

ELECTRICAL CONTROL EQUIPMENT
BY
GENERAL ELECTRIC
ENGINEERING SERVICES
FOR
CANADIAN COAST GUARD
CANADA
PROPULSION CONTROL SYSTEM UPGRADE OF THE CCGS GRIFFON

G.E. REQUISITION — 84702084
SHOP ORDER — ZTG038
INSTRUCTION BOOK
DIAGRAM INDEX

DIAGRAM	SHEET	TYPE	DESCRIPTION
359B7019CA	0A	ELEMENTARY	TITLE & INDEX
359B7019CA	0B	ELEMENTARY	DRAWING SYMBOLS, NOTES & GROUNDING
359B7019CA	0C, 0C1	ELEMENTARY	SYSTEM ONE-LINE / BLOCK DIAGRAM
359B7019CA	0D	ELEMENTARY	SYSTEM LAN TOPOLOGY
359B7019CA	0E	ELEMENTARY	SYSTEM CCOM LAYOUT
359B7019CA	0F	ELEMENTARY	AMPHENOL CONNECTOR PIN ASSIGNMENTS
359B7019CA	1AB	ELEMENTARY	PORT SIDE UC CONTROLLER
359B7019CA	1BA	ELEMENTARY	PORT SIGNAL RELAYS
359B7019CA	2AA-2HA	ELEMENTARY	PORT OUTBOARD GEN EXC
359B7019CA	3AA-3HA	ELEMENTARY	PORT INBOARD GEN EXC
359B7019CA	4AA-4HB	ELEMENTARY	PORT MOTOR FIELD EXCITER
359B7019CA	5AA-5HA	ELEMENTARY	STARBOARD OUTBOARD GEN EXC
359B7019CA	6AA-6HA	ELEMENTARY	STARBOARD INBOARD GEN EXC
359B7019CA	7AA-7HB	ELEMENTARY	STARBOARD MOTOR FIELD EXCITER
359B7019CA	8AA-8HA	ELEMENTARY	SPARE GEN EXC
359B7019CA	9AA-9HA	ELEMENTARY	SPARE MOTOR FIELD EXC
359B7019CA	10AB	ELEMENTARY	STARBOARD UC CONTROLLER
359B7019CA	10BA	ELEMENTARY	STBD SIGNAL RELAYS
359B7019CA	20AA	ELEMENTARY	24VDC SYSTEM

AS COMMISSIONED
NOV 14 2003
PORT WELLER
ONTARIO

SYMBOLS

LOCATIONS

SUPPLIED BY OTHERS--DISCLAIMER THE INFORMATION APPEARING ON THIS DOCUMENT INDICATED BY WAS OBTAINED BY GE FROM A THIRD PARTY AND IS PROVIDED SOLELY AS A CONVENIENCE. GE HAS NOT INDEPENDENTLY VERIFIED SUCH INFORMATION AND, THEREFORE, DOES NOT WARRANT ITS ACCURACY OR SAFE OPERATION

- OR REMOTELY MOUNTED
 MOUNTED AT MOTOR
 MOUNTED IN CORE ONE, TWO, ETC.
 MOUNTED IN CASE ONE, TWO, ETC.
 MOUNTED ON DOOR, DOOR OF CASE 1, DOOR OF CASE 2, ETC.
 MOUNTED ON RTB CARD
 PANEL MOUNTED, SUPPLIED BY OTHERS
 EQUIPMENT EXISTS IN PLACE
 REMOTE DEVICE SUPPLIED BY GE
 CATALOG OPTION
 CONTINUED ON

CROSS MAPPING

[100AB03]
 "CROSS MAPPING" NUMBER, SPECIFIES LOCATION OF CONTINUATION OF ELECTRICAL CIRCUIT OR ORIGIN OF ELECTRICAL CIRCUIT. EXAMPLE INDICATES DRIVE NO. 100, SHEET AB, LINE 3.
 NOTE: DRIVE NO. AND/OR SHEET NO. IS OMITTED IF MAPPED TO LOCATION IN THE SAME DRIVE NO. OR SAME SHEET NO.

WIRE NUMBERING

WIRE NO. ARE A CONCATENATED STRING CONSTRUCTED AS FOLLOWS: DRIVE NO. + SHEET NO. + LINE NO. + COLUMN NO. FOR CLARITY, THE DRIVE NO. AND/OR SHEET NO. MAY BE OMITTED ON THE ELEMENTARY IF THE WIRE ORIGINATES IN THE SAME DRIVE NO. SET OR THE SAME SHEET NO.

DEVICES

- THERMAL SWITCH
 LIMIT SWITCH (N.C.)
 TERMINAL JUMPER
 FAN
 SELECTOR SWITCH
 ADJUSTMENT POT.
 AC COIL SUPPRESSION (RC ONLY)
 DC COIL SUPPRESSION (RC & MOV)
 CENTRIFUGAL SPEED SWITCH
 PUSHBUTTON (N.C.)
 PUSHBUTTON (N.O.)
 REDUNDANT RELAY CONTACT, SHOWN FOR DRAWING CLARITY

- PLUG WITH SCREW TERMINATION
 PLUG TERMINATION
 COLLECTOR

- TWISTED PAIR WIRE
 TWISTED SHIELDED PAIR WIRE
 SHIELDED PAIR WIRE
 HARNESS WIRING
 COAXIAL CABLE
 FIBER OPTIC CABLE

- INTERNAL COMMON / NOT, I.E., /C = NOT C
 TERMINAL BOARD JUMPER PLUG
 IS INTERPRETED AS 2TB(6)
 FESTOON CABLE
 LOW LEVEL WIRING
 HIGH LEVEL WIRING
 POWER WIRING
 POWER WIRING: >800V AND/OR >800A
 LOW LEVEL SIGNAL WIRING PRACTICES REQUIRED
 PL PIN NUMBER
 TEST POINT
 DELTA
 WYE

NOTES:

- A. UNLESS OTHERWISE SHOWN ON THE ELEMENTARY DIAGRAM:
 1. ALL CONNECTIONS TO THE CONTROLLER'S COMMON MUST BE MADE TO PCOMX.
 2. NO CONNECTION SHOULD BE MADE TO 3TB60 (+5 VOLTS).
 3. ALL DIGITAL TACH AND ENCODER SIGNALS SHOULD BE DIFFERENTIAL.
 4. DRIVE COMMON (PCOMX) SHOULD BE GROUNDED AT ONLY ONE POINT. IF THE REFERENCE IS SUPPLIED BY NUMERICAL CONTROL OR PROCESS INSTRUMENT WITH A GROUNDED COMMON THE DRIVE COMMON SHOULD NOT BE GROUNDED SEPARATELY.
 B. CONTROL SYSTEM RELAYS, SOLENOIDS OR BRAKE COILS CAN PRODUCE ERRATIC DRIVE BEHAVIOR DUE TO ELECTRICAL NOISE TRANSIENTS. TO REDUCE THIS POSSIBILITY, AN RC SUPPRESSOR SHOULD BE ADDED IN PARALLEL WITH THE COILS OF THESE DEVICES. A 220 OHM, 2 WATT RESISTOR IN SERIES WITH 0.5 MFD, 600 VOLT CAPACITOR CAN BE USED. AVOID ELECTROMAGNETIC INTERFERENCE OR "NOISE" INTRODUCED BY:
 1. RADIO FREQUENCY SIGNALS, TYPICALLY FROM PORTABLE TRANSMITTERS USED IN THE VICINITY OF THE EQUIPMENT OR ITS WIRING.
 2. STRAY HIGH VOLTAGE OR HIGH FREQUENCY SIGNALS AS MIGHT BE PROVIDED BY ARC WELDERS.
 C. WIRING SHOULD BE RUN IN SEPARATE CONDUITS OR WIREWAYS FOR SIGNAL, CONTROL AND POWER WIRING LEVELS.
 SIGNAL - LOW LEVEL ANALOG AND DIGITAL SIGNALS
 - SPEED, POSITION AND OTHER FEEDBACK/REFERENCE SIGNALS
 - POWER SUPPLIES AND LOGIC SYMBOLS (SEE SYSTEM ELEMENTARY AND NOTES TO IDENTIFY SIGNALS)
 CONTROL - AC OR DC CONTROL CIRCUITS, 115VAC CIRCUITS
 POWER - FIELD LEADS, ARMATURE LEADS
 - BRAKES, LINE VOLTAGE AC CIRCUITS
 D. SIGNAL WIRING AND POWER WIRING MUST CROSS AT RIGHT ANGLES WITH A MINIMUM ONE INCH SEPARATION. AVOID PARALLEL RUNS BETWEEN SIGNAL LEVEL WIRES AND POWER OR CONTROL WIRES. IF SIGNAL WIRES MUST BE RUN IN PARALLEL TO CONTROL OR POWER WIRES, A MINIMUM OF A FOUR-INCH SEPARATION MUST BE MAINTAINED BETWEEN THE WIRES.
 E. INDICATES [SHIELDED/TWISTED] OR [TWISTED PAIR] WIRING.
 -FOR SHORT WIRE RUNS INTERNAL TO THE CONTROLLER, TWISTED PAIR IS ADEQUATE.
 -FOR WIRE RUNS EXTERNAL TO THE CONTROLLER (AND INTERNAL TO THE CONTROLLER WHEN LONGER THAN 20 FEET) SHIELDED, TWISTED WIRE IS REQUIRED.
 -ALL SHIELD DRAINS SHOULD BE TERMINATED ON ONE END ONLY, THAT END BEING AT THE CONTROLLER. THIS POINT MAY BE DEPICTED ON THE ELEMENTARIES AS THE REMOTE END OF THE SHIELD DRAIN WIRE SHOULD BE CUT OFF AND THE WIRE TAPED TO PREVENT ACCIDENTAL GROUNDING.
 -NO SHIELD DRAIN WIRES SHOULD EVER BE ROUTED THROUGH ANY CONTROLLER MOUNTED FERRITE CORES.
 F. THIS EQUIPMENT MAY CONTAIN THERMOSWITCHES OR OTHER DEVICES WHICH INDICATE CONDITIONS HAZARDOUS TO CONTINUED EQUIPMENT OPERATION. IT IS RECOMMENDED THAT THE CUSTOMER CONNECT THESE DEVICES IN STOP OR ALARM CIRCUITS IN A MANNER THAT PREVENTS ACCIDENTAL RESTART OF THE EQUIPMENT UPON RESETTING OF THE DEVICE.
 G. CLOSED PUSHBUTTONS AND/OR CLOSED INTERLOCKS INDICATE MAINTAINED CIRCUIT CLOSURE REQUIRED.
 H. OPEN PUSHBUTTONS INDICATE MOMENTARY CIRCUIT CLOSURE REQUIRED.
 I. SOME SINGLE TERMINAL BOARD CONNECTION POINTS MAY BE SHOWN MORE THAN ONCE FOR DRAWING CLARITY.
 J. RELAY CONTACT RATINGS ARE 1 AMP (NON-INDUCTIVE) AT 115 VAC OR 28 VDC, AND .5 AMPS (NON INDUCTIVE) AT 125 VDC UNLESS NOTED OTHERWISE.
 K. ADDITIONAL CONSIDERATIONS:
 ATTENTION SHOULD BE GIVEN TO THE NATIONAL ELECTRICAL CODE AND ANY APPLICABLE LOCAL CODES WHEN INSTALLING ANY DRIVES. WIRE SIZE AND INSULATION TYPE, CONDUIT SIZING, ENCLOSURES, ETC., SHOULD BE DETERMINED PER THESE CODES.
 ENVIRONMENTS WHICH INCLUDE EXCESSIVE AMOUNTS OF ONE OR MORE OF THE FOLLOWING CHARACTERISTICS SHOULD BE CONSIDERED HOSTILE TO DRIVE PERFORMANCE AND LIFE:
 1. DUST, DIRT OR FOREIGN MATTER.
 2. VIBRATION OR SHOCK.
 3. MOISTURE OR VAPORS.
 4. RAPID TEMPERATURE EXCURSIONS OR HIGH AMBIENT TEMPERATURES.
 5. CAUSTIC FUMES.
 6. POWER LINE FLUCTUATIONS.

STANDARD PANEL GROUNDING PROCEDURES TO BE FOLLOWED AT INSTALLATION

SCOPE

THIS DRAWING WILL DOCUMENT PROCEDURES WHICH ARE TO BE FOLLOWED BY CUSTOMER'S CONTRACTOR WHEN HE INSTALLS DRIVES PANELS SUPPLIED BY THE DRIVES DEPARTMENT OF GENERAL ELECTRIC COMPANY. IN ORDER TO UNDERSTAND THE REASONS FOR MANY OF THE PRACTICES THAT ARE RECOMMENDED, IT IS HELPFUL TO SEGREGATE THESE PRACTICES INTO TWO CATEGORIES AS FOLLOWS:
 1) THOSE GENERALLY REFERRED TO AS PROTECTIVE GROUNDING PRACTICES WHOSE PURPOSES ARE:
 X) TO PROTECT AGAINST THE RISK OF ELECTRICAL SHOCK OR BURN.
 Y) TO PROTECT THE EQUIPMENT FROM FIRE OR OTHER DAMAGE DUE TO GROUND FAULTS OR LIGHTNING STRIKES.
 THESE PRACTICES WOULD TYPICALLY BE FOLLOWED BY THE CONTRACTOR IN COMPLIANCE WITH NEC OR OTHER CODE REQUIREMENTS.
 2) THOSE PRACTICES WHICH MAKE THE EQUIPMENT IMMUNE TO ELECTRICAL NOISE ORIGINATING WITHIN OR WITHOUT THE EQUIPMENT. THESE COMPLEMENT THE PROTECTIVE GROUNDING AND LEVEL WIRING PRACTICES IN PROVIDING NOISE IMMUNITY.

PROTECTIVE GROUNDING

- ALL METAL BUILDING STRUCTURES SUCH AS COLUMNS, FLOOR BEAMS, ETC. SHOULD BE GROUNDED BY AN INTERCONNECTING HEAVY GROUND CABLE IN ACCORDANCE WITH RECOMMENDED BUILDING PRACTICES AND LOCAL CODES.
- ALL ELECTRICAL JOINTS AND CONNECTIONS TO THE BUILDING STRUCTURES SHOULD BE BRAZED OR CAD WELDED TO ASSURE THAT THE REQUIRED GOOD ELECTRICAL AND MECHANICAL PROPERTIES DO NOT DETERIORATE WITH THE PASSAGE OF TIME.
- ALL PANELS SHOULD BE GROUNDED AT AT LEAST ONE POINT USING A HEAVY SAFETY CABLE WHEN THE PANEL IS >15 FT. LONG IT SHOULD BE GROUNDED AT BOTH ENDS. THE GROUND CABLE NEEDS TO BE AT LEAST 1/0 FOR MECHANICAL REASONS AND NEED NOT BE GREATER THAN 500 MCM. THIS CABLE IS USUALLY NON-INSULATED.
- THE SAFETY GROUND CABLE SHOULD BE BRAZED OR CAD WELDED A BUILDING GROUND CABLE AT ITS CONNECTION TO A BUILDING STEEL STRUCTURE THAT IS CLOSEST TO THE PANEL.
- THE EQUIPMENT END OF THE SAFETY GROUND SHOULD BE BOLTED OR BRAZED TO A GROUND TERMINATION POINT ON THE PANEL.
- THE EQUIPMENT GROUNDING TERMINAL IS A COPPER GROUND BUS OR STUB BUS BONDED TO THE PANEL ENCLOSURE USING BRAZING OR BOLTING IN SUCH MANNER THAT THE CONDUCTING PATH HAS A RESISTANCE OF ONE OHM OR LESS.
- THE GROUNDING CONDUCTORS MUST BE CAPABLE OF HANDLING ANTICIPATED GROUND FAULT CURRENTS.
- THERE SHOULD BE A JUMPER CABLE ACROSS THE GROUND BUS FLOOR SILL BETWEEN ANY SHIPPING SPLITS AND SIZED THE SAME AS THE SAFETY GROUND UNLESS OTHERWISE SPECIFIED.
- THE PROTECTIVE GROUNDING DESCRIBED ABOVE FOR POWER CONVERSION AND CONTROL CABINETS IS ALSO NEEDED FOR MOTORS, TRANSFORMERS AND REACTORS. EACH OF THESE SHOULD HAVE ITS OWN GROUNDING CONDUCTOR GOING DIRECTLY TO THE BUILDING GROUND GRID.

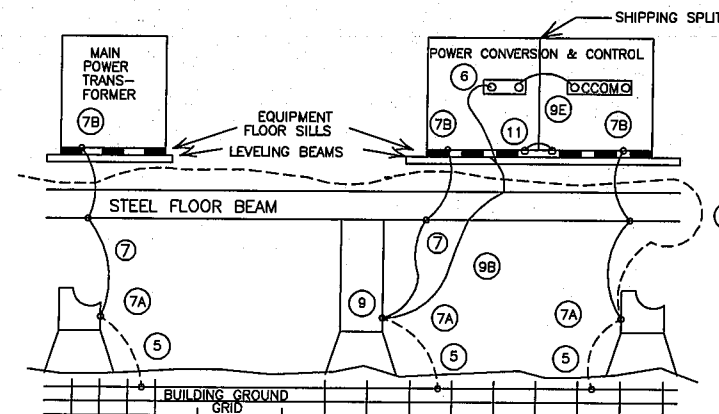
GROUNDING PROCEDURES NEEDED TO ENSURE ELECTRICAL NOISE IMMUNITY

THE FOLLOWING PROCEDURES OVER AND ABOVE THOSE DESCRIBED ABOVE FOR PROTECTIVE GROUNDING ARE SOME OF THOSE NEEDED TO MAKE THE INSTALLATION IMMUNE TO ELECTRICAL NOISE.

- LEVELING BEAMS (STEEL CHANNELS) SHOULD BE EMBEDDED IN THE CONCRETE AT THE TIME THE FOUNDATION IS BEING PREPARED. THESE SHOULD BE CONNECTED TO THE BUILDING GROUND SYSTEM USING A BRAZING OR CAD WELDING PROCESS.
- GROUNDING LEVELING BEAMS ARE NOT AN ABSOLUTE NECESSITY FOR SATISFACTORY OPERATION. ON NEW CONSTRUCTION SUCH BEAMS CAN BE PROVIDED WITH LITTLE DIFFICULTY. FOR EXISTING CONSTRUCTION IT USUALLY WILL BE MORE DIFFICULT, IN WHICH CASE THE LEVELING BEAMS MAY BE DISPENSED WITH PROVIDED OTHER GROUNDED STRUCTURES SUCH AS COLUMNS AND FLOOR BEAMS ARE WITHIN 10 FEET OF THE EQUIPMENT.
- AFTER SETTING THE CONTROL PANELS IN PLACE, THE PERIPHERY OF THE CONTROL PANELS SHOULD BE SPOT WELDED TO THE STEEL CHANNELS APPROXIMATELY EVERY 18 INCHES. THIS CREATES A VERY GOOD HIGH FREQUENCY GROUND PLANE. CARE SHOULD BE TAKEN TO AVOID ELECTRONIC COMPONENT DAMAGE DURING THE WELDING PROCESS BY KEEPING THE WELDED RETURN PATH AS CLOSE AS POSSIBLE TO THE WORK POSITION. THAT IS, THE RETURN PATH SHOULD ALWAYS BE WITHIN 3 FEET OF THE ELECTRODE.
- IF LEVELING BEAMS ARE NOT INSTALLED, A NUMBER OF GROUNDING CABLES SHOULD BE RUN FROM THE GROUND LUGS PROVIDED ON THE PANEL TO THE NEAREST GROUNDED COLUMN OR FLOOR BEAM. THIS WILL PROVIDE THE NECESSARY HIGH FREQUENCY GROUND PLANE.

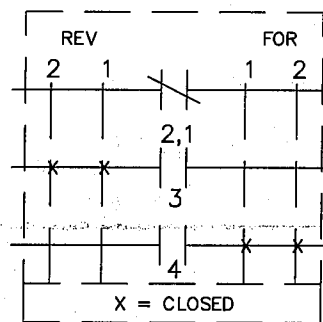
INTERNAL COMMON SIGNAL COMM. GROUNDING

- THE ELECTRONIC CONTROL COMMON SIGNAL MUST BE GROUNDED AT ONE POINT ONLY FOLLOWING THE METHOD OUTLINED IN 6.
- AN INSULATED GROUND CABLE 1/0, CAN BE RUN BETWEEN COMTB AND A SELECTED CONTROL COMMON GROUND TAP AT A BUILDING STRUCTURE SUCH AS A COLUMN, WHERE THE COMMON BUILDING GROUND CABLE IS ACTUALLY BRAZED OR CAD WELDED TO THE COLUMN. THIS CABLE IS TO BE AS SHORT AS POSSIBLE AND SHOULD BE SEPARATE FROM ANY PROTECTIVE GROUND CABLES.
- SOLIDLY BOLTED CONNECTIONS AT THE EQUIPMENT ARE DESIRABLE FOR THAT THE CONNECTION CAN BE REMOVED TO ALLOW ANY SERIOUS GROUNDS WHICH MAY OCCUR LATER TO BE TRACKED DOWN AND CLEARED.
- AN 1/0 JUMPER SHOULD BE INSTALLED TO CONNECT CCOMTB ACROSS SHIPPING SPLITS.



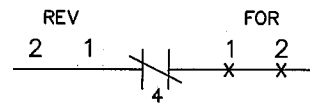
DRAWING SYMBOLS

MASTER AND SELECTOR SWITCHES



VARIATIONS OF THIS SYMBOL ARE USED FOR SWITCHES WITH MORE OR FEWER CONTACTS AND POSITIONS. DOUBLE NUMBERS AT A CONTACT SYMBOL INDICATE TWO CONTACTS IN SERIES (DOUBLE BREAK).

TO INTERPRET THIS SYMBOL, CONSIDER THE OPERATING HANDLE TO BE IN POSITION REV.2. WHEN THIS CONDITION EXISTS, CONTACT 3 IS CLOSED AND CONTACTS 1,2 & 4 ARE OPEN.



AN INDIVIDUAL CONTACT MAY BE SHOWN DISASSOCIATED FROM THE OTHERS IN DIFFERENT AREAS OF THE DIAGRAM. IN THIS CASE A CONTACT SEQUENCE TABLE IS SHOWN ELSEWHERE.

CONTACT	POSITION	
	REV	FOR
2,1		
3	X	X
4		X
X = CLOSED		

INTERLOCKS				TIMER INTERLOCKS				FLOAT SWITCHES		PUSHBUTTONS	
NORM OPEN	NORM CLOSED	NORM OPEN W/BLOWOUT	NORM CLO W/BLOWOUT	NORM CLO W/BLOWOUT	NORM CLO W/BLOWOUT	NORM CLO W/BLOWOUT	NORM CLO W/BLOWOUT	NORM OPEN	NORM CLO	NORM OPEN	NORM CLO

LIMIT SWITCHES				FLOW SWITCHES		PRESSURE SWITCHES		TEMP ACTUATED		CAPACITOR	CENTRIFUGAL SPEED SW
NORMALLY OPEN	NORMALLY CLOSED	NORM OPEN HELD CLOSED	NORM CLO HELD OPEN	NORM OPEN	NORM CLO	NORM OPEN	NORM CLO	NORM OPEN	NORM CLO		

FUSE	COIL SUPPRESSION		COILS			THERMOCOUPLE		RTD		MOV
	DC	AC	SHUNT	THERMAL	BREAKER	NON-GND	GROUND	3-WIRE	2-WIRE	

CIRCUIT BREAKER	LINE SWITCH	FUSED SWITCH	AMMETER	VOLTMETER	METER & SHUNT	HORN, SIREN	RECTIFIER HALF WAVE	SCR	ZENER DIODE

POTENTIAL	AUTO	CURRENT	SERIES	SATURABLE	RESISTORS		POTENTIOMETER	BATTERY	LAMP
					FIXED	ADJUSTABLE			

FAN	TERMINAL JUMPER	PLUG WITH SCREW TERMINATION	PLUG TERMINATION	SOFTWARE PROGRAMMABLE	PL PIN NUMBER	TEST POINT

CONNECT WIRES	CROSSING WIRES	TERMINALS	COMM. CONN.	CHASSIS/FRAME CONN	TWISTED WIRE	SHIELDED CABLE	TWISTED SHIELDED	EARTH GROUND	WIRE TRUNKING	CONNECTOR	FESTOON CABLE

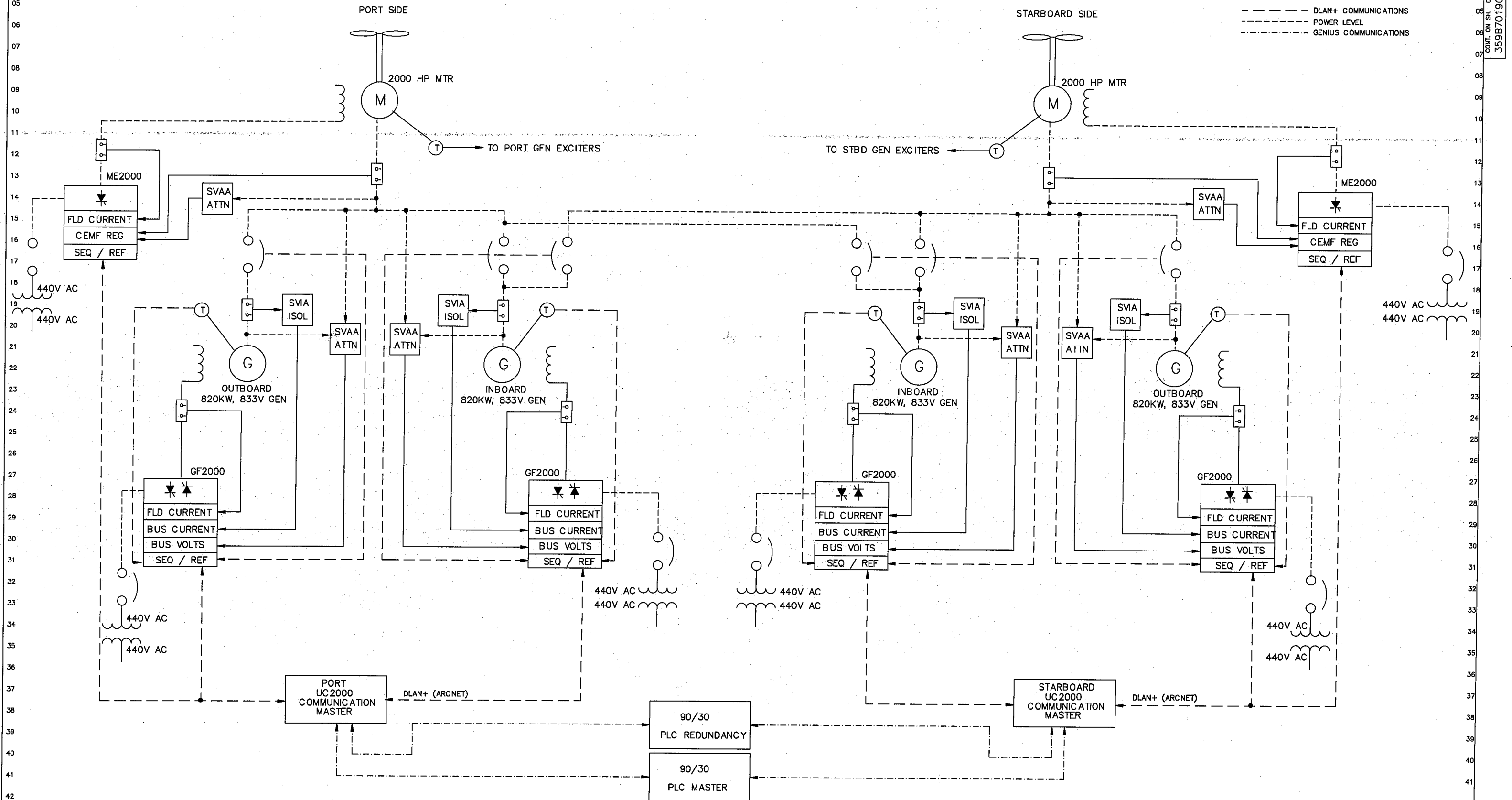
HARNESS WIRING	COAXIAL CABLE	FIBER OPTIC

CCSG GRIFFON
PROPULSION CONTROL SYSTEM

NOTE: BACKUP EQUIPMENT NOT SHOWN

(T) = TACHOMETER
(M) = MOTOR
(DS) = OVERSPEED DEVICE

--- DLAN+ COMMUNICATIONS
--- POWER LEVEL
--- GENIUS COMMUNICATIONS

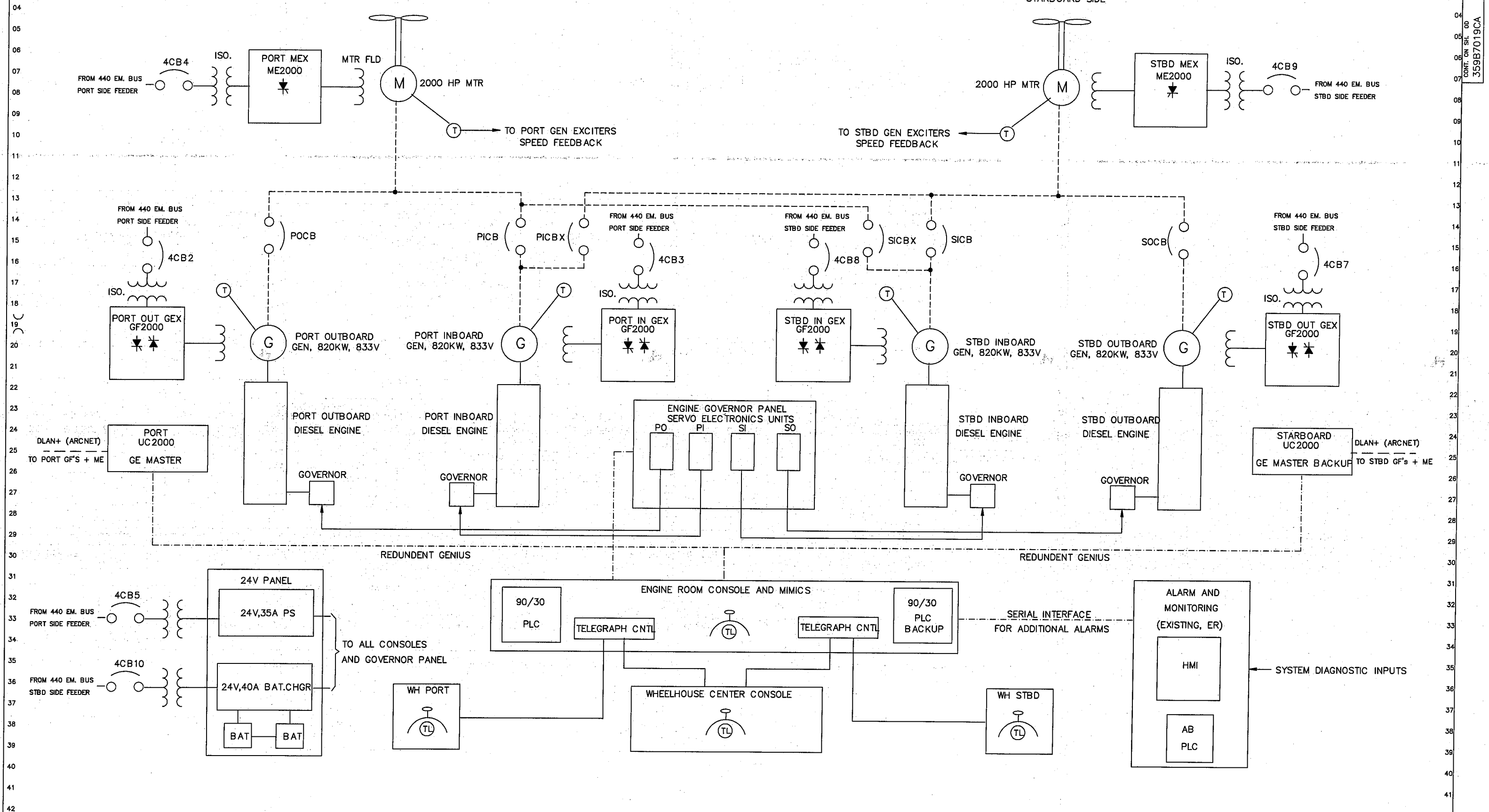


REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	DRAWN BY	ISSUE DATE	REQUISITION	SHOP ORDER	GENERAL ELECTRIC - DRIVES APPLICATION CENTER	ELEMENTARY DIAGRAM CANADIAN COAST GUARD SYSTEM ONE-LINE DIAGRAM	359B7019CA	SH. NO. OC
3	Nov 7 03	PS	D.WALLACE		D. WALLACE	11/25/2002	84702084	ZTG038			CONT. ON SH. OC1	

CCSG GRIFFON PROPULSION CONTROL SYSTEM BLOCK DIAGRAM

NOTE: BACKUP EQUIPMENT NOT SHOWN

--- DLAN+ COMMUNICATIONS
 --- POWER LEVEL
 --- GENIUS COMMUNICATIONS
 (T) = TACHOMETER
 (M) = MOTOR
 (TL) TELEGRAPH

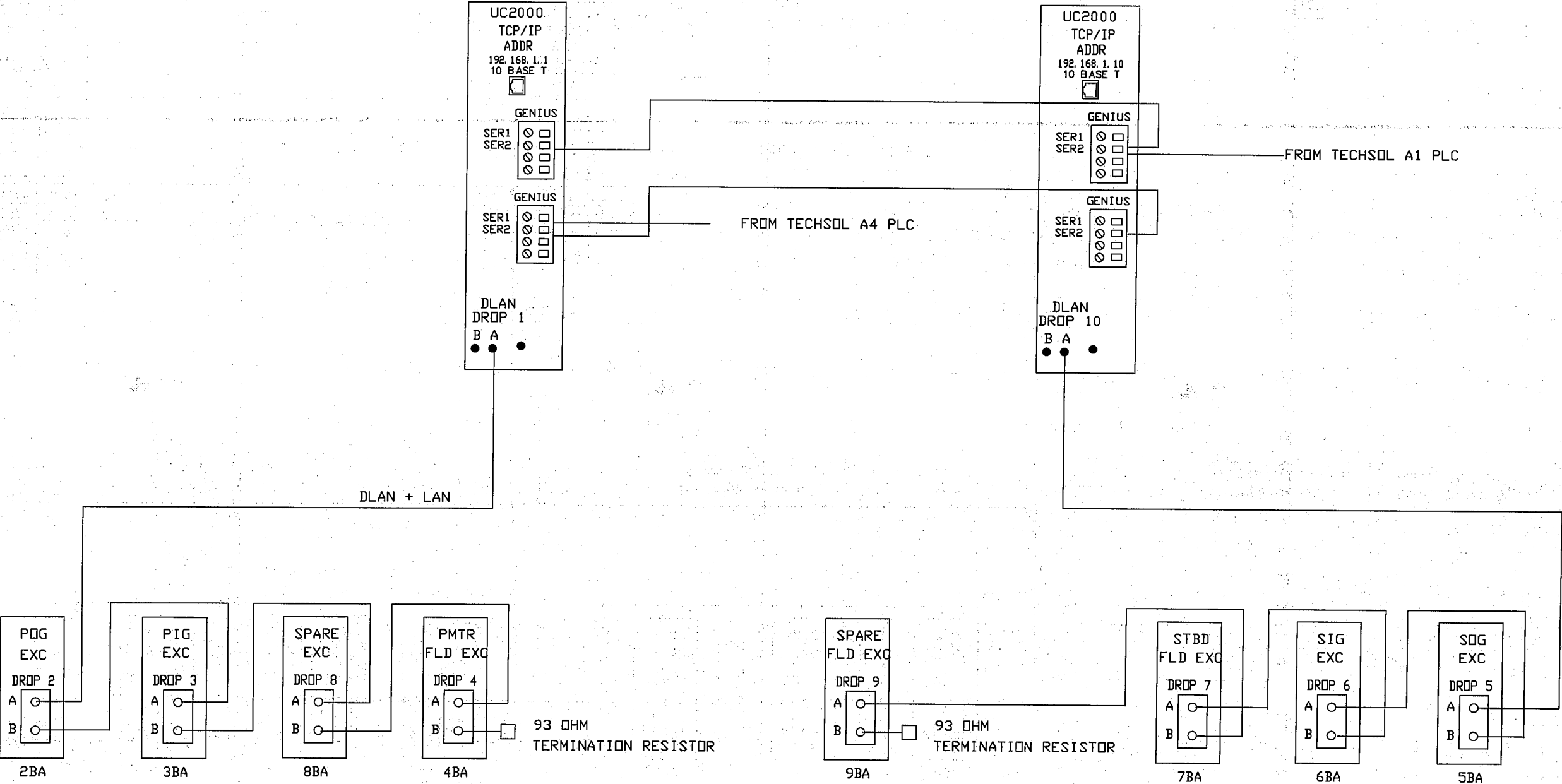


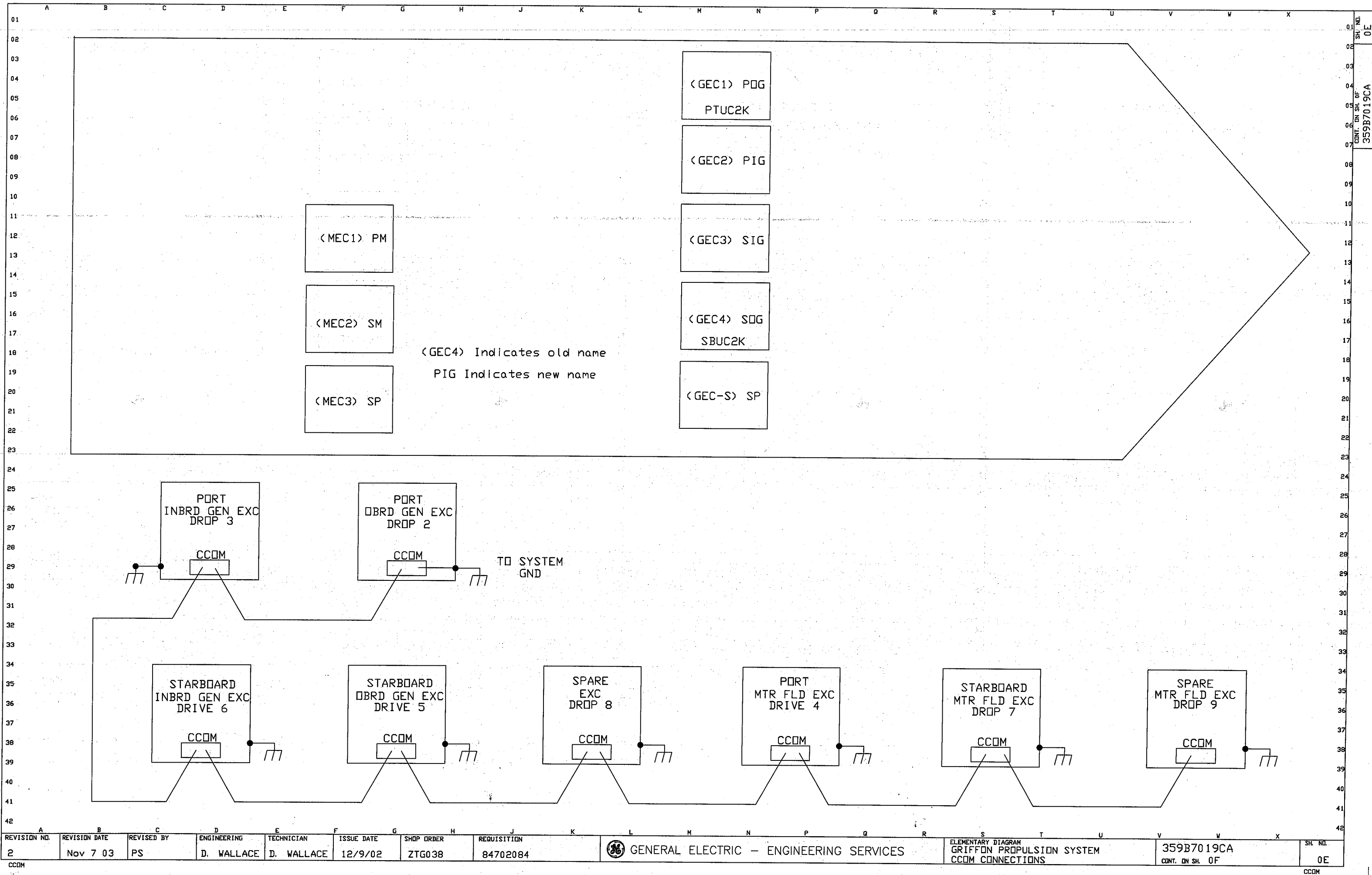
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1	Nov 7 03	PS	P.SCHULTZ		P.SCHULTZ	Nov 3 03	84702084	ZTG038				OC1

GRIFFON - PROPULSION CONTROL SYSTEM LAN TOPOLOGY

PORT SIDE
 DRIVE COMMUNICATION MASTER

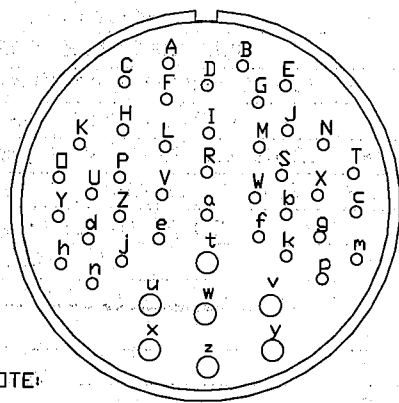
STARBOARD SIDE
 DRIVE COMMUNICATION MASTER



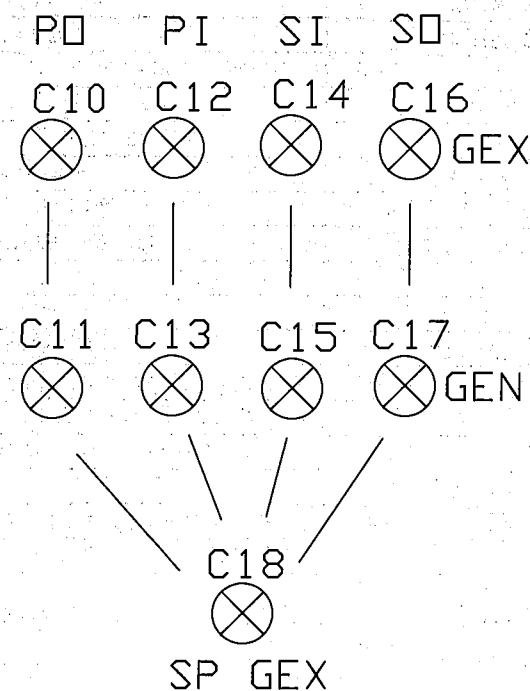


REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC - ENGINEERING SERVICES				ELEMENTARY DIAGRAM GRIFFON PROPULSION SYSTEM CCOM CONNECTIONS	359B7019CA CONT. ON SH. OF	SH. NO. 0E
2	Nov 7 03	PS	D. WALLACE	D. WALLACE	12/9/02	ZTG038	84702084							

AMPHENOL CONNECTOR 7#12's 40 #16's
SOCKET AC02A36-7S
PLUG AC06F36-7P
RATING: 700VDC, 23A, 500VAC



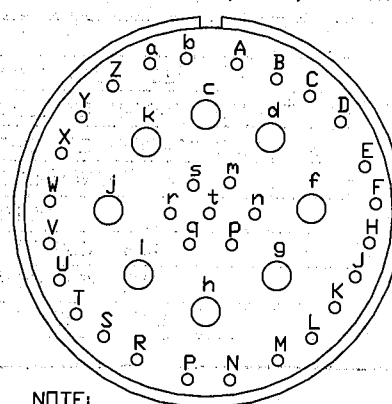
NOTE:
1) * = NEW SIGNAL



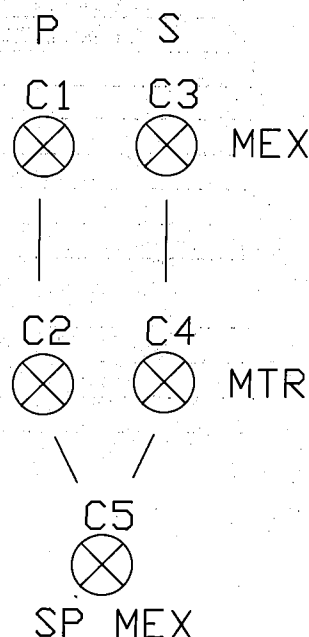
GENERATOR EXCITER PLUG CONNECTORS

PIN	ASSIGNMENT
A	GENERATOR CURRENT FDBK + *
B	GENERATOR CURRENT FDBK - *
C	GEN CURRENT REF FROM OTHER GEN+ *
D	GENERATOR CURRENT FDBK SIGNAL SHIELD *
E	GEN CURRENT REF TO OTHER GEN + *
F	GEN CURRENT REF FROM OTHER GEN SHIELD *
G	GEN CURRENT REF TO OTHER GEN SHIELD *
H	GEN CURRENT REF FROM OTHER GEN - *
I	ALT DC BRKR CLOSE CMD
J	GEN CURRENT REF TO OTHER GEN - *
K	SPARE #16 1
L	SPARE #16 2
M	SPARE #16 3
N	24 VDC TO CURRENT ISOLATOR SHIELD *
O	GENERATOR TACHOMETER FDBK +
P	GENERATOR TACHOMETER FDBK -
R	MAIN DC BRKR CNTL PWR
S	ALT DC BRKR TRIP CMD
T	24 VDC TO CURRENT ISOLATOR COM *
U	EXC TIED TO AN INBOARD GEN
V	SPARE 1 PAIR SHIELDED BLK
W	GF2000 115VAC I/O POWER *
X	24 VDC TO CURRENT ISOLATOR + *
Y	MOTOR TACHOMETER FDBK + *
Z	MOTOR TACHOMETER FDBK - *
a	MAIN DC BRKR CLOSE CMD
b	MAIN DC BRKR TRIP CMD
c	MOTOR VOLTAGE FDBK +
d	MTR FIELD EXC NO TRIP FAULT CONTACT PT 2
e	SPARE 1 PAIR SHIELDED WHT
f	EXC CONNECTED TO PORT SIDE GEN
g	ALT DC BRKR CNTL PWR
h	GENERATOR VOLTAGE FDBK +
J	SPARE 1 PAIR SHIELDED GND
K	SPARE #16 4
m	MOTOR VOLTAGE FDBK -
n	GENERATOR VOLTAGE FDBK -
P	ALTERNATE CIRCUIT BRKR IS CLOSED *
r	GENERATOR CIRCUIT BRKR IS CLOSED *
s	CURRENT ISOLATOR STATUS FDBK *
t	
u	GENERATOR SHUNT FIELD CONNECTION F1
v	GENERATOR SHUNT FIELD CONNECTION F2
w	
x	440VAC POWER PHASE A *
y	440VAC POWER PHASE B
z	440VAC POWER PHASE C

AMPHENOL CONNECTOR 8 #8's 31 #16's
SOCKET AC02A36-54S
PLUG AC06F36-54P
RATING: 700VDC, 46A, 500VAC

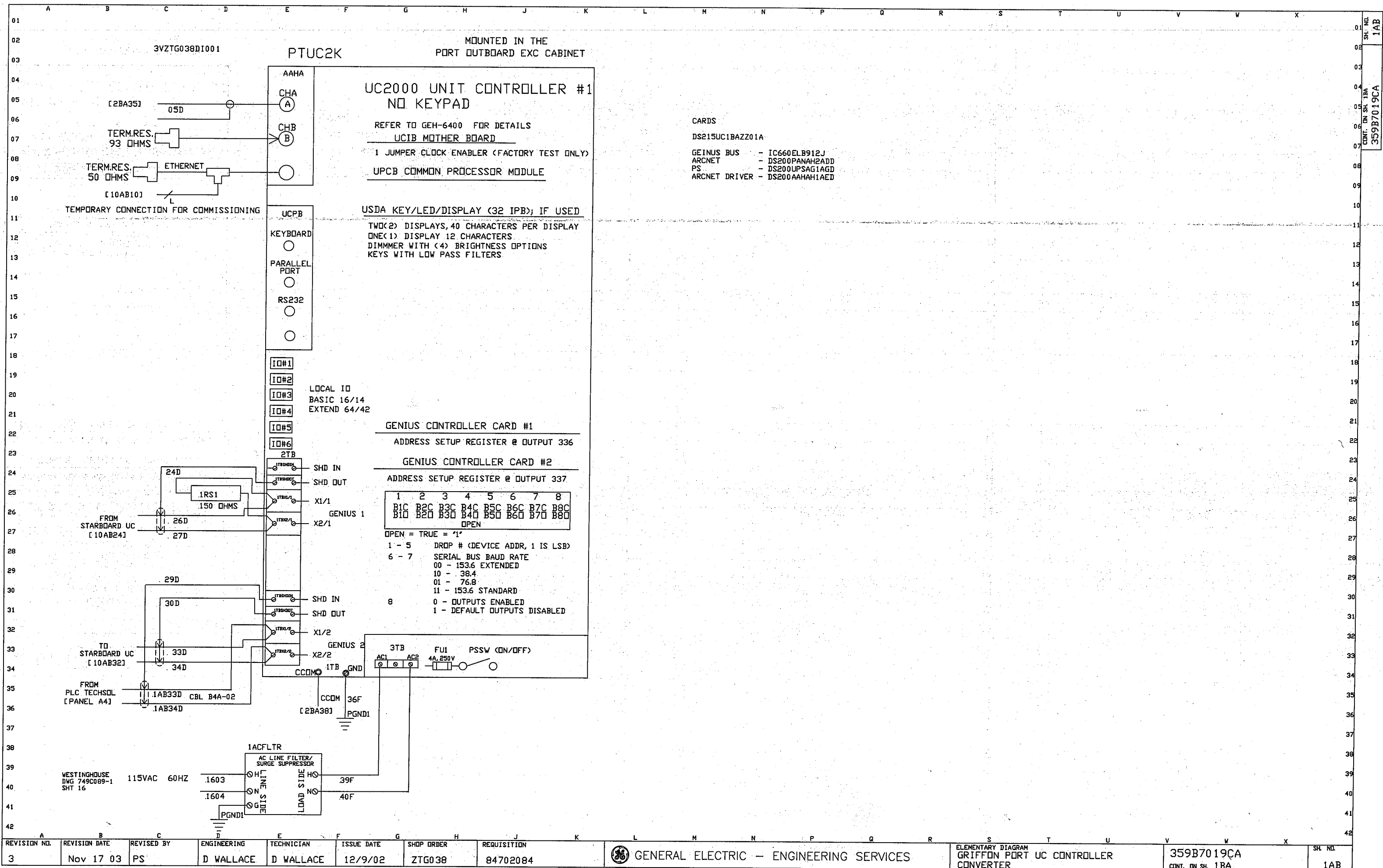


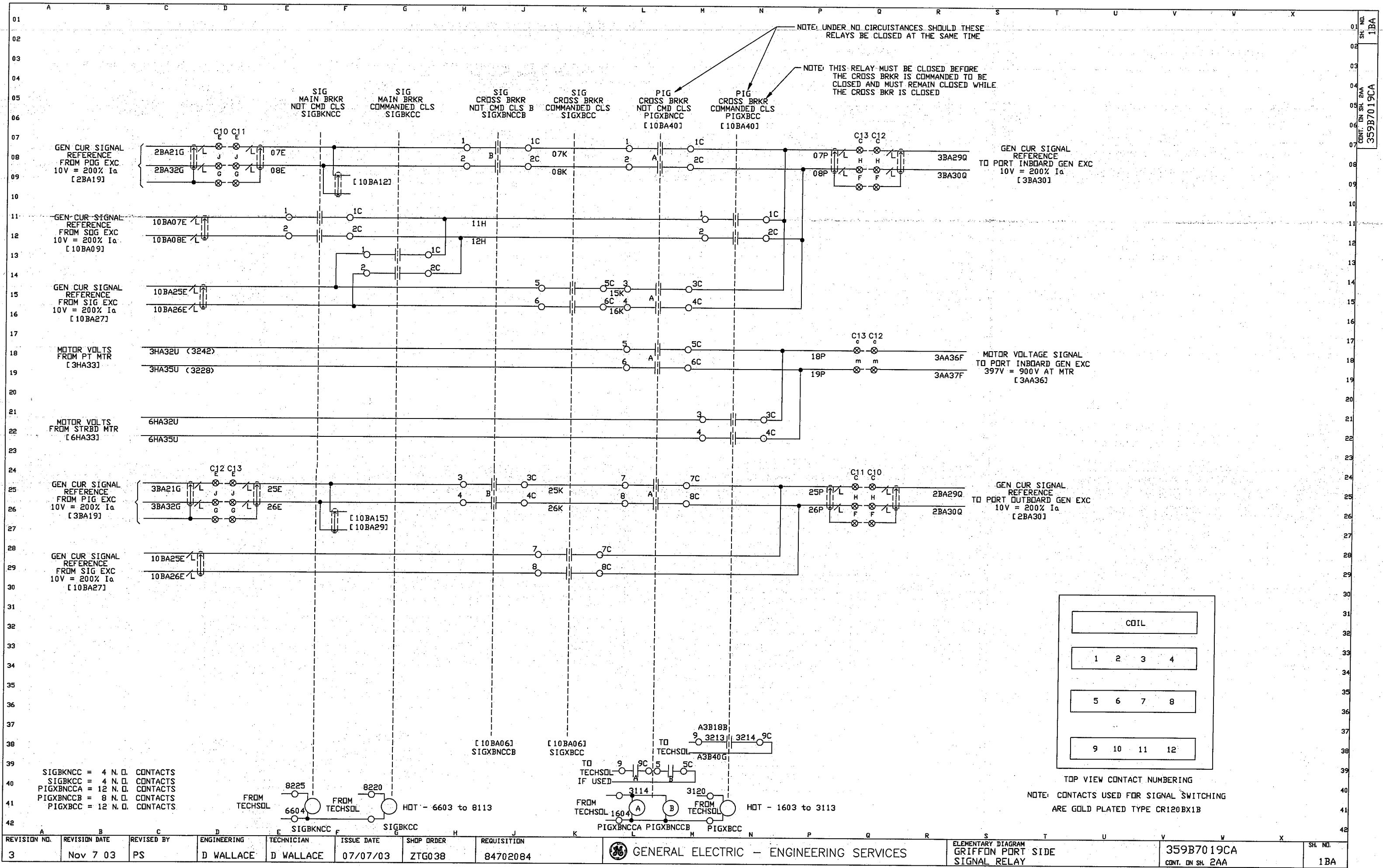
NOTE:
1) * = NEW SIGNAL



MOTOR FIELD EXCITER PLUG CONNECTORS

PIN	ASSIGNMENT
A	SPARE #16 3
B	CURRENT ISOLATOR STATUS FDBK *
C	TRIP FAULT CONTACT TO INBOARD GEN PT 1
D	TRIP FAULT CONTACT TO INBOARD GEN PT 2
E	GF2000 115VAC I/O POWER *
F	TIED TO PORT MOTOR
H	SPARE 1 PAIR SHIELDED BLK
J	SPARE 1 PAIR SHIELDED WHT
K	SPARE 1 PAIR SHIELDED SHLD
L	SPARE #16 4
M	SPARE #16 2
N	MOTOR VOLTAGE FDBK -
P	MOTOR VOLTAGE FDBK +
R	
S	MOTOR CURRENT FDBK SHIELD *
T	MOTOR CURRENT FDBK - *
U	MOTOR CURRENT FDBK + *
V	24 VDC TO CURRENT ISOLATOR SHIELD *
W	24 VDC TO CURRENT ISOLATOR - *
X	24 VDC TO CURRENT ISOLATOR CCOM *
Y	24 VDC TO CURRENT ISOLATOR + *
Z	TRIP FAULT CONTACT TO OUTBOARD GEN PT 1
a	TRIP FAULT CONTACT TO OUTBOARD GEN PT 2
b	SPARE #16 1
c	440VAC POWER PHASE B
d	440VAC POWER PHASE C
f	MOTOR SHUNT FIELD CONNECTION F1
g	MOTOR SHUNT FIELD CONNECTION F2
h	
i	
j	
k	440VAC POWER PHASE A *
m	
n	
p	
q	MOTOR GROUND FAULT SIGNAL SHIELD
r	MOTOR GROUND FAULT SIGNAL
s	
t	



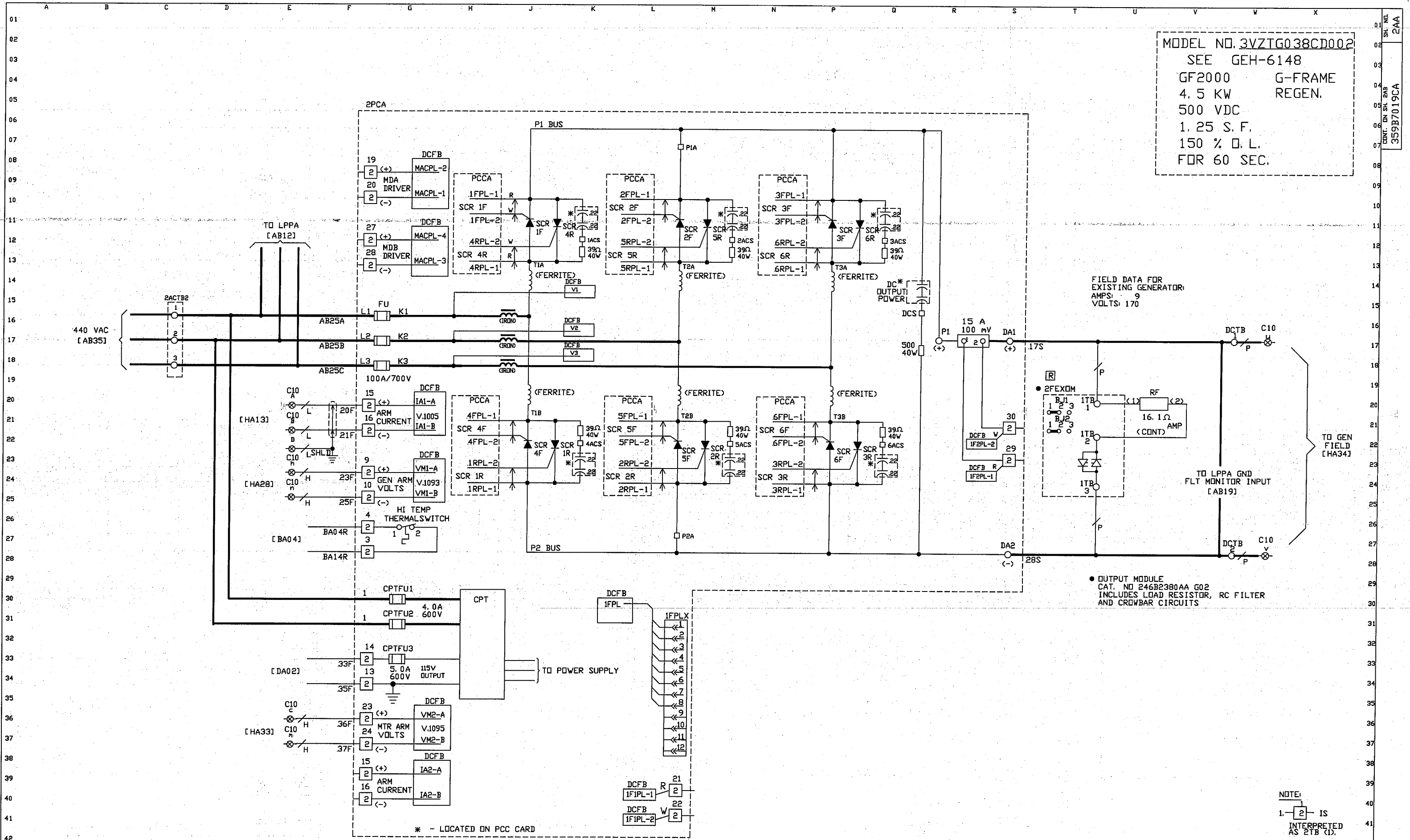


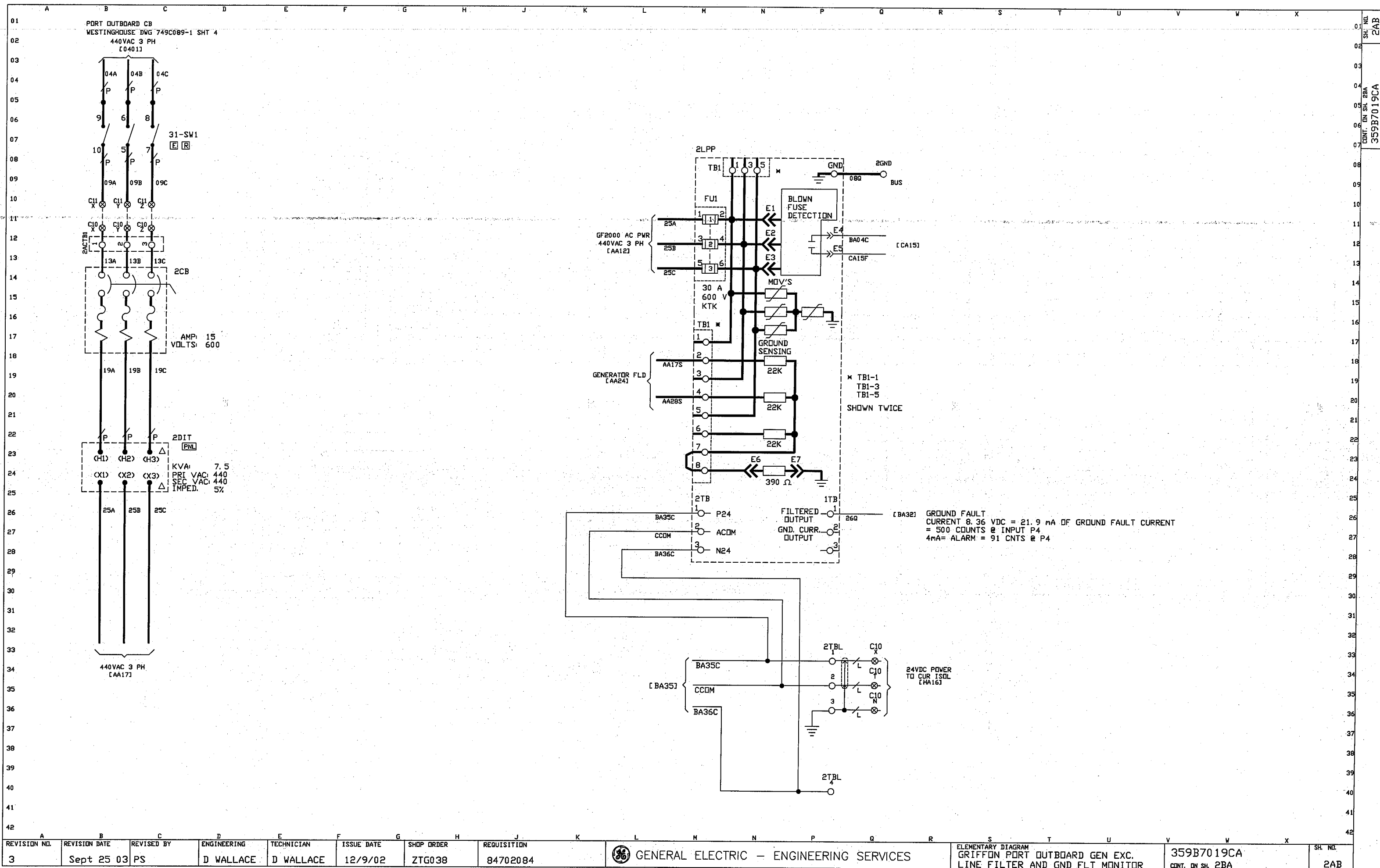
MODEL NO. 3VZTG038CD002
 SEE GEH-6148
 GF2000 G-FRAME
 4.5 KW REGEN.
 500 VDC
 1.25 S. F.
 150 % O. L.
 FOR 60 SEC.

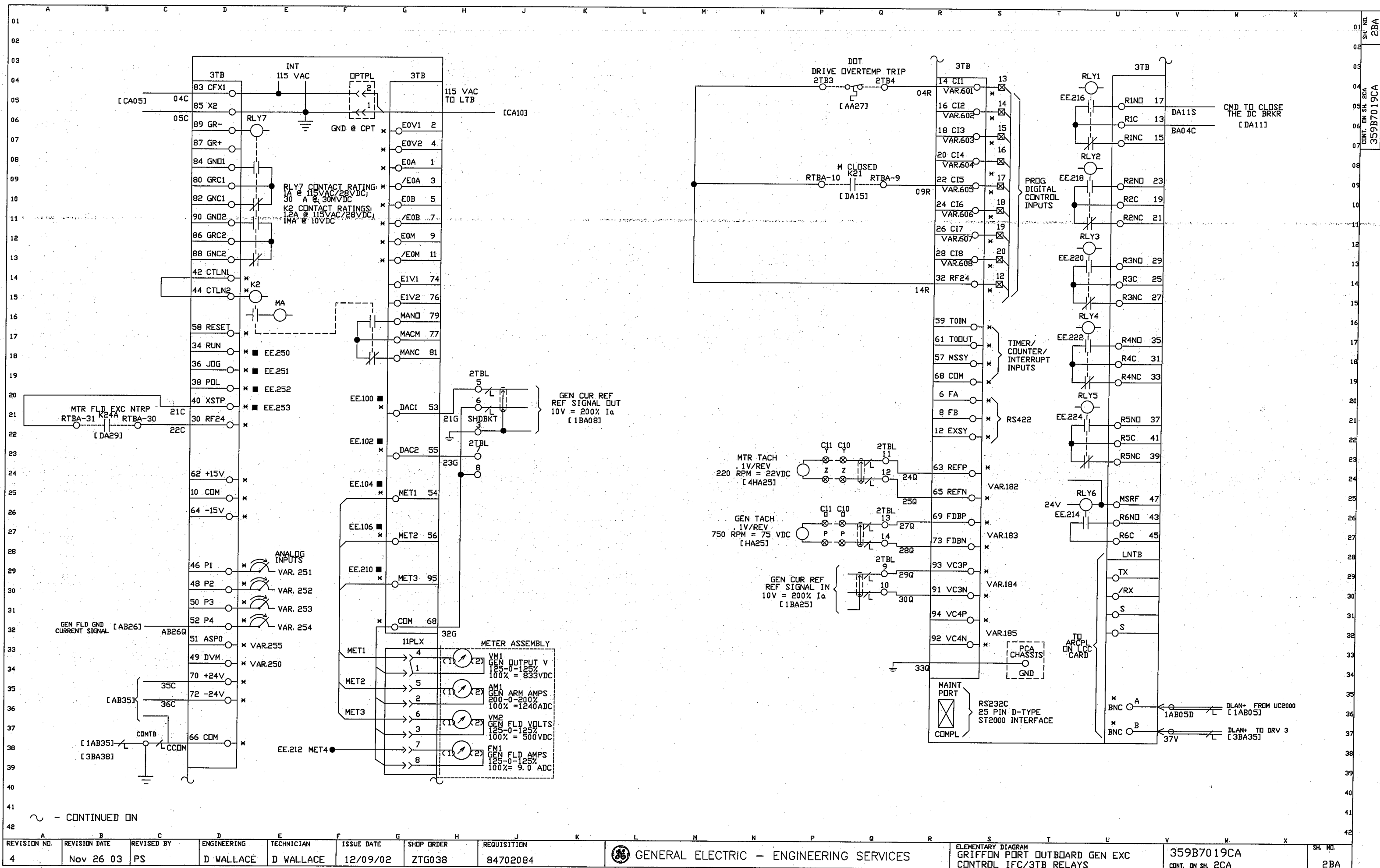
FIELD DATA FOR
 EXISTING GENERATOR:
 AMPS: 9
 VOLTS: 170

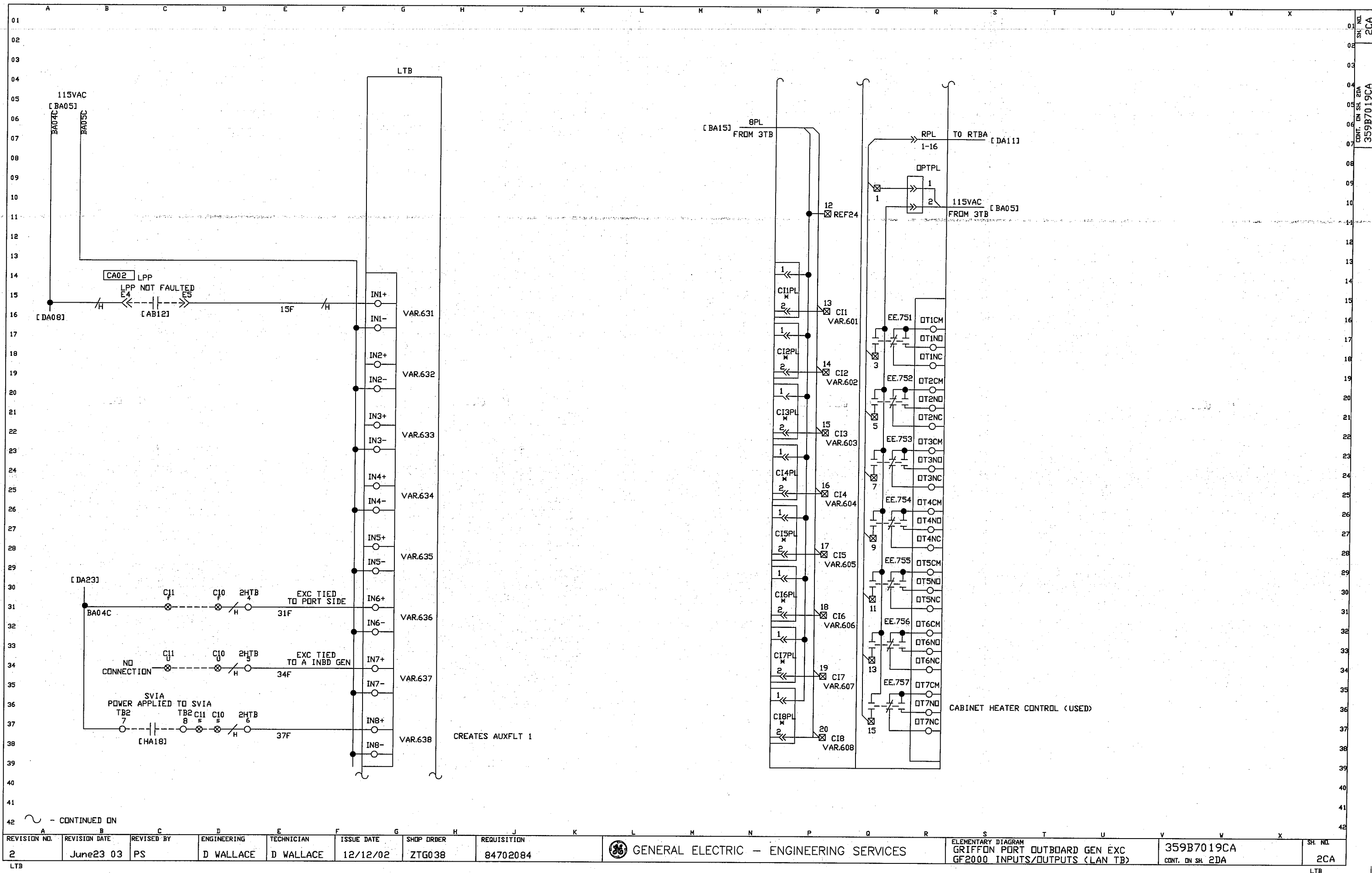
• OUTPUT MODULE
 CAT. NO 246B2380AA G02
 INCLUDES LOAD RESISTOR, RC FILTER
 AND CROWBAR CIRCUITS

NOTE:
 1-2 IS
 INTERPRETED
 AS 2TB (1).

