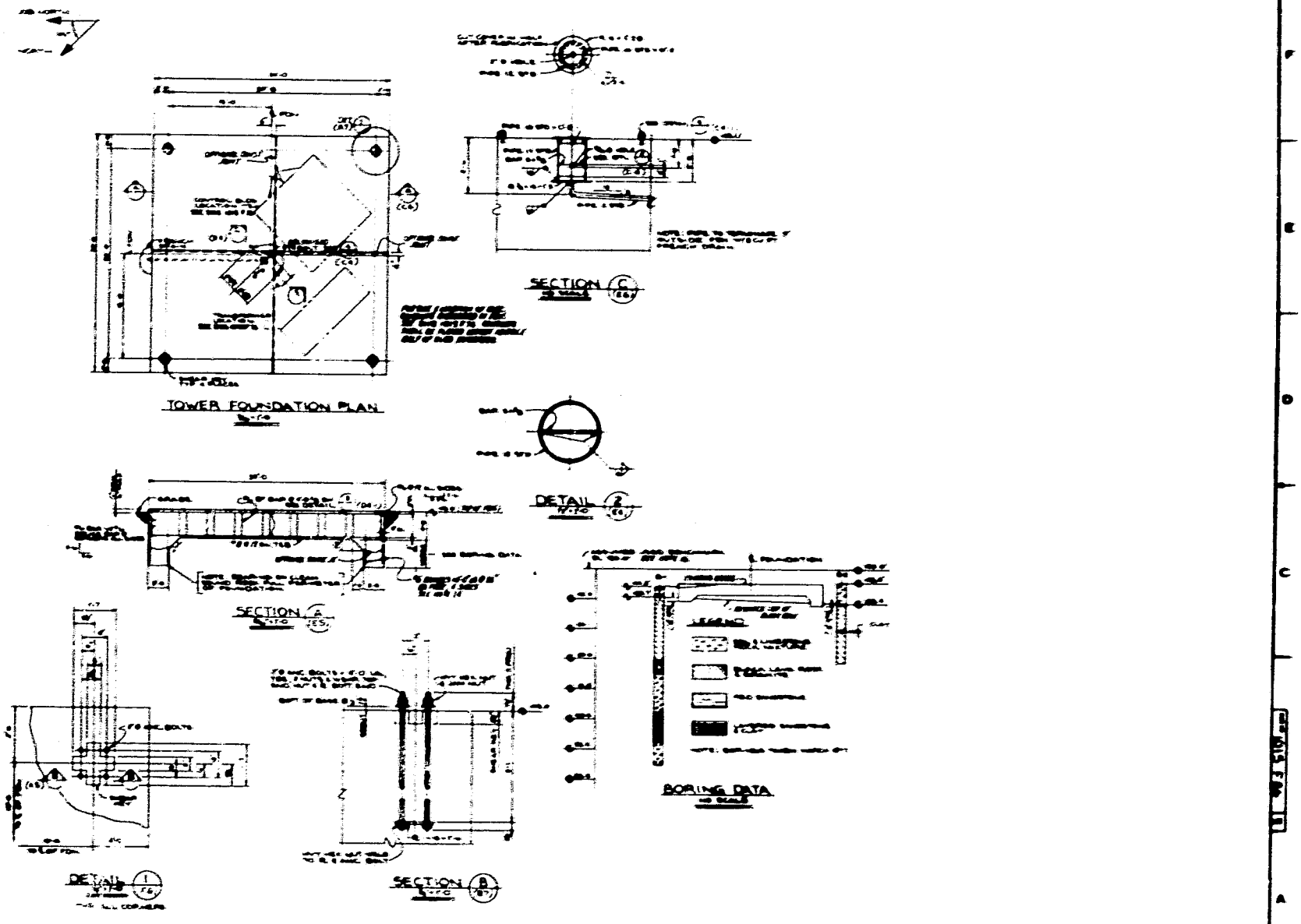


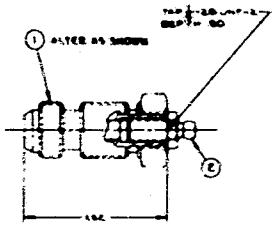




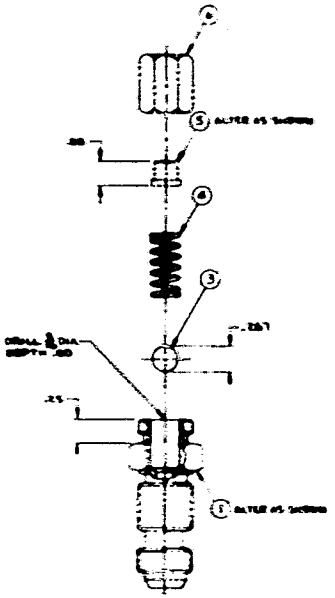


ASSEMBLY STAND FOUNDATION
SECTION E
SECTION D
DETAIL 3
CONST. JOINT DETAIL
DETAIL 4
LOCATION PLAN
(D5)
(D5)
TYP. ANC. BOLT
PARTS LIST
TOWER LADY STAND FOUNDATION DETAILS
WIND TURBINE GENERATOR
F
58031
1015F86
REV
REV STATUS
SHEET
OF SHEETS
2
1
8
7
6
5
4
3
2
1
F
E
D
C
B
A


TOWER FOUNDATION PLAN
SECTION C
DETAIL 2
SECTION A
BORING DATA
DETAIL 1
SECTION B



GROUP-1



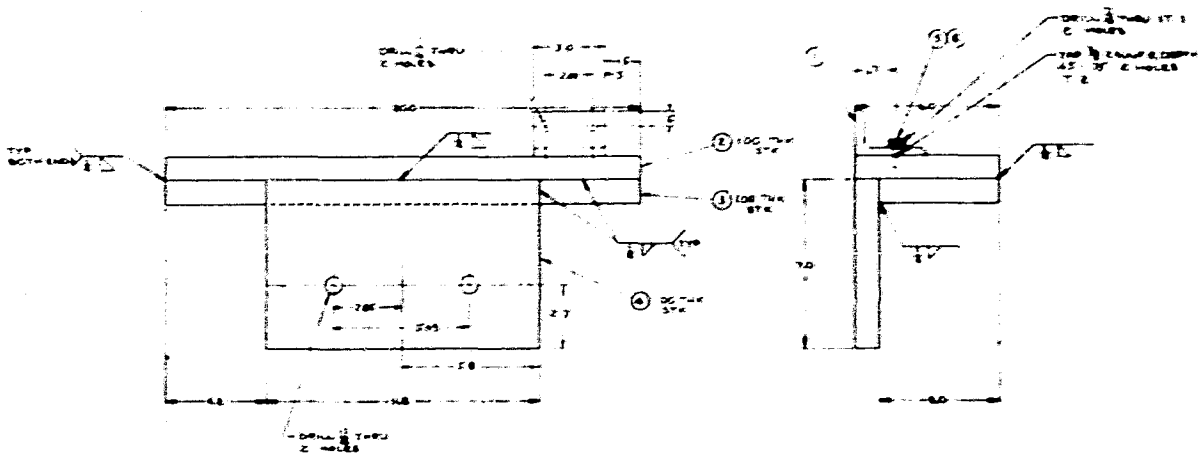
GROUP-2

TABLE 1	
GROUP NO.	PART NO.
1	[illegible]
2	[illegible]

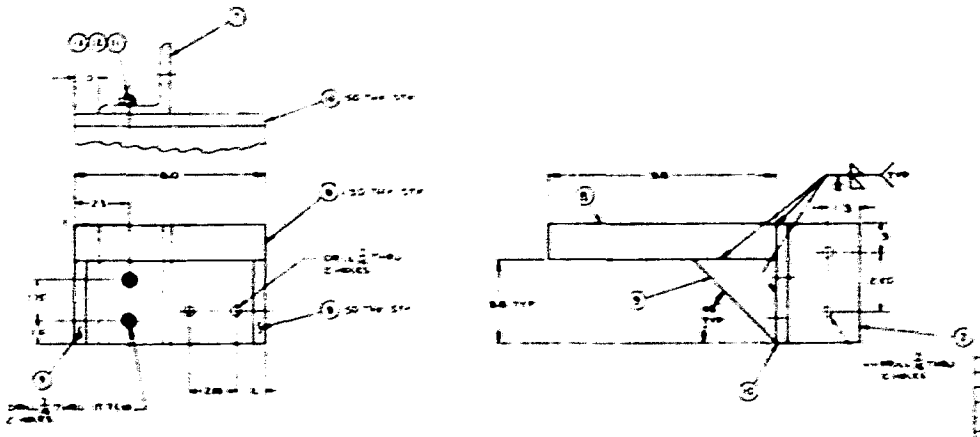
			6	[illegible]			
			5	SLEEVE			
			4	[illegible]			
			3	[illegible]		STL	
		1	2	[illegible]			
		1	1	[illegible]			
QTY	REQD			PARTS LIST			

	GREASE PRESSURE RELIEF FITTINGS
	MOD 08 - 200 KW
	WIND TURBINE GENERATOR
SIZE	DRAWING NO. 1015F87
F	08831
SCALE	NONE
WEIGHT	
SHEET	1 OF 1

1015F87 1/1



GROUP-1



GROUP 2

TABLE 1

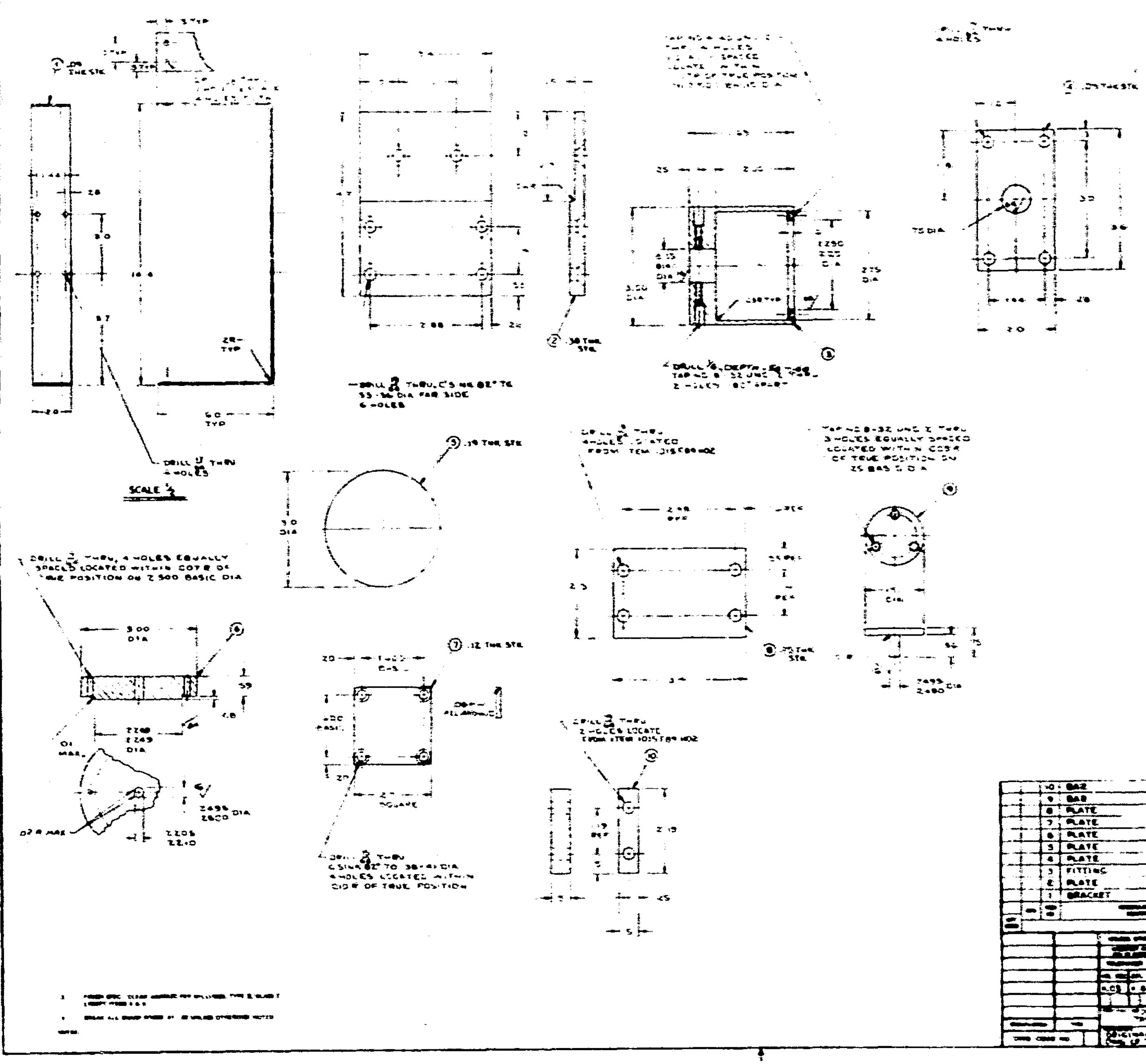
GROUP NO	PART NO
1	1C15F88GR1
2	1C15F88GR2

13		STL	COMM
12			COMM
11			COMM
10	PLATE		
9	GUSSET		
8	PLATE		
7			
6			COMM
5			COMM
4	PLATE		
3	PLATE		
2	PLATE		
1		STL	

PARTS LIST

WIND TURBINE GENERATOR

1C15F88



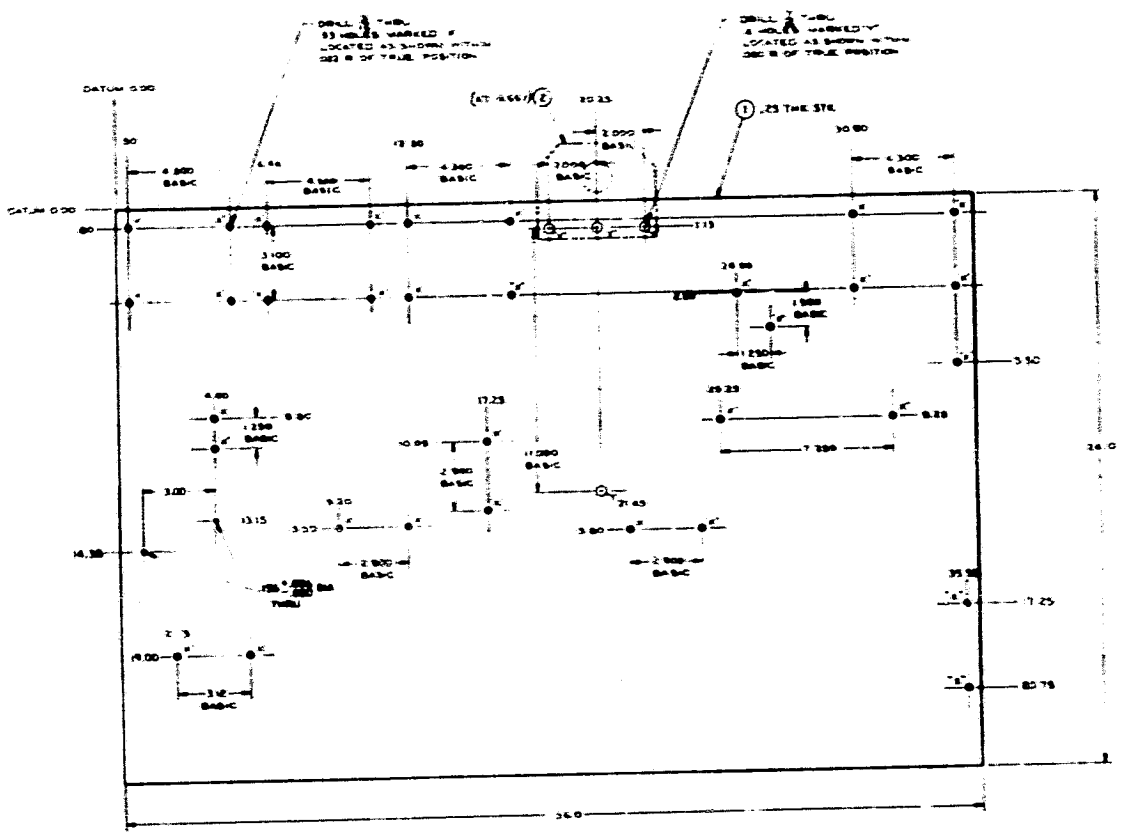
10	BAR	1015 F89 [illegible]	ALUM	[illegible]-T6	
9	BAR	1015 F89 [illegible]	BRASS	ASTM-B21	
8	PLATE	1015 F89 [illegible]	TEFLON		
7	PLATE	1015 F89 [illegible]	ALUM	6061-T6	
6	PLATE	1015 F89 [illegible]			
5	PLATE	1015 F89 [illegible]			
4	PLATE	1015 F89 [illegible]			
3	FITTING	1015 F89 [illegible]			
2	PLATE	1015 F89 [illegible]			
1	BRACKET	1015 F89 [illegible]	ALUM	[illegible]-T6	

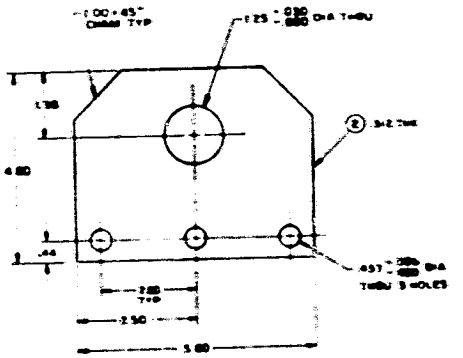
PARTS LIST

DETAILS
MOD-0A-200KW
WIND TURBINE GENERATOR

F 58031 1015 F89

1015 F89





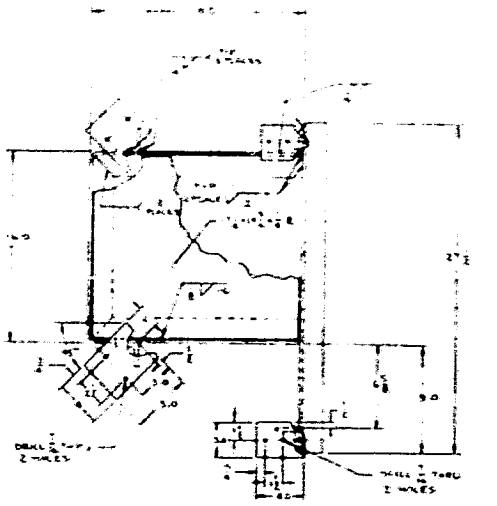
2	LIFTING LUG	1015F90-002	ALLIED
1	MTG PANEL	1015F90-001	ALLIED

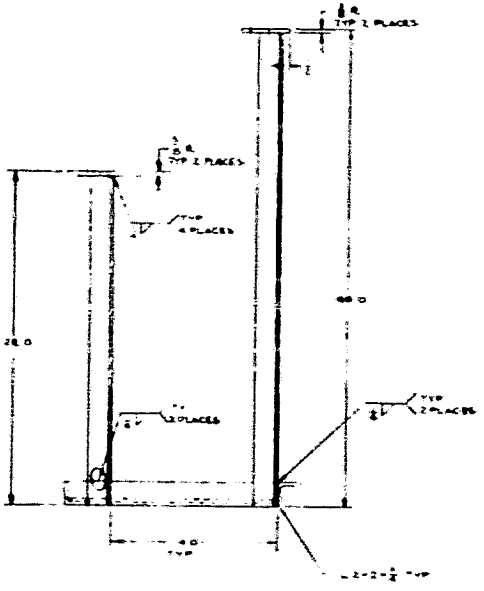
PARTS LIST

HYDRAULIC COMPONENTS INC.
MOD OA-200 KW
WIND TURBINE GENERATOR

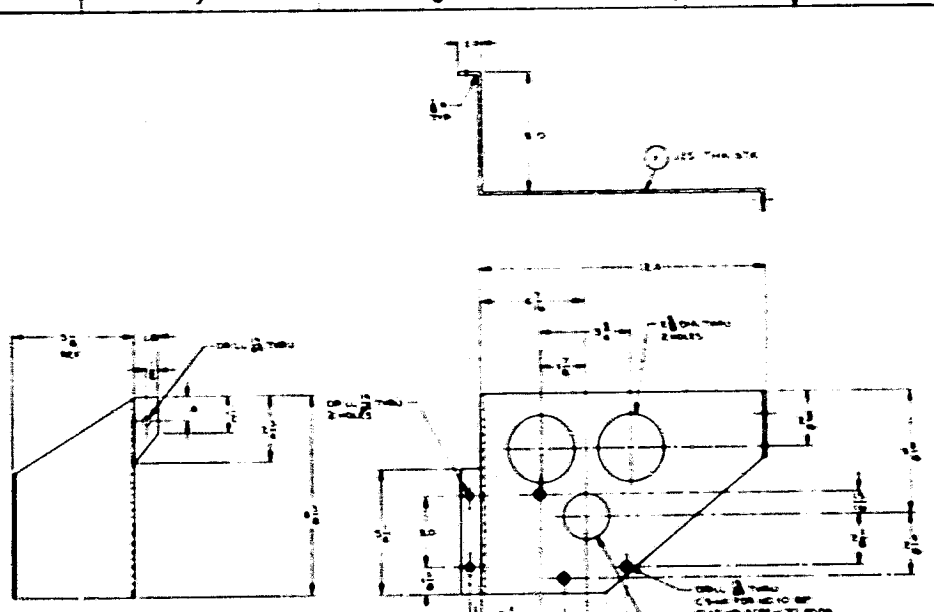
SIZE	DWG NO	REV
F	00031	1015 F90

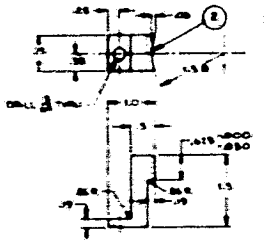
SCALE 1/8 WEIGHT SHEET 1 OF 1





8
7
6
5
4
3
2
1
F
E
D
C
B
A
8.0
TYP 2 PLACES
14.0
27 1/2
6 5/8
9.0
3.0
DRILL 1/2 TYP 2 HOLES
DRILL 1/2 THRU 2 HOLES
TYP 2 PLACES
TYP 4 PLACES
2 PLACES
TYP 2 PLACES
28.0
48.0
4.0 TYP
L 2×2×1/4 TYP
SUPPORT
1015F91-01
ST
A36
PARTS LIST
STRUCTURAL SUPPORT-
1015F91
1015F91



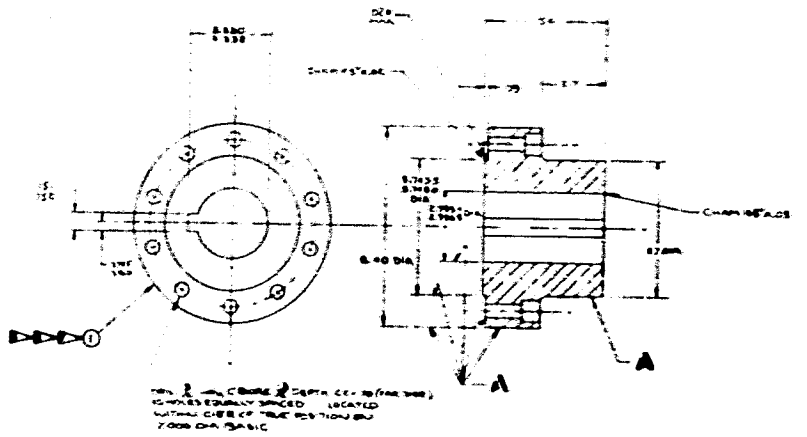


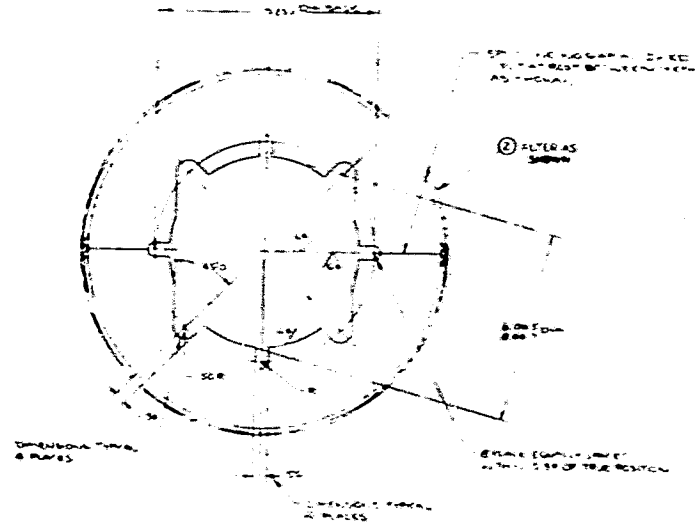
1	SPACER	1	6061-T6
1	BRACKET	1	6061-T6

PARTS LIST

SIZE	10151F92
SCALE	
DWG NO	
REV	

A-R BOTTLE RACK BRACKET ASSY
MOD OA-200 KW
WIND TURBINE GENERATOR

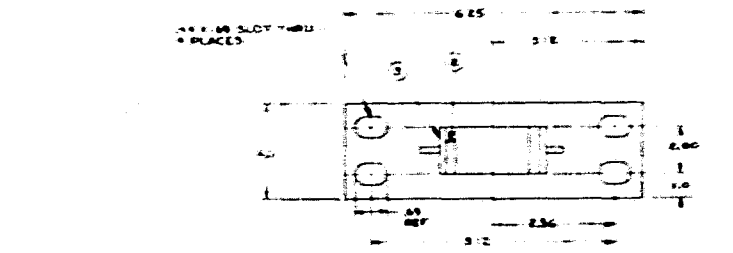


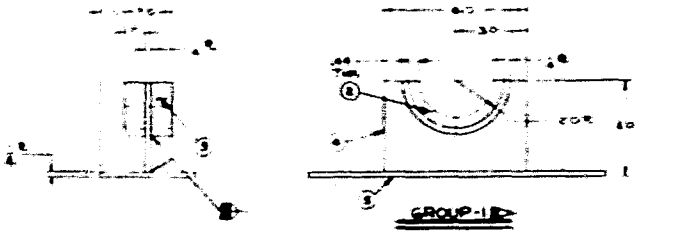


PARTS LIST

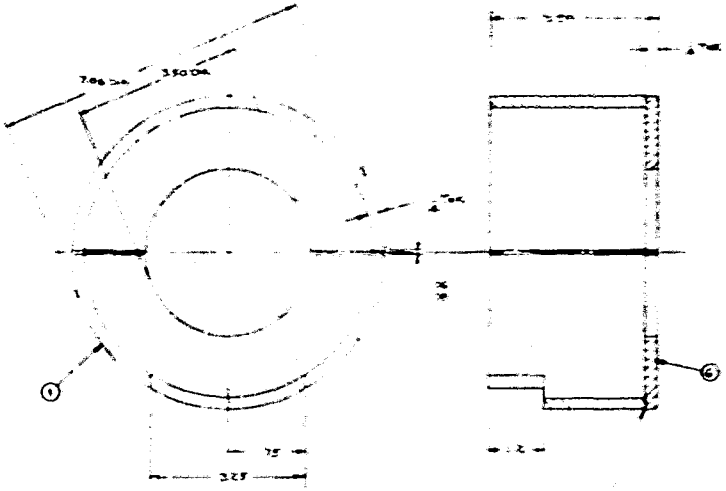
DETAILS
MOD OA-200 KW
WIND TURBINE GENERATOR

F 58031 KCSF93





GROUP-1



GROUP-2

TABLE 1	
GROUP NO.	PART NO.
2	

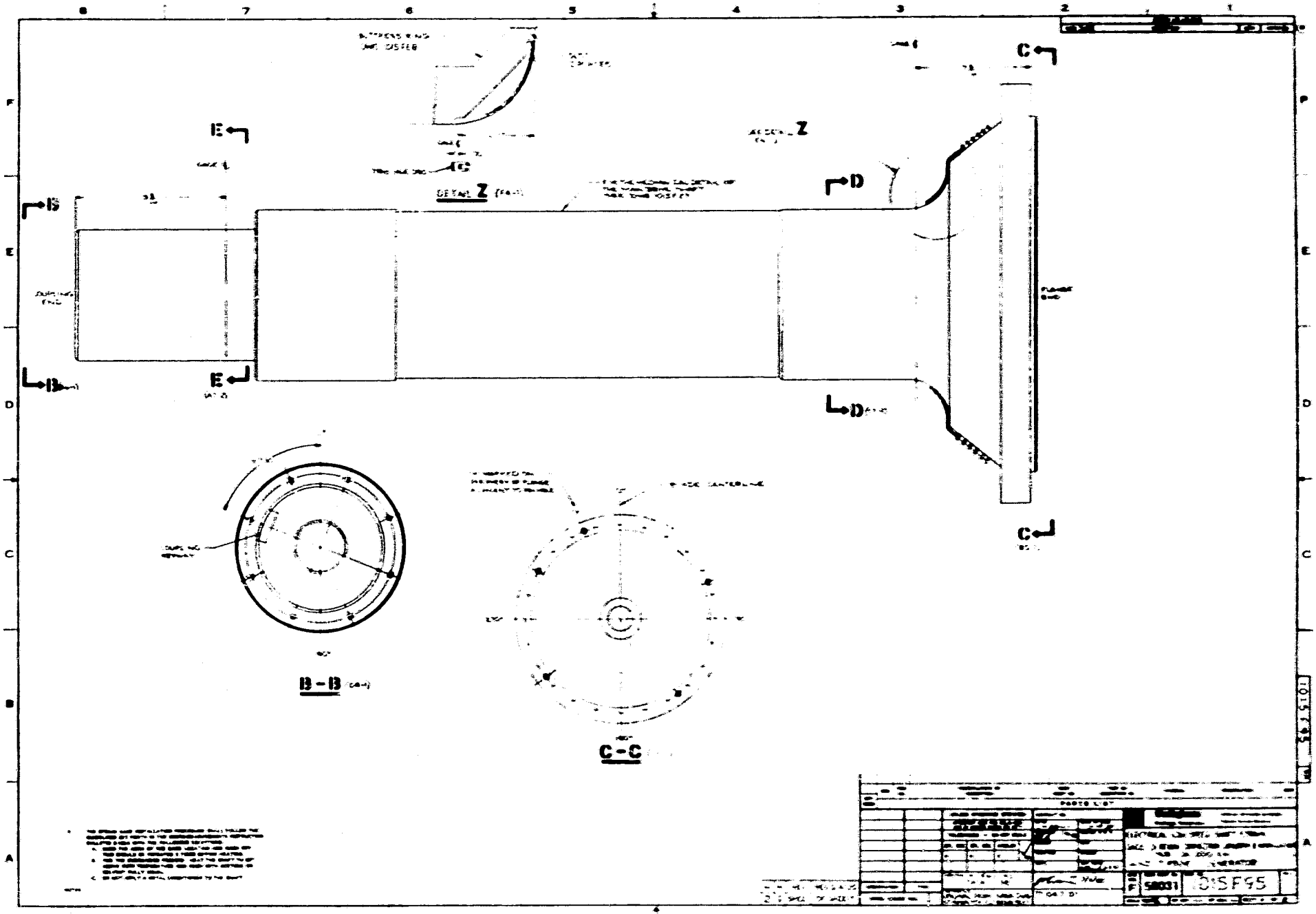
PARTS LIST					
	7				
	6			PLASTIC	
	5			AL.	
	4			AL.	
	3			AL.	
	2				
	1			PLASTIC	

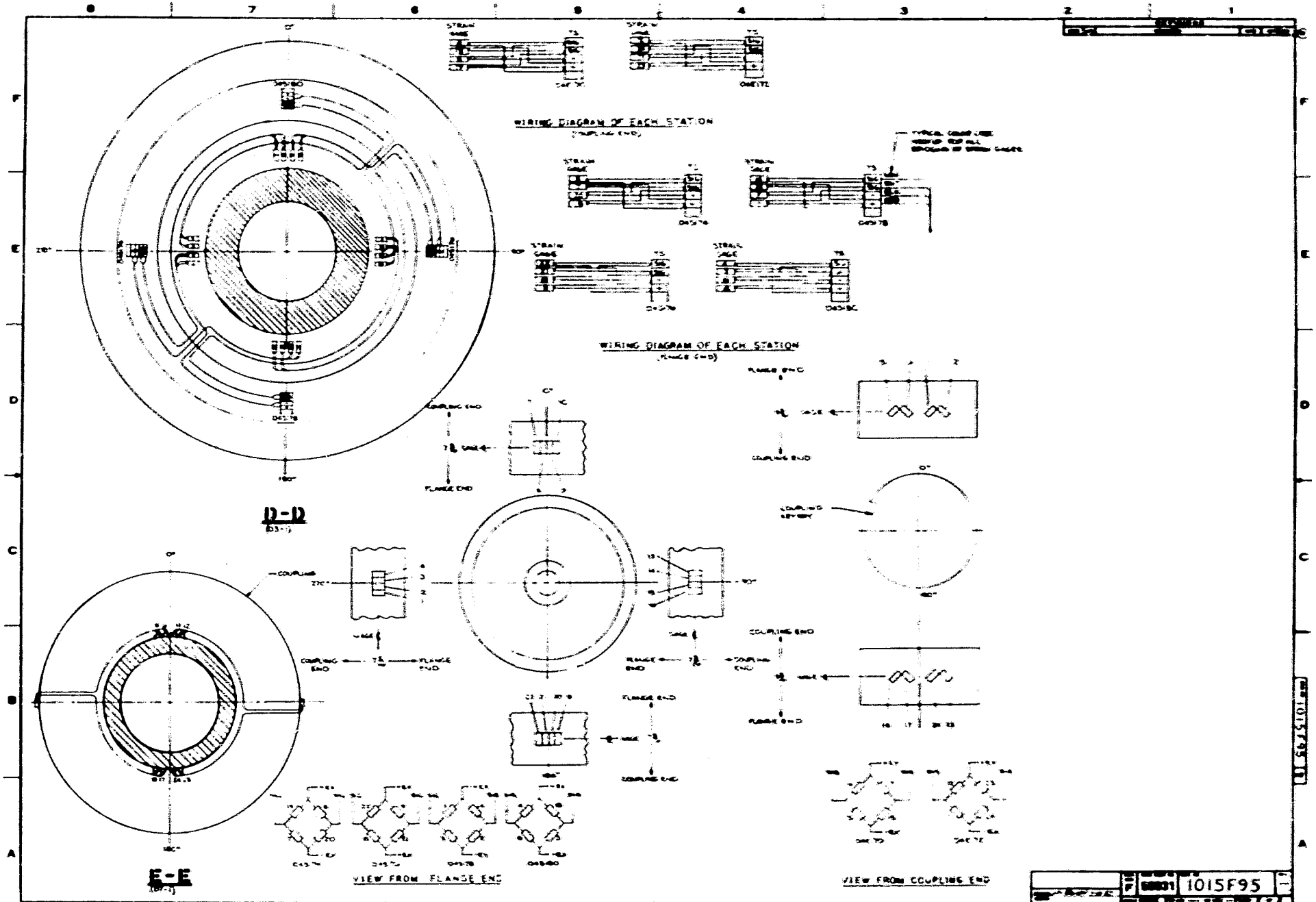
DUBLIN MOUNT | SLIP RING BODY ORDER

1000 GA - 2000 H/W

WIND TURBINE GENERATOR

1015F94


DETAIL Z
B-B
C-C


WIRING DIAGRAM OF EACH STATION
WIRING DIAGRAM OF EACH STATION
D-D
E-E
VIEW FROM FLANGE END
VIEW FROM COUPLING END
1015F95