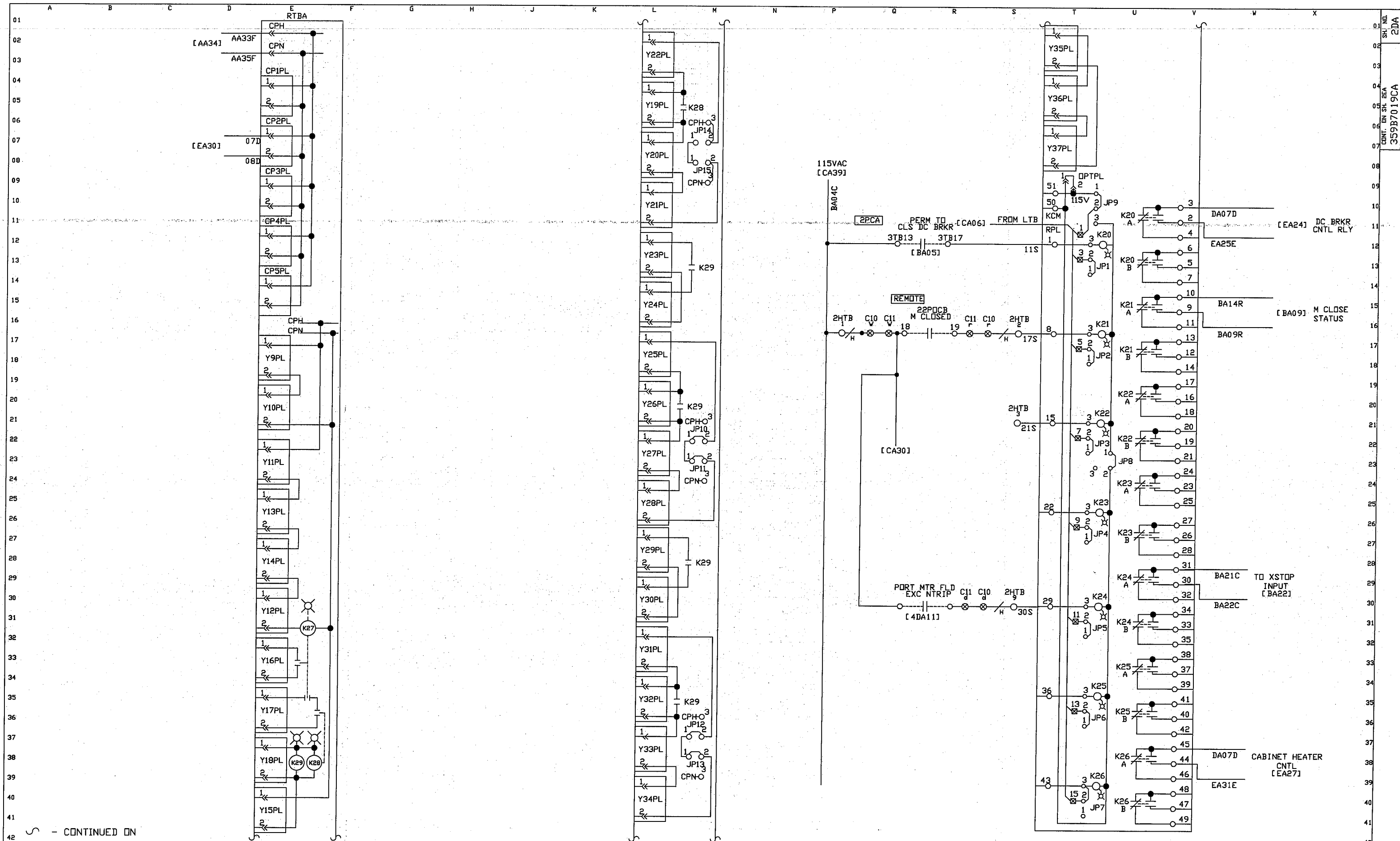




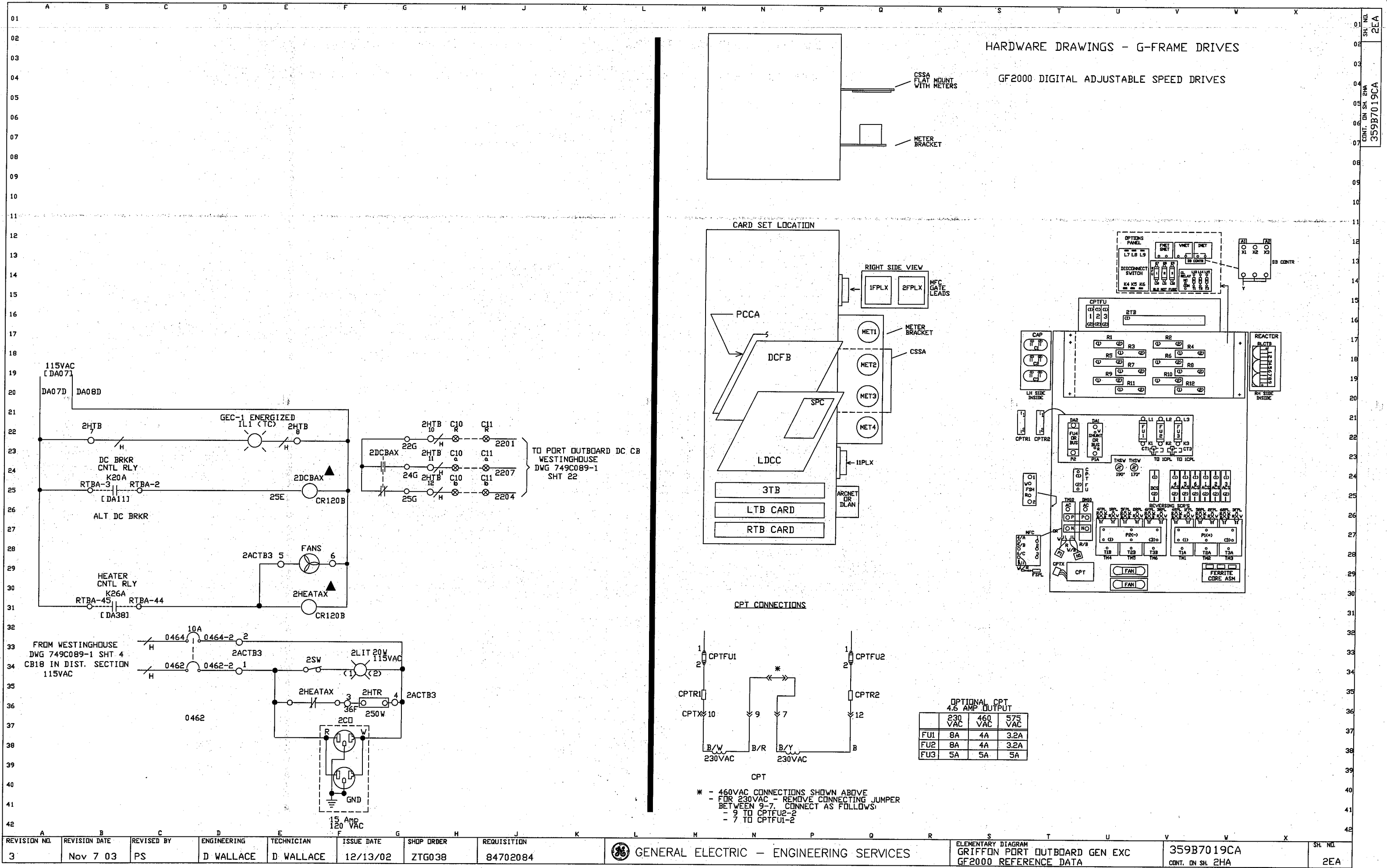




REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC - ENGINEERING SERVICES	ELEMENTARY DIAGRAM GRIFFON PORT OUTBOARD GEN EXC GF2000 INPUTS/OUTPUTS (LAN TB)	359B7019CA CONT. DN SH. 2DA	SH. NO. 2CA
2	June23 03	PS	D WALLACE	D WALLACE	12/12/02	ZTG038	84702084				



REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC - ENGINEERING SERVICES	ELEMENTARY DIAGRAM	359B7019CA	SH. NO.
2	Nov 7 03	PS	D WALLACE	D WALLACE	12/12/02	ZTG038	84702084	GENERAL ELECTRIC - ENGINEERING SERVICES	GRIFTON PORT OUTBOARD GEN EXC	359B7019CA	2DA
RTBA										CONT. ON SH. 2EA	2DA



HARDWARE DRAWINGS - G-FRAME DRIVES

GF2000 DIGITAL ADJUSTABLE SPEED DRIVES

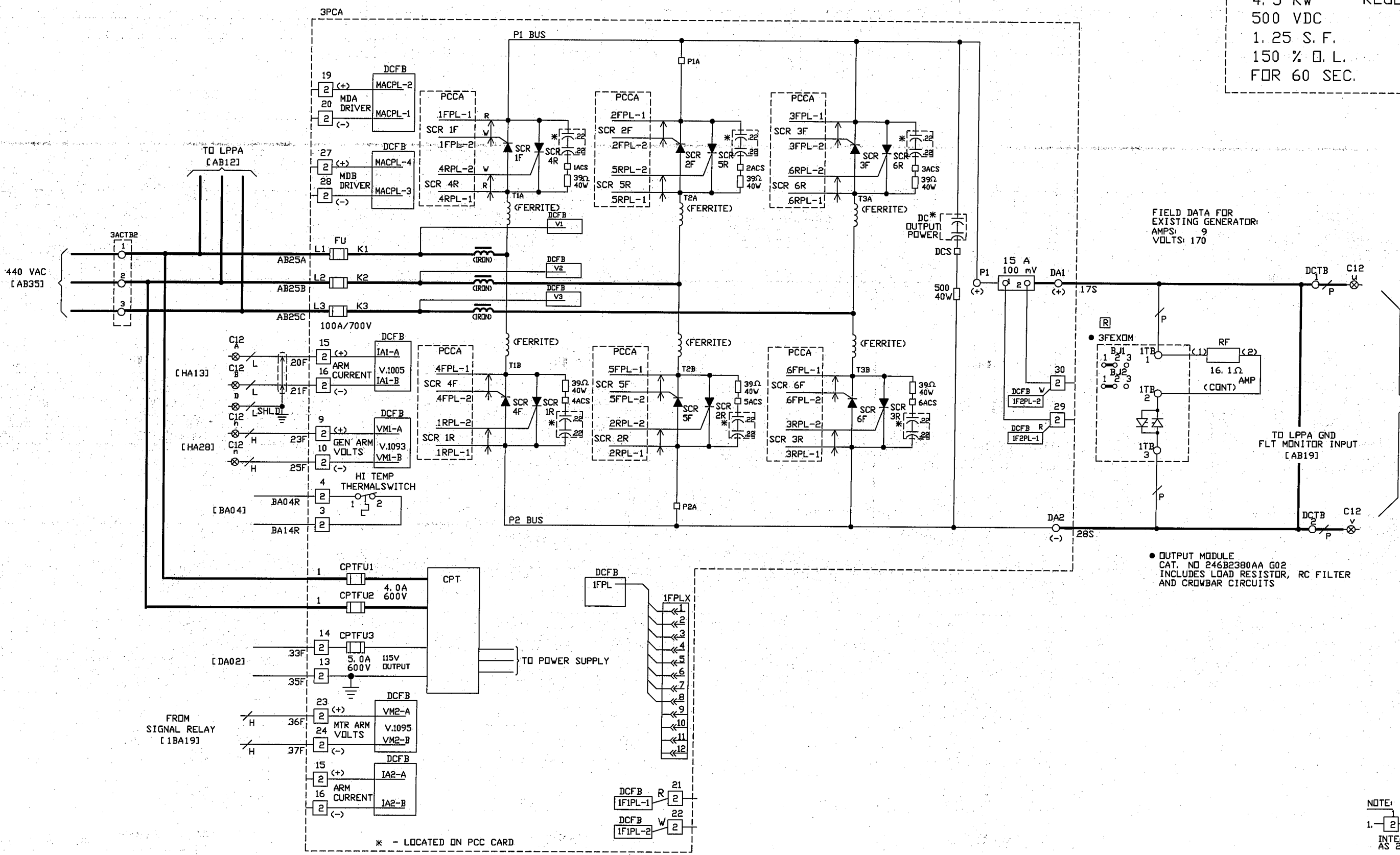
CARD SET LOCATION

RIGHT SIDE VIEW

CPT CONNECTIONS

OPTIONAL CPT 4.6 AMP OUTPUT			
	230 VAC	460 VAC	575 VAC
FU1	8A	4A	3.2A
FU2	8A	4A	3.2A
FU3	5A	5A	5A

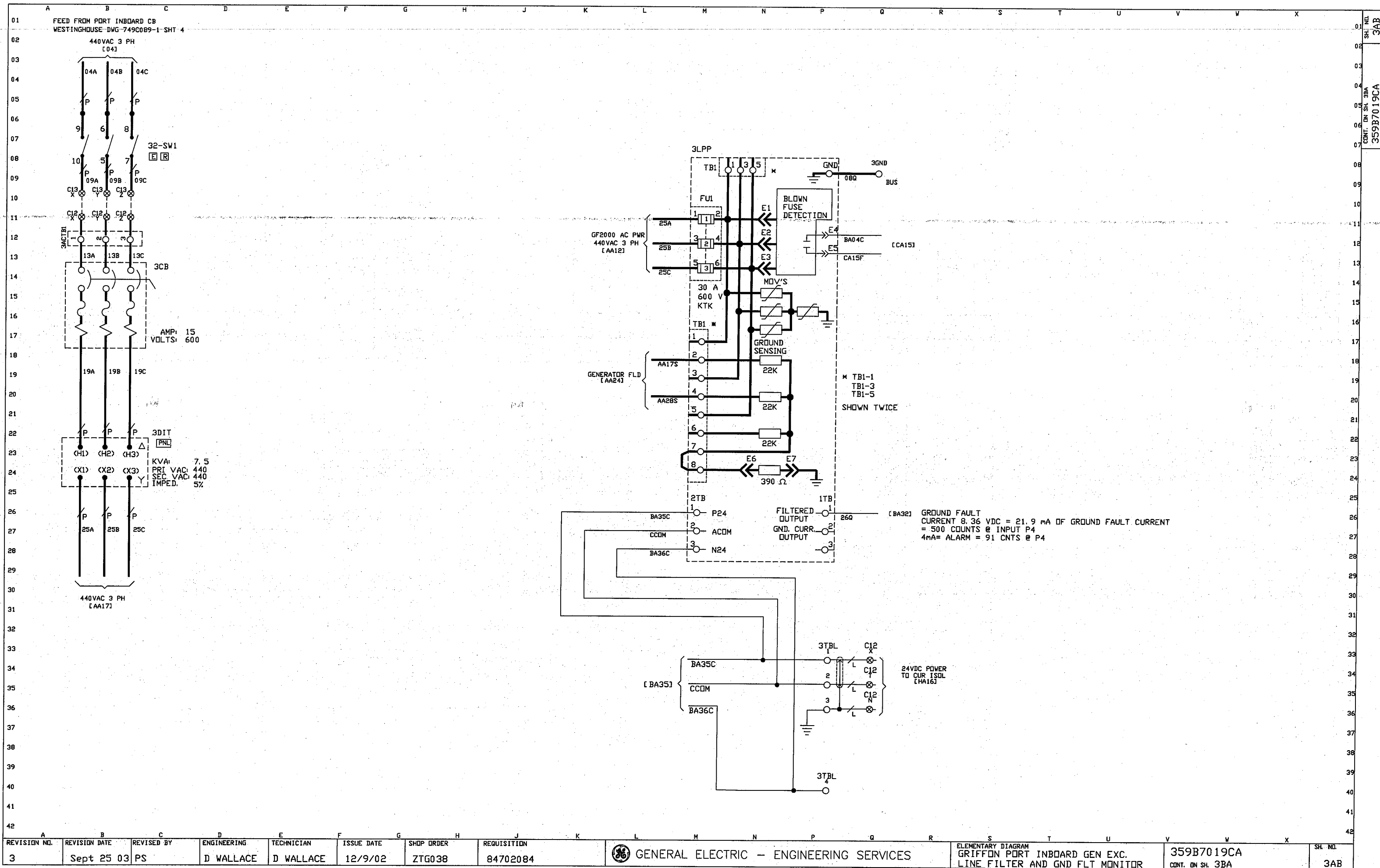
MODEL NO. 3VZTG038CD003
 SEE GEH-6148
 GF2000 G-FRAME
 4.5 KW REGEN.
 500 VDC
 1.25 S. F.
 150 % D. L.
 FOR 60 SEC.

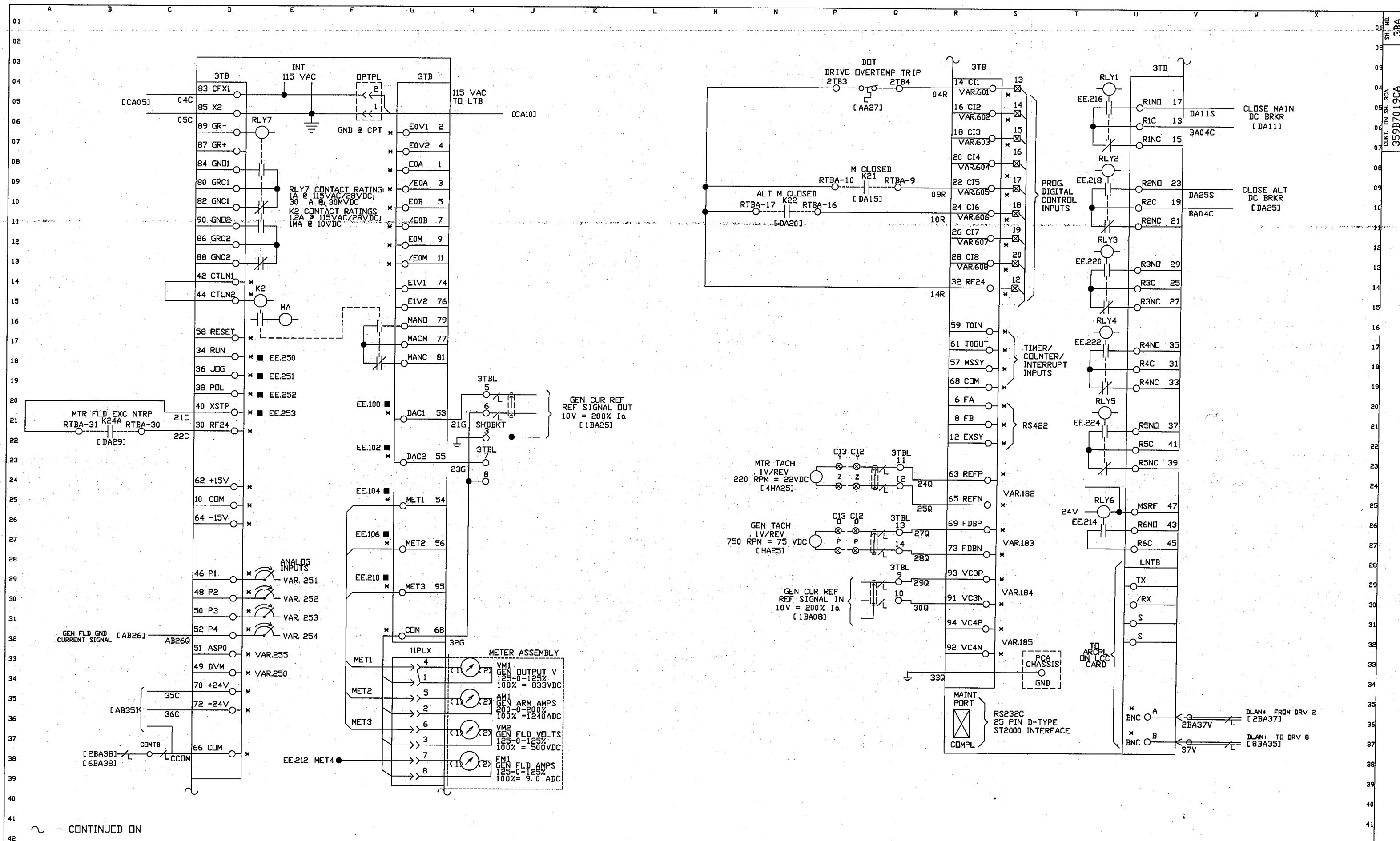


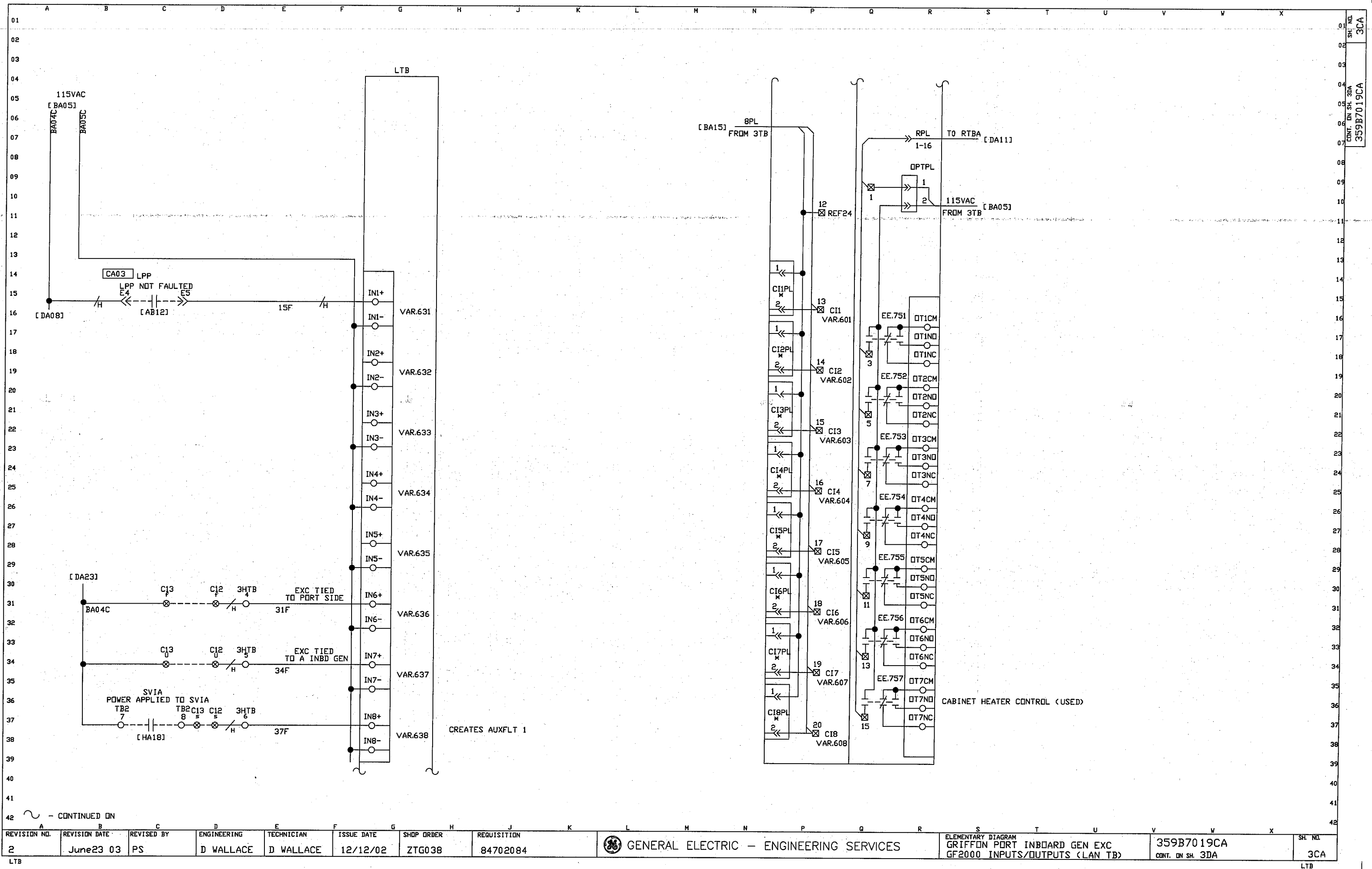
FIELD DATA FOR
 EXISTING GENERATOR:
 AMPS: 9
 VOLTS: 170

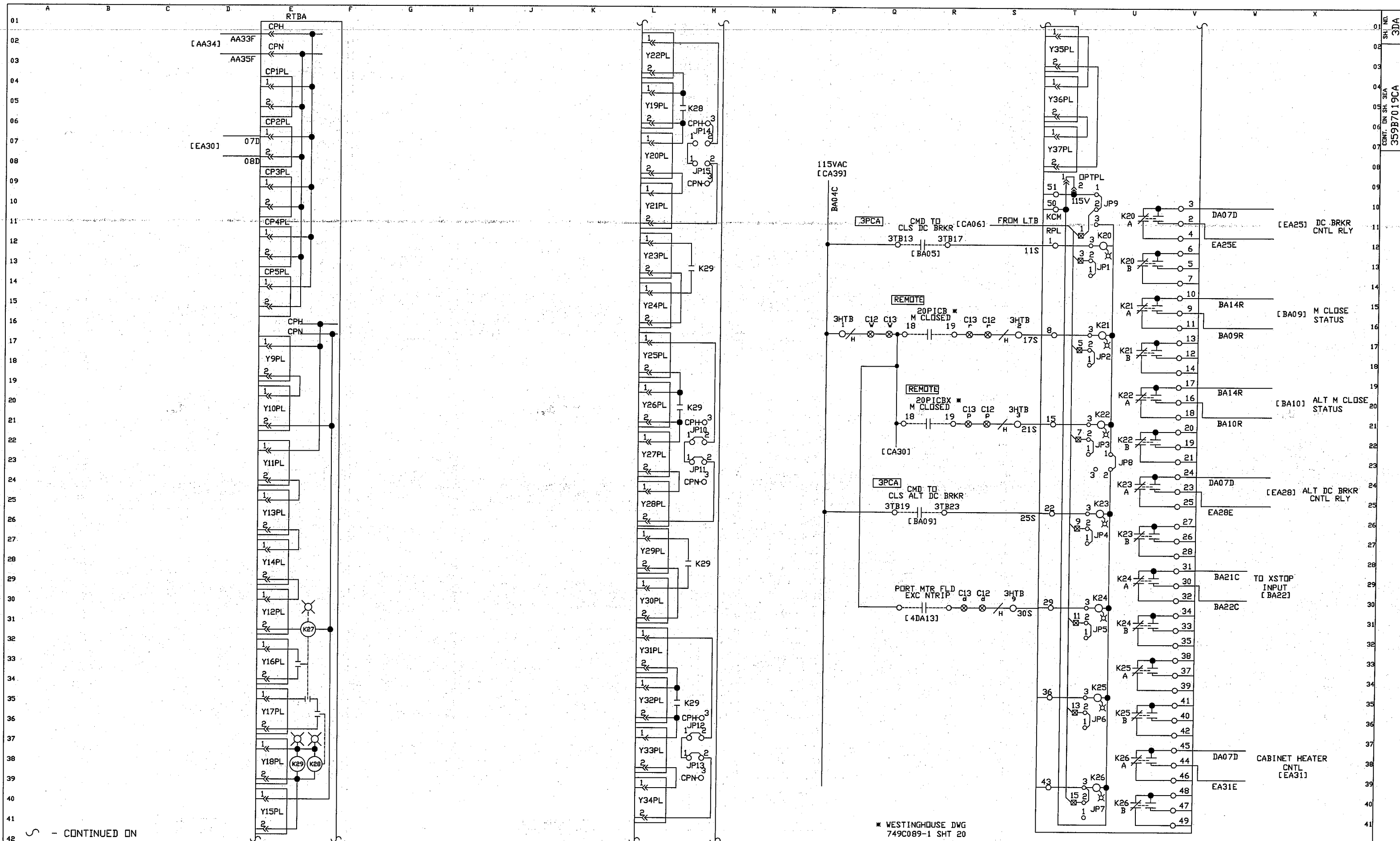
• OUTPUT MODULE
 CAT. NO 246B2380AA G02
 INCLUDES LOAD RESISTOR, RC FILTER
 AND CROWBAR CIRCUITS

NOTE:
 1-2 IS
 INTERPRETED
 AS 2TB (1).



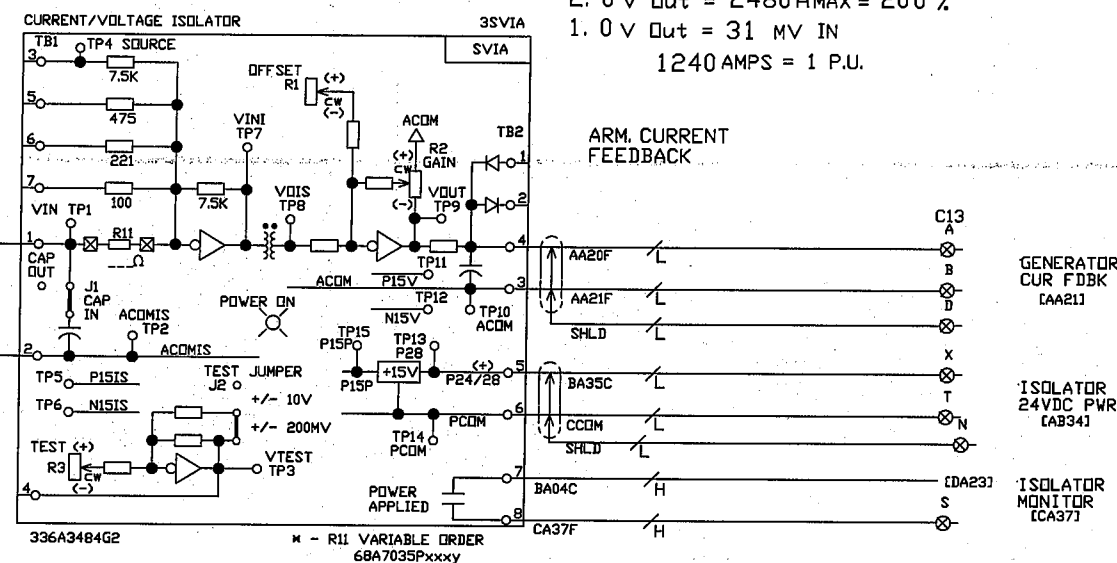
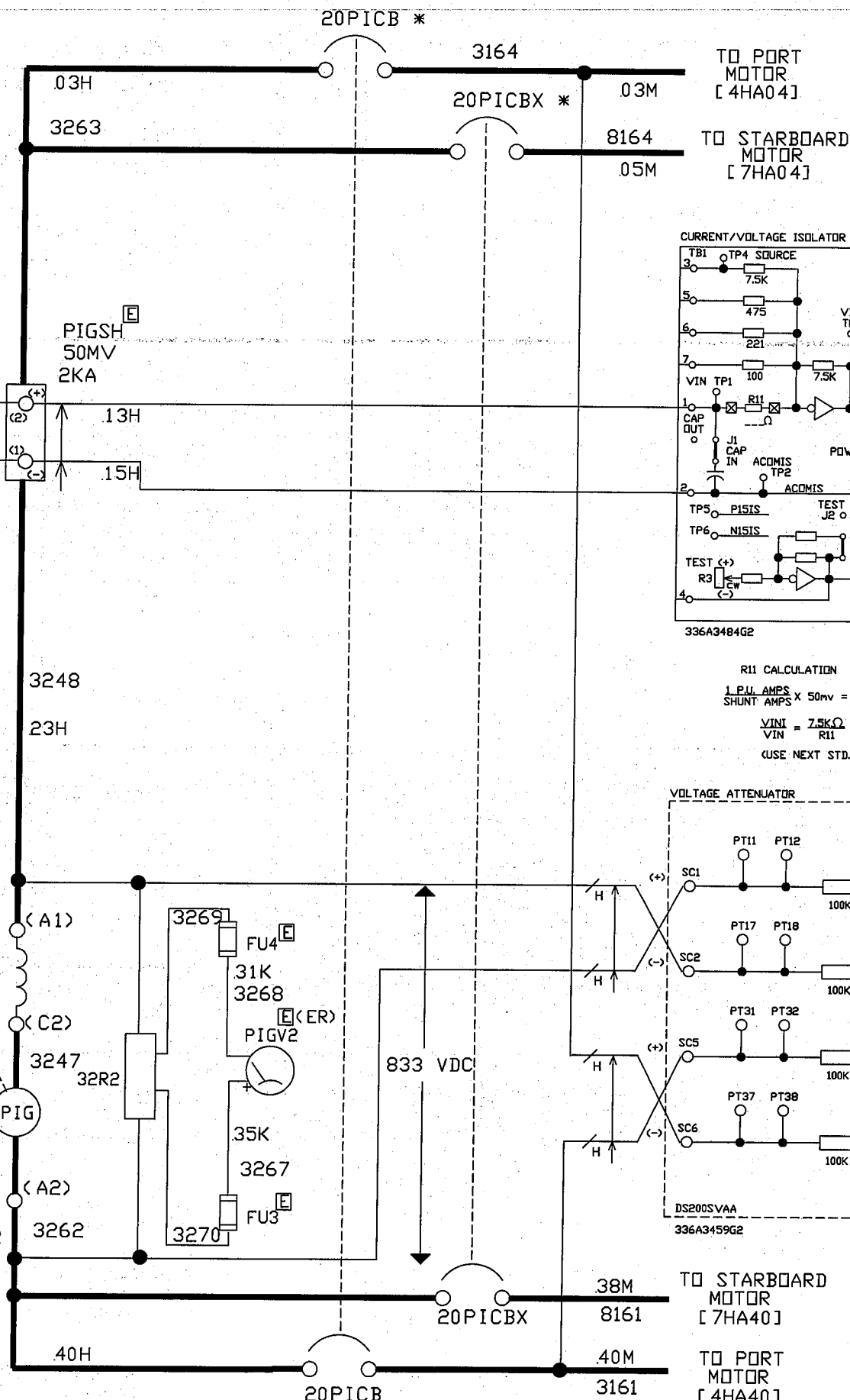
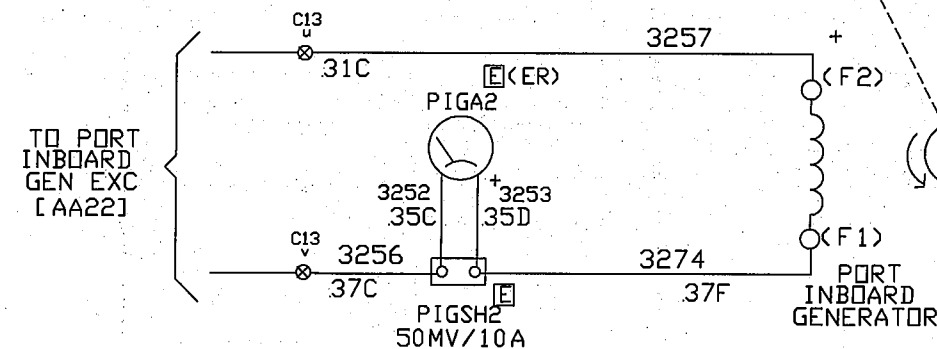
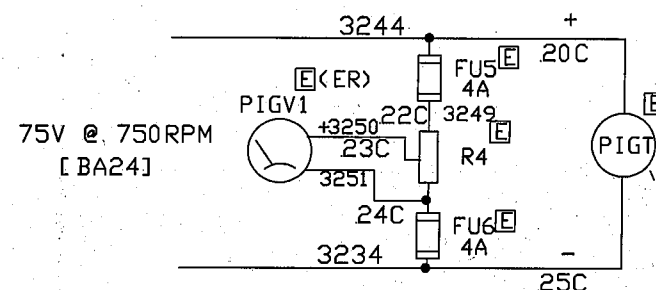




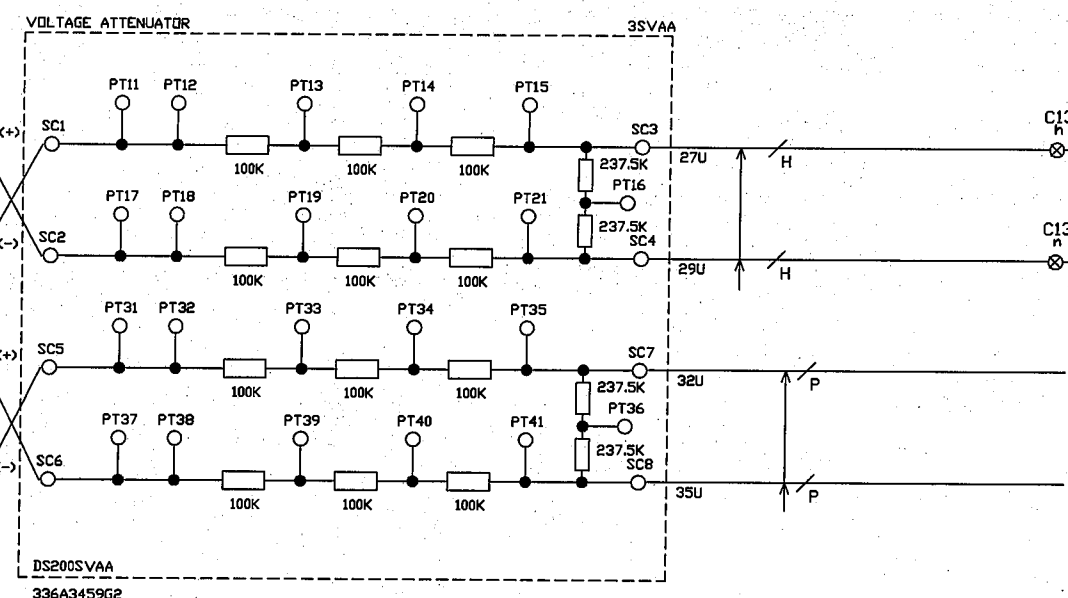


REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC — ENGINEERING SERVICES	ELEMENTARY DIAGRAM GRIFFON PORT INBOARD GEN EXC GF2000 RELAY TB	359B7019CA CONT. ON SH. 3EA	SH. NO. 3DA
2	Nov 7 03	PS	D WALLACE	D WALLACE	12/12/02	ZTG038	84702084				


FLD R 16.1 FIELD IND ??? H (UNSAT)



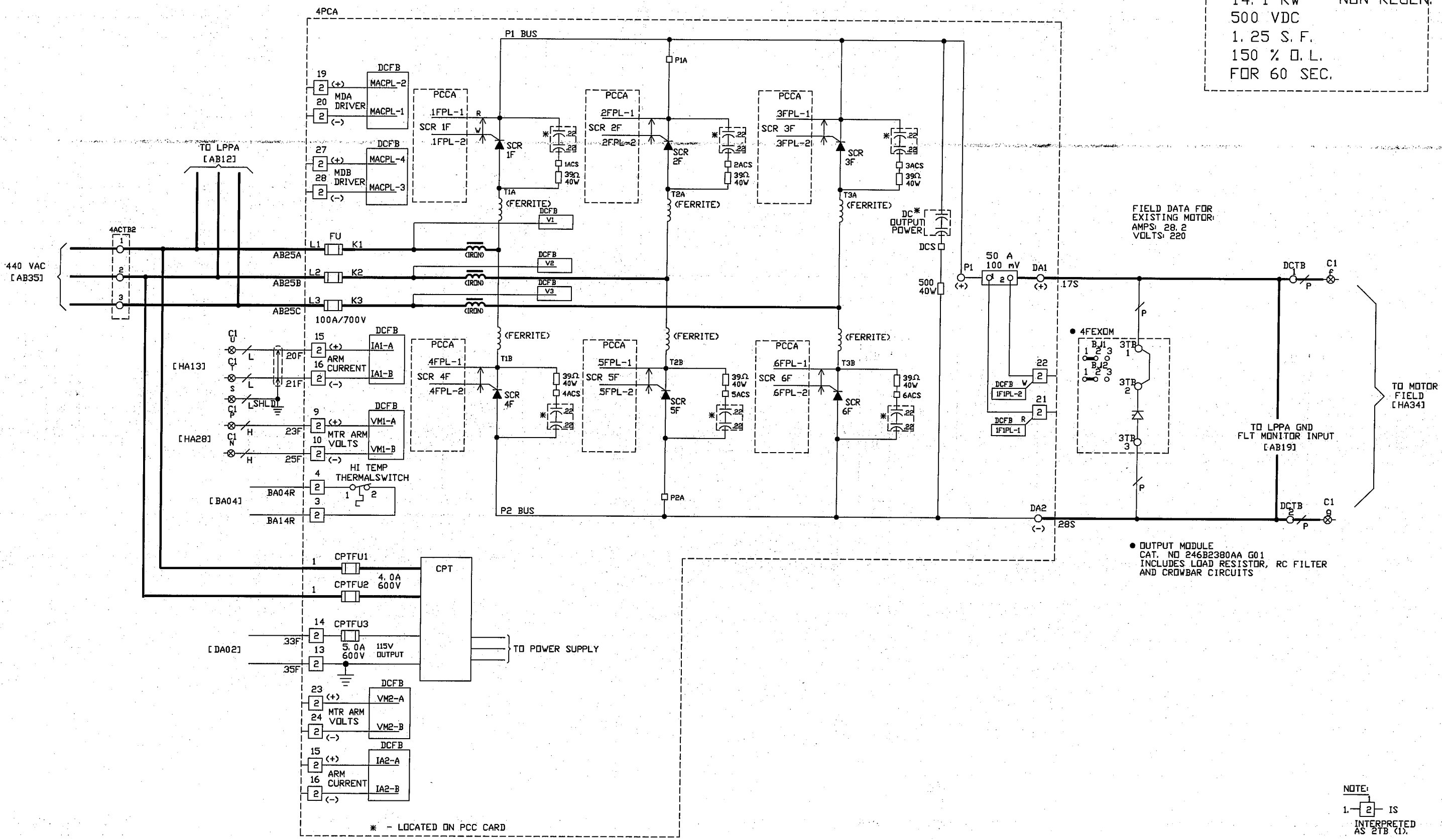
(USE NEXT STD. RES = 250 Ω , 1/4 WATT)



* WESTINGHOUSE DWG 749C089-1 SHT 20

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION														
2	Nov 26 03	PS	D. WALLACE	D. WALLACE	12/9/02	ZTG038	84702084		GENERAL ELECTRIC - ENGINEERING SERVICES							ELEMENTARY DIAGRAM GRIFFON PORT INBOARD GEN EXC. GENERATOR ARMATURE CIRCUIT			359B7019CA CONT. ON SH. 4AA		SH. NO. 3HA

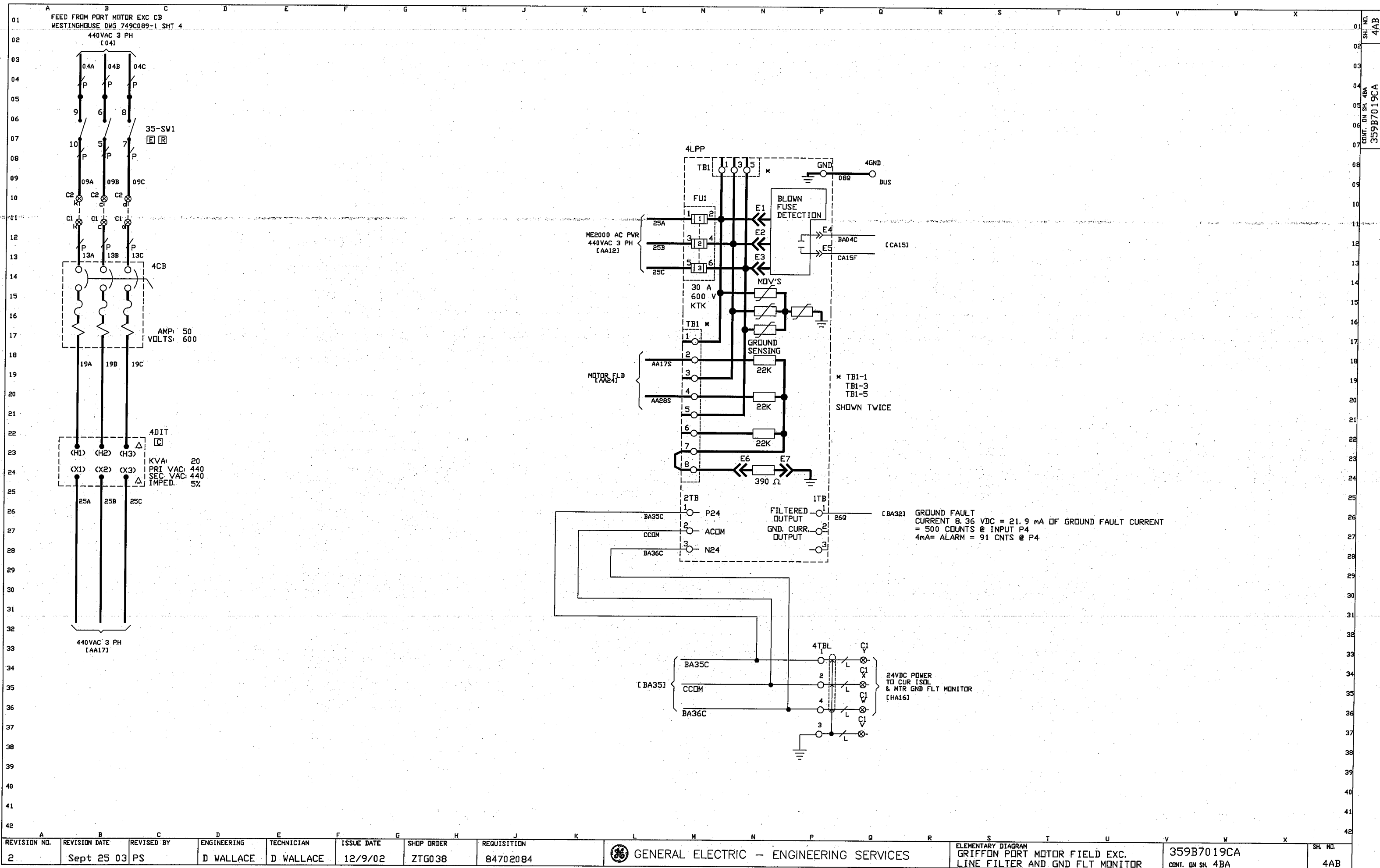
MODEL NO. 3VZTG038CD004
 SEE GEH-6150
 ME2000 G-FRAME
 14.1 KW NON-REGEN.
 500 VDC
 1.25 S. F.
 150 % O. L.
 FOR 60 SEC.

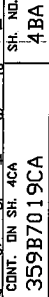



FIELD DATA FOR
 EXISTING MOTOR:
 AMPS: 28.2
 VOLTS: 220

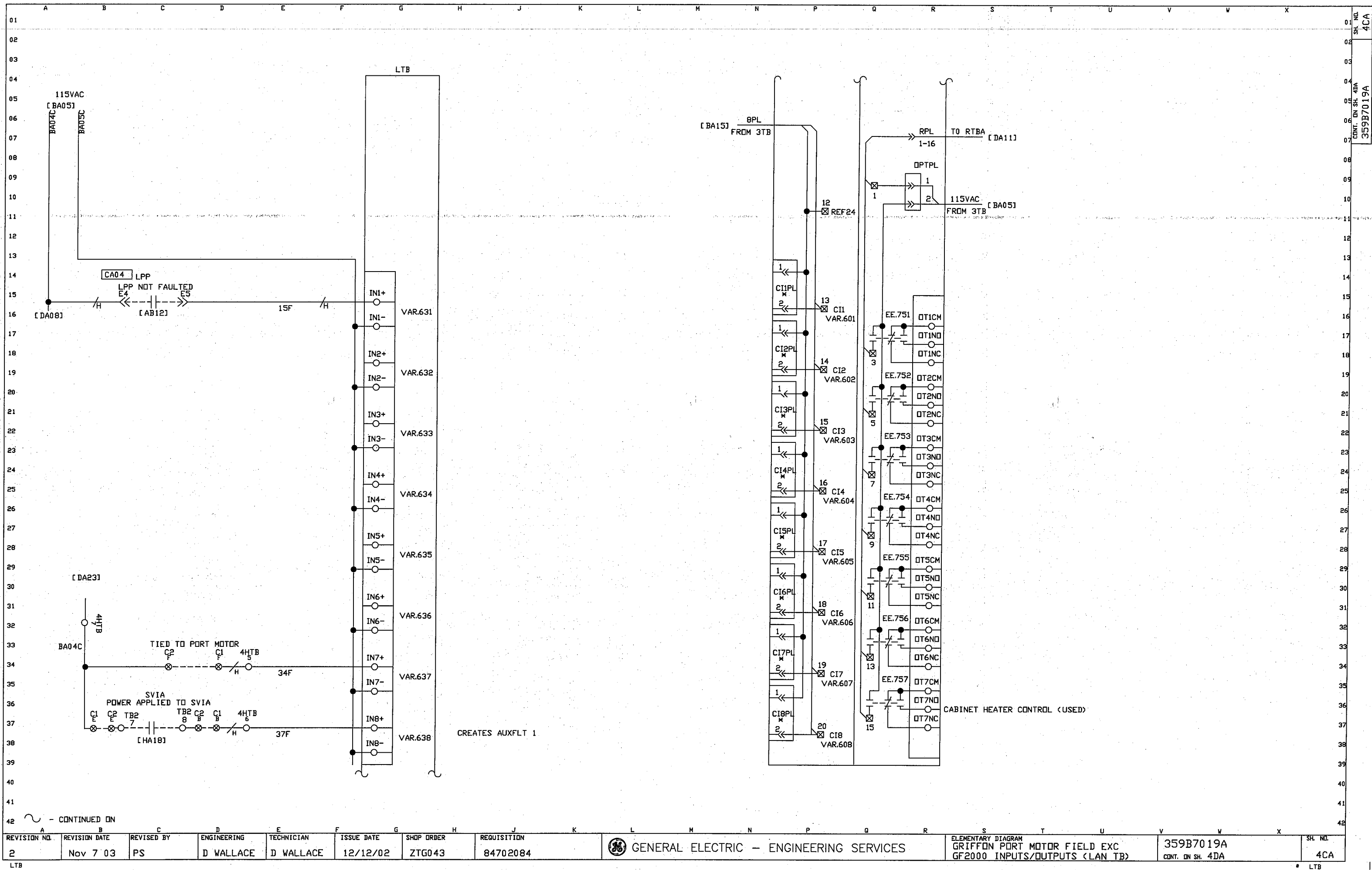
• OUTPUT MODULE
 CAT. NO 246B2380AA G01
 INCLUDES LOAD RESISTOR, RC FILTER
 AND CROWBAR CIRCUITS

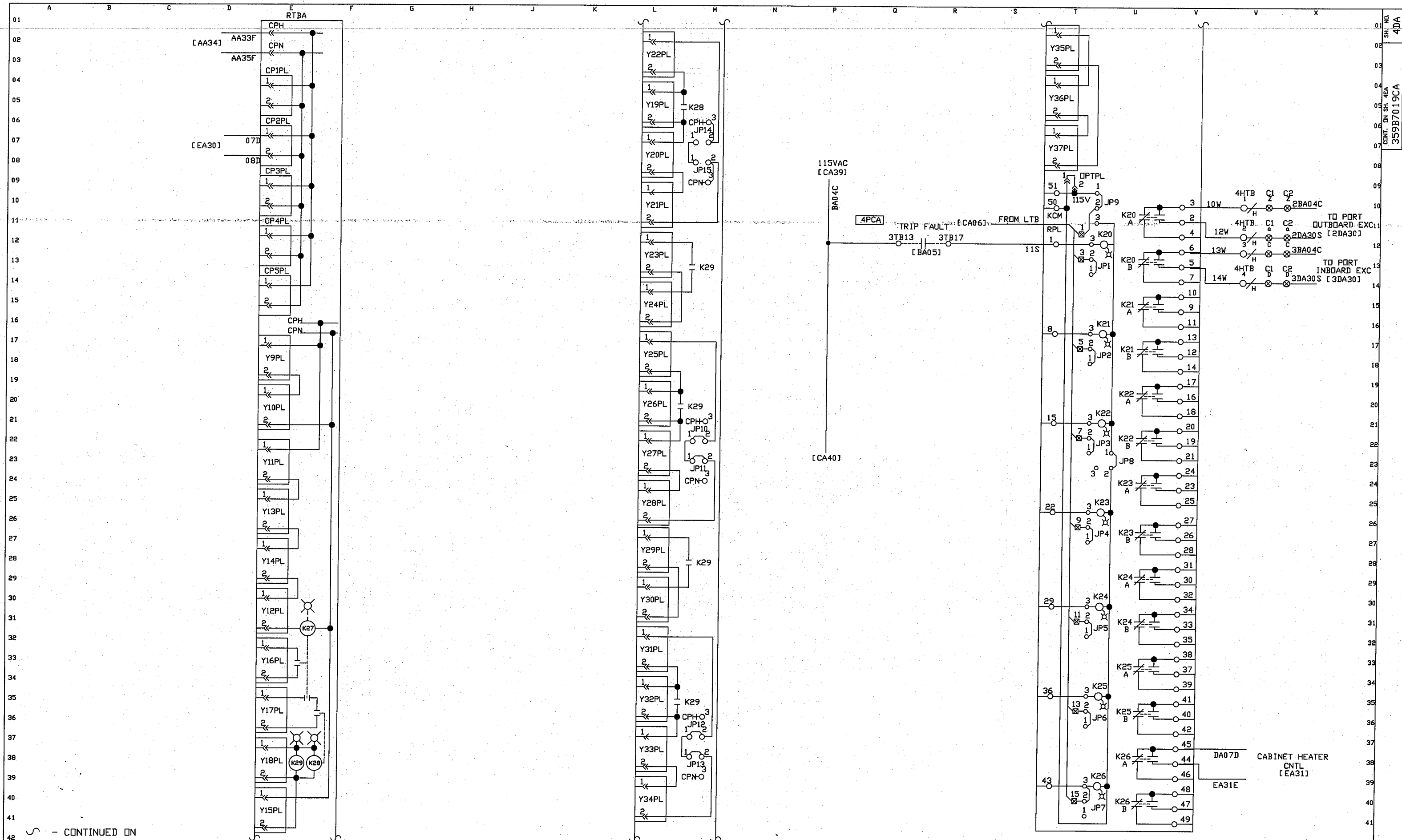
NOTE:
 1. 2 IS
 INTERPRETED
 AS 2TB (1).



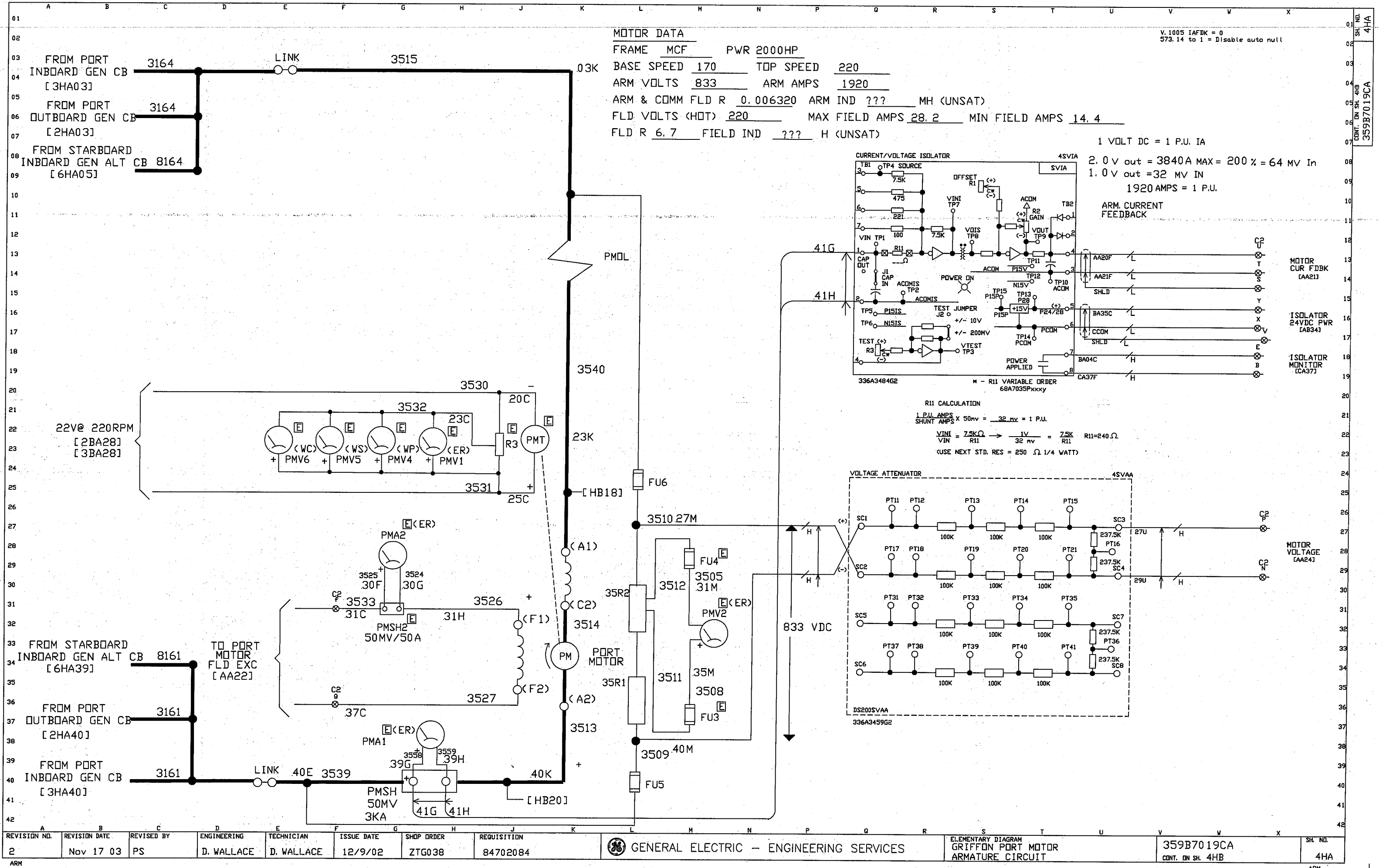


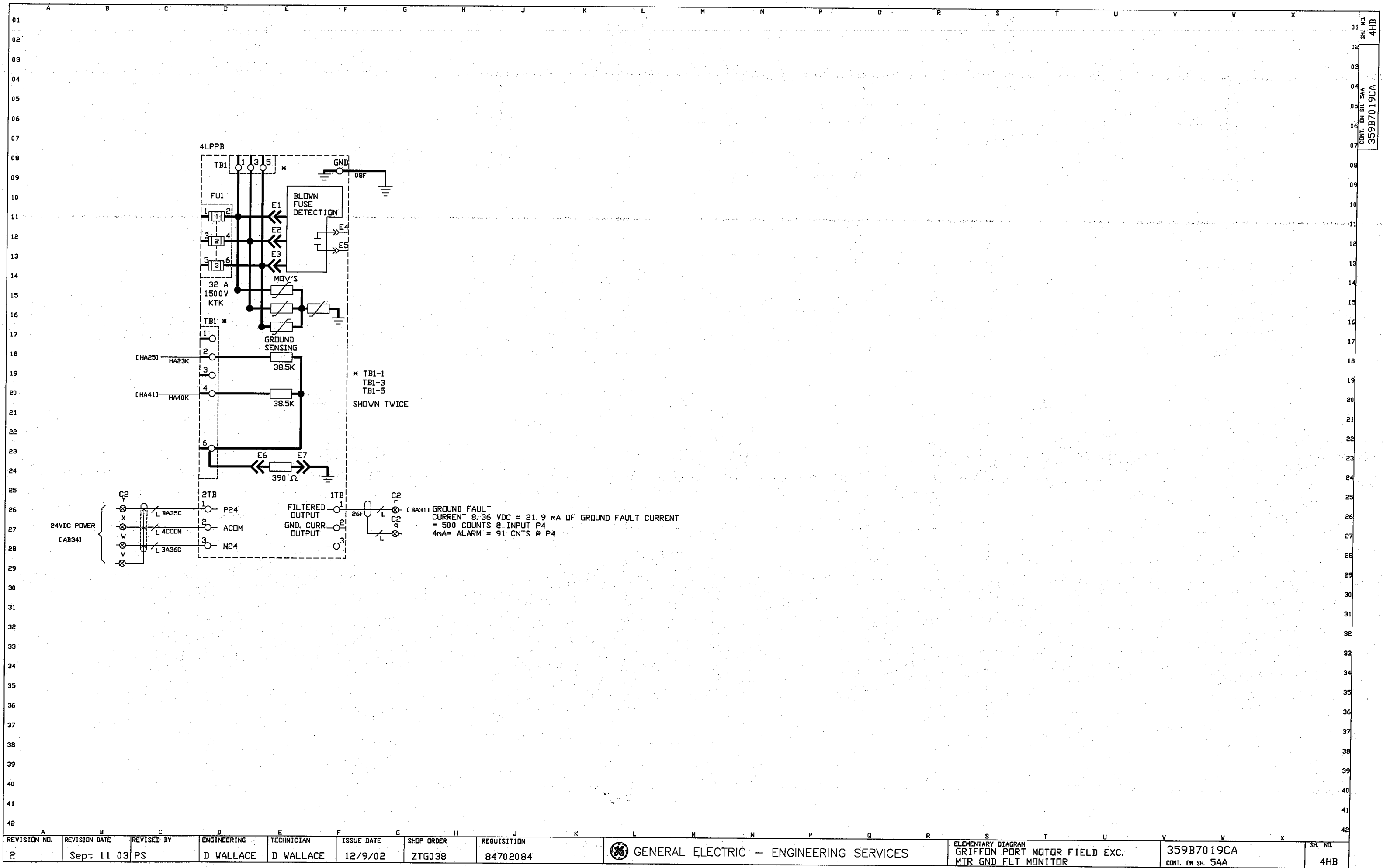
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION														
3	Nov 7 03	PS	D WALLACE	D WALLACE	12/09/02	ZTG038	84702084			 GENERAL ELECTRIC - ENGINEERING SERVICES							ELEMENTARY DIAGRAM GRIFFON PORT MOTOR FIELD EXC CONTROL IFC/3TB RELAYS		359B7019CA CONT. ON SH. 4CA	SH. NO. 4BA	



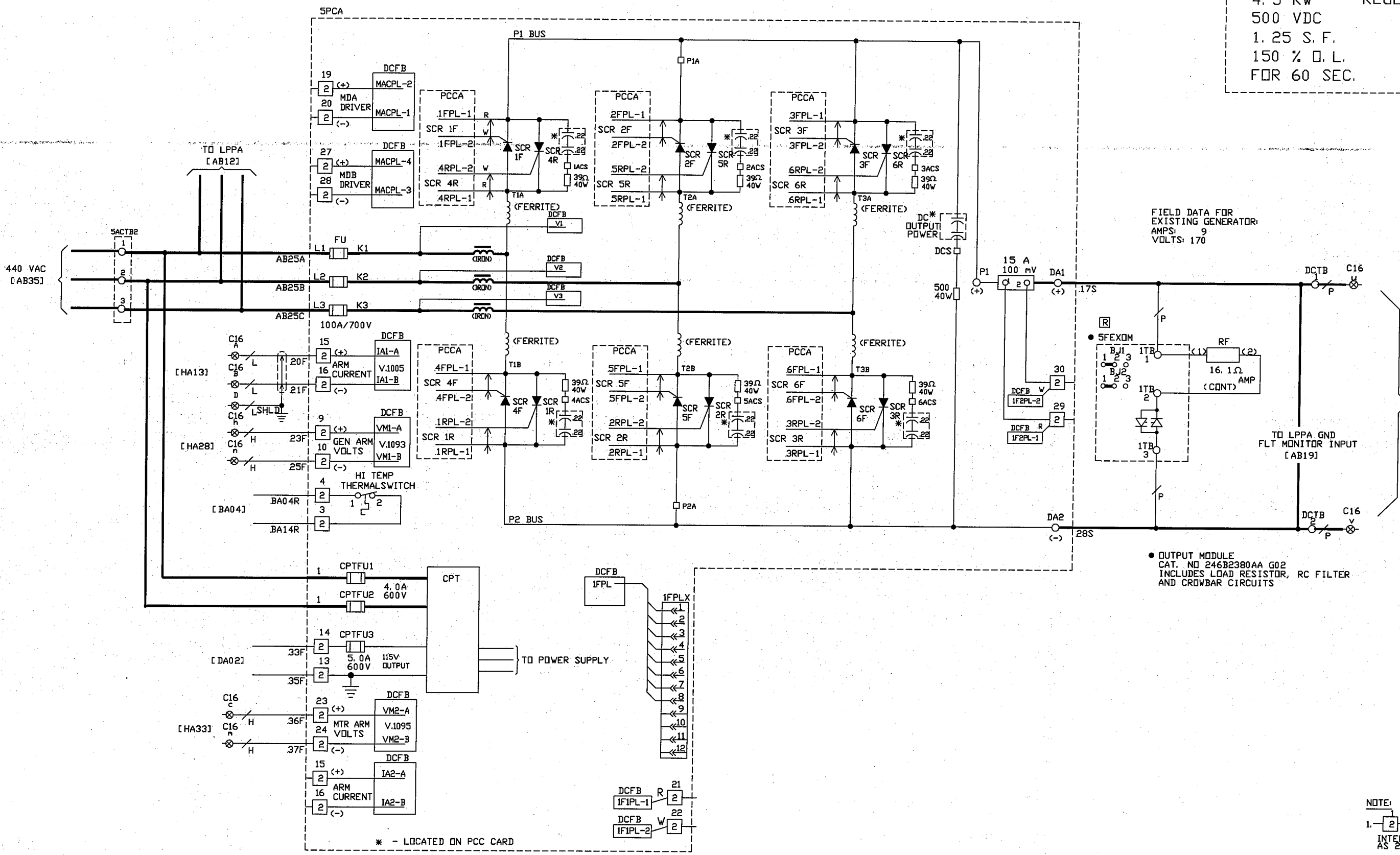


REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC — ENGINEERING SERVICES				ELEMENTARY DIAGRAM GRIFFON PORT MOTOR FIELD EXC GF2000 RELAY TB				359B7019CA	SH. NO.
2	Nov 7 03	PS	D WALLACE	D WALLACE	12/12/02	ZTG038	84702084									CONT. ON SH. 4EA	4DA





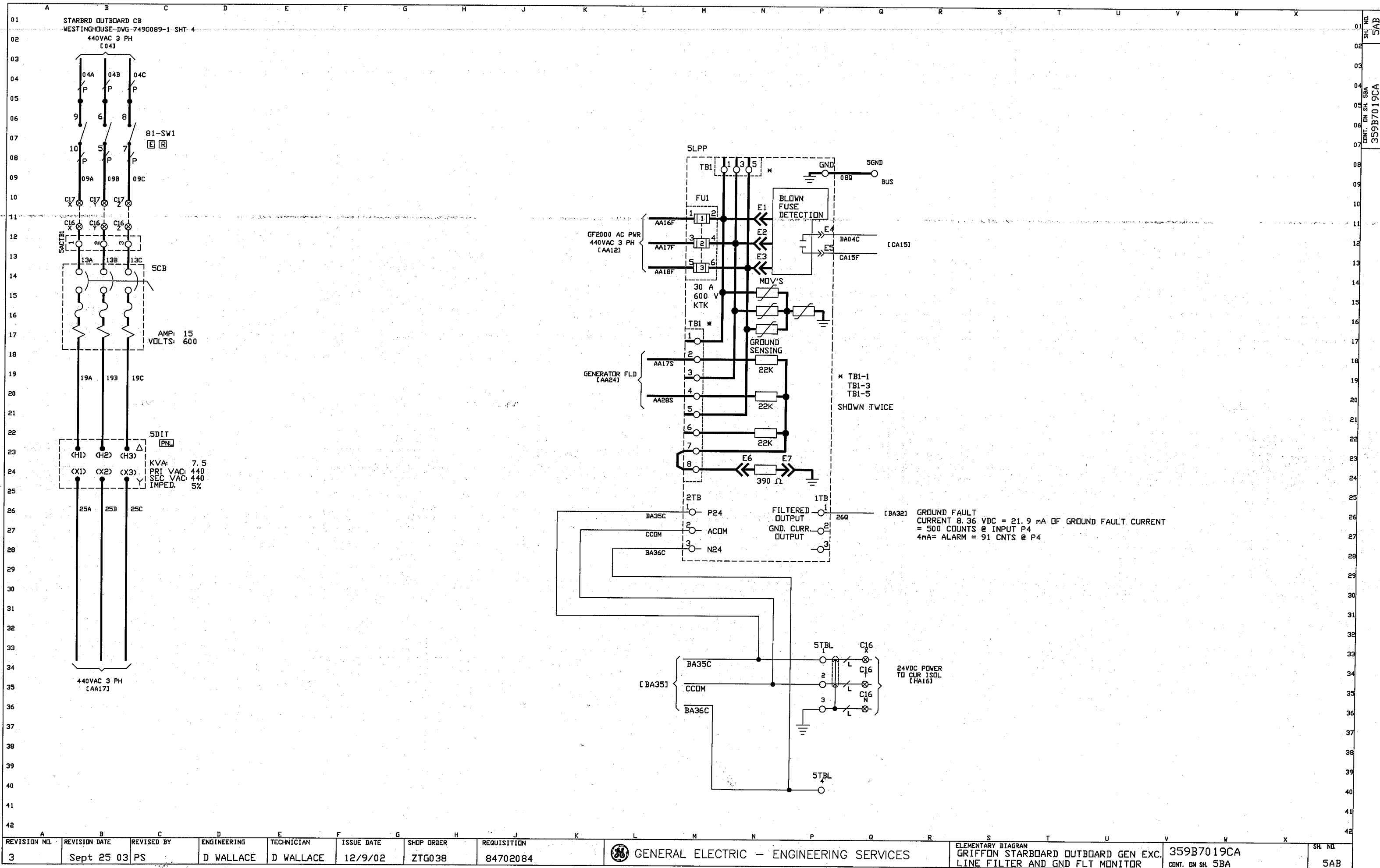
MODEL NO. 3VZTG038CD005
 SEE GEH-6148
 GF2000 G-FRAME
 4.5 KW REGEN.
 500 VDC
 1.25 S. F.
 150 % O. L.
 FOR 60 SEC.

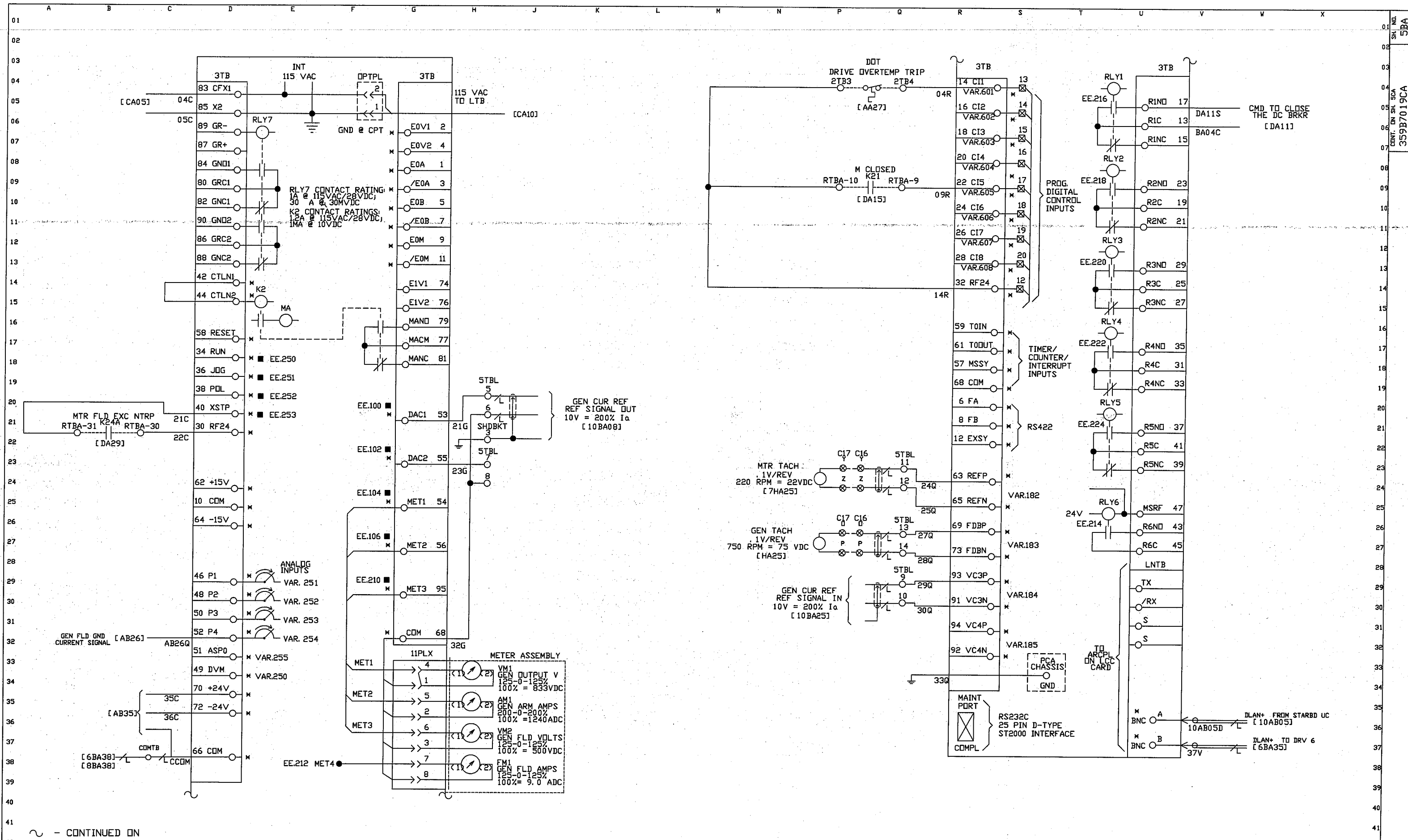


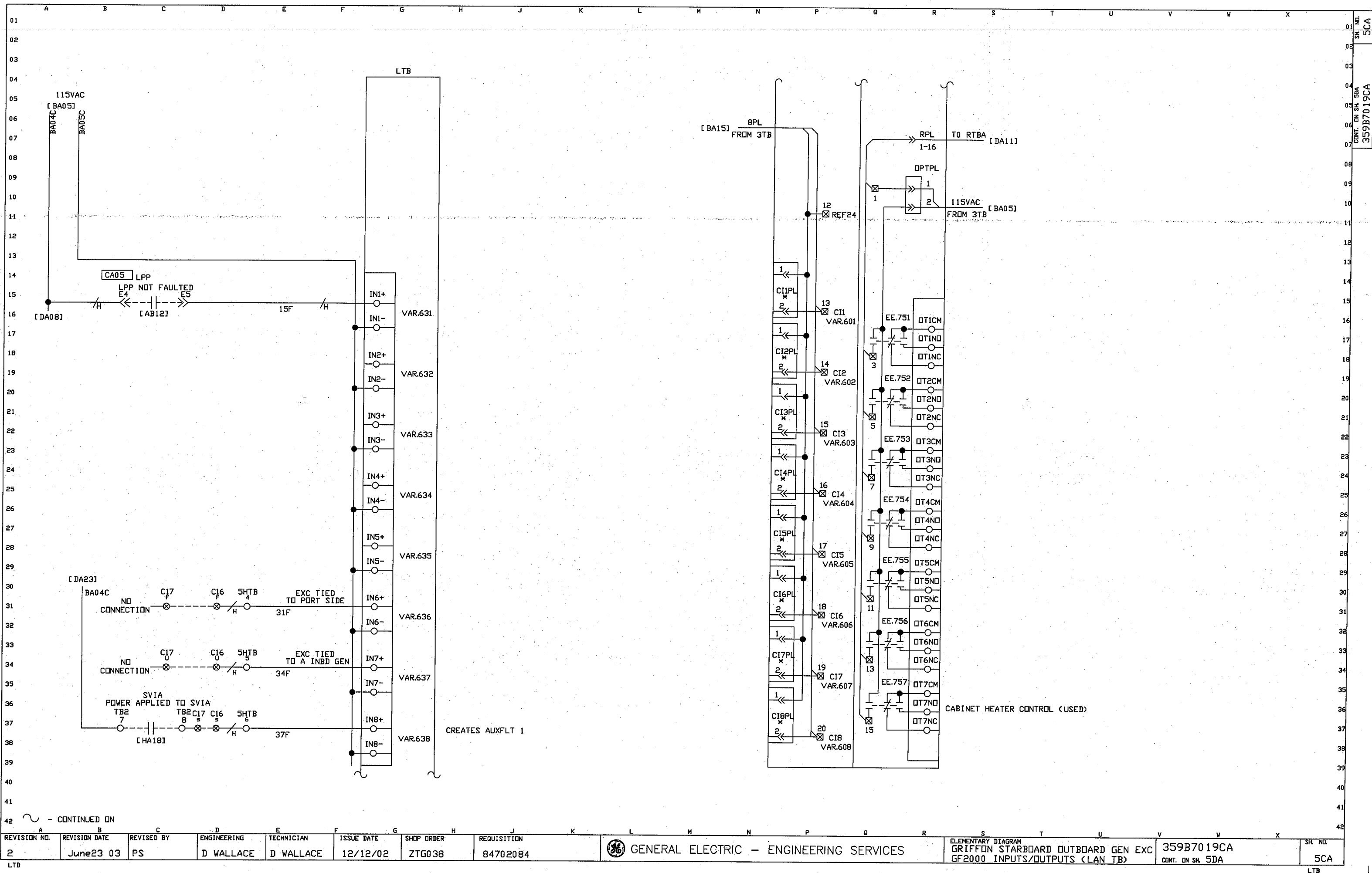
FIELD DATA FOR
 EXISTING GENERATOR
 AMPS: 9
 VOLTS: 170

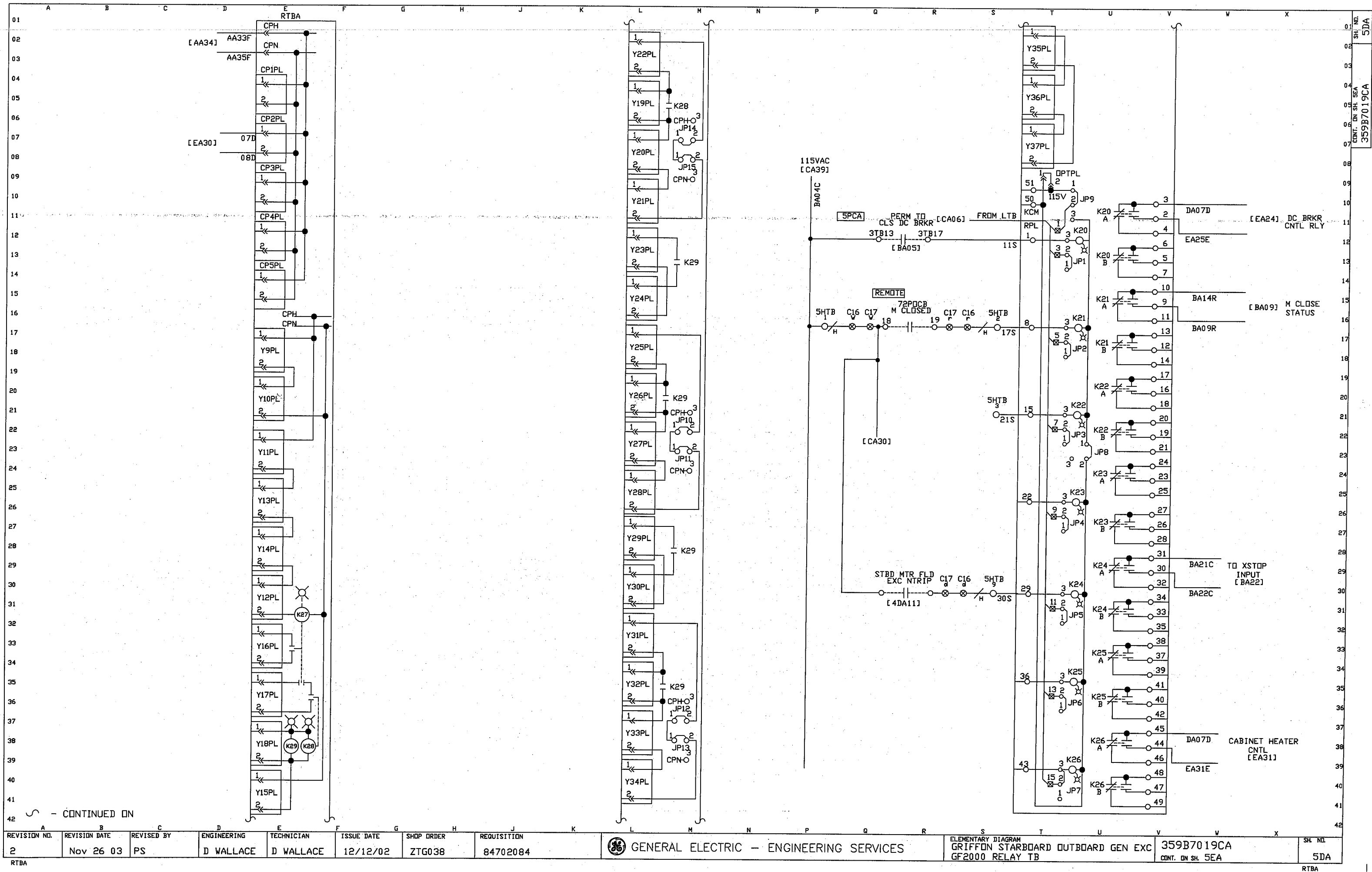
• OUTPUT MODULE
 CAT. NO 246B2380AA G02
 INCLUDES LOAD RESISTOR, RC FILTER
 AND CROWBAR CIRCUITS

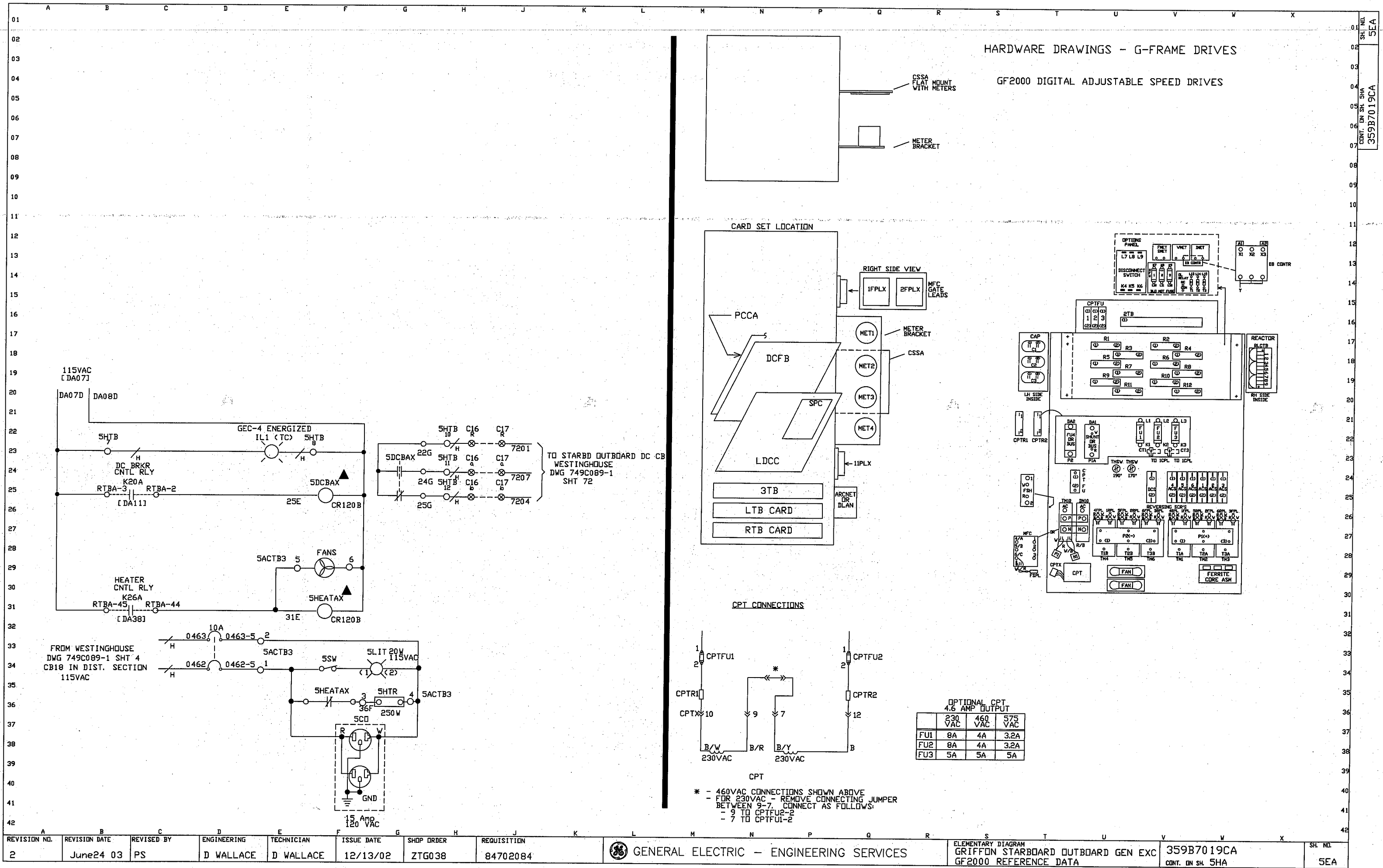
NOTE:
 1-2 IS
 INTERPRETED
 AS 2TB (1).

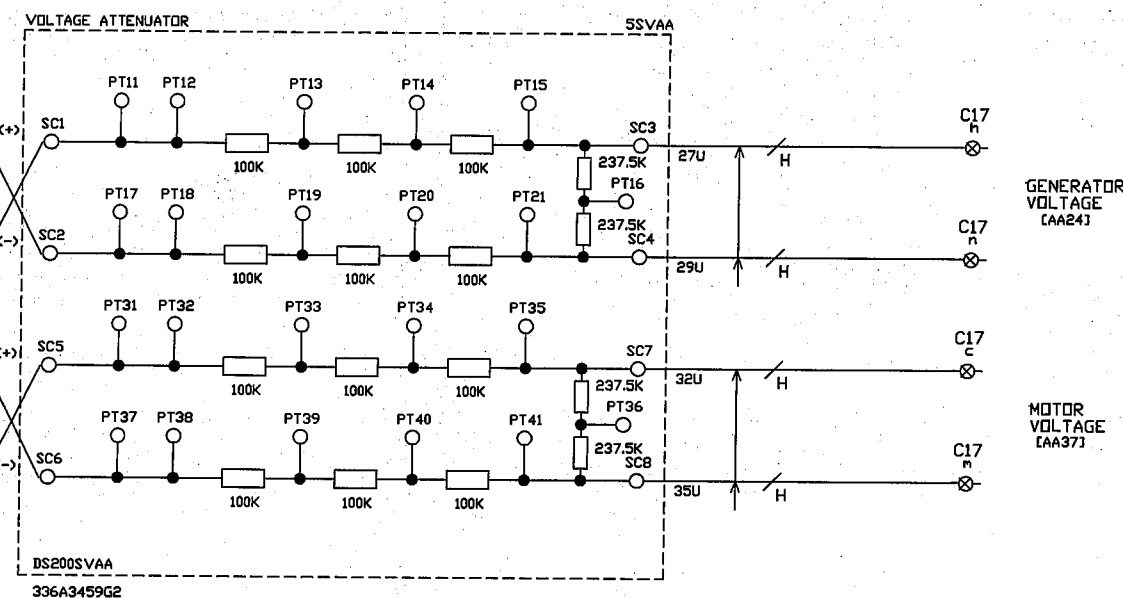
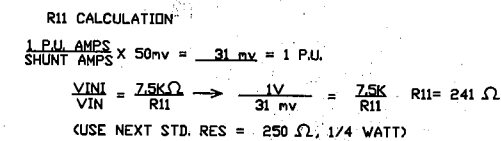











[illegible]

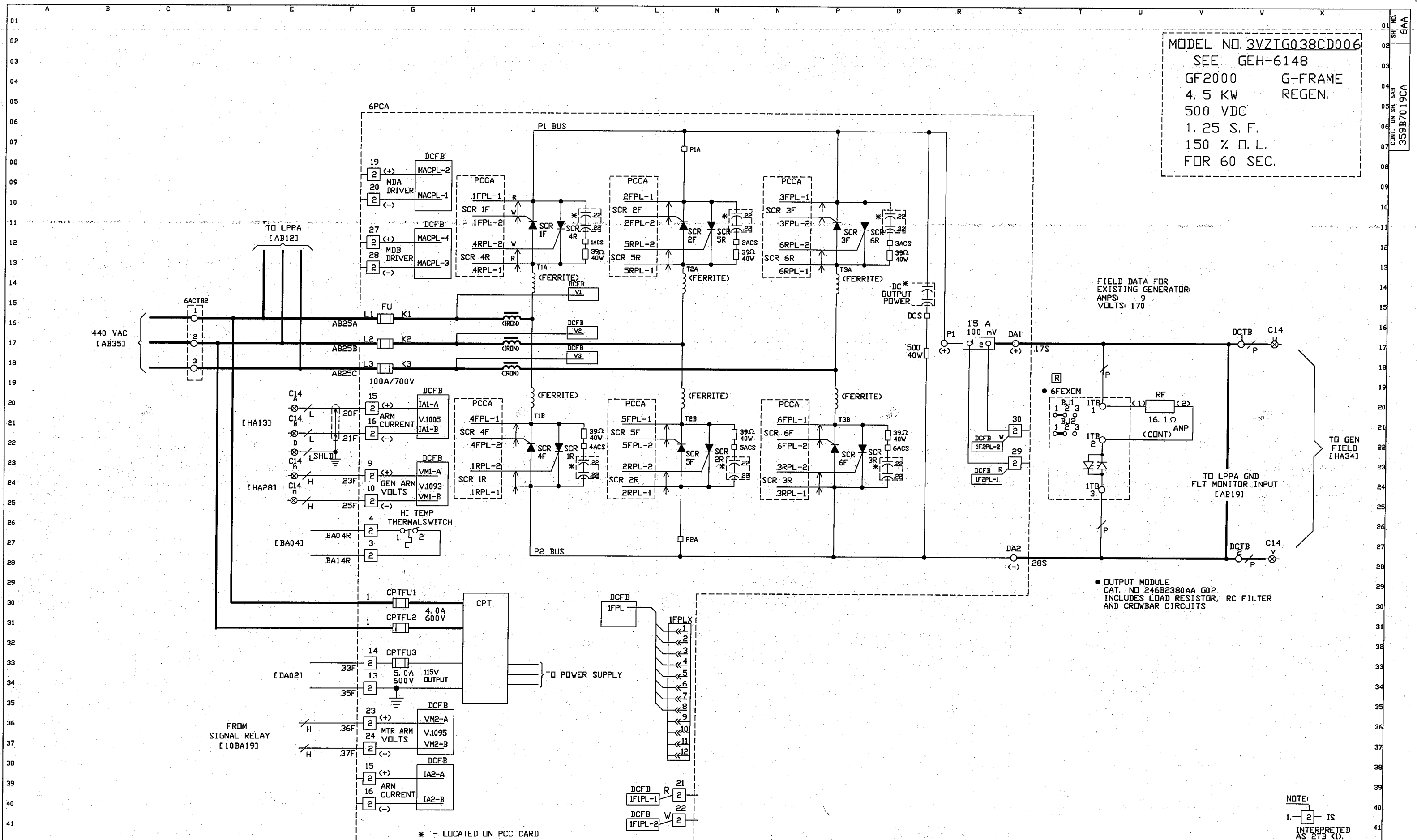
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	42
REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION															
3	Nov 26 03	PS	D. WALLACE	D. WALLACE	12/9/02	ZTG038	84702084				GENERAL ELECTRIC - ENGINEERING SERVICES						ELEMENTARY DIAGRAM	GRIFTON STARBOARD OUTBOARD GEN EXC.	359B7019CA		SH. NO.	
																		GENERATOR ARMATURE CIRCUIT	CONT. ON SH. 6AA		5HA	

MODEL NO. 3VZTG038CD006
 SEE GEH-6148
 GF2000 G-FRAME
 4.5 KW REGEN.
 500 VDC
 1.25 S.F.
 150 % O.L.
 FOR 60 SEC.

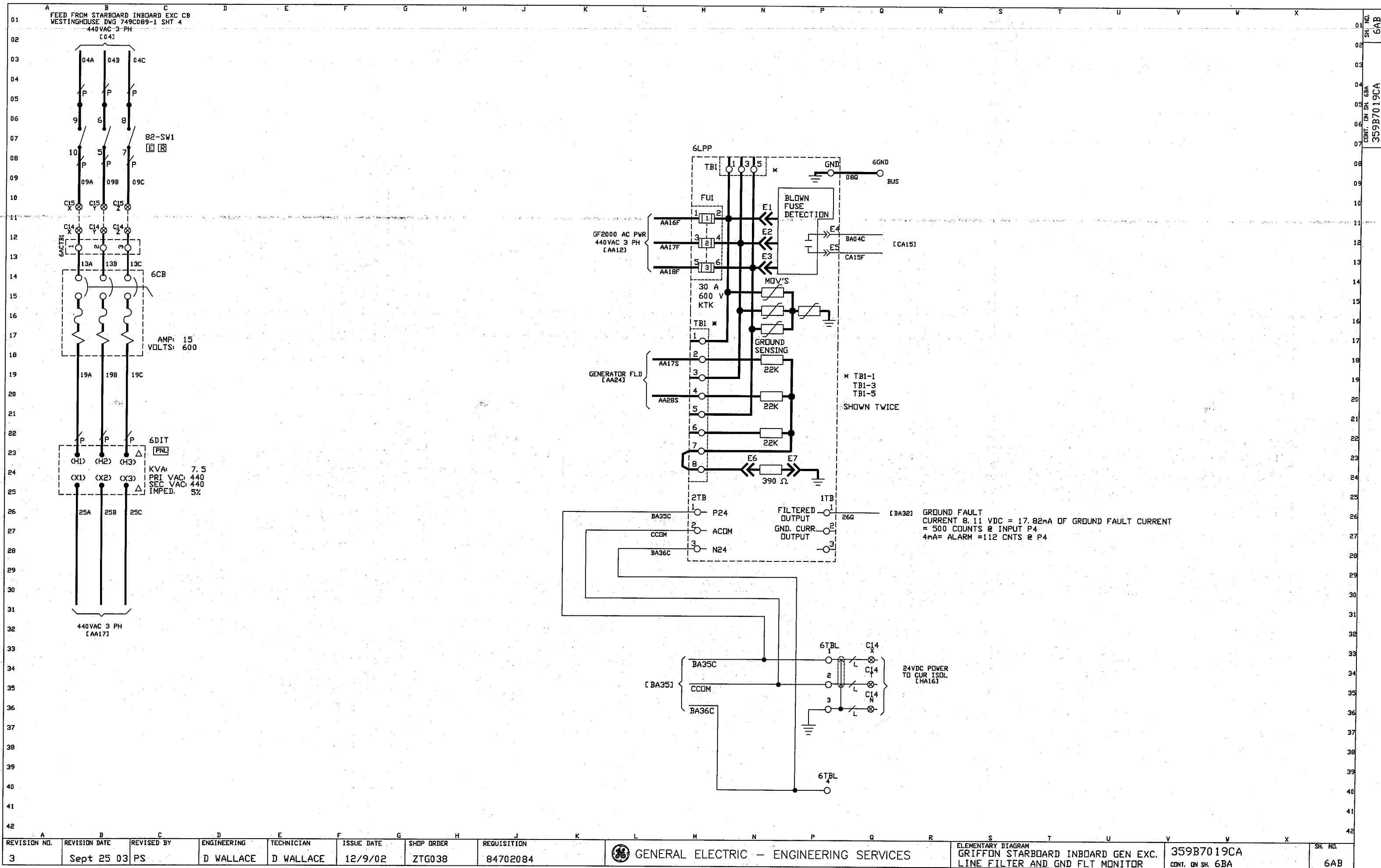
FIELD DATA FOR
 EXISTING GENERATOR:
 AMPS: 9
 VOLTS: 170

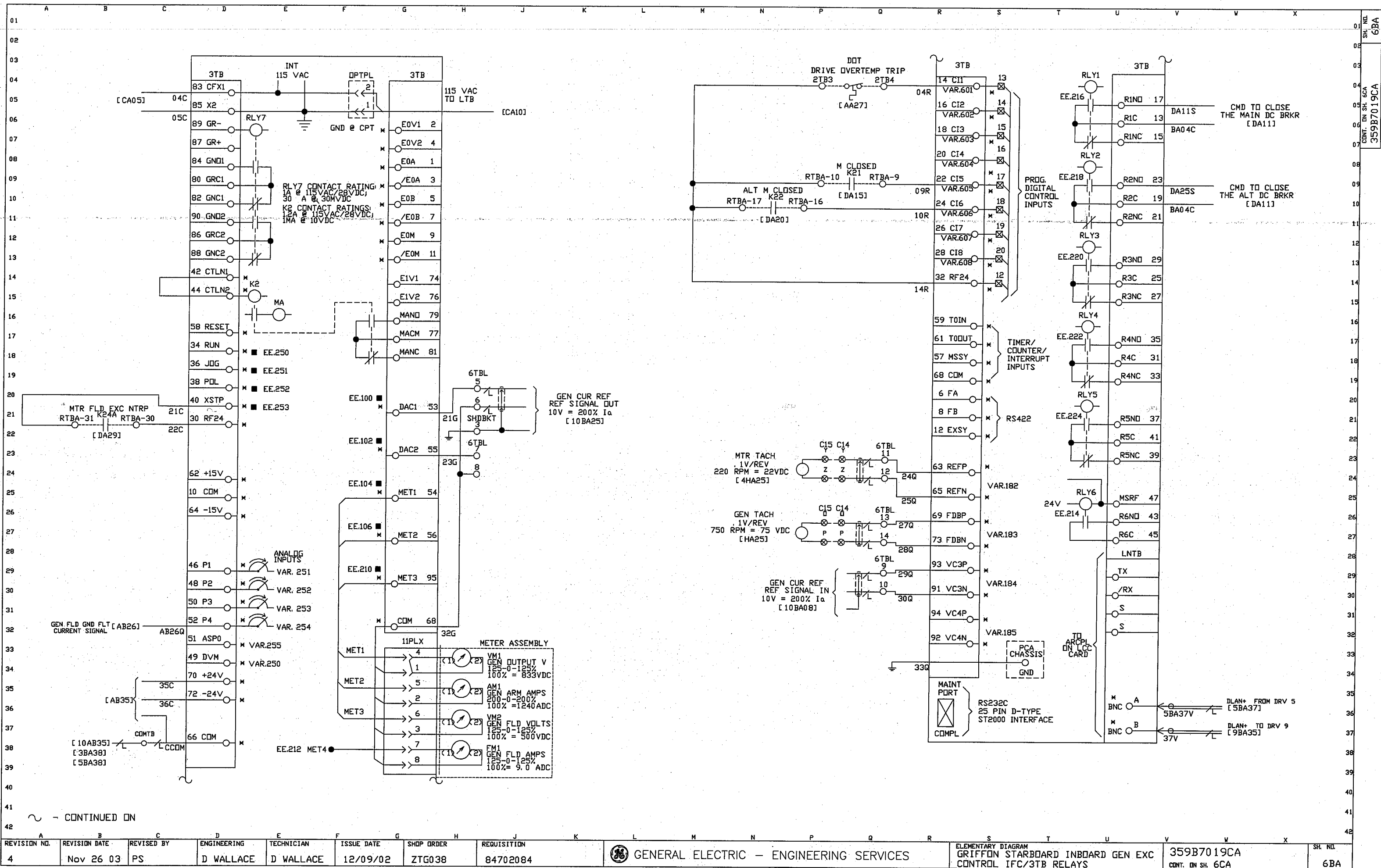
• OUTPUT MODULE
 CAT. NO 246B2380AA G02
 INCLUDES LOAD RESISTOR, RC FILTER
 AND CROWBAR CIRCUITS

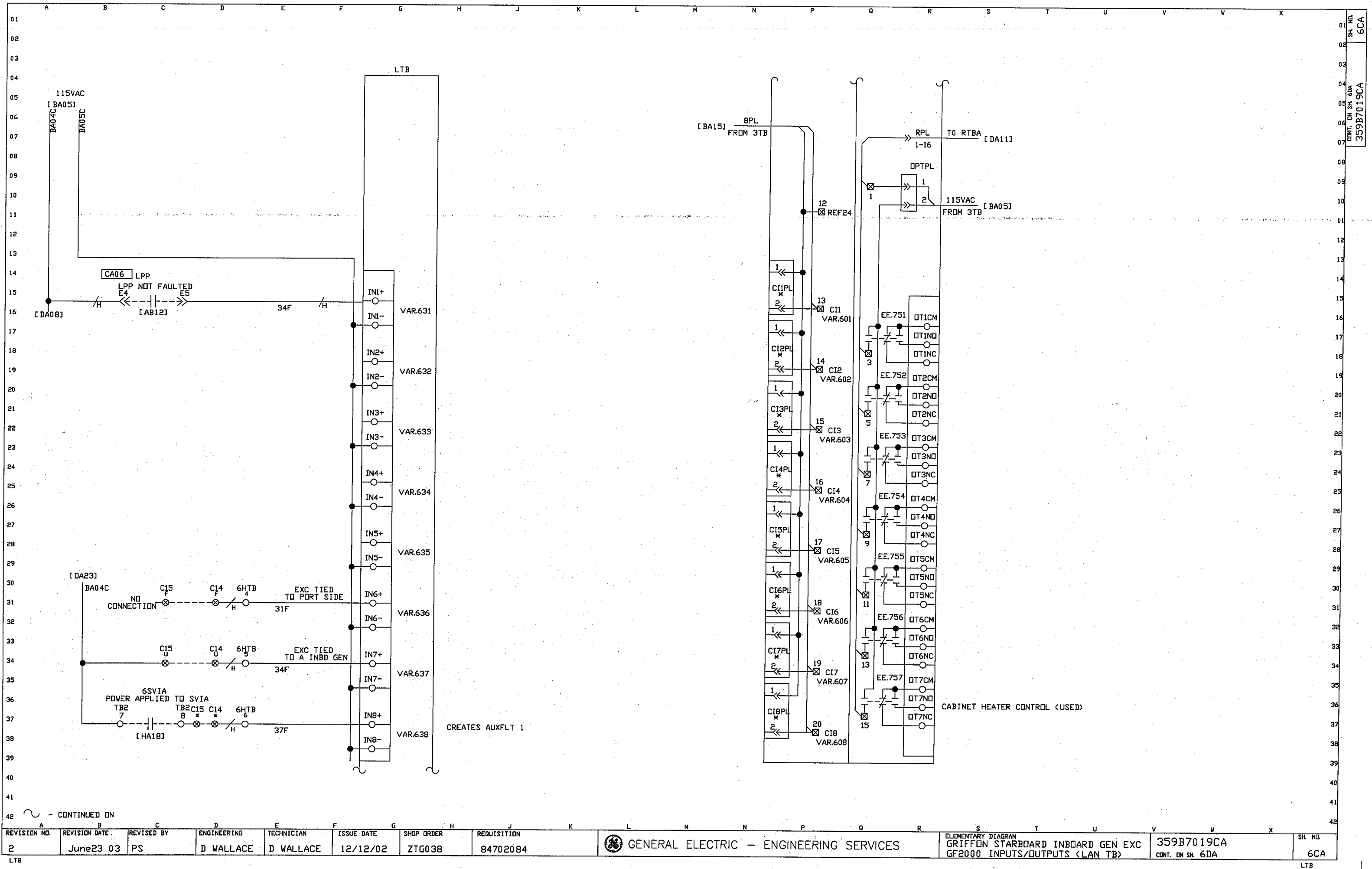
NOTE:
 1. 2 IS
 INTERPRETED
 AS 2TB (1).

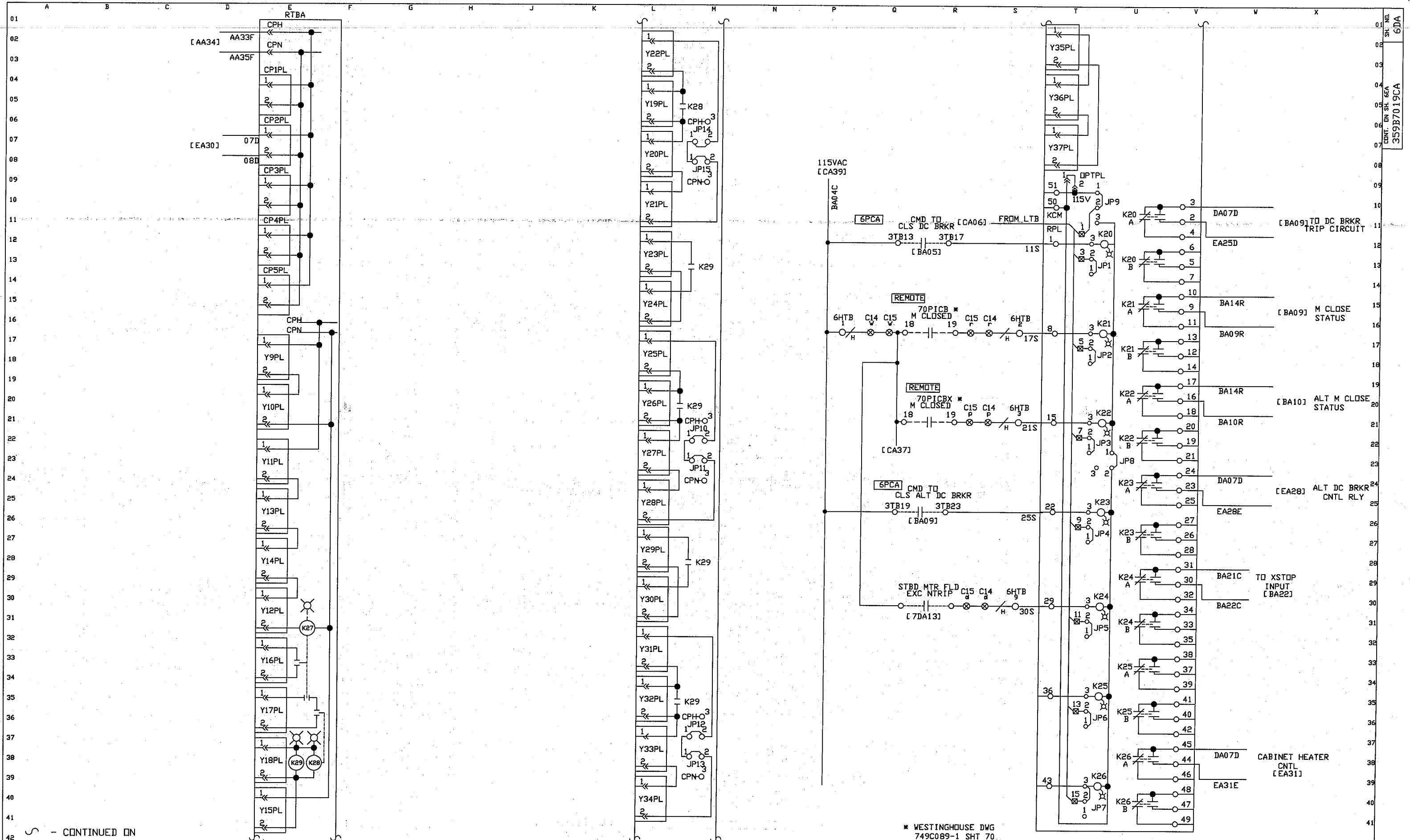


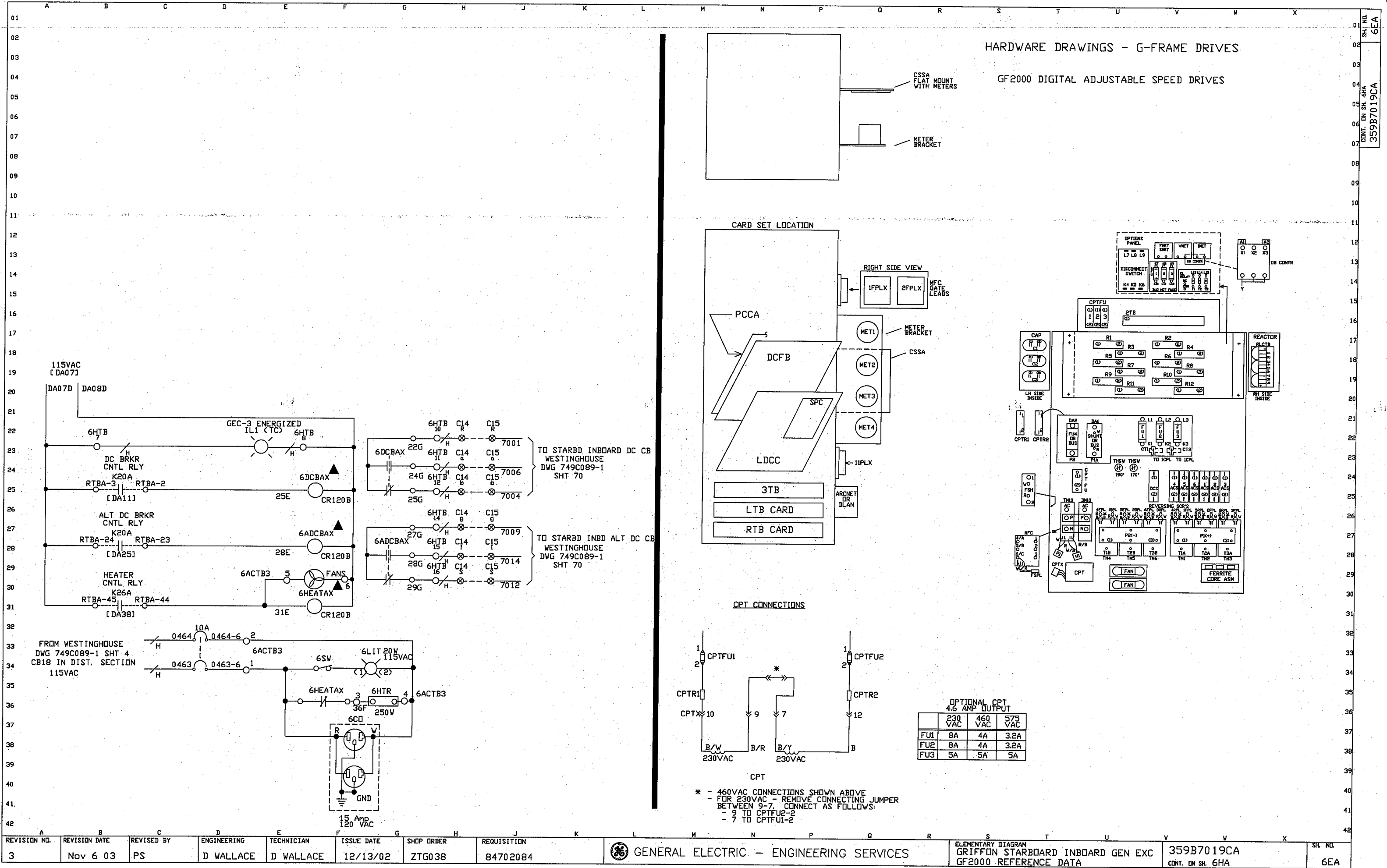
REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	ELEMENTARY DIAGRAM	GRIFTON STARBOARD INBOARD GEN EXC	CONVERTER	359B7019CA	SH. NO.
2	Nov 26 03	PS	D WALLACE	D WALLACE	12/9/02	ZTG038	84702084	GENERAL ELECTRIC - ENGINEERING SERVICES			CONT. ON SH. 6AB	6AA



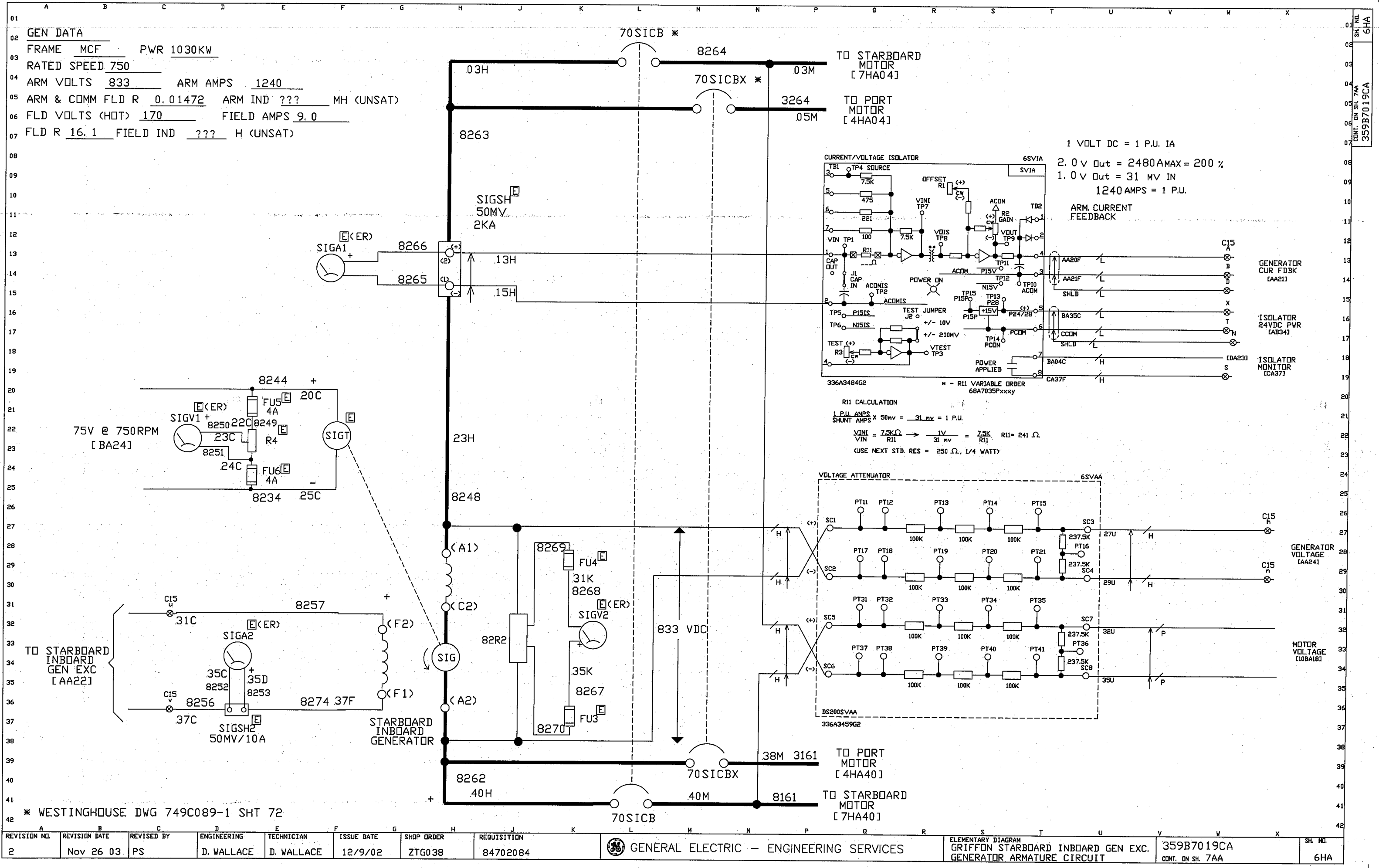




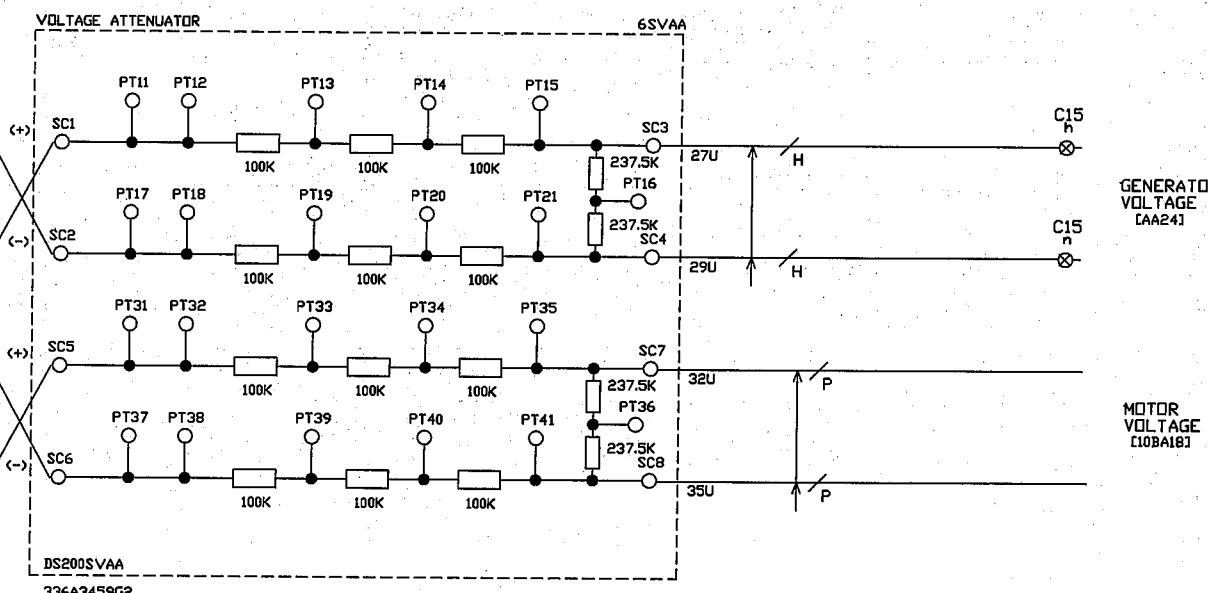
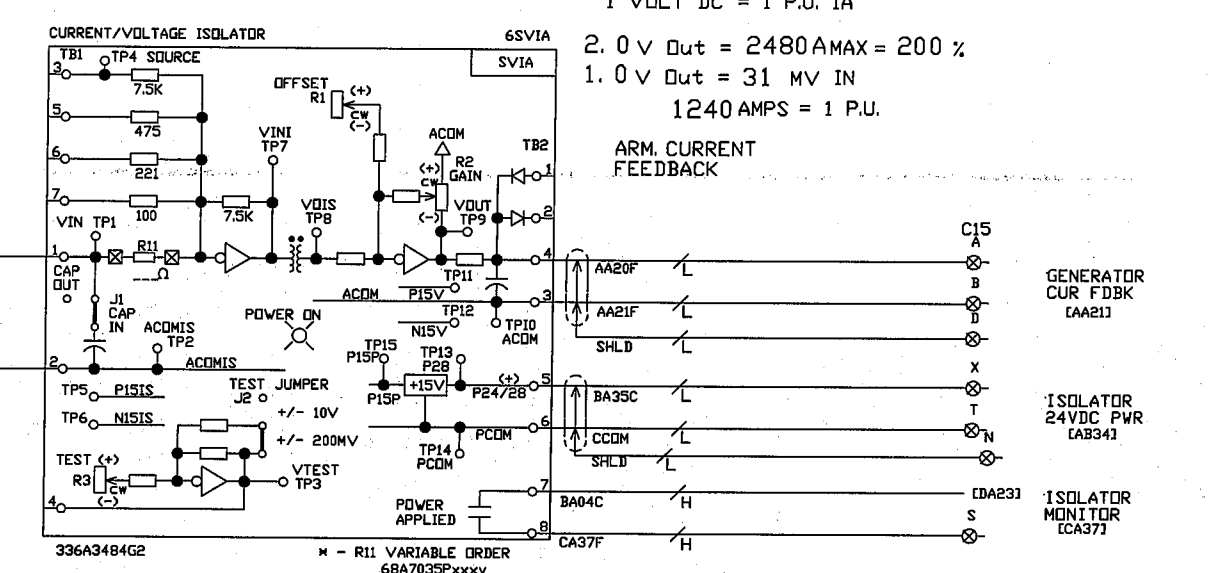


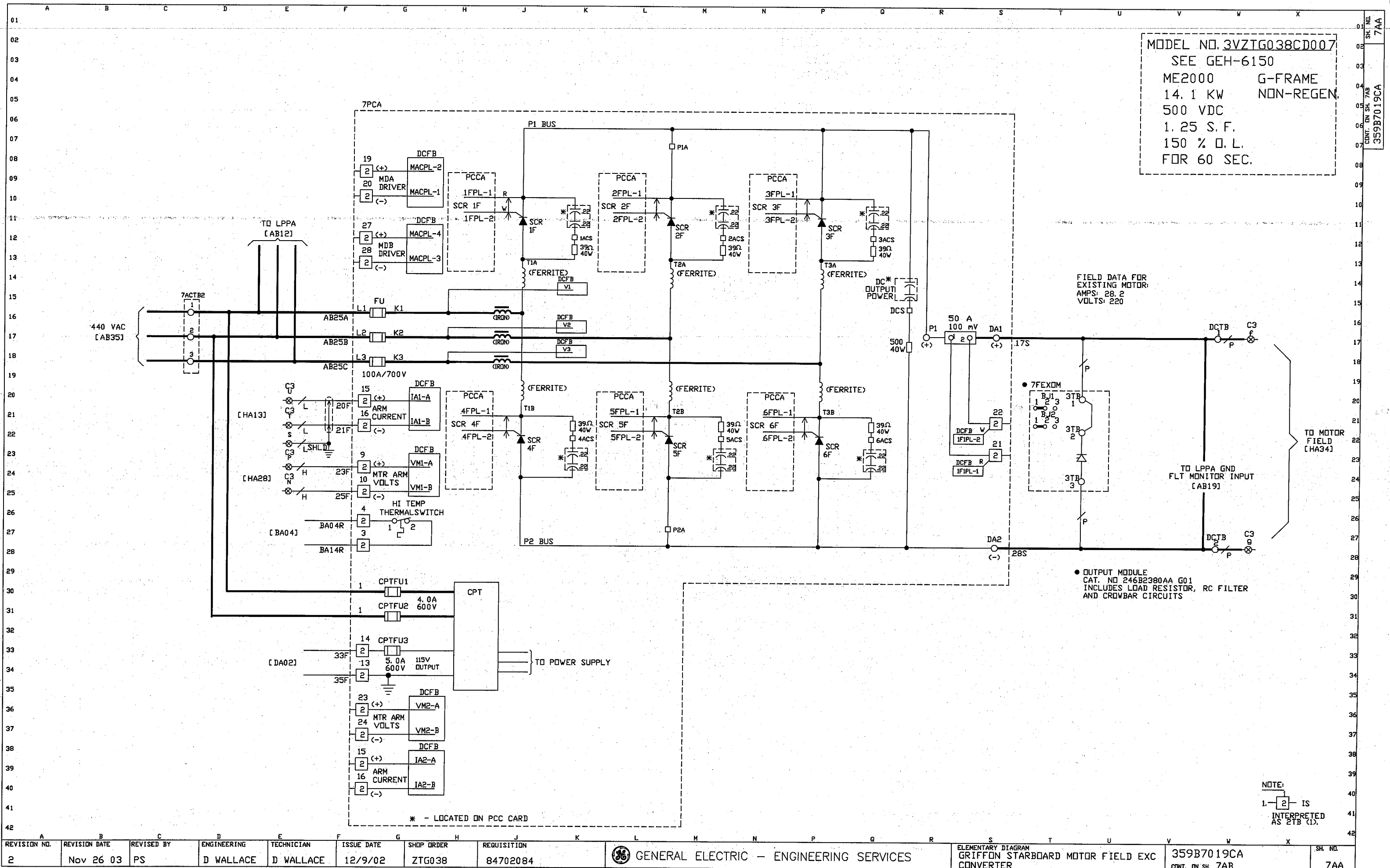


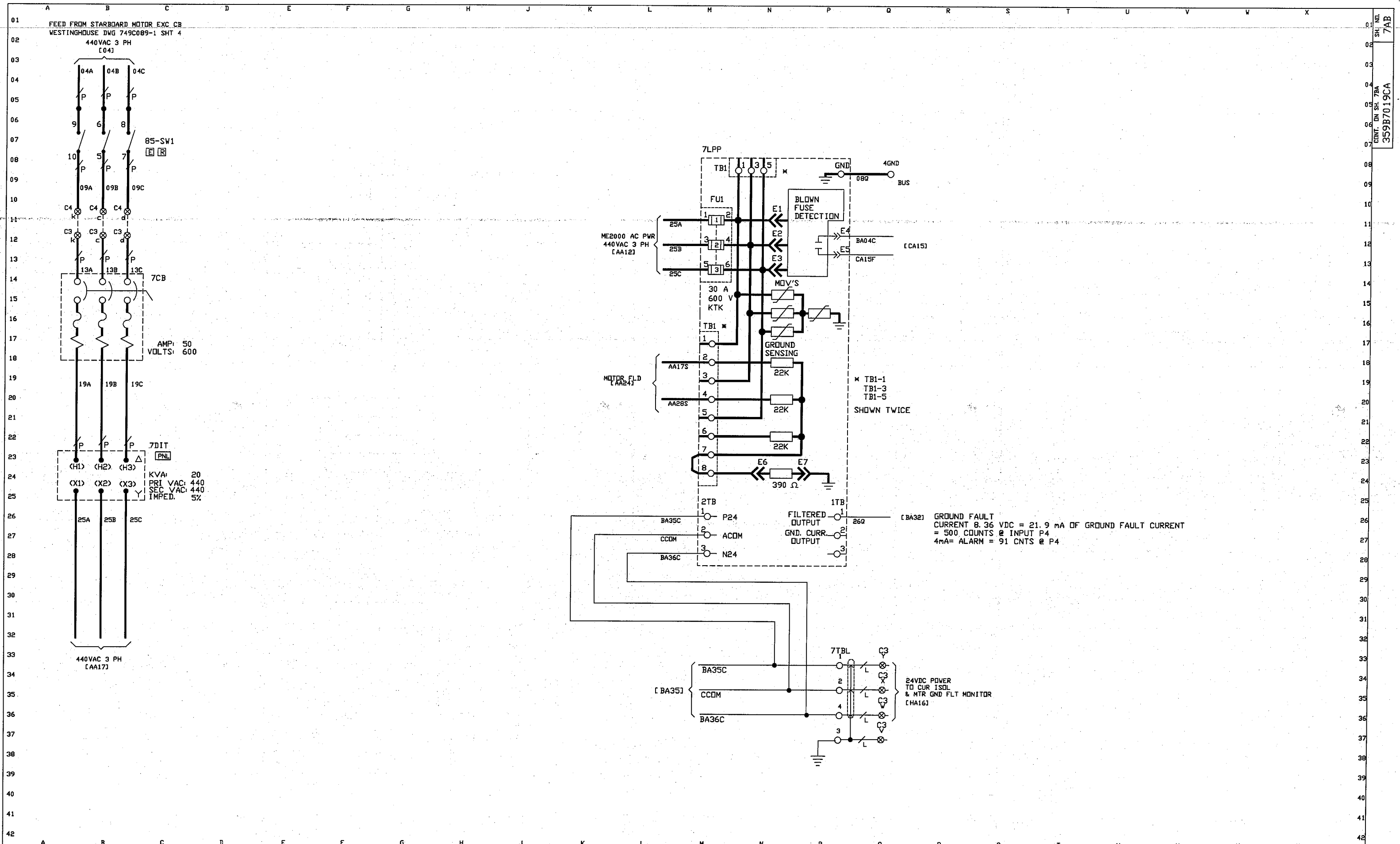
REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC - ENGINEERING SERVICES	ELEMENTARY DIAGRAM	GF2000 REFERENCE DATA	359B7019CA	CONT. ON SH. 6HA	SH. NO.
3	Nov 6 03	PS	D WALLACE	D WALLACE	12/13/02	ZTG038	84702084						6EA

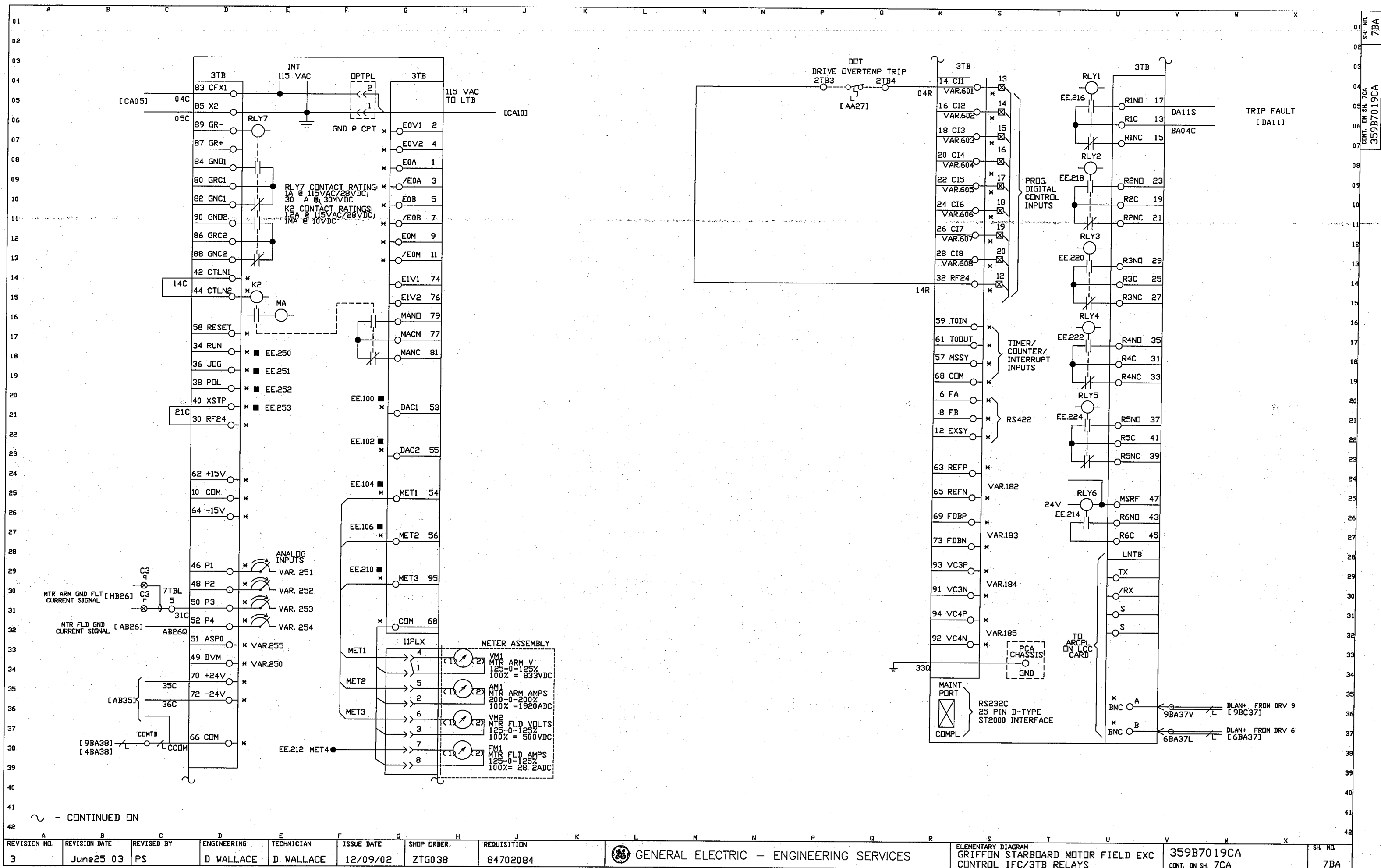


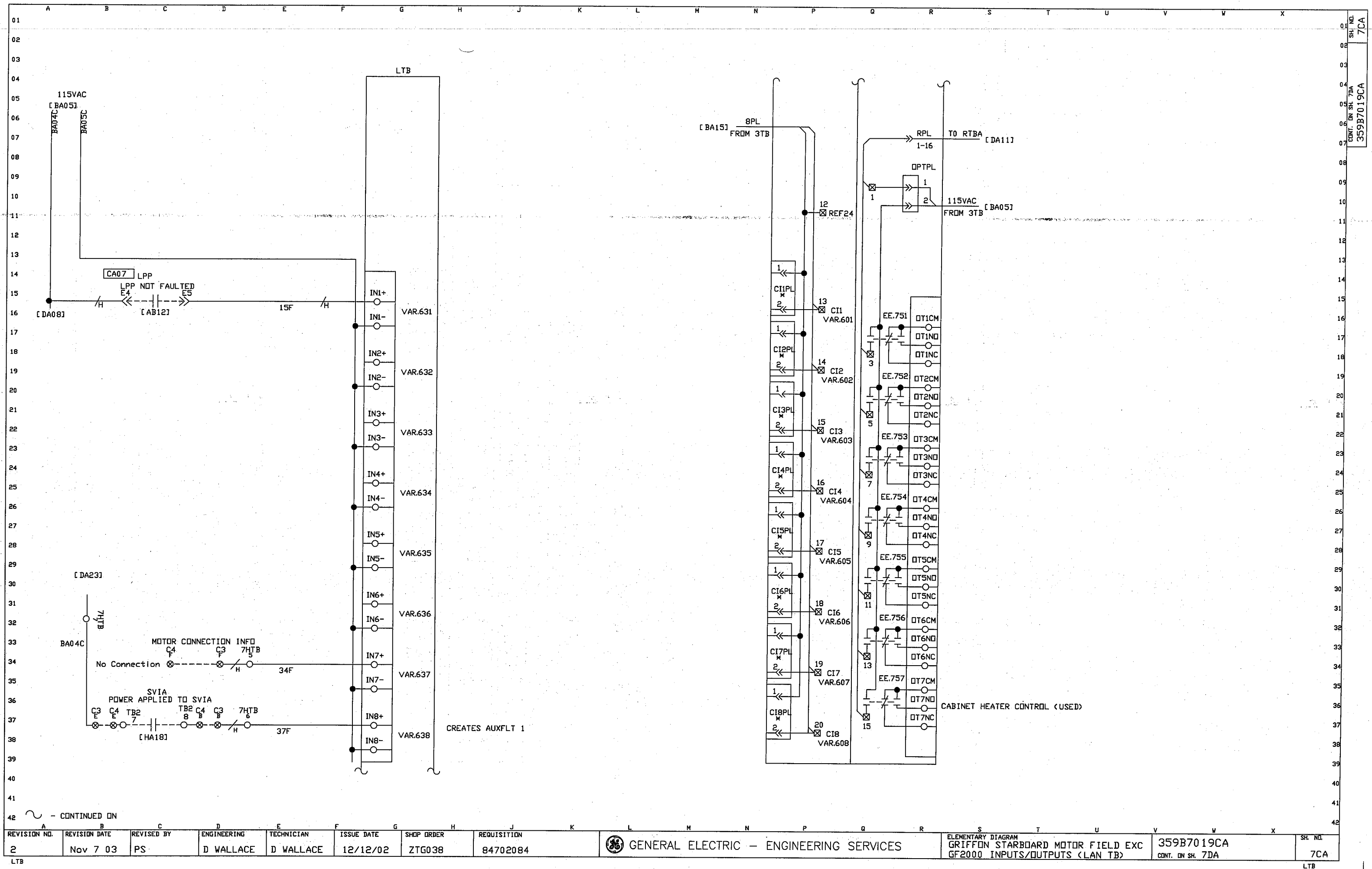
01 GEN DATA
02 FRAME MCF PWR 1030KW
03 RATED SPEED 750
04 ARM VOLTS 833 ARM AMPS 1240
05 ARM & COMM FLD R 0.01472 ARM IND ??? MH (UNSAT)
06 FLD VOLTS (HOT) 170 FIELD AMPS 9.0
07 FLD R 16.1 FIELD IND ??? H (UNSAT)

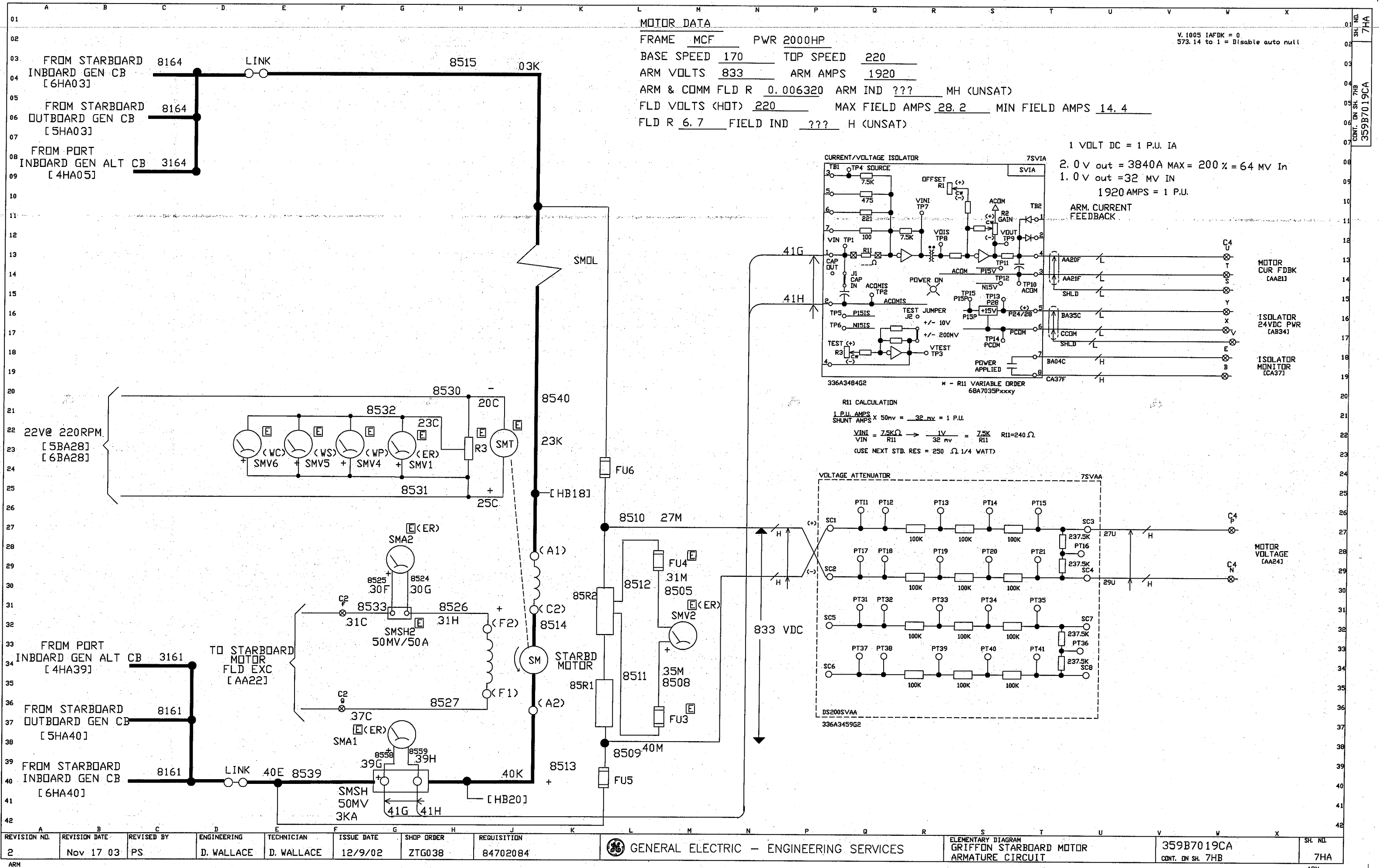








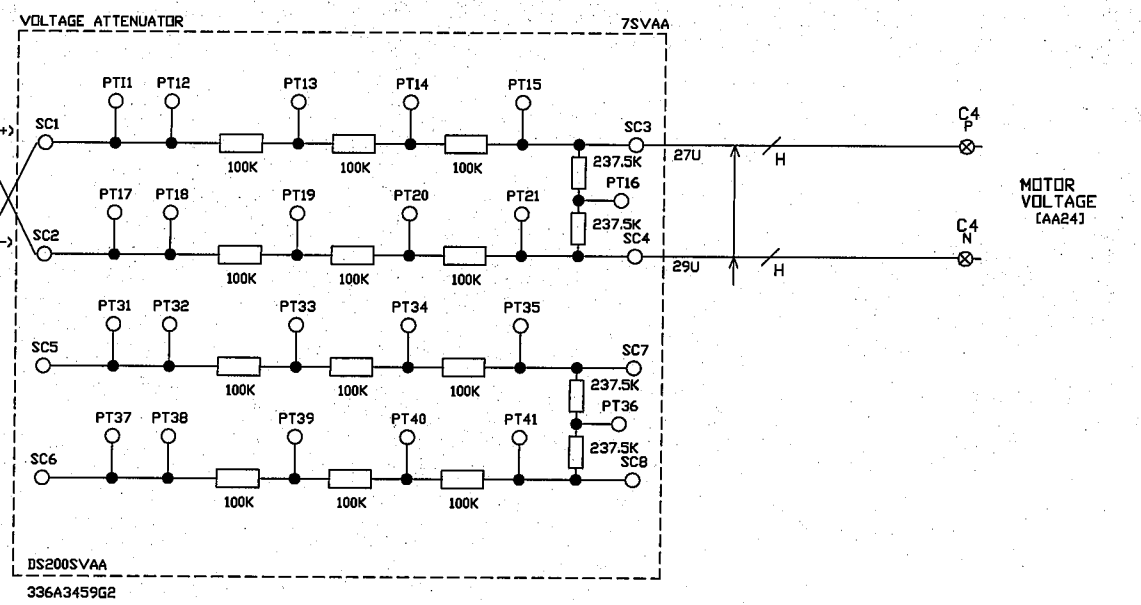
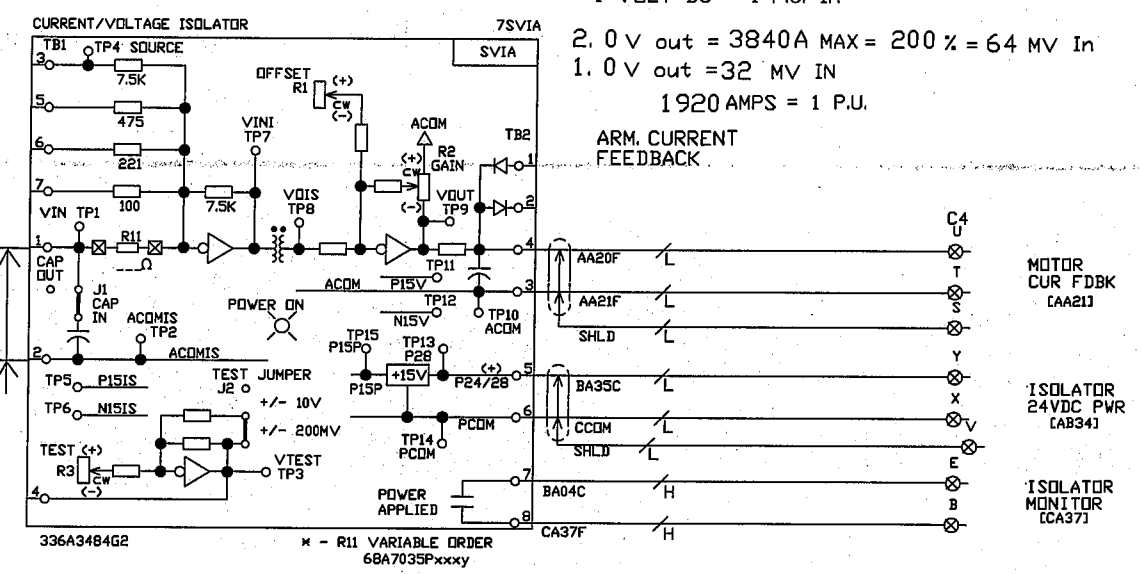


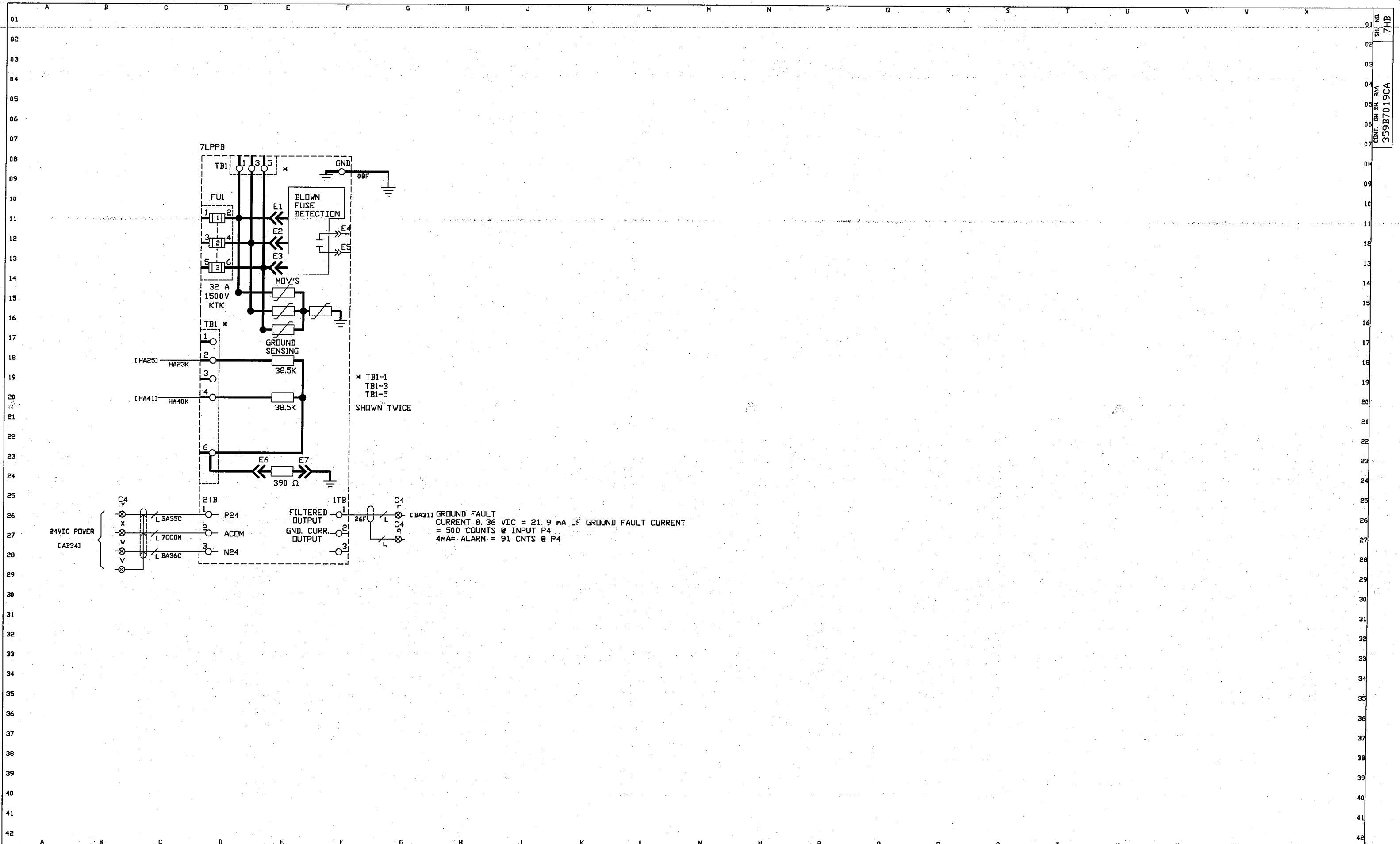


MOTOR DATA
FRAME MCF PWR 2000HP
BASE SPEED 170 TOP SPEED 220
ARM VOLTS 833 ARM AMPS 1920
ARM & COMM FLD R 0.006320 ARM IND ??? MH (UNSAT)
FLD VOLTS (HOT) 220 MAX FIELD AMPS 28.2 MIN FIELD AMPS 14.4
FLD R 6.7 FIELD IND ??? H (UNSAT)

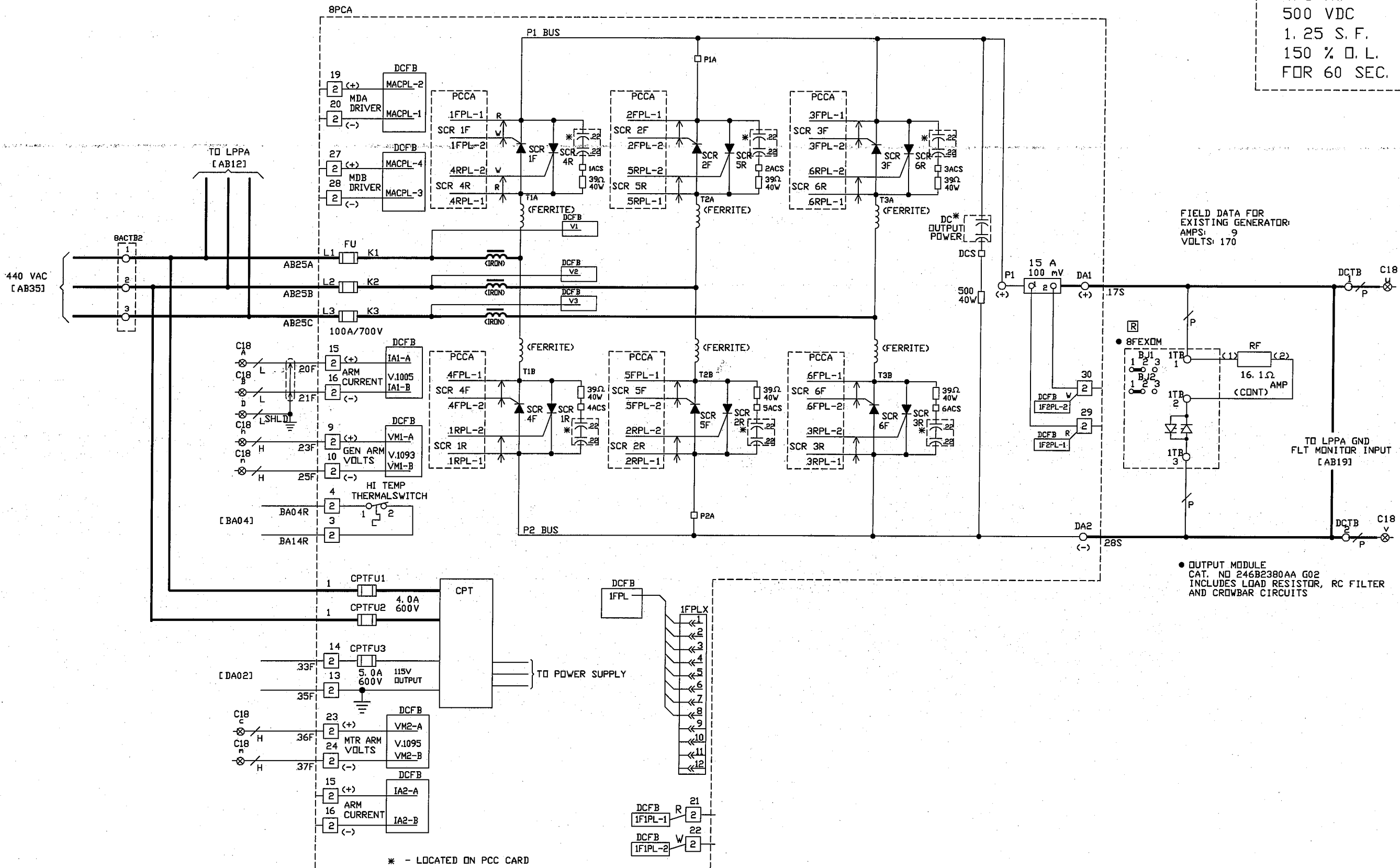
V. 1005 IAFDK = 0
573.14 to 1 = Disable auto null

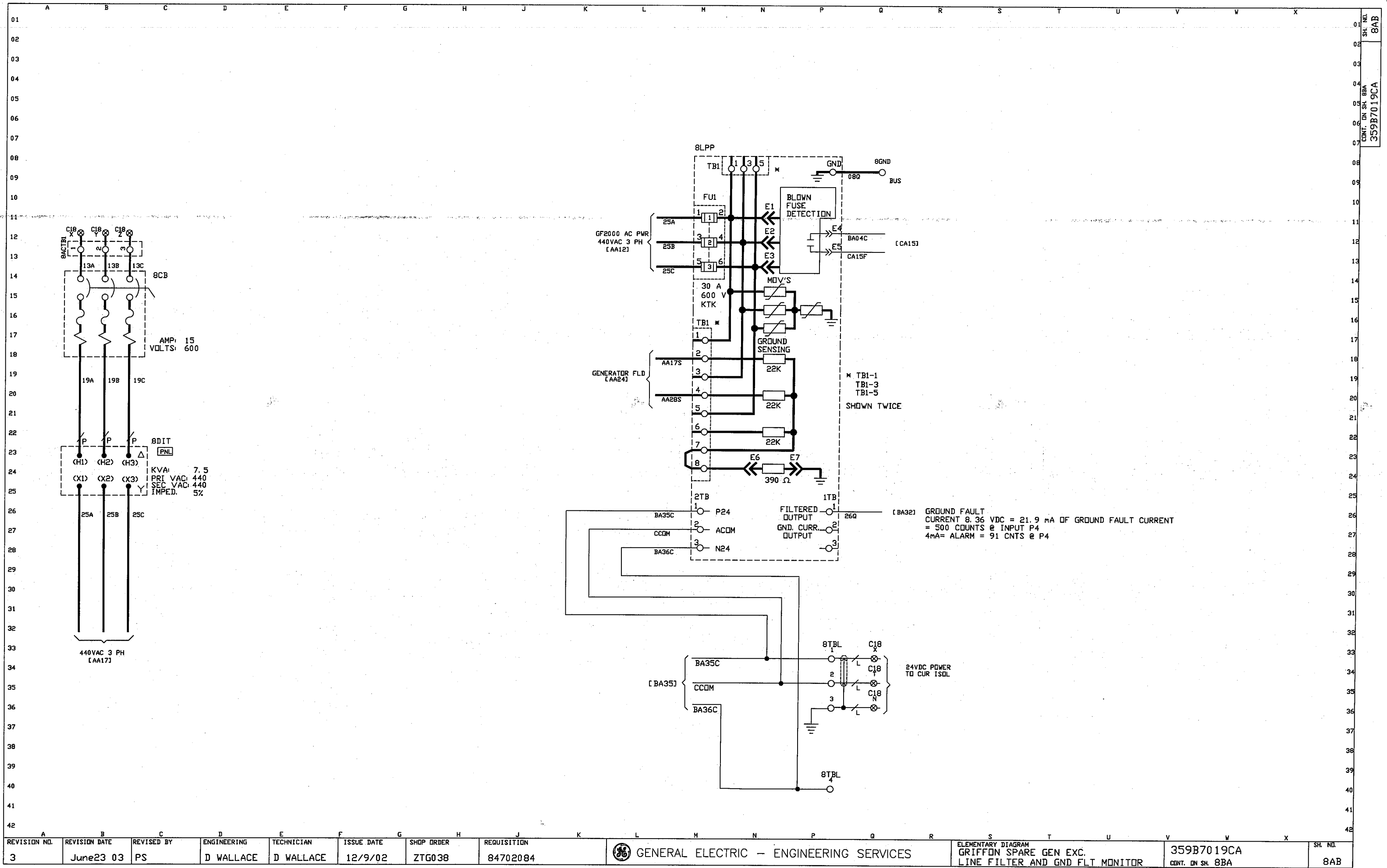
1 VOLT DC = 1 P.U. IA
2.0 V out = 3840A MAX = 200% = 64 MV In
1.0 V out = 32 MV IN
1920 AMPS = 1 P.U.