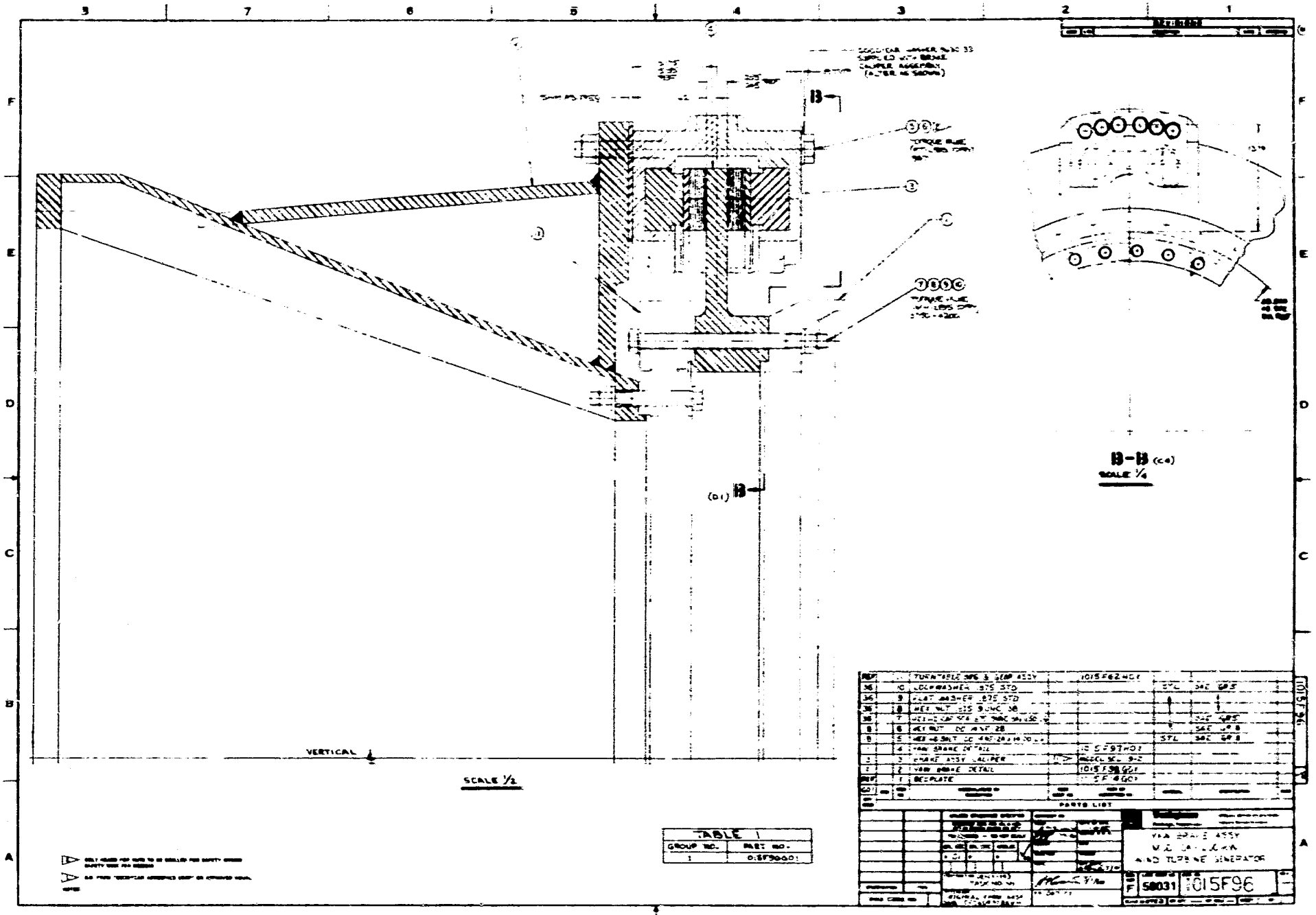


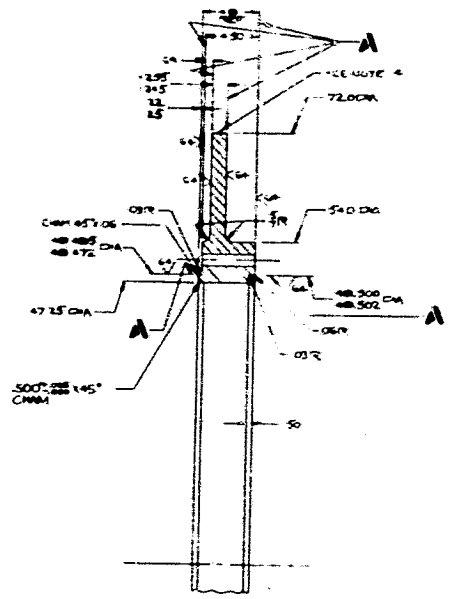
TABLE I	
GROUP NO.	PART NO.
1	0.5F9060.1

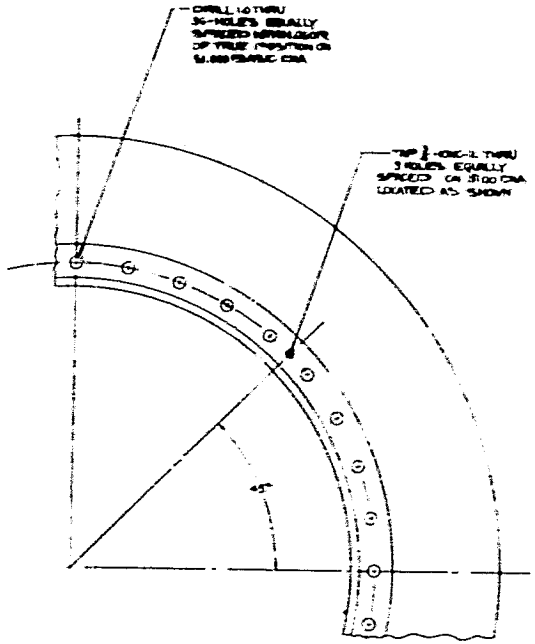
REF	QTY	DESCRIPTION	PART NO.	MATL	SIZE	GRADE
		TURNTABLE SPG & STEER ASSY	1015F62-HDY			
36	10	LOCKWASHER .875 STD		STL	SAE	GR 5
35	9	FLAT WASHER .875 STD				
34	8	HEX NUT .875 9 UNC 3B				
33	7	HEX CAP SCR .875 9 UNC 3A x 5.50 LG			SAE	GR 5
8	6	HEX NUT .50 UNF 2B			SAE	GR 8
8	5	HEX CAP SCR .50 UNF 2A x 4.00 LG		STL	SAE	GR 8
	4	YAW BRAKE DETAIL	10 5F97-H01			
1	3	CHART ASSY CALIPER	MODEL SC 9-2			
1	2	YAW BRAKE DETAIL	1015F98-H01			
REF	1	BEDPLATE	5F460.1			

PARTS LIST

YAW BRAKE ASSY
WIND TURBINE GENERATOR

F | 58031 | 1015F96





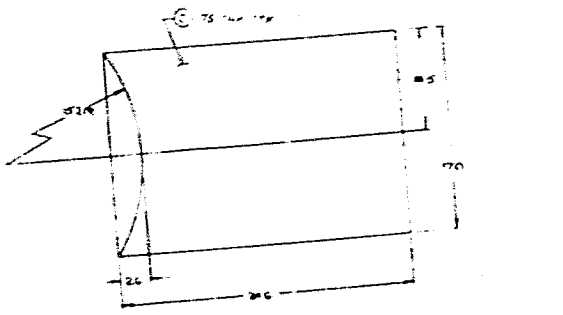
1	YAW BRAKE RING	1015F97H01	STL	SAE 1010-1030

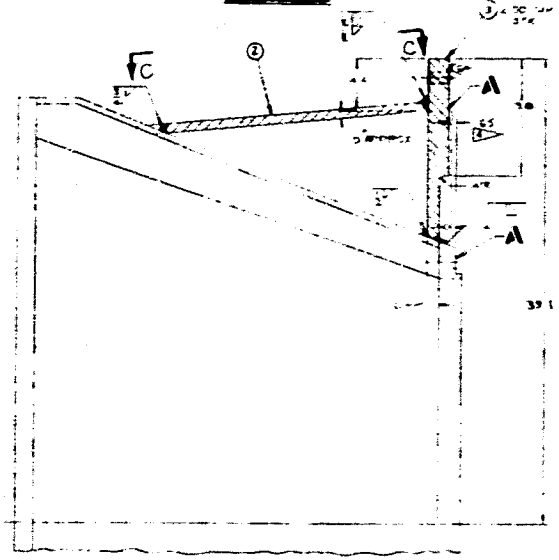
PARTS LIST

YAW BRAKE DETAIL
MOD OA-200 KW
WIND TURBINE GENERATOR

F	99831	1015F97

1015F97





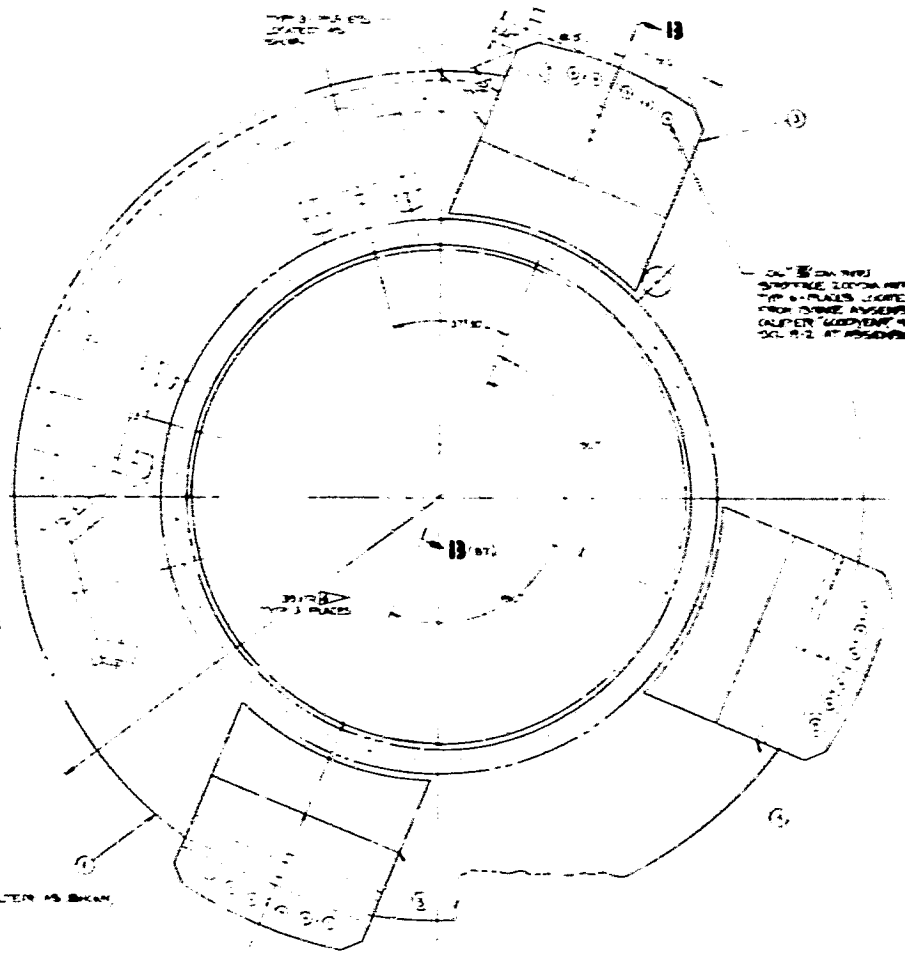
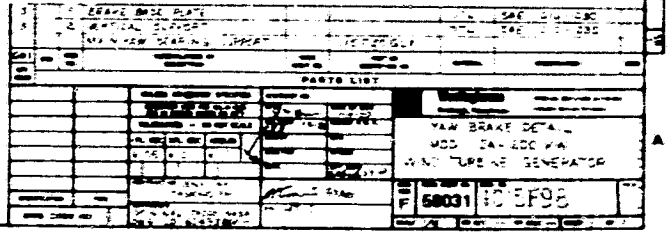
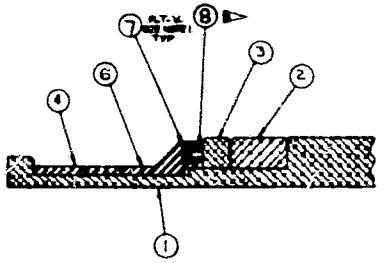


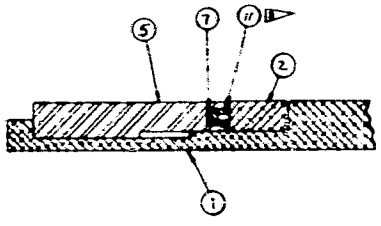
TABLE 1	
GROUP NO.	PART NO.
1	0158F2850-1





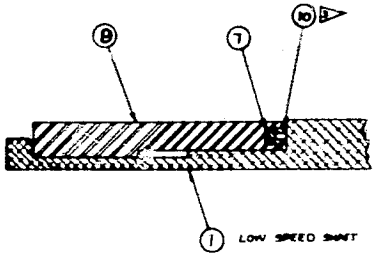
GROUP - 3

FIXTURE CONFIGURATION FOR SEAL INSTALLATION



GROUP 2

FIXTURE CONFIGURATION FOR SEAL INSTALLATION LOW SPEED SHAFT



GROUP - 1

FIXTURE CONFIGURATION FOR SEAL INSTALLATION LOW SPEED SHAFT

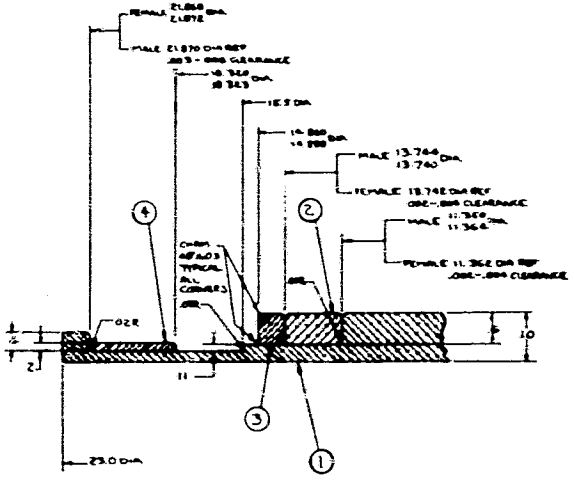


TABLE 1	
GROUP NO.	PART NO.
1	
2	
3	

	1			11	SEAL (APPROX 4.17 LG)			
		1		10	SEAL (APPROX 8.7 LG)			
		1		9	SEAL RETAINER PLATE			
1				8	SEAL (APPROX 46.00 LG)			
AR	AR	AR		7	SEALANT			
1				6				
	1			5	SEAL RETAINER PLATE			
REF				4	RING		ALUM	6061-T6
REF				3	RING		ALUM	6061-T6
REF	REF			2	RING		ALUM	6061-T6
REF	REF	REF		1	BASE		ALUM	6061-T6
QTY	02	041						
QTY	01							

PARTS LIST

FIXTURES FOR SEAL INSTALLATION
MOD OA-200 KW
WIND TURBINE GENERATOR

F 99031 10/5F99

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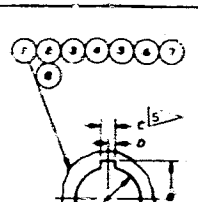
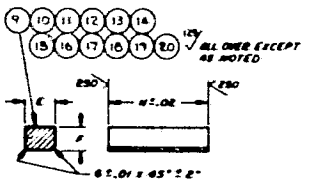


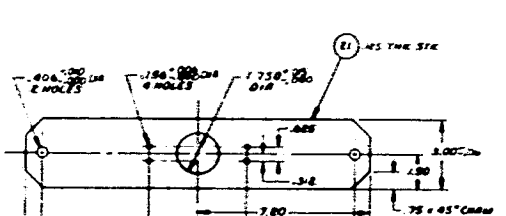
IT	A	B	C	D	
1	2.377	3.81	.877	.438	FIXED
	2.376	3.80	.876	.437	
	2.373	3.81	.877	.438	FLEX
	2.372	3.80	.876	.437	
2	2.373	3.81	.877	.438	FLEX
	2.372	3.80	.876	.437	
	2.310	3.73	.877	.438	FIXED
	2.309	3.72	.876	.437	
3	1.374	4.54	.346	.467	FLEX
	1.373	4.53	.345	.466	
	1.498	4.53	.502	.439	FIXED
	1.497	4.52	.501	.438	
4	1.498	4.53	.502	.126	BOTH SIDES
	1.497	4.52	.501	.125	
5	2.874	5.29	.756	.876	FIXED
	2.873	5.28	.755	.875	
	2.999	5.06	.627	.3125	FLEX
	2.998	5.05	.626	.3125	
6	2.999	5.06	.627	.3125	BOTH SIDES
	2.998	5.05	.626	.3125	
7	2.876	5.54	.765	.376	
	2.875	5.53	.751	.375	
8	3.251	5.61	.765	.376	
	3.250	5.61	.751	.375	



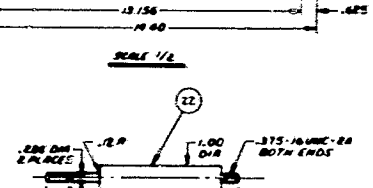
IT	E	F	G	H
9	8.0015 / 8.0000	1.500 / 1.495	.040	8.00
10	.7505 / .7500	.755 / .750	.030	2.00
11	.4385 / .4350	.439 / .440	.021	2.00
12	.7505 / .7500	.755 / .750	.030	7.00
13	.7505 / .7500	.755 / .750	.030	3.75
14	.8755 / .8750	.875 / .870	.030	3.50
15	.8755 / .8750	.875 / .870	.030	4.00
16	.1255 / .1250	.135 / .130	.020	2.00
17	.3130 / .3095	.314 / .309	.020	2.00
18	.7505 / .7500	.755 / .750	.030	6.00
19	.2505 / .2500	.260 / .250	.020	2.00
20	.8755 / .8750	.875 / .870	.030	6.00

TABLE-I

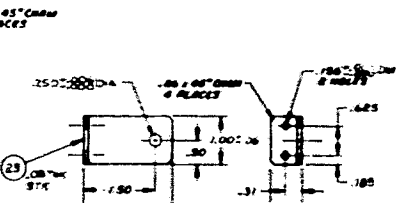
GROUP NO.	PART NO.
1	1017F02G01



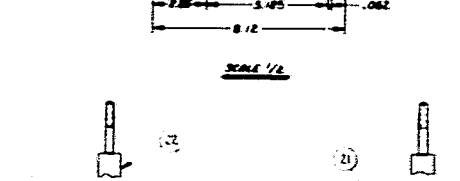
SCALE 1/2



SCALE 1/2



SCALE 1/1



GROUP-1
SCALE 1/2

4	28	LOCKWASHER .375 MED		STL	COML GPS
4	27	NUT HEX .375-16UNC-2B		STL	COML GPS
4	26	HEX HD CAP SCR .375-16 UNC-2B×1.50LG		STL	COML GPS
2	25	LOCKWASHER .375 STD		STL	COML GPS
2	24	NUT HEX .375-16UNC-2B		STL	COML GPS
2	23	MOUNTING BRACKET		STL	SAE 4130-1020
2	22	SHAFT		STL	SAE 4140-1020
1	21	MOUNTING BRACKET		STL	SAE 4130-1020
	20	KEY	1017F02#20		
	19	KEY	1017F02#19		
	18	KEY	1017F02#18		
	17	KEY	1017F02#17		
	16	KEY	1017F02#16		
	15	KEY	1017F02#15		
	14	KEY	1017F02#14		
	13	KEY	1017F02#13		
	12	KEY	1017F02#12		
	11	KEY	1017F02#11		
	10	KEY	1017F02#10		
	9	KEY	1017F02#09		
	8	SHEAVE	WD.HOUSING		
	7	SHEAVE	WD.HOUSING		
	6	COUPLING	SERIES PE SIZE 06		GEAR TYPE
	5		SERIES P SIZE 05		GEAR TYPE
	4		SERIES P SIZE 04		
	3		SERIES P SIZE 03		
	2		SERIES P SIZE 02		
	1	COUPLING	SERIES P SIZE 01		

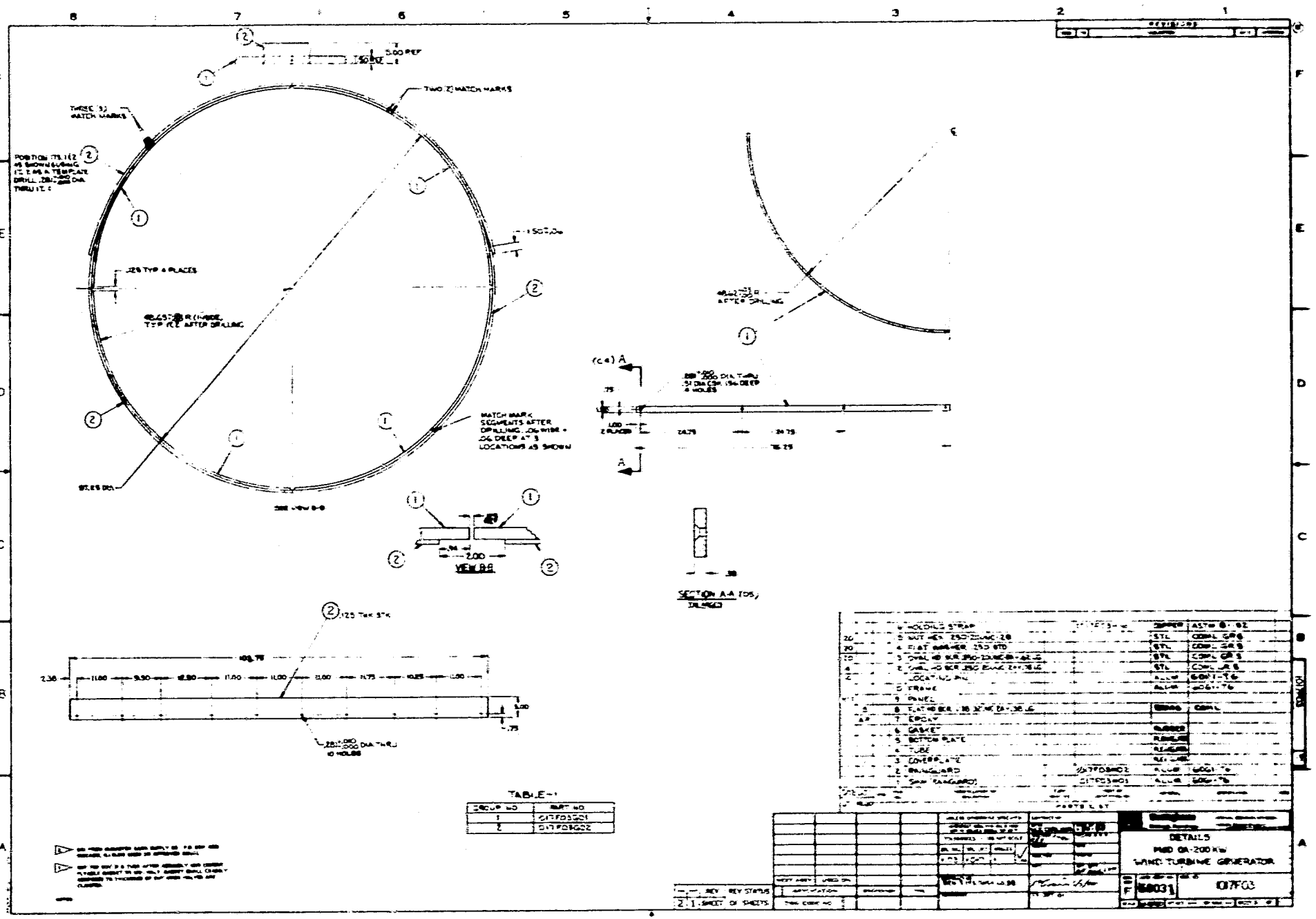
PARTS LIST

APPLICATION			
ENG. CHG. NO.			

GENERATOR TACH MOUNT ASSY WITH KEYS AND DETAILS. MOD 0A-2.0OK W WIND TURBINE GENERATOR

SIZE	CAGE CODE	DWG. NO.	REV
F	58031	1017F02	

SCALE 1/1 | SHEET 1 OF 1



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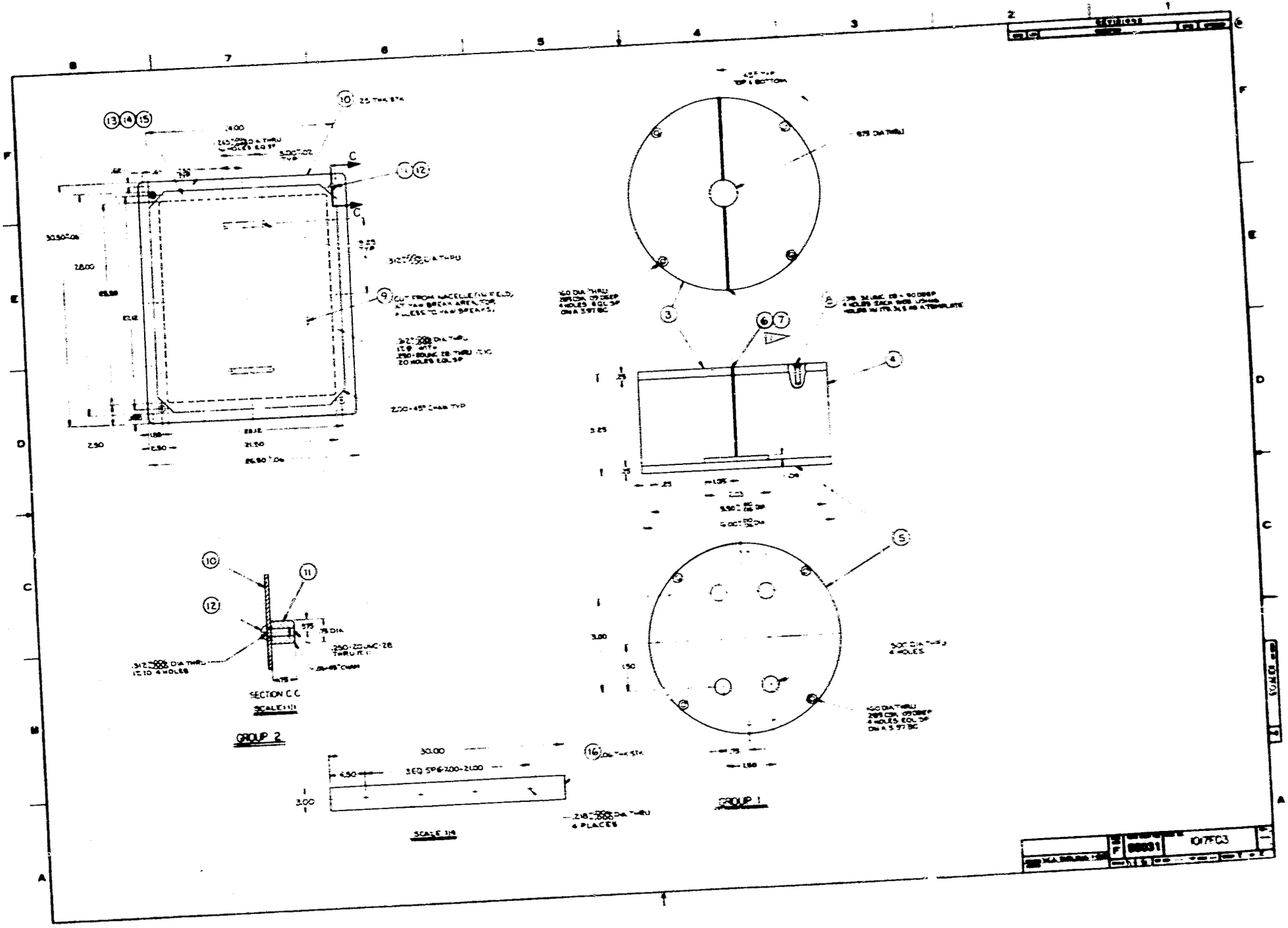
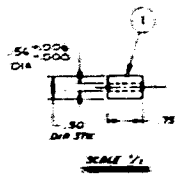
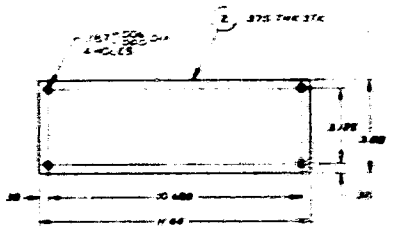
OF POOR QUALITY

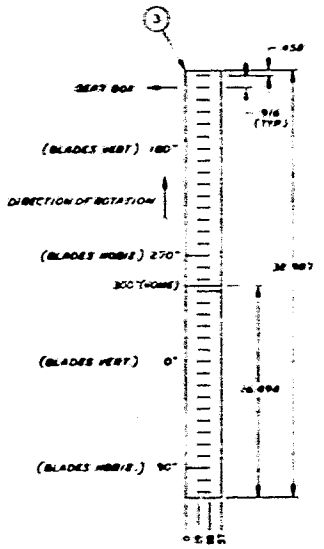

SECTION C-C
SCALE 1:10
GROUP 2
SCALE 1:10
GROUP 1



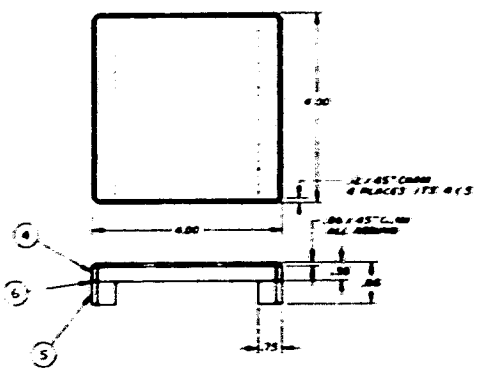
SCALE 1/1



SCALE 1/2



SCALE 1/8



GROUP 1

SCALE 1/1

TABLE-1

GROUP NO.	PART NO.
1	1017F04G01

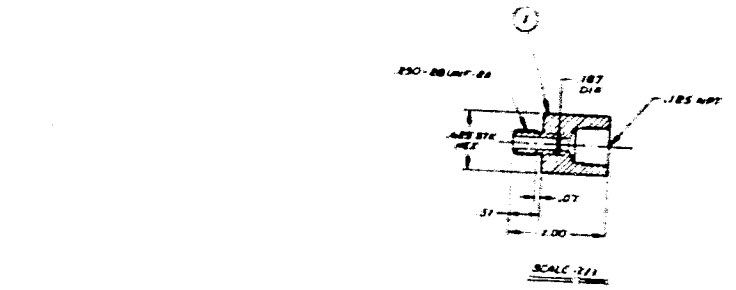
NO	QTY	DESCRIPTION	MATERIAL
6	1	EPOXY	
5	2	LEG	
4	1	TOP	
3	1	INDICATOR TAPE	1017F04-003
2	1	DUST COVER	1017F04-002
1	1	SPACER	1017F04-001

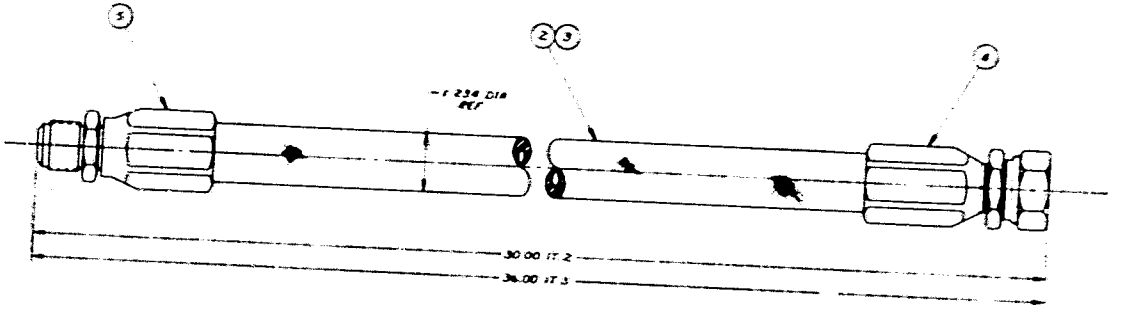
PARTS LIST

DETAILS
MOD 0A-800KW
WIND TURBINE GENERATOR

SIZE F | CAGE CODE 58031 | 1017F04

1017F04_01





GROUP-1 & 2

SCALE 1/1

TABLE 1

GROUP NO.	PART NO.
1	1017F0550
2	1IC-1F0550Z

1	5	FLARE STRAIGHT FITTING	MS 9906-08	
1	4	STRAIGHT FITTING	MS 9790-08	
1	3	HOSE	MS 1500-18	3000 PSIG W.P.
1	2	HOSE	MS 1500-18	3000 PSIG W.P.
1	1	CONNECTOR	1017F05-#01	SAE 10-8 - 1000

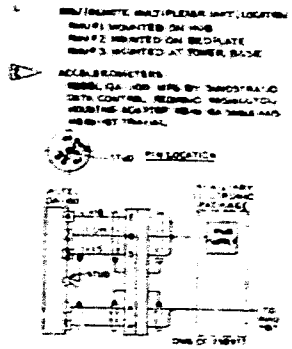
NOTES

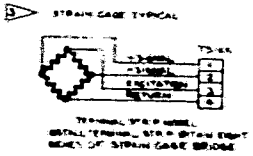
1. [illegible]
2. [illegible]
3. [illegible]