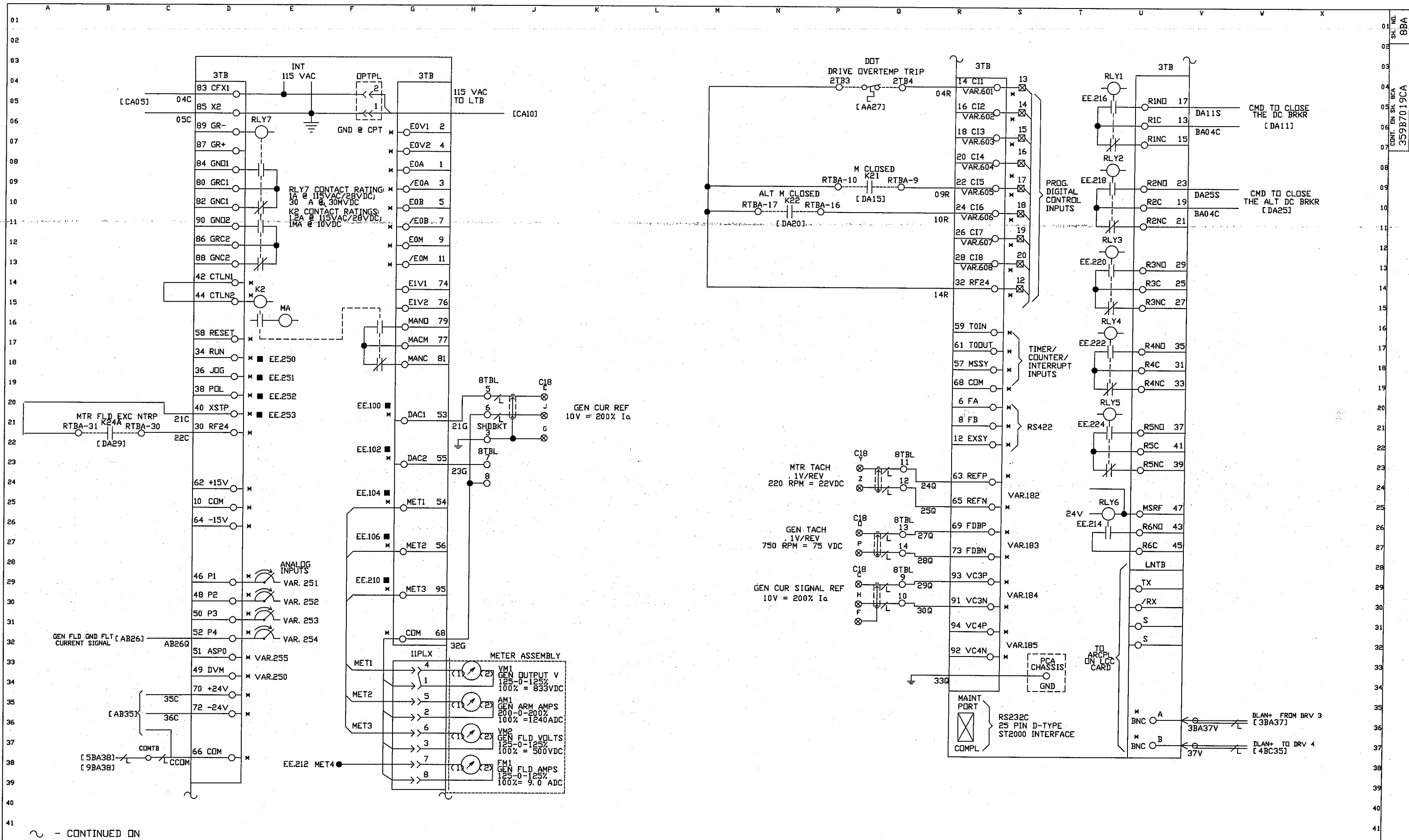


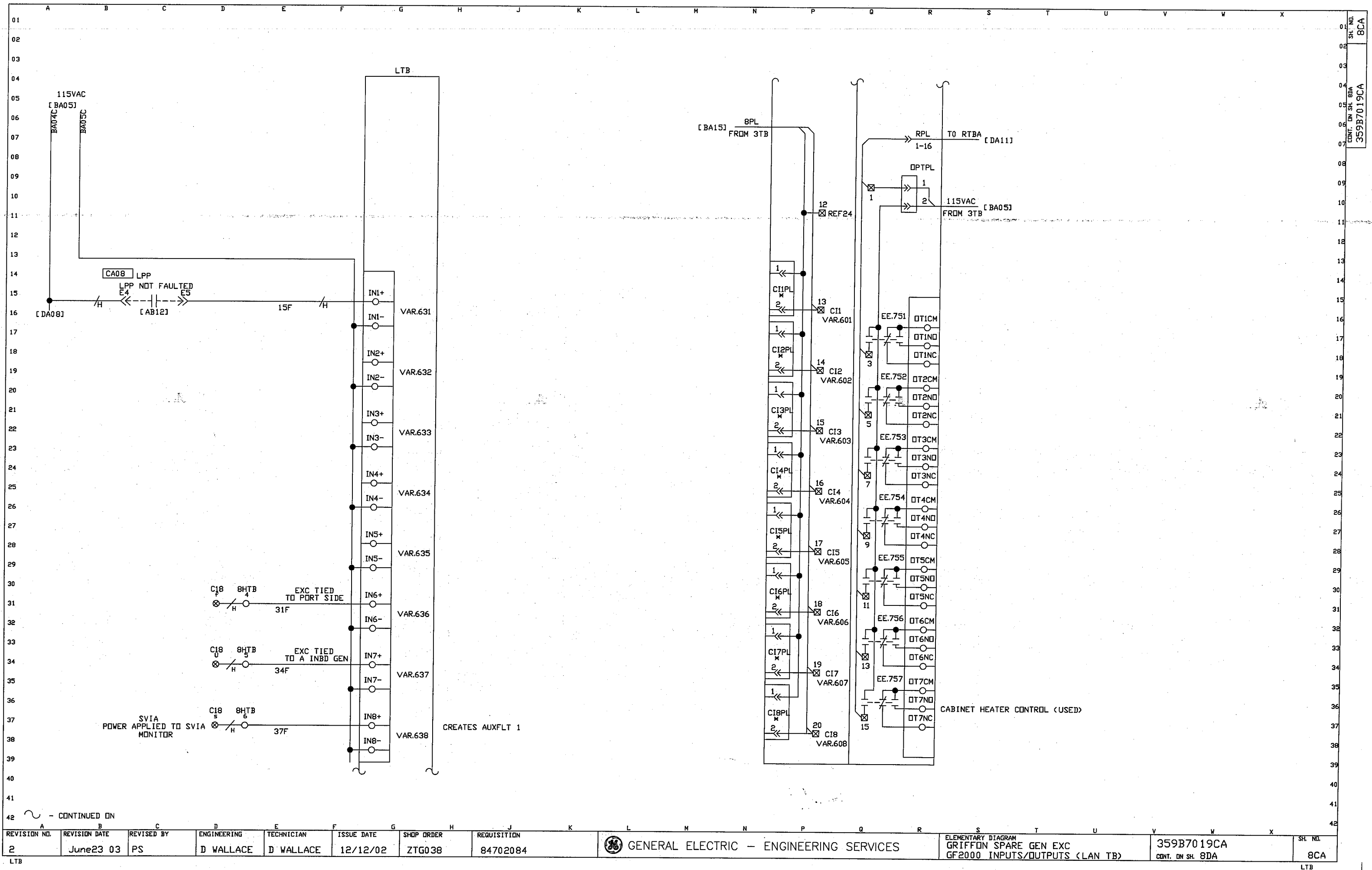


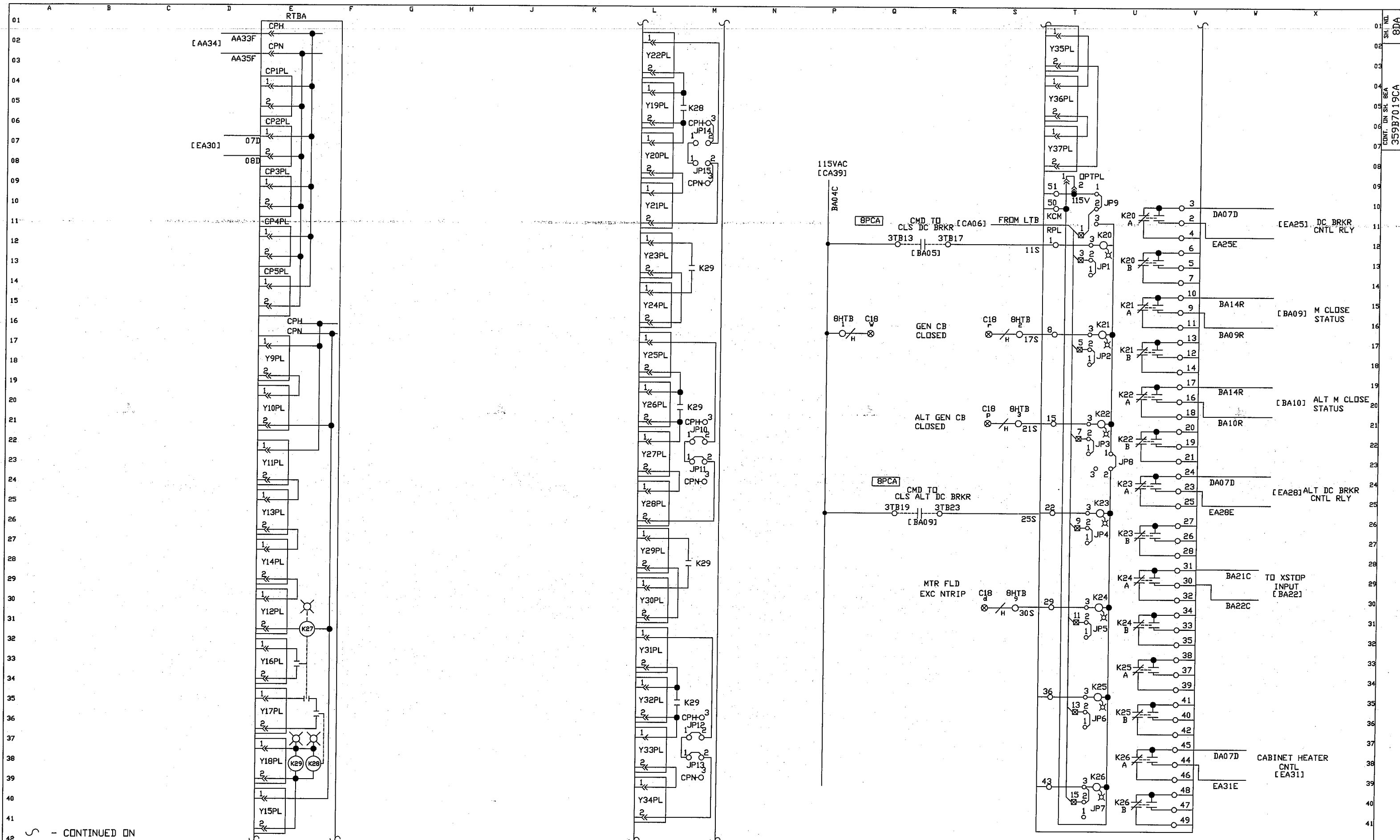
MODEL NO. 3VZTG038CD008
 SEE GEH-6148
 GF2000 G-FRAME
 4.5 KW REGEN.
 500 VDC
 1.25 S.F.
 150 % O.L.
 FOR 60 SEC.

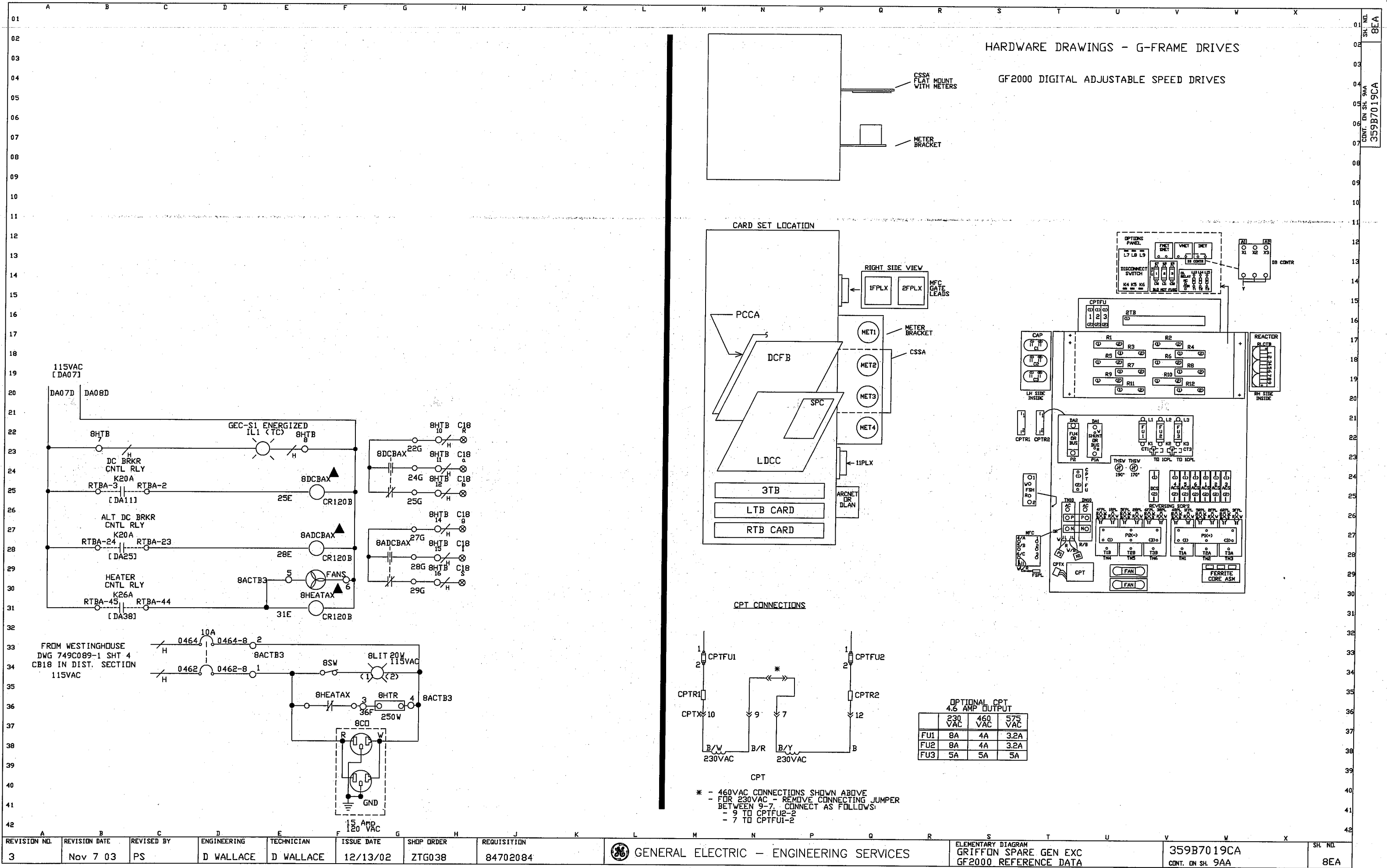






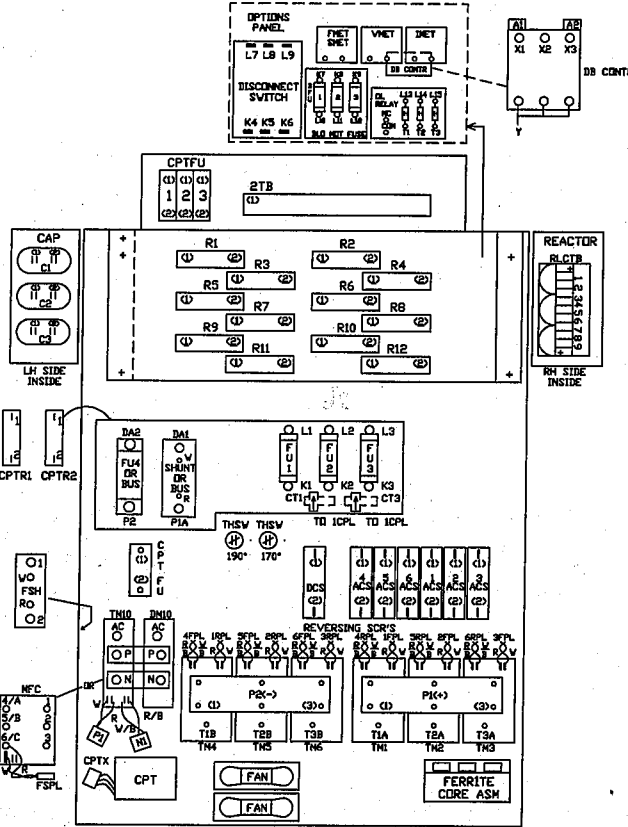
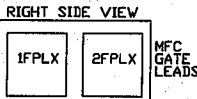




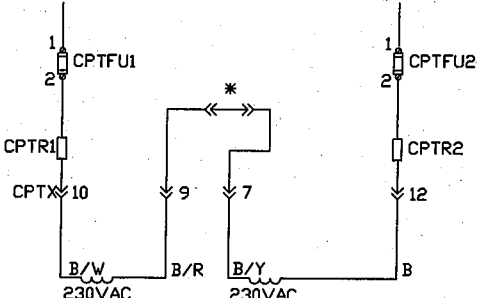


HARDWARE DRAWINGS - G-FRAME DRIVES
GF2000 DIGITAL ADJUSTABLE SPEED DRIVES

CARD SET LOCATION



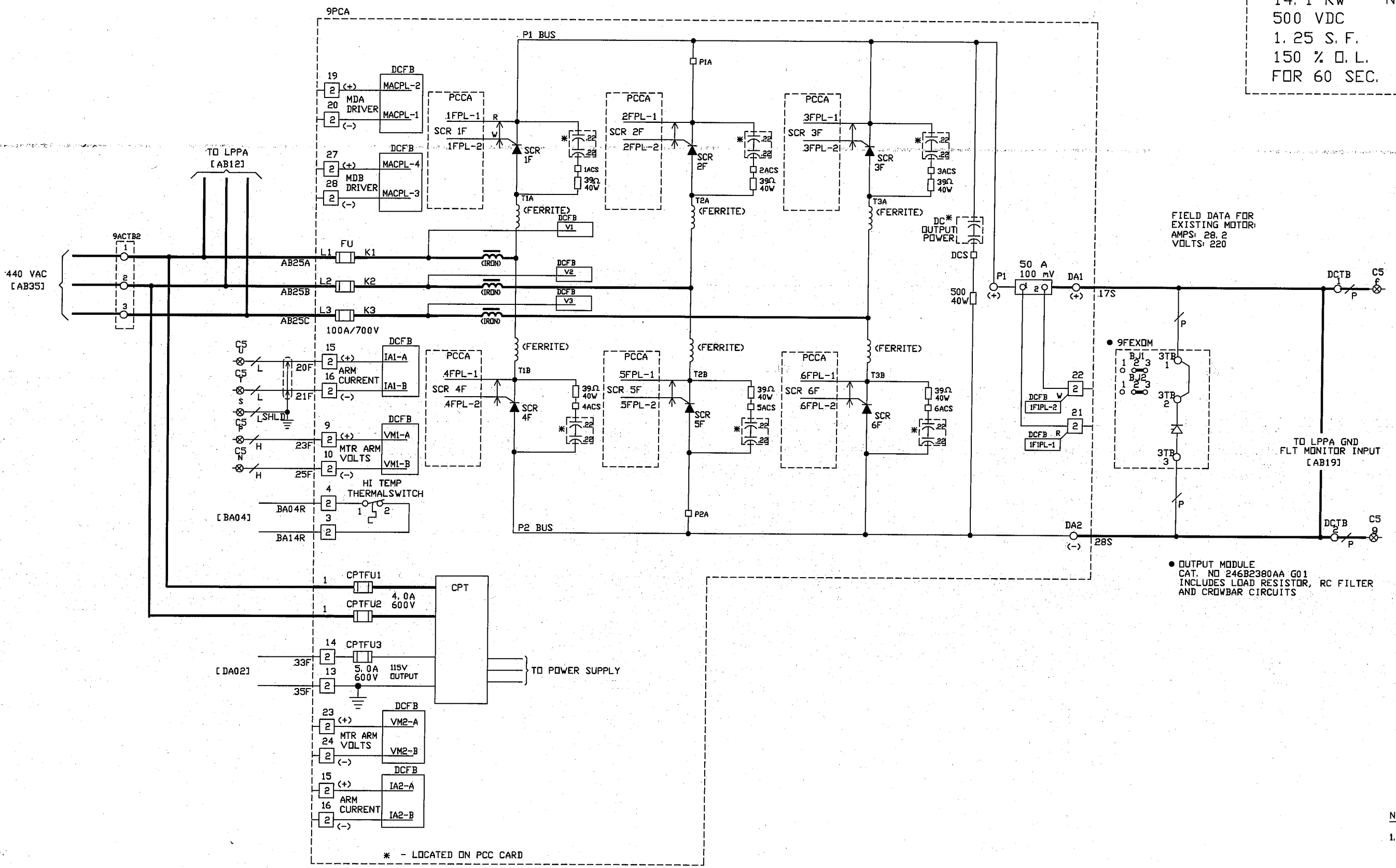
CPT CONNECTIONS



OPTIONAL CPT 4.6 AMP OUTPUT			
	230 VAC	460 VAC	575 VAC
FU1	8A	4A	3.2A
FU2	8A	4A	3.2A
FU3	5A	5A	5A

CPT
* - 460VAC CONNECTIONS SHOWN ABOVE
- FOR 230VAC - REMOVE CONNECTING JUMPER
BETWEEN 9-7. CONNECT AS FOLLOWS:
- 9 TO CPTFU2-2
- 7 TO CPTFU1-2

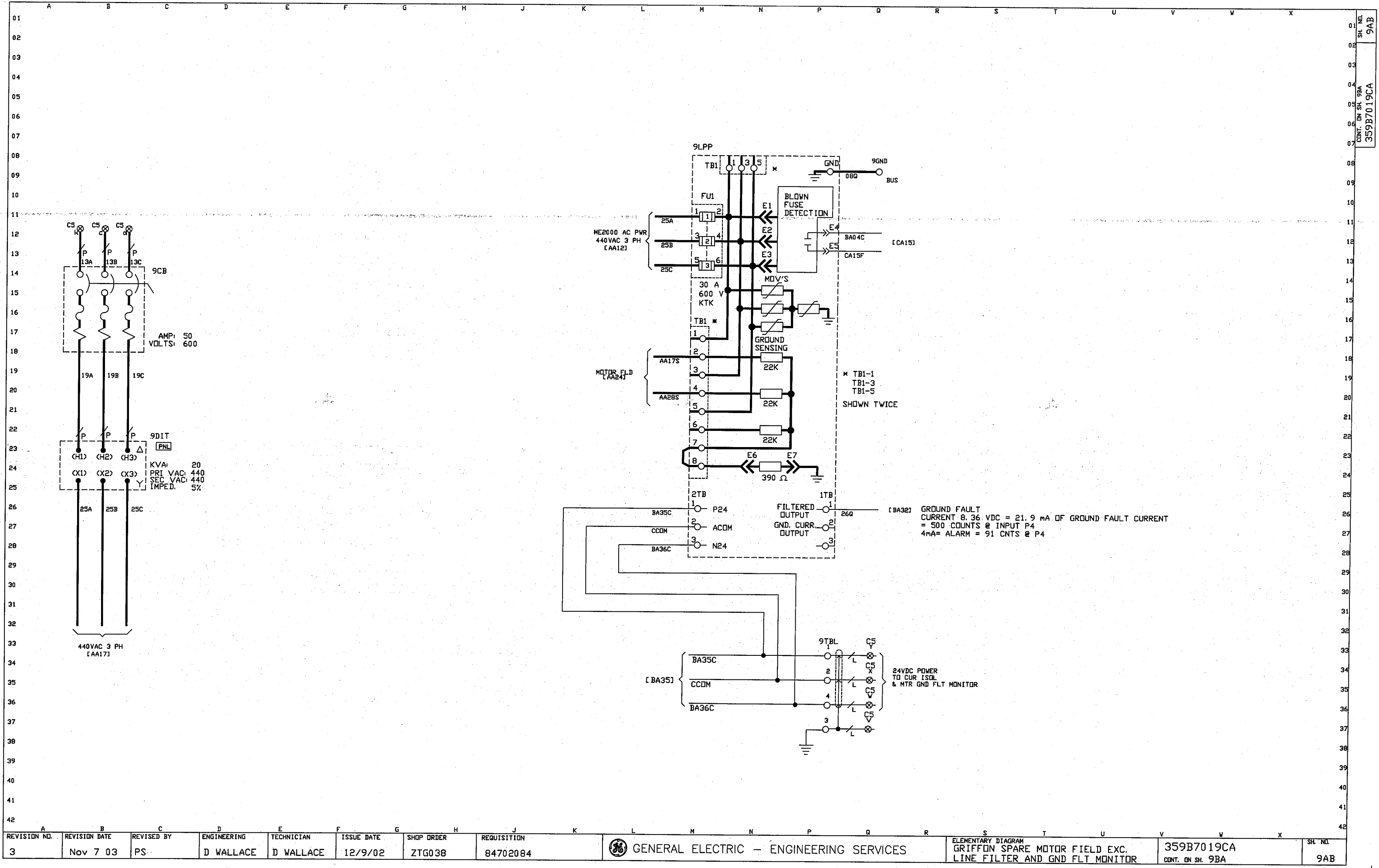
MODEL NO. 3VZTG038CD009
 SEE GEH-6150
 ME2000 G-FRAME
 14.1 KW NON-REGEN.
 500 VDC
 1.25 S.F.
 150 % O.L.
 FOR 60 SEC.

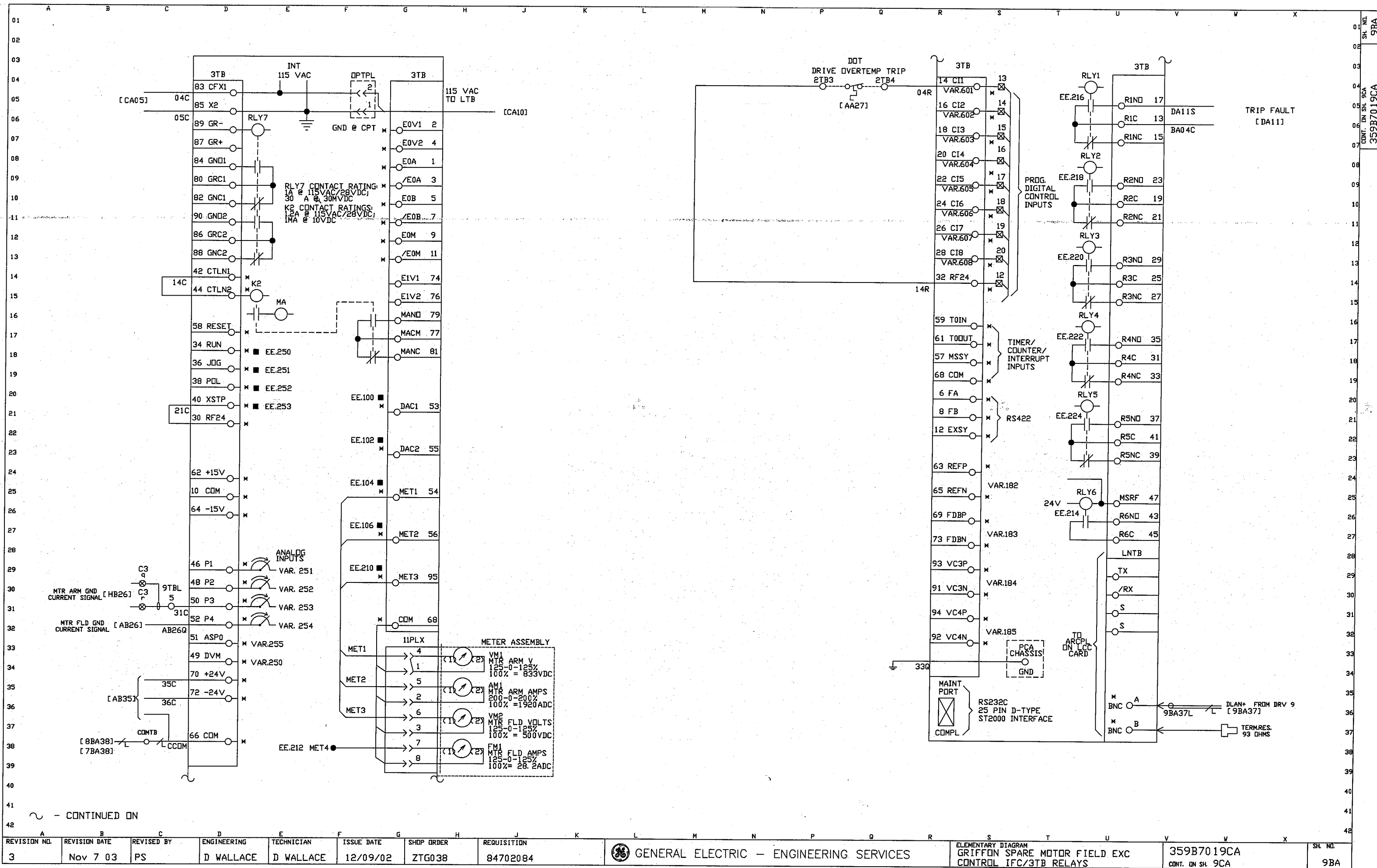


FIELD DATA FOR
 EXISTING MOTOR:
 AMPS: 28.2
 VOLTS: 220

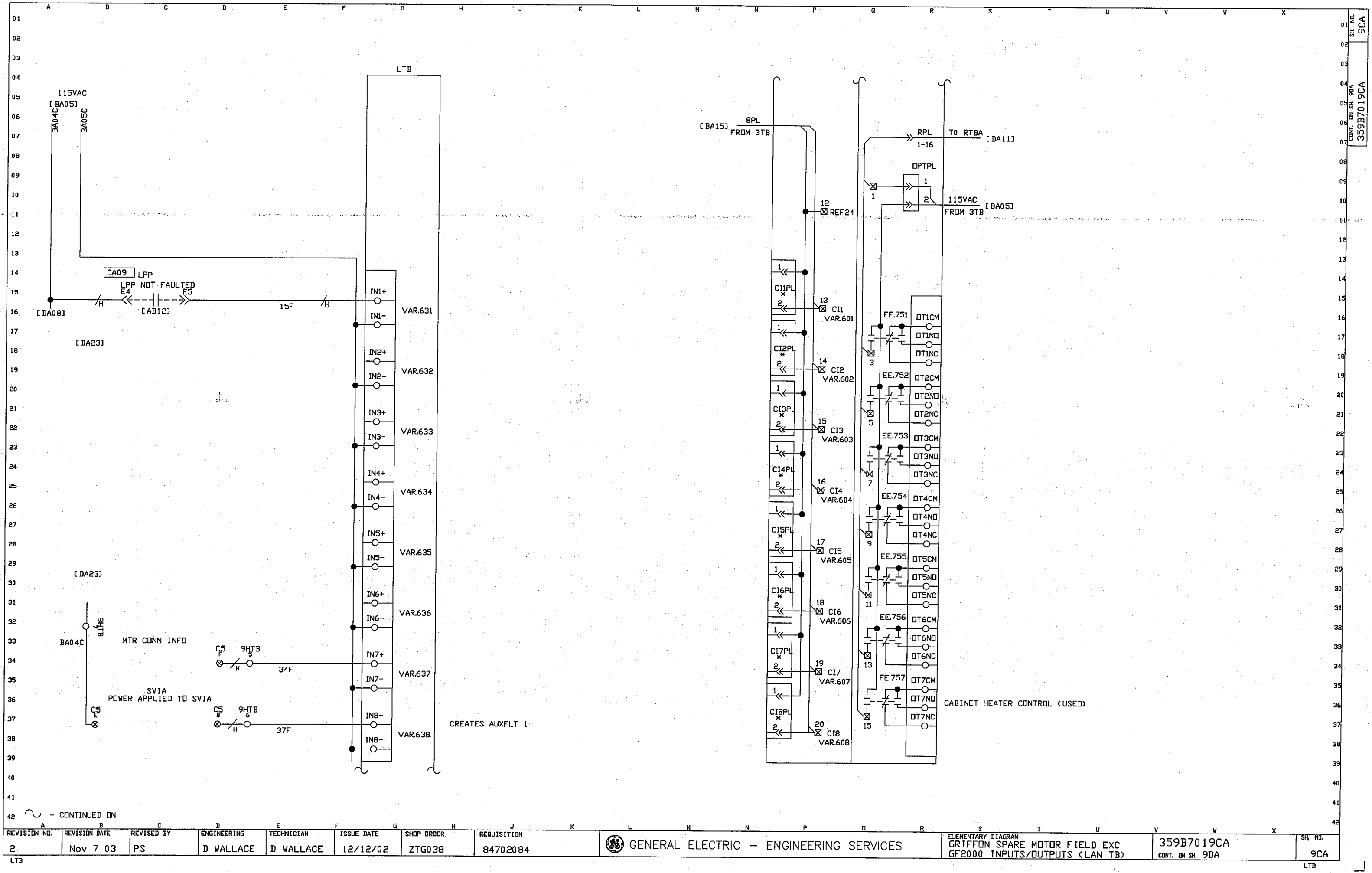
• OUTPUT MODULE
 CAT. NO 246B2380AA G01
 INCLUDES LOAD RESISTOR, RC FILTER
 AND CROWBAR CIRCUITS

NOTE:
 1. 2 IS
 INTERPRETED
 AS 2TB (1).

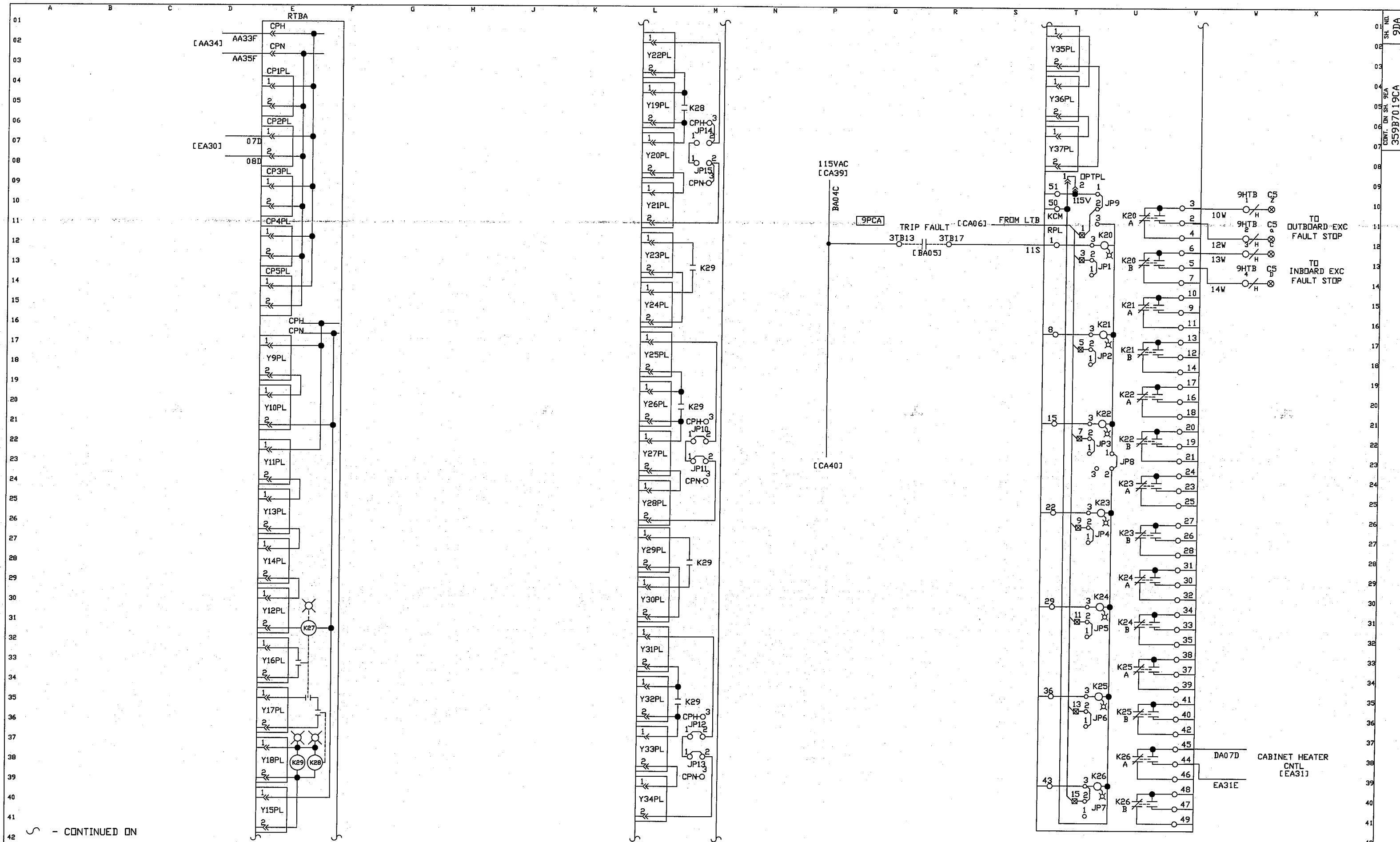





REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC - ENGINEERING SERVICES	ELEMENTARY DIAGRAM GRIFFON SPARE MOTOR FIELD EXC CONTROL IFC/3TB RELAYS	359B7019CA CONT. ON SH. 9CA	SH. NO. 9BA
3	Nov 7 03	PS	D WALLACE	D WALLACE	12/09/02	ZTG038	84702084				



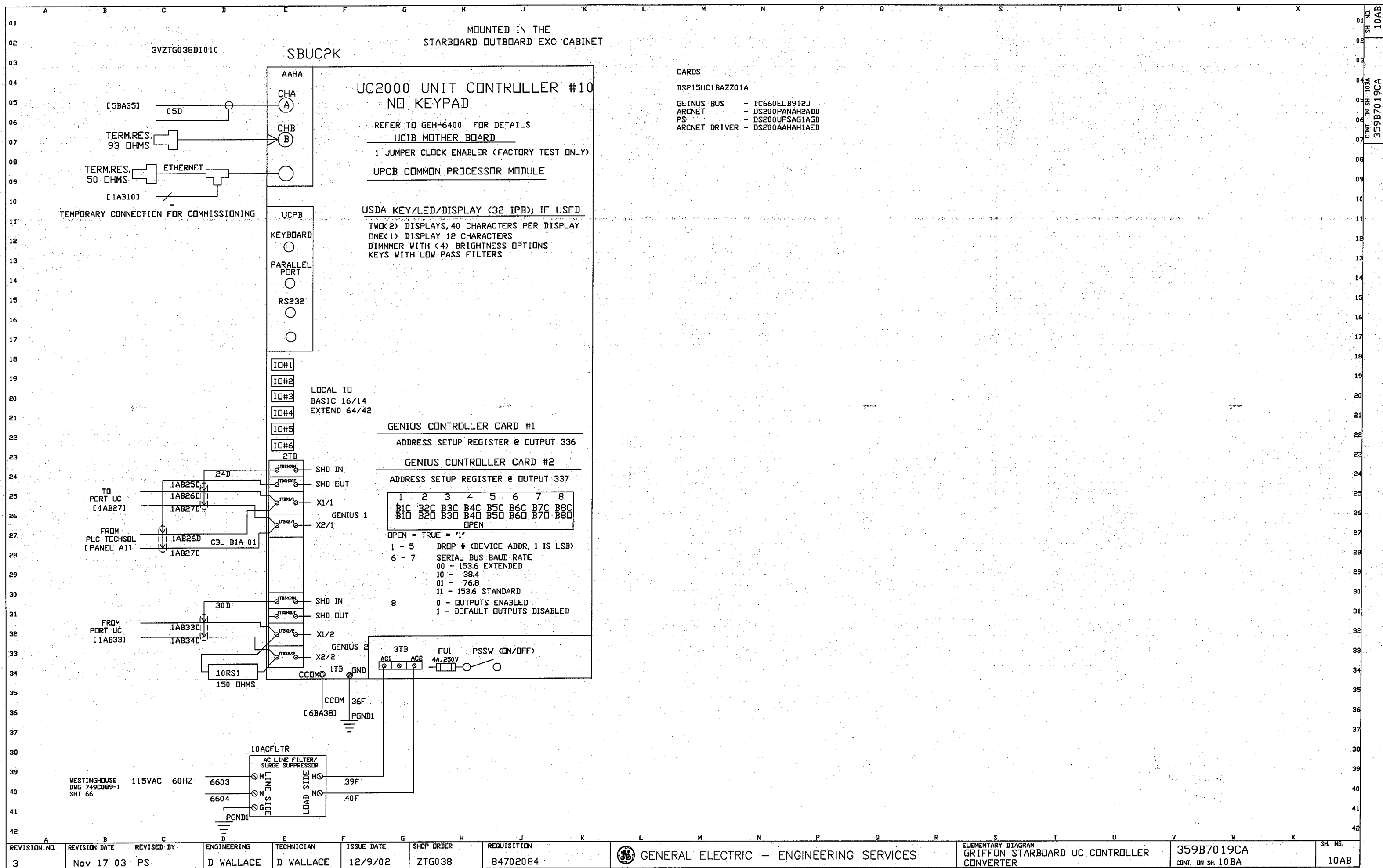
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2	Nov 7 03	PS	D WALLACE	D WALLACE	12/12/02	ZTG038	84702084				

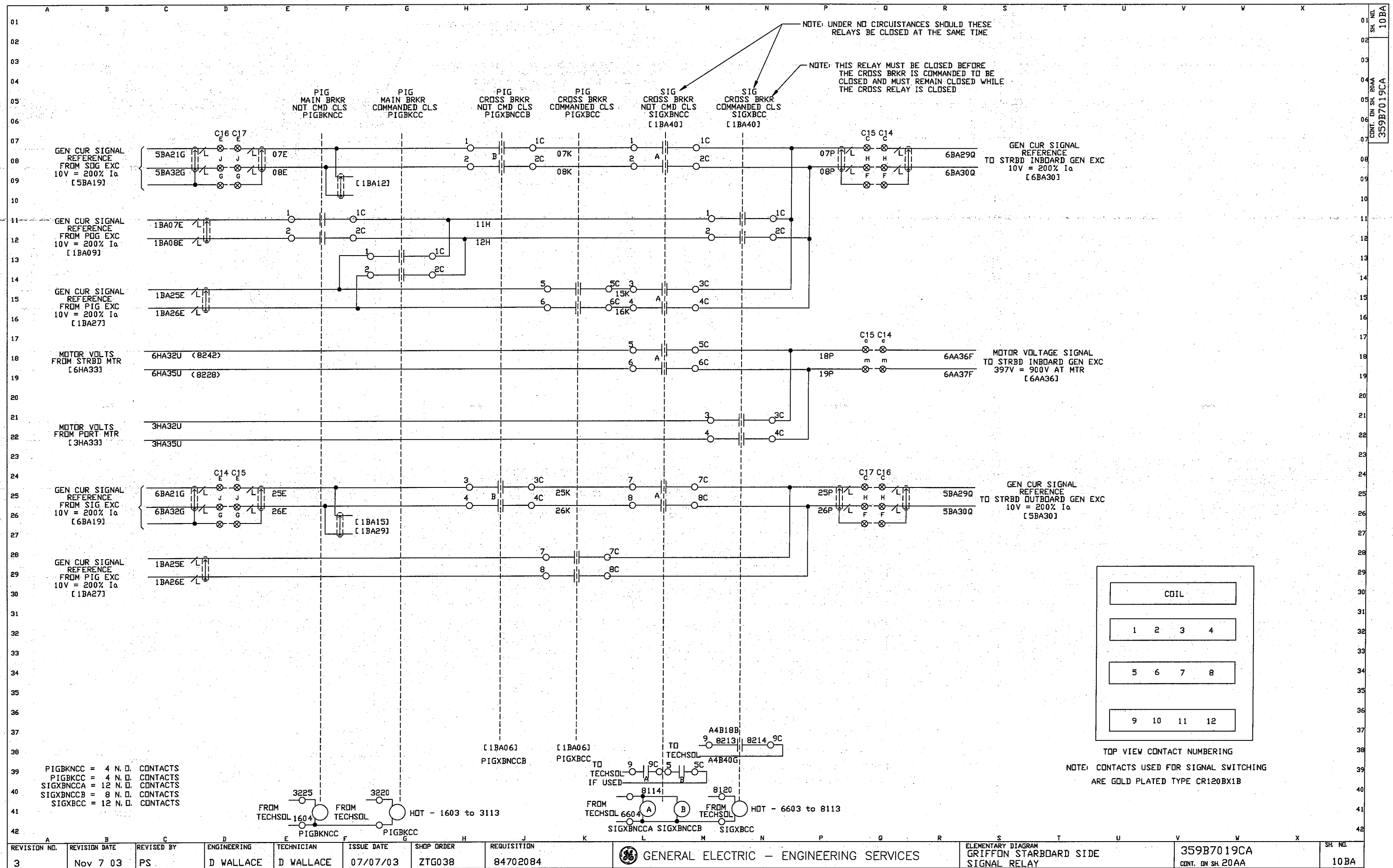


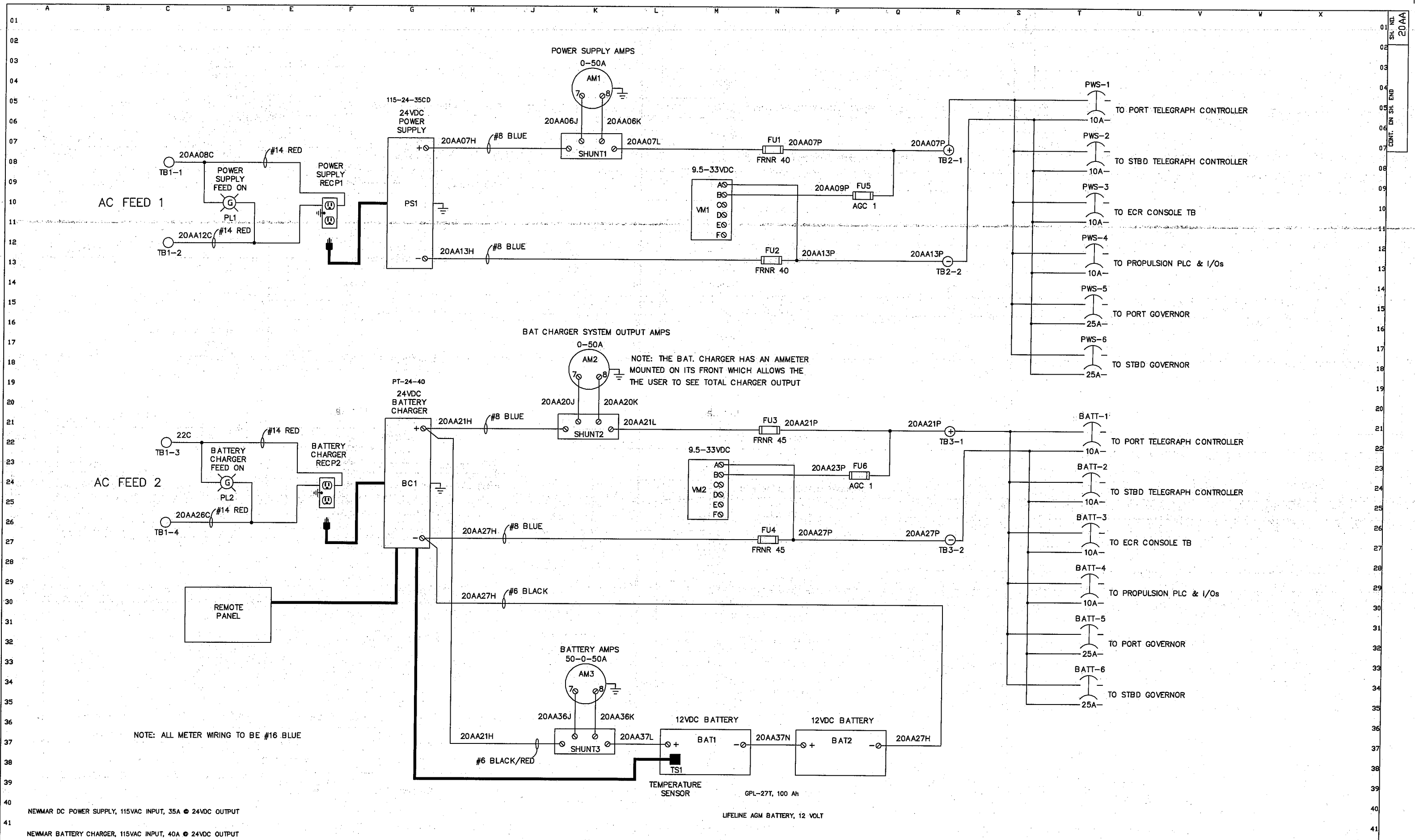
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REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	 GENERAL ELECTRIC - ENGINEERING SERVICES							ELEMENTARY DIAGRAM GRIFFON SPARE MOTOR FIELD EXC GF2000 RELAY TB			359B7019CA CONT. ON SH. 9EA		SH. NO.			
2	Sept 7 03	PS	D WALLACE	D WALLACE	12/12/02	ZTG038	84702084													9DA			
RTBA																						RTRA	

RTBA

RTBA







REVISION NO.	REVISION DATE	REVISED BY	ENGINEERING	TECHNICIAN	ISSUE DATE	SHOP ORDER	REQUISITION	GENERAL ELECTRIC - ENGINEERING SERVICES	ELEMENTARY DIAGRAM	SH. NO.
2	Nov 6 03	PS	KELTOUR	GE/TECHSQL	Aug 1 03	K2781	847-02084	GENERAL ELECTRIC - ENGINEERING SERVICES	GRIFTON 24 VDC SYSTEM 24VDC POWER SUPPLY SCHEMATIC	20AA

PROPULSION CONTROL SYSTEM

CCGS GRIFFON

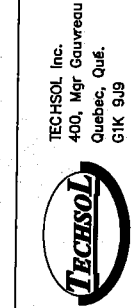
HULL 664

RE-DRAWN WESTINGHOUSE ELEMENTARY DIAGRAMS
(SHEETS RE-DRAWN FROM WESTINGHOUSE ELEMENTARY DIAGRAMS 749C089")

October 2003

DWG 749C089-1

As Commissioned Nov 14 2003




REV.	1	Sept 23 03 PS	4	DRAWN	S. ROYAL	CHKD	C.M.
2	Nov 10 03 PS	5					
3		6					
				DATE		02-10-01	

GENERAL ELECTRIC Industrial Systems	PROPULSION CONTROL TITLE SHEET		PRINTS TO	
749C089-1		CONT. ON SH. 2	SH. No. 1	

INDEX

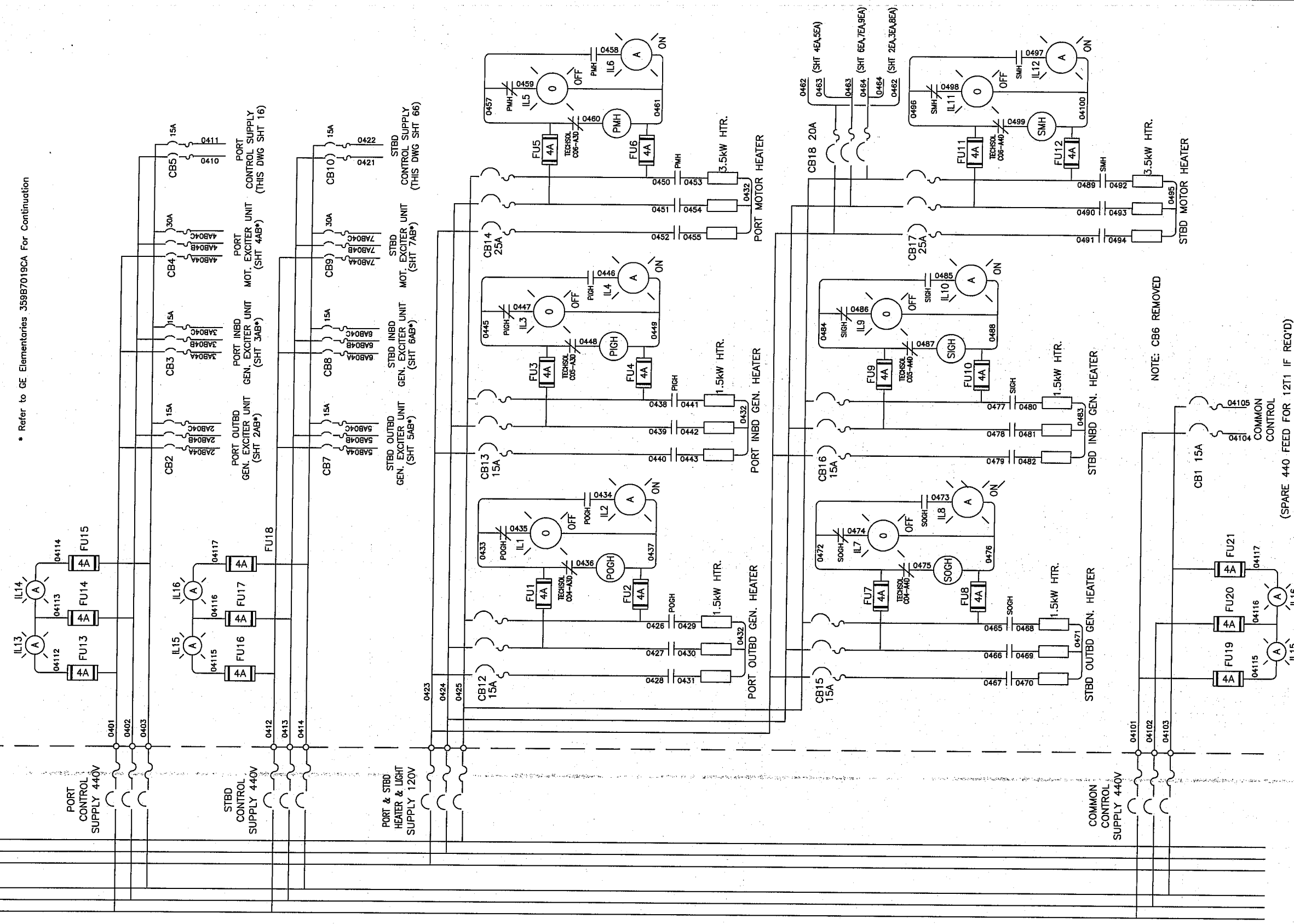
SHEET DESCRIPTION

1	TITLE SHEET
2	INDEX
4	COMMON CONTROL DISTRIBUTION
11	PROPULSION AUXILIARIES CONTROL AND INDICATION
12	COMMON CONTROL XFMR 12T1 - SPARE CIRCUITS
16	PORT 120V CONTROL DISTRIBUTION
20	PICB and PICBX BREAKER CONTROL
22	POCB BREAKER CONTROL
66	STBD 120V CONTROL DISTRIBUTION
70	SICB and SICBX BREAKER CONTROL
72	SOCB BREAKER CONTROL

REV. 1	Sept 23 03 PS	4	DRAWN S. ROYAL	CHKD C.M.	 TECHSOL Inc. 400, Mgr Gauvreau Quebec, Que. G1K 9J9	GENERAL ELECTRIC Industrial Systems	PROPULSION CONTROL INDEX SHEET	PRINTS TO	
	2	Nov 10 03 PS						5	
	3						6		


PROPULSION CONTROL DISTRIBUTION

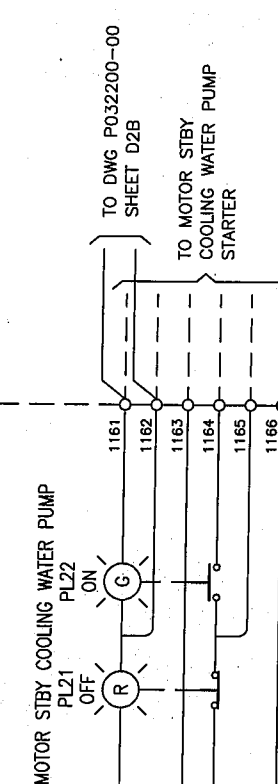
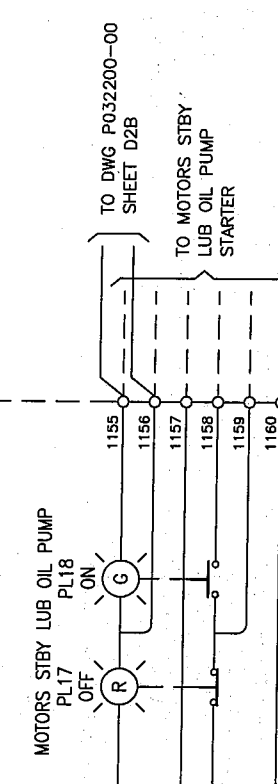
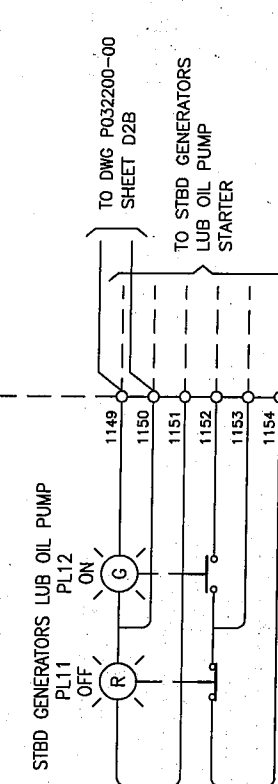
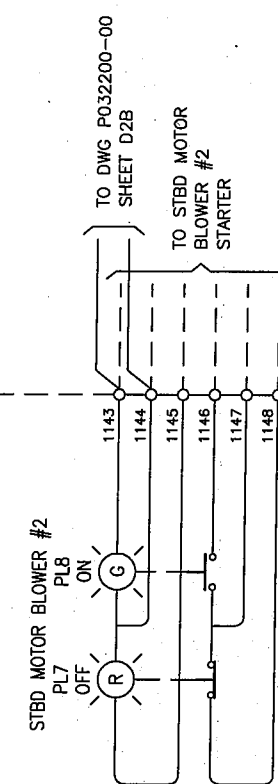
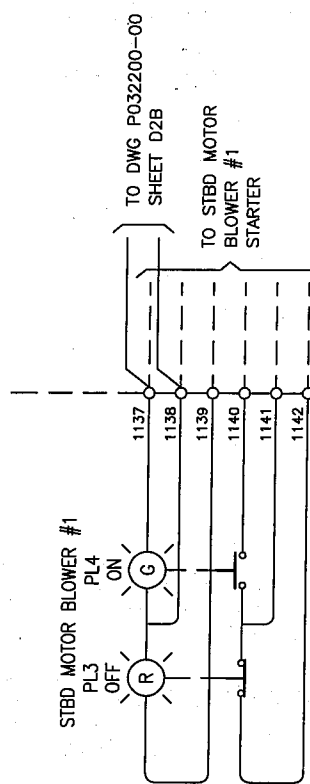
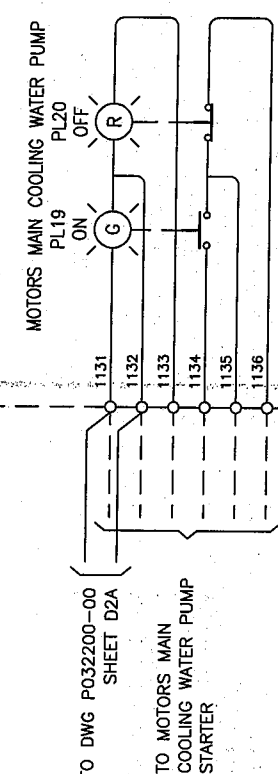
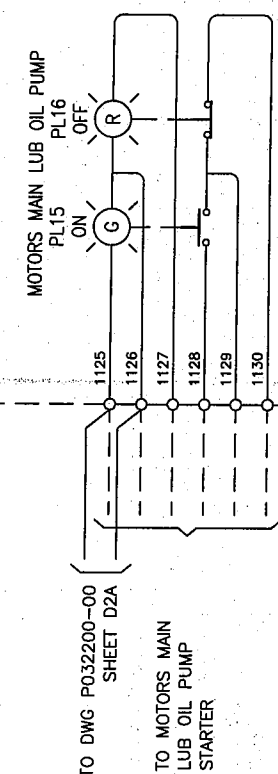
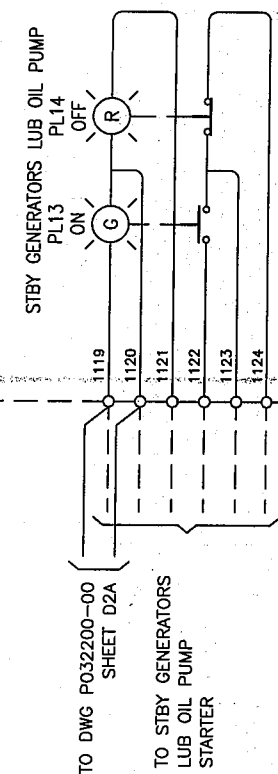
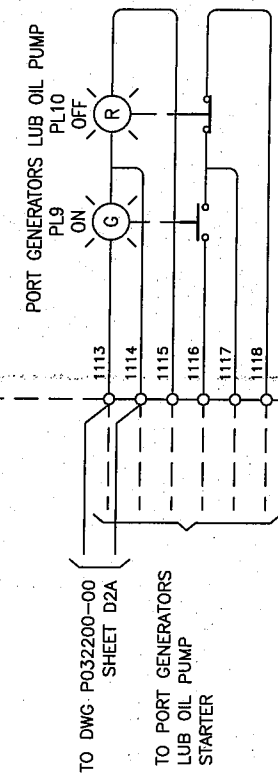
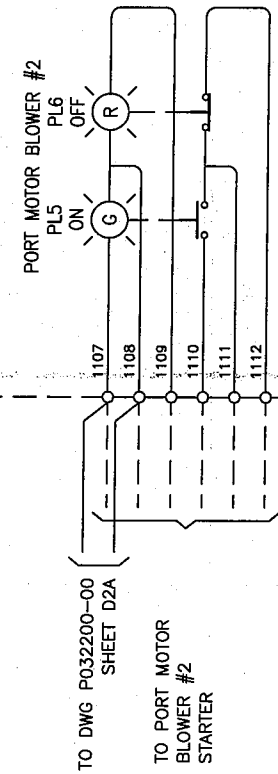
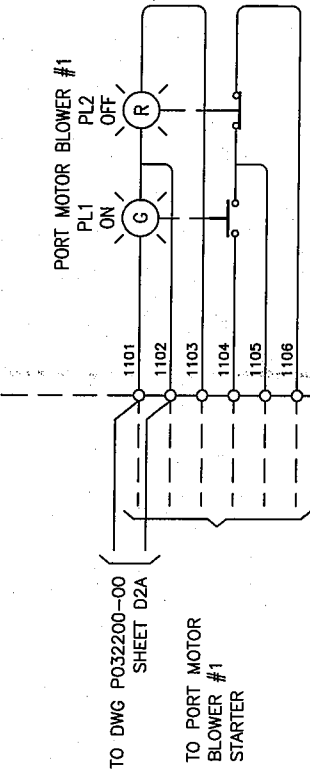
* Refer to GE Elementaries 359B7019CA For Continuation



NOTE: CB6 REMOVED

(SPARE 440 FEED FOR 12T1 IF REQ'D)

REV.	1	Sept 23 03	PS	4	<div></div> <div>TECHSOL Inc. 400, Mgr Gauthier Québec, Qué. G1K 9J9</div>	GENERAL ELECTRIC Industrial Systems	PROPULSION CONTROL COMMON CONTROL DISTRIBUTION 749C089-1	CONT. ON SH. 11	4	SH. No.	
2	Nov 10 03	PS	5	<div>DRAWN S. ROYAL</div>							<div>CHKD C.M.</div>
3			6	DATE 02-10-01							

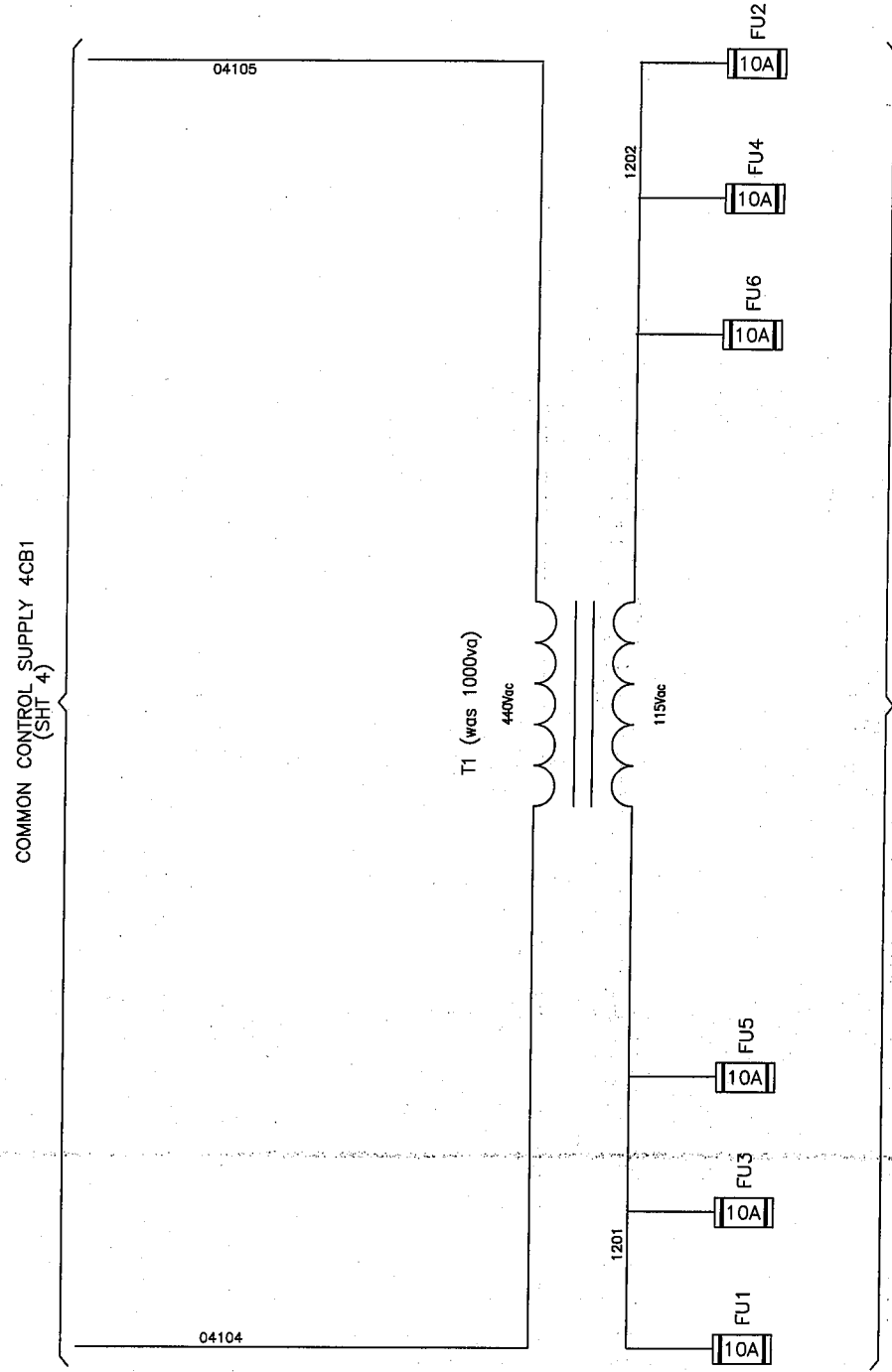


REV.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
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TECHSOL Inc.
400, Mgr Gauvreau
Quebec, Que.
G1K 8J9



NOT IN SERVICE - POSSIBLE FUTURE USE

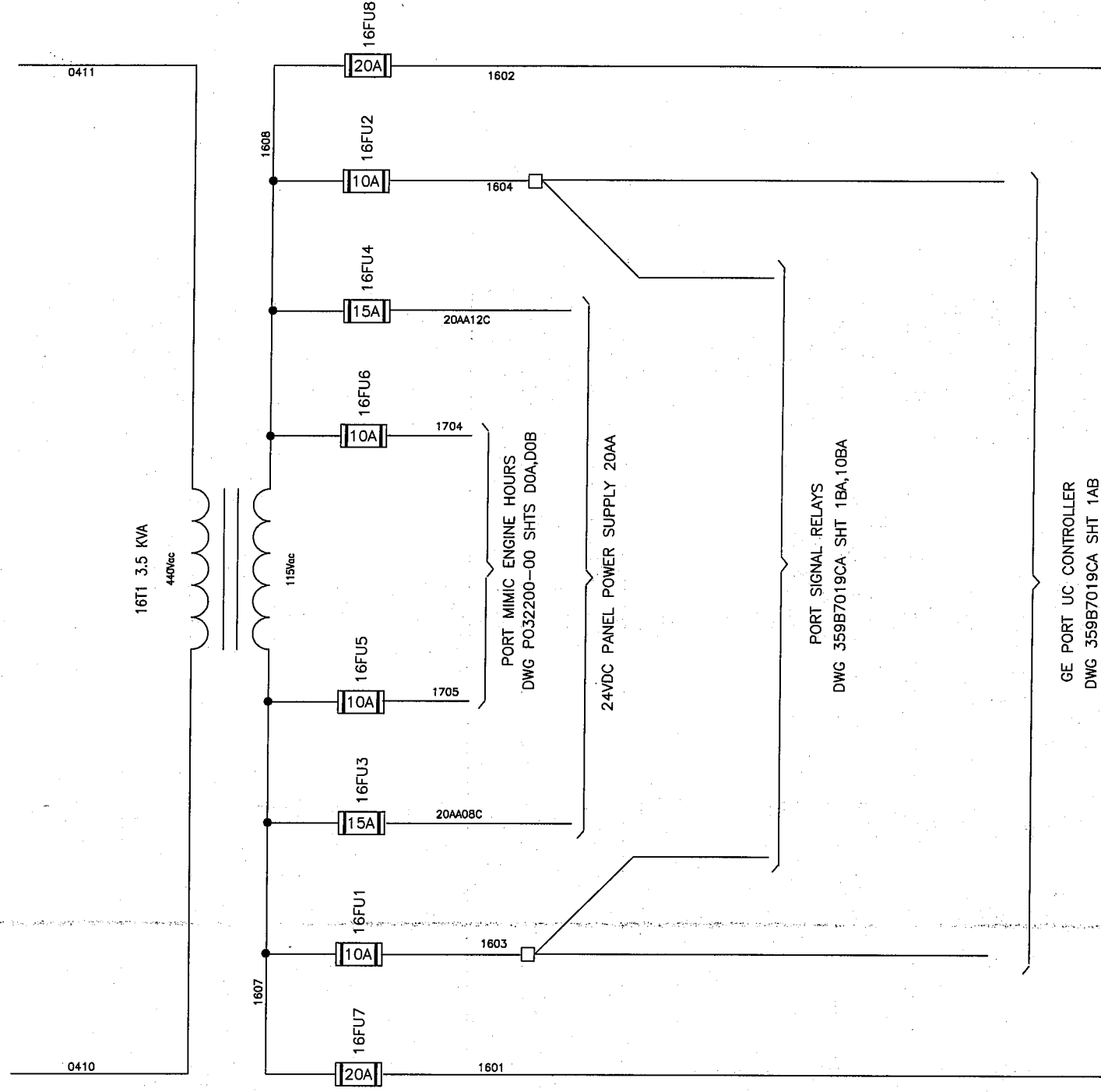


NOTE: XFMR 12T1 (1000VA) WILL BE REMOVED. 4CB1 WILL BE INSTALLED FOR SPARE USE. ONE OF THE XFMR'S FROM SHT 16 or 66 WILL BE RETAINED IN CASE WE REQUIRE IT FOR USE ON THIS SHEET. KEEP THESE FUSES AVAILABLE.

REV. 1	Sept 24 03 PS	4	DRAWN S. ROYAL	CHKD C.M.	TECHSOL Inc. 400, Mgr Gauvreau Quebec, Quc. G1K 9J9	GENERAL ELECTRIC Industrial Systems	PROPULSION CONTROL COMMON CONTROL XFMR 12T1	PRINTS TO	
2		5							
3		6		DATE 02-10-01			749C089-1 CONT. ON SH. 16		12 SH. No.

□ TB IN DIST. SECTION

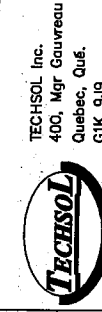
PORT CONTROL SUPPLY 4CB5
(SHT 4)



RE-SHOWN FROM SHEETS 20 and 22



REV. 1	Sept 24 03 PS	4	DRAWN S. ROYAL	CHKD C.M.	DATE 02-10-01
2	Nov 10 03 PS	5			
3		6			

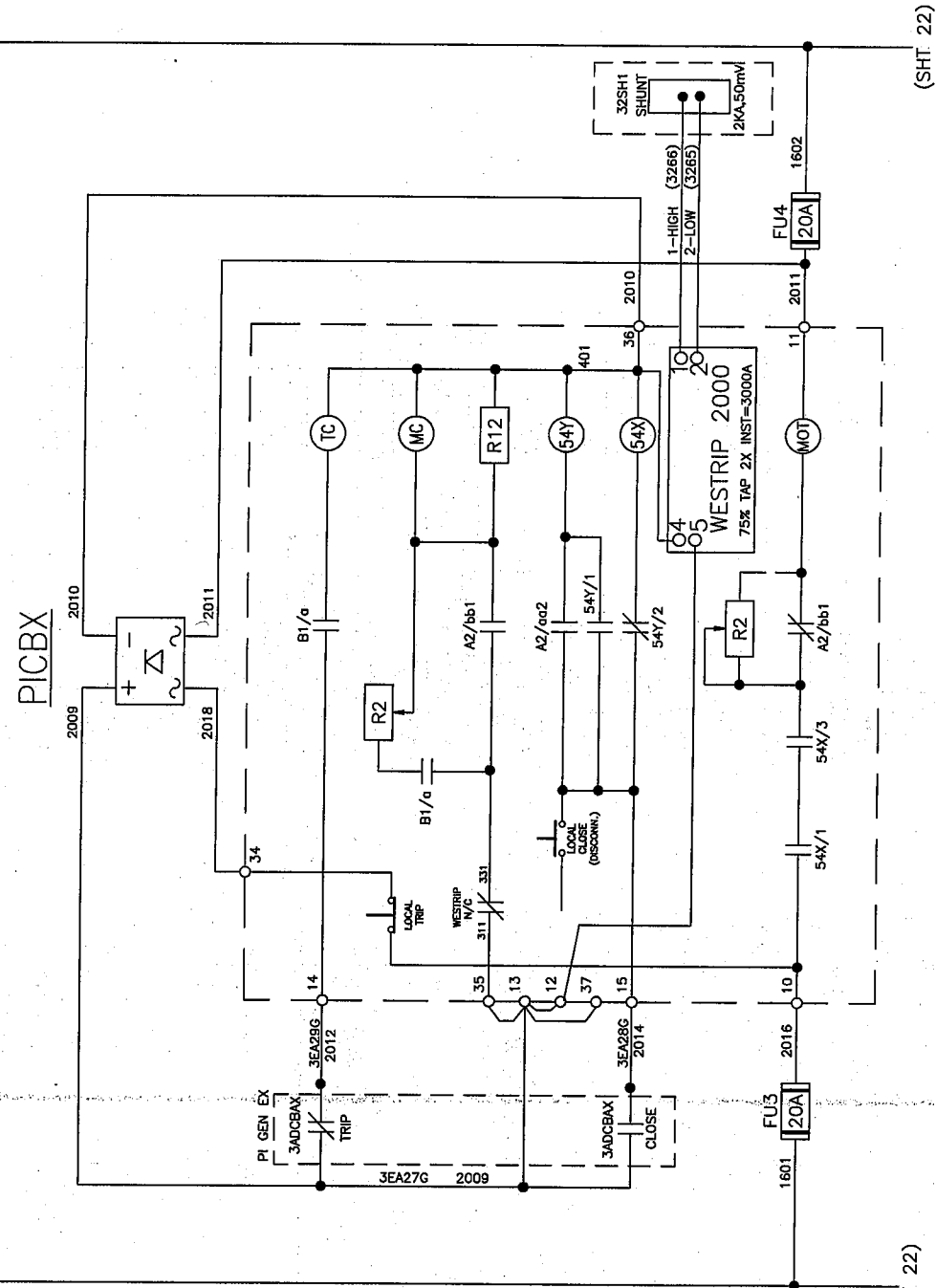
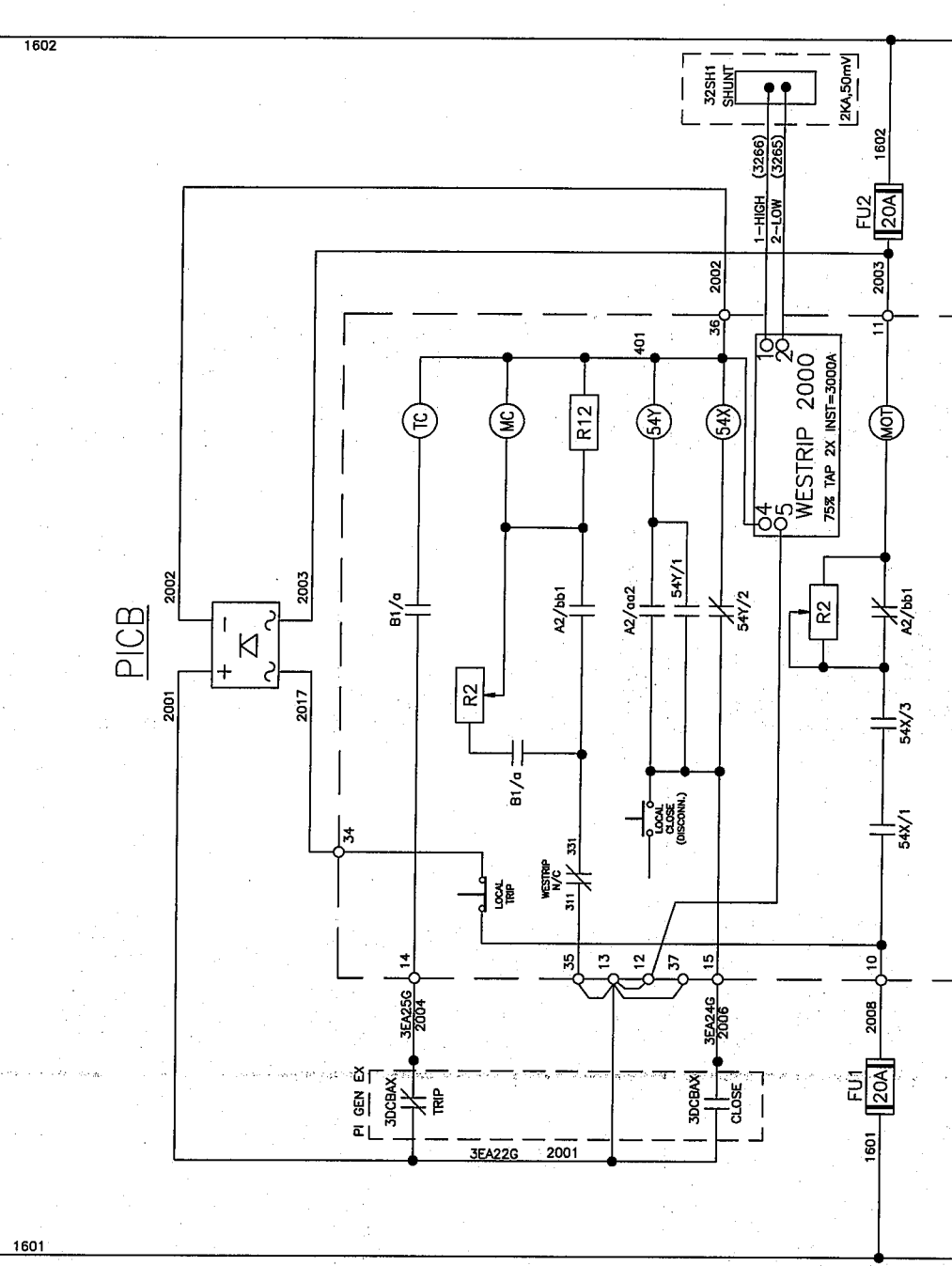


GENERAL ELECTRIC
Industrial Systems

PROPULSION CONTROL
PORT 120V CONTROL DISTRIBUTION

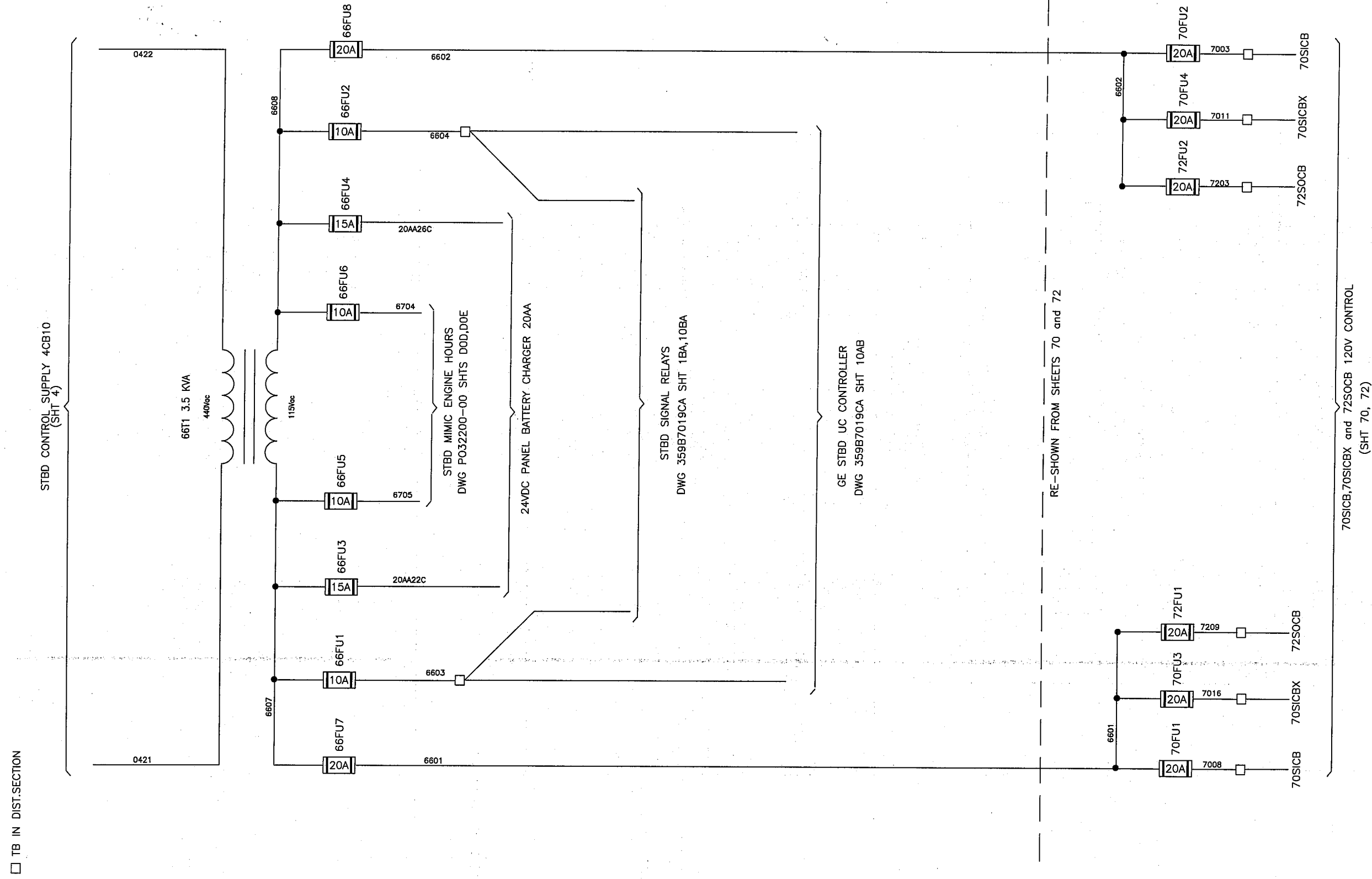
749C089-1 CONT. ON SH. 20
SH. No. 16

PORT CIRCUIT BREAKER BUS
(SHT 16)



Main Circuit Breaker TB

REV.	REV. No.	REV. DATE	DRAWN	CHKD	C.M.	DATE	TECHSOL Inc. 400, Mgr Gauvreau Quebec, Que. G1K 9J9	GENERAL ELECTRIC Industrial Systems	PROPULSION CONTROL PICB AND PICBX BREAKER CONTROL	PRINTS TO
1	1	Sept 24 03 PS	4							
2	2	Oct 1 03 PS	5							
3	3	Nov 10 03 PS	6							



REV. 1	Sept 24 03 PS	4			
2	Nov 10 03 PS	5			
3		6			

TECHSOL

TECHSOL Inc.
400, Mgr Gauvreau
Quebec, Qué.
G1K 9J9

GENERAL ELECTRIC
Industrial Systems

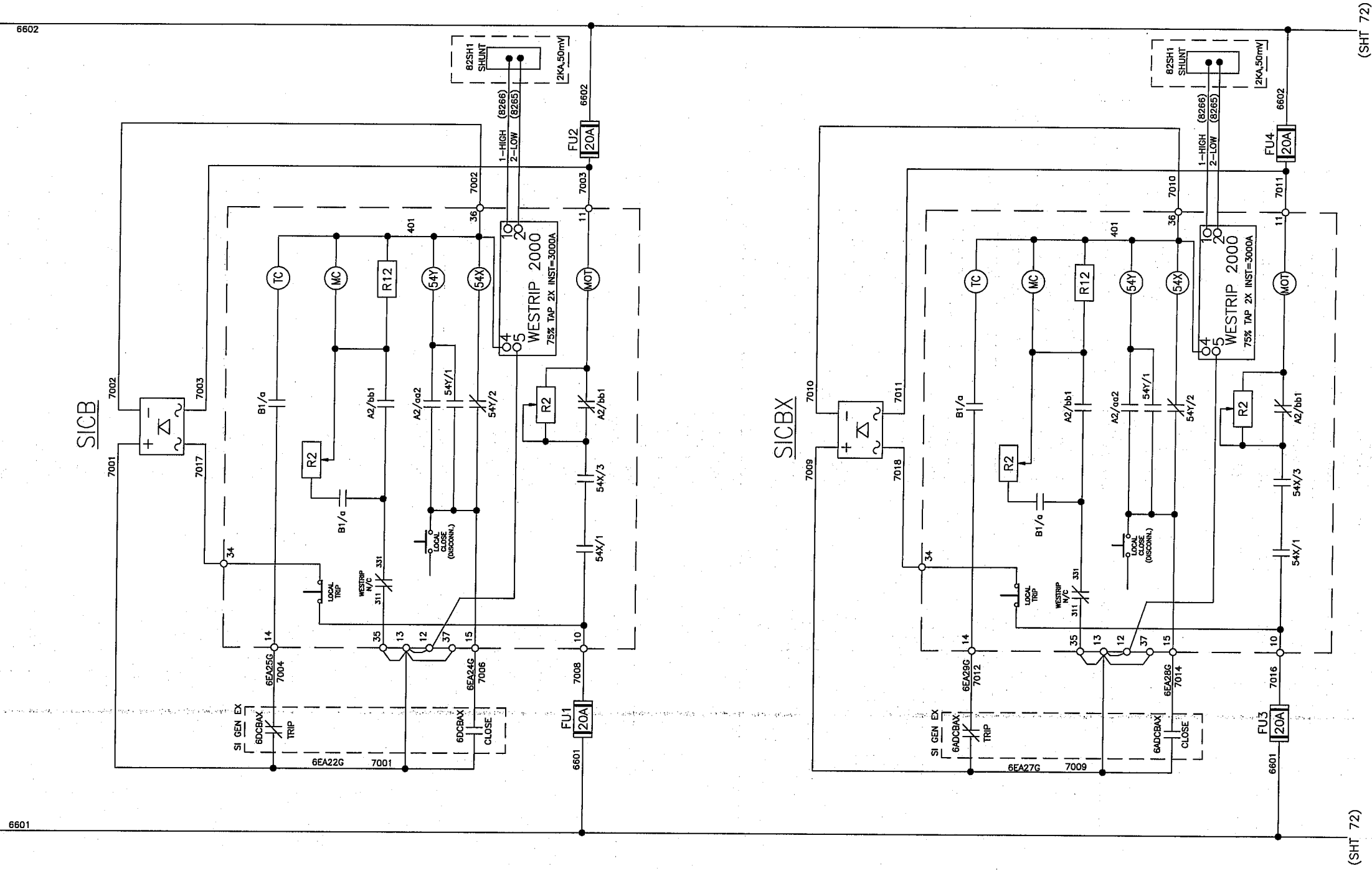
PROPULSION CONTROL
STBD 120V CONTROL DISTRIBUTION

PRINTS TO


749C089-1 CONT. ON SH. 7C

SH. No. 66

STBD CIRCUIT BREAKER BUS
(SHT 66)



—○— Main Circuit Breaker TB

REV.	SEPT 25 03 PS	4	DRAWN	CHKD	 TECHSOL Inc. 400, Mgr Gauvreau Quebec, Que. G1K 9J9	GENERAL ELECTRIC Industrial Systems	PROPULSION CONTROL SICB AND SICBX BREAKER CONTROL	749C089-1	CONT. ON SH. 72	PRINTS TO
2	OCT 1 03 PS	5	S.ROYAL	C.M.						
3	NOV 10 03 PS	6	DATE	02-10-01						70
										SH. No.

H. M. STEIN SOHN GmbH
Automation

Gr. Mühlenstraße 49
24217 Schöenberg
Germany

Tel.: 04344 / 307 - 0
Fax: 04344 / 307 - 290

Customer	:	TECHSOL ELECTROTECHNIQUE	Shipyard	:	PORT WELLER DRY DOCK
Order No.	:	030775	Hull No	:	664
System	:	A067 DOUBLE EOT-SYSTEM	Ship's Name	:	CCGS GRIFFON
Owner	:	CANADIAN COAST GUARD			

Responsible For Project J.Dittmer

Created : 20.01.2003
Last Revision : 24.11.2003
By : S. ROYAL

Projectname : A067_030775

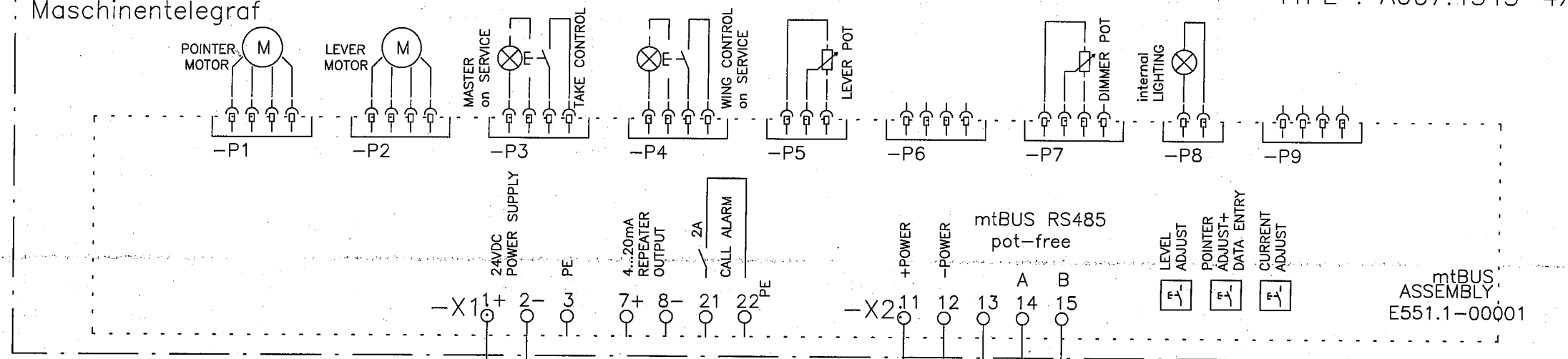
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Number Of Pages : 16

LIST OF DRAWINGS

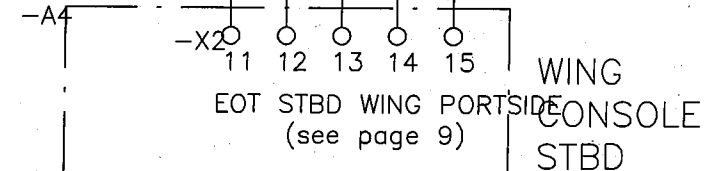
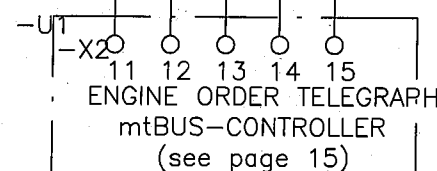
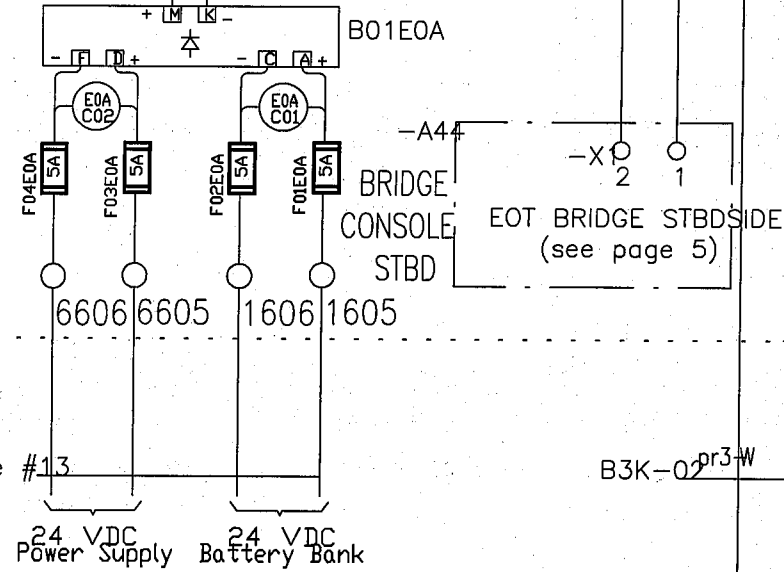
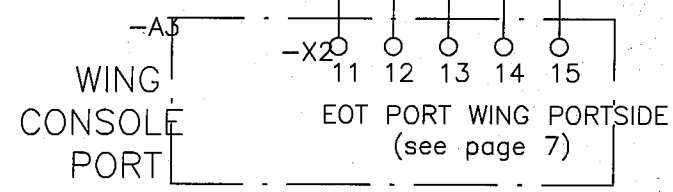
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-A2 EOT BRIDGE PORTSIDE Maschinentelegraf

TYPE : A067.4343-4X -0611



INTERNAL
CONNECTIONS
EXTERNAL



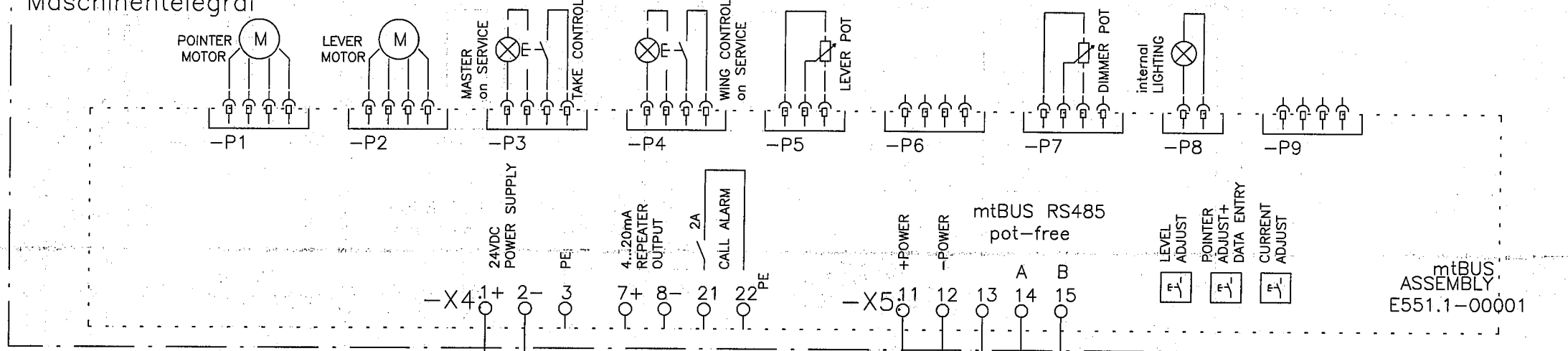
=AG1 +PB
WHEELHOUSE

ECR-CONSOLE

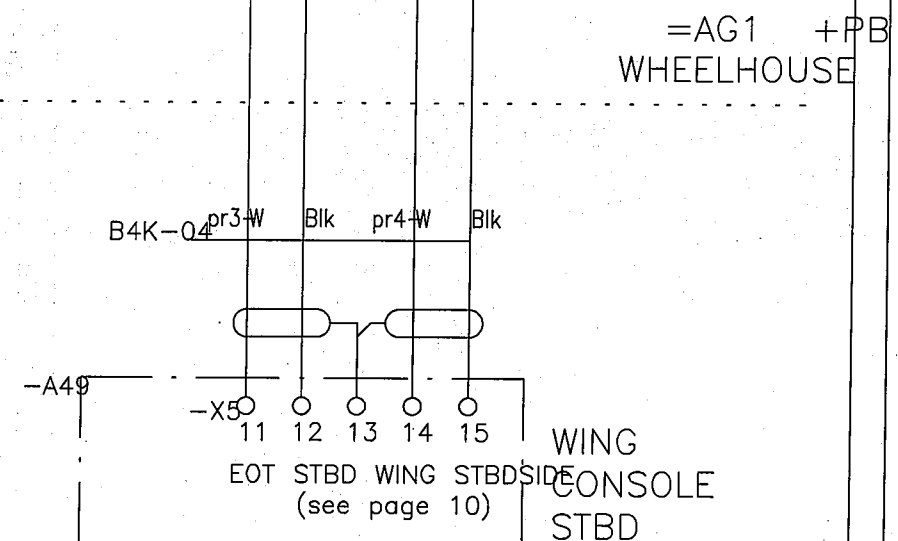
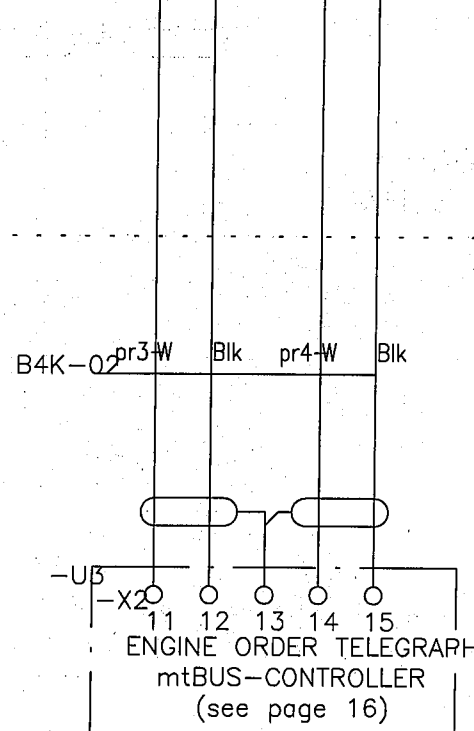
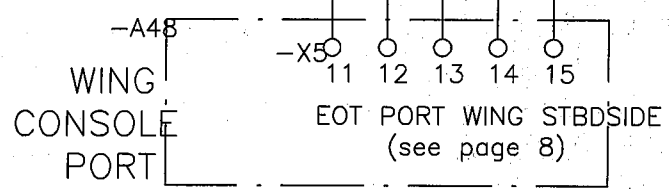
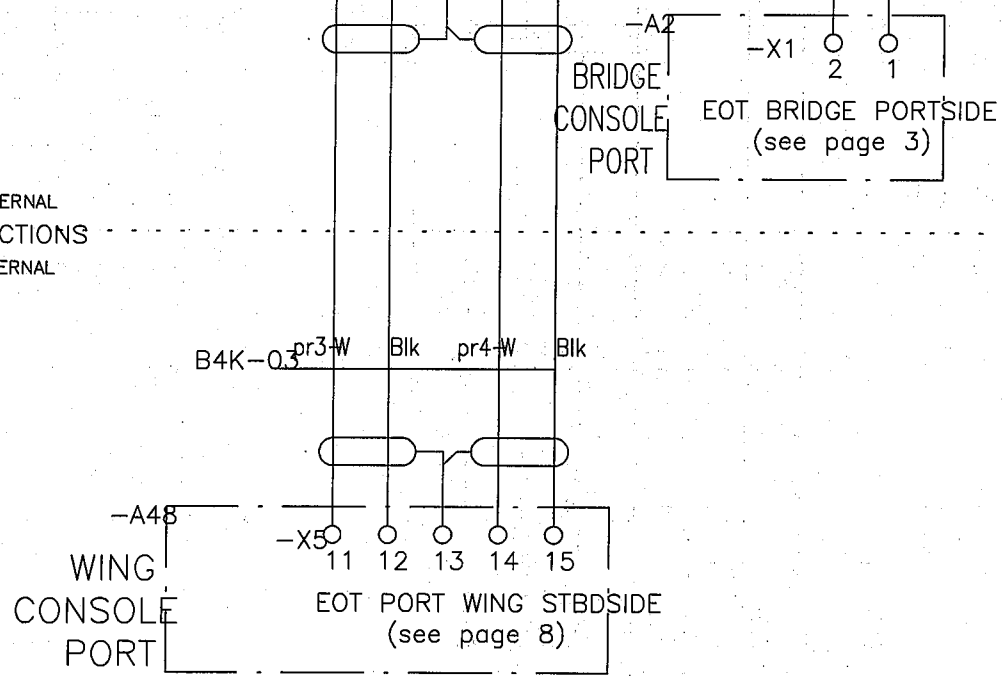
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2 - AS FITTED	03.11.24	S.Royal	DESIGN	Dittmer		TECHSOL ELECTROTECH.	ORDER NUMBER	TYP - STAND	
1	03.08.06	S.Royal	CHECK						
REVISION	DATE	NAME	PR	J.Dittmer				WERFT	HULINEUBAU

-A44 EOT BRIDGE STBDSIDE
Maschinentelegraf

TYPE : A067.4343-4X1-0611



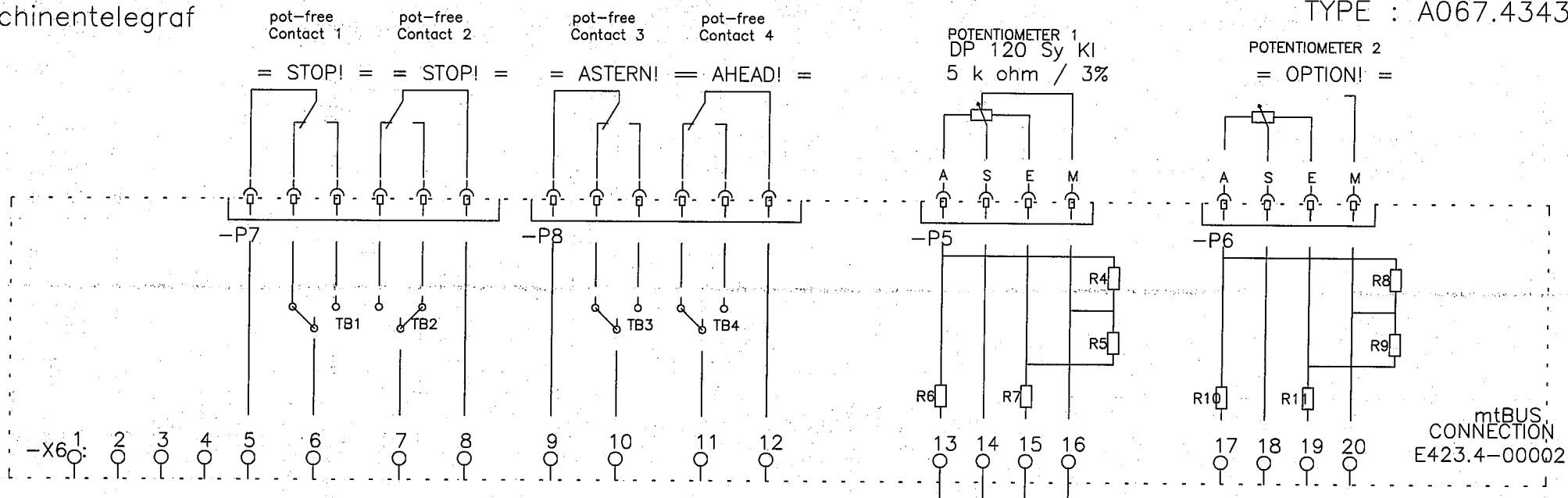
INTERNAL
CONNECTIONS
EXTERNAL



=AG1 +PB
WHEELHOUSE

2 - AS FITTED 03.11.24 S.Royal			DATE	15.05.2003	A067 DOUBLE EOT-SYSTEM		CUSTOMER	030775	+ A067	
1	03.08.06	S.Royal	DESIGN	Dittmer			TECHSOL ELECTROTECH.			
REVISION			CHECK		M/E REMOTE CONTROL BRIDGE TELEGRAPH		ORDER NUMBER		TYP - STAND	
			PR	J.Dittmer						
						WERFT		HULINEUBAU	PAGE:	5 OF: 16

-A4/ EOT BRIDGE STBDSIDE
Maschinentelegraf



INTERNAL
CONNECTIONS
EXTERNAL

=AG1 +PB
WHEELHOUSE

B4K-02 pr1 Wpr2 Bpr2 Wpr1 B

-MEC/1

(see page B4K)

MAIN ENGINE REMOTE CONTROL SYSTEM
(see DWG P032200-00)

ECR-CONSOLE

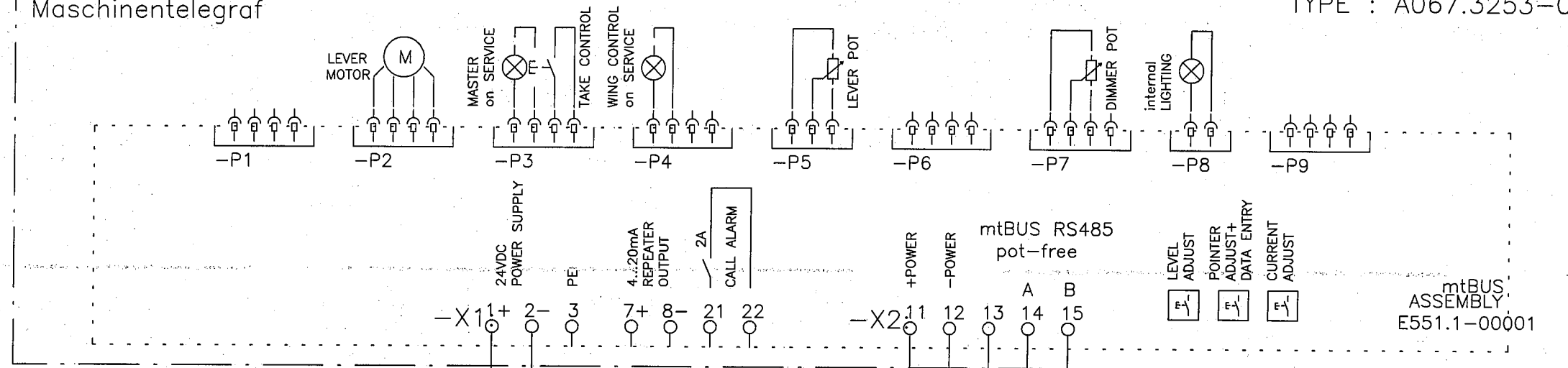
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1	03.08.06	S.Royal	DESIGN	Dittmer			TECHSOL ELECTROTECH.		TYP - STAND	
REVISION	DATE	NAME	CHECK		M/E REMOTE CONTROL BRIDGE TELEGRAPH		ORDER NUMBER		PAGE: 6 OF: 16	
			PR	J.Dittmer						

WERFT

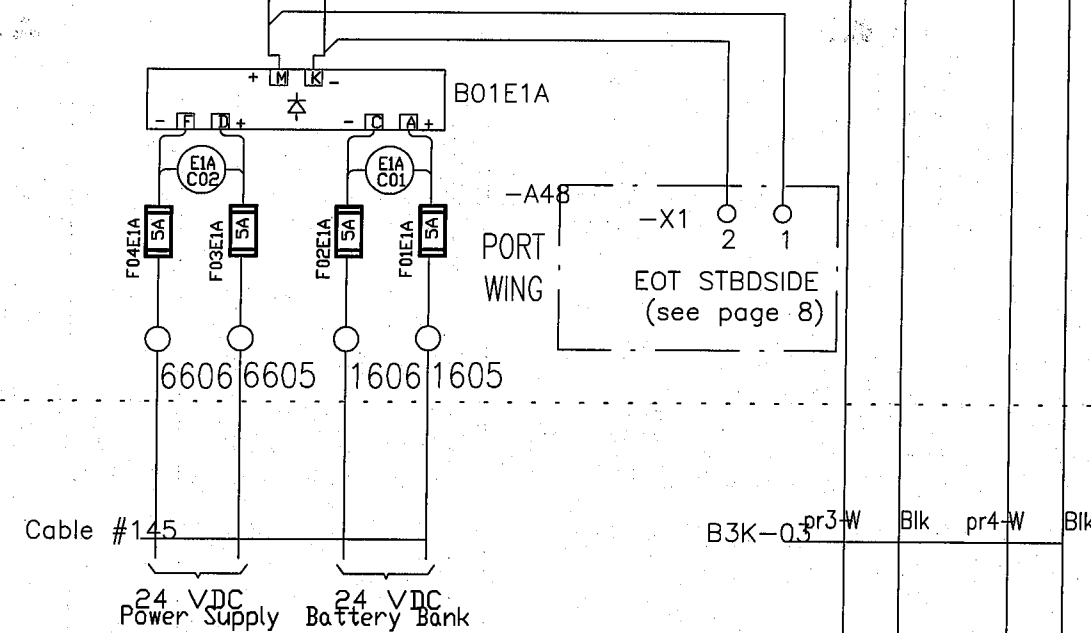
HULINEUBAU

-A3 EOT PORT WING PORTSIDE
Maschinentelegraf

TYPE : A067.3253-000-0611



INTERNAL
CONNECTIONS
EXTERNAL



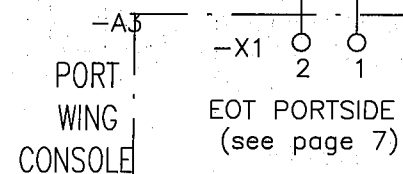
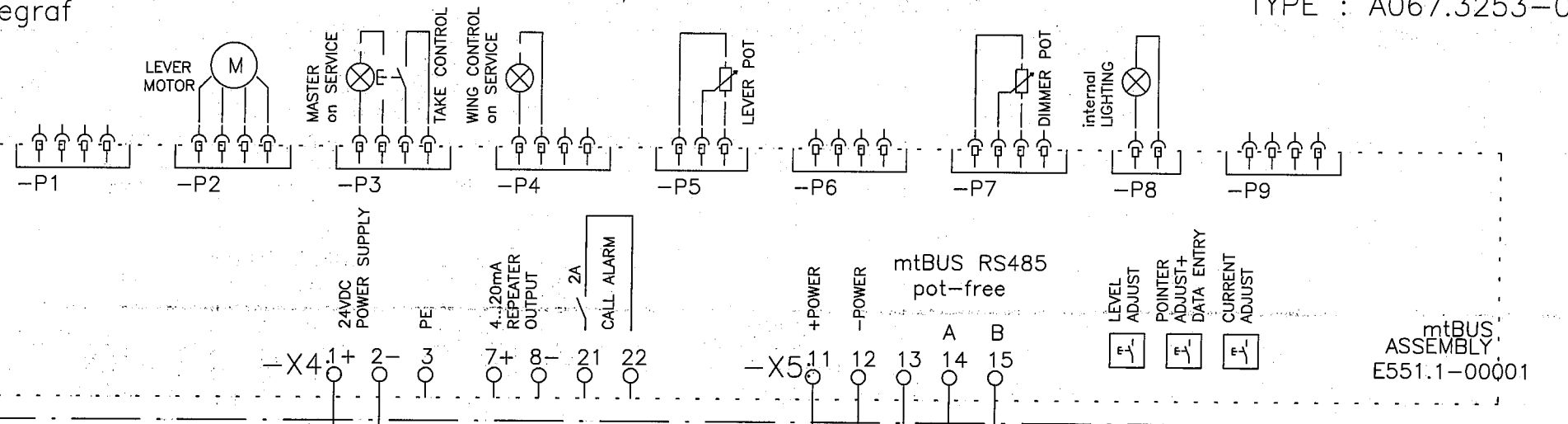
=AG1 +PC01
WING PORTSIDE

WHEELHOUSE CONSOLE

2 - AS FITTED	03.11.24	S.Royal	DATE	15.05.2003	A067 DOUBLE EOT-SYSTEM	CUSTOMER	030775	=	+ A067
1	03.08.06	S.Royal	DESIGN	Dittmer	M/E REM.CONTROL PORT WING TELEGRAPH	TECHSOL ELECTROTECH.	ORDER NUMBER		TYP - STAND
REVISION	DATE	NAME	CHECK	J.Dittmer			WERFT	HULINEUBAU	PAGE: 7 OF: 16

-A48 EOT PORT WING STBDSIDE
Maschinentelegraf

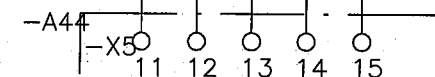
TYPE : A067.3253-000-0611



INTERNAL
CONNECTIONS
EXTERNAL

=AG1 +PC01
WING PORTSIDE

B4K-03 pr3-W Blk pr4-W Blk



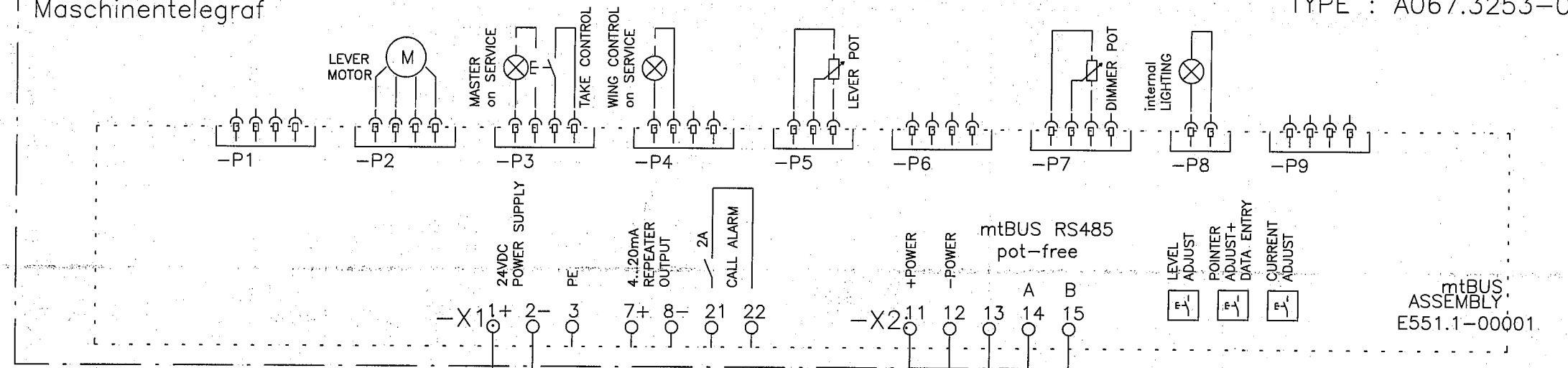
ENGINE ORDER TELEGRAPH
(see page 5)

WHEELHOUSE CONSOLE

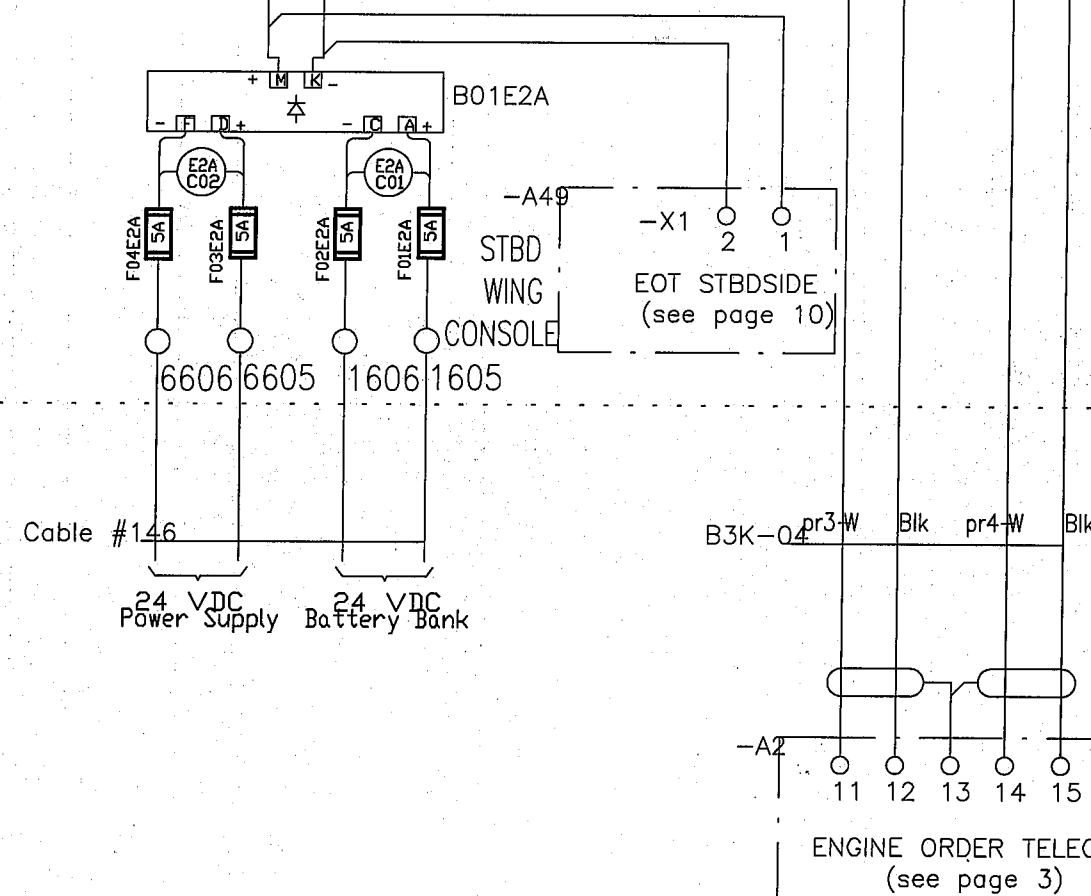
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1			CHECK							
REVISION			DATE	NAME						
			PR	J.Dittmer						
								WERFT	HULINEUBAU	PAGE: 8 OF: 16

-A4 EOT STBD WING PORTSIDE Maschinentelegraf

TYPE : A067.3253-000-0611



INTERNAL
CONNECTIONS
EXTERNAL



=AG1 +PC02
WING STBDSIDE

2 - AS FITTED	03.11.24	S.Royal
1	03.08.06	S.Royal
REVISION	DATE	NAME

DATE	15.05.2003
DESIGN	Dittmer
CHECK	
PR	J.Dittmer

A067 DOUBLE EOT-SYSTEM
M/E REM.CONTROL PORT WING TELEGRAPH

CUSTOMER
TECHSOL ELECTROTECH.

030775
ORDER NUMBER

=

+ A067

TYP - STAND

WERFT

HULINEUBAU

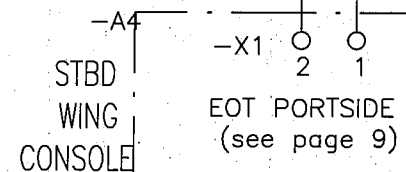
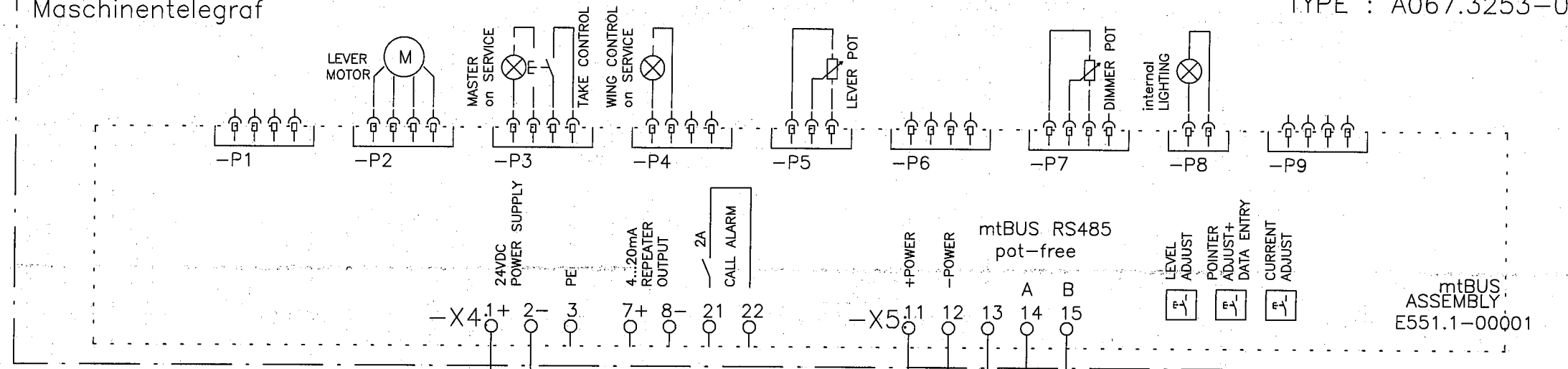
PAGE:

9 OF:

16

-A49 EOT STBD WING STBDSIDE
Maschinentelegraf

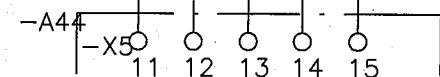
TYPE : A067.3253-000-0611



INTERNAL
CONNECTIONS
EXTERNAL

=AG1 +PC02
WING STBDSIDE

B4K-04 pr3-W Blk pr4-W Blk



ENGINE ORDER TELEGRAPH
(see page 5)

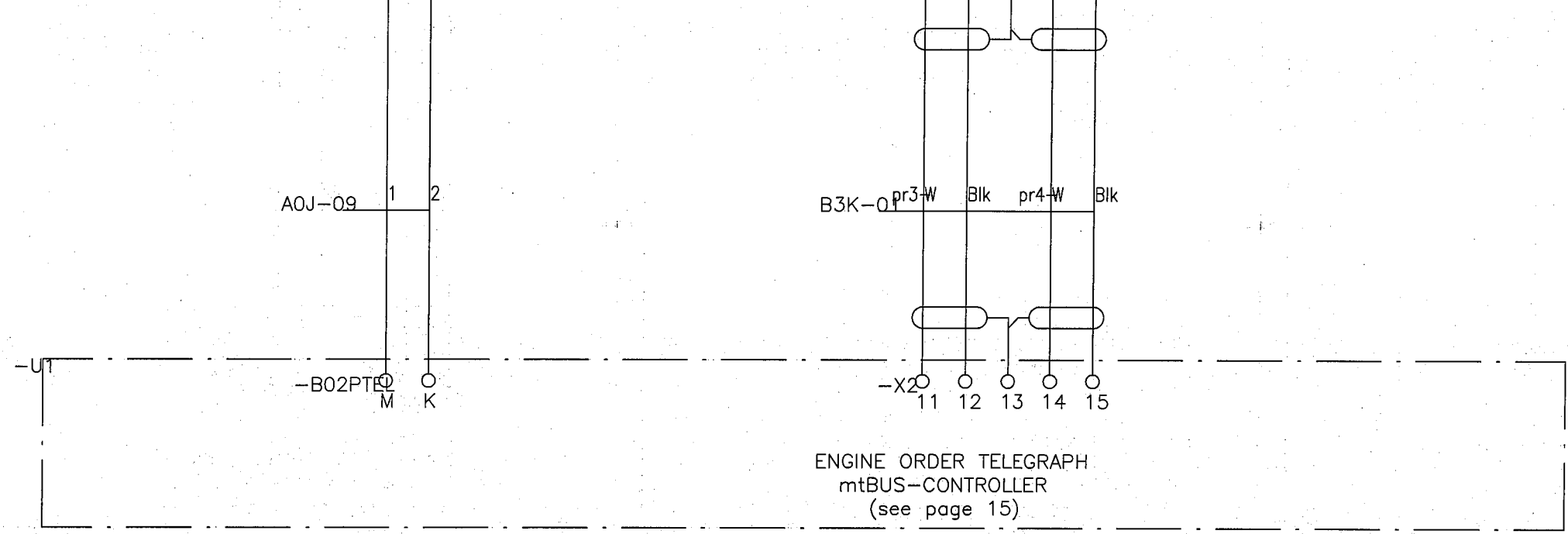
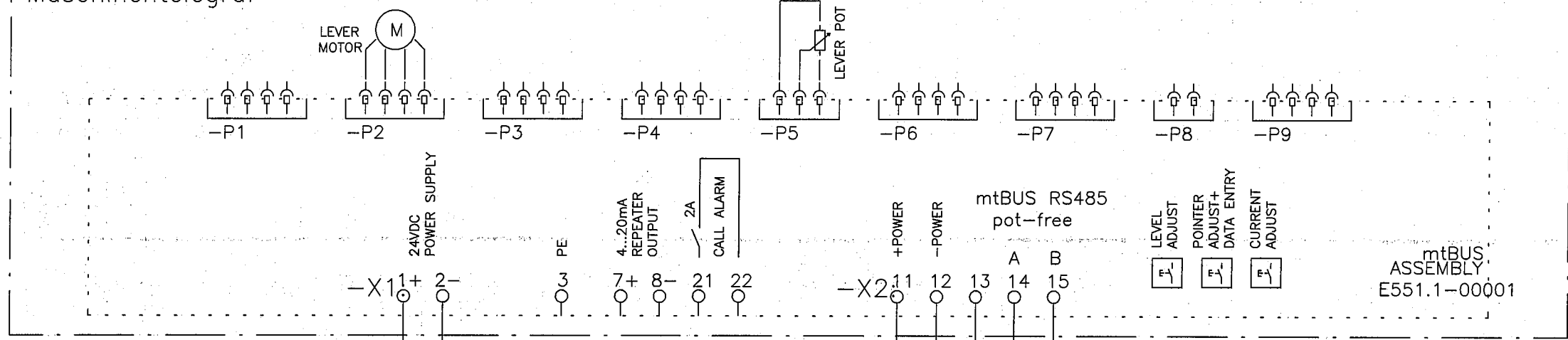
WHEELHOUSE CONSOLE

			DATE	15.05.2003	A067 DOUBLE EOT-SYSTEM		CUSTOMER	030775	+ A067	
2 - AS FITTED			DESIGN	Dittmer	M/E REM.CONTROL PORT WING TELEGRAPH		TECHSOL ELECTROTECH.		TYP - STAND	
1			CHECK				ORDER NUMBER			
REVISION			DATE	NAME			WERFT	HULINEUBAU	PAGE:	100F: 16
			PR	J.Dittmer						

-A1

EOT ECR PORTSIDE
Maschinentelegraf

TYPE : A067.4160-4X1-0610

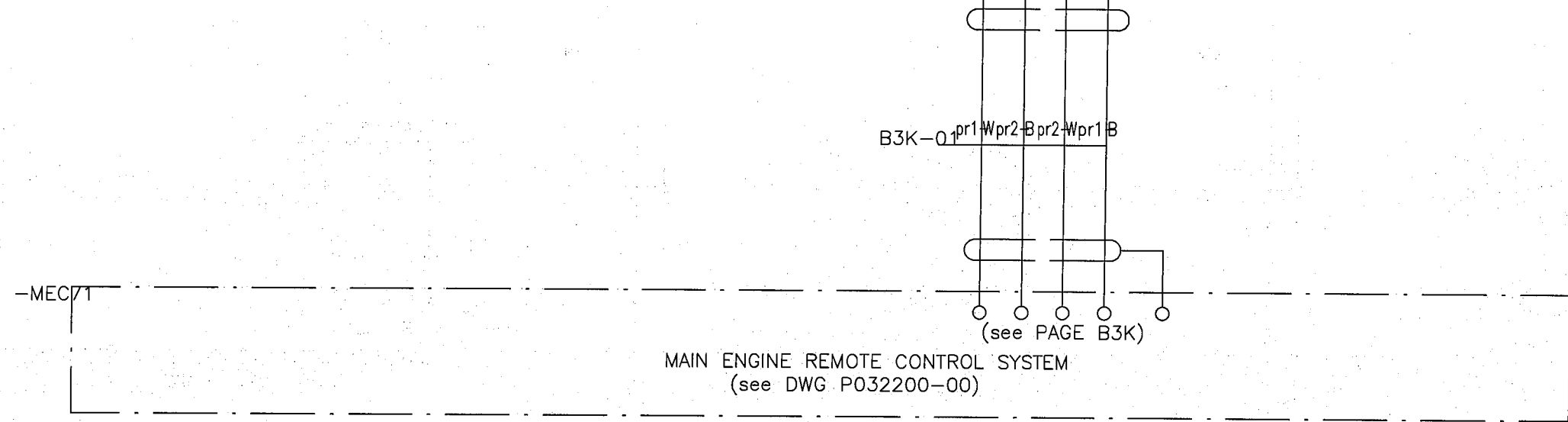
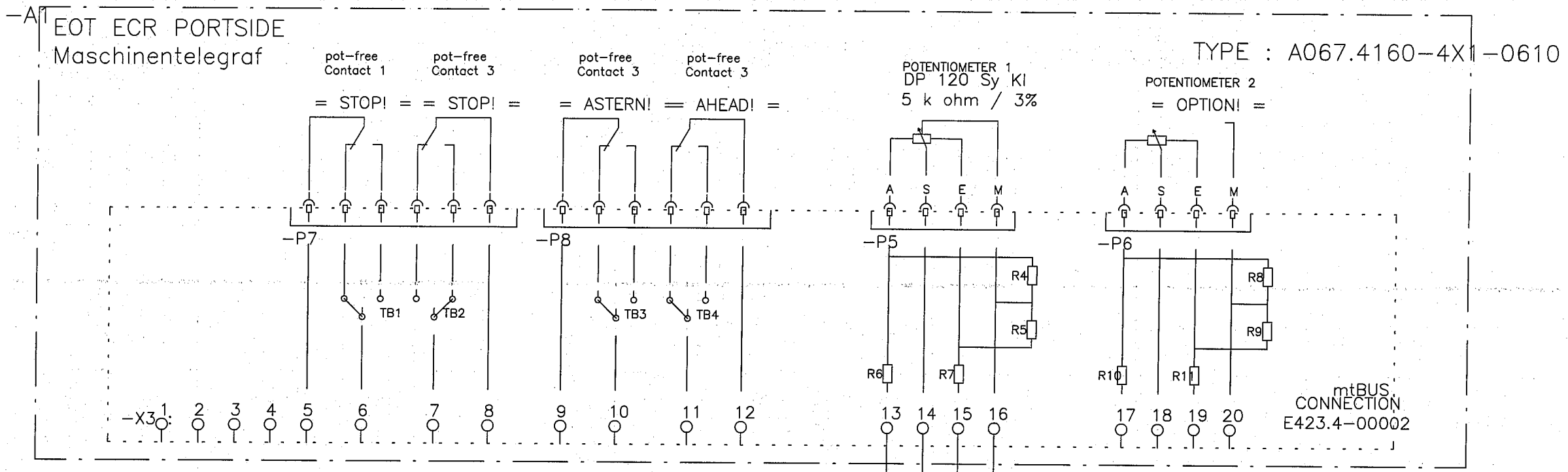


INTERNAL
CONNECTIONS

EXTERNAL

=AG1 +PA
ECR-CONSOLE

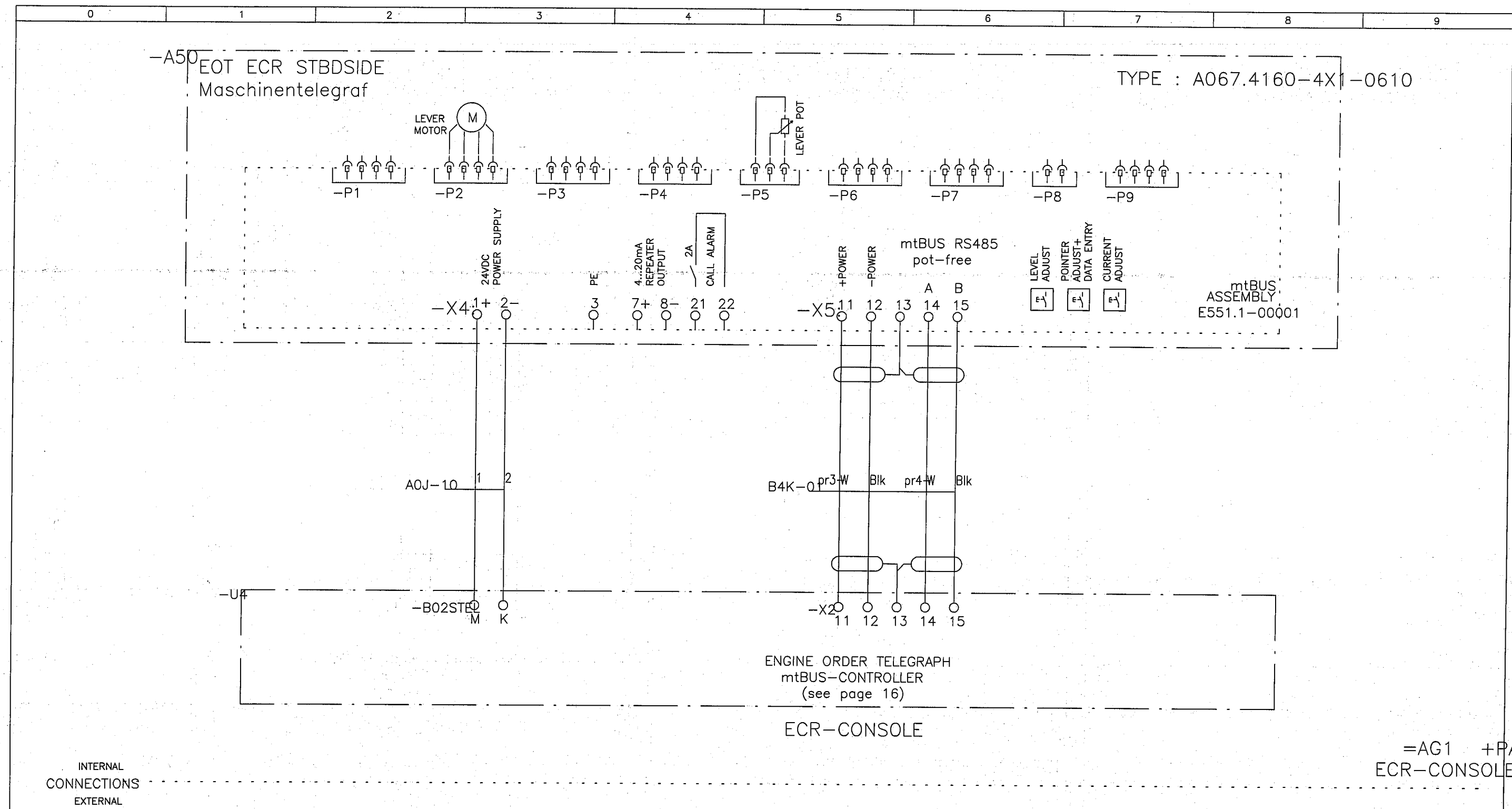
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2 - AS FITTE			DESIGN	Dittmer			TECHSOL ELECTROTECH.	ORDER NUMBER		TYP - STAND
1			CHECK		M/E REMOTE CONTROL ECR TELEGRAPH					
REVISION			PR	J.Dittmer						
			DATE	03.08.06					WERFT	HULLNEUBAU
			NAME	S.Royal					PAGE:	11 OF 16



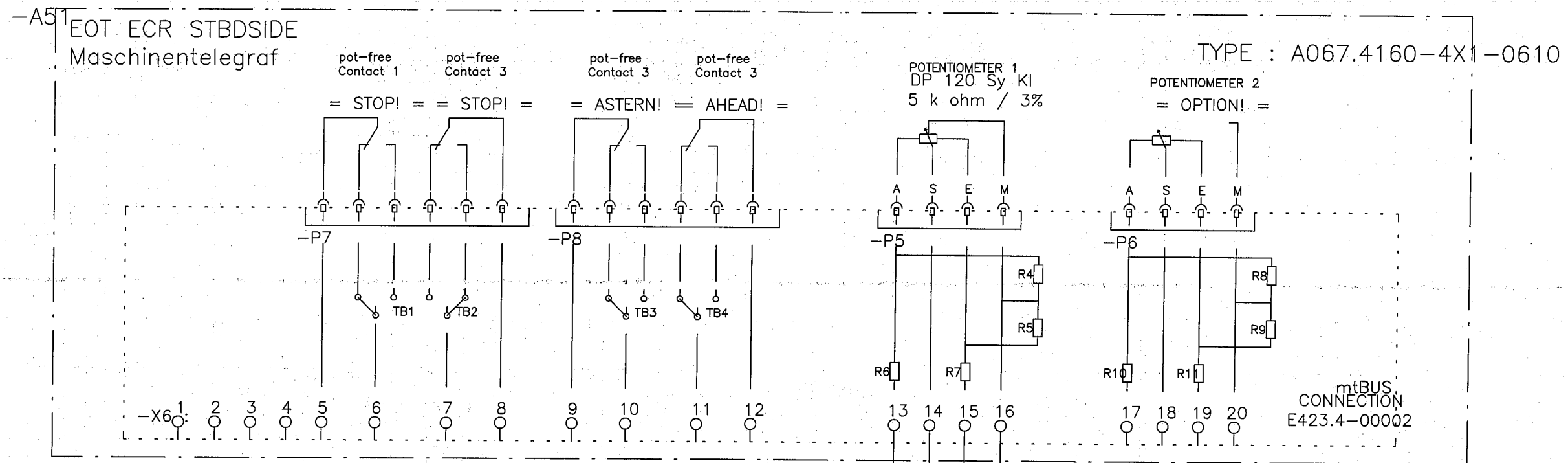
INTERNAL
CONNECTIONS
EXTERNAL

=AG1 +PA
ECR-CONSOLE

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2 - AS FITTED	03.11.24	S.Royal	DESIGN	Dittmer		TECHSOL ELECTROTECH.	ORDER NUMBER			TYP - STAND					
1	03.08.06	S.Royal	CHECK												
REVISION	DATE	NAME	PR	J.Dittmer						WERFT		HULINEUBAU		PAGE: 12 OF: 16	



			DATE	15.05.2003	A067 DOUBLE EOT-SYSTEM M/E REMOTE CONTROL ECR TELEGRAPH	CUSTOMER	030775			=			+ A067		
2 - AS FITTED	03.11.24	S.Royal	DESIGN	Dittmer		TECHSOL ELECTROTECH.	ORDER NUMBER	TYP - STAND							
1	03.08.06	S.Royal	CHECK												
REVISION	DATE	NAME	PR	J.Dittmer			WERFT		HULINEUBAU		PAGE:		150F:		16



B4K-01 pr1 Wpr2 Bpr2 Wpr1 B

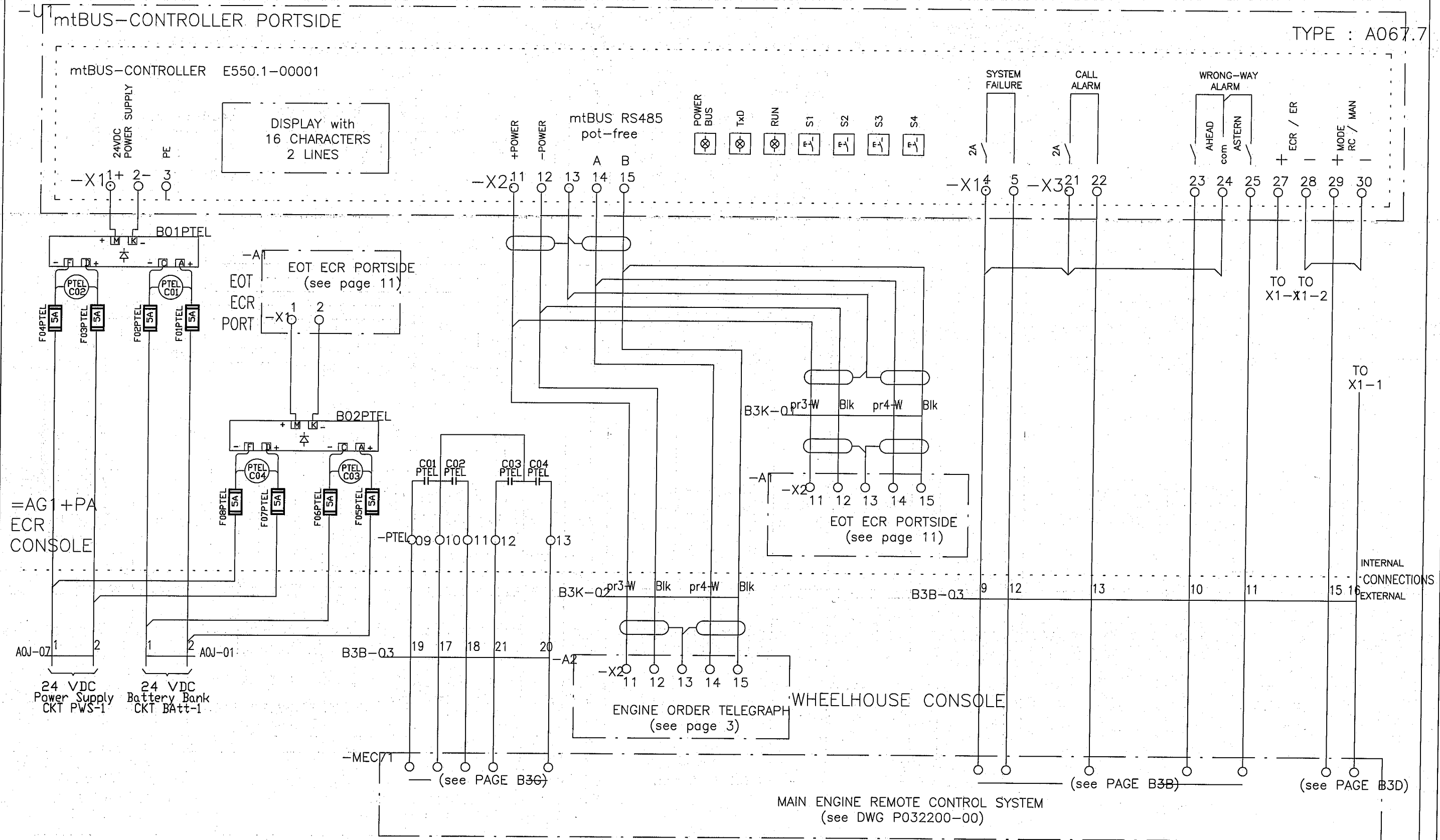
(see PAGE B4K)

MAIN ENGINE REMOTE CONTROL SYSTEM
(see DWG P032200-00)

=AG1 +PA
ECR-CONSOLE

INTERNAL
CONNECTIONS
EXTERNAL

				DATE	15.05.2003	A067 DOUBLE EOT-SYSTEM M/E REMOTE CONTROL ECR TELEGRAPH	CUSTOMER	030775	= + A067			
2 - AS FITTED	03.11.24	S.Royal		DESIGN	Dittmer		TECHSOL ELECTROTECH.	ORDER NUMBER			TYP - STAND	
1	03.08.06	S.Royal		CHECK								
REVISION	DATE	NAME		PR	J.Dittmer			WERFT HULINEUBAU PAGE: 14 OF: 16				



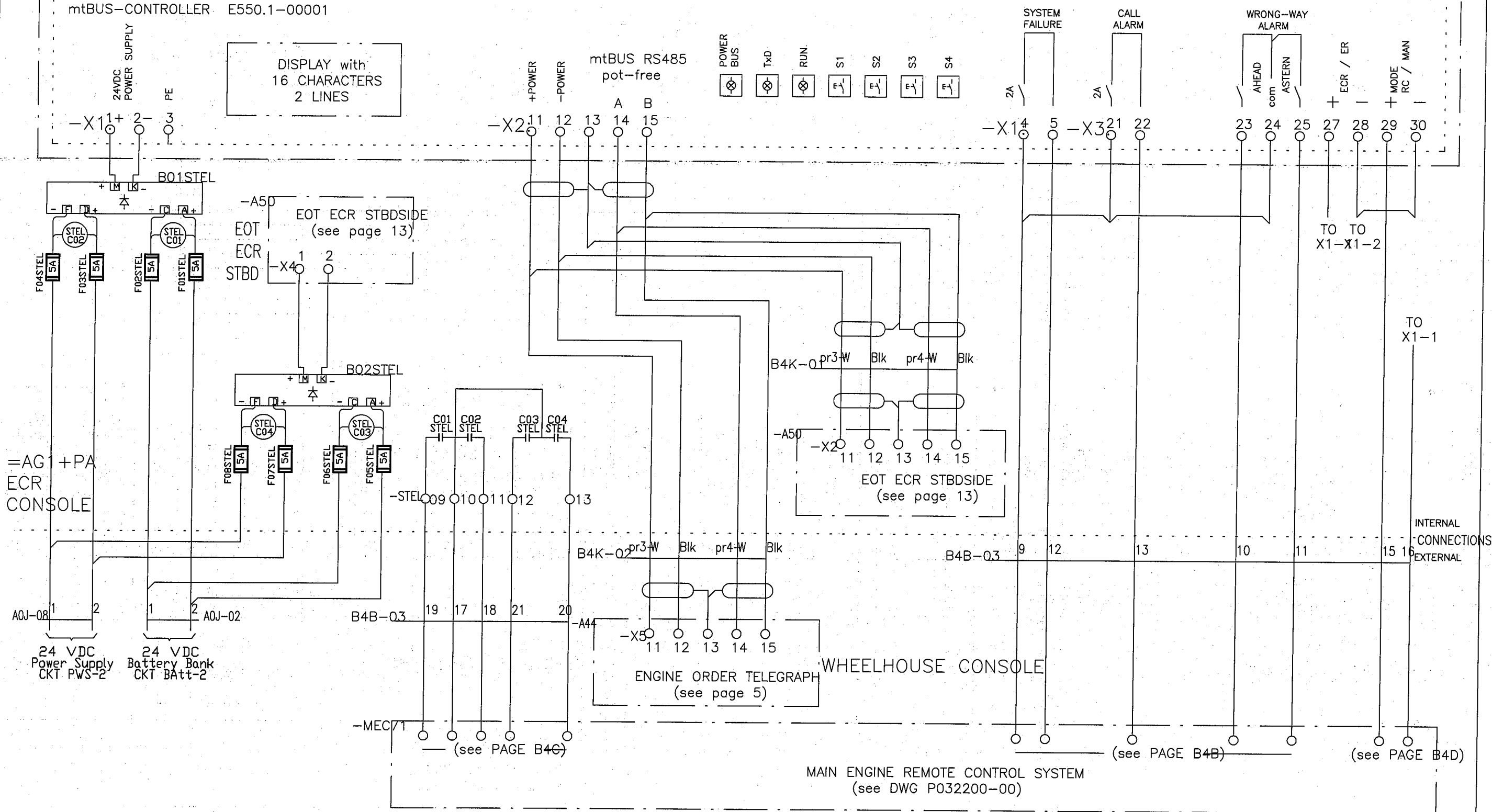
			DATE	19.05.2003	A067 DOUBLE EOT-SYSTEM M/E REM. CONTROL mtBUS-CONTROLLER	CUSTOMER TECHSOL ELECTROTECH.	030775		+ A067			
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1	03.08.06	S.Royal	CHECK						WERFT	HULINEUBAU	PAGE:	15 OF:
REVISION	DATE	NAME	PR	J.Dittmer								

-U3 mtBUS-CONTROLLER STBDSIDE

TYPE : A067.7

mtBUS-CONTROLLER E550.1-00001

DISPLAY with
16 CHARACTERS
2 LINES



2 - AS FITTED	03.11.24	S.Royal
1	03.08.06	S.Royal
REVISION	DATE	NAME

DATE	19.05.2003
DESIGN	Dittmer
CHECK	
PR	J.Dittmer

A067 DOUBLE EOT-SYSTEM
M/E REM. CONTROL mtBUS-CONTROLLER

CUSTOMER
TECHSOL ELECTROTECH

030775

ORDER NUMBER

+ A067

TYP - STAND

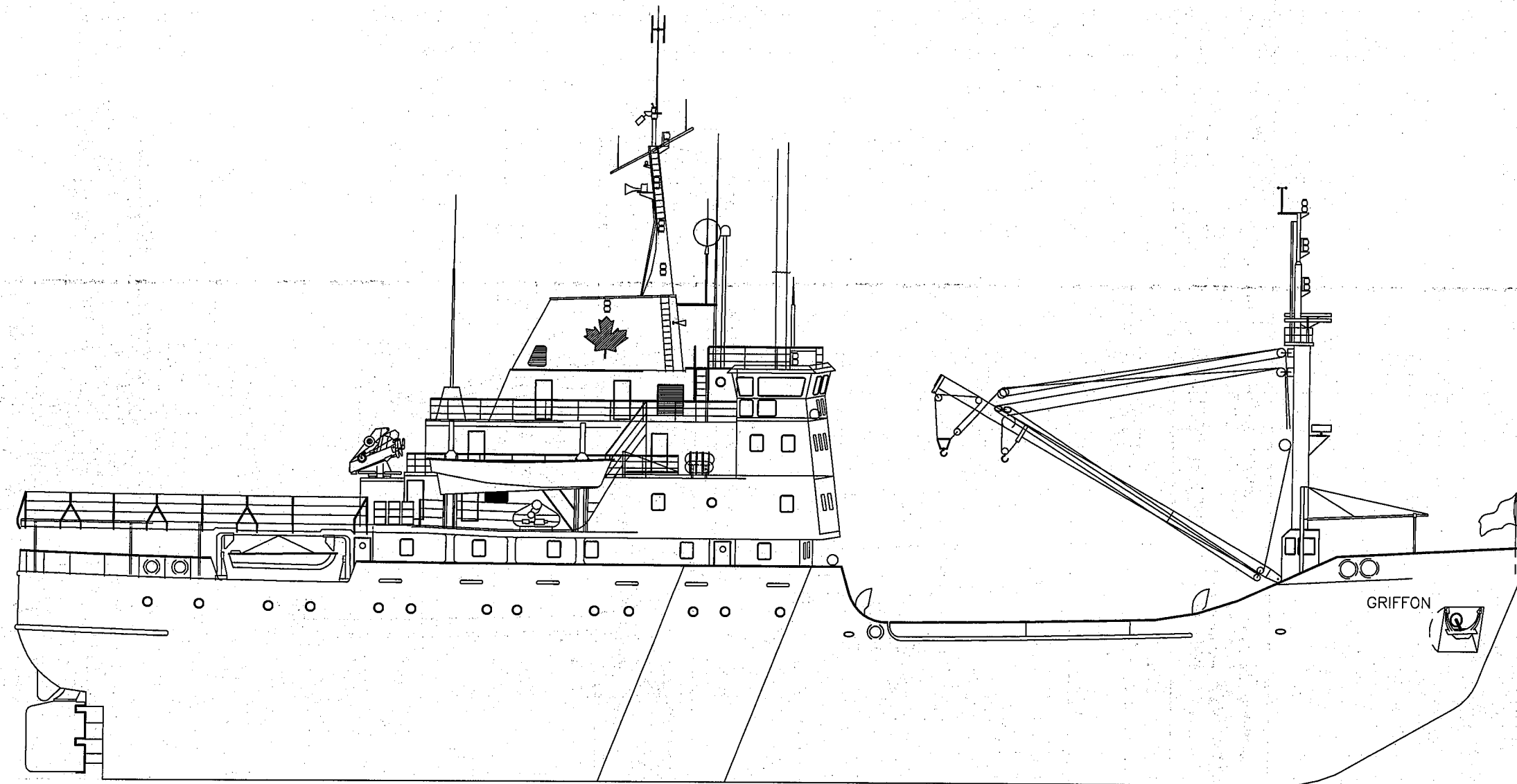
WERFT

HULINEUBAU

PAGE:

160F:

16



PROPULSION CONTROL SYSTEM

CCGS GRIFFON

ELEMENTARY SYSTEM AND WIRING DIAGRAMS

OCTOBER 01, 2002

CONFIDENTIAL



400, Mgr. Gauvreau
 Qu?bec (Qu?bec)
 G1K 9J9
 Tel : (418) 688-2230
 Fax: (418) 688-2233

TECHSOL Inc.
 400, Mgr Gauvreau
 Qu?bec, Qu?c.
 G1K 9J9



DRAWN S.ROYAL
 CHKD C.M.
 DATE 02-10-01

REV. 1	AS FITTED (by Ser)	4
2		5
3		6

GENERAL ELECTRIC
 Industrial Systems
 Salem, Virginia

ELEMENTARY DIAGRAM
 PROPULSION CONTROL SYSTEM

P032200-00 CONT. ON SH. AOA

PRINTS TO
 SH. No. A0

01-	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
02-																				
03-																				
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52-																				
53-																				
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V

INDEX TO SECTION B (LOCAL PANEL CABLING & WIRING)

0 SHEET	DESCRIPTION	1 SHEET	DESCRIPTION	2 SHEET	DESCRIPTION
	<u>ONELINES & PLC COMMUNICATION</u>		<u>PORT CONTROL MIMIC</u>		<u>STBD CONTROL MIMIC</u>
A		A	NINTH GENIUS COMMUNICATION MODULE	A	TENTH GENIUS COMMUNICATION MODULE
B		B	DIGITAL INPUTS BANK #1	B	DIGITAL INPUTS BANK #1
C		C	DIGITAL INPUTS BANK #2	C	DIGITAL OUTPUTS BANK #1
D	PANEL 1 ONELINE DIAGRAM	D	DIGITAL OUTPUTS BANK #1	D	DIGITAL OUTPUTS BANK #2
E	PANEL 2 ONELINE DIAGRAM	E	DIGITAL OUTPUTS BANK #2	E	DIGITAL OUTPUTS BANK #3
F	PANEL 3 ONELINE DIAGRAM	F	DIGITAL OUTPUTS BANK #3	F	
G	PANEL 4 ONELINE DIAGRAM	G		G	
H	GENIUS COMMUNICATION DIAGRAM	H		H	
JA		J		J	
JB		K		K	
JC		L		L	
JD		M		M	
JE					
K					
L					
M					
3 SHEET	DESCRIPTION	4 SHEET	DESCRIPTION	5 SHEET	DESCRIPTION
	<u>PORT CONTROL</u>		<u>STBD CONTROL</u>		
A	ELEVENTH GENIUS COMMUNICATION MODULE	A	TWELVETH GENIUS COMMUNICATION MODULE	A	
B	DIGITAL INPUTS BANK #1	B	DIGITAL INPUTS BANK #1	B	
C	DIGITAL INPUTS BANK #2	C	DIGITAL INPUTS BANK #2	C	
D	DIGITAL OUTPUTS BANK #1	D	DIGITAL OUTPUTS BANK #1	D	
E	VOLTAGE ANALOG INPUTS BANK #1	E	VOLTAGE ANALOG INPUTS BANK #1	E	
F	VOLTAGE ANALOG OUTPUTS BANK #1	F	VOLTAGE ANALOG OUTPUTS BANK #1	F	
G		G		G	
H		H		H	
J		J		J	
K	ANALOG INPUT CALIBRATION BOARD #1	K	ANALOG INPUT CALIBRATION BOARD #1	K	
M	PORT OUTBOARD ENGINE GOVERNOR	M	STBD OUTBOARD ENGINE GOVERNOR	L	
N	PORT INBOARD ENGINE GOVERNOR	N	STBD INBOARD ENGINE GOVERNOR	M	

PRINTS TO

AOB

SH. No.

ELEMENTARY DIAGRAM

PROPULSION CONTROL SYSTEM

P032200-00 CONT. ON SH. AOC

GENERAL ELECTRIC

Industrial Systems

Salem, Virginia

TECHSOL Inc.

400, Mgr Gouveau

Quebec, Que.

G1K 9J9

TECHSOL

CHKD

C.M.

DATE

02-10-01

DRAWN

S.ROYAL

4

5

6

REV.

1

AS FITTED (by Set)

2

3

01-	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	01	PRINTS TO	AOC	SH. No.
02-																					02			
03-																					03			
04-																					04			
05-																					05			
06-																					06			
07-																					07			
08-																					08			
09-																					09			
10-	0																				10			
11-	SHEET																				11			
12-																					12			
13-																					13			
14-																					14			
15-																					15			
16-	A																				16			
17-	B																				17			
18-	C																				18			
19-	D																				19			
20-	E																				20			
21-	F																				21			
22-	G																				22			
23-	H																				23			
24-	J																				24			
25-	K																				25			
26-	L																				26			
27-	M																				27			
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32-	3																				32			
33-	SHEET																				33			
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38-	A																				38			
39-	B																				39			
40-	C																				40			
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46-	H																				46			
47-	J																				47			
48-	M																				48			
49-	N																				49			
50-																					50			
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52-																					52			
53-																					53			
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V				

INDEX TO SECTION C (EXTERNAL I/Os CABLING & WIRING)

INDEXES, GENERAL & PLC

PORT CONTROL MIMIC

STBD CONTROL MIMIC

PORT CONTROL

STBD CONTROL

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gauthier
Quebec, Qué.
G1K 9J9



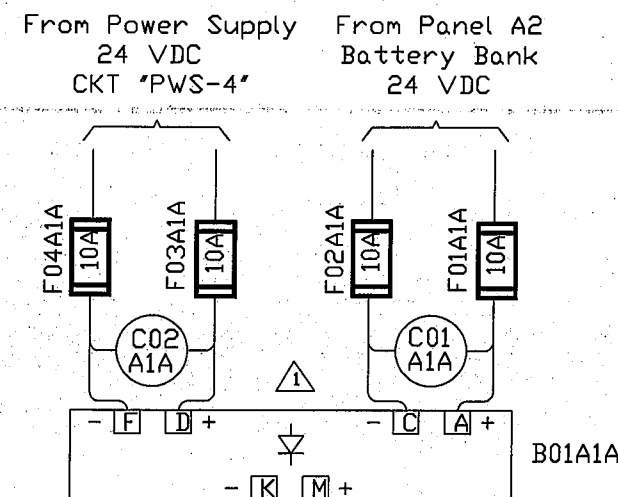
CHKD C.M.
DRAWN S.ROYAL
DATE 02-10-01

REV.	1	AS FITTED (by Set)	4	5	6
2					
3					

[illegible]

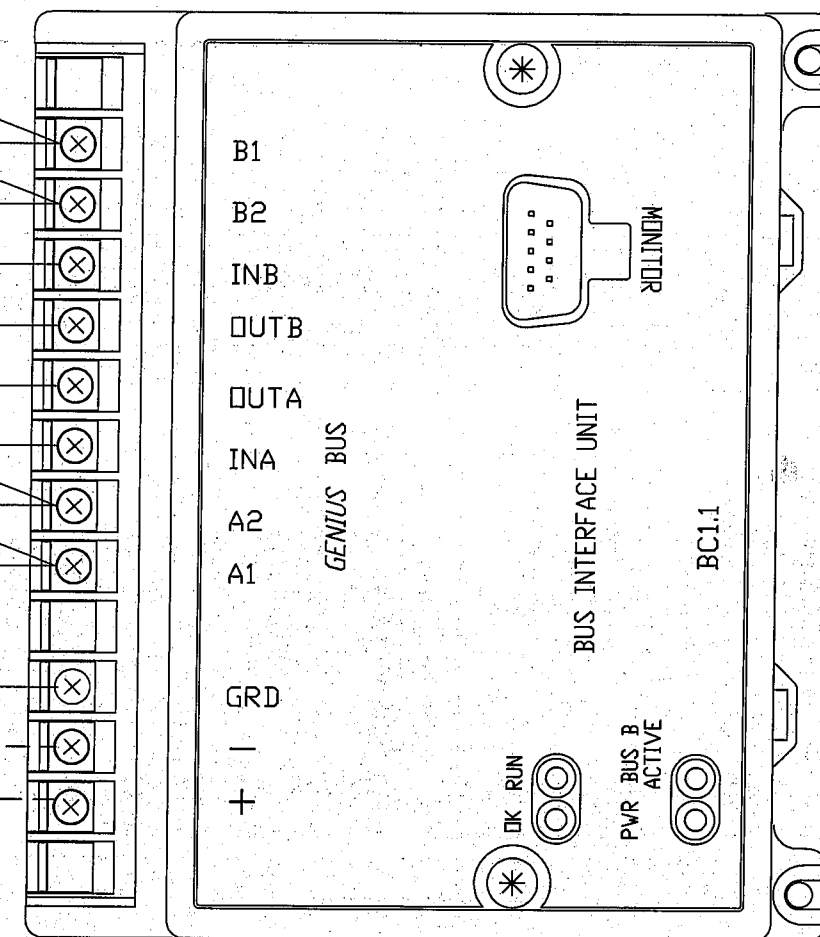
Located Behind ECR Mimic (PORT)

- | | |
|------------|----------------|
| [A0L37M] | TO STBD UC2000 |
| [A0L36M] | TO STBD UC2000 |
| [A0L35M] | TO STBD UC2000 |
| [A3A05N] | [A3A05J] |
| [A3A04N] | [A3A04J] |
| [A3A03N] | [A3A03J] |



33G

35G



Genius Bus Address : 01

[A1B11B] [A1C09B] [A1D11B] [A1E11B] [A1F09B] [A1G09B] [A1H09B] [D0A08B] [D0C08B] [D2A08H]

[A1B13B] [A1C11B] [A1D13B] [A1E13B] [A1F11B] [A1G11B] [A1H11B] [D0A09B] [D0C09B] [D2A10H]

⚠ Techsol Module, Inside Port Mimic Panel
Part # TM-H001

Wiring Diagram See DWG # B1A

Note : Dashed Lines Are Wired By Techsol.