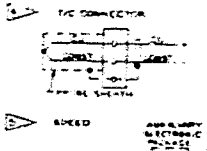
HYDRAULIC FITTINGS
MOD 0A - 200 KW
WIND TURBINE GENERATOR

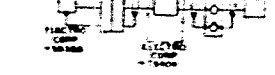
F 58031 1017F05

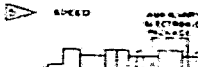
SHT 1 OF 1

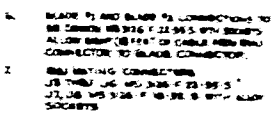


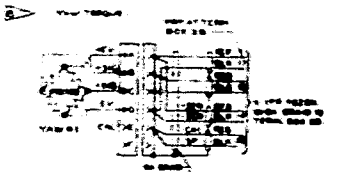


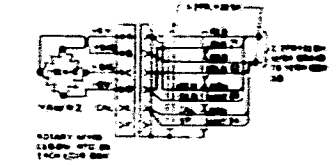


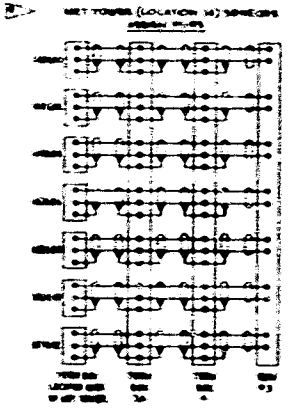








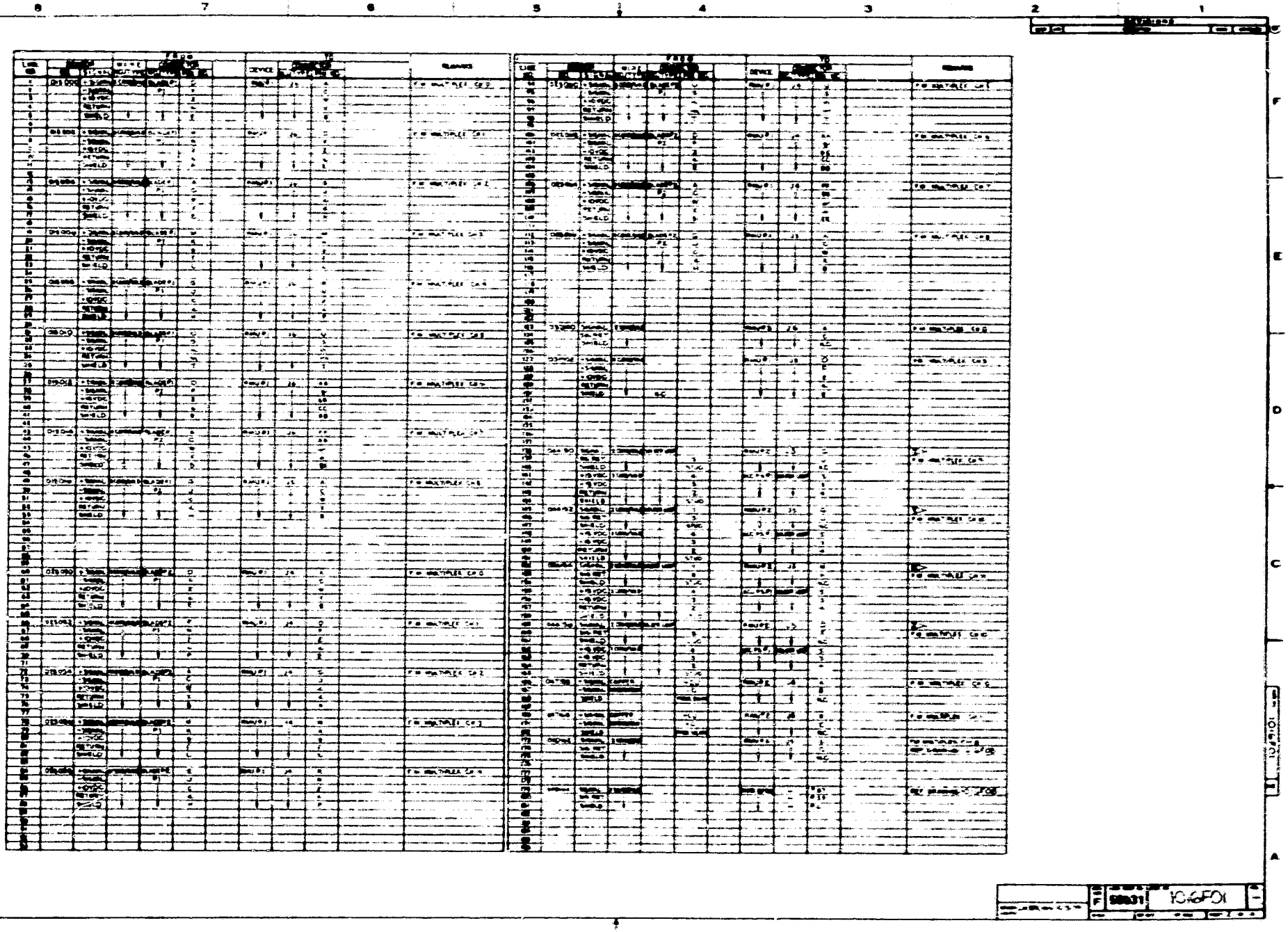


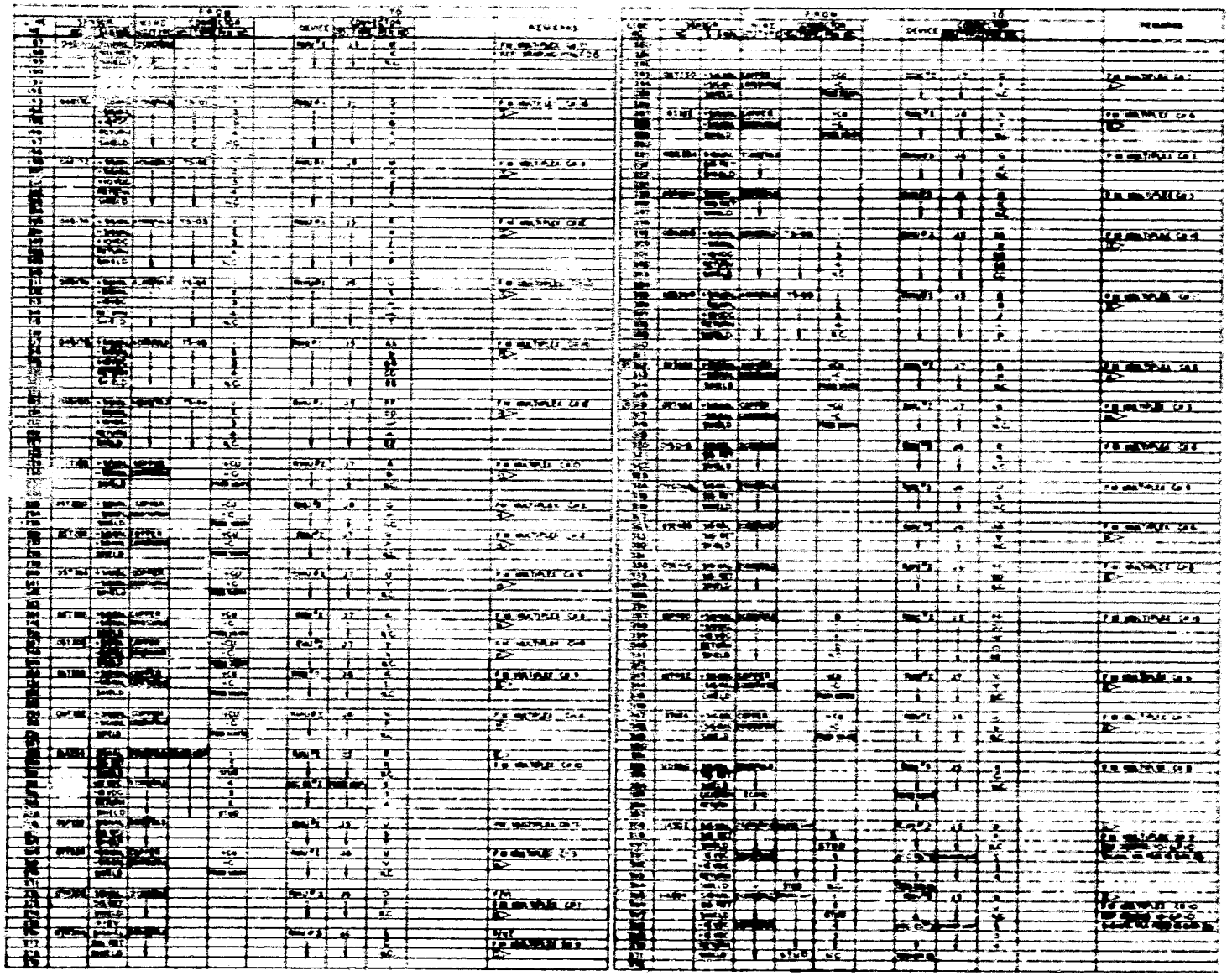


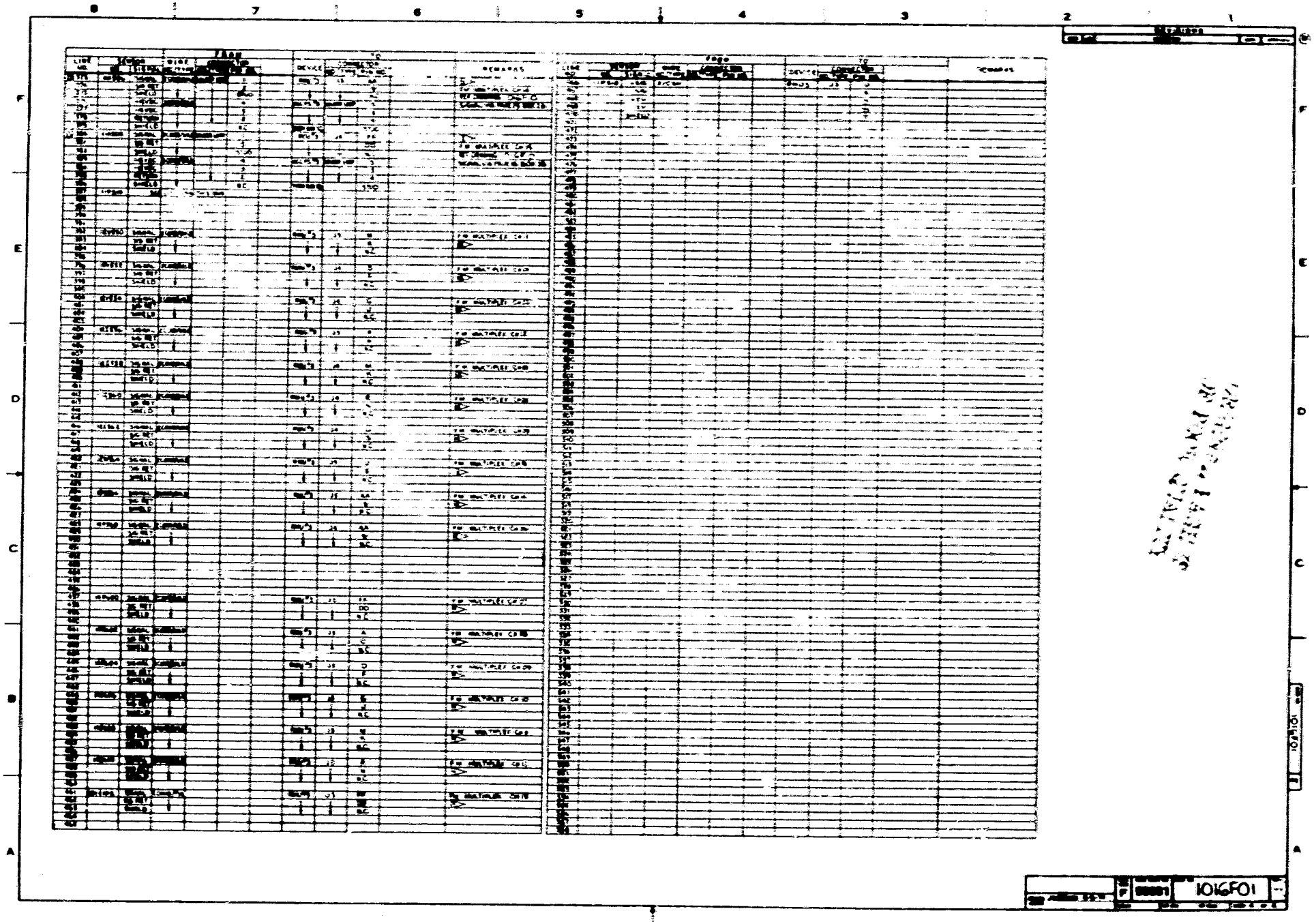
PARTS LIST

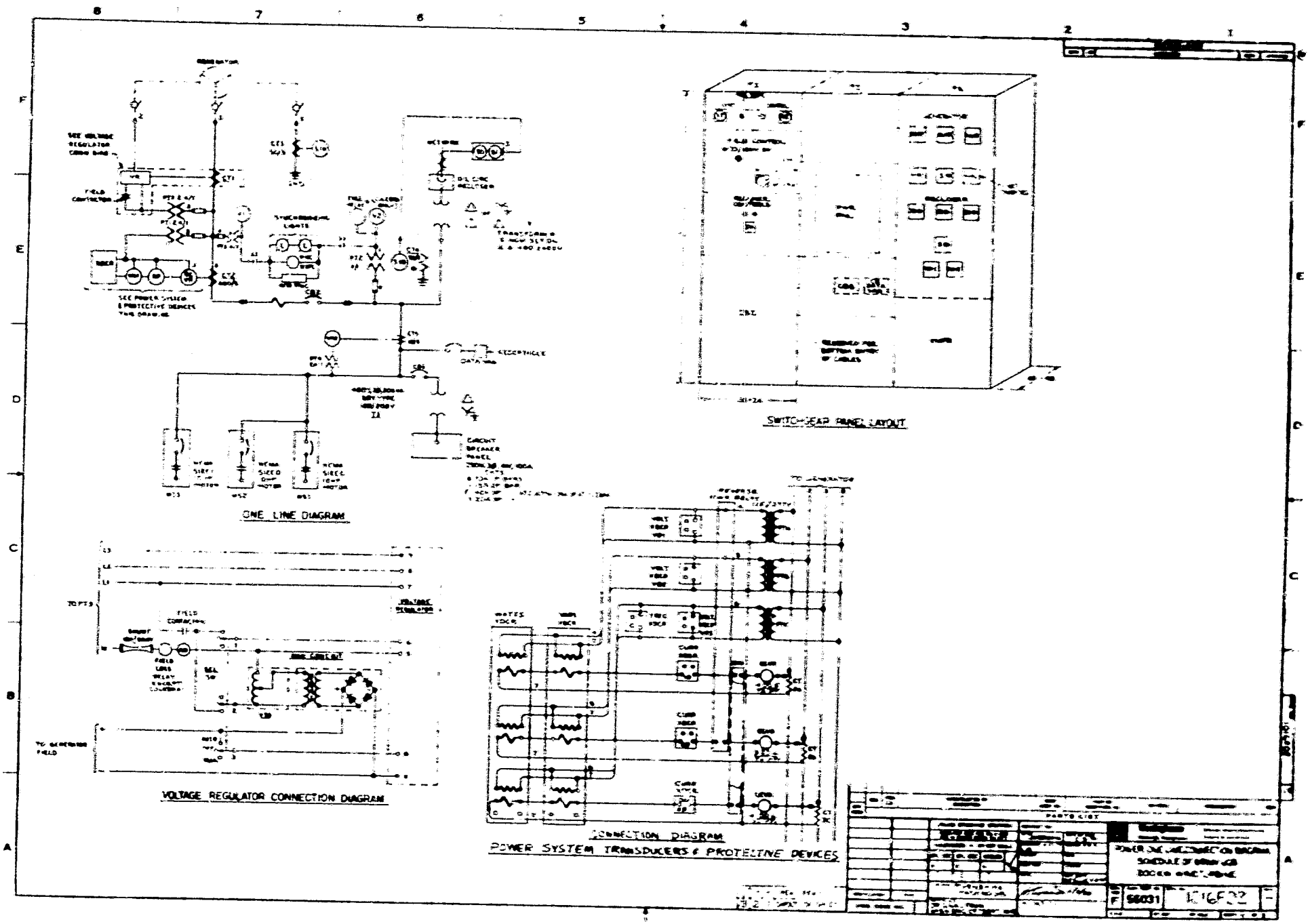
INSTRUMENTATION SENSOR WIRING - ST 200 KW WINDTURBINE

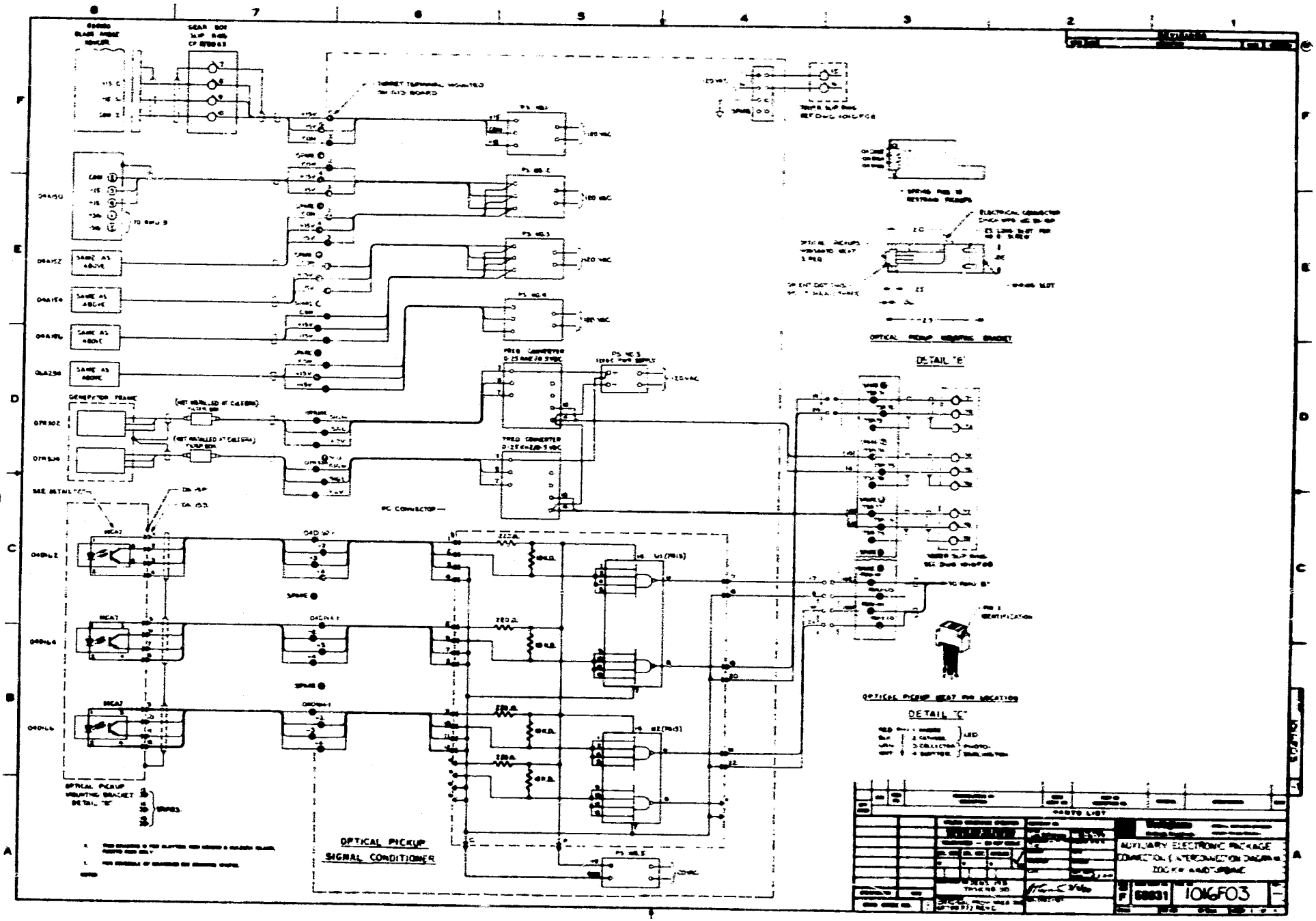
SIZE F | SB031 | 1016F01

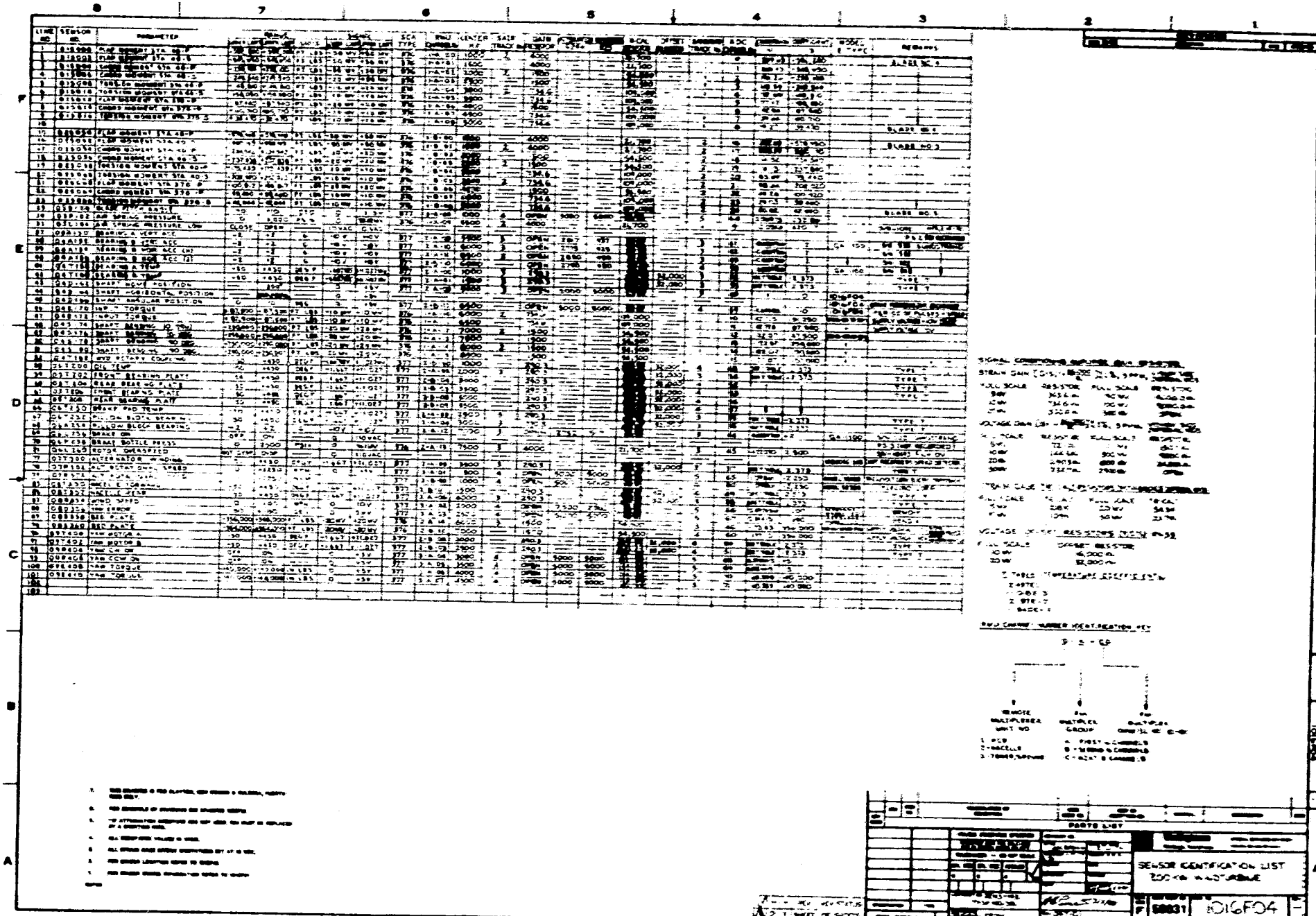


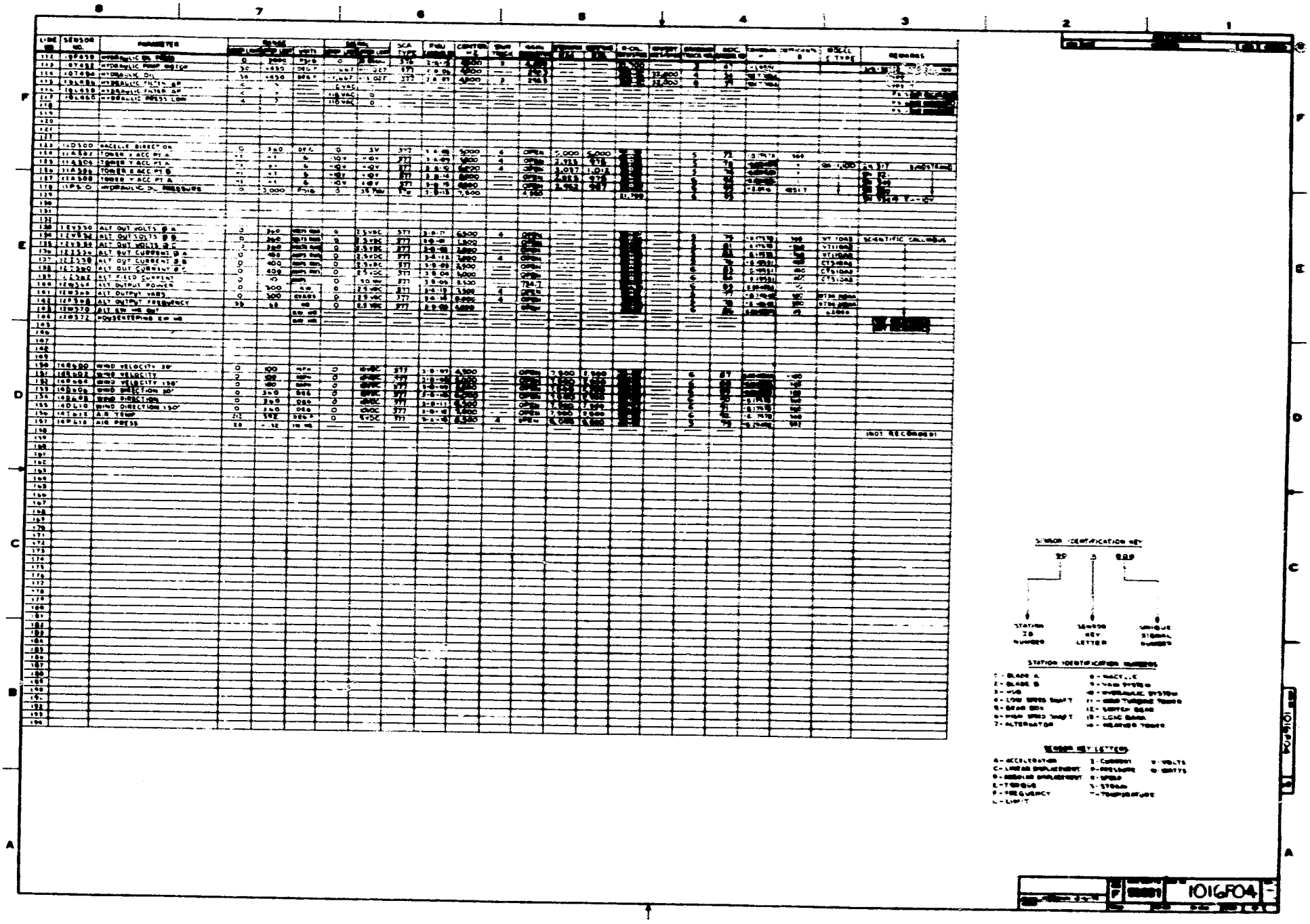





ONE LINE DIAGRAM
SWITCHGEAR PANEL LAYOUT
VOLTAGE REGULATOR CONNECTION DIAGRAM
CONNECTION DIAGRAM
POWER SYSTEM TRANSDUCERS & PROTECTIVE DEVICES


OPTICAL PICKUP
SIGNAL CONDITIONER
DETAIL "E"
DETAIL "C"
OPTICAL PICKUP MOUNTING BRACKET
AUXILIARY ELECTRONIC PACKAGE
10IGF03