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr. Gauthier
Quebec, Qué.
G1K 9J9



CHKD
C.M.
DRAWN
S.ROYAL
DATE
02-10-01

REV. 1 AS FITTED (by Ser)
2
3

PRINTS TO
A1A
SH. No.

ELEMENTARY DIAGRAM
PROPULSION CONTROL SYSTEM

P032200-00 CONT. ON SH. A1B

Digital Inputs Bank #1

TB101

A

N/C

B

DC-

01

Port OUTBD CB CLOSE
Push-Button

02

Port OUTBD CB OPEN
Push-Button

03

Port OUTBD Diesel AUTO
Push-Button

04

Port OUTBD Diesel MANUAL
Push-Button

05

Port OUTBD Diesel E-STOP
Push-Button

06

Port System Feedback Reference NORMAL
Push-Button

07

Port System Feedback Reference EMERGENCY
Push-Button

08

Spare_%I0008

09

Spare_%I0009

10

Spare_%I0010

11

Spare_%I0011

12

Spare_%I0012

13

Spare_%I0013

14

Spare_%I0014

15

Power Supply Failure Panel A1

16

Battery Supply Failure Panel A1

TB102

TB101

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

B

A

TB104

TB103

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

B

A

24 VDC
Positive / Negative
Input Module

%I0001

%I0002

%I0003

%I0004

%I0005

%I0006

%I0007

%I0008

%I0009

%I0010

%I0011

%I0012

%I0013

%I0014

%I0015

%I0016

BC1.1.1

IC670MDL640

24 VDC
Digital Output Module
16 Outputs

BC1.1.2

IC670MDL740

Source Input Configuration

Wiring Diagram See DWG # B1B

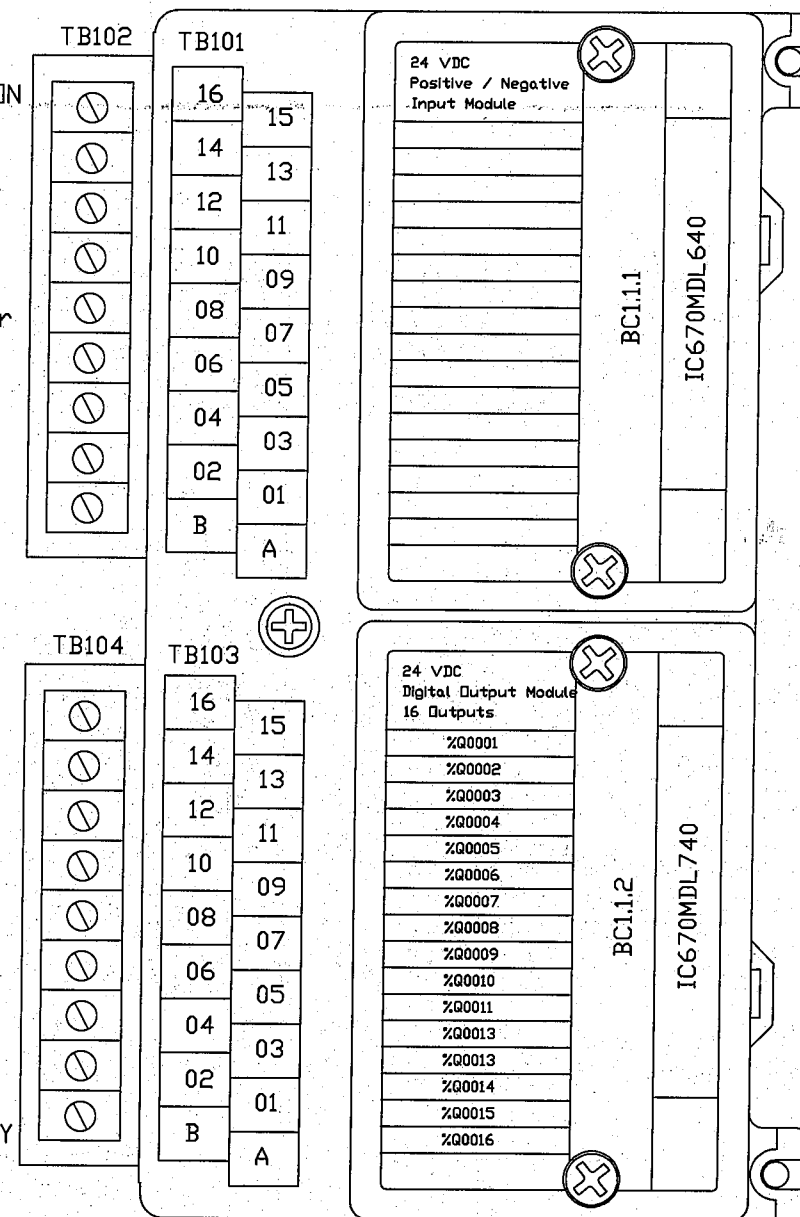
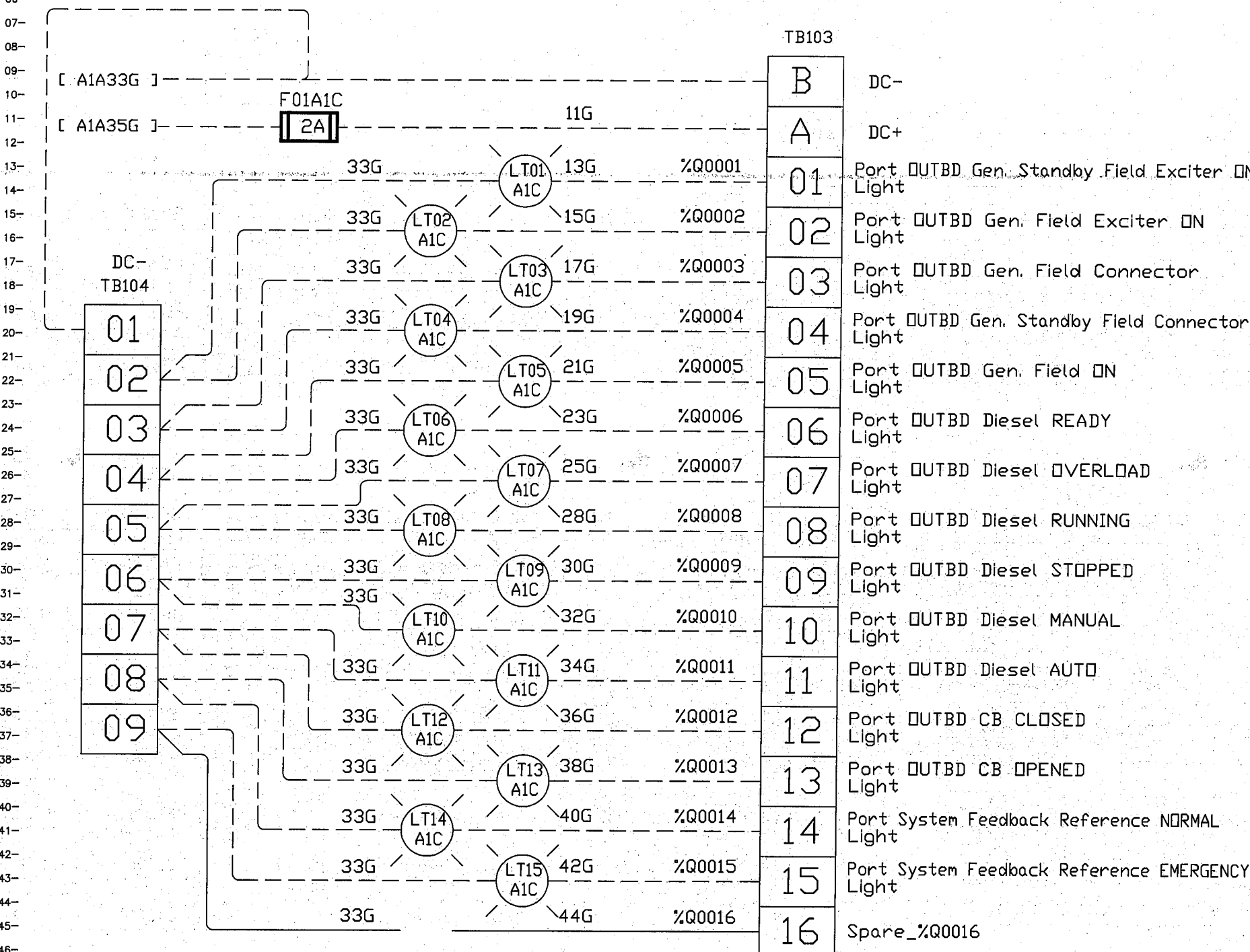
Note : Dashed Lines Are Wired By Techsol.

REV.	AS FITTED (by Ser)	DRAWN	CHKD	C.M.	DATE	PRINTS TO	ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
1		S. ROYAL			02-10-01				A1B
2									
3									

GENERAL ELECTRIC

Industrial Systems
Salem, VirginiaTECHSOL Inc.
400, Mgr. Gauthier
Quebec, Que.
G1K 9J9

Digital Outputs Bank #1



Source Output Configuration

Wiring Diagram See DWG # B1C

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO
A1C SH. No.

ELEMENTARY DIAGRAM
PROPULSION CONTROL SYSTEM
P032200-00 CONT. ON SH. A1D

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gouveau
Quebec, Qué.
G1K 9J9

TECHSOL

CHKD
C.M.
DATE
02-10-01

DRAWN
S.ROYAL

REV. 1 AS FITTED (by Ser) 4 5 6

Digital Inputs Bank #2

TB105

A N/C

B DC-

01 Port INBD CB CLOSE Push-Button

02 Port INBD CB OPEN Push-Button

03 Port INBD X-Conn CB CLOSE Push-Button

04 Port INBD Diesel AUTO Push-Button

05 Port INBD Diesel MANUAL Push-Button

06 Port INBD Diesel E-STOP Push-Button

07 Port Exciters RESET Push-Button

08 Port Ground Test Push-Button

09 Spare_%I0025

10 Spare_%I0026

11 Spare_%I0027

12 Spare_%I0028

13 Spare_%I0029

14 Spare_%I0030

15 Spare_%I0031

16 Spare_%I0032

TB106

TB105

16 15

14 13

12 11

10 09

08 07

06 05

04 03

02 01

B A

TB108

TB107

16 15

14 13

12 11

10 09

08 07

06 05

04 03

02 01

B A

24 VDC Positive / Negative Input Module

%I0017
%I0018
%I0019
%I0020
%I0021
%I0022
%I0023
%I0024
%I0025
%I0026
%I0027
%I0028
%I0029
%I0030
%I0031
%I0032

BC1.1.3

IC670MDL640

24 VDC Positive / Negative Input Module

BC1.1.4

IC670MDL640

Source Input Configuration

Wiring Diagram See DWG # B1B

Note : Dashed Lines Are Wired By Techsol.

TECHSOL Inc.
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Quebec, Que.
G1K 9J9

TECHSOL

CHKD C.M.
DRAWN S.ROYAL
DATE 02-10-01

REV. 1 AS FITTED (by Self)
2
3

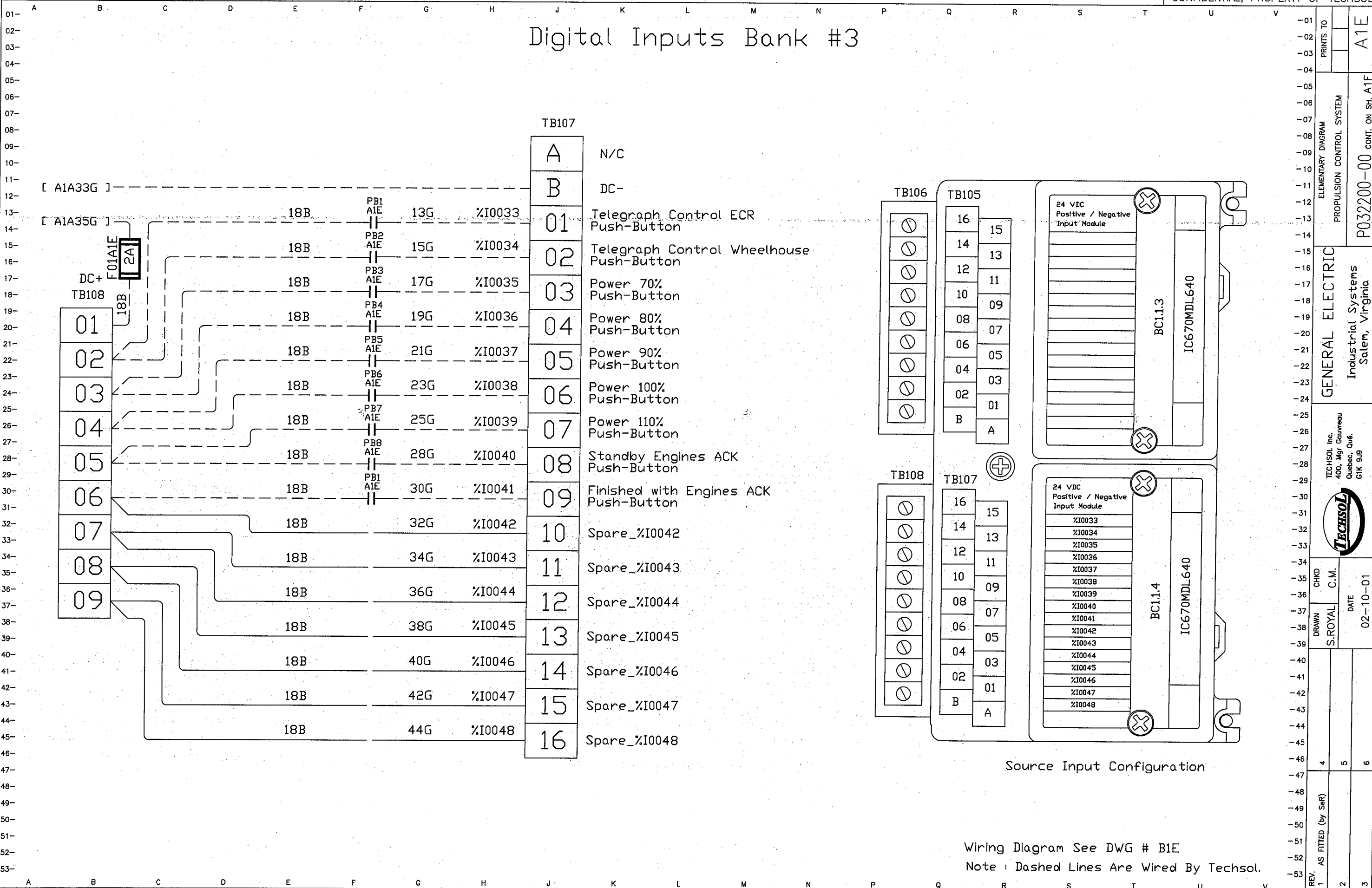
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

ELEMENTARY DIAGRAM
PROPULSION CONTROL SYSTEM

PRINTS TO
A1D
SH. No.

P032200-00 CONT. ON SH. A1E

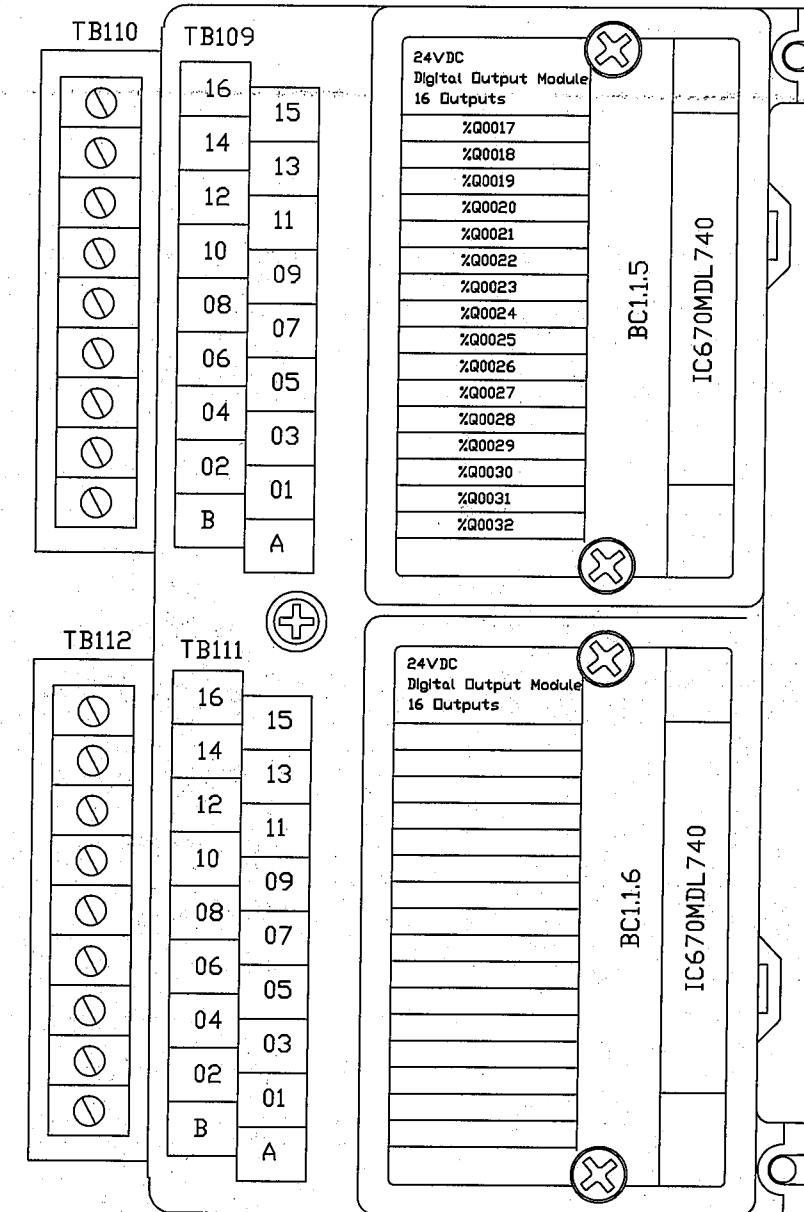
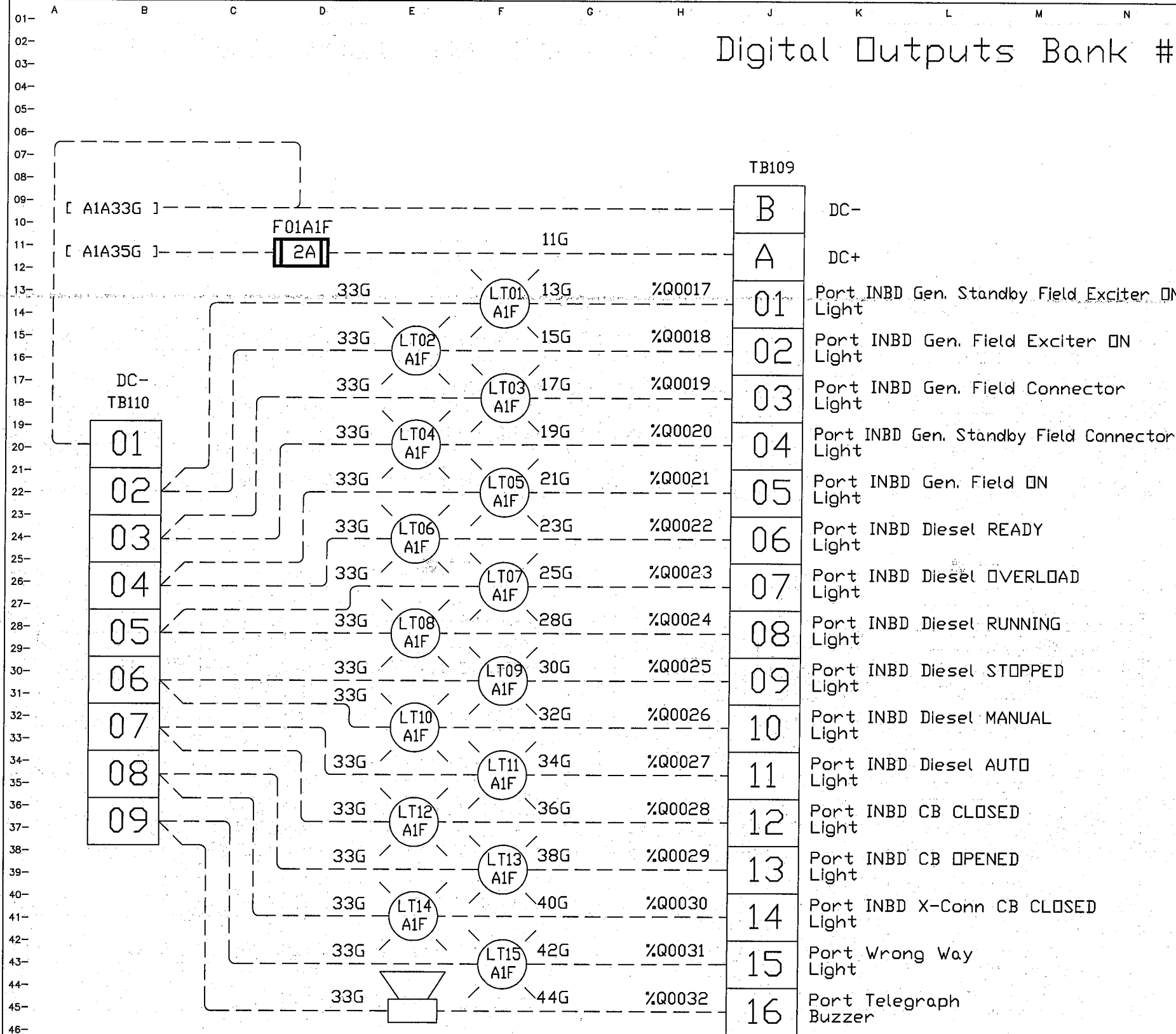
Digital Inputs Bank #3



Source Input Configuration

Wiring Diagram See DWG # B1E
Note : Dashed Lines Are Wired By Techsol.

Digital Outputs Bank #2



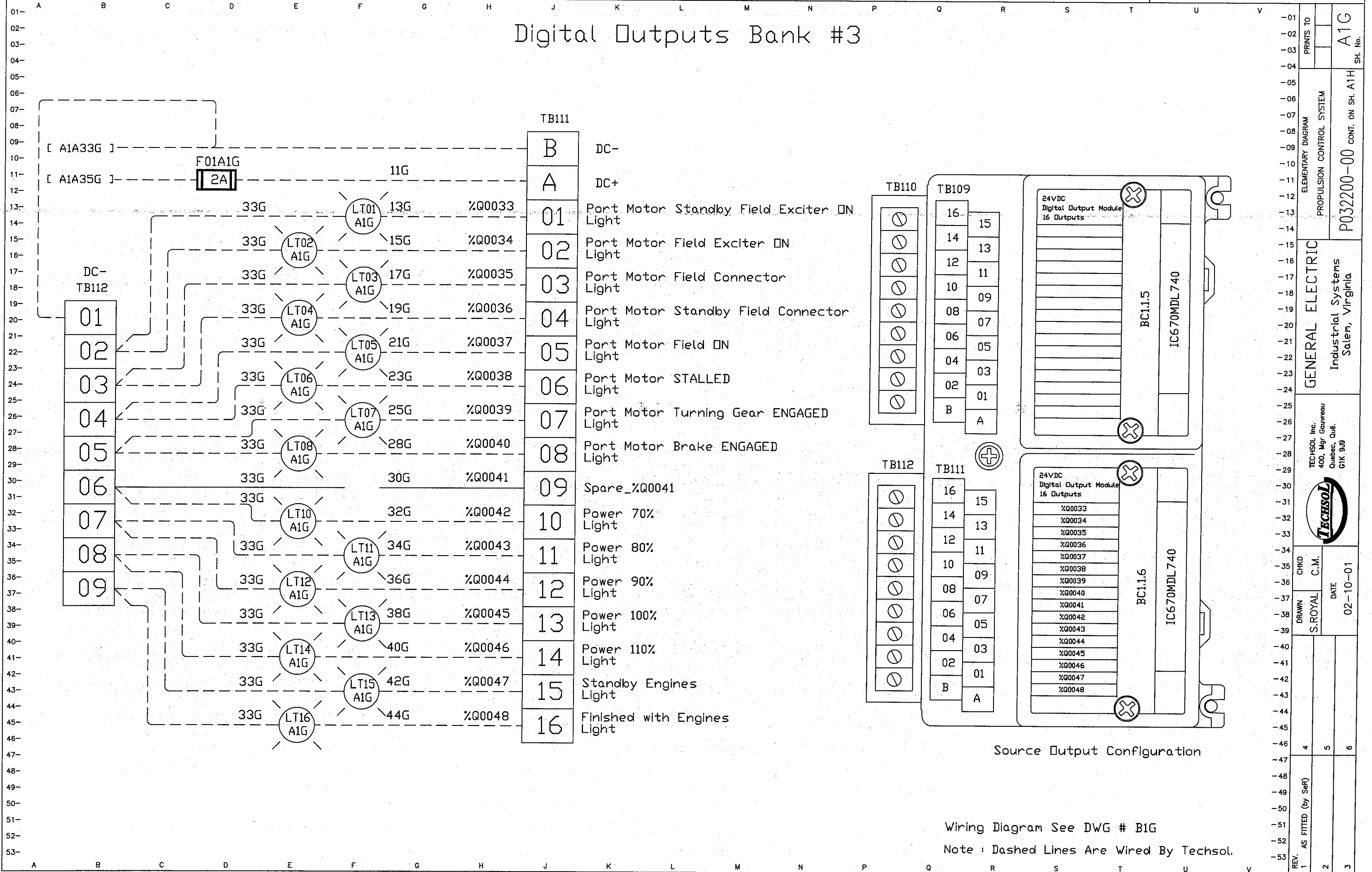
Source Output Configuration

Wiring Diagram See DWG # B1F

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO			
01			A1F
02			
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53			

Digital Outputs Bank #3

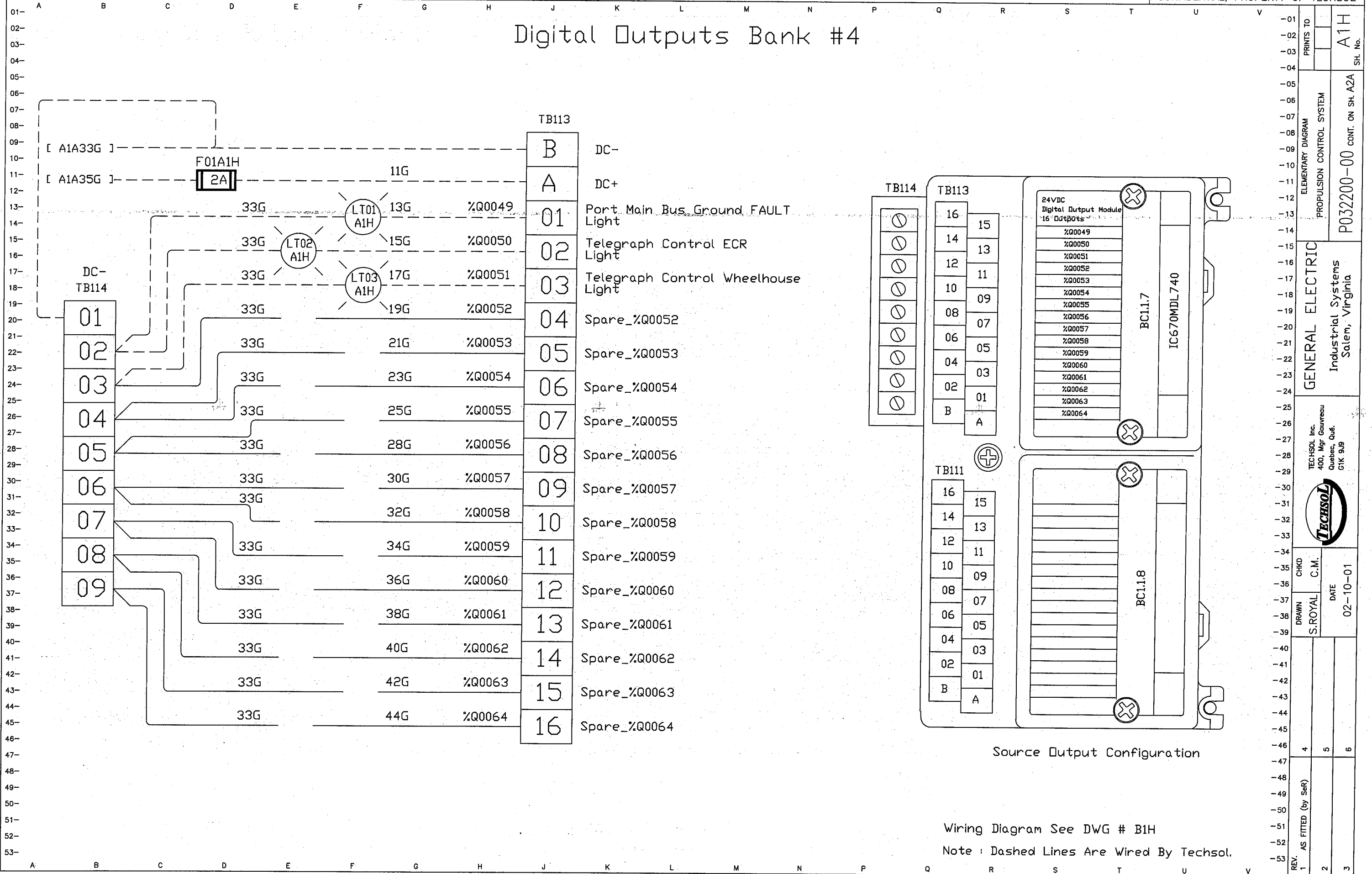


Source Output Configuration

Wiring Diagram See DWG # B1G

Note : Dashed Lines Are Wired By Techsol.

Digital Outputs Bank #4

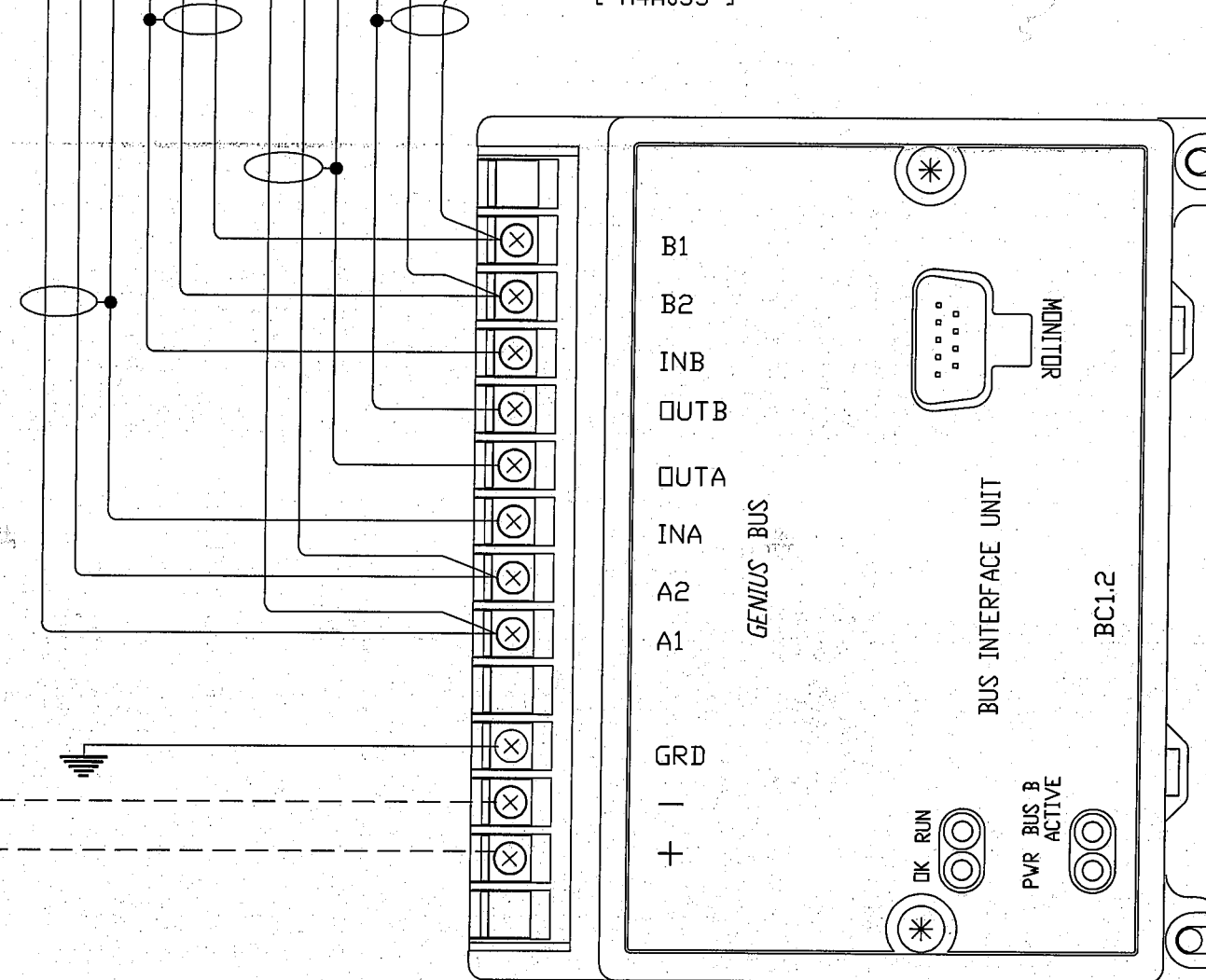
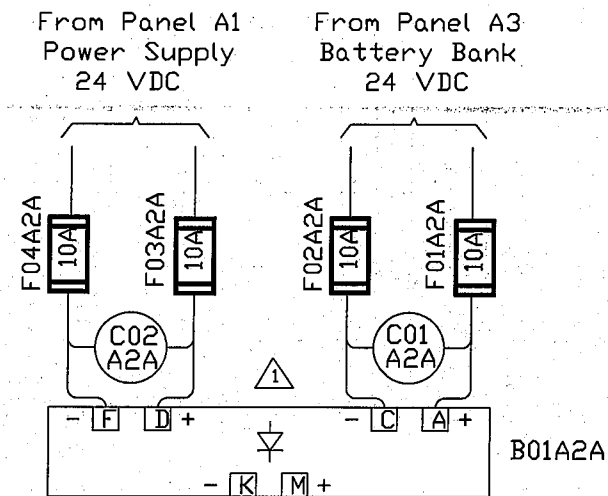


Wiring Diagram See DWG # B1H

Note : Dashed Lines Are Wired By Techsol.

Located Behind ECR Mimic (STBD)

- | | |
|------------|------------|
| [A3A08N] | [A3A08J] |
| [A3A07N] | [A3A07J] |
| [A3A06N] | [A3A06J] |
| [A4A05N] | [A4A05J] |
| [A4A04N] | [A4A04J] |
| [A4A03N] | [A4A03J] |



33G

35G

Genius Bus Address : 2

[A2B11B] [A2C09B] [A2D11B] [A2E09B] [A2F09B] [A2G09B] [D0D08B] [D0F08B] [D1A08D] [D2B08H]

[A2B13B] [A2C11B] [A2D13B] [A2E11B] [A2F11B] [A2G11B] [D0D09B] [D0F09B] [D1A10D] [D2B10H]

△ Techsol Module, Inside Stbd Mimic Panel
Part # TM-H001

Wiring Diagram See DWG # B2A

Note : Dashed Lines Are Wired By Techsol.

GENERAL ELECTRIC

Industrial Systems
Salem, Virginia

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Quebec, Qud.
G1K 9J9



CHKD
DRAWN
S. ROYAL
C.M.

DATE
02-10-01

REV.
1 AS FITTED (by Ser)

2
3

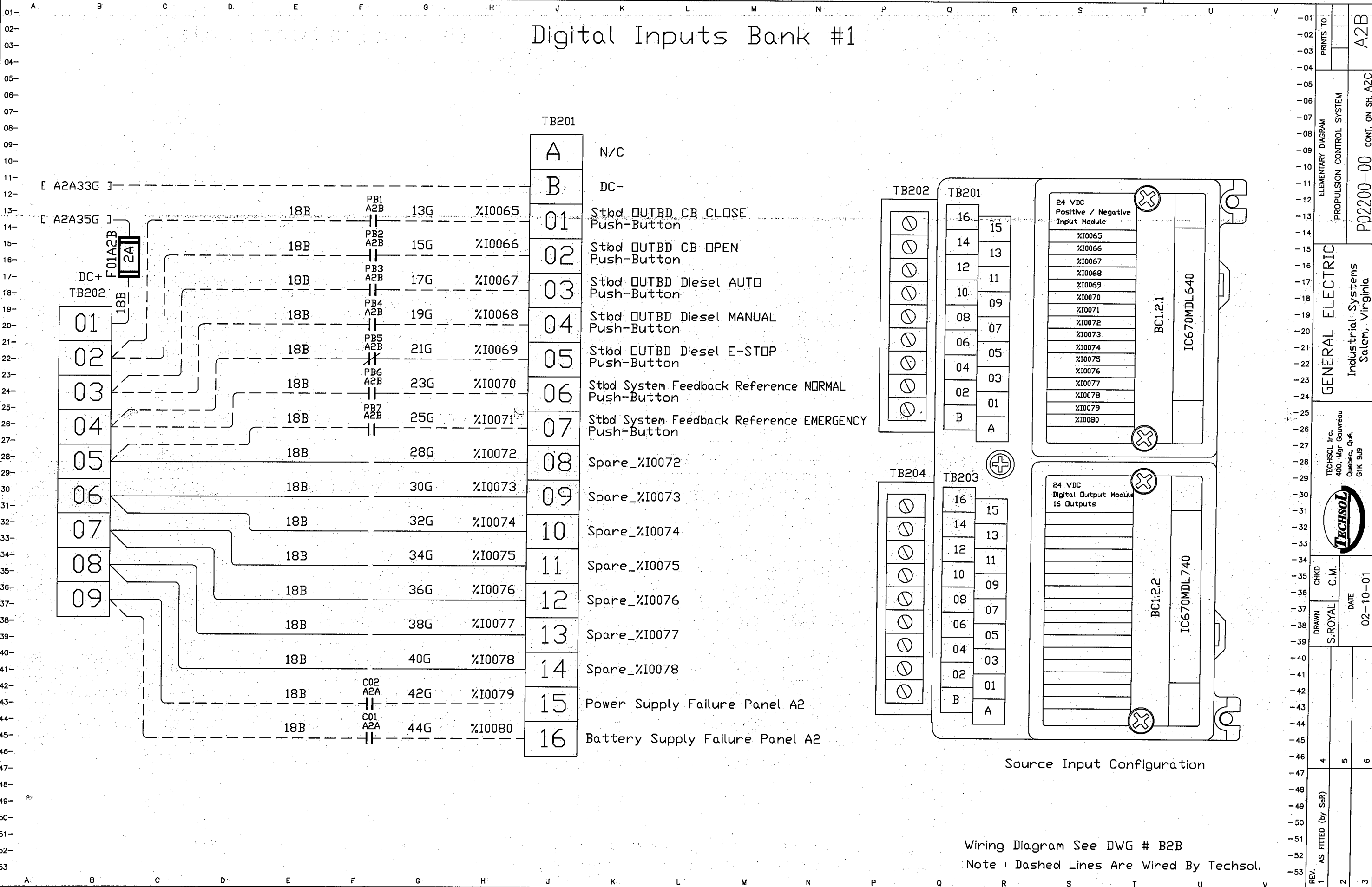
ELEMENTARY DIAGRAM
PROPULSION CONTROL SYSTEM

P032200-00 CONT. ON SH. A2B

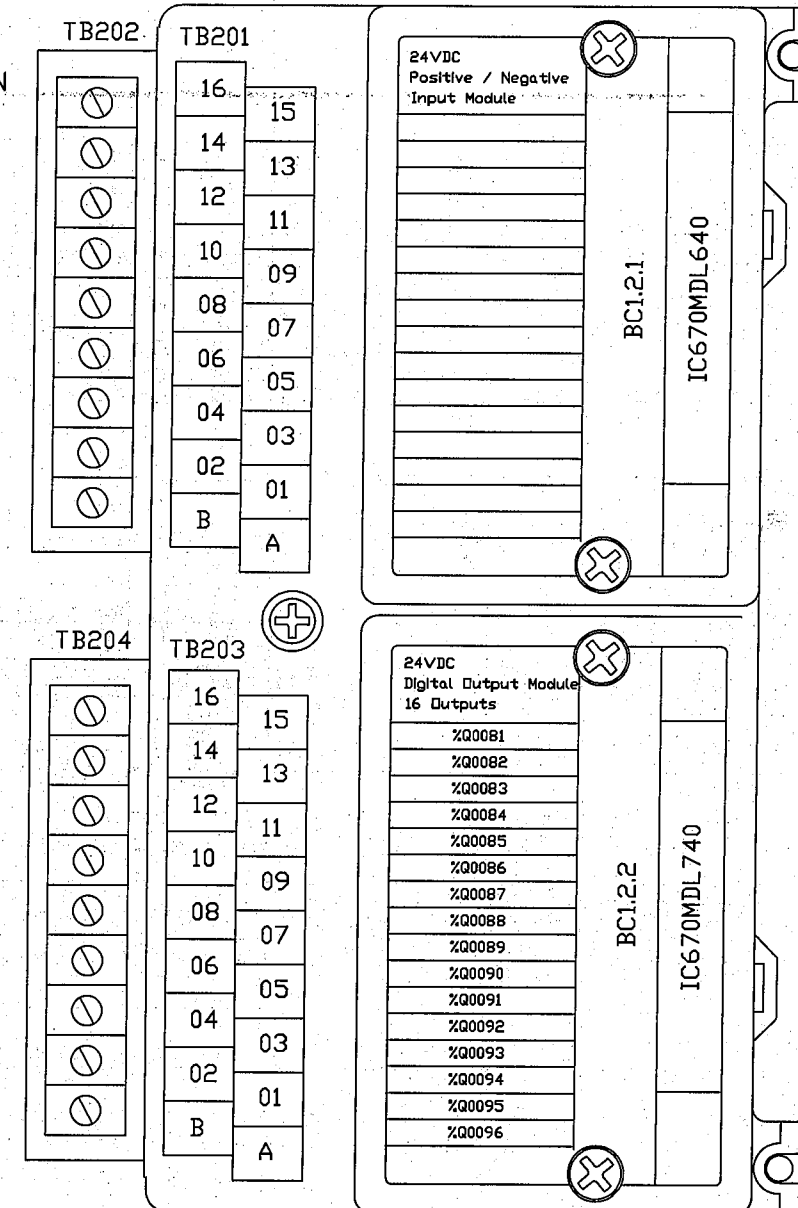
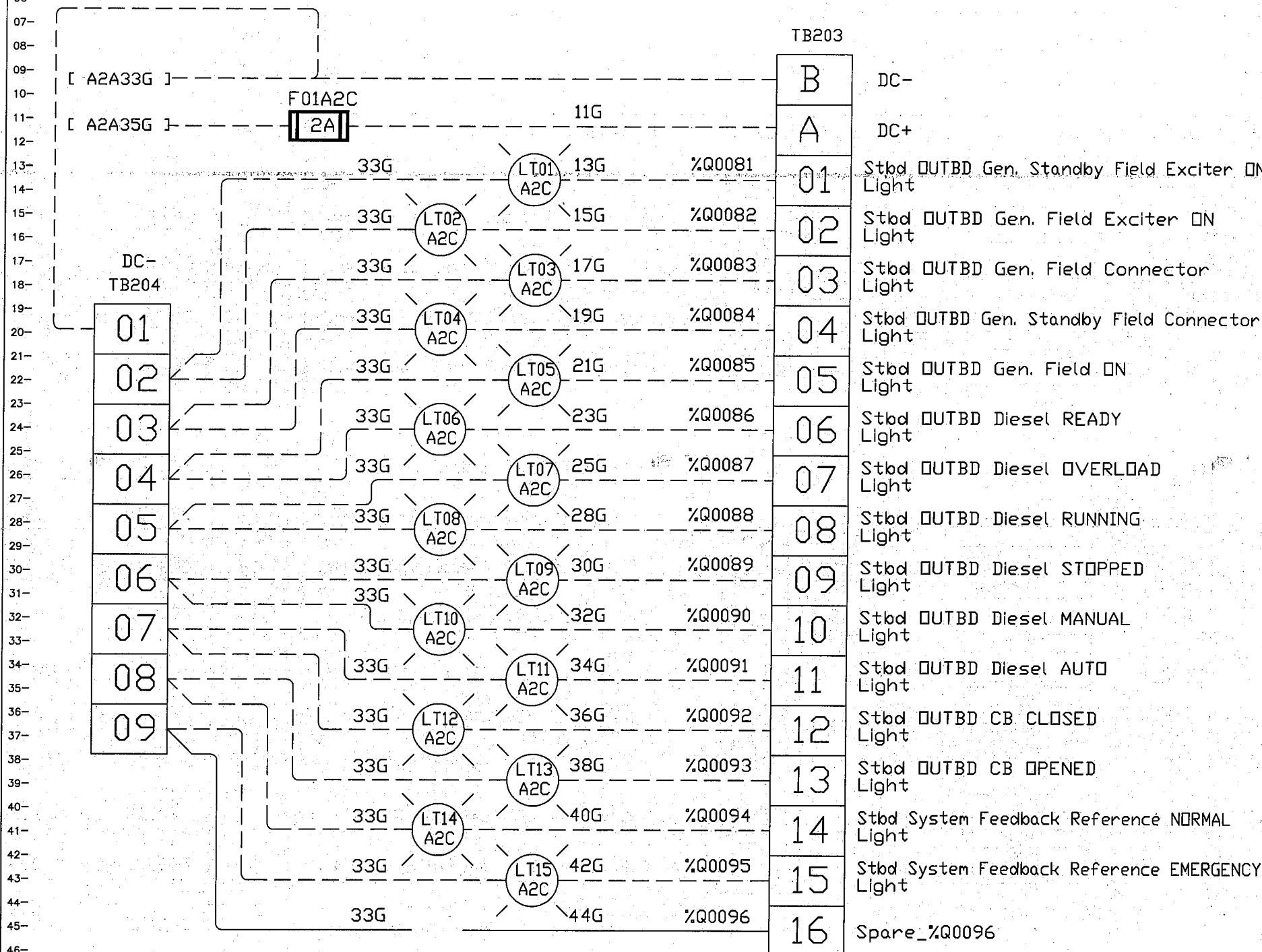
PRINTS TO
A2A

SH. No.

Digital Inputs Bank #1



Digital Outputs Bank #1

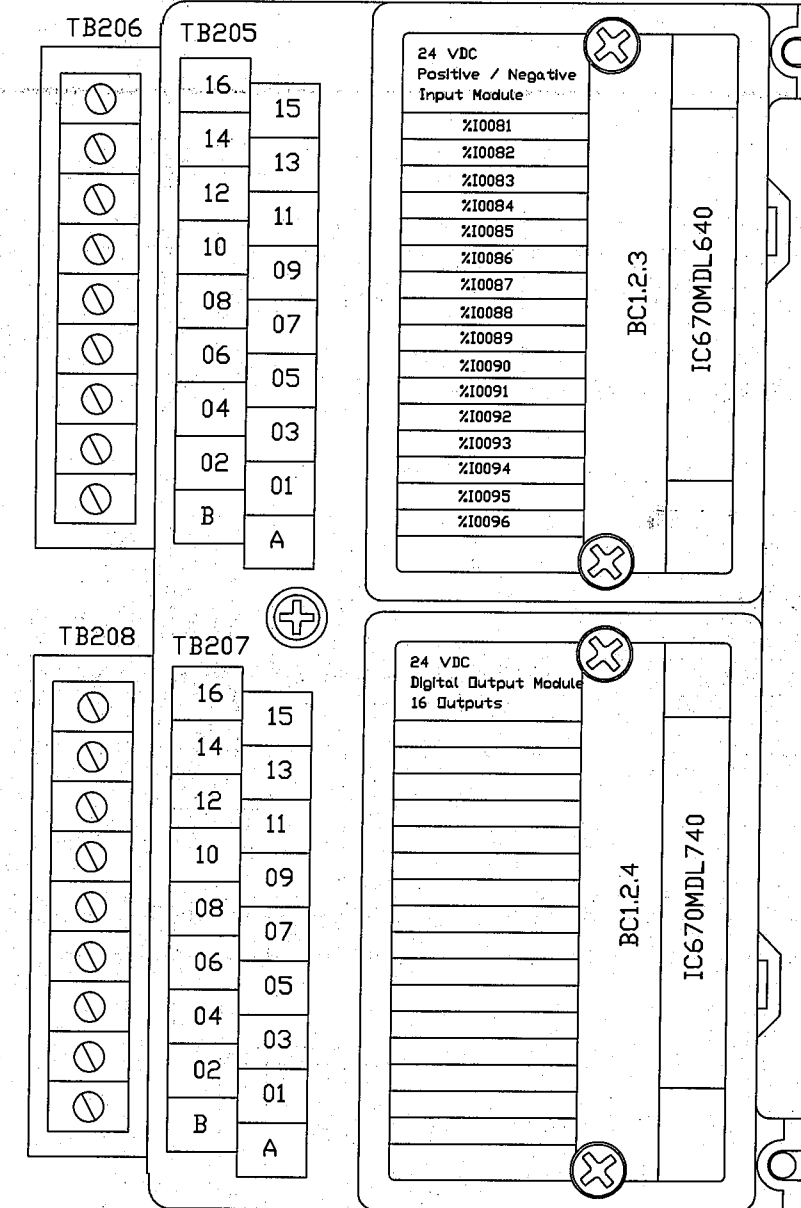


Source Output Configuration

Wiring Diagram See DWG # B2C

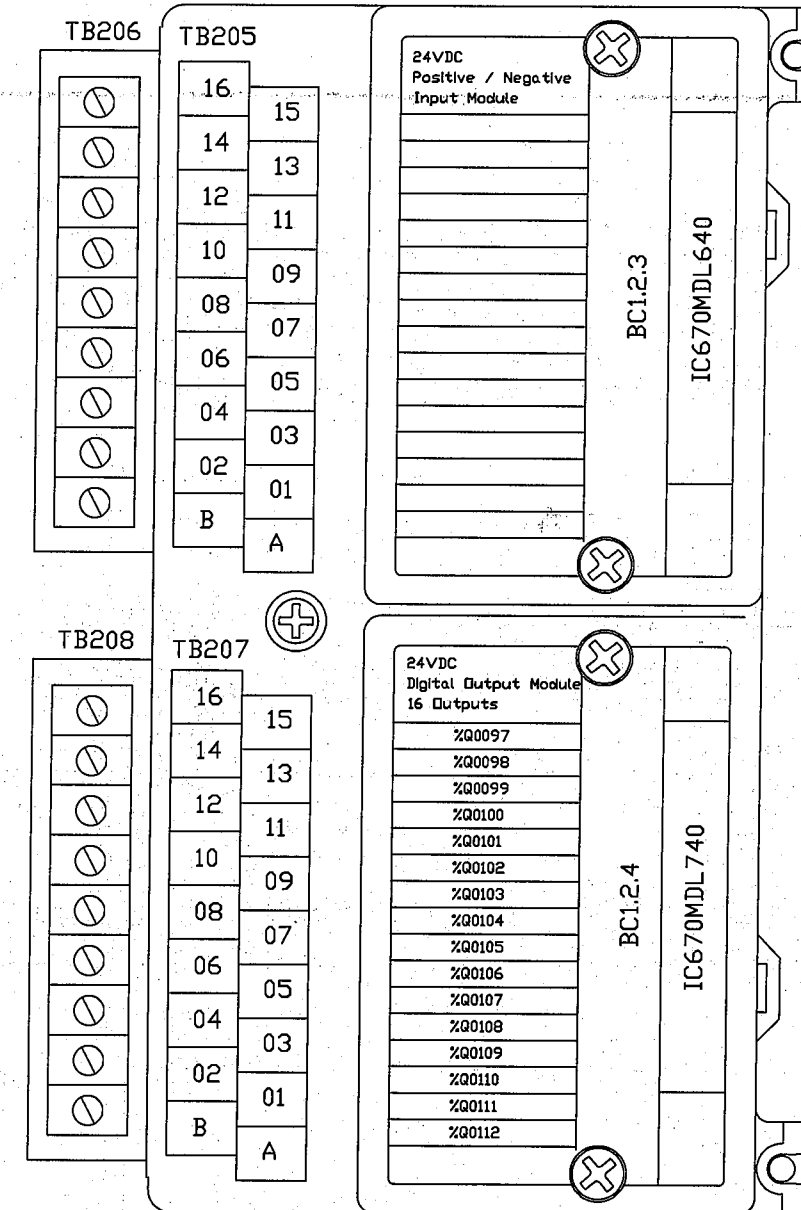
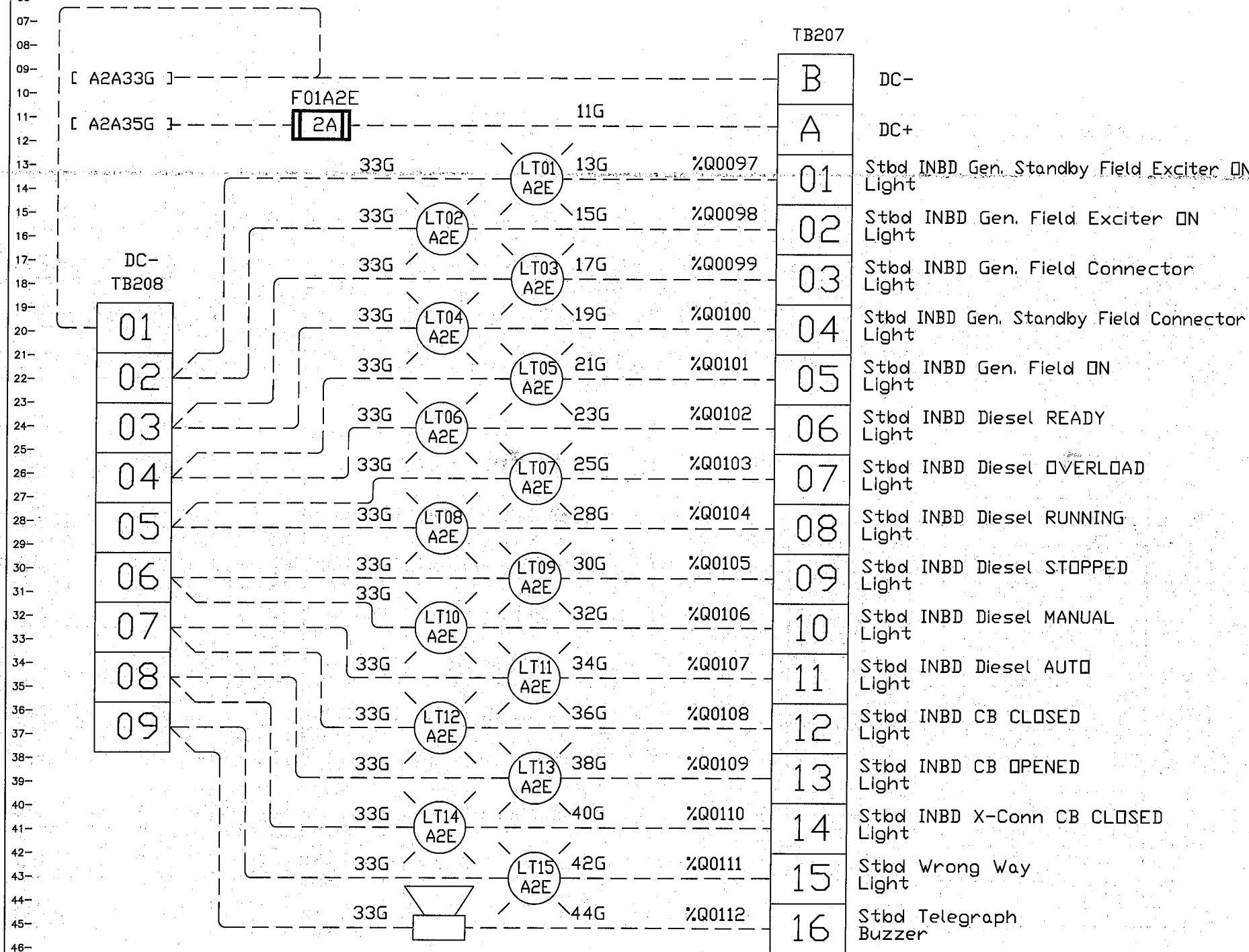
Note : Dashed Lines Are Wired By Techsol.

- 01	PRINTS TO	A2D	H. No.
- 02			
- 03			



Wiring Diagram See DWG # B2D
Note : Dashed Lines Are Wired By Techsol.

Digital Outputs Bank #2



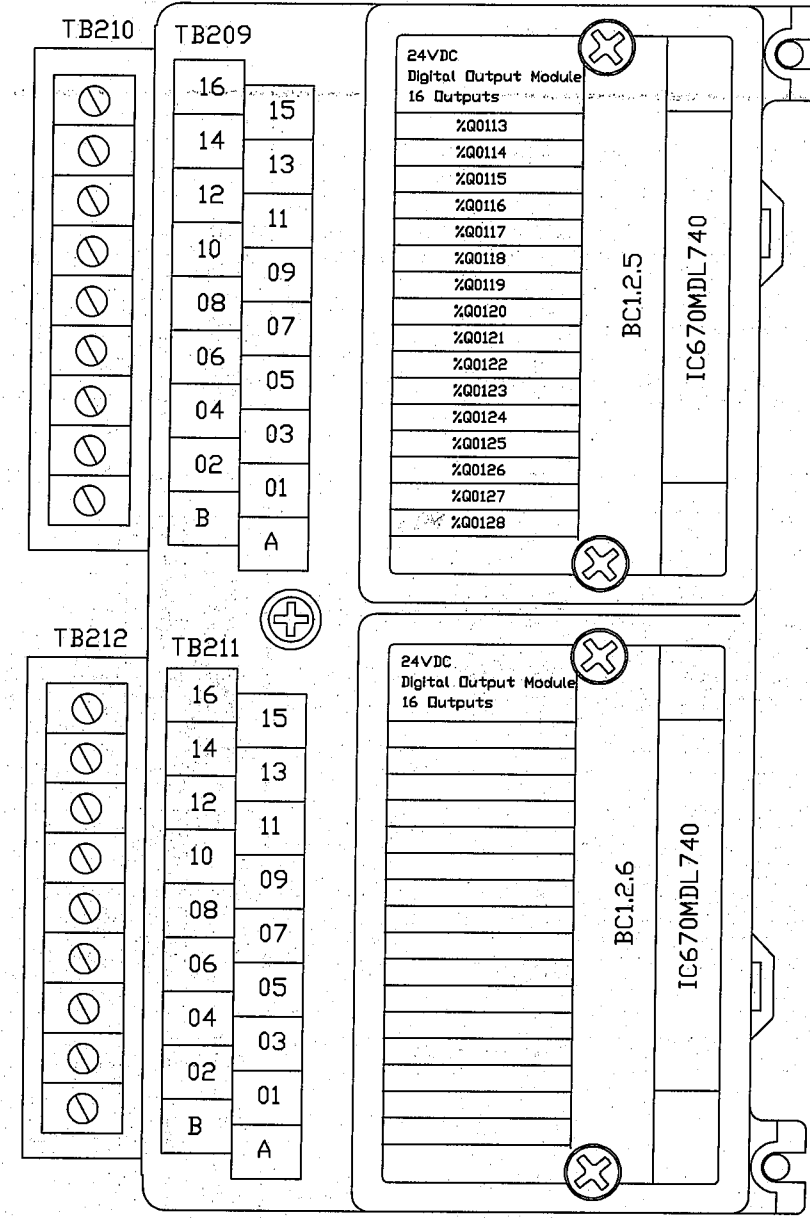
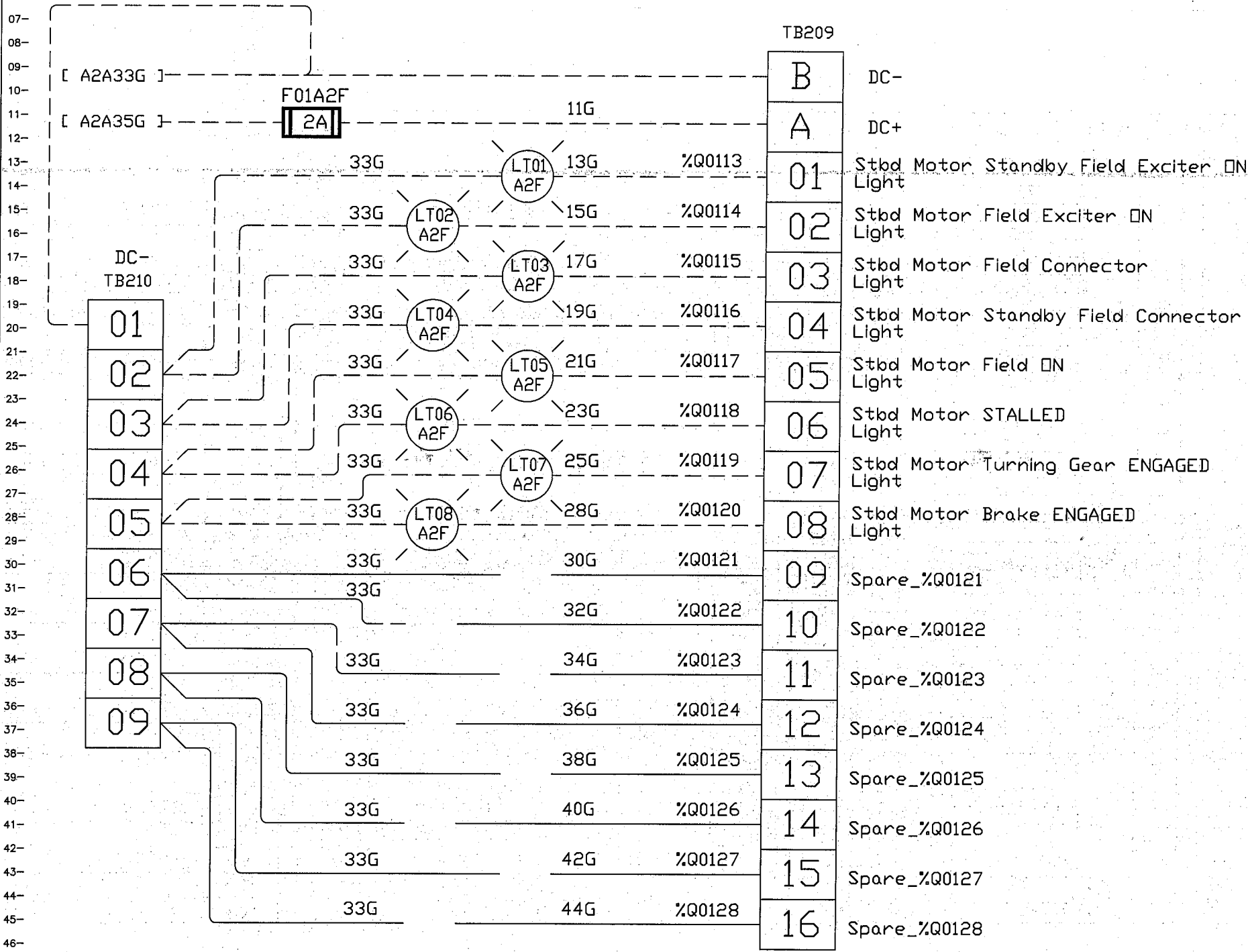
Source Output Configuration

Wiring Diagram See DWG # B2E

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO		A2E SH. No.
PROPULSION CONTROL SYSTEM		
P032200-00 CONT. ON SH. A2F		
GENERAL ELECTRIC Industrial Systems Salem, Virginia		
TECHSOL Inc. 400, Mgr. Gauthier Quebec, Que. G1K 9J9		
CHKD C.M.	DATE 02-10-01	
DRAWN S. ROYAL		
REV. 1 AS FITTED (by Ser)	2	3

Digital Outputs Bank #3



Source Output Configuration

Wiring Diagram See DWG # B2F
Note : Dashed Lines Are Wired By Techsol.

REV.	AS FITTED (by Ser)	DATE	CHD	C.M.	DATE
1		02-10-01			
2					
3					

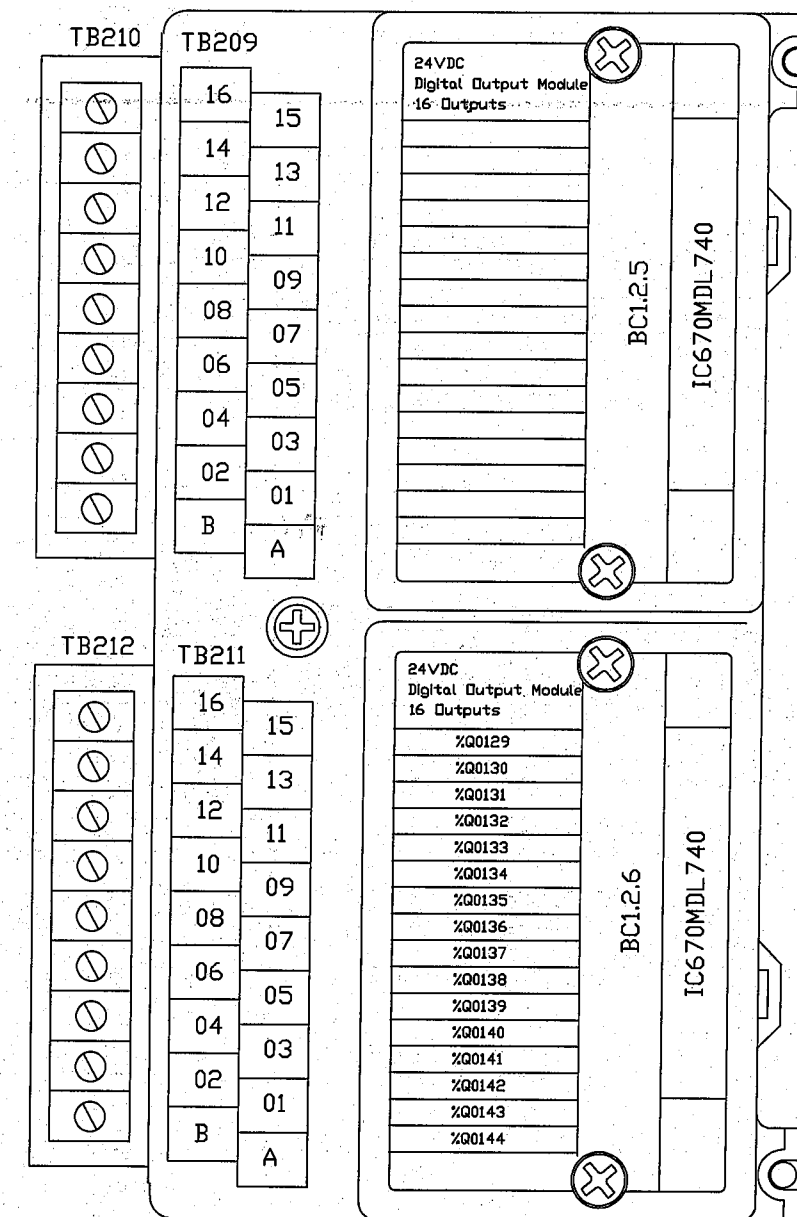
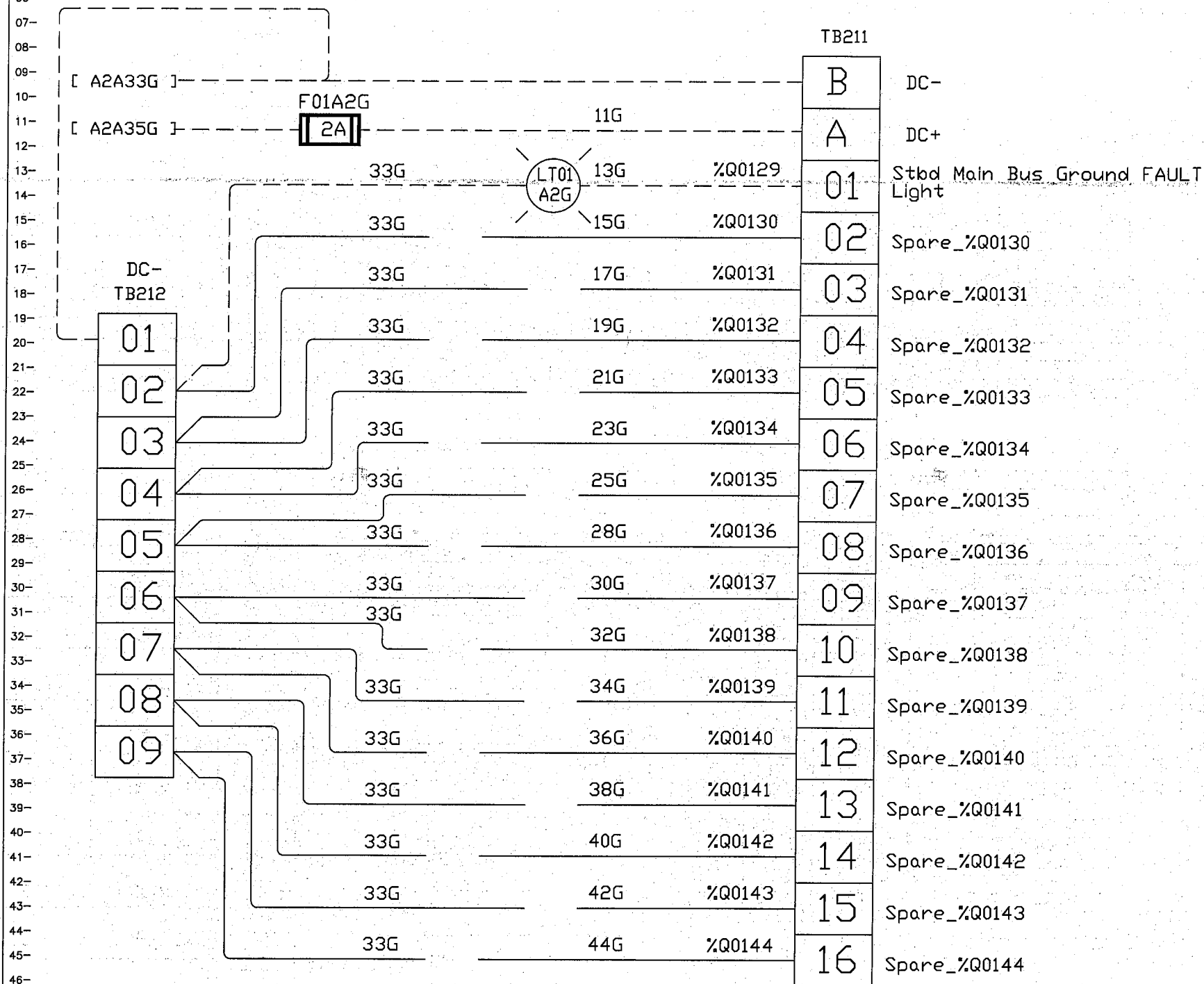
TECHSOL Inc.
400, Mgr Gauthier
Quebec, Que.
G1K 9J9

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

PRINTS TO
A2F
SH. No.