SENSOR IDENTIFICATION KEY

STATION ID NUMBER

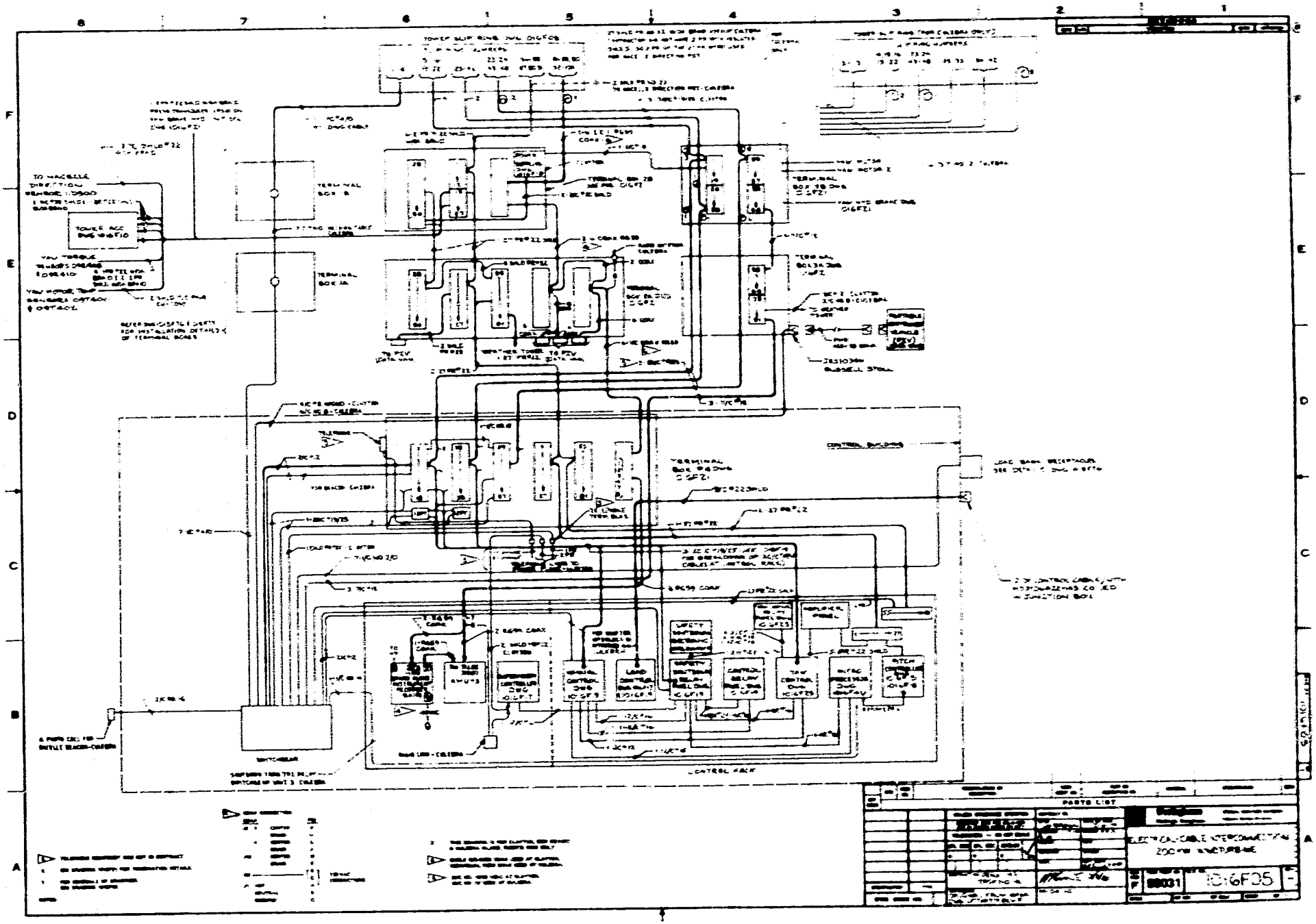
SENSOR KEY LETTER

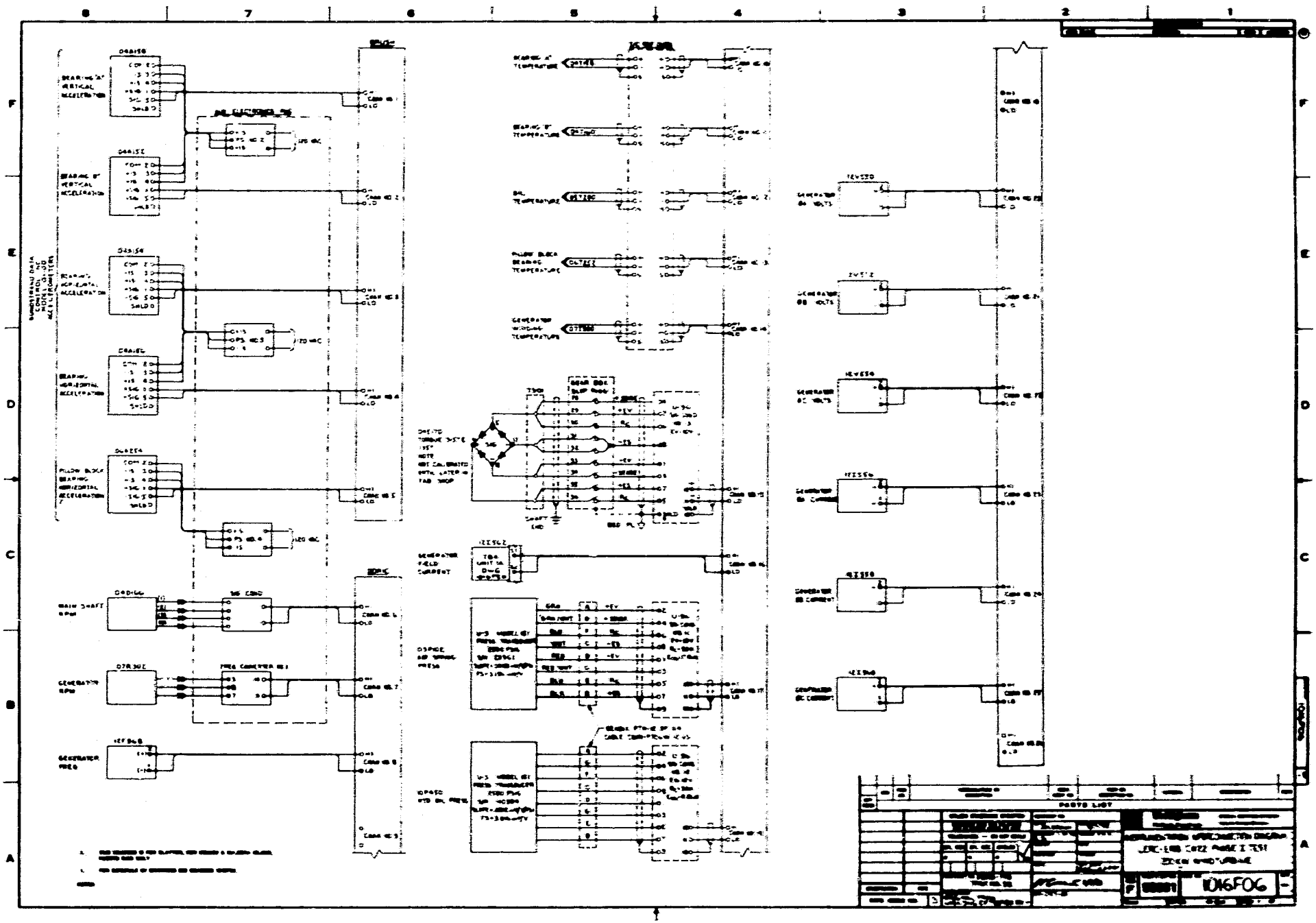
UNIQUE SIGNAL NUMBER

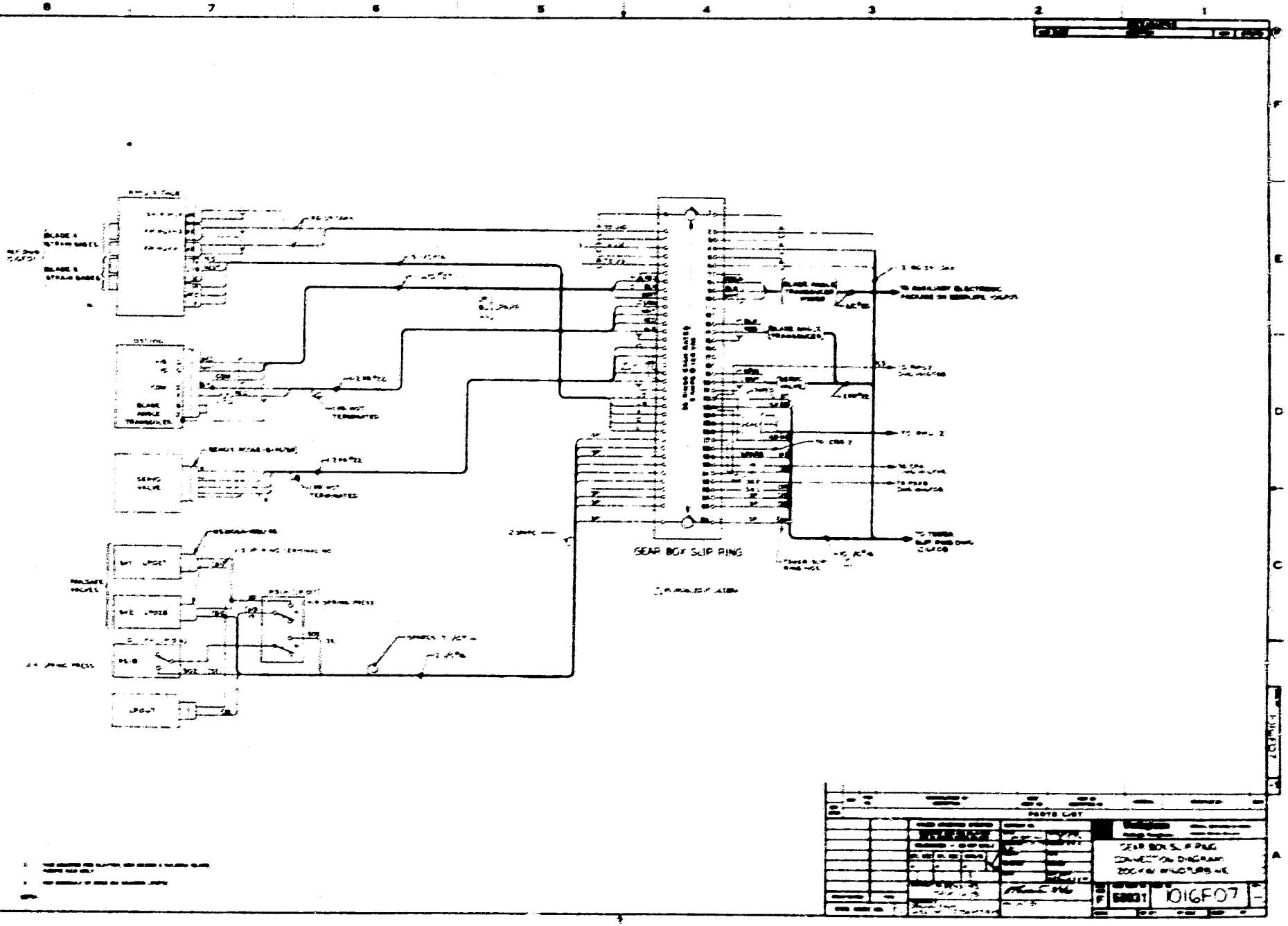
STATION IDENTIFICATION NUMBERS

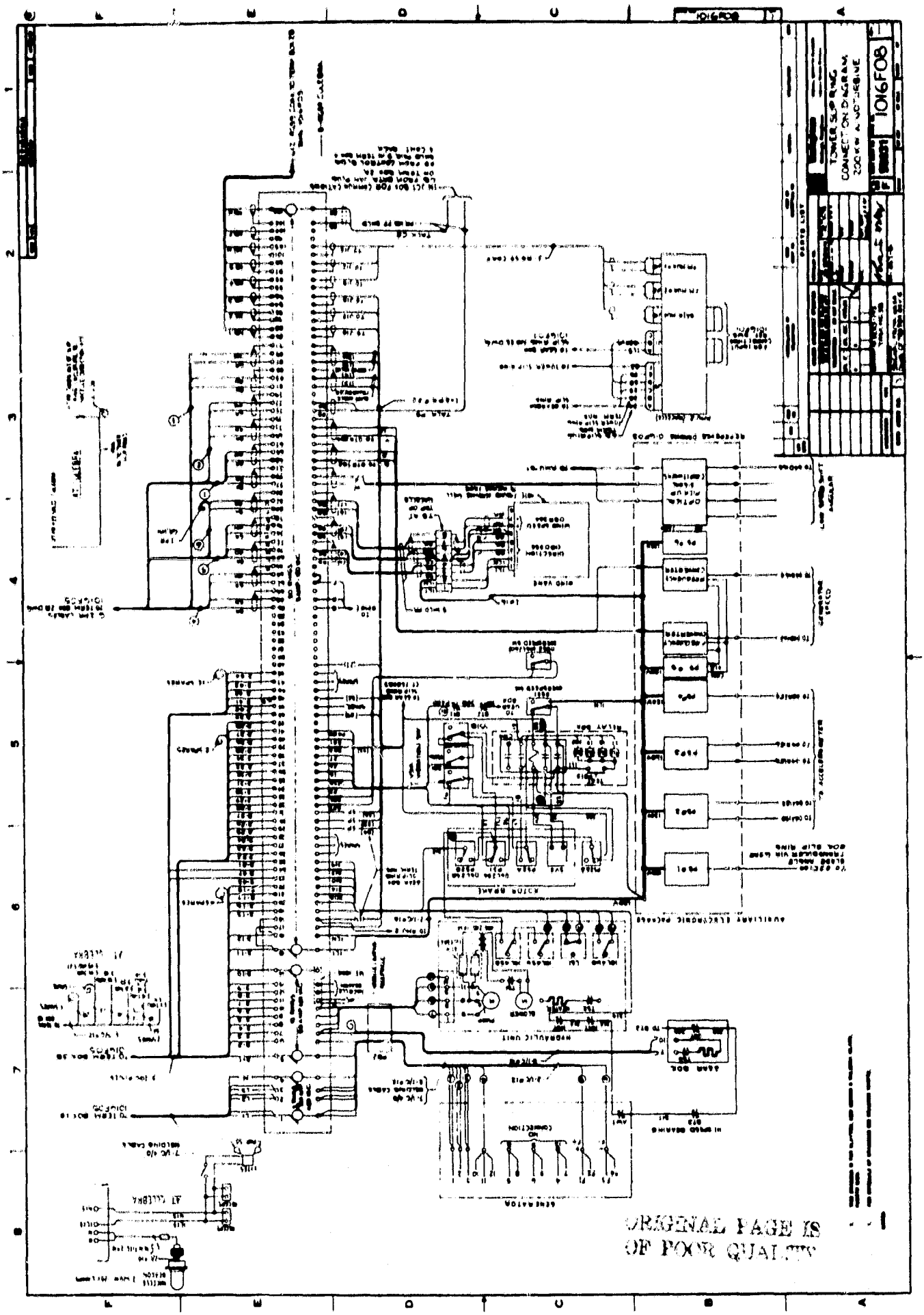
SENSOR KEY LETTERS

1016F04

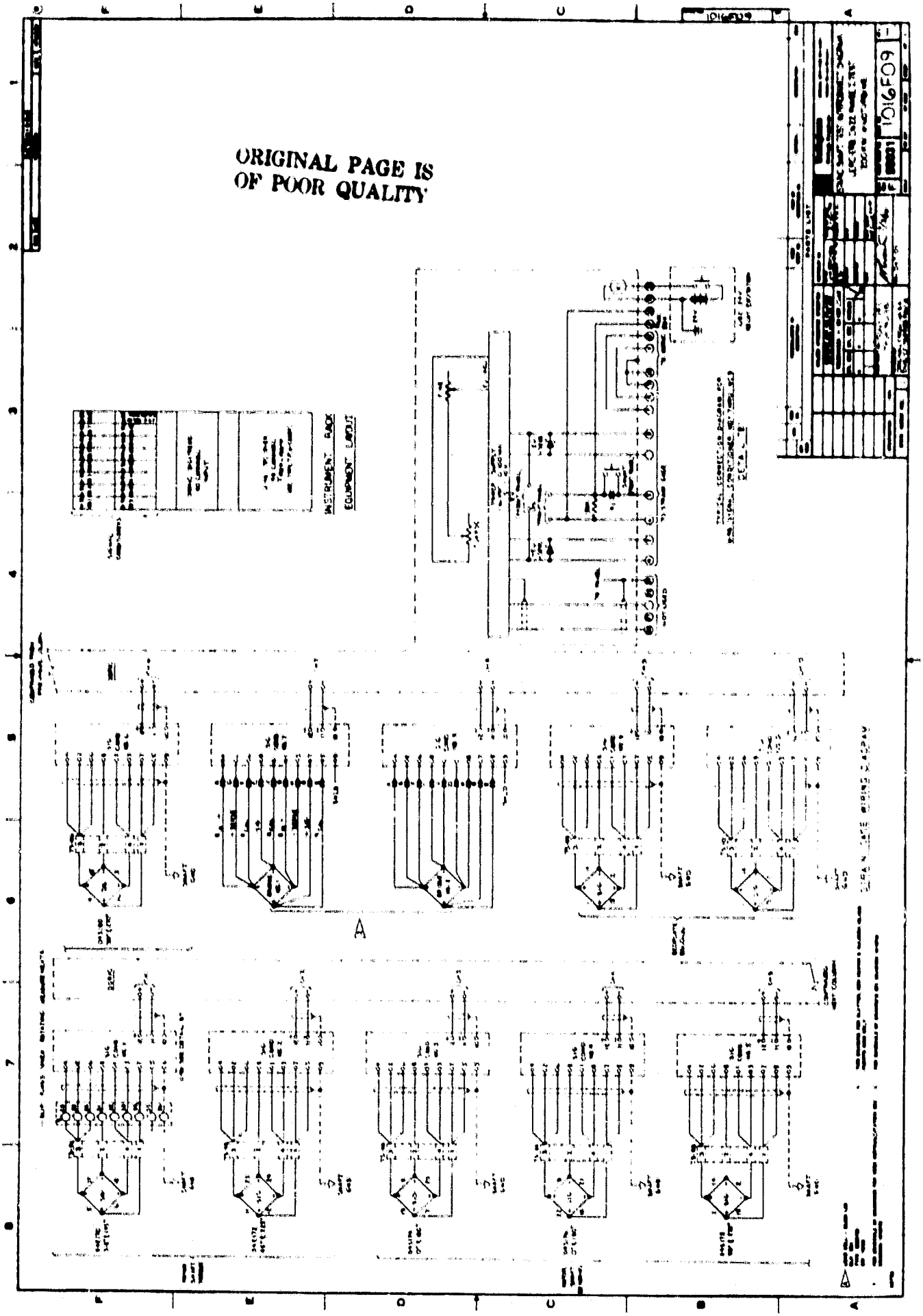


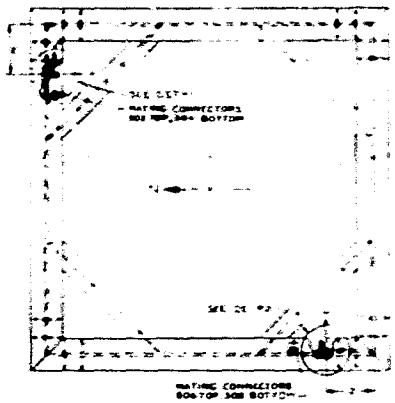



GEAR BOX SLIP RING

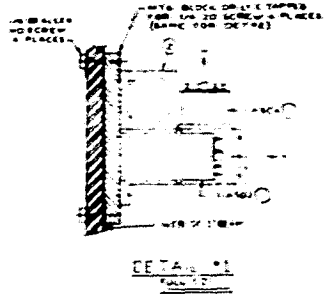


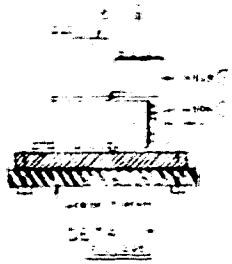
ORIGINAL PAGE IS
OF POOR QUALITY

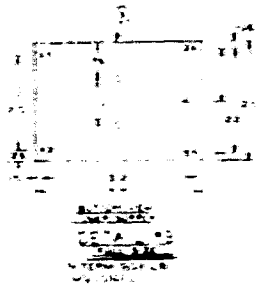


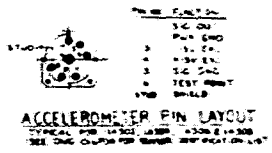


PLAN-TOWER MOUNTING FRAME

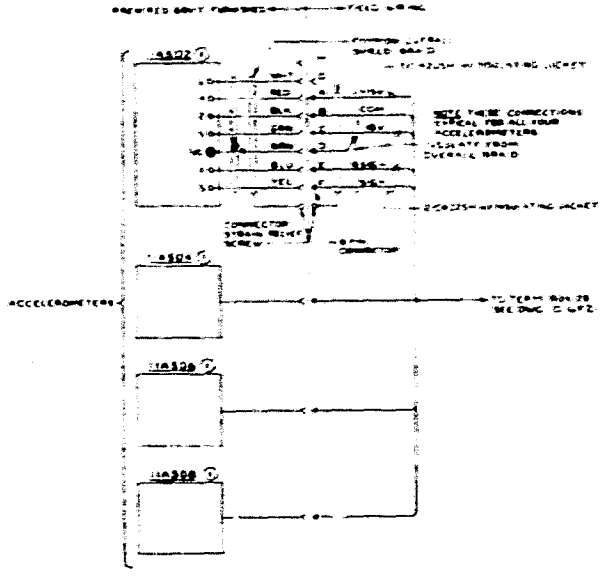




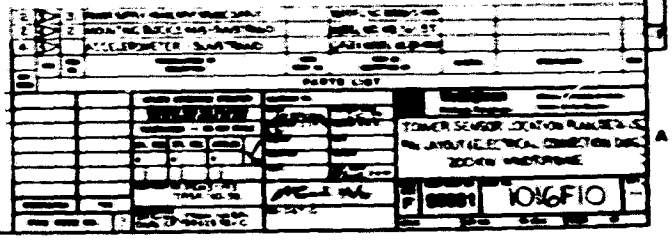


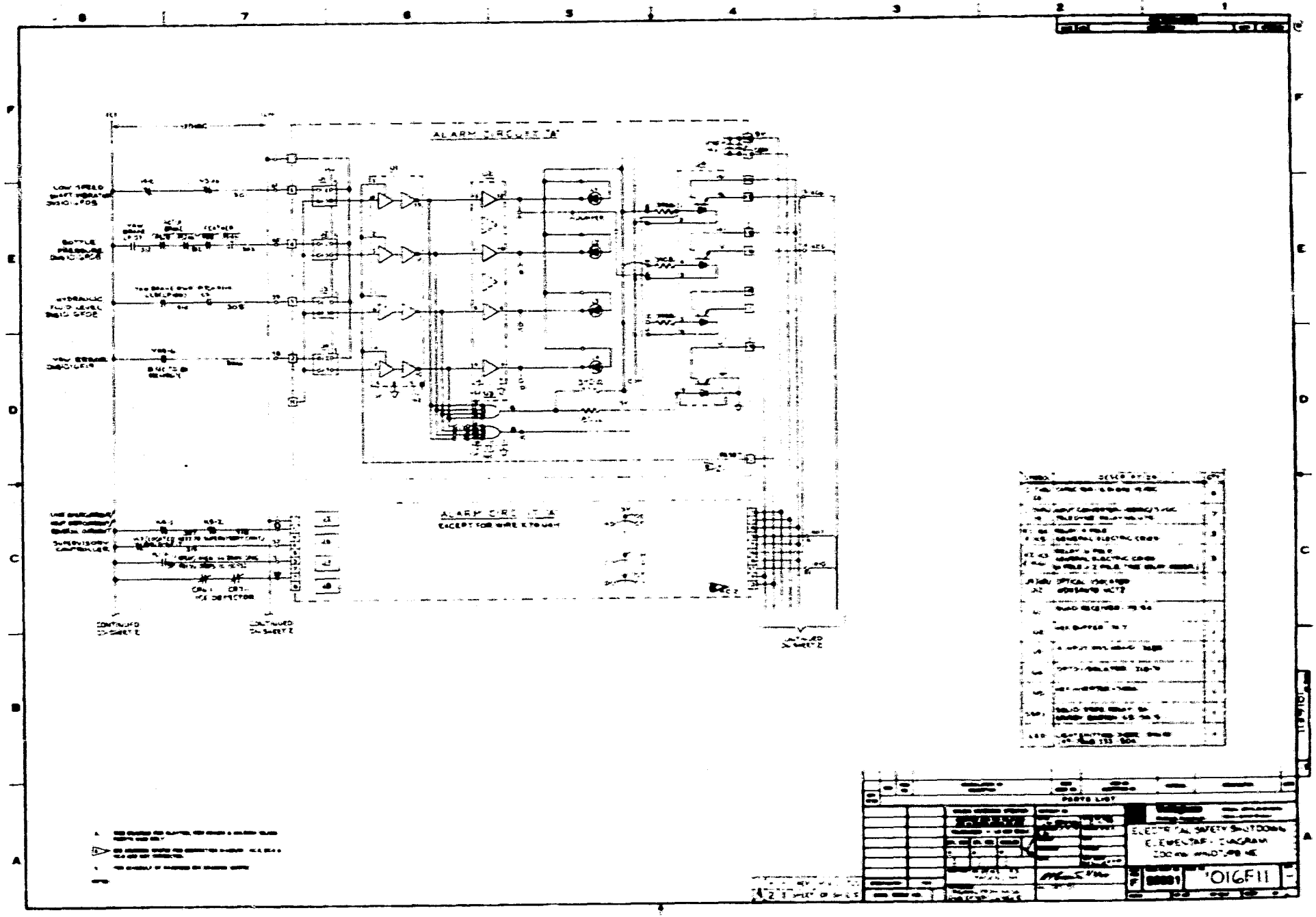


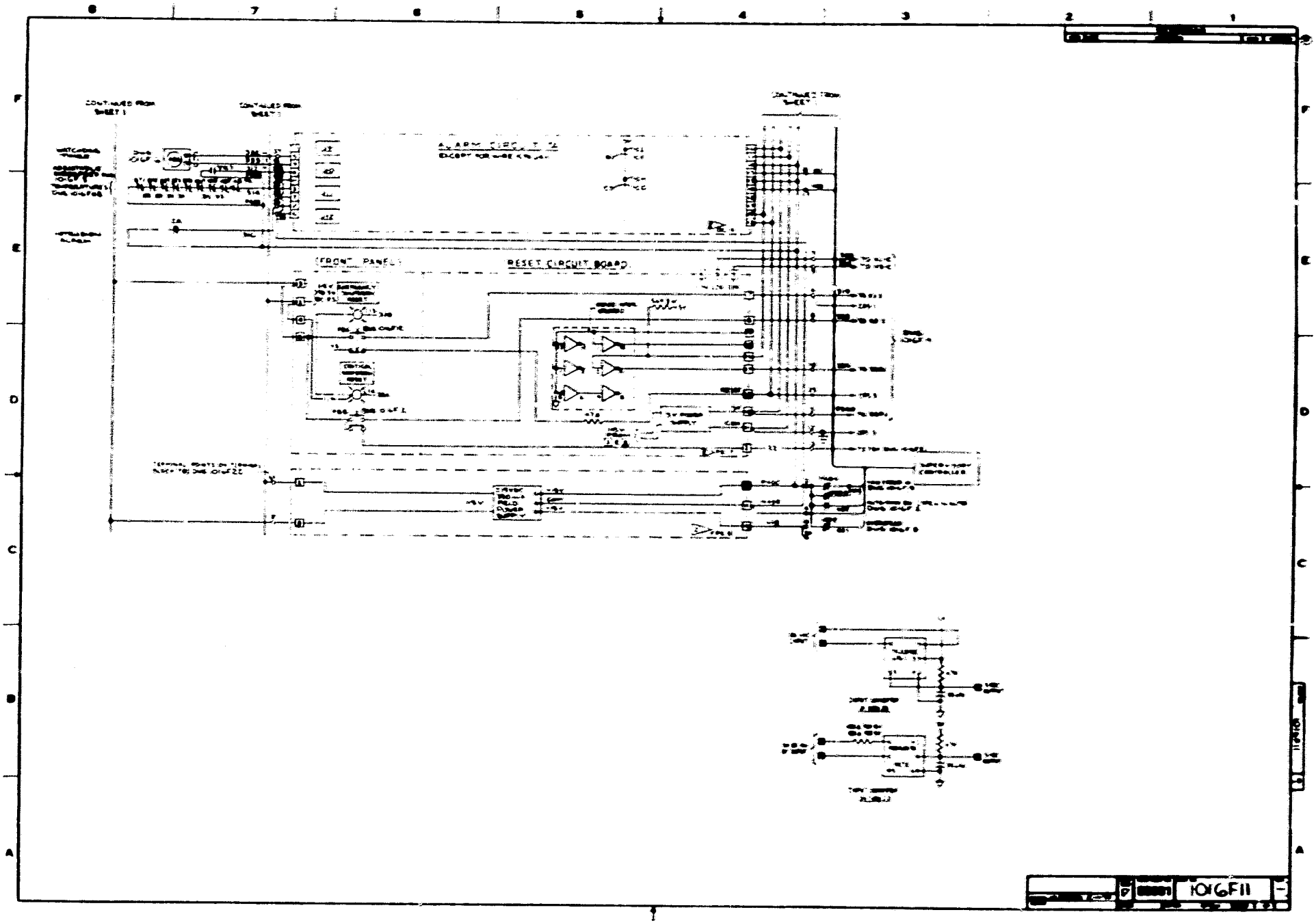
ACCELEROMETER PIN LAYOUT

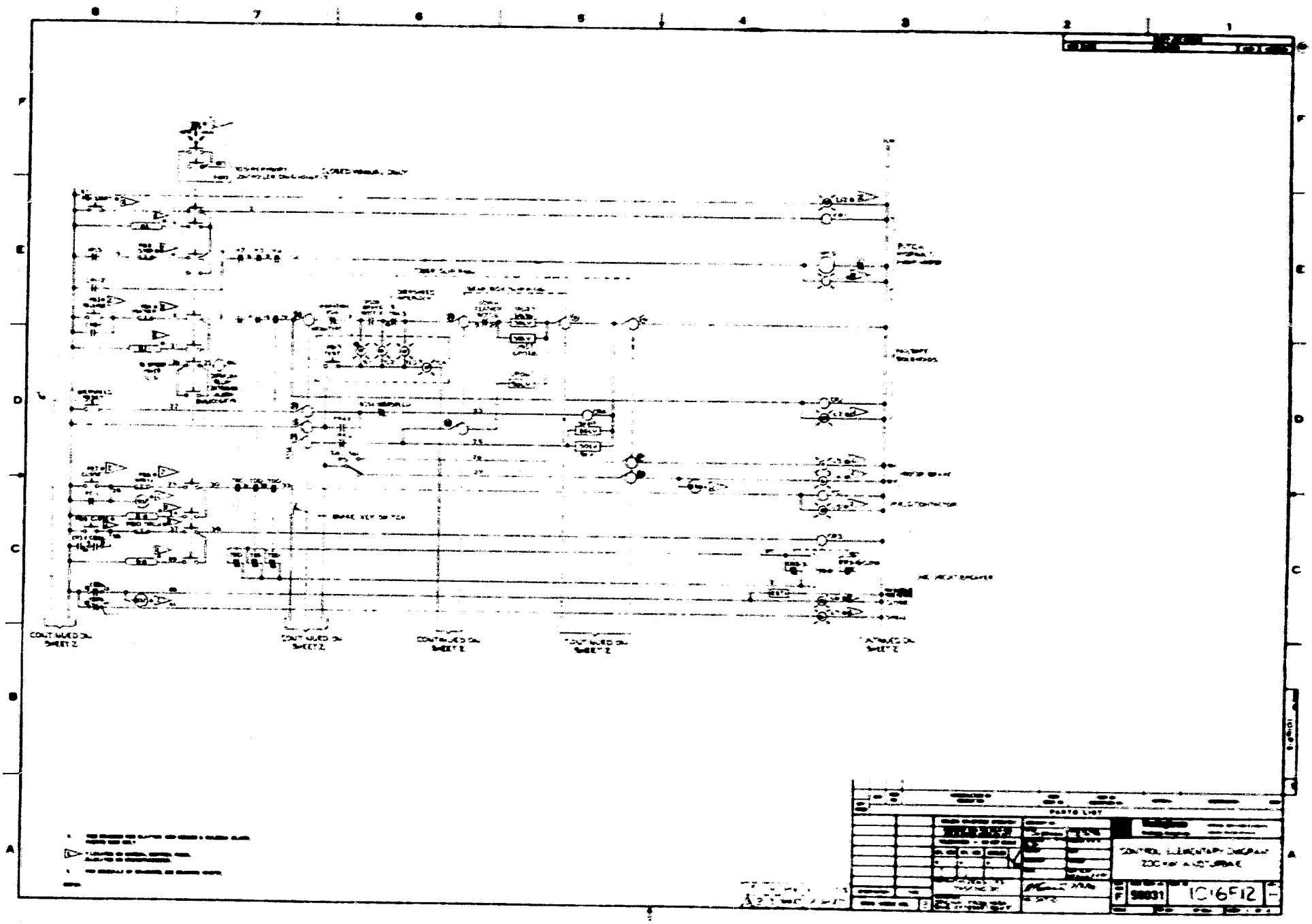


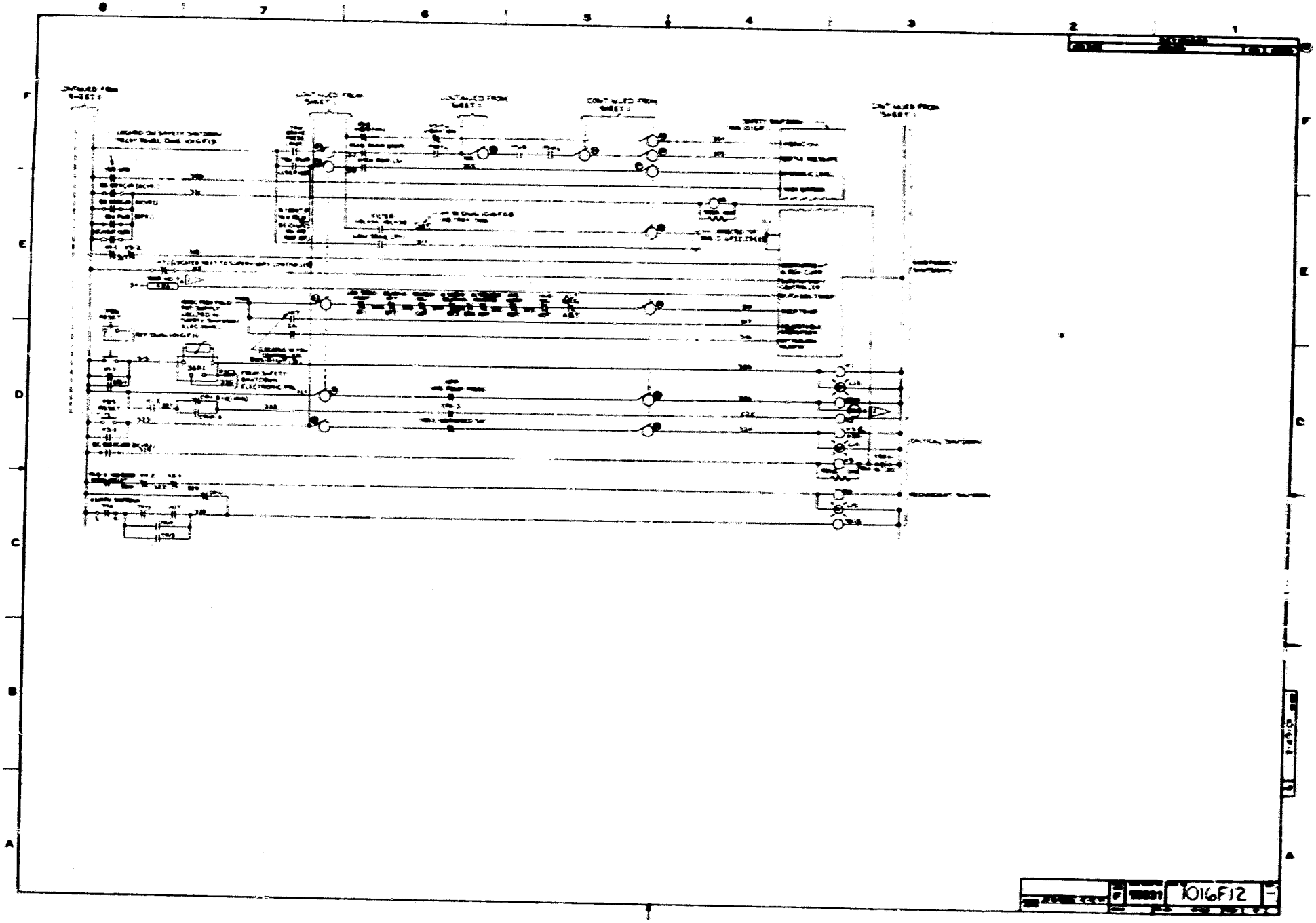
TOWER ACCELEROMETER CONNECTION DIAGRAM

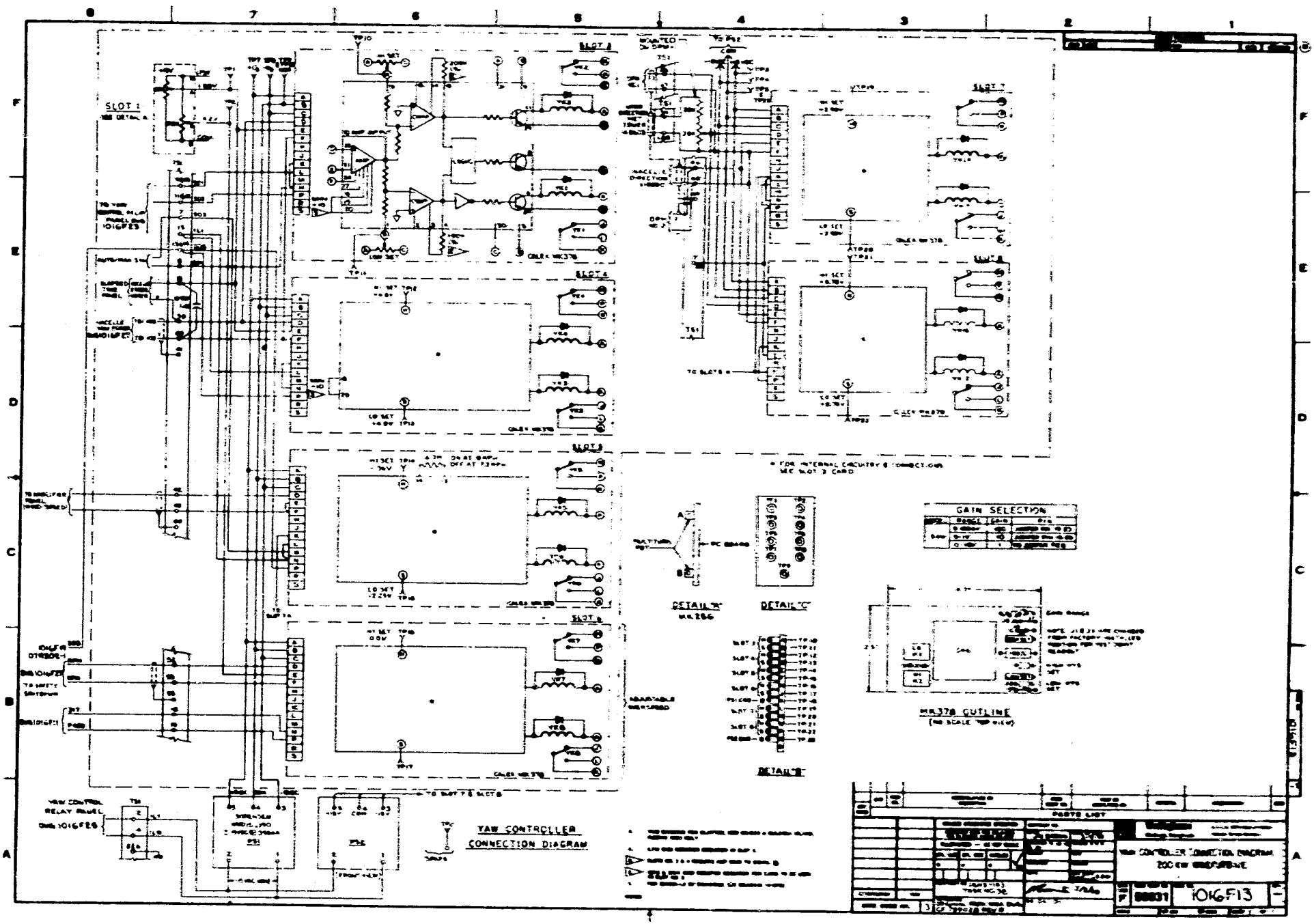


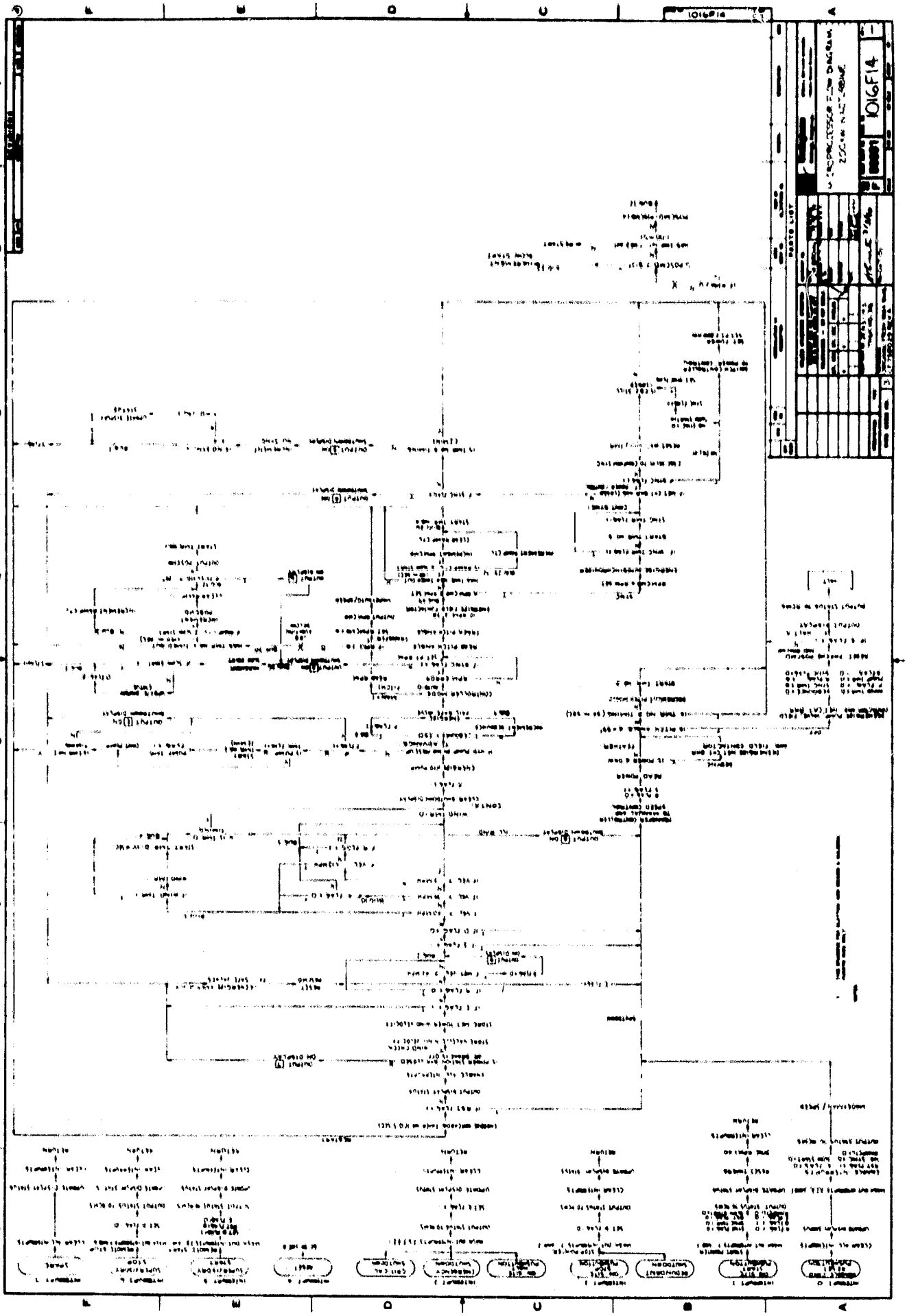


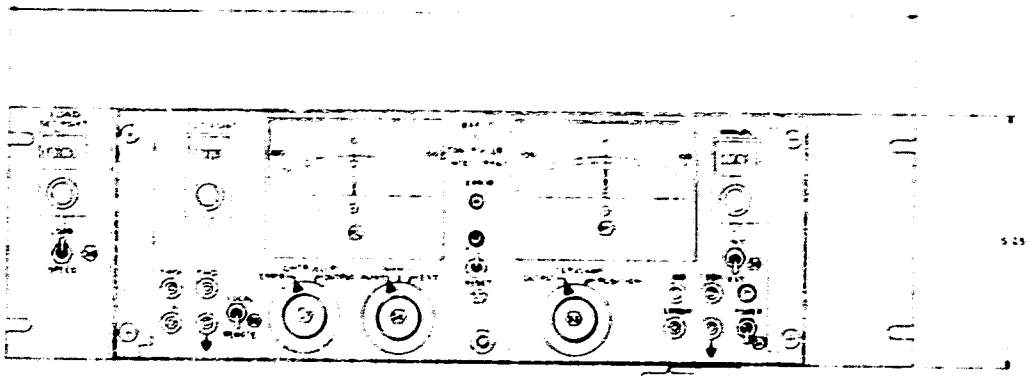

FRONT PANEL
RESET CIRCUIT BOARD



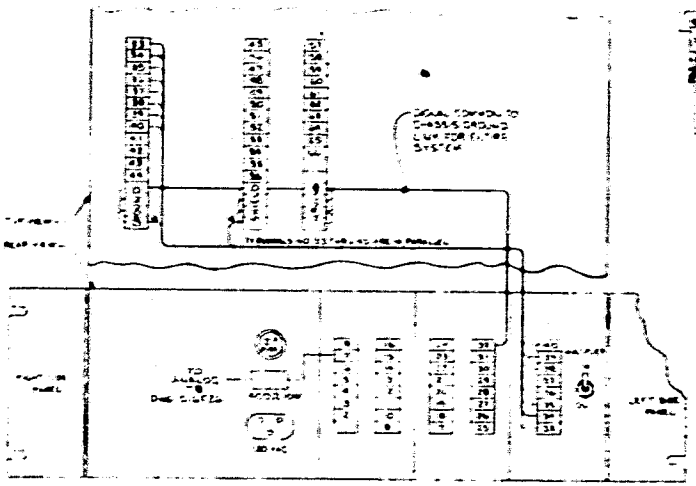



SLOT 1
SLOT 2
SLOT 3
SLOT 4
SLOT 5
SLOT 6
SLOT 7
SLOT 8
GAIN SELECTION
DETAIL "A"
DETAIL "C"
DETAIL "B"
MR378 OUTLINE
YAW CONTROLLER
CONNECTION DIAGRAM
YAW CONTROLLER CONNECTION DIAGRAM
200 CW CONFIGURATION
1016F13

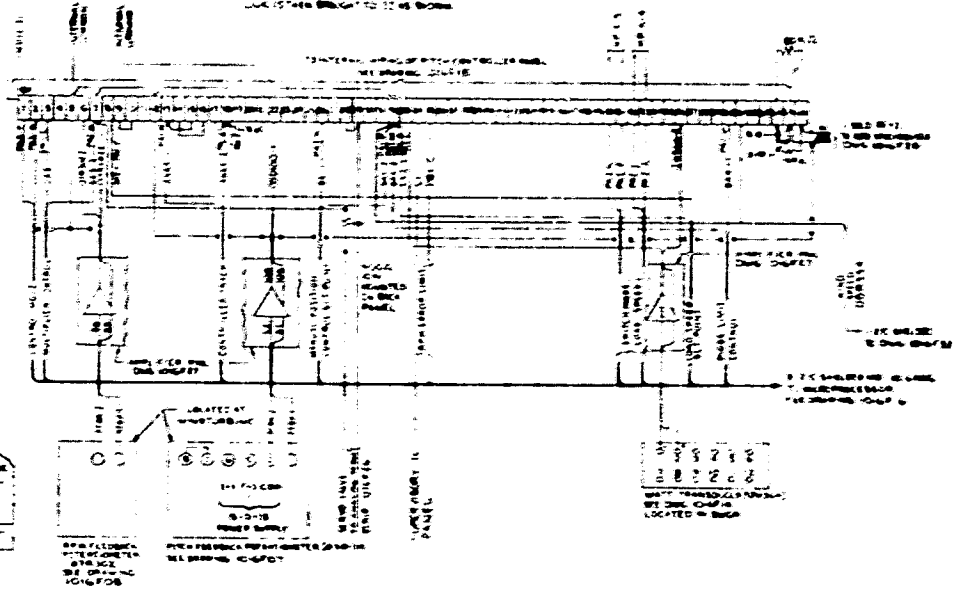




PITCH CONTROLLER PANEL



TERMINAL ARRANGEMENT

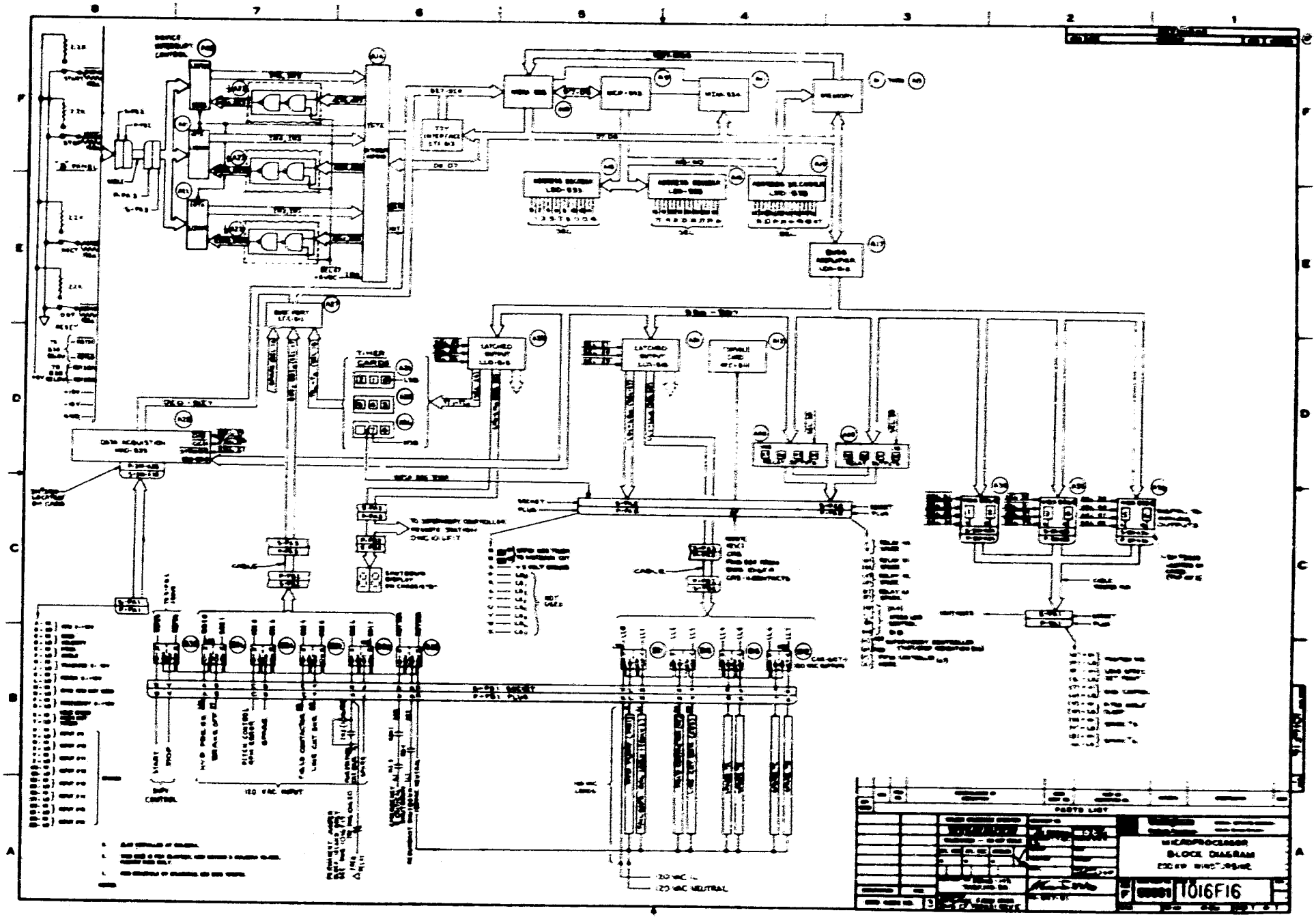


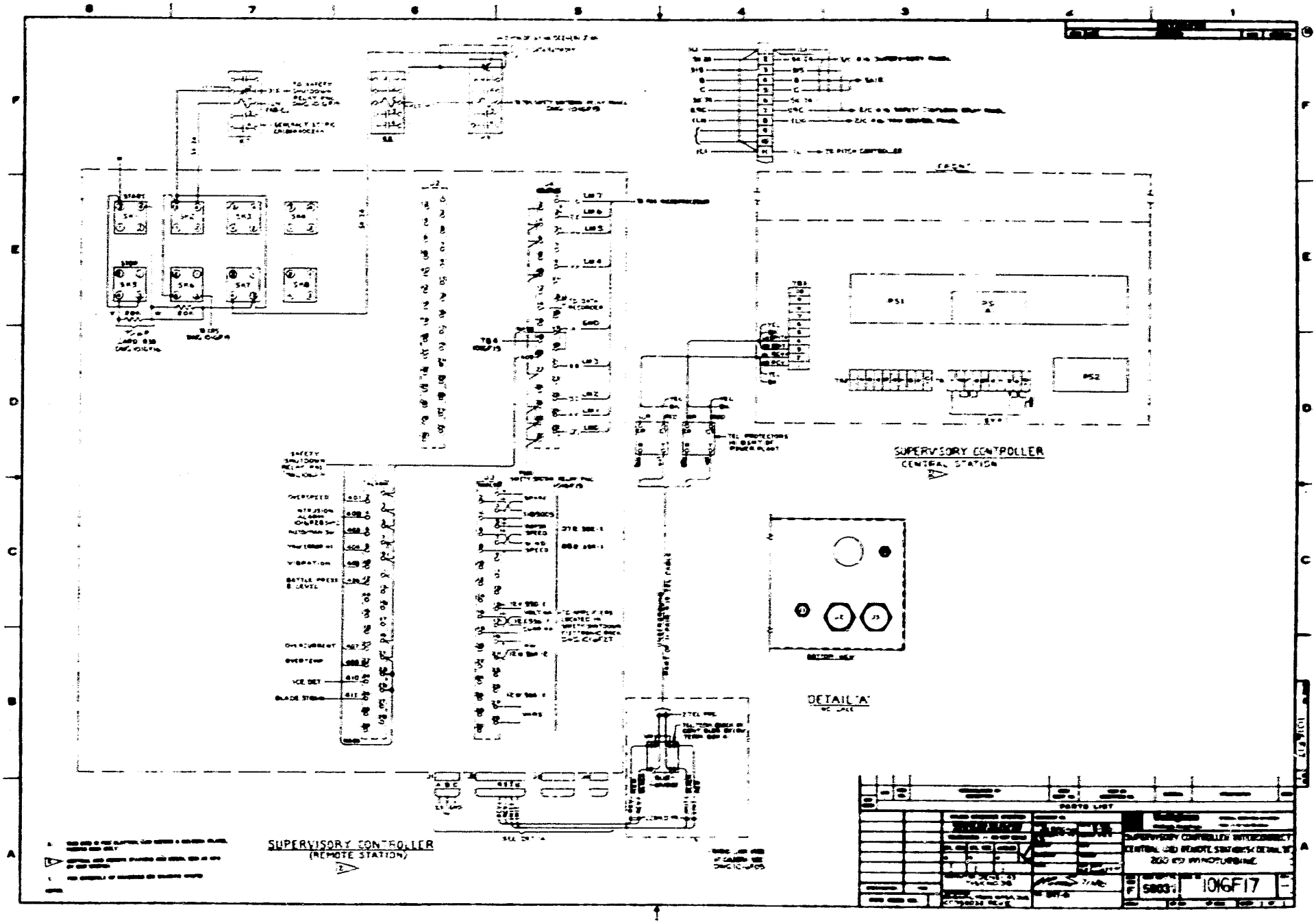
TERMINAL CONNECTIONS

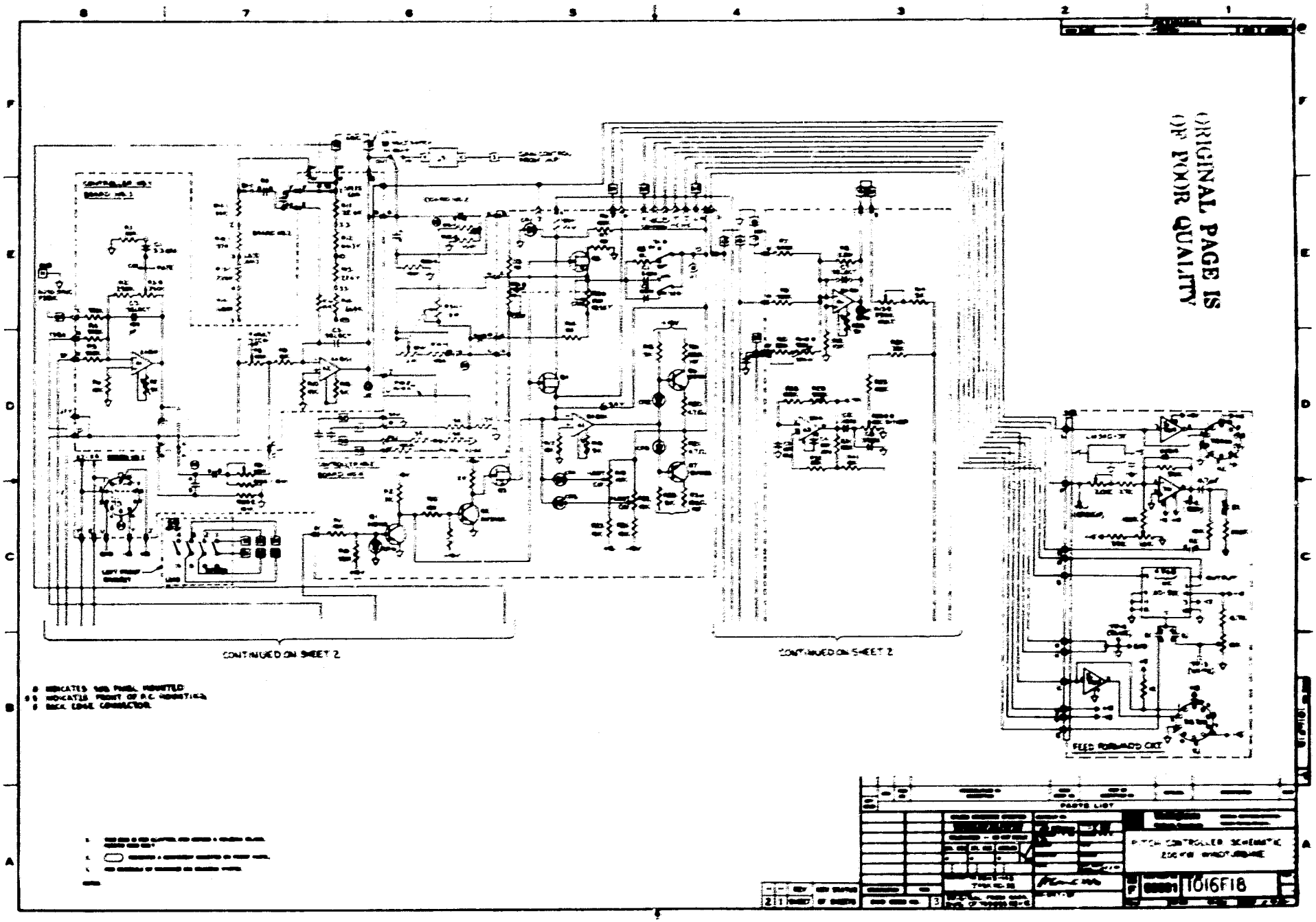
PARTS LIST

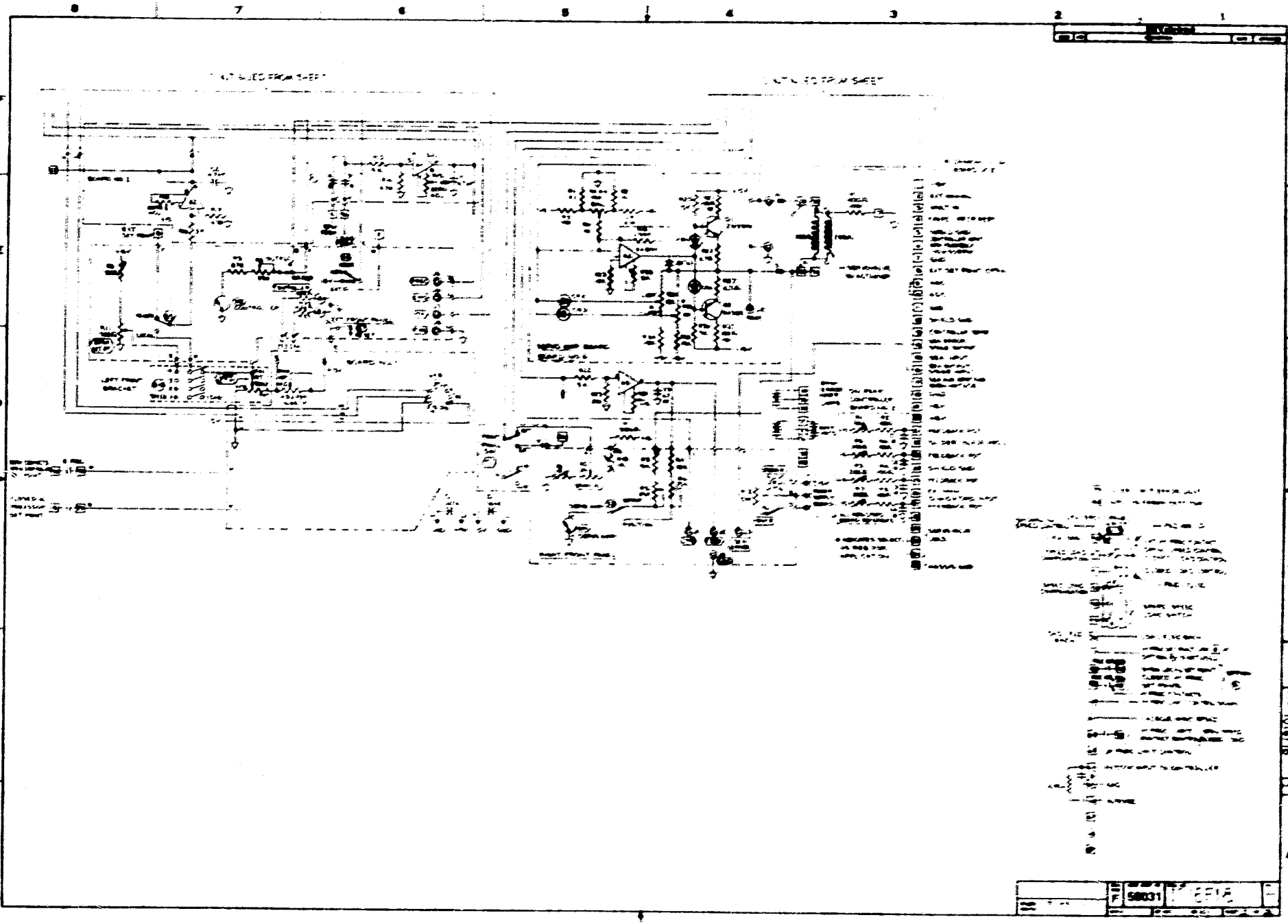
ELECTRICAL CONNECTION DIAGRAM
PITCH CONTROLLER
200 KW WIND TURBINE

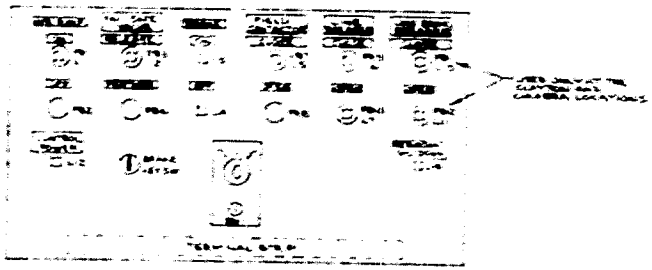
	8831	016F15


8
7
6
5
4
3
2
1
F
E
D
C
B
A
120 VAC INPUT
120 VAC NEUTRAL
1016F16

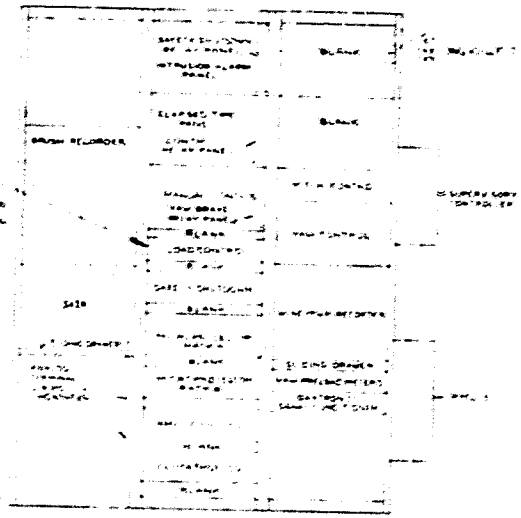

SUPERVISORY CONTROLLER
CENTRAL STATION
SUPERVISORY CONTROLLER
(REMOTE STATION)
DETAIL 'A'
PARTS LIST
1016F17



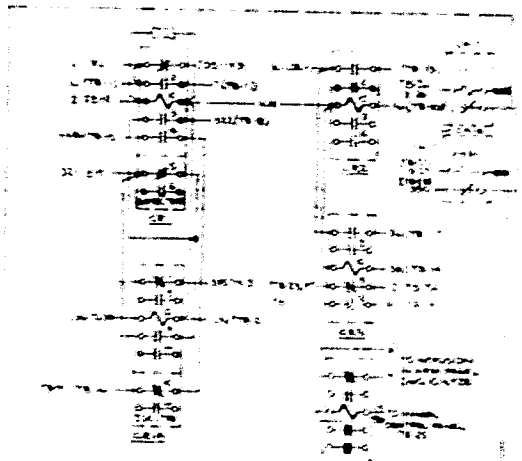


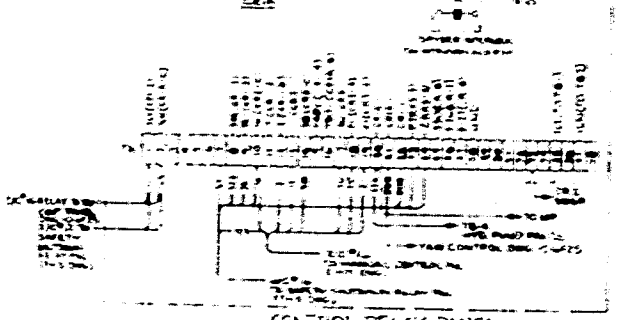


MANUAL CONTROL PANEL LAYOUT



SOUTH & PATH ELEVATION

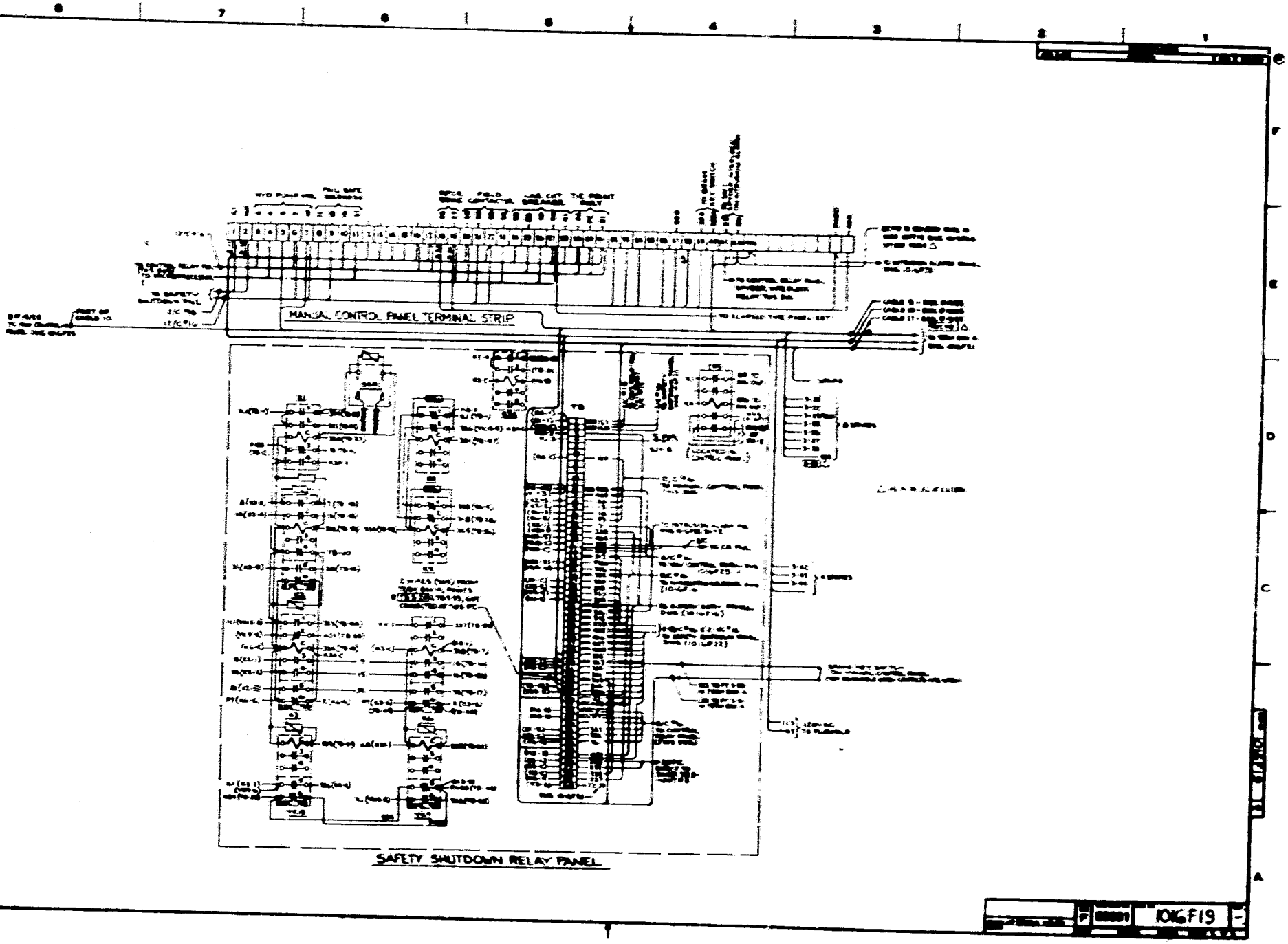


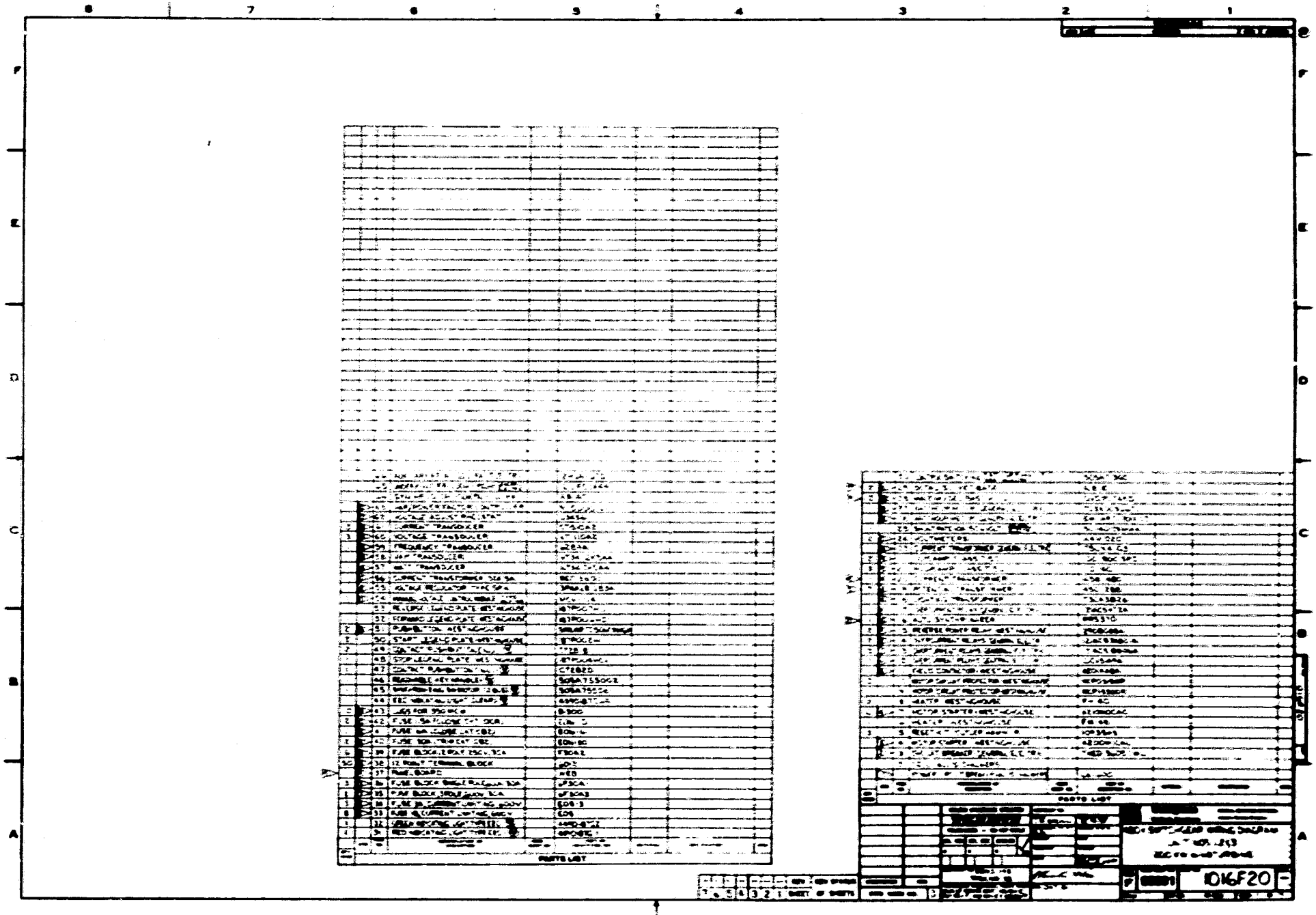


CONTROL RELAY PANEL

CONTROL PANEL GROUPS RELAY PANEL
CONNECTION DIAGRAMS
1000 KW WINDTURBINE

1016F19

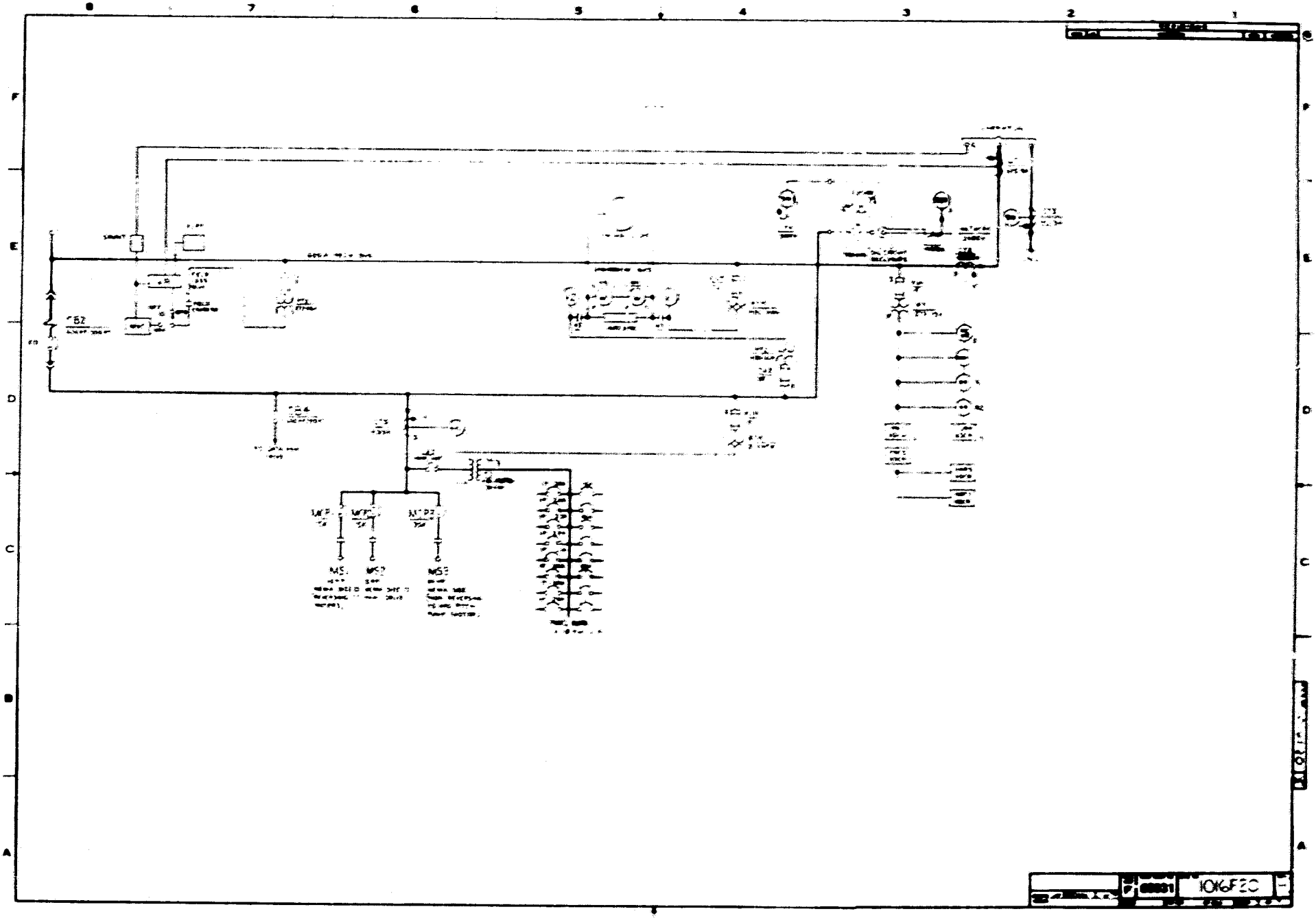

MANUAL CONTROL PANEL TERMINAL STRIP
SAFETY SHUTDOWN RELAY PANEL

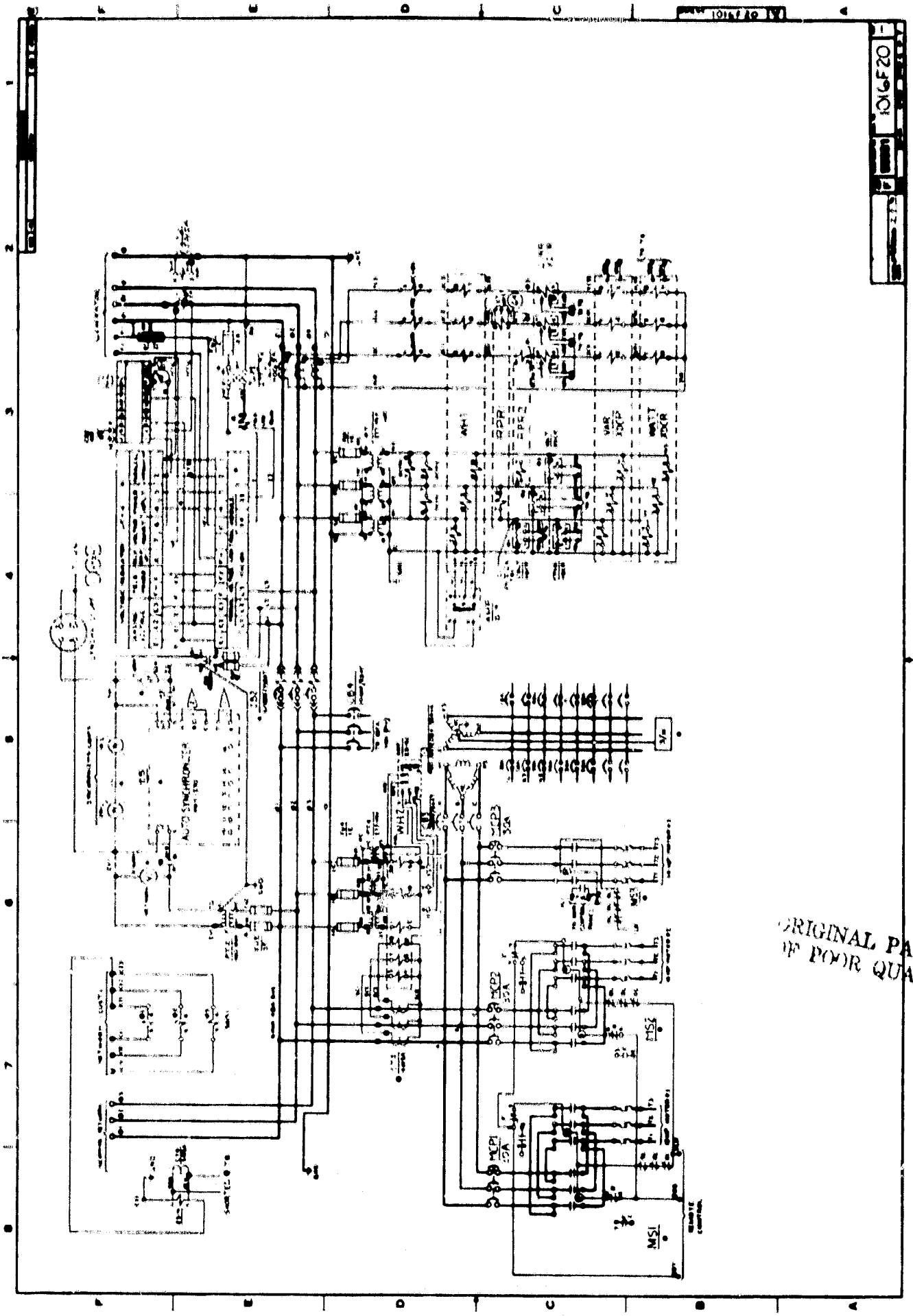


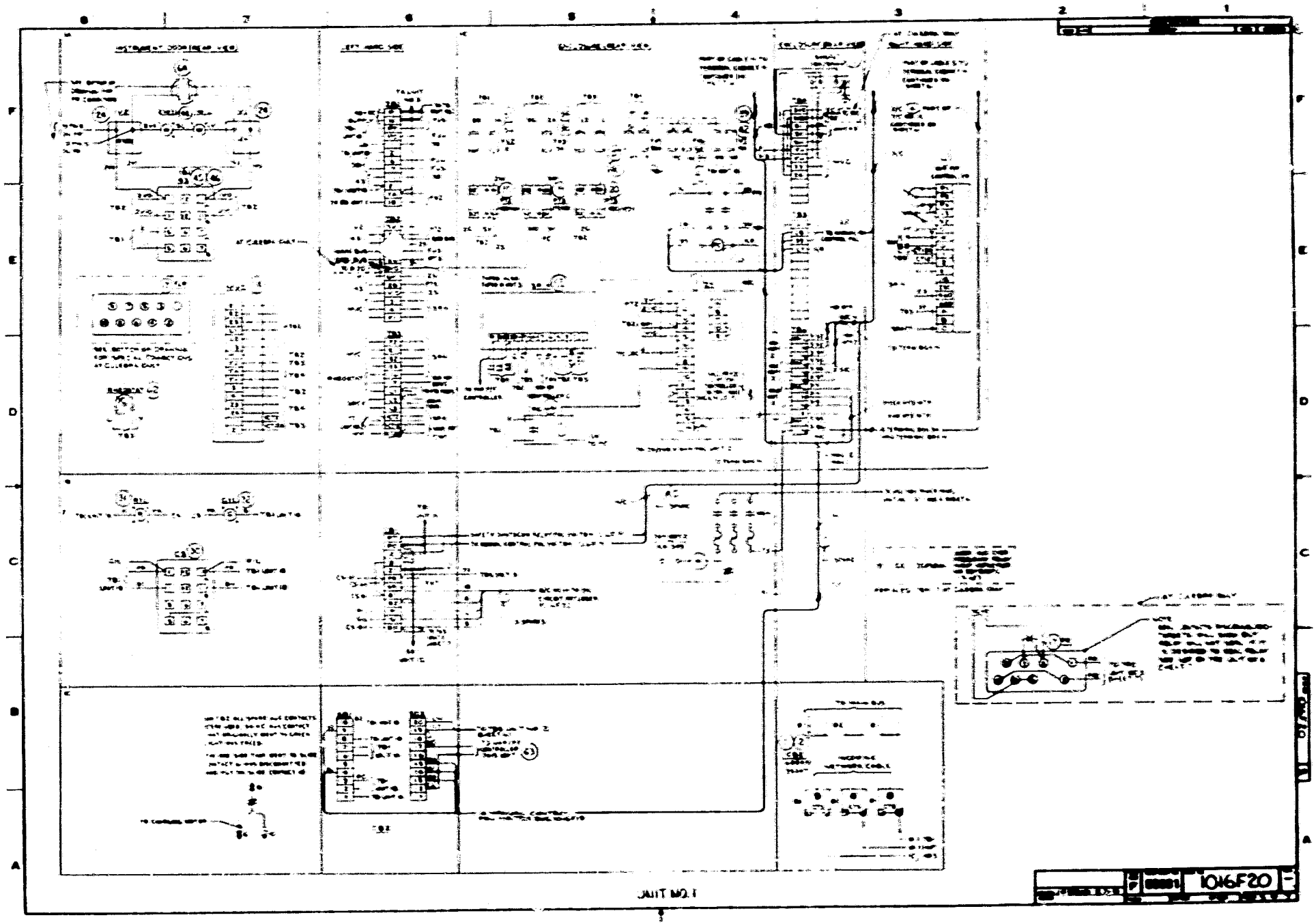
EQUIPMENT LEGEND

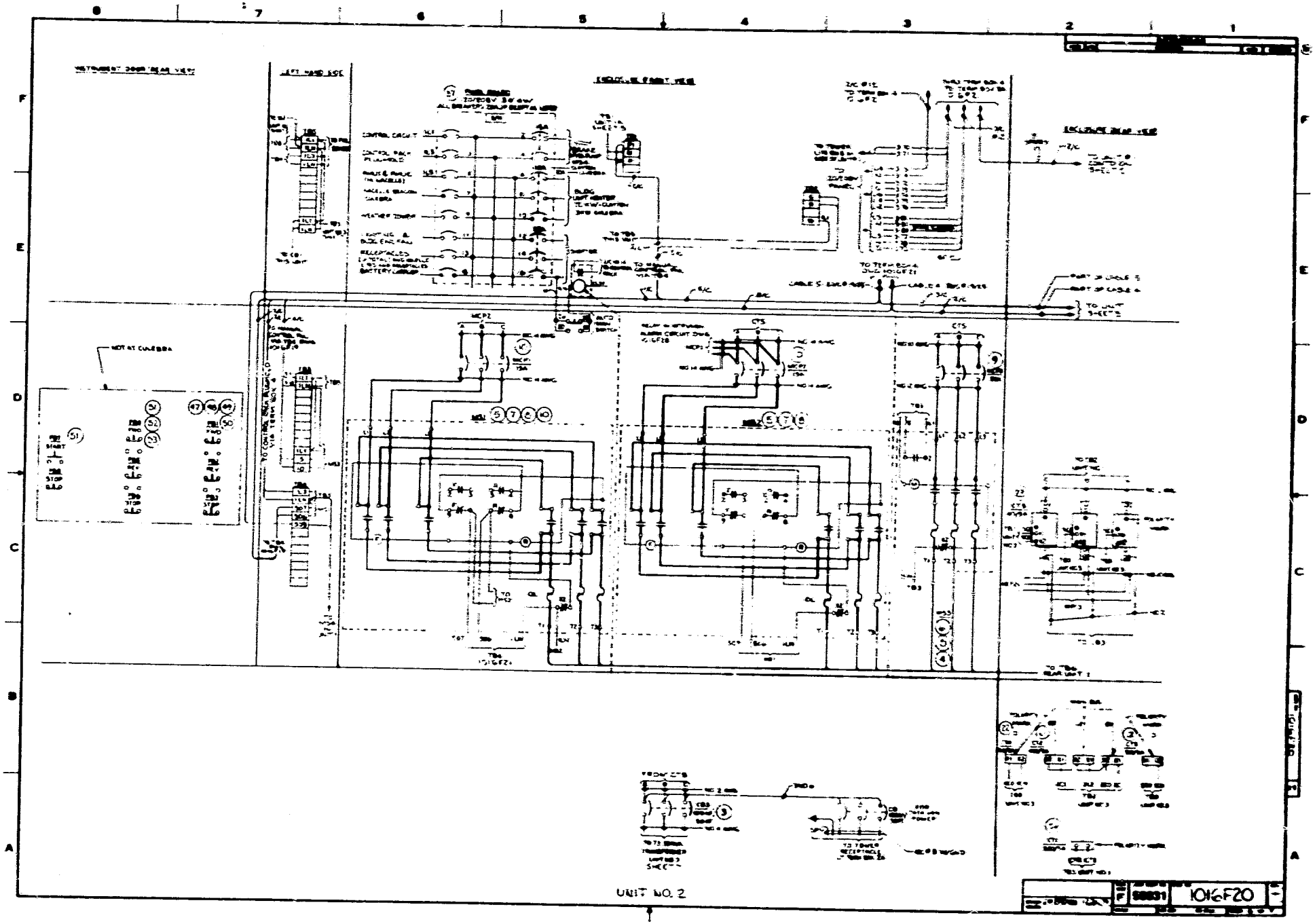
ITEM	DESCRIPTION
AUTO SYNC	AUTOMATIC SYNCHRONIZER, 25V DC
CB	CIRCUIT BREAKER
CT	CIRCUIT TRANSFORMER
FU	FUSE
SL	SYNCHRONIZING LIGHTS
MCP	MOTOR CIRCUIT PROTECTOR
MS	MOTOR STARTER
OCVR	OVERCURRENT VOLTAGE RESTRAINT RELAY
PT	POTENTIAL TRANSFORMER
RPR	REVERSE POWER RELAY
V	VOLTMETER
VR	VOLTAGE REGULATOR
WH	WATT-HOUR METER
XDCR	TRANSDUCER
50/51	INSTANTANEOUS AND TIME OVERCURRENT RELAY
51N	TIME OVERCURRENT RELAY (NEUTRAL)
81	SYNCHRONIZING SWITCH
VAR	VAR/POWER FACTOR CONTROLLER
AVC	MANUAL VOLTAGE CONTROL
UFOF	UNDER FREQUENCY/POWER FREQUENCY RELAY (CALIFORNIA ONLY)

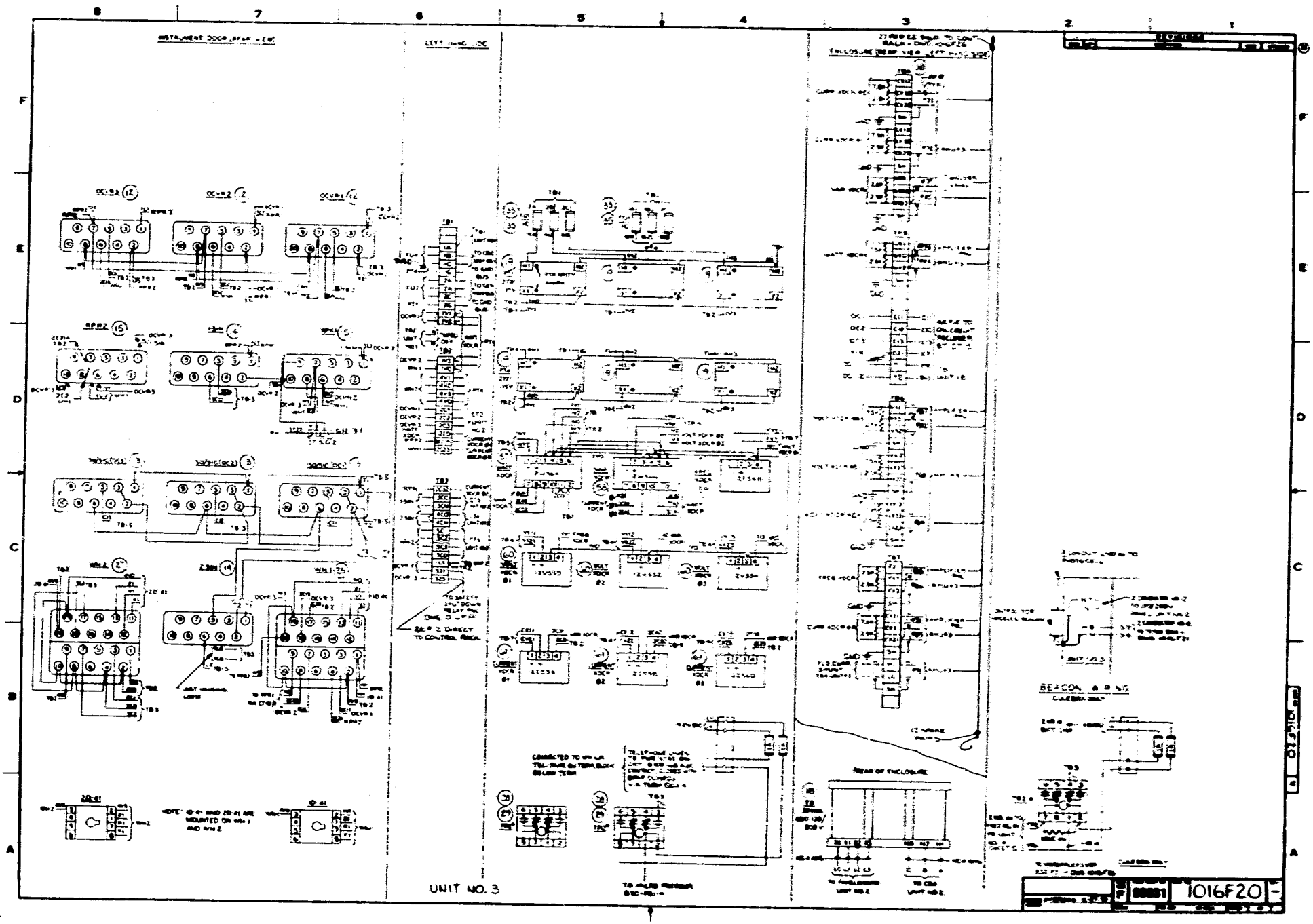
34. THIS DRAWING IS FOR CLARK/LUMEN MEXICO EQUIPMENT. SLAVE PARTS TO BE ONLY
35. FORWARD / REVERSE CONTACTS ARE MECHANICALLY INTERLOCKED.
36. SYMBOLS ON THIS DRAWING:
A (●) INDICATES LOCATION AT UNIT NO. 1 (OTHER UNITS SIMILAR NO. 8)
● = AGUA" OIL TRANSFORMER (FURNISHED BY OTHERS).
37. USE SHIELD CABLE TO CONNECT THE GOVERNOR RAISING POINT TO TERMINALS 10(X1), 11(X2), 12(X3) IN GOVERNOR & APPROPRIATE.
38. FOR SCHEDULE OF DRAWINGS SEE DRAWING 10U1F00
39. JUMPER FOR SELECTION OF BREAKER CLOSING ANGLE FOR 8° OR 15° JUMPER A1C, B1C, A1B FOR 20° NO JUMPER.
40. CONNECTION FOR AUTOMATIC RESET. FOR REMOTE RESET, REMOVE JUMPER AND REPLACE BY N/O CONTACT.
41. PURCHASE ITEMS FROM BASLER ELECTRONIC CONTROLS 1651 19TH ST. SANTA MONICA, CALIFORNIA 90404
42. PURCHASE ITEMS FROM SCIENTIFIC COLUMBUS INC. 4965 W. BROAD AVE. COLUMBUS, OHIO 43228
43. PURCHASE ITEMS FROM BARKER ELECTRIC CO. ST. #3 P.O. BOX 249 HIGHLAND, ILLINOIS 62249
44. RESISTOR MANUFACTURED CONTACT ASSEMBLY EXCEPT WITH 2-OTZA CONTACT BLOCKS.
45. LUGS FOR 350 MCM FOR GENERATOR AND METERING CONNECTIONS PURCHASE FROM T&B CO. 2400 STICKNEY AVE. P.O. BOX 99, CAZENOVIA, OHIO 45221.
46. PANELBOARD, 250 V AC, 12 CKT, 3 WIRE, 4 WIRE, 100 AMP, WITH 12-20 AMP CIRCUIT BREAKERS, WEST TYPE BL.
47. PURCHASE ITEMS 35, 36, 38 & 39 FROM WISCONSIN ELECTRIC MFG. CORP. 1000 E. BRADY PL. P.O. BOX 401 BELOIT, WISCONSIN 53511.