PROPULSION CONTROL SYSTEM
P032200-00 CONT. ON SH. A2G

Digital Outputs Bank #4



Source Output Configuration

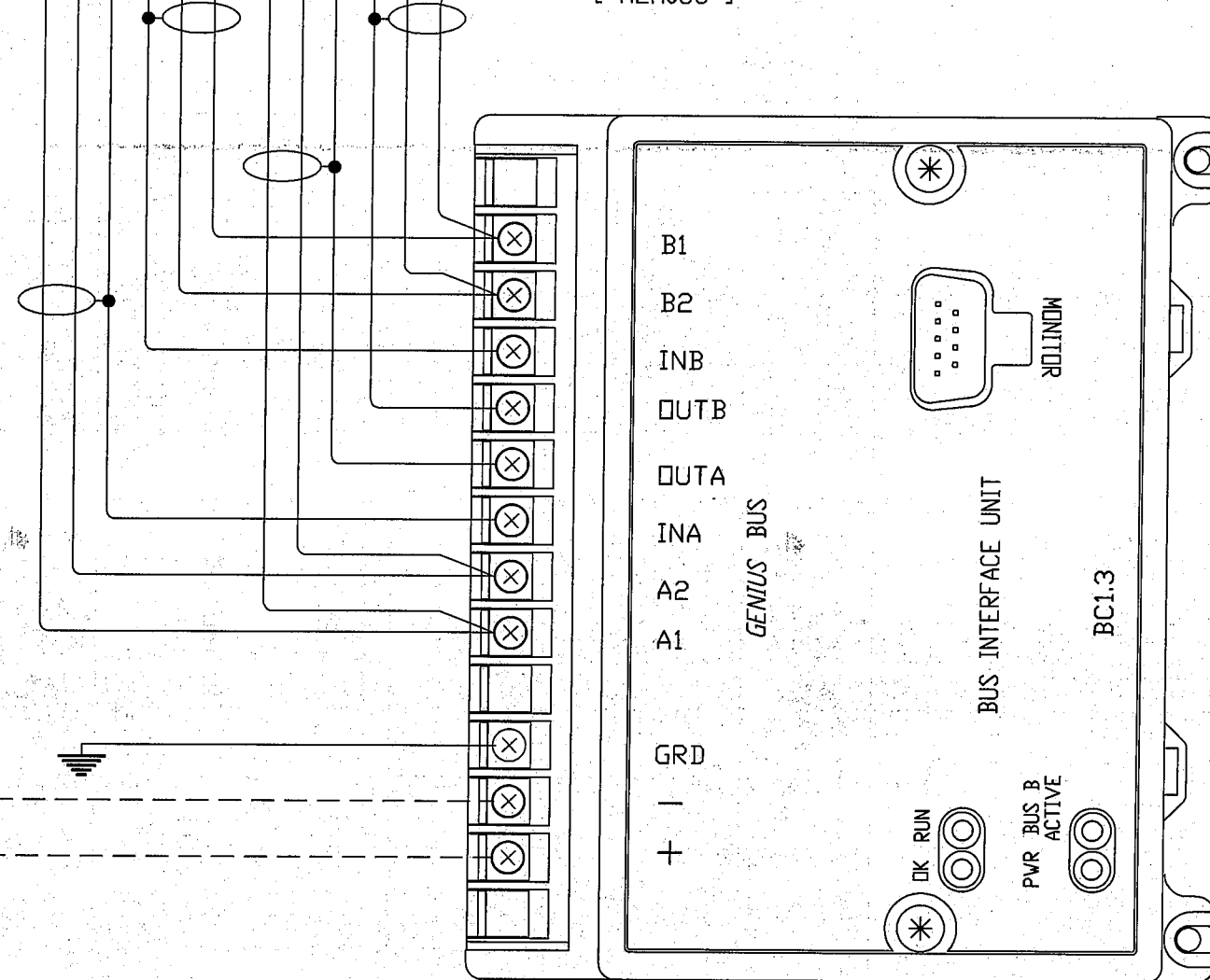
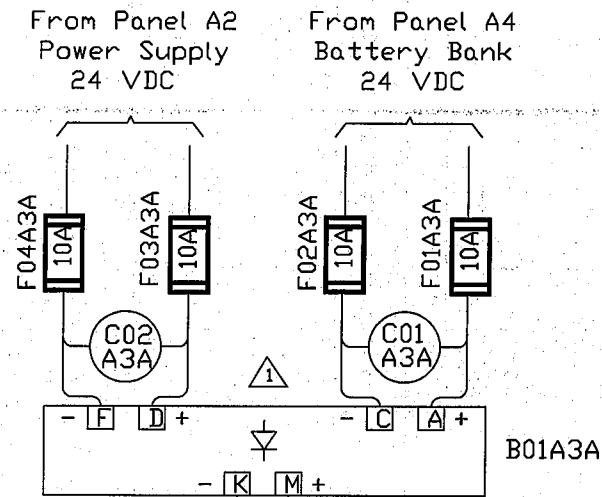
Wiring Diagram See DWG # B2G

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO	A2G
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr. Gouveau Quebec, Que. G1K 9J9	DATE 02-10-01
CHKD S. ROYAL	C.M. DATE
REV. 1 AS FITTED (by Ser)	4
2	5
3	6

Located Behind ECR Console (PORT)

- | | |
|------------|------------|
| [A1A08N] | [A1A08J] |
| [A1A07N] | [A1A07J] |
| [A1A06N] | [A1A06J] |
| [A2A05N] | [A2A05J] |
| [A2A04N] | [A2A04J] |
| [A2A03N] | [A2A03J] |



33G
35G

- | | | | |
|------------|------------|------------|------------|
| [A3B11B] | [A3C11B] | [A3D09B] | [A3F09B] |
| [A3B13B] | [A3C13B] | [A3D11B] | [A3F11B] |

- | | |
|------------|------------|
| F06A3A 47E | [A3K45Q] |
| F05A3A 49E | [A3B43Q] |

Genius Bus Address : 3

1 Techsol Module, Inside ECR Console
Part # TM-H001

Wiring Diagram See DWG # B3A

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO			
01			
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GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

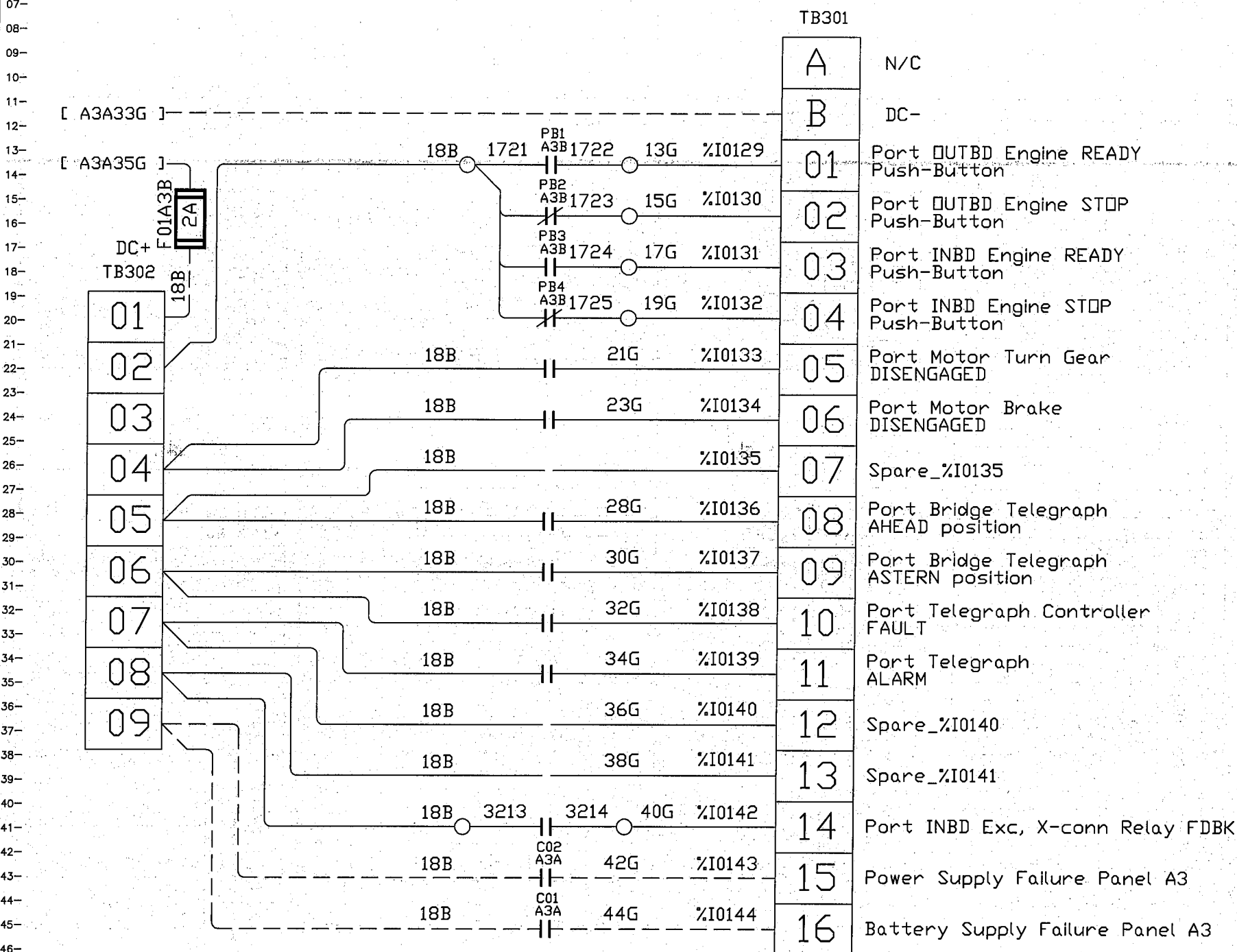
TECHSOL Inc.
400, Mgr Gouvéau
Quebec, Qué.
G1K 9J9



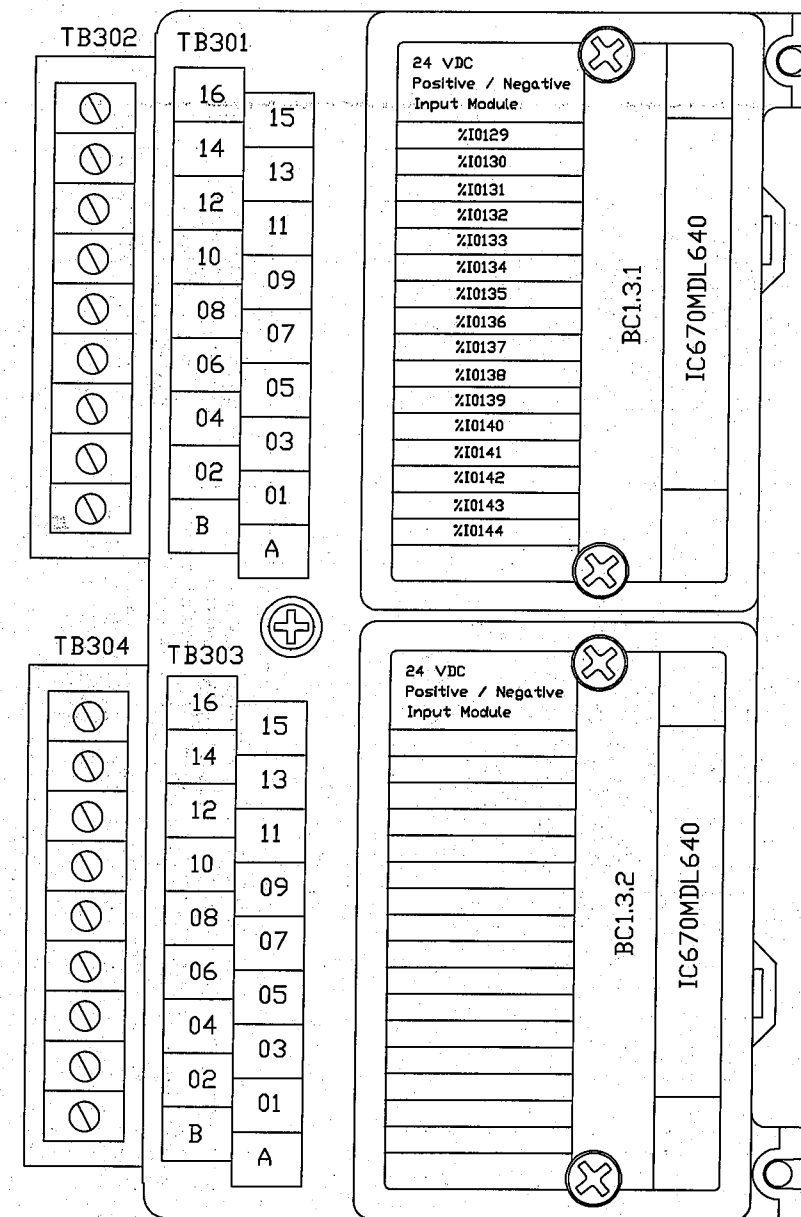
CHKO
DRAWN
S. ROYAL
C.M.
DATE
02-10-01

REV.	AS FITTED (by Ser)	4	5	6
1				
2				
3				

Digital Inputs Bank #1



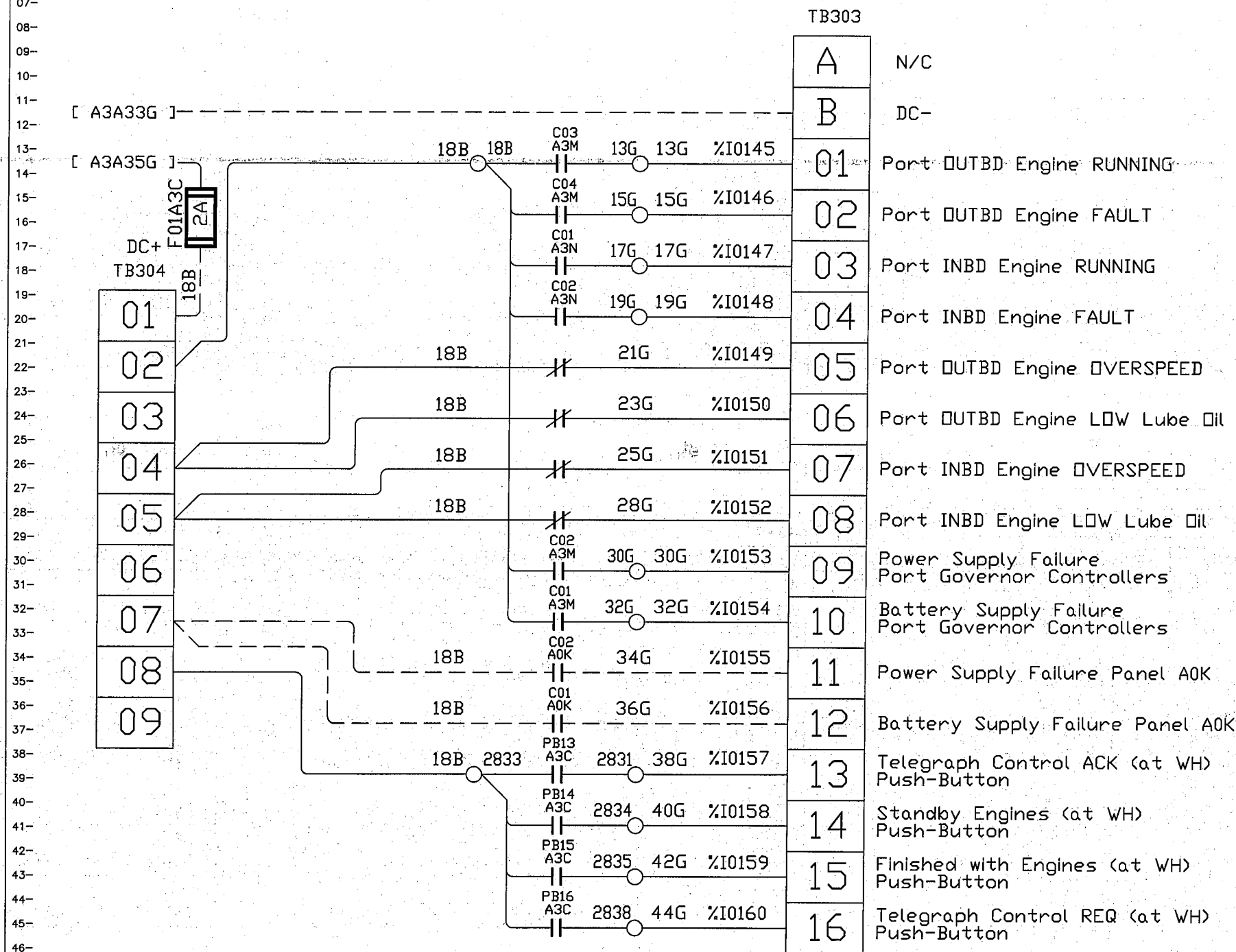
7408 Represents TB in ECR Console



Wiring Diagram See DWG # B3B
Note : Dashed Lines Are Wired By Techsol.

PRINTS TO	A3B
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr. Gauthier Quebec, Qué. G1K 9J9	
CHKD	C.M.
DRAWN	S.ROYAL
DATE	02-10-01
REV.	1 AS FITTED (by Ser)
2	
3	

Digital Inputs Bank #2



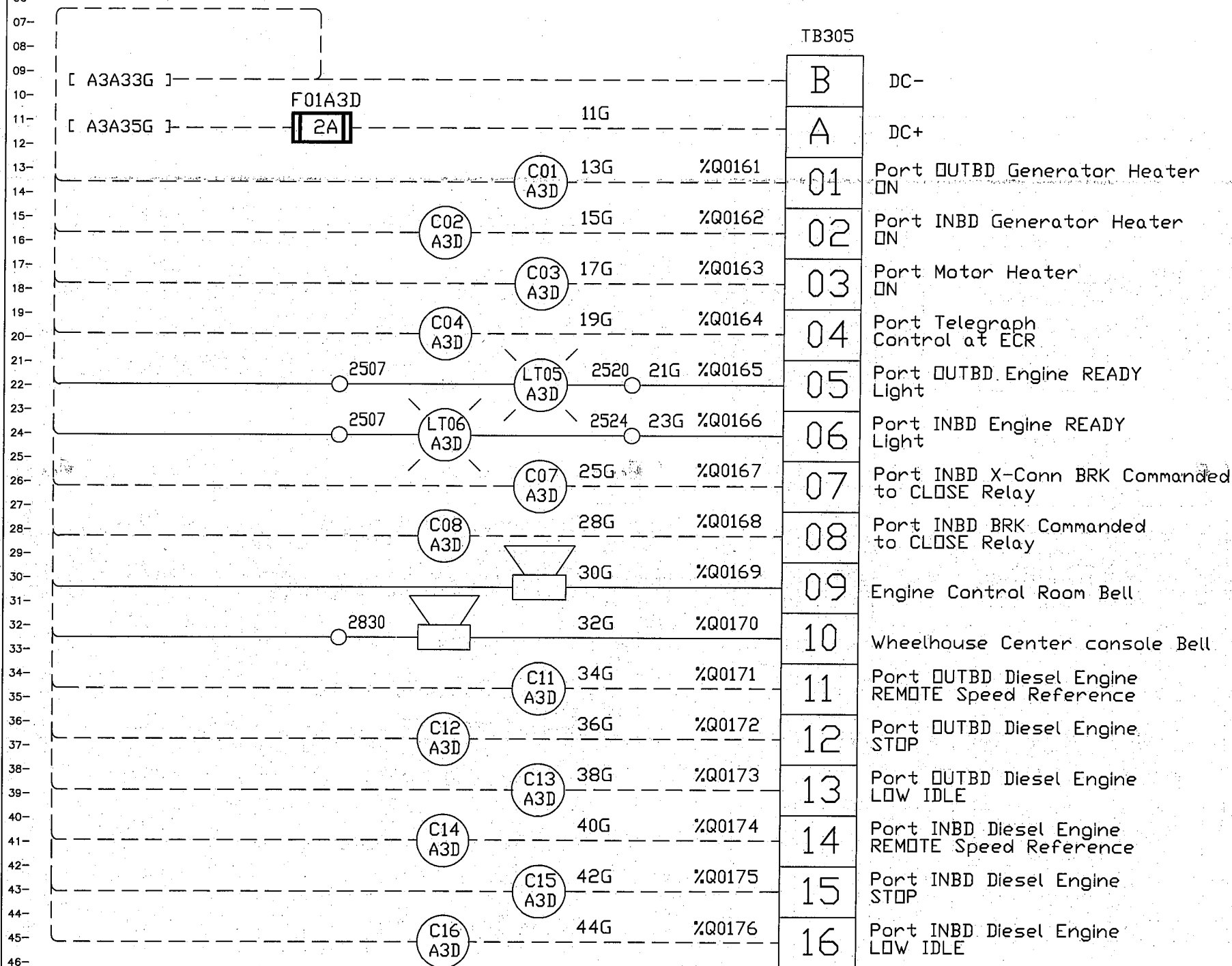
Source Input Configuration

Wiring Diagram See DWG # B3C

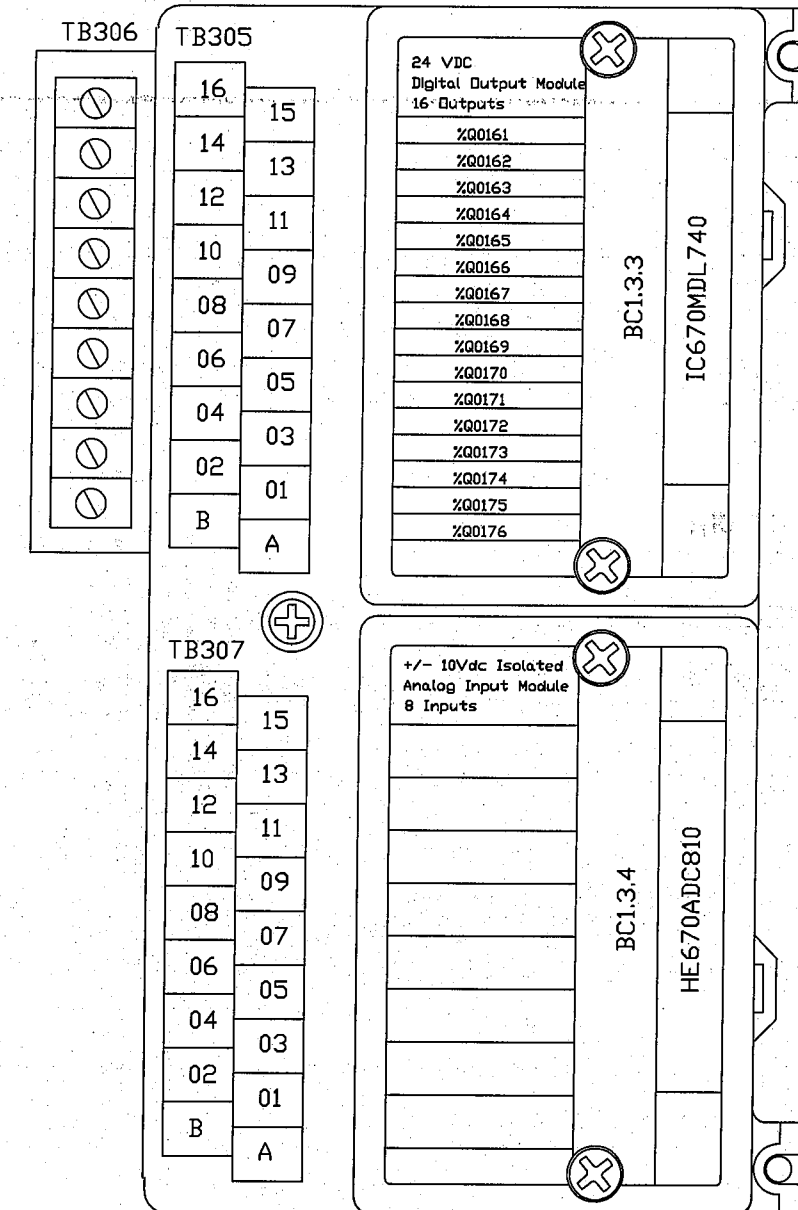
Note : Dashed Lines Are Wired By Techsol.

7408 ○ Represents TB in ECR Console

Digital Outputs Bank #1



7408 Represents TB in ECR Console



Source Output Configuration

Wiring Diagram See DWG # B3D

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO

Elementary Diagram

PROPULSION CONTROL SYSTEM

GENERAL ELECTRIC

Industrial Systems

Salem, Virginia

TECHSOL Inc.

400, Mgr Gauthier

Quebec, Que.

G1K 9J9

CHKD C.M.

DRAWN S.ROYAL

DATE 02-10-01

REV. 1 AS FITTED (by Ser)

2

3

4

5

6

P032200-00 CONT. ON SH. A3E

SH. No. A3D

+/- 10Vdc Analog Inputs Bank #1

TB307			
			B
			A
[A3K21R]	13G	%AI0097	01
[A3K19R]	15G		02
[A3K26R]	17G	%AI0098	03
[A3K24R]	19G		04
	21G	%AI0099	05
	23G		06
	25G	%AI0100	07
	28G		08
	30G	%AI0101	09
	32G		10
	34G	%AI0102	11
	36G		12
	38G	%AI0103	13
	40G		14
	42G	%AI0104	15
	44G		16

Port Telegraph Speed Reference (ECR)
(+/-10Vdc = +/- 100%)

Port Telegraph Speed Reference (WH)
(+/-10Vdc = +/- 100%)

Spare_%AI0099

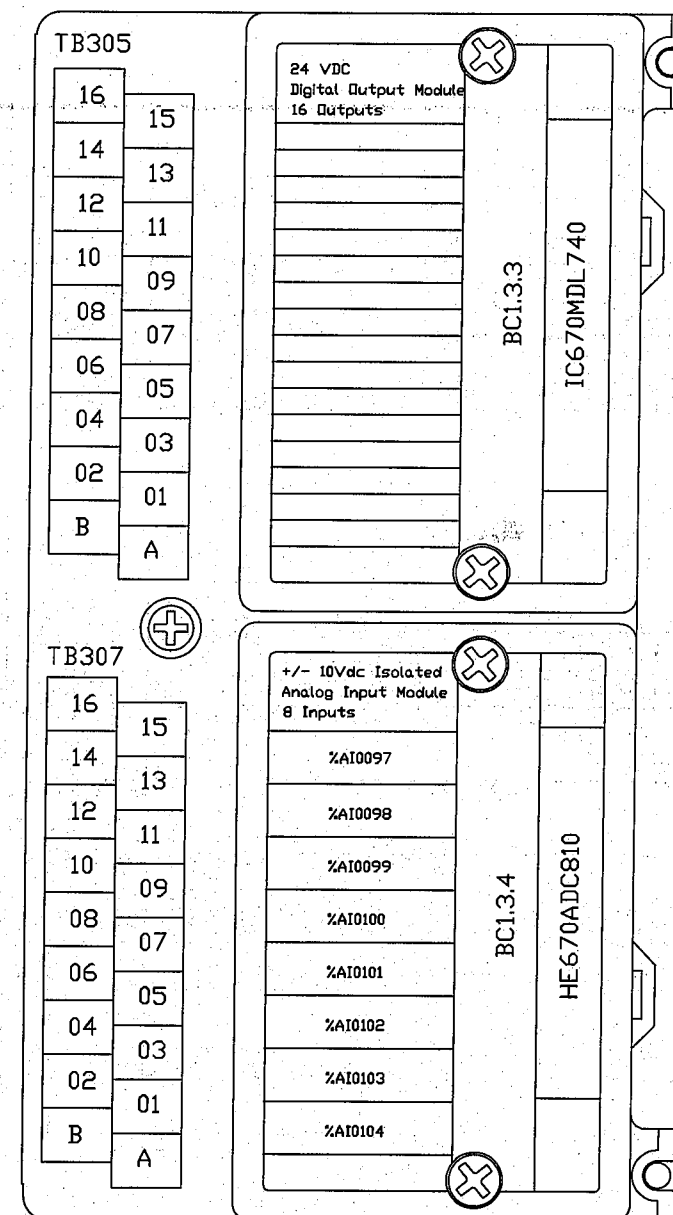
Spare_%AI0100


Spare_%AI0101

Spare_%AI0102

Spare_%AI0103

Spare_%AI0104



7408  Represents TB in ECR Console

Wiring Diagram See DWG # B3E

Note : Dashed Lines Are Wired By Techsol.

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

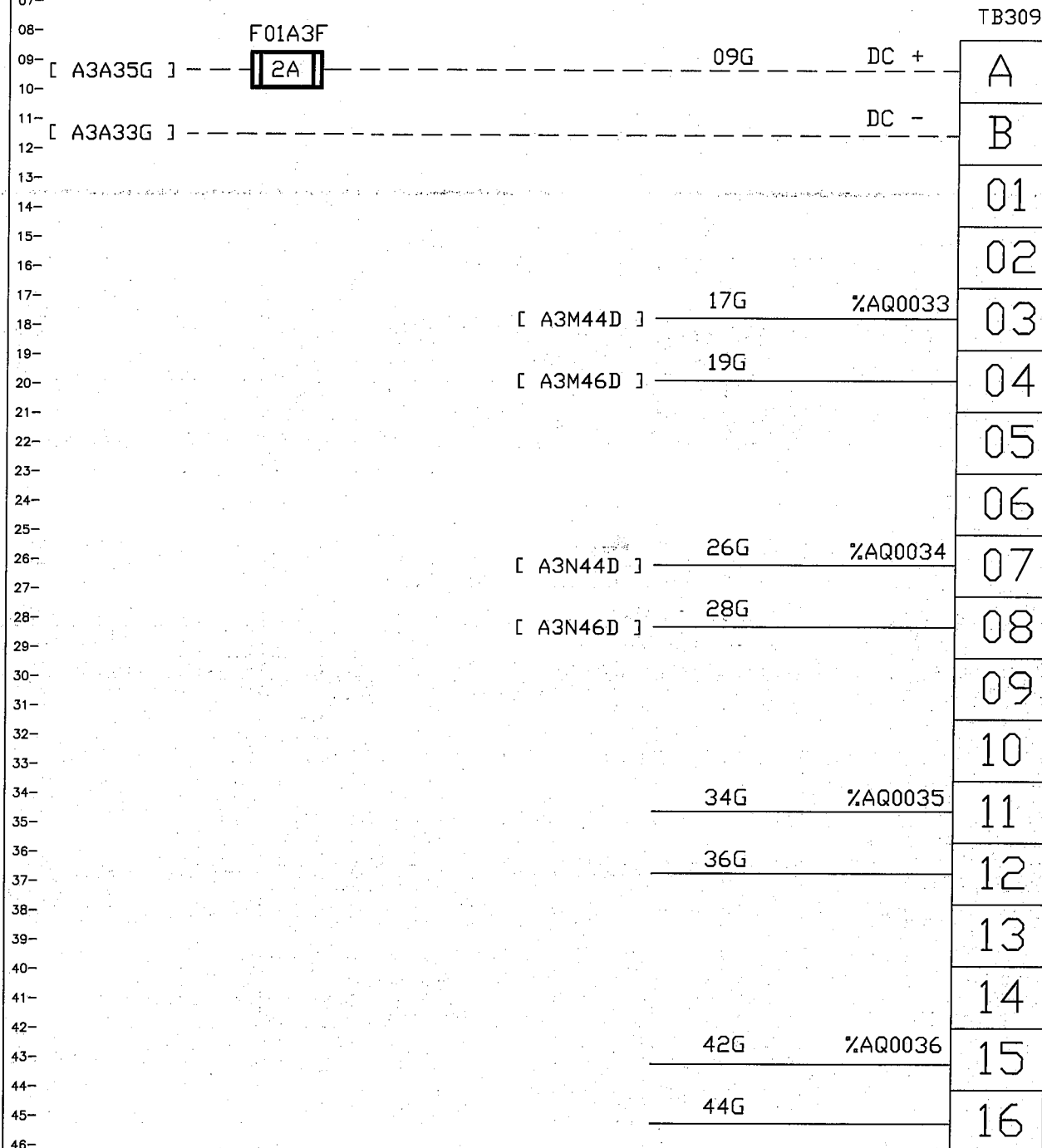
TECHSOL Inc.
400, Mgr Gauthier
Quebec, Que.
G1K 9J9



CHKD
C.M.
DATE
02-10-01

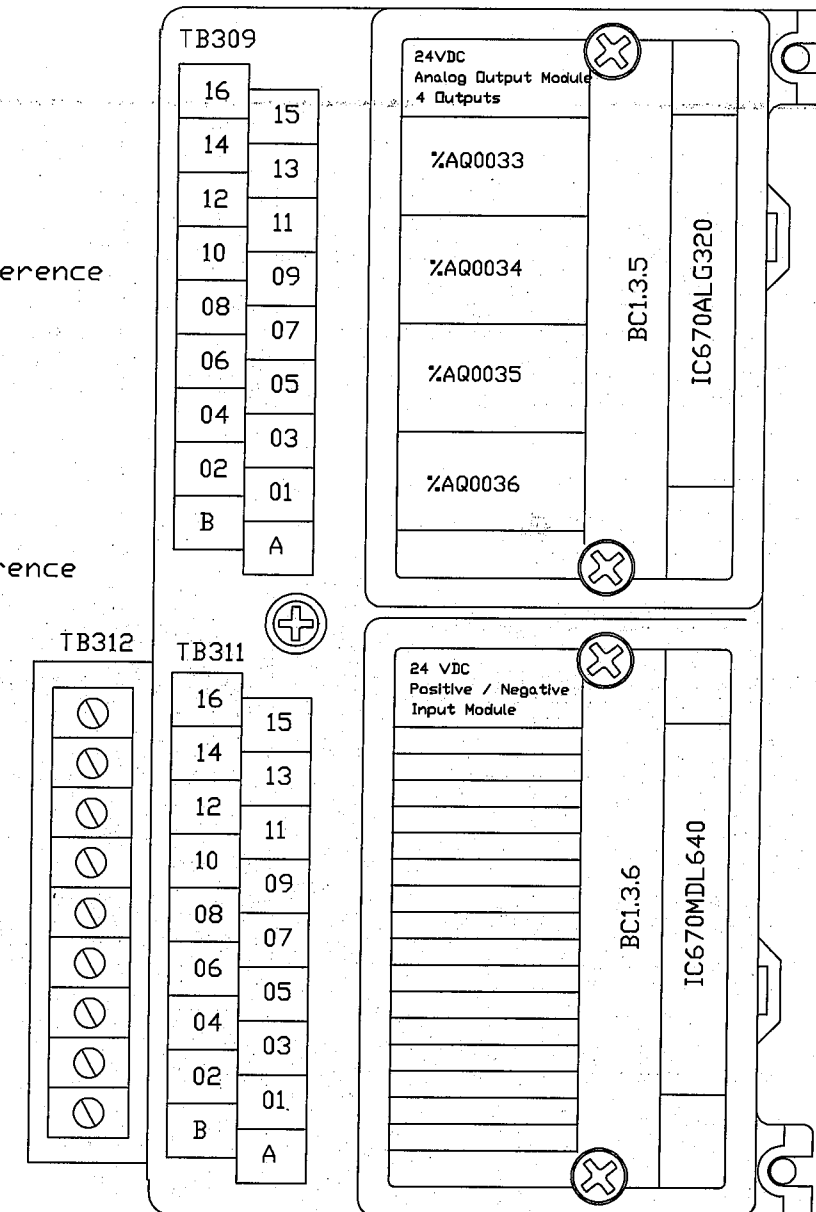
REV. 1 AS FITTED (by Ser) 4 5 6

Current Analog Outputs Bank #1



Port OUTBD Diesel Engine Speed Reference
(4-20mA = 400-750rpm)

Port INBD Diesel Engine Speed Reference
(4-20mA = 400-750rpm)



7408 Represents TB in ECR Console

Wiring Diagram See DWG # B3F

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO		A3F SH. No.
PROPULSION CONTROL SYSTEM		
ELEMENTARY DIAGRAM		P032200-00 CONT. ON SH. A3G
GENERAL ELECTRIC		
Industrial Systems Salem, Virginia		TECHSOL Inc. 400, Mgr Gauthier Quebec, Que. G1K 9J9
CHKD C.M. DATE 02-10-01		
REV.	AS FITTED (by Ser)	4
1		5
2		6
3		

Digital Inputs Bank #3

TB311

A N/C

B DC-

01

Power Supply Failure Wheelhouse Central Console

02

Battery Supply Failure Wheelhouse Central Console

03

Power Supply Failure Wheelhouse Port Console

04

Battery Supply Failure Wheelhouse Port Console

05

Power Supply Failure Wheelhouse Stbd Console

06

Battery Supply Failure Wheelhouse Stbd Console

07

Power Supply Failure Port Telegraph Controller

08

Battery Supply Failure Port Telegraph Controller

09

Power Supply Failure Port ECR Telegraph Handle

10

Battery Supply Failure Port ECR Telegraph Handle

11

Spare_%I0171

12

Spare_%I0172

13

Spare_%I0173

14

Spare_%I0174

15

Spare_%I0175

16

Spare_%I0176

[A3A33G]

[A3A35G]

DC+

TB312

01

02

03

04

05

06

07

08

09

18B 1308

C02 E0A

1313

13G

%I0161

C01 E0A

1409

15G

%I0162

C02 E1A

1318

17G

%I0163

C01 E1A

1328

19G

%I0164

C02 E2A

1323

21G

%I0165

C01 E2A

1333

23G

%I0166

C02 PTEL

25G

%I0167

C01 PTEL

28G

%I0168

C04 PTEL

30G

%I0169

C03 PTEL

32G

%I0170

18B

34G

%I0171

18B

36G

%I0172

18B

38G

%I0173

18B

40G

%I0174

18B

42G

%I0175

18B

44G

%I0176

7408

Represents TB in ECR Console

TB309

16

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07

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03

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01

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A

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TB311

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02

01

B

A

24VDC Analog Output Module 4 Outputs

BC1.3.5

IC670ALG320

24 VDC Positive / Negative Input Module

BC1.3.6

IC670MDL640

Source Input Configuration

Wiring Diagram See DWG # B3G

Note : Dashed Lines Are Wired By Techsol.

REV.	AS FITTED (by Ser)	DATE	CHKD	C.M.	DATE
1		02-10-01	S.ROYAL		
2					
3					

GENERAL ELECTRIC

Industrial Systems
Salem, Virginia

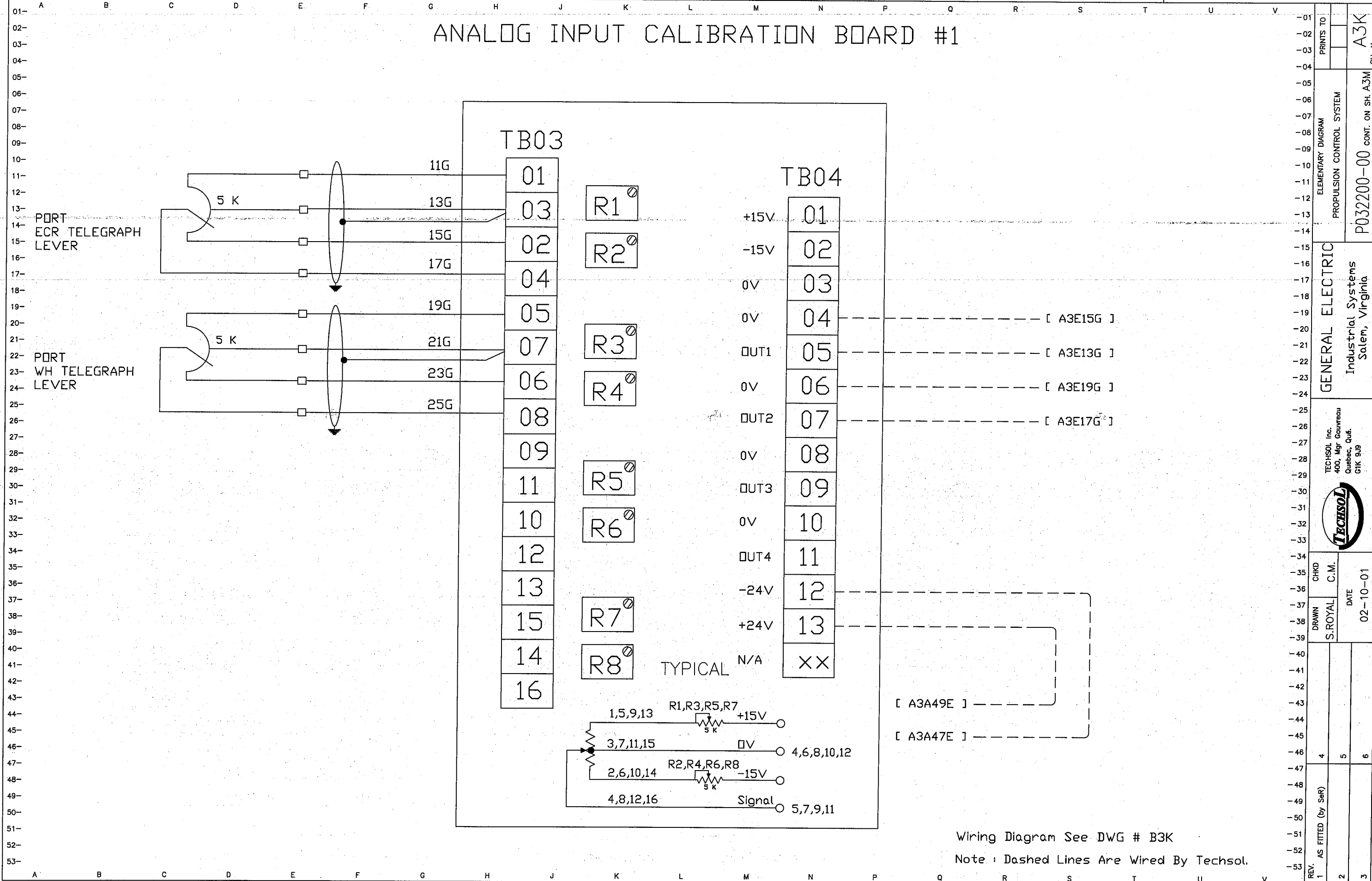
TECHSOL Inc.
400, Mgr Gauthier
Quebec, Que.
G1K 9J9

TECHSOL

PRINTS TO
PROPULSION CONTROL SYSTEM
P032200-00 CONT. ON SH. A3K

A3G
SH. No.

ANALOG INPUT CALIBRATION BOARD #1



Wiring Diagram See DWG # B3K

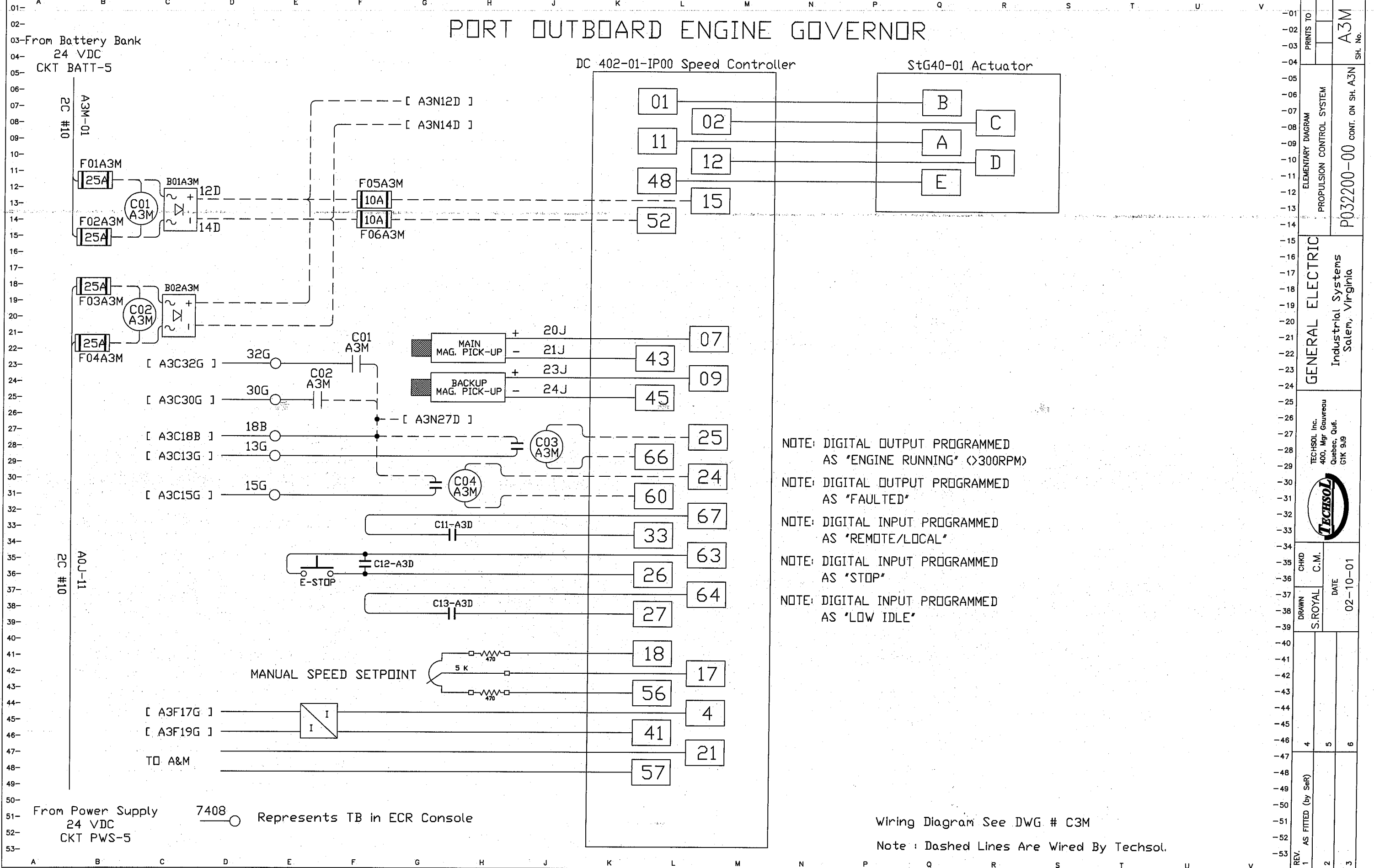
Note : Dashed Lines Are Wired By Techsol.

REV.	AS FITTED (by Ser)	DRAWN	CHKD	C.M.	DATE	PRINTS TO	ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
1		S. ROYAL			02-10-01				A3K
2									
3									

PORT OUTBOARD ENGINE GOVERNOR

DC 402-01-IP00 Speed Controller

StG40-01 Actuator



GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gauthier
Quebec, Que.
G1K 9J9

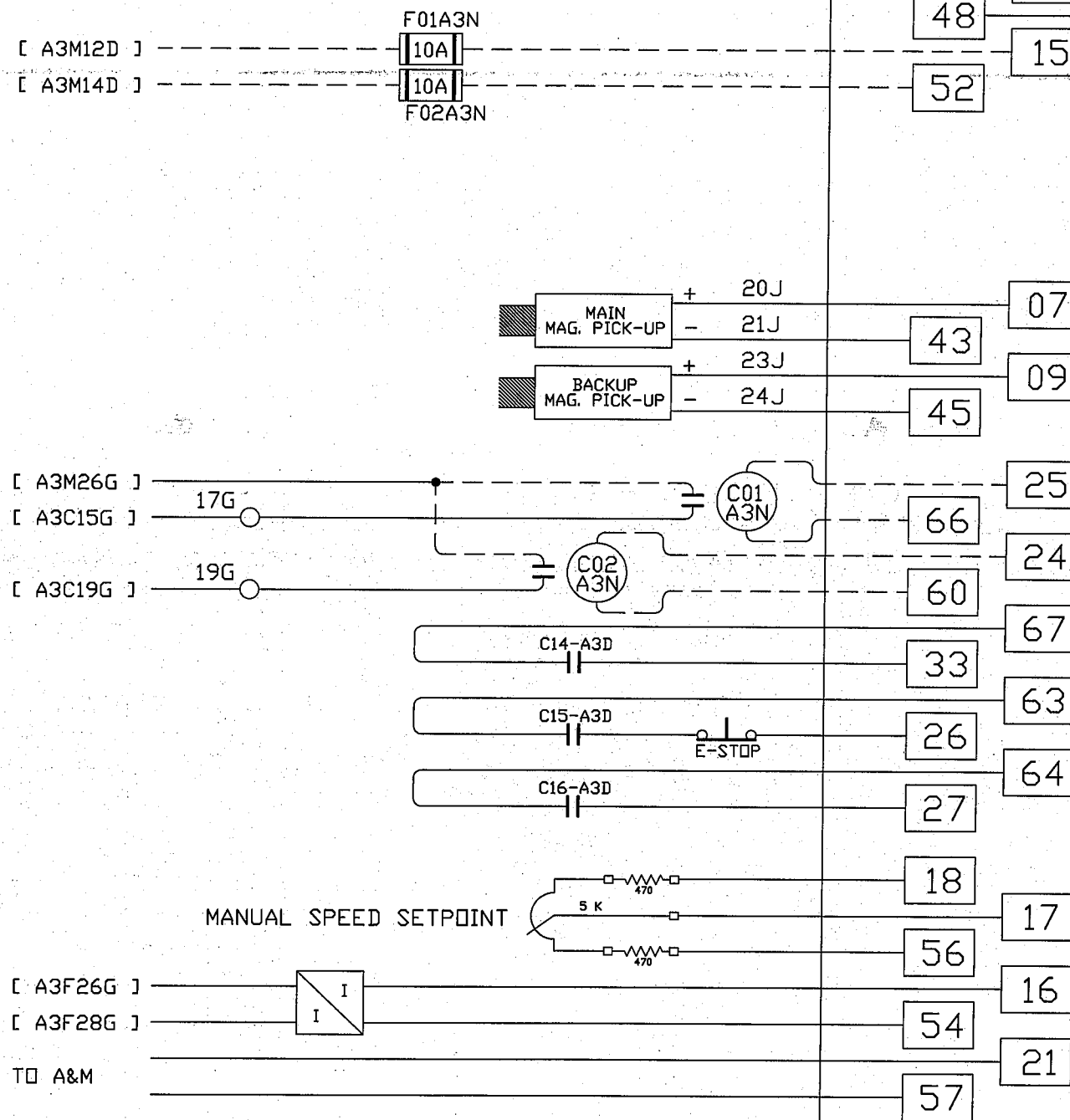
CHKO
DRAWN
S. ROYAL
DATE
02-10-01

REV. 1 AS FITTED (by Ser)
2
3

PORT INBOARD ENGINE GOVERNOR

DC 402-01-IP00 Speed Controller

StG40-01 Actuator



NOTE: DIGITAL OUTPUT PROGRAMMED AS "ENGINE RUNNING" (>300RPM)

NOTE: DIGITAL OUTPUT PROGRAMMED AS "FAULTED"

NOTE: DIGITAL INPUT PROGRAMMED AS "REMOTE/LOCAL"

NOTE: DIGITAL INPUT PROGRAMMED AS "STOP"

NOTE: DIGITAL INPUT PROGRAMMED AS "LOW IDLE"

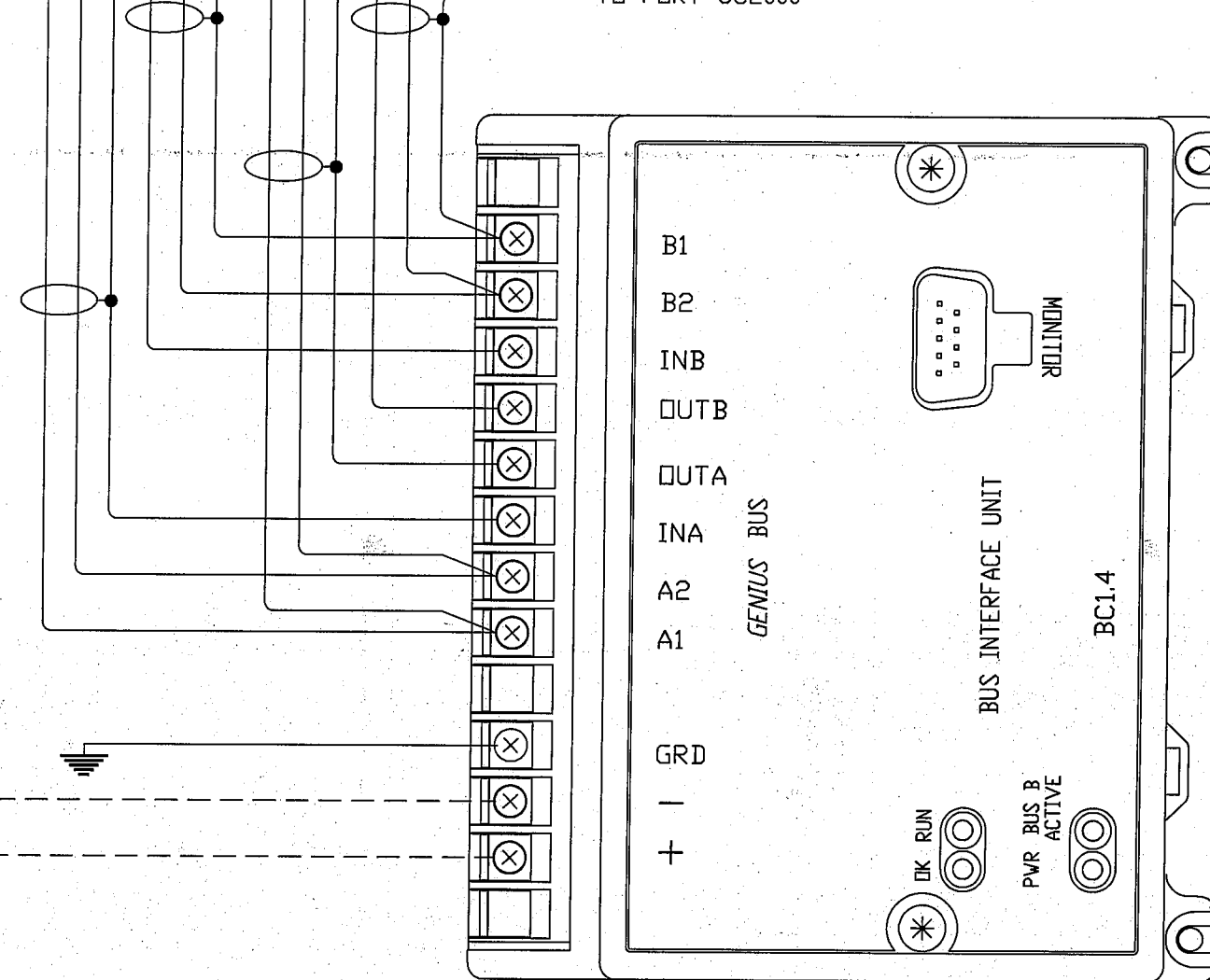
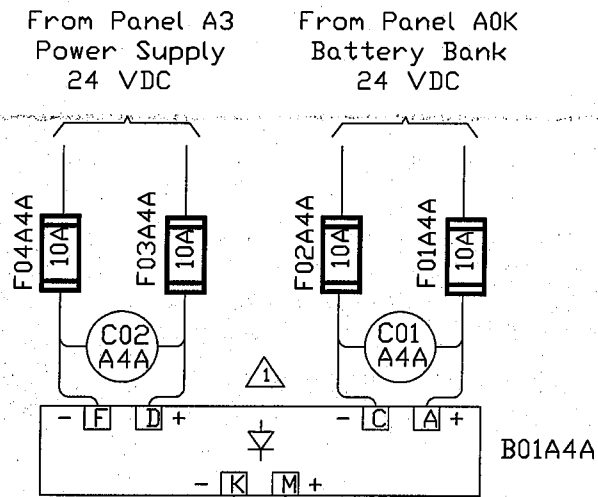
Wiring Diagram See DWG # C3N

Note: Dashed Lines Are Wired By Techsol.

PRINTS TO			ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
01-	02-	03-			
04-	05-	06-	GENERAL ELECTRIC	Industrial Systems Salem, Virginia	P032200-00 CONT. ON SH. A4A
07-	08-	09-			
10-	11-	12-			
13-	14-	15-			
16-	17-	18-			
19-	20-	21-			
22-	23-	24-			
25-	26-	27-			
28-	29-	30-			
31-	32-	33-			
34-	35-	36-	TECHSOL Inc. 400, Mgr. Gouveau Quebec, Que. G1K 9J9	DATE 02-10-01	REV. 1 AS FITTED (by Set)
37-	38-	39-			
40-	41-	42-			
43-	44-	45-			
46-	47-	48-			
49-	50-	51-			
52-	53-				

Located Behind ECR Console (PORT)

- | | |
|------------|----------------|
| [A2A08N] | [A2A08J] |
| [A2A07N] | [A2A07J] |
| [A2A06N] | [A2A06J] |
| [A0K35M] | TO PORT UC2000 |
| [A0K36M] | TO PORT UC2000 |
| [A0K37M] | TO PORT UC2000 |



33G

35G

[A4B3B] [A4C3B] [A4D09B] [A4F09B]

[A4B13B] [A4C13B] [A4D11B] [A4F11B]

F06A4A 47E [A4K45Q]
 F05A4A 49E [A4B43Q]

Genius Bus Address : 4

⚠ Techsol Module, Inside ECR Console
 Part # TM-H001

Wiring Diagram See DWG # B4A

Note : Dashed Lines Are Wired By Techsol.

GENERAL ELECTRIC
 Industrial Systems
 Salem, Virginia

TECHSOL Inc.
 400, Mgr. Gauthier
 Quebec, Que.
 G1K 9J9



CHKD
 DRAWN S. ROYAL
 C.M.
 DATE 02-10-01

REV. 1

AS FITTED (by Ser)

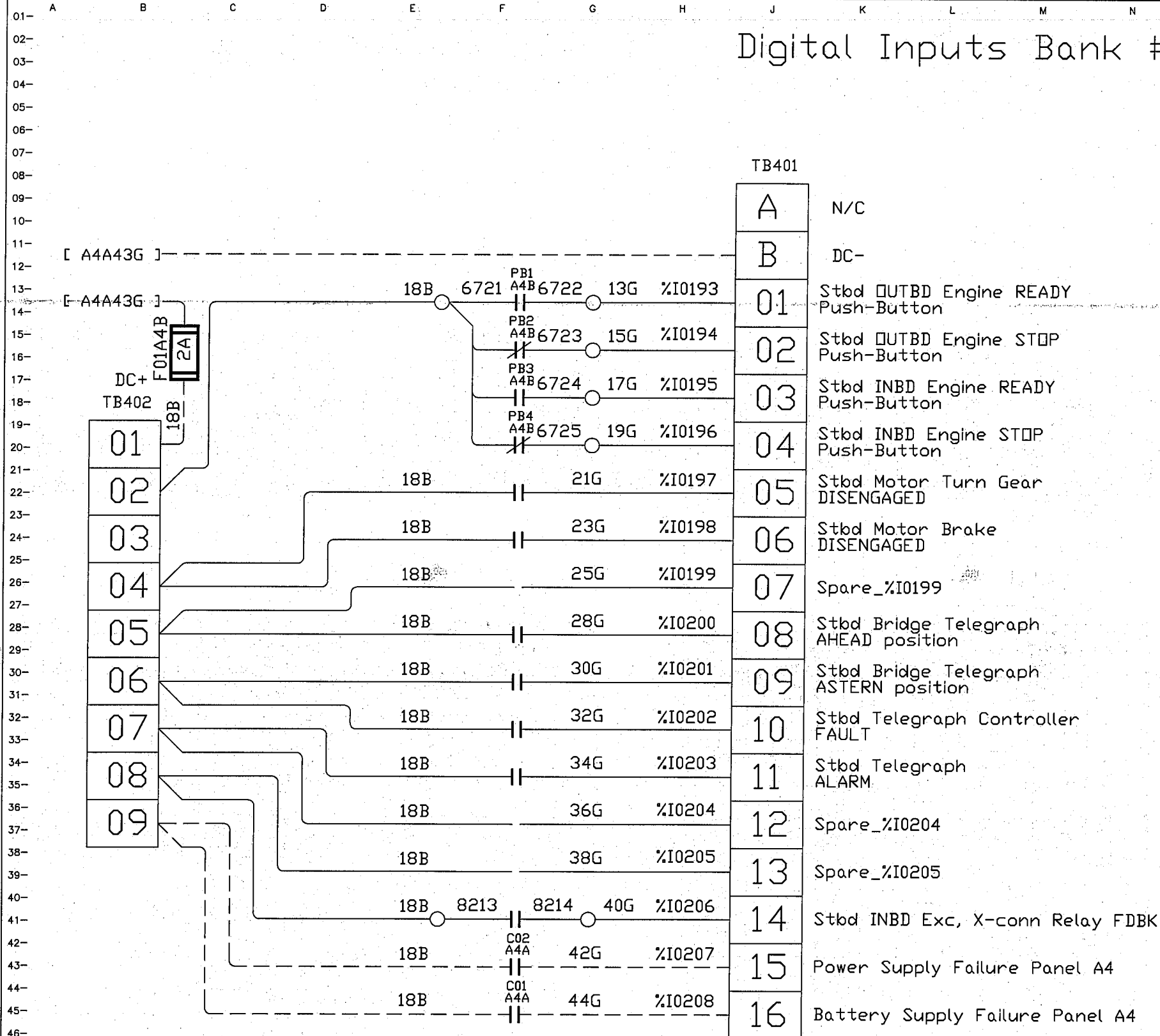
2

3

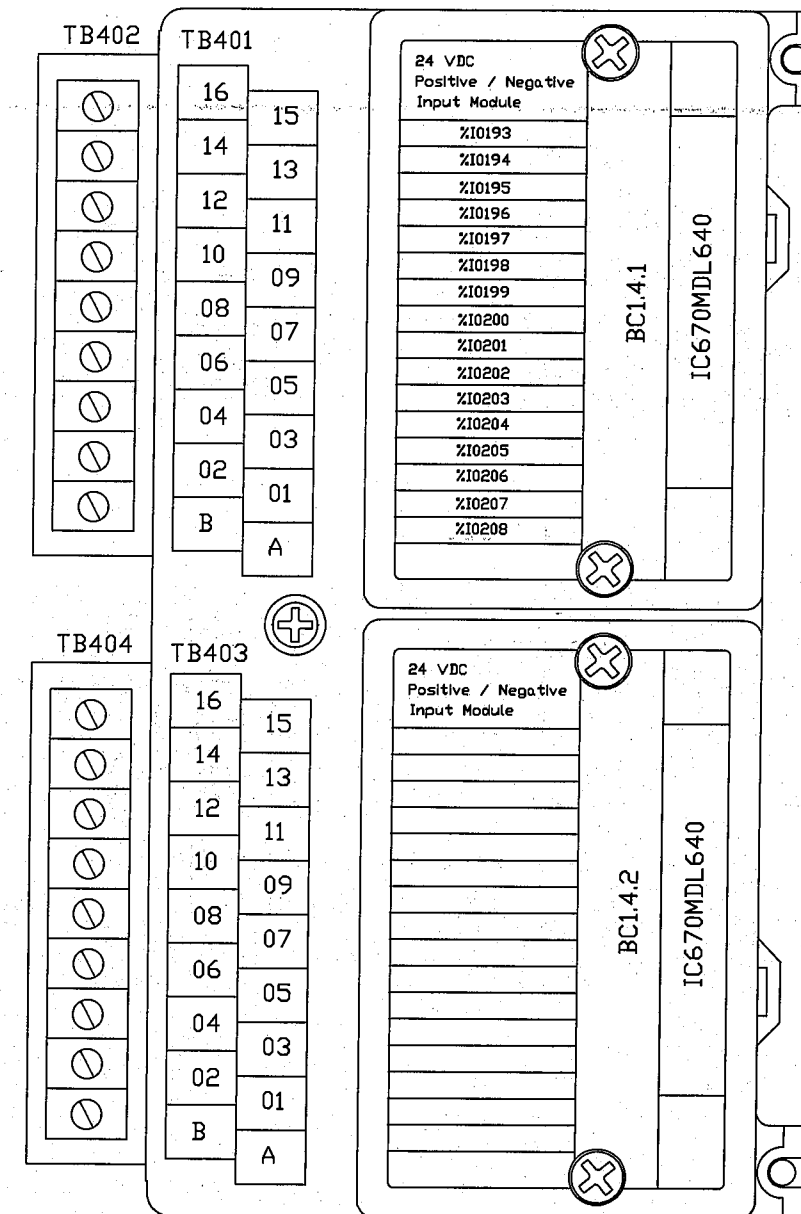
PRINTS TO
 A4A
 SH. No.

ELEMENTARY DIAGRAM
 PROPULSION CONTROL SYSTEM
 P032200-00 CONT. ON SH. A4B

Digital Inputs Bank #1



7408 Represents TB in ECR Console



Source Input Configuration

Wiring Diagram See DWG # B4B
Note : Dashed Lines Are Wired By Techsol.

PRINTS TO			ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
01	02	03			
04	05	06	07	08	09
10	11	12	13	14	15
16	17	18	19	20	21
22	23	24	25	26	27
28	29	30	31	32	33
34	35	36	37	38	39
40	41	42	43	44	45
46	47	48	49	50	51
52	53				

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr. Gouveau
Quebec, Que.
G1K 9J9



CHKD
C.M.
DATE
02-10-01

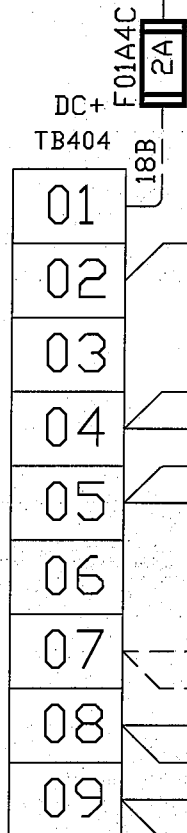
REV.	AS FITTED (by Ser)	1	2	3
1				
2				
3				

Digital Inputs Bank #2

01-
02-
03-
04-
05-
06-
07-
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53-

[A4A43G]

[A4A45G]

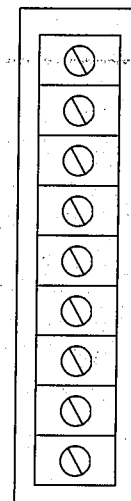


TB403

A	N/C
B	DC-
01	Stbd OUTBD Engine RUNNING
02	Stbd OUTBD Engine FAULT
03	Stbd INBD Engine RUNNING
04	Stbd INBD Engine FAULT
05	Stbd OUTBD Engine OVERSPEED
06	Stbd OUTBD Engine LOW Lube Oil
07	Stbd INBD Engine OVERSPEED
08	Stbd INBD Engine LOW Lube Oil
09	Power Supply Failure Stbd Governor Controllers
10	Battery Supply Failure Stbd Governor Controllers
11	Power Supply Failure Panel A0L
12	Battery Supply Failure Panel A0L
13	Power Supply Failure Stbd Telegraph Controller
14	Battery Supply Failure Stbd Telegraph Controller
15	Power Supply Failure Stbd Telegraph Handles
16	Battery Supply Failure Stbd Telegraph Handles

TB402

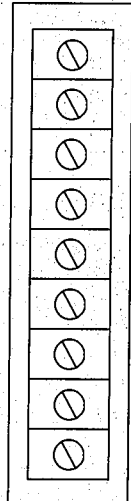
TB401



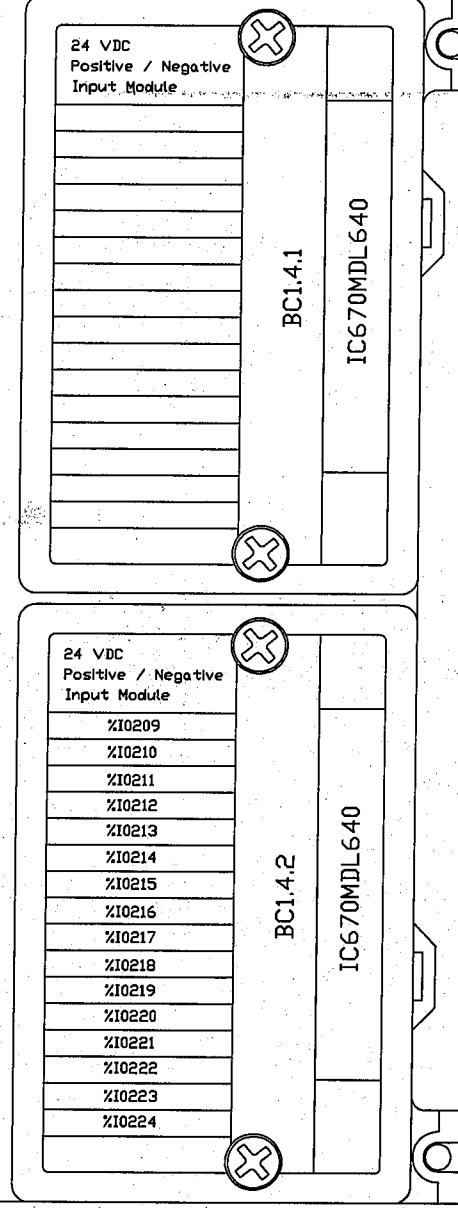
16	15
14	13
12	11
10	09
08	07
06	05
04	03
02	01
B	A

TB404

TB403



16	15
14	13
12	11
10	09
08	07
06	05
04	03
02	01
B	A



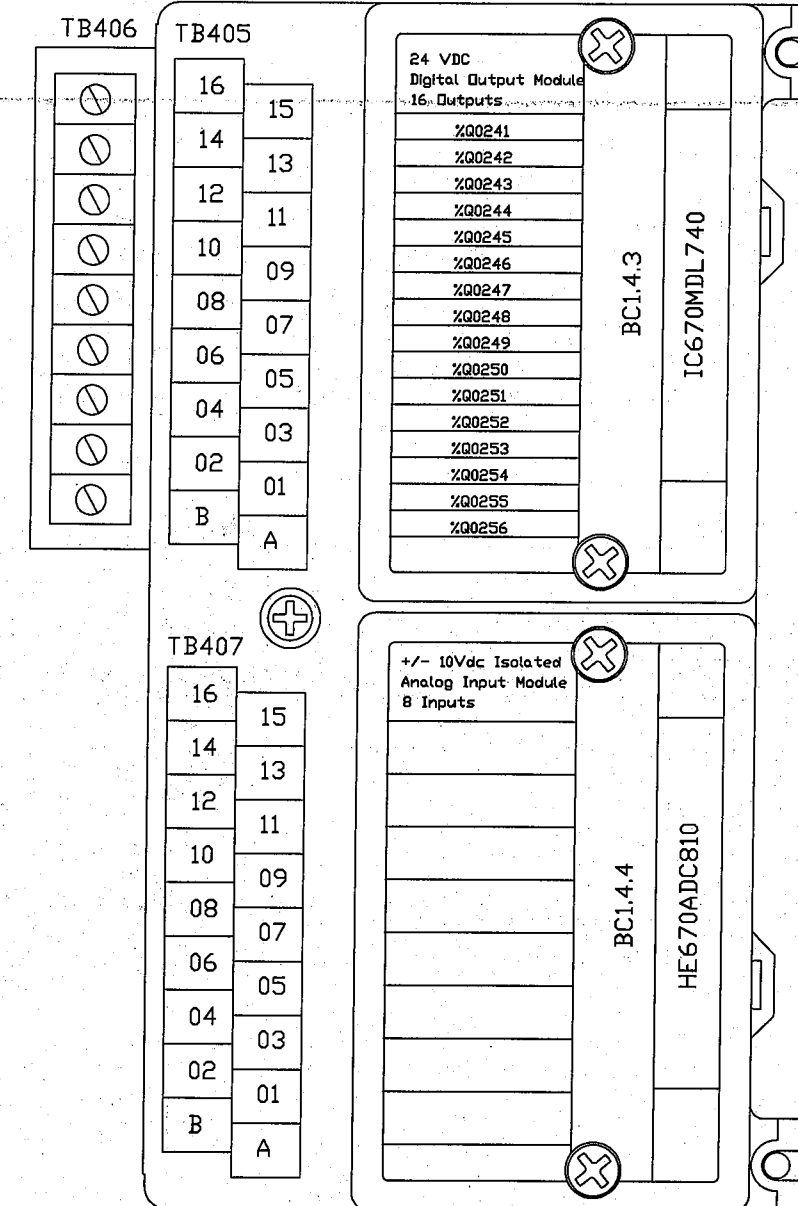
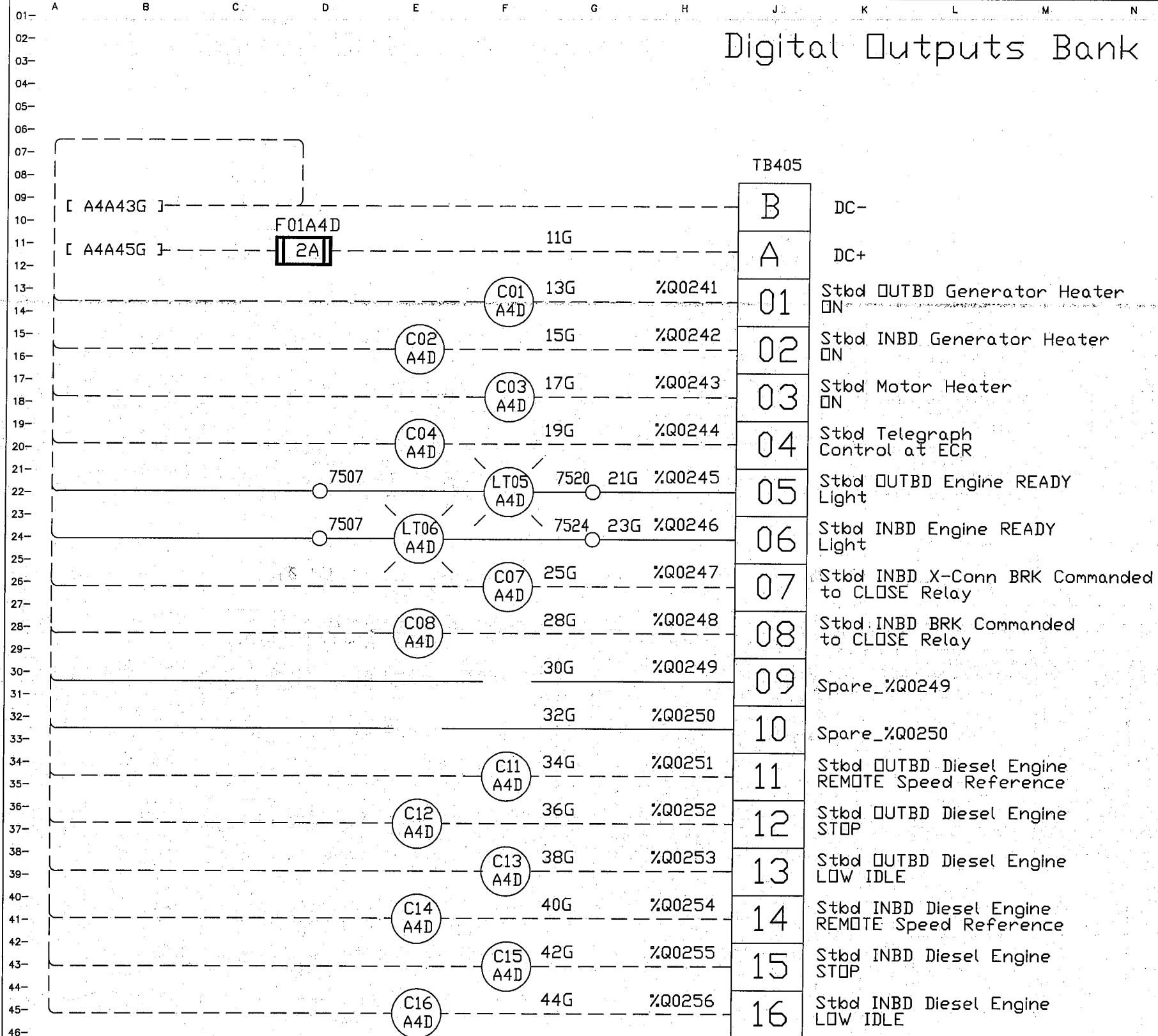
Source Input Configuration

7408 Represents TB in ECR Console

Wiring Diagram See DWG # B4C
Note : Dashed Lines Are Wired By Techsol.

PRINTS TO	A4C
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9	DATE 02-10-01
CHKD S. ROYAL	DATE 02-10-01
REV. 1 AS FITTED (by Set)	2
2	5
3	6

Digital Outputs Bank #1



Source Output Configuration

Wiring Diagram See DWG # B4D

Note : Dashed Lines Are Wired By Techsol.

PRINTS TO: A4D SH. No.

ELEMENTARY DIAGRAM

PROPULSION CONTROL SYSTEM

GENERAL ELECTRIC

Industrial Systems

Salem, Virginia

TECHSOL Inc.

400, Mgr. Gouveau

Quebec, Que.

G1K 9J9

CHKD C.M.

DRAWN S. ROYAL

DATE 02-10-01

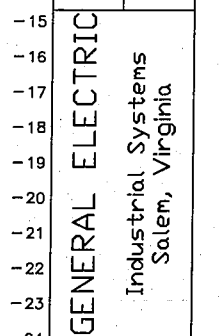
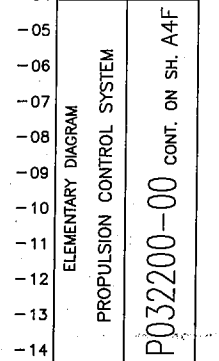
REV. 1 AS FITTED (by Ser)

2

3

P032200-00 CONT. ON SH. A4E

- 01	PRINTS TO:	A4E	SH. No.
- 02			
- 03			
- 04			



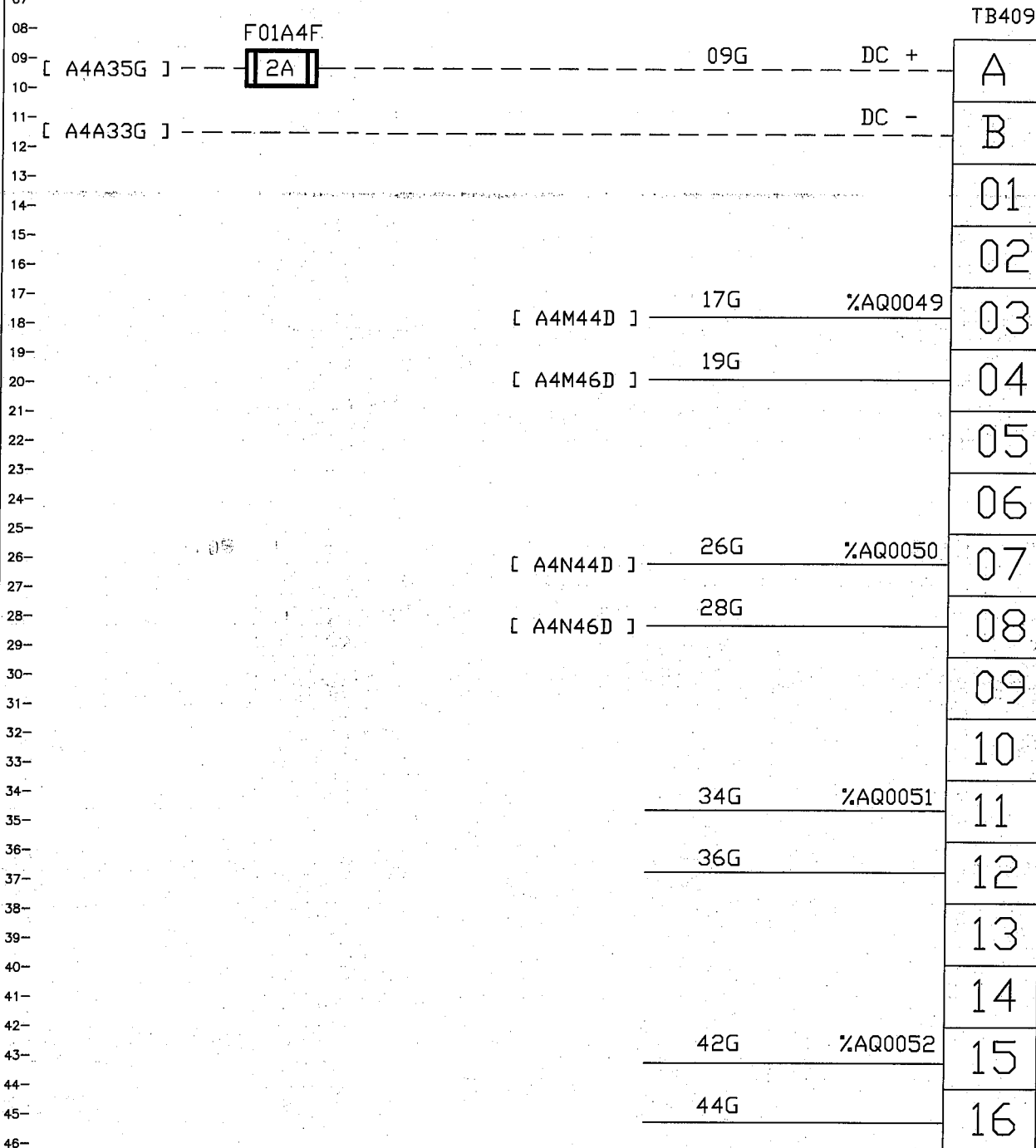
TECHSOL Inc.
100, Mgr Gauvreau
Quebec, Qué.
G1K 9J9

TECHSOL

- 34	CHKD C.M.	DATE 02-10-01
- 35		
- 36		
- 37	DRAWN ROYAL	
- 38		

LAST MODIFICATION: 11/21/03 04:20PM

Current Analog Outputs Bank #1

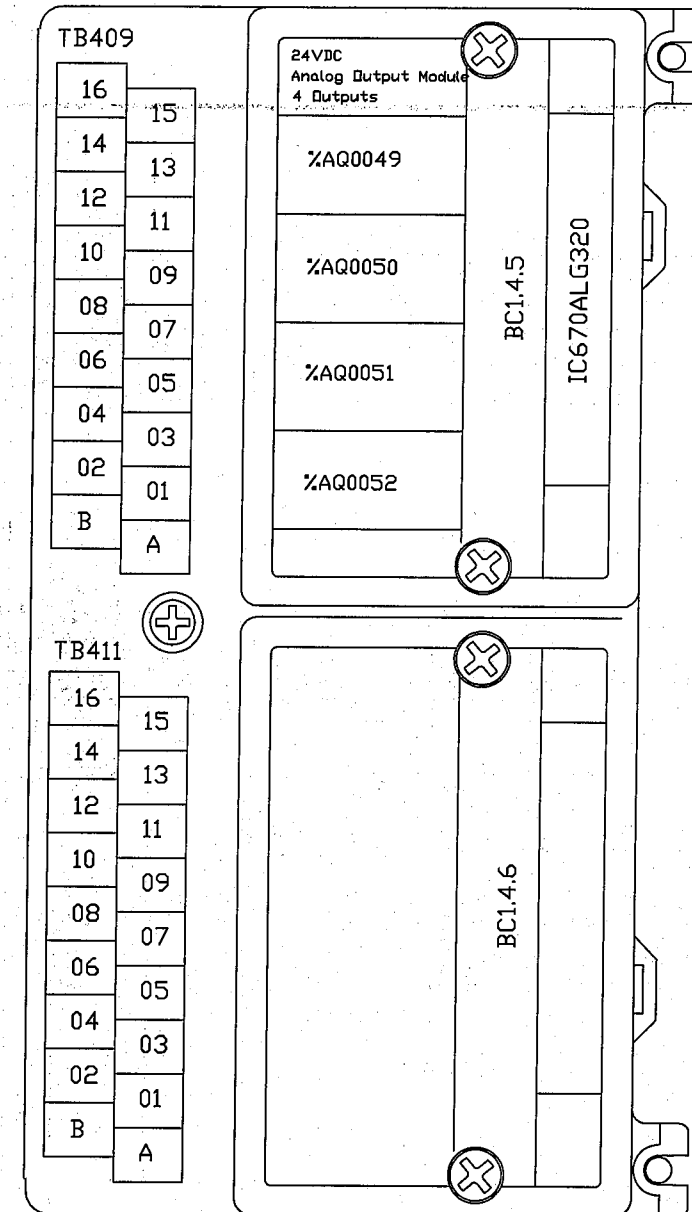


Stbd OUTBD Diesel Engine Speed Reference
(4-20mA = 400-750rpm)

Stbd INBD Diesel Engine Speed Reference
(4-20mA = 400-750rpm)

Spare_%AQ0051

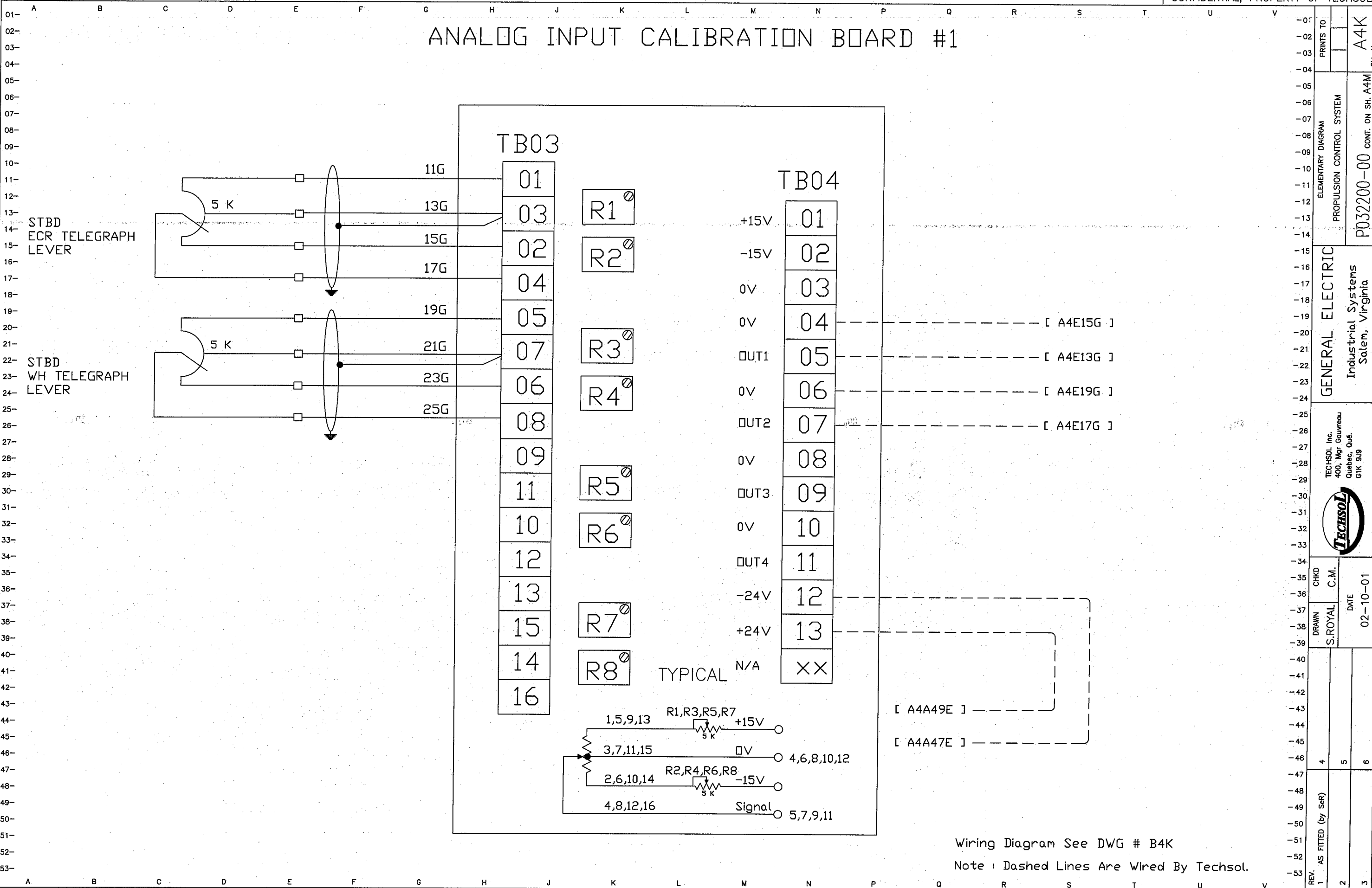
Spare_%AQ0052



Wiring Diagram See DWG # B4F

Note : Dashed Lines Are Wired By Techsol.

ANALOG INPUT CALIBRATION BOARD #1

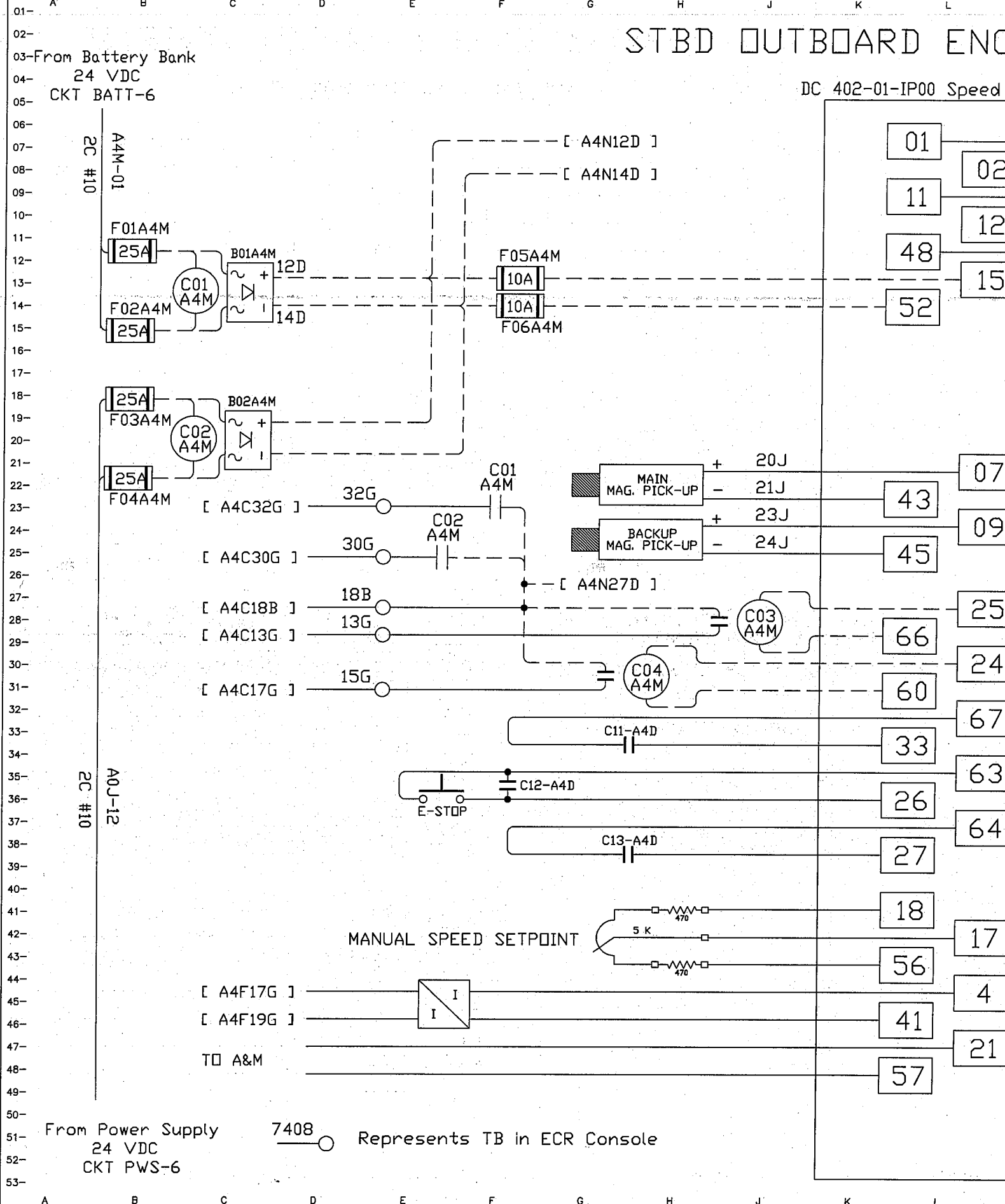


PRINTS TO			ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
01	02	03			
04	05	06	GENERAL ELECTRIC	Industrial Systems Salem, Virginia	P032200-00 CONT. ON SH. A4M
07	08	09			
10	11	12	TECHSOL Inc. 400, Mgr. Gouveau Quebec, Que. G1K 9J9	DATE	02-10-01
13	14	15			
16	17	18	CHKD	C.M.	4
19	20	21			
22	23	24	DRAWN	S.ROYAL	5
25	26	27			
28	29	30	REV.	AS FITTED (by Ser)	3
31	32	33			
34	35	36	1	2	3
37	38	39			
40	41	42	4	5	6
43	44	45			
46	47	48	5	6	7
49	50	51			
52	53		6	7	8

STBD OUTBOARD ENGINE GOVERNOR

DC 402-01-IP00 Speed Controller

StG40-01 Actuator



- NOTE: DIGITAL OUTPUT PROGRAMMED AS "ENGINE RUNNING" (>300RPM)
- NOTE: DIGITAL OUTPUT PROGRAMMED AS "FAULTED"
- NOTE: DIGITAL INPUT PROGRAMMED AS "REMOTE/LOCAL"
- NOTE: DIGITAL INPUT PROGRAMMED AS "STOP"
- NOTE: DIGITAL INPUT PROGRAMMED AS "LOW IDLE"

Wiring Diagram See DWG # C4M

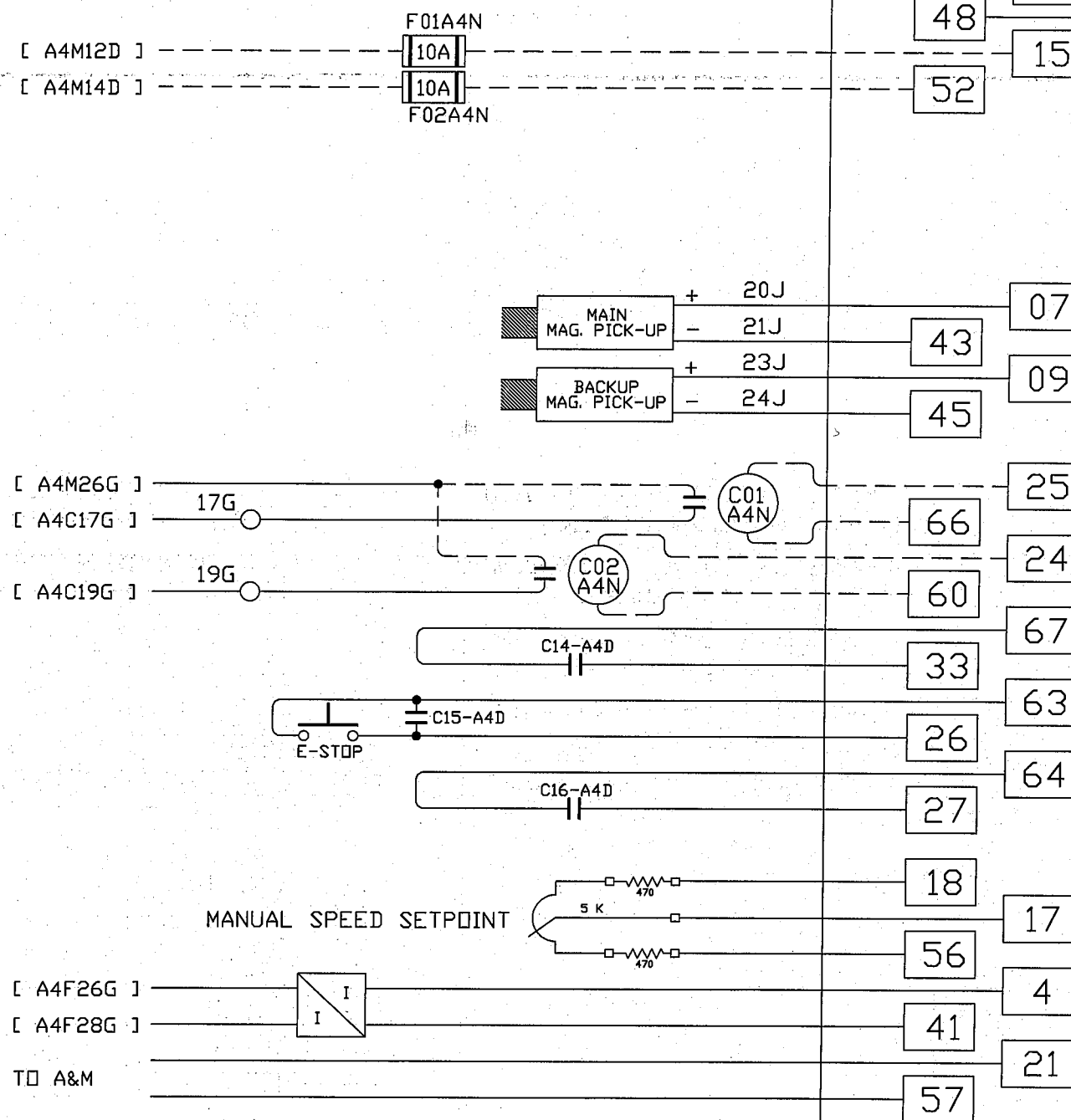
Note : Dashed Lines Are Wired By Techsol.

REV.	AS FITTED (by Ser)	DRAWN	CHKD	C.M.	DATE	PRINTS TO	ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
1		S. ROYAL			02-10-01				A4M
2									
3									

STBD INBOARD ENGINE GOVERNOR

DC 402-01-IP00 Speed Controller

StG40-01 Actuator



NOTE: DIGITAL OUTPUT PROGRAMMED AS "ENGINE RUNNING" (>300RPM)
 NOTE: DIGITAL OUTPUT PROGRAMMED AS "FAULTED"
 NOTE: DIGITAL INPUT PROGRAMMED AS "REMOTE/LOCAL"
 NOTE: DIGITAL INPUT PROGRAMMED AS "STOP"
 NOTE: DIGITAL INPUT PROGRAMMED AS "LOW IDLE"

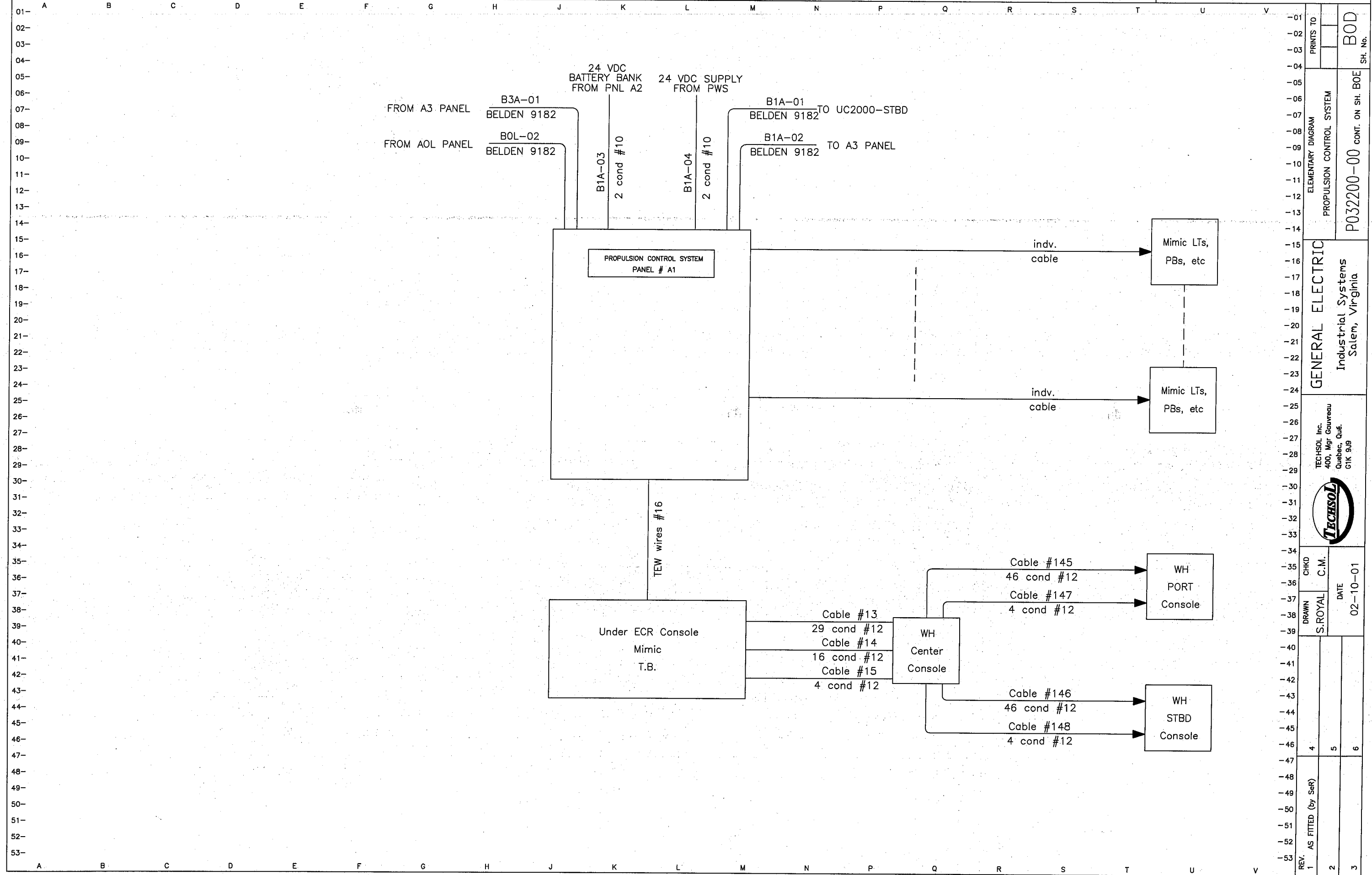
Wiring Diagram See DWG # C4N

Note : Dashed Lines Are Wired By Techsol.

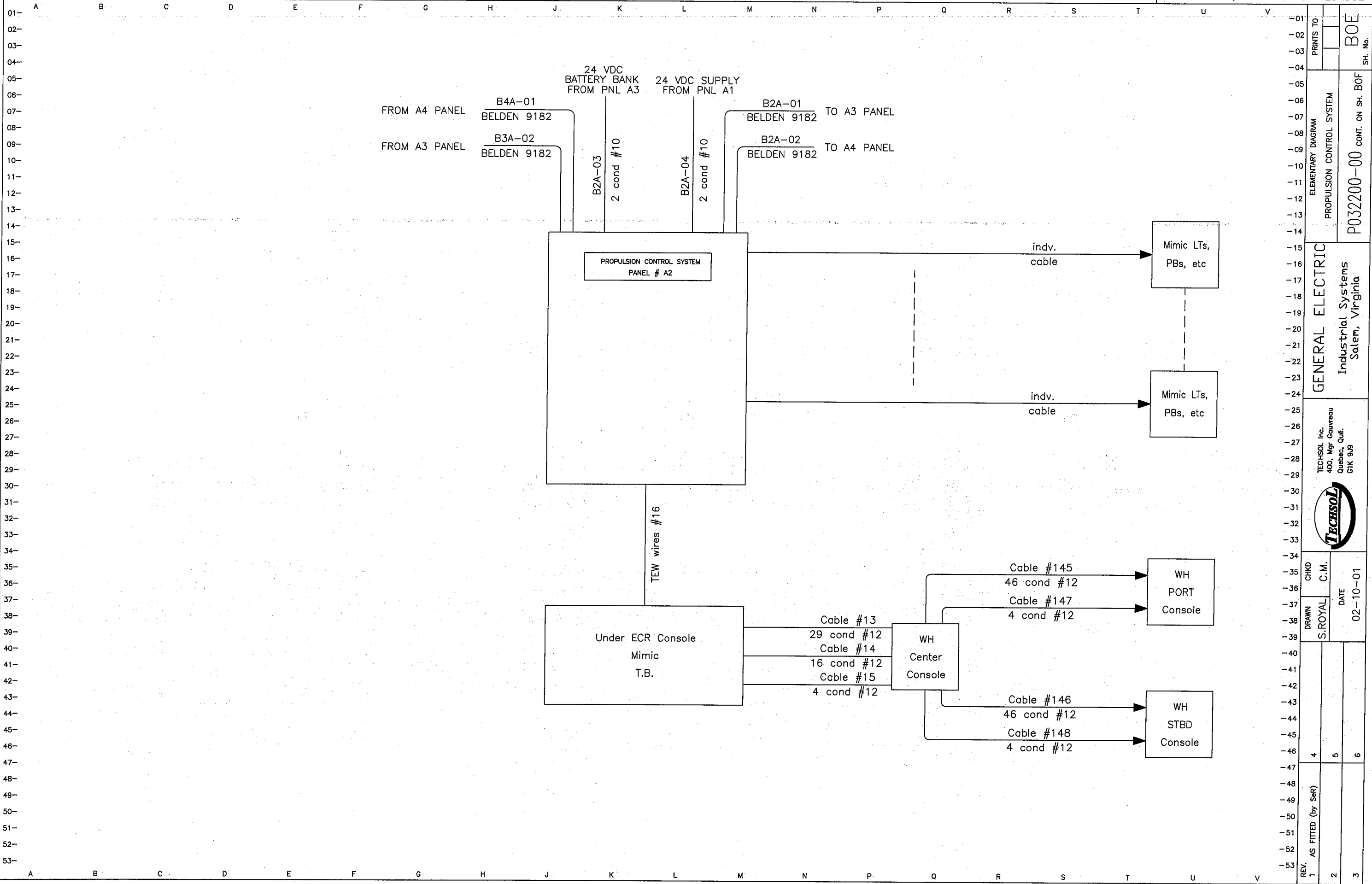
7408 Represents TB in ECR Console

PRINTS TO			ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	A4N	Sh. No.
01-	02-	03-				
04-	05-	06-	GENERAL ELECTRIC	Industrial Systems Salem, Virginia	P032200-00	CONT. ON SH. B0D
07-	08-	09-				
10-	11-	12-				
13-	14-	15-				
16-	17-	18-				
19-	20-	21-				
22-	23-	24-				
25-	26-	27-				
28-	29-	30-				
31-	32-	33-				
34-	35-	36-	TECHSOL Inc. 400, Mgr. Gauthier Quebec, Que. G1K 9J9	CHKD C.M.	DATE 02-10-01	REV. 1 AS FITTED (by Set)
37-	38-	39-				
40-	41-	42-				
43-	44-	45-				
46-	47-	48-				
49-	50-	51-				
52-	53-					

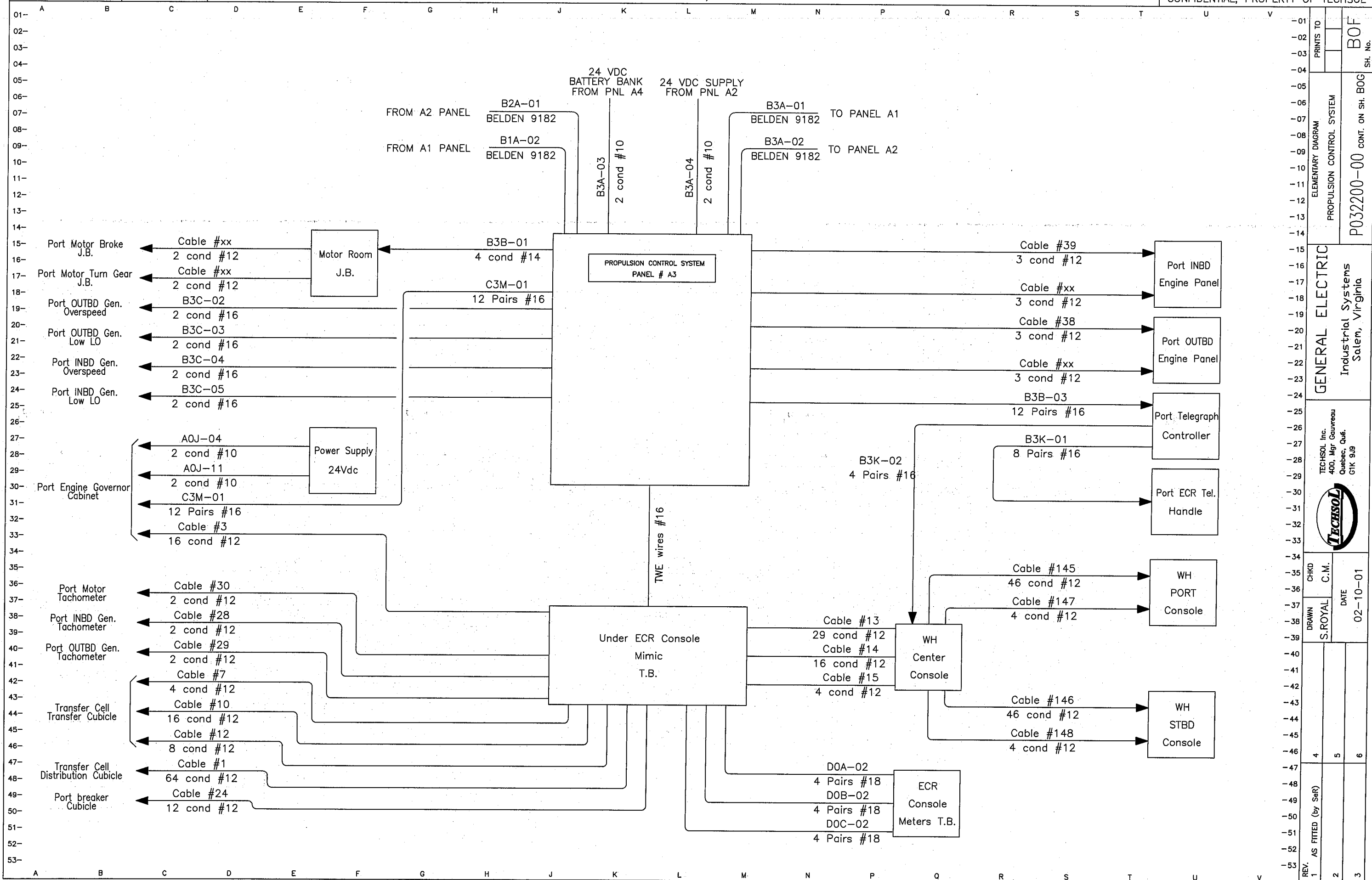
PROPULSION CONTROL SYSTEM, CCGS GRIFFON

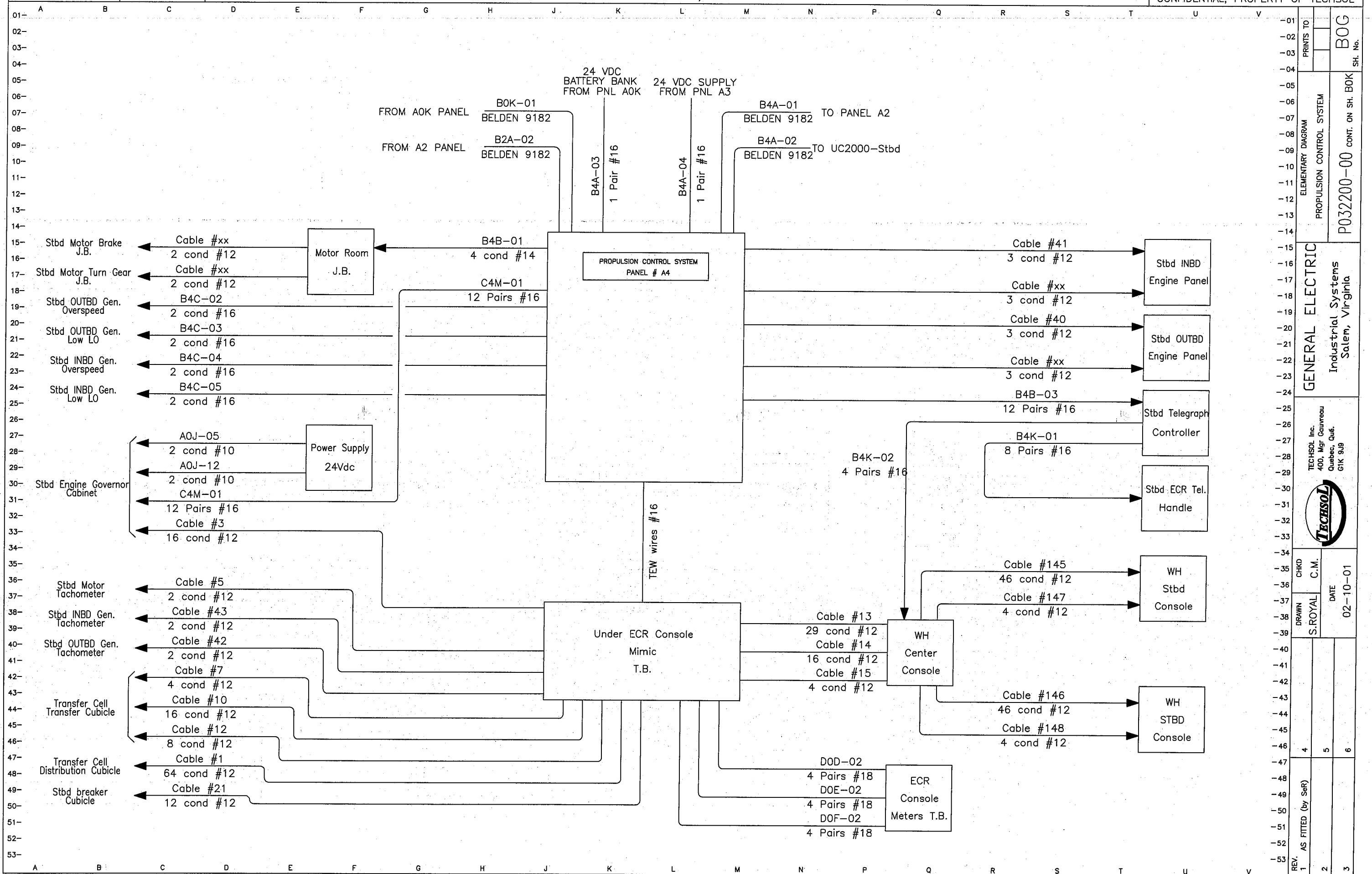


PRINTS TO	B0D	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. B0E
GENERAL ELECTRIC	Industrial Systems	Salem, Virginia
TECHSOL Inc.	400, Mgr Gouvreau	Quebec, Que.
CHKD	C.M.	DATE
DRAWN	S. ROYAL	02-10-01
REV.	1 AS FITTED (by Ser)	4
	2	5
	3	6



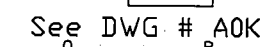
PRINTS TO	BOE
SH. No.	
ELEMENTARY DIAGRAM	
PROPULSION CONTROL SYSTEM	
P032200-00	CONT. ON SH. BOF
GENERAL ELECTRIC	
Industrial Systems	
Salem, Virginia	
TECHSOL Inc.	
400, Mgr. Gauthier	
Quebec, Que.	
G1K 909	
CHKD	
C.M.	
DATE	02-10-01
DRAWN	
S.ROYAL	
REV.	
1 AS FITTED (by Ser)	
2	
3	





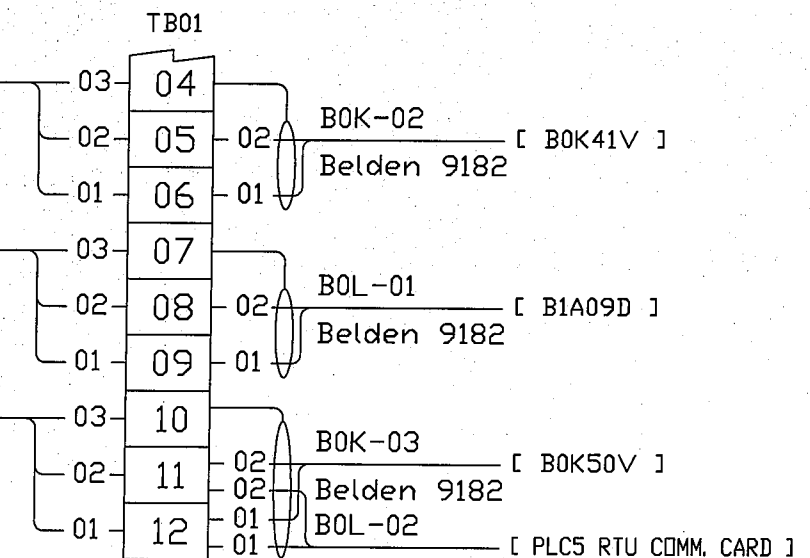
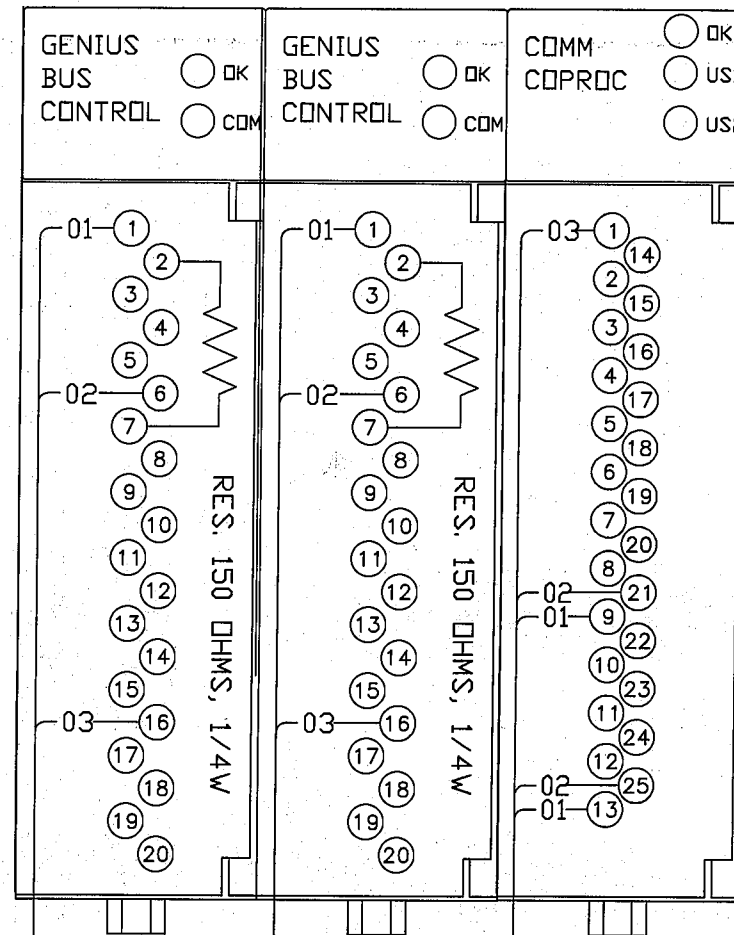
01-	PRINTS TO	BOK
02-		SH. No.
03-		
04-		
05-		
06-		
07-		
08-		
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10-		
11-		
12-		
13-		
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52-		
53-		

RS-485



PLC Slave Communication

Genius Bus RTU Bus
 Add : 31 Add : 29 Address : 02
 BC1.31 BC2.29 RS-485



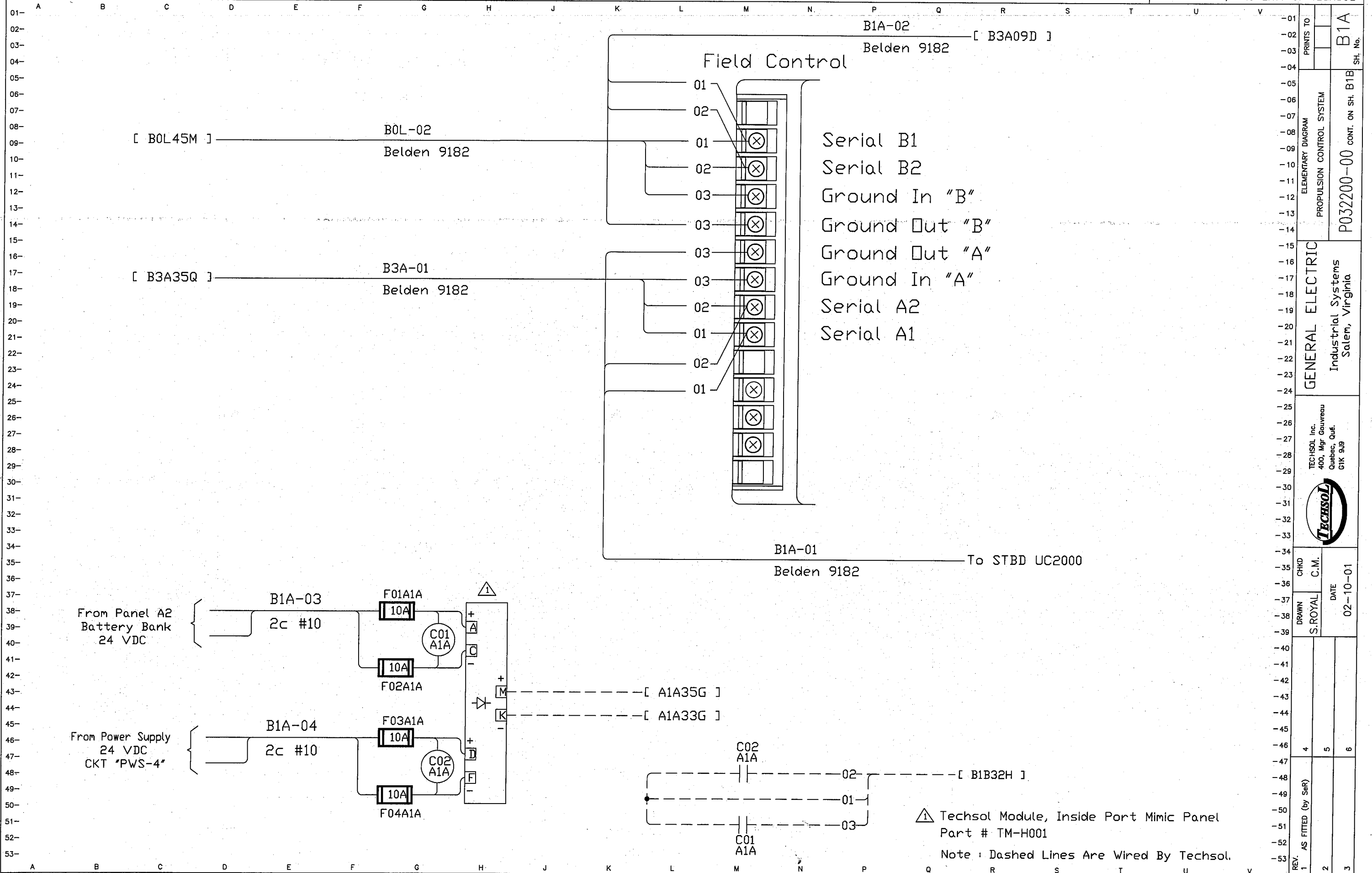
See DWG # A0L

REV.	AS FITTED (by Ser)	DRAWN	CHKD	C.M.	DATE	PRINTS TO	ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
1		S. ROYAL			02-10-01				
2									
3									

TECHSOL Inc.
 400, Mgr Gouveau
 Quebec, Que.
 G1K 9J9



GENERAL ELECTRIC
 Industrial Systems
 Salem, Virginia



REV.	AS FITTED (by Ser)	DRAWN	CHKD	DATE	C.M.	DATE	SH. No.
1		S. ROYAL		02-10-01			B1A
2							
3							

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr. Gouveau
Quebec, Que.
G1K 9J9

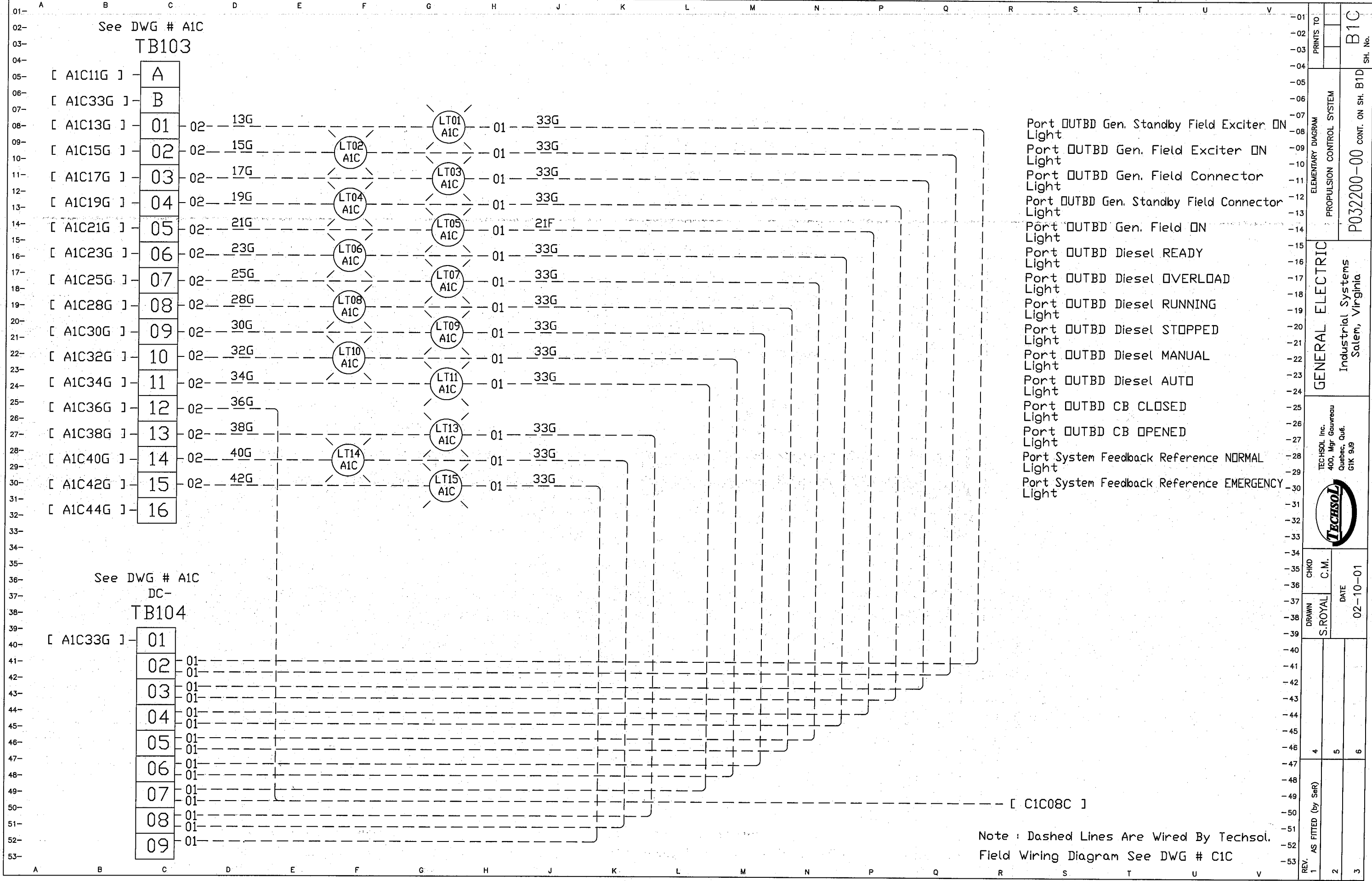
TECHSOL

PRINTS TO
B1A

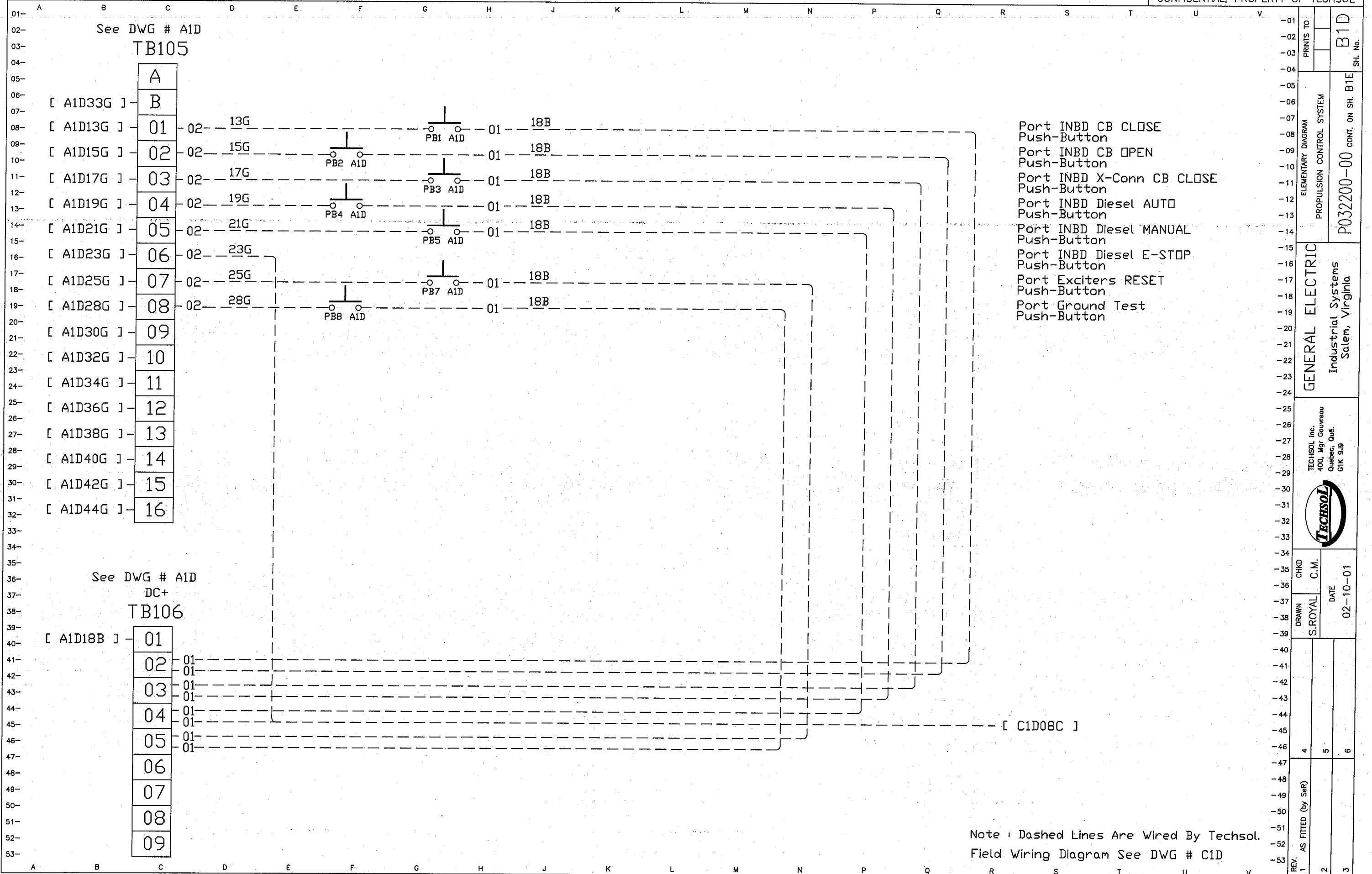
ELEMENTARY DIAGRAM
PROPULSION CONTROL SYSTEM

P032200-00 CONT. ON SH. B1B



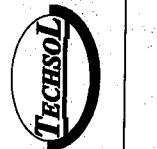


PRINTS TO	B1C
SH. No.	P032200-00 CONT. ON SH. B1D
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr. Gouveau Quebec, Que. G1K 9J9	DATE 02-10-01
CHKD C.M.	DATE 02-10-01
DRAWN S. ROYAL	DATE 02-10-01
REV. 1 AS FITTED (by Ser)	2 3



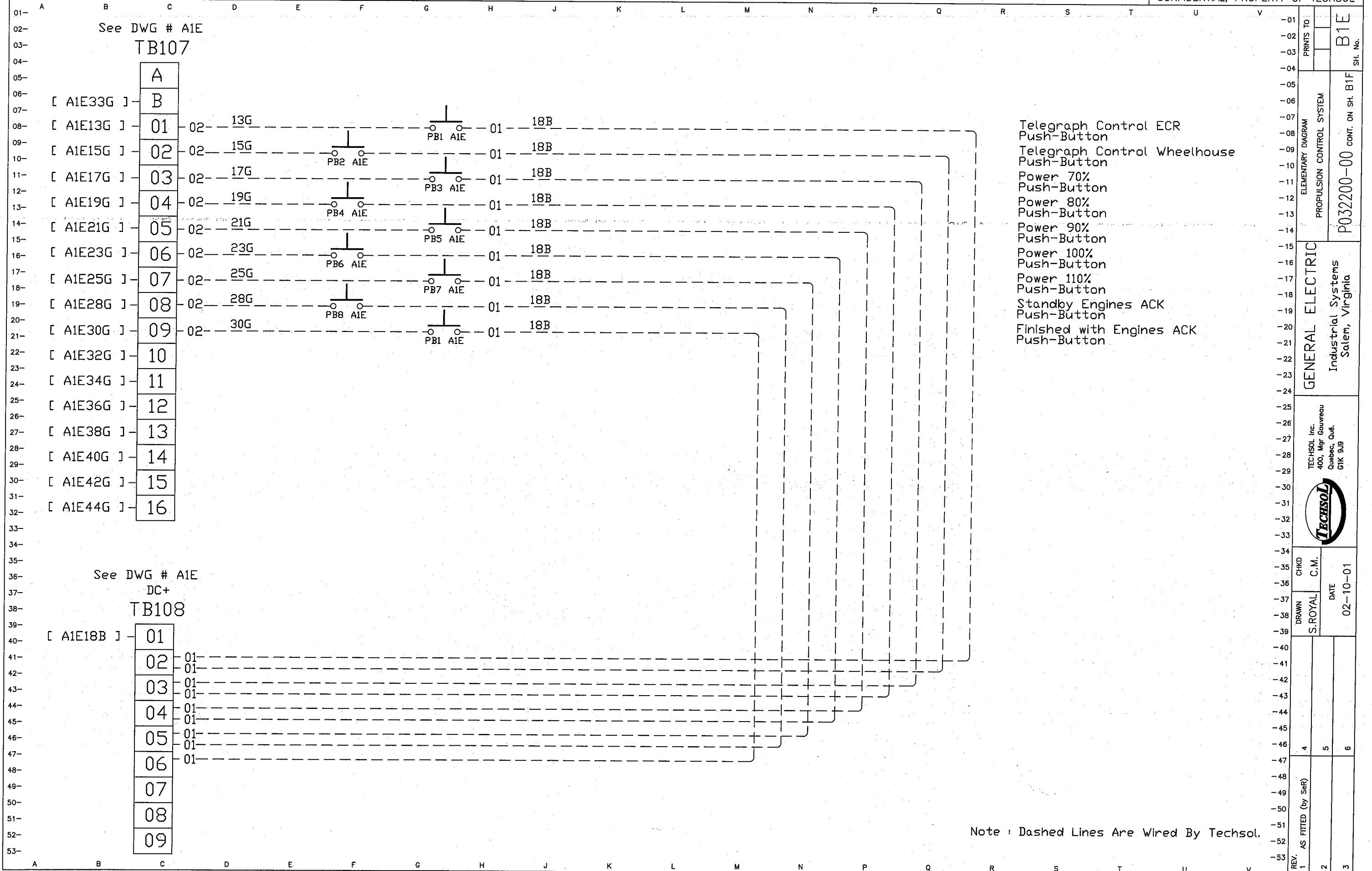
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gouveau
Quebec, Que.
G1K 9J9

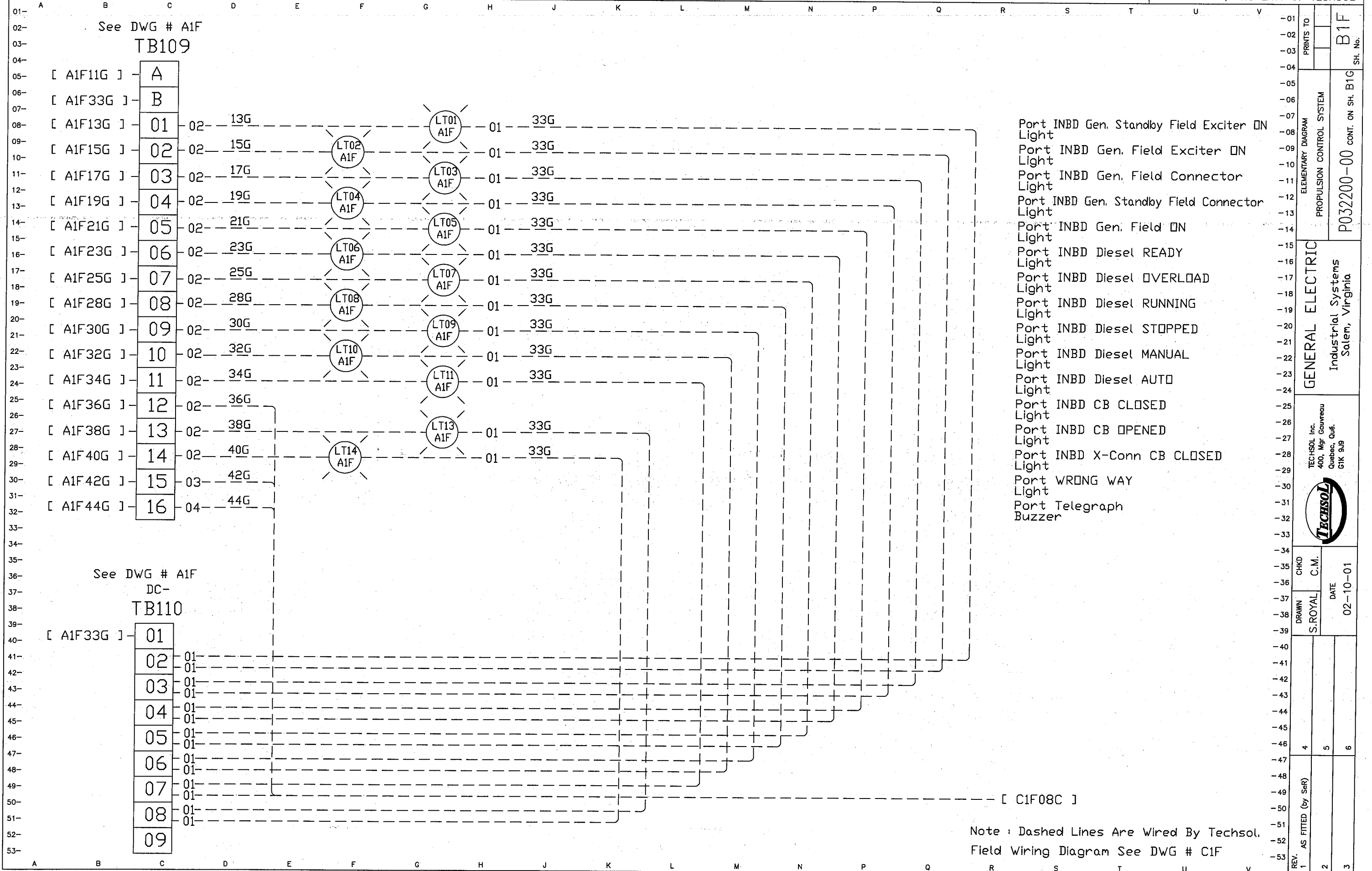


CHKD
C.M.
DATE
02-10-01

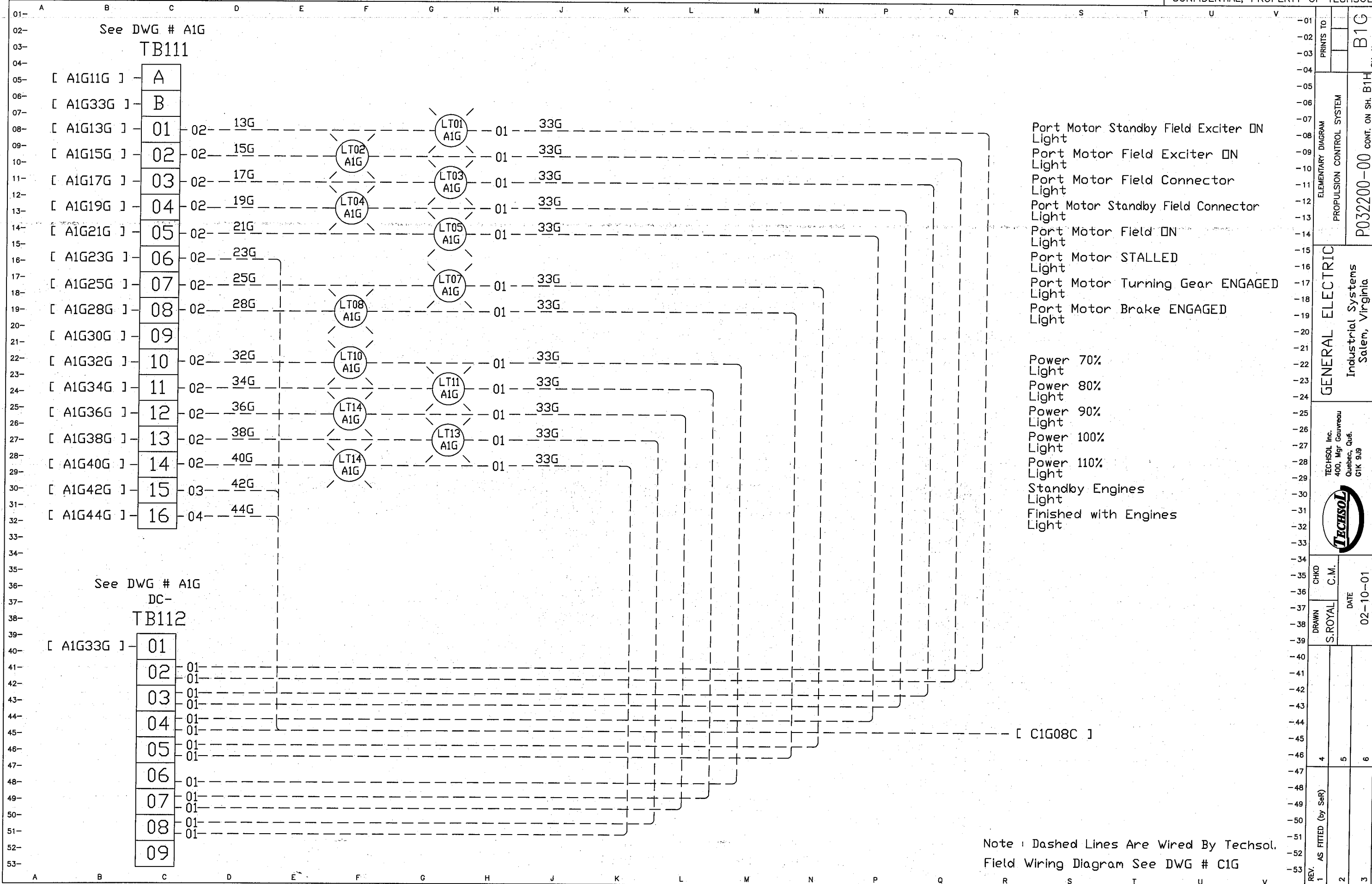
REV.	AS FITTED (by Set)	DATE	DATE
1	4	5	6
2			
3			



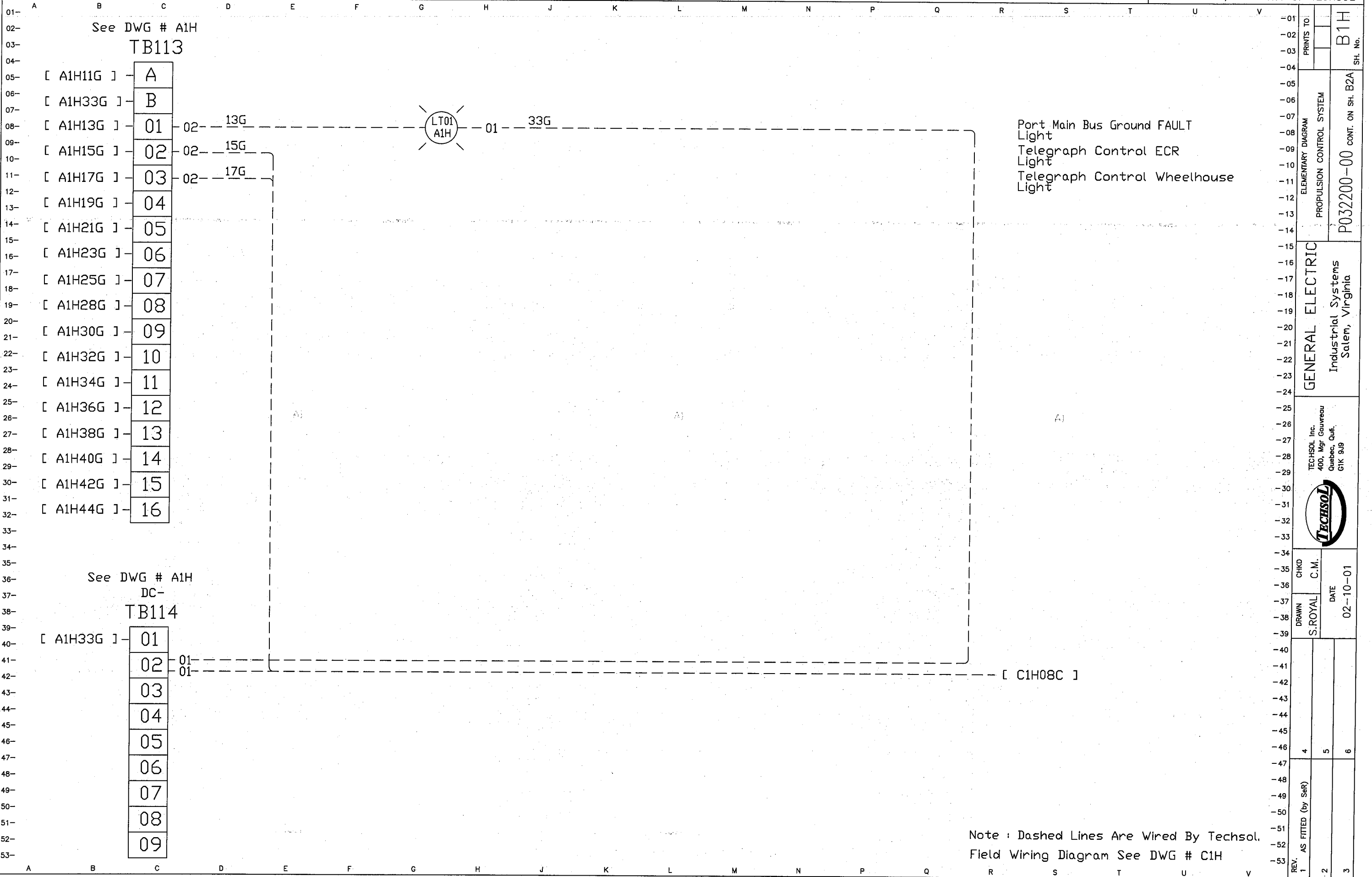
PRINTS TO	B1E
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9	
CHKD C.M.	DATE
DRAWN S. ROYAL	02-10-01
REV. 1 AS FITTED (by Set)	2 3



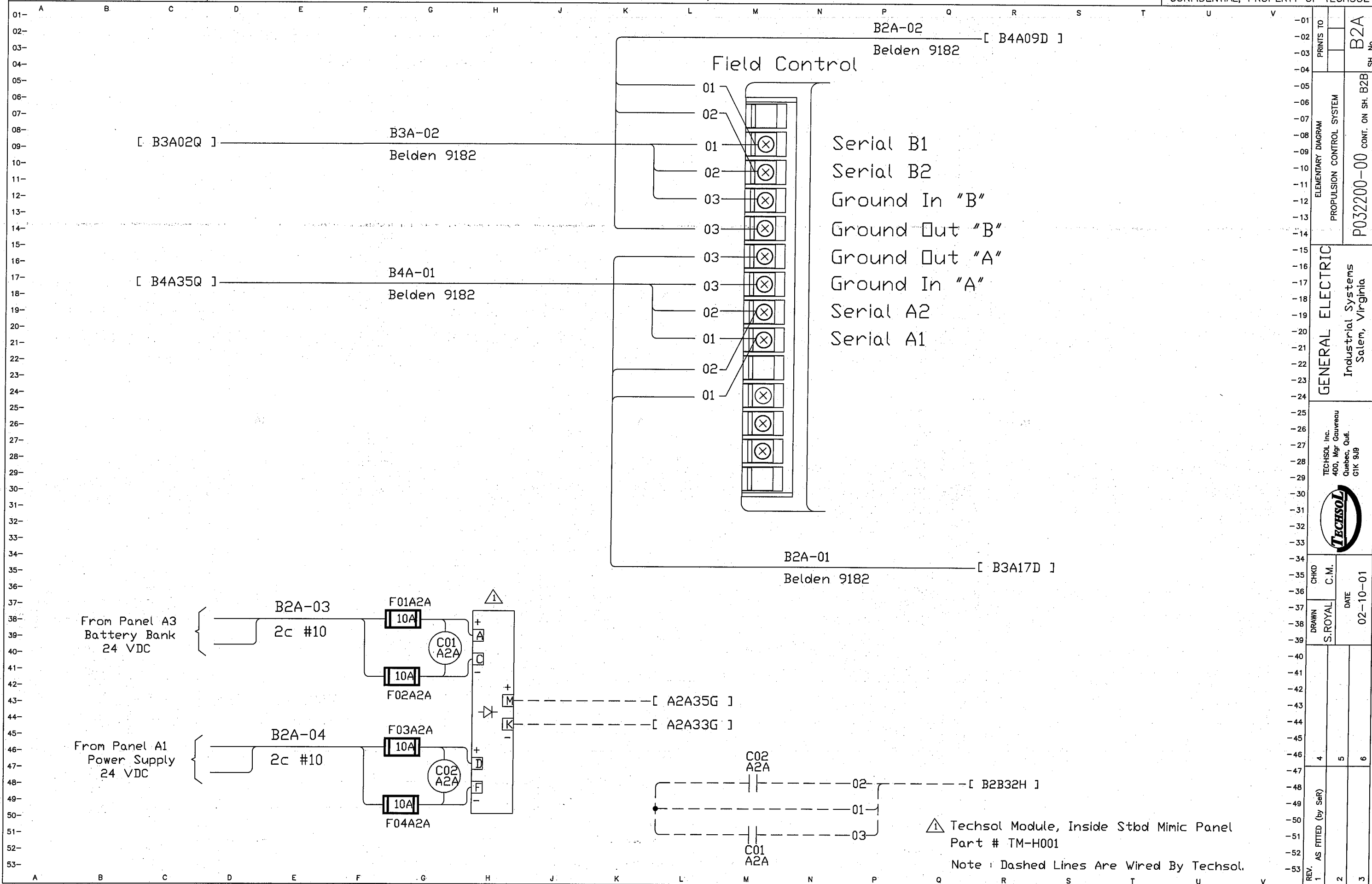
PRINTS TO	B1F
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9	
CHKD C.M.	DATE 02-10-01
DRAWN S. ROYAL	
REV. 1 AS FITTED (by Ser)	2 3

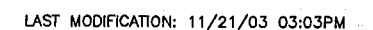


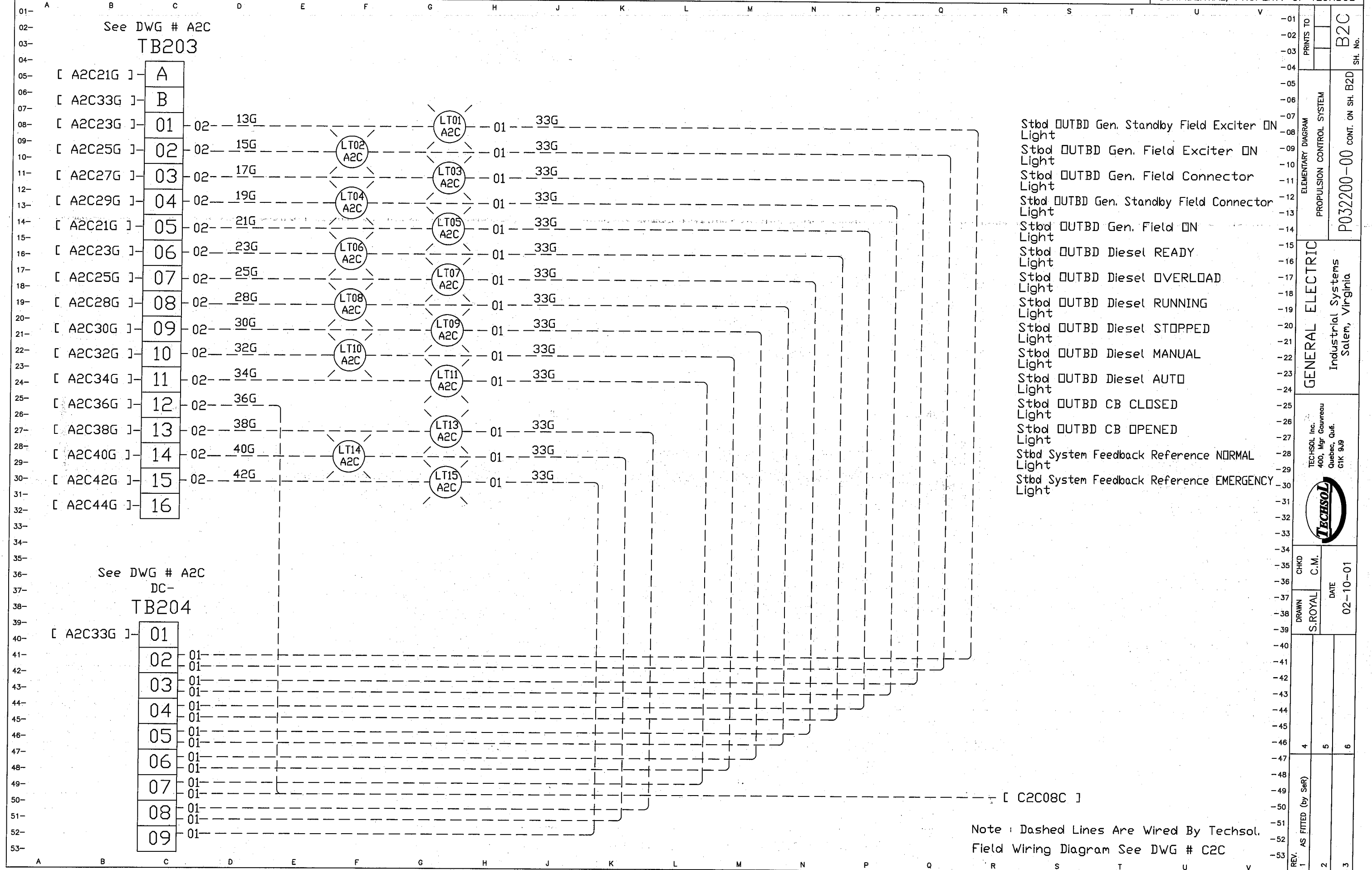
Note: Dashed Lines Are Wired By Techsol.
Field Wiring Diagram See DWG # C1G

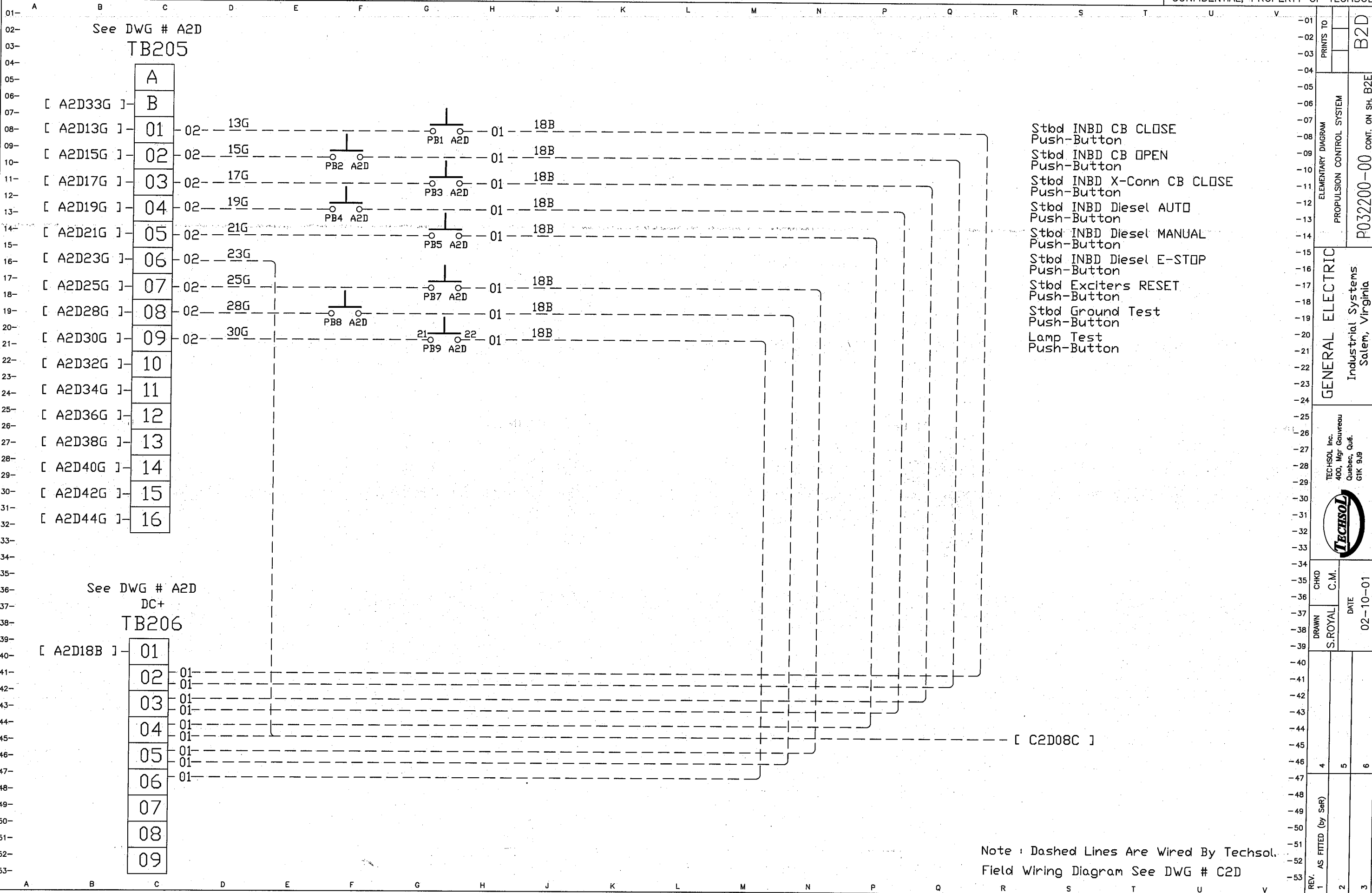