48. PURCHASE ITEMS 33 & 34 AS A UNIT FROM FEDERAL PACIFIC ELECTRIC CO. 1950 AVE. "L" GRANITE CITY, ILLINOIS 62040
49. 20 TAB SOCKET BASE 6P2T INDUSTRIAL SERIES TERMINALS FOR ITEM 28.
50. TYPE DAS PLUGABLE MOLDED BASE, SEMI-FLUSH, PLUGGED PLUG IN RELAY 2A CONTACTS, 240V AC COIL TRIPPING RELAYS "TRIP-OUT".
51. WATT-HOUR METER, 3Ø4W, 2.5 AMP, 3 STATOR CYCLOMETER REGISTER FOR USE WITH 3-200/5A CT AND 3-2400/120 V PT'S CONNECTED PHASE TO NEUTRAL ON A 3 Ø, 4 W, 60 HZ SYSTEM WITH A 1 KW PULSE GENERATOR, 120 V AC 100 PPH/PULSE
52. WATT-HOUR METER, 120 V, 5 AMP, 3 STATOR CYCLOMETER REGISTER FOR USE WITH 3-400/5A CTS AND 3-2770 V/120 V PT'S, CONNECTED PHASE TO NEUTRAL ON A 3 PHASE, 4 W, 60 HZ SYSTEM WITH A 1 KW PULSE GENERATOR, 120 V AC, 2 PULSE
53. VOLTMETER, 150 V MOMENTARY, 4½" SCALE, FOR USE WITH 2½" S.P.T. PURCHASE FROM WESTON INSTRUMENTS DIVISION, DANIEL WOODHEAD INC. OF SANTA BARBARA, CALIFORNIA
54. 1.25 KVA, 5 KV, 5/50 CURRENT TRANSFORMER, TYPE JCH-0, 5A
55. PURCHASE ITEMS 4 & 32 (1/32) FROM ABBOTT TRANSISTOR LABORATORIES INC. 5200 W. JEFFERSON BLVD. LOS ANGELES, CALIFORNIA 90016
56. CURRENT TRANSFORMER, 600:5, 10 KV, DROP-OUT TYPE, BTC-2 (BTC).
57. POTENTIAL TRANSFORMER, 2,770 V/120 V, 10 KV, 60 HZ, 1 PH, 2 WIRE, OPEN TYPE (PT'S)
58. LIGHTING TRANSFORMER, 1 PHASE, 60 HZ, 480 V PRIMARY, 208-230 V SECONDARY, DRY TYPE, 5 KVA, 115 °C RISE, 2 WIRE, 480 V PRIMARY TAPS, 60 HZ, RATED FOR 100 VOLTS (1) PURCHASE FROM MAGNETRAN CORP. 9 CORB AVE. SANTA ANA, CALIFORNIA
59. TYPE MC OVERCURRENT RELAY, MULTIPLE TIME (5 AMP RANGE, 4 NO, 4 NC CONTACTS, CASE SIZE 9M2 OR 12M2, CUSTOMER SUPPLIES 4.5 TO 5.0 AMP TARGET SEAL-IN UNIT.
60. AUTO SYNCHRONIZER, FOR 3 PHASE, 4 WIRE, 60 HZ GENERATORS, 3 PHASE, 115 V, 60 HZ, SOLID STATE, MOUNTING BEHIND THE PANEL.
61. REVERSE POWER RELAY, 3 PHASE, 208 VOLT, 60 HZ, 2 WIRE, RANGE TYPE CRR-1, CASE FT-21
62. OVERCURRENT RELAY, SINGLE PHASE, 60 HZ, VERY INVERSE, 0.5-16 A RANGE, TYPE IAC (BLACK, STANDARD CASE 51).
63. OVERCURRENT RELAY, SINGLE PHASE, 60 HZ, MODERATELY INVERSE, 2-16 A RANGE, INSTANTANEOUS 10-160 A RANGE, TYPE IAC, 50/51, 3 ½ CASE 51).
64. OVERCURRENT RELAY, SINGLE PHASE, VOLTAGE RESTRAINT, 60 HZ, INVERSE TIME, 4 AMP RANGE, 10 TO 16 A, 2 NO CONTACTS (CASE)
65. FIELD CONTACTOR, DPST, 120 V AC CONTROL COIL.
66. MOTOR STARTER, 480 VOLT, 3 PHASE, 60 HZ, SIZE 0, 3 POLE, 60 A, 120 VAC CONTROL COIL, 3 THERMAL OVERLOAD RELAYS, 1 NO + 1 NC AUXILIARY CONTACTS, NEMA 1, NON-REVERSING, FOR 40 HP TEFC 4 POLE, 1800 RPM, SQUIRREL CAGE INDUCTION MOTOR.
67. MOTOR STARTER, 480 VOLT, 3 PHASE, 60 HZ, NEMA SIZE 1, 3 POLE, 60 A, 120 V AC CONTROL COIL, 3 THERMAL OVERLOADS, VERTICAL DESIGN, QUICK-MAKE, QUICK-BREAK, TYPE CR306, FOR 10 HP MOTOR.
68. MOLDED CASE CIRCUIT BREAKER, 400 AMP FRAME, 350 AMP TRIP, 3 PHASE, 60 HZ, 25,000 AMP INT. SHORT CIRCUIT RATING, THERMAL MAGNETIC, 600 V.
69. MOTOR CIRCUIT BREAKER, INDOOR DRAWOUT, ELECTRICALLY OPERATED, RATED 600 V, 800 AMP FRAME, 250 AMP TRIP, 3 PHASE, 60 HZ, 3 POLE, 65,000 AMP SHORT CIRCUIT, THREE ELEMENT OVERCURRENT TRIP DEVICE (LONG TIME, SHORT TIME, AND INSTANTANEOUS) MOTOR OPERATED, STORED ENERGY CLOSING, 120 VAC CLOSE AND TRIP CONTROL, DRAWOUT TRUCK, AUXILIARY SWITCH WITH 2 4-A AND 2 4-C CONTACTS, AND STANDARD ACCESSORIES (CB2).

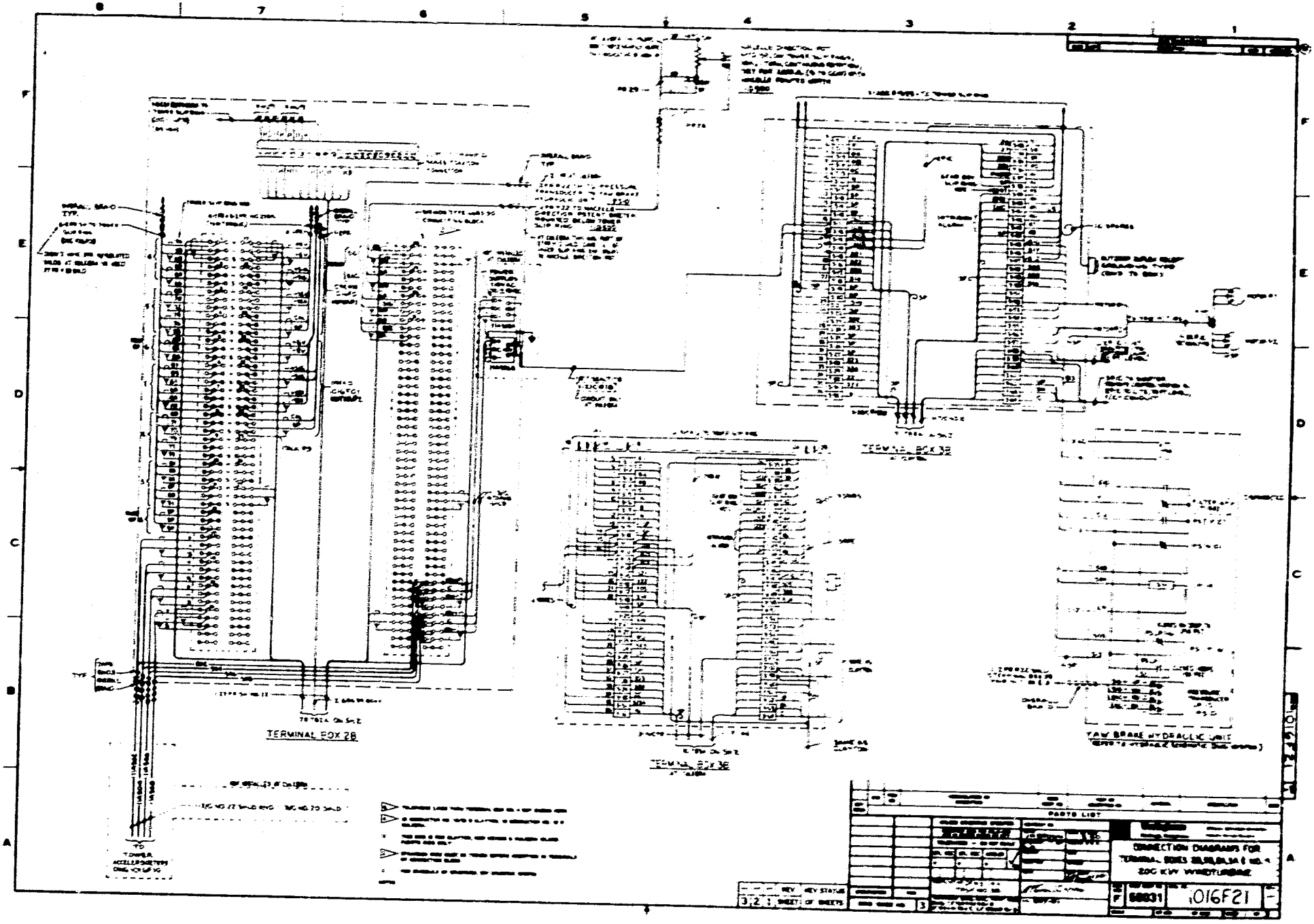


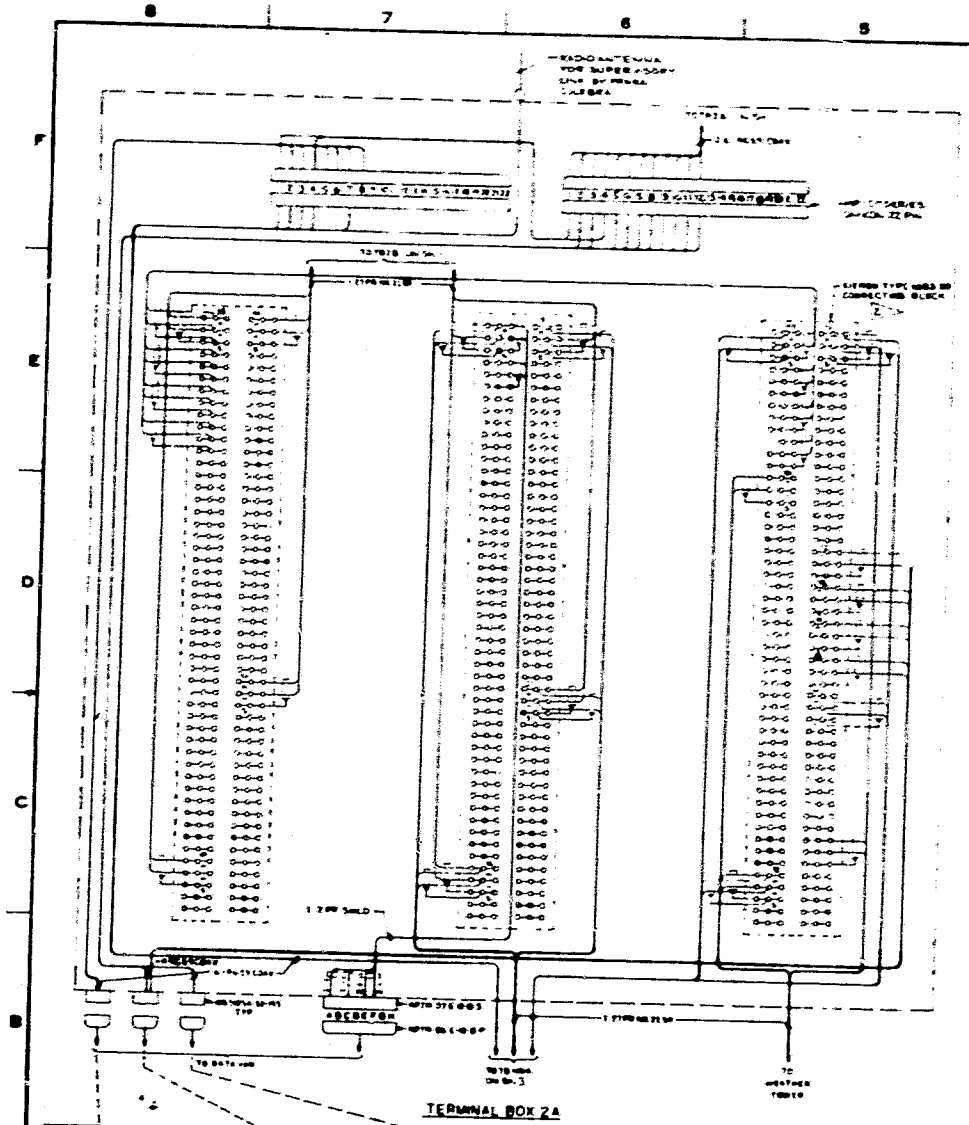




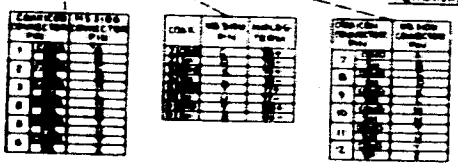

UNIT NO. 2
1016F20


UNIT NO. 3
1016F20

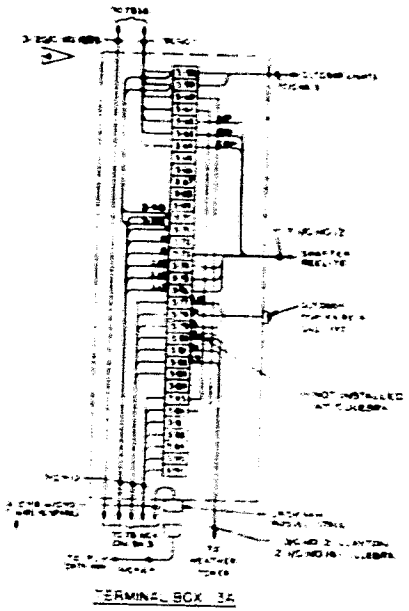

TERMINAL BOX 28
TERMINAL BOX 32
TERMINAL BOX 36
YAW BRAKE HYDRAULIC UNIT
TO TOWER ACCELEROMETER
PARTS LIST
CONNECTION DIAGRAMS FOR
20C KW WINDTURBINE
68031
1016F21



TERMINAL BOX 2A

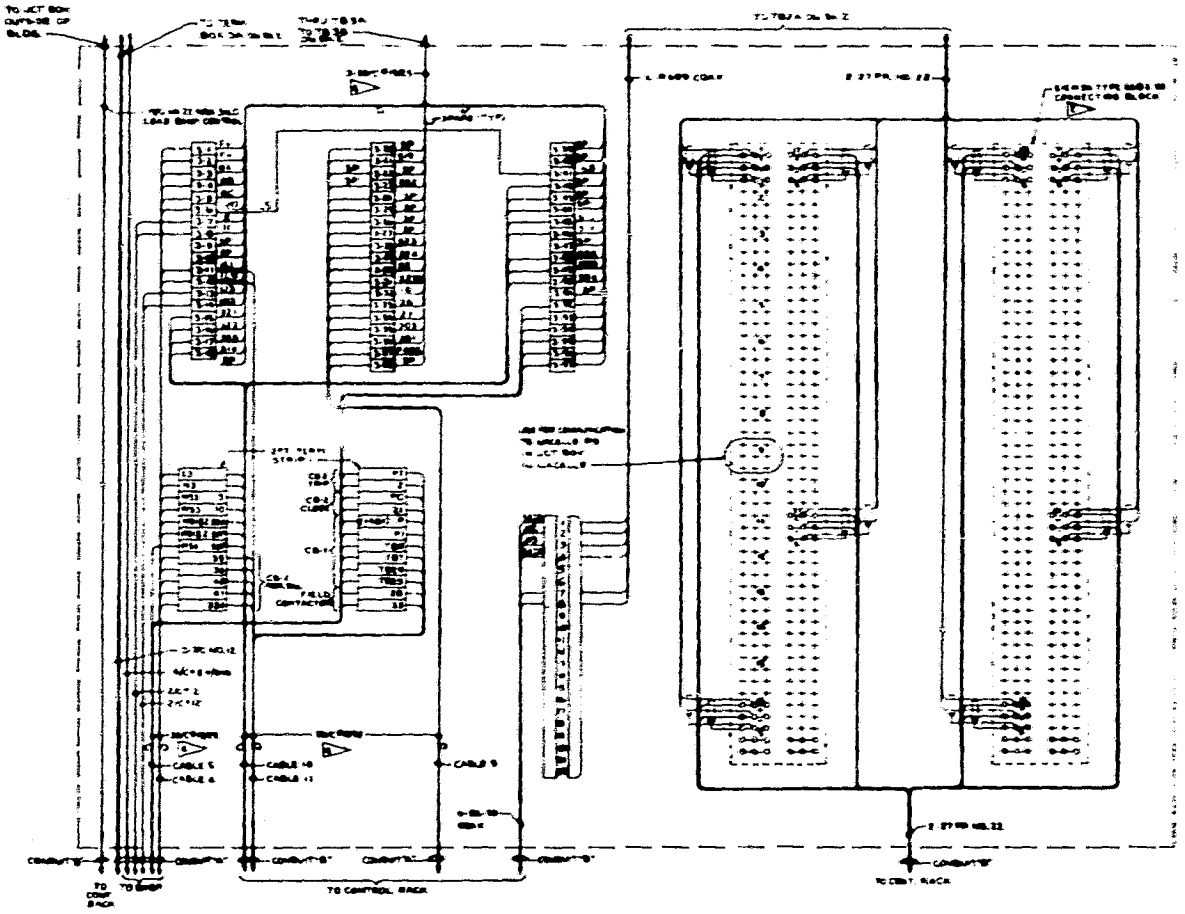


CONNECTOR WIRING SCHEDULE



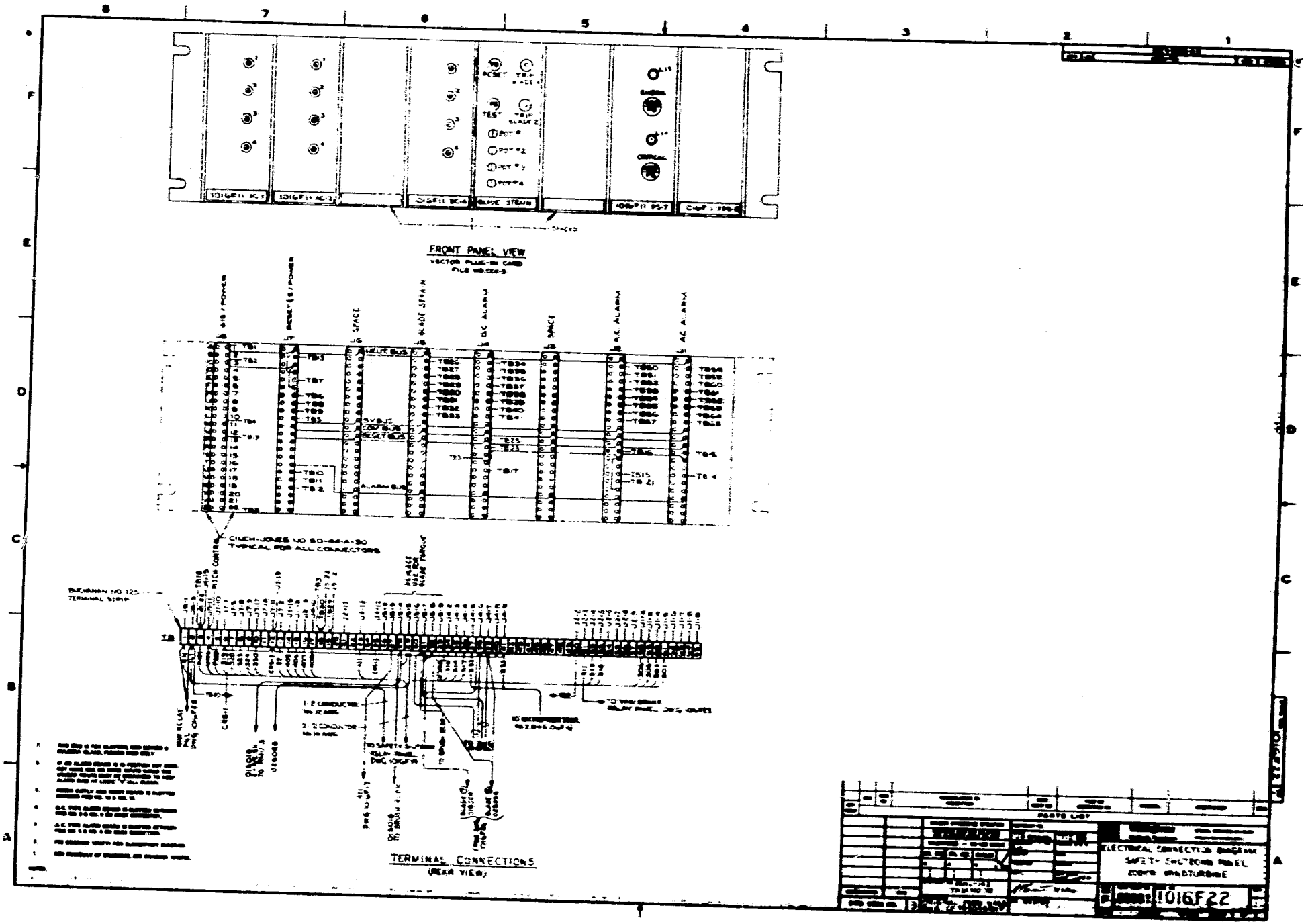
TERMINAL BOX 3A

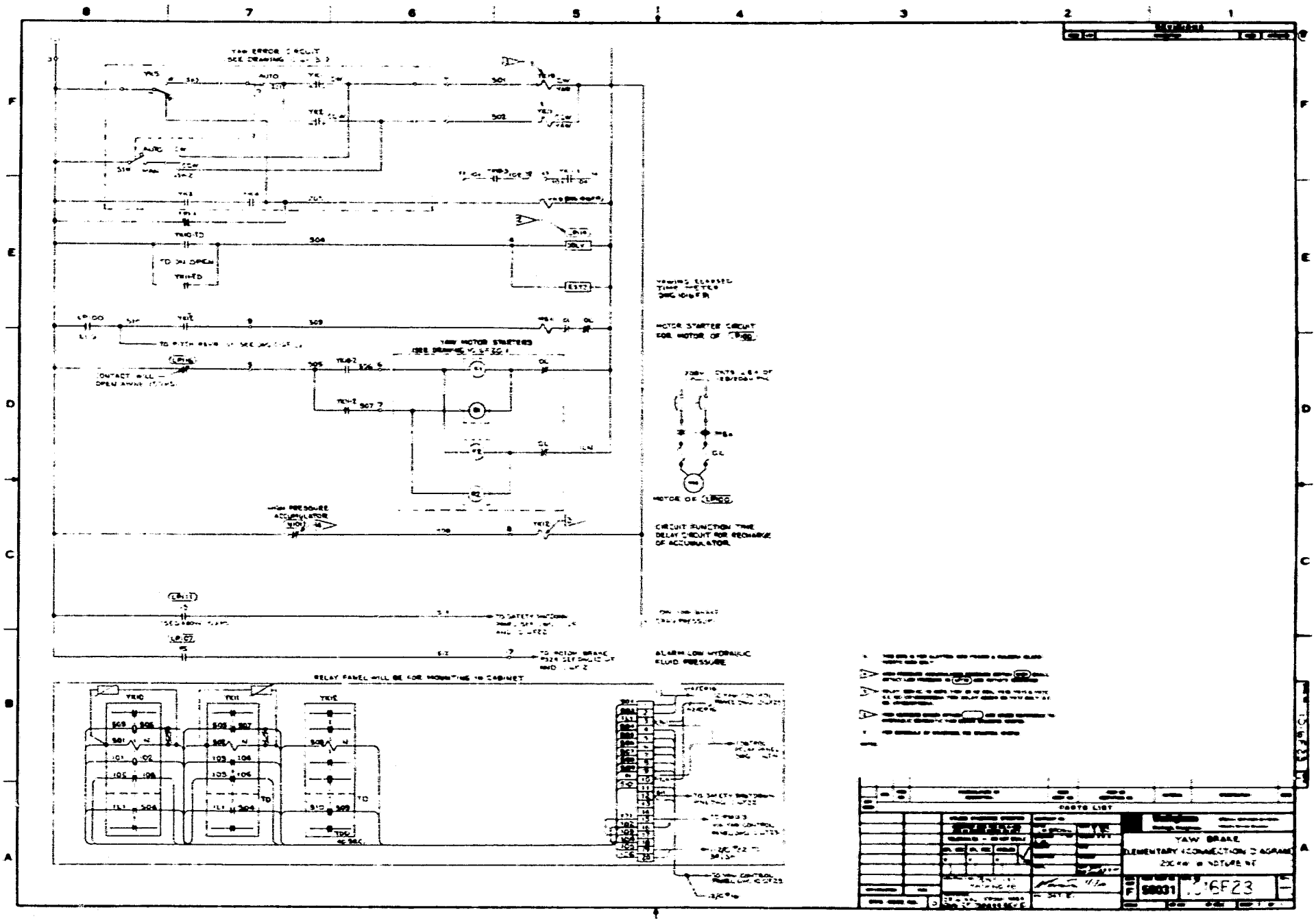
1016F21

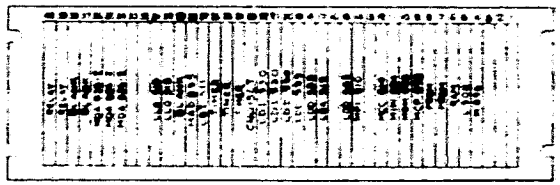


TERMINAL BOX NO. 6

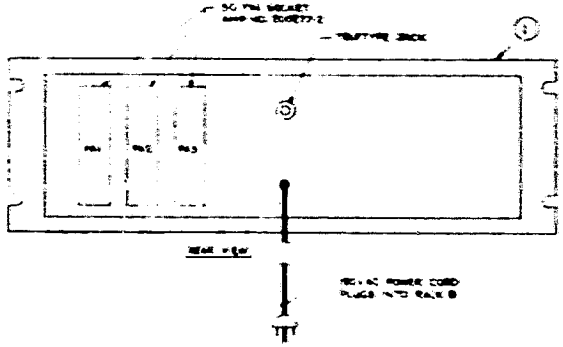
1016F21


FRONT PANEL VIEW
TERMINAL CONNECTIONS
(REAR VIEW)
1016F22


YAW BRAKE
ELEMENTARY CONNECTION DIAGRAM
98031
PARTS LIST

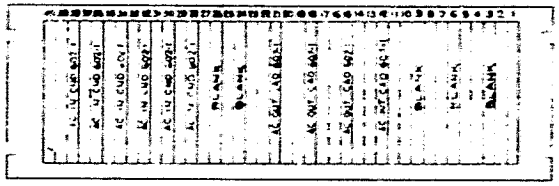


FRONT VIEW

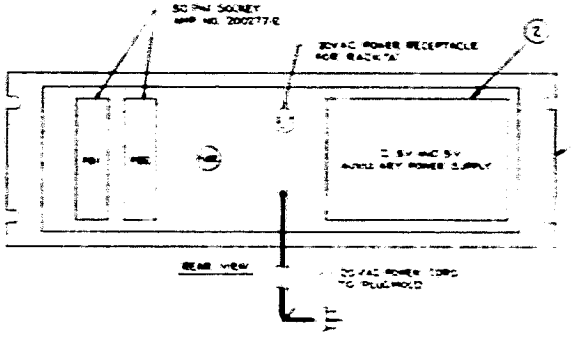


REAR VIEW

RACK A

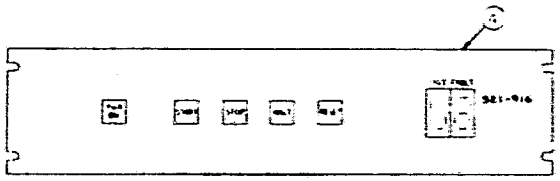


FRONT VIEW



REAR VIEW

RACK B



FRONT VIEW

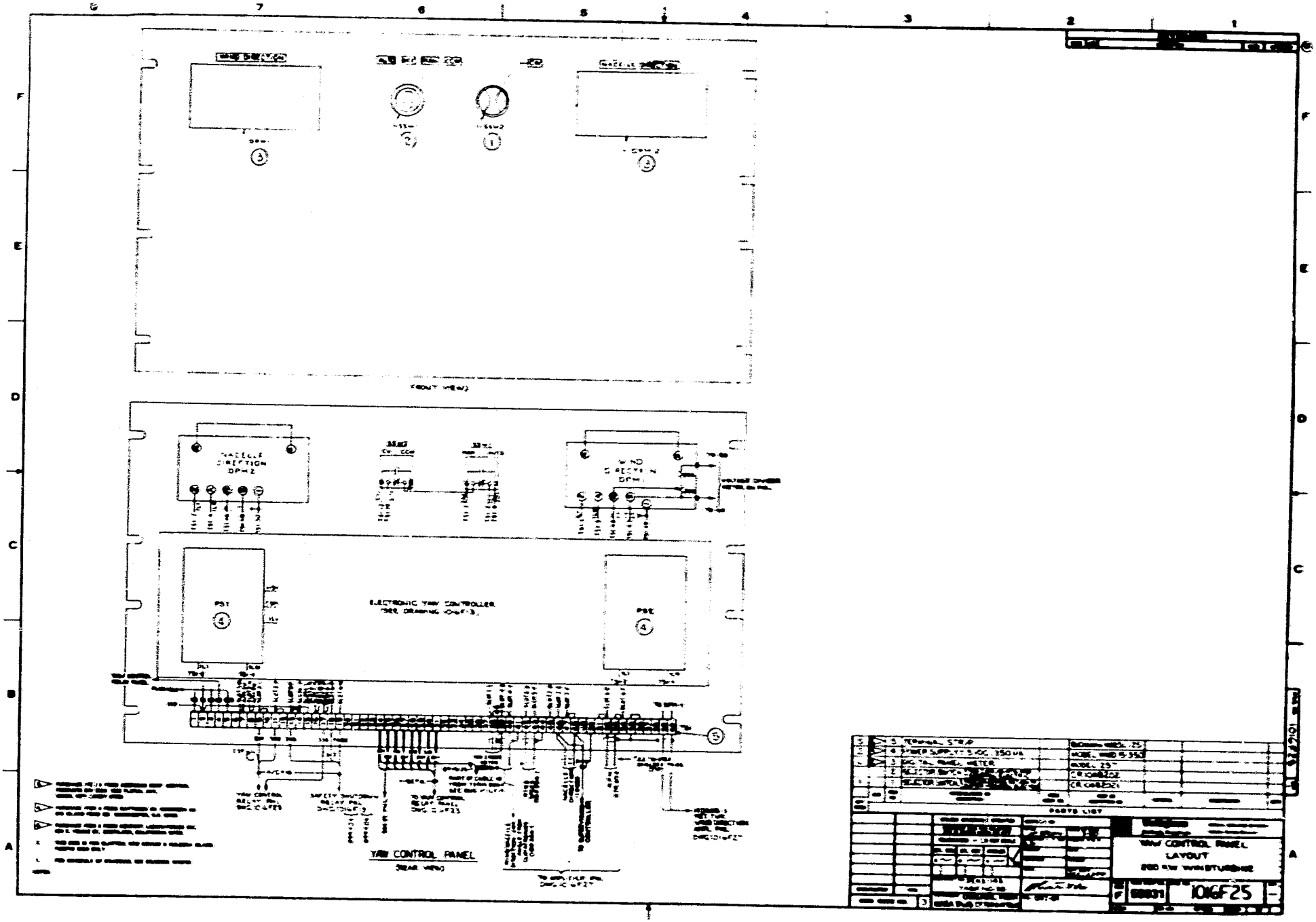
AMPLIFIER PANEL
RACK "A"

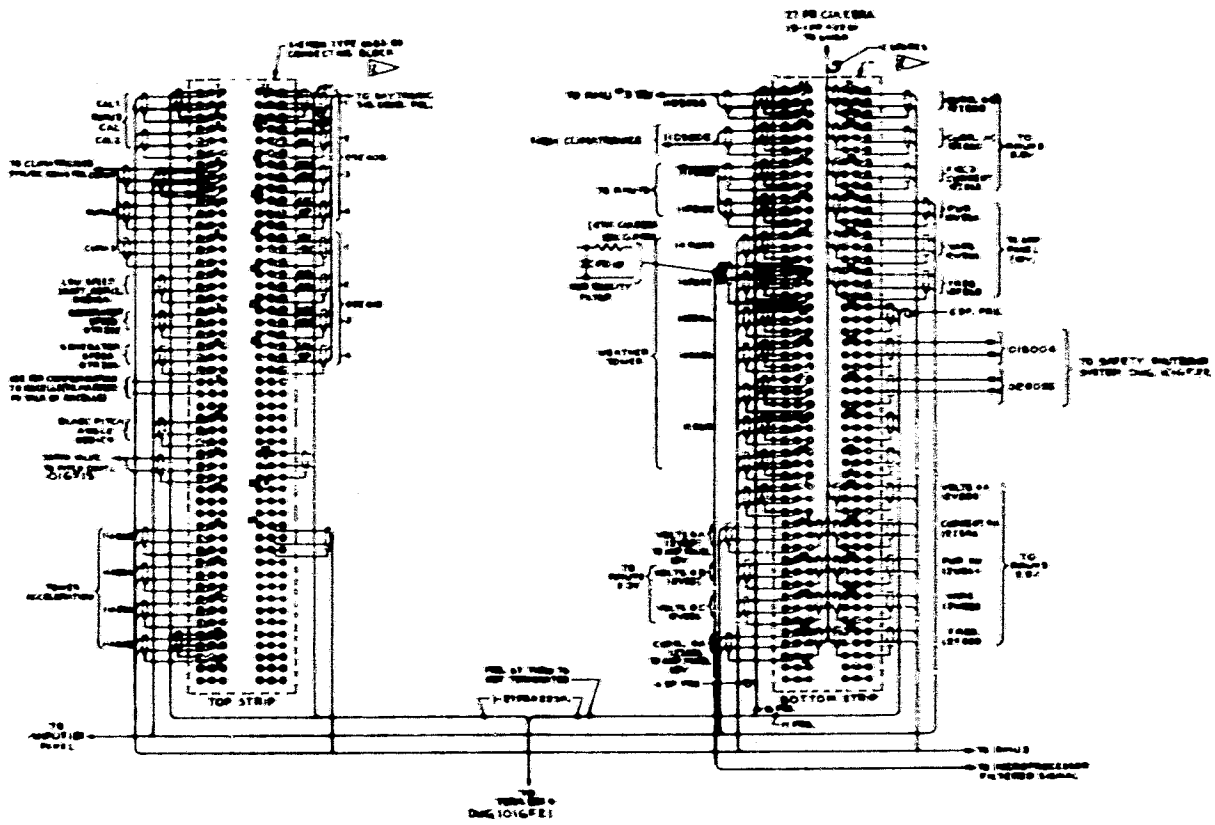
1	PANEL		
1	ENCLOSURE		
1	POWER SUPPLY		
1	ENCLOSURE		

PARTS LIST

MICRO PROCESSOR CIRCUIT CARD
LOCATION, RACK A / RACK B
800 EW WINDTURBINE

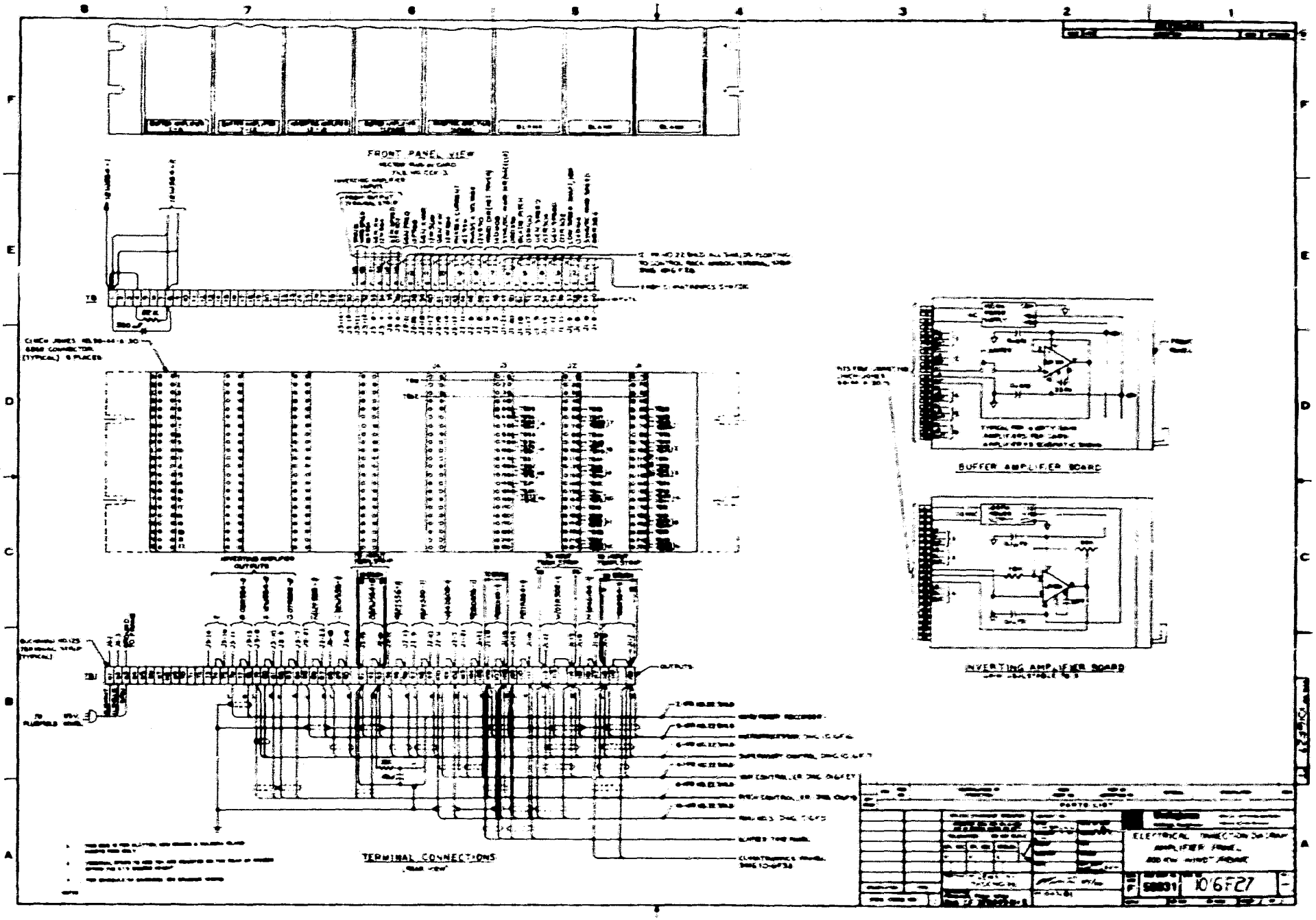
1016 F24

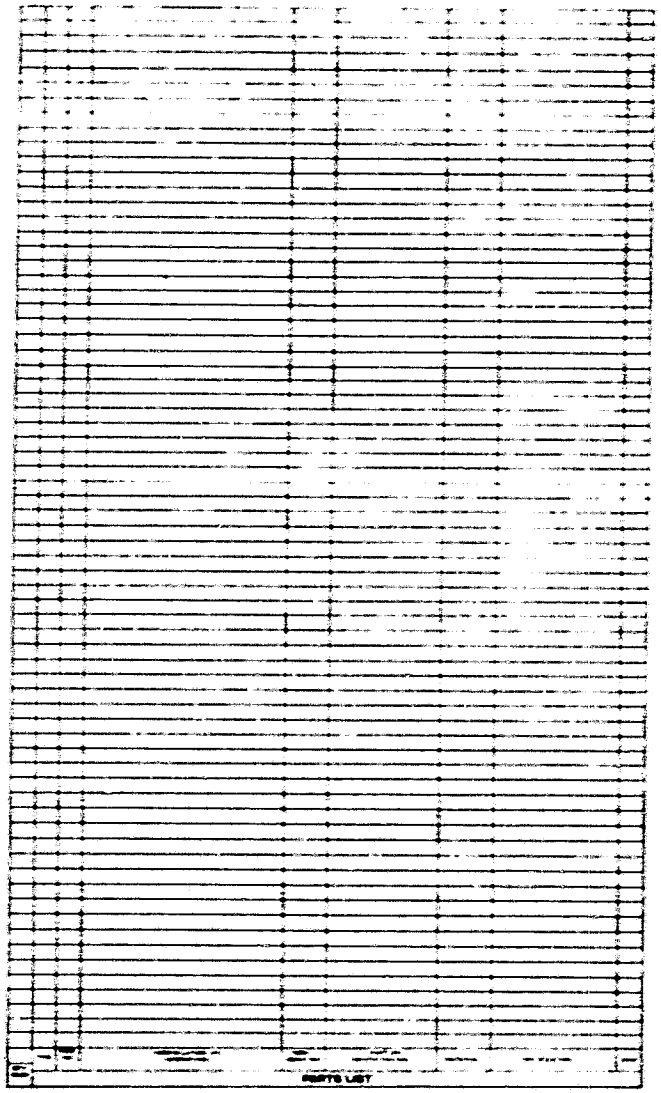

YAW CONTROL PANEL
YAW CONTROL PANEL
LAYOUT
10GF25

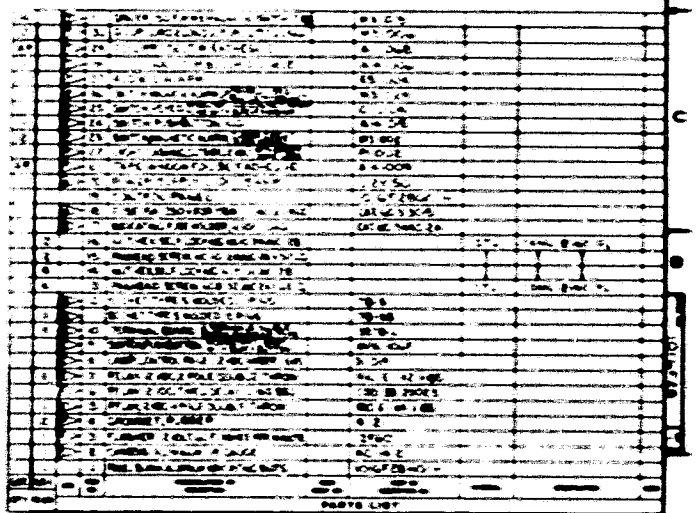


CONTROL RACK ASSEMBLY
TERMINAL STRIP INTERCONNECTION

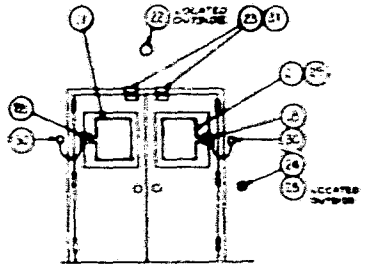
10 OF 26

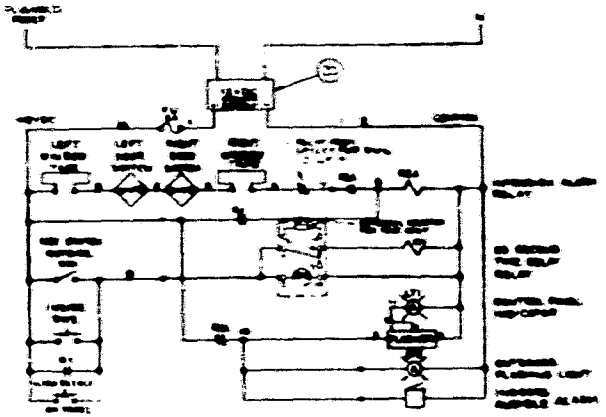

FRONT PANEL VIEW
BUFFER AMPLIFIER BOARD
INVERTING AMPLIFIER BOARD
TERMINAL CONNECTIONS
10 6F27

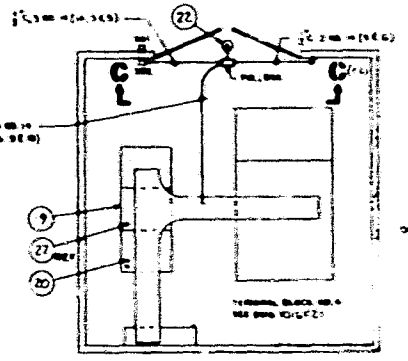




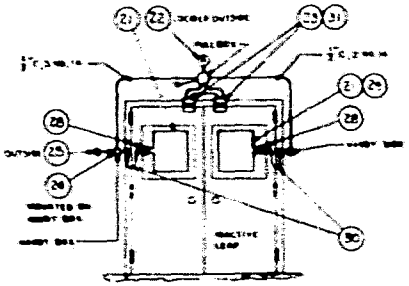
1016F28





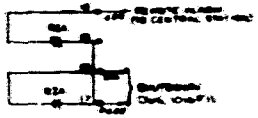


PLAN VIEW

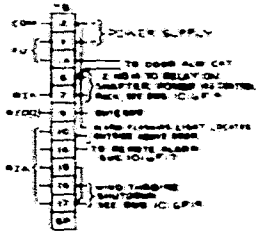


C-C

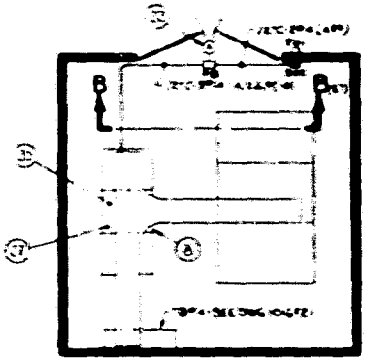
INTRUSION ALARM ELEMENTARY DIAGRAM



GROUP NO.	PART NO.
1	1016FTBGO--
2	1016FZSHCCZ-



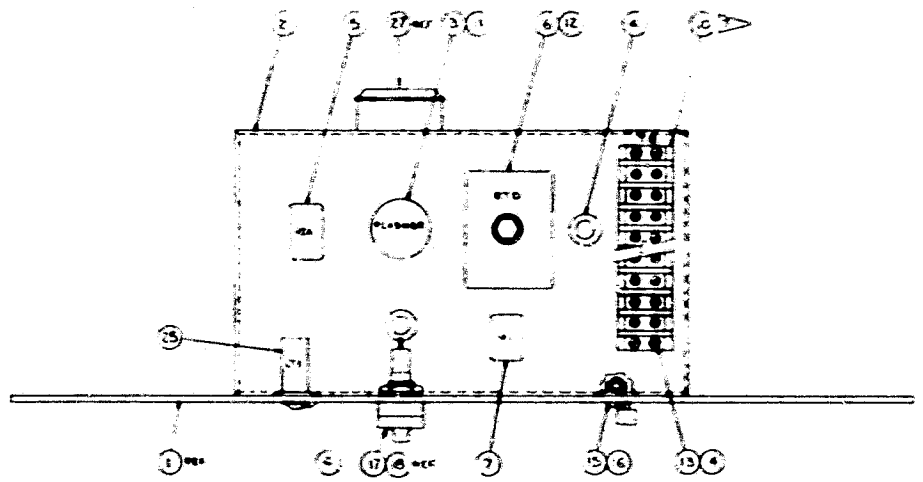
TERMINAL CONNECTIONS

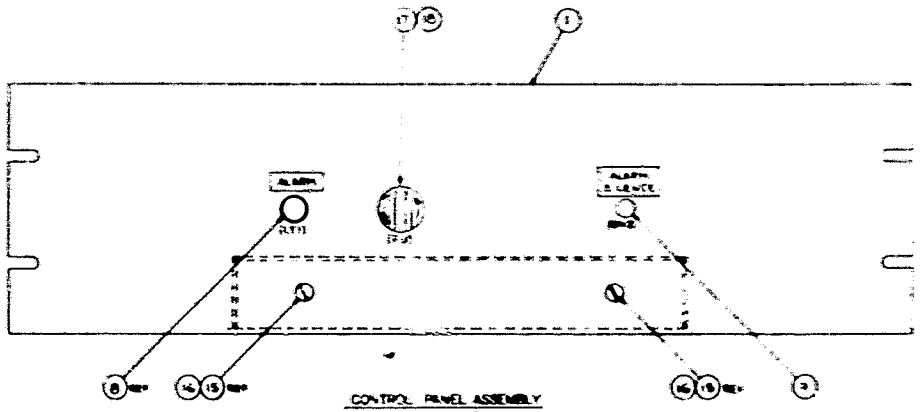


PLAN VIEW

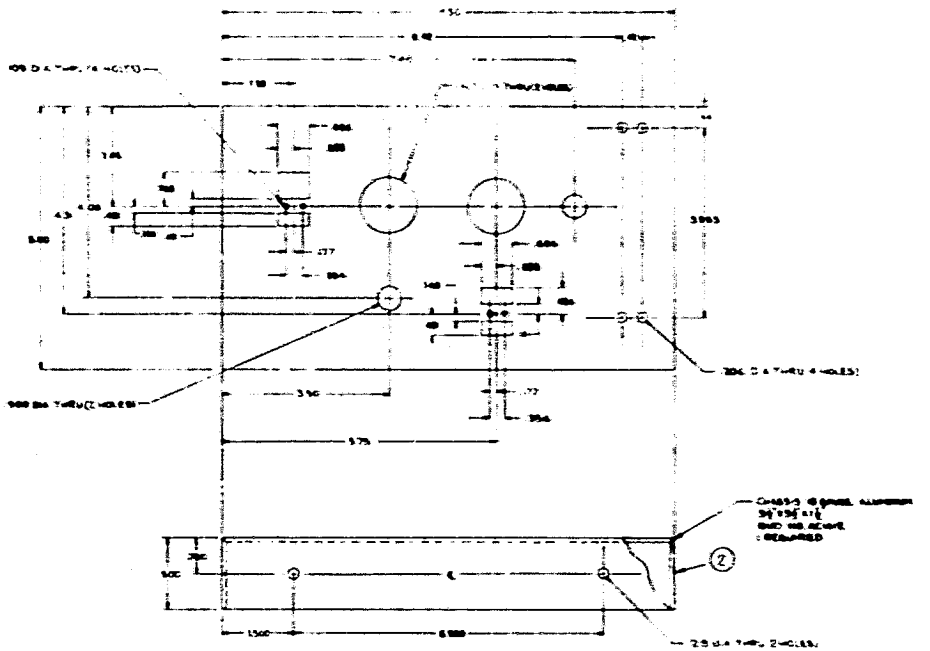
CLAYTON

1016FZ8

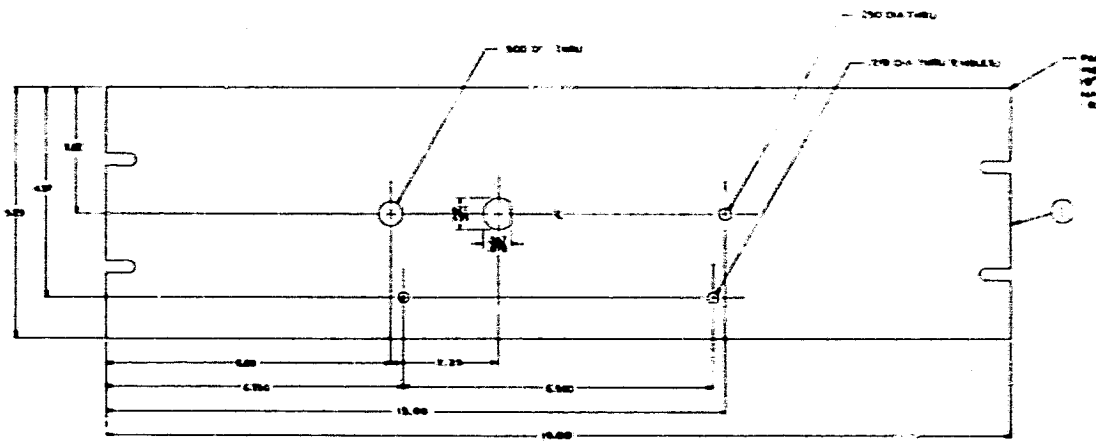




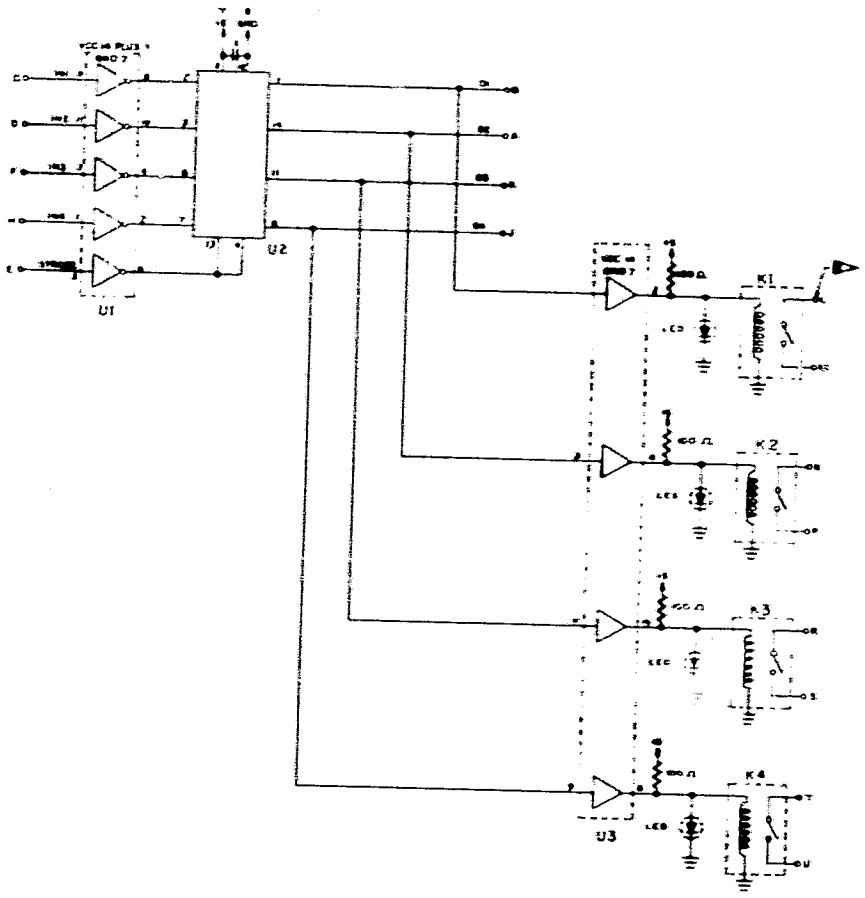
CONTROL PANEL ASSEMBLY



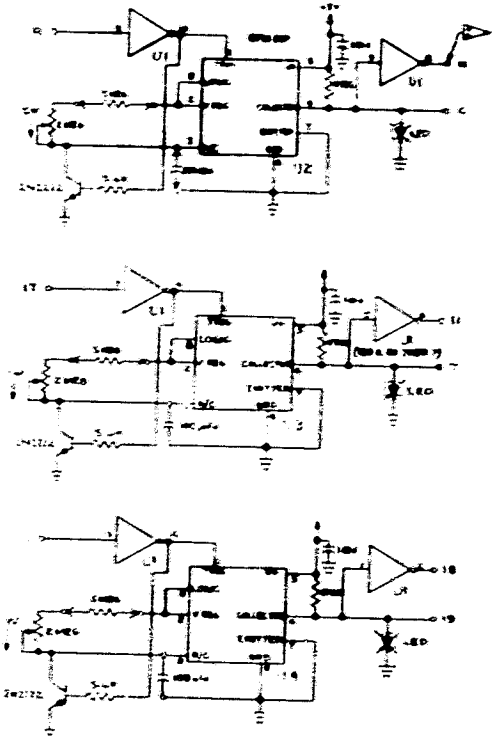
CHASSIS LAYOUT
SCALE –



CONTROL PANEL LAYOUT
SCALE 1/2



RELAY CARD

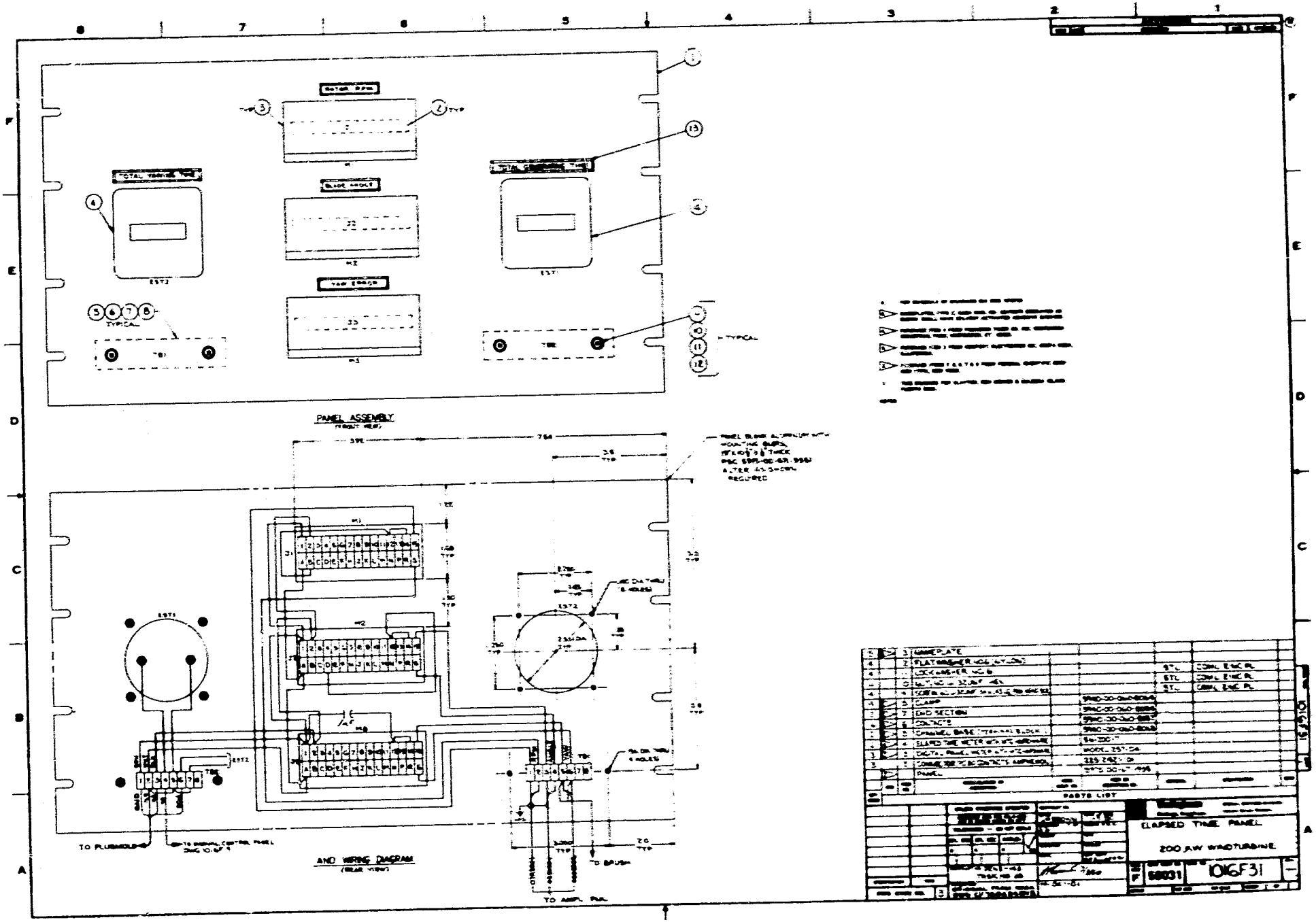


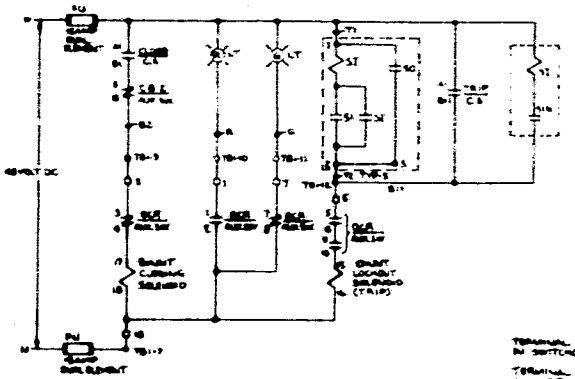
TIMER CARD

PARTS LIST

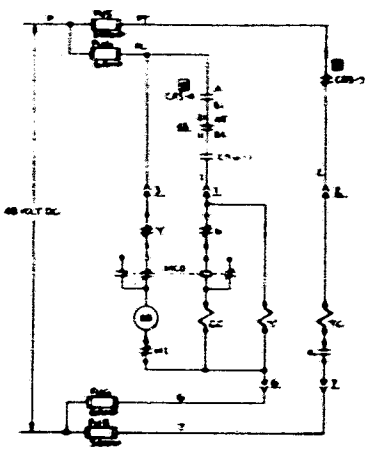
MICROPROCESSOR: TIMER AND RELAY CARD SCHEMATIC
200 KW WINDTURBINE

F 99991 1016 F30

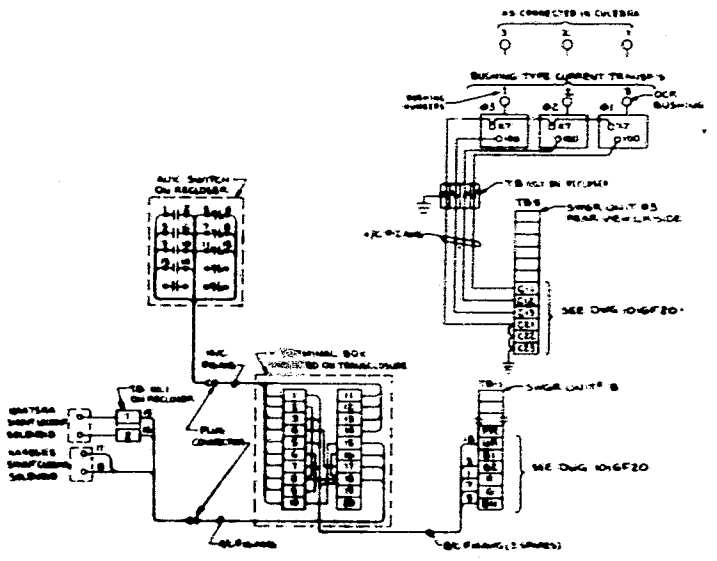

PANEL ASSEMBLY
AND WIRING DIAGRAM
TO PLUMBOLINE
TO BRUSH
TO AMPL. PNL.
ELAPSED TIME PANEL
200 A.W. WINDTURBINE
10161F31



ELEMENTARY DIAGRAM

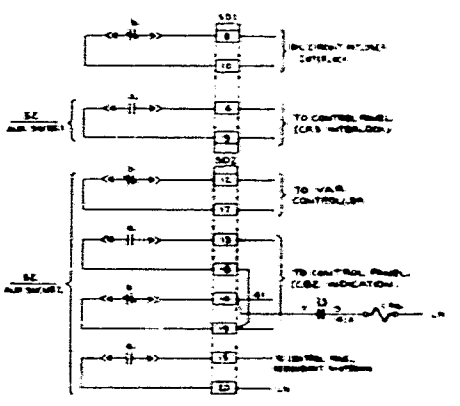


ELEMENTARY DIAGRAM



WIRING DIAGRAM

OIL CIRCUIT RECLOSER CONTROL CIRCUIT



WIRING DIAGRAM

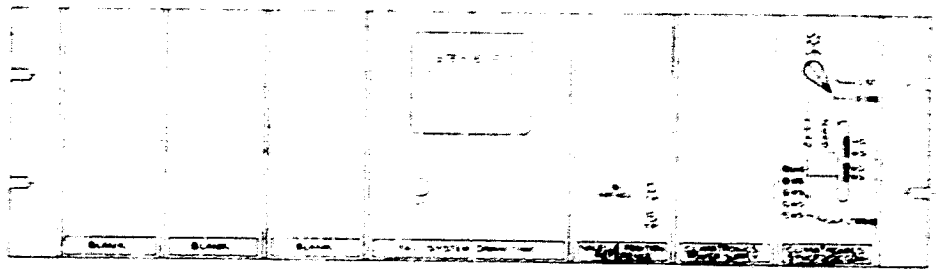
CIRCUIT BREAKER NO 2 CONTROL CIRCUIT

SYMBOL	DESCRIPTION
CC	CIRCUIT BREAKER CLOSING COIL
TC	CIRCUIT BREAKER TRIP COIL
Y	AIR CLOSING RELAY-MOTOR PUMP
MCO	MOTOR CUTOFF SWITCH
SM	SPRING CHARGING MOTOR
CS	CONTROL SWITCH
MI	MECHANICAL INTERLOCK
25	AUTO-SYNCHRONIZER
43	SYNCHRONIZING SWITCH
AR	AUXILIARY RELAY
○	TERMINAL LOCATED IN SWITCHGEAR
□	TERMINAL LOCATED IN OCR
■	IN CONTROL PANEL

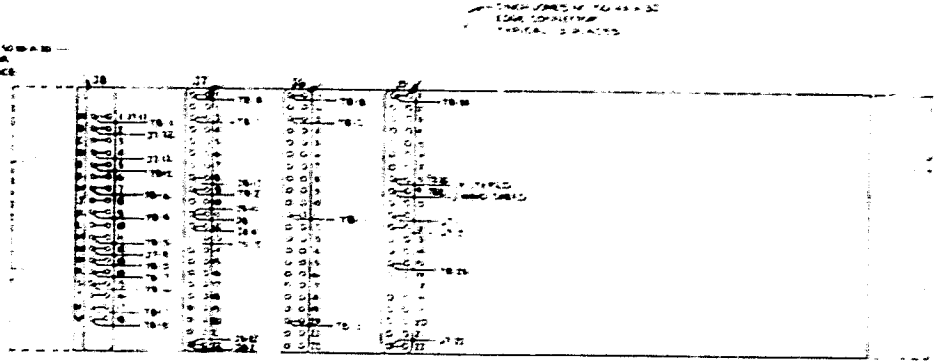
PARTS LIST

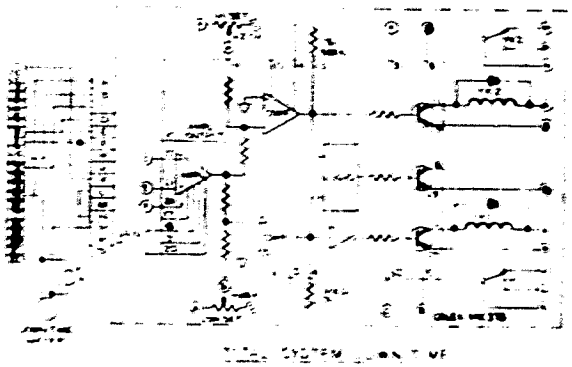
RECLOSER AND CIRCUIT BREAKER NO 2
ELEMENTARY AND WIRING DIAGRAMS
20C-VW-W180F4BNE

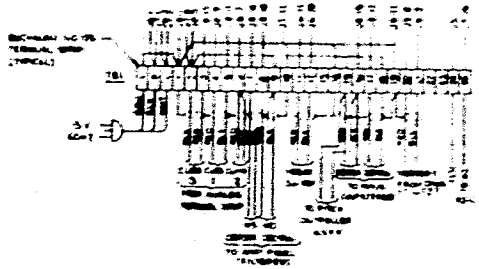
F 69691 1016F32



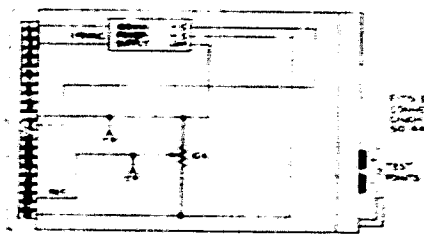
FRONT PANEL VIEW



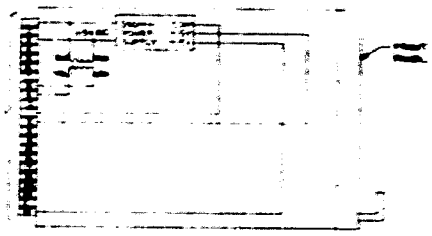




TERMINAL CONNECTION DIAGRAM
(REAR VIEW)



NACELLE POSITION REFERENCE

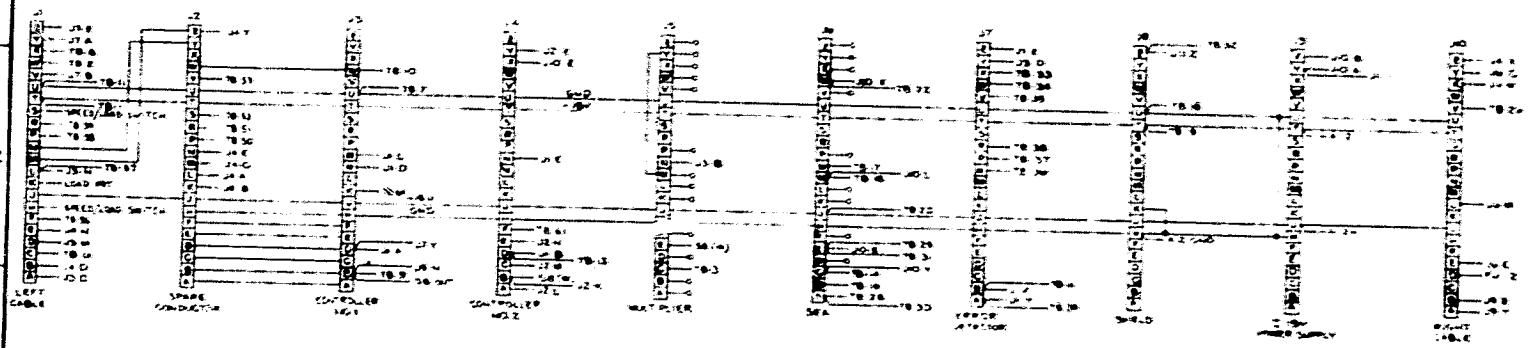


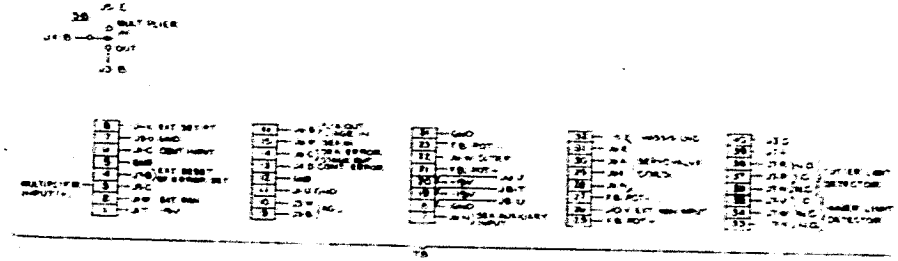
SCIMATRONICS REFERENCE
AND POWER SUPPLY BOARD

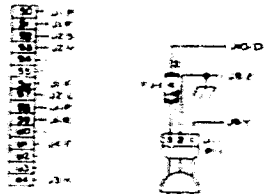
PARTS LIST

ELECTRICAL CONNECTION DIAGRAM
SCIMATRONICS AND REFERENCE PANEL
ECO RAY WING TURBINE

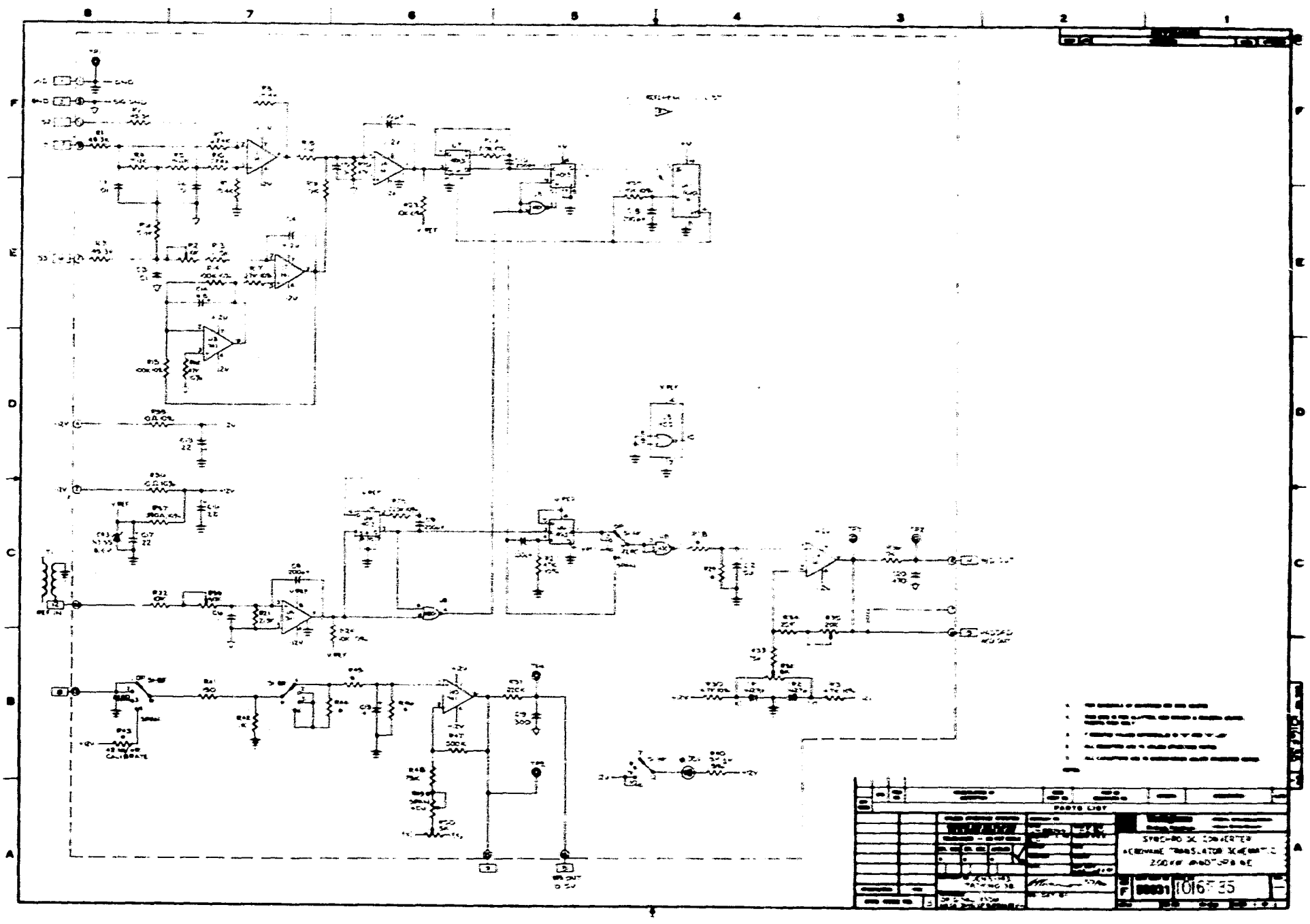
58831 1016F33

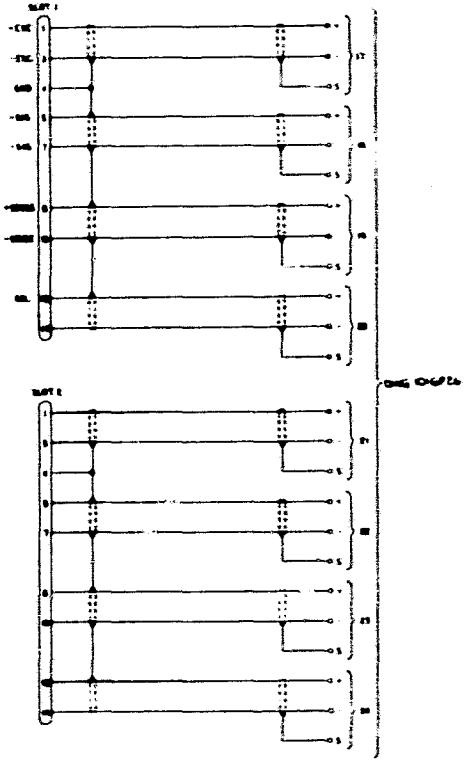


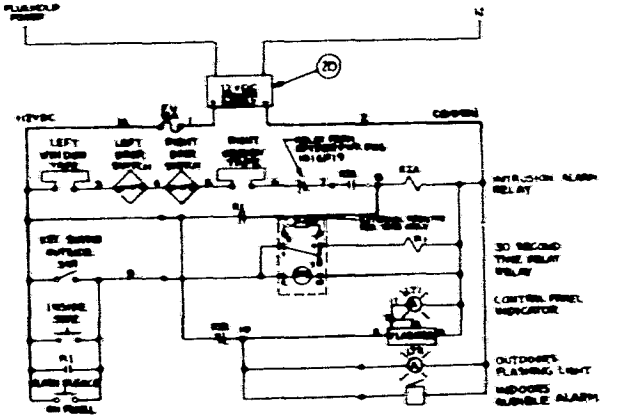


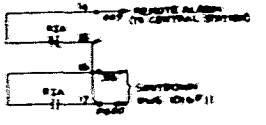


BACK PLANE WIRING
LEFT CABLE
SPARE CONDUCTOR
CONTROLLER NO 1
CONTROLLER NO 2
MULTIPLIER
SEA
ERROR DETECTOR
SHIELD
POWER SUPPLY
RIGHT CABLE
SPEED/LOAD SWITCH
LOAD SET
MULTIPLIER INPUT
MANUFACTURER INSTALLED TERMINAL STRIPS
FIELD INSTALLED TERMINAL STRIPS
POWER CORD
PARTS LIST
1016F34

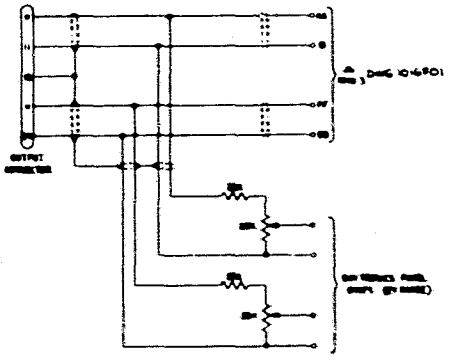


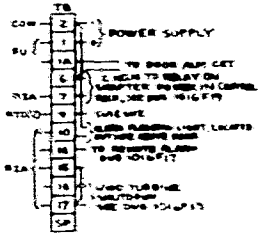






INTRUSION ALARM ELEMENTARY DIAGRAM





TERMINAL CONNECTIONS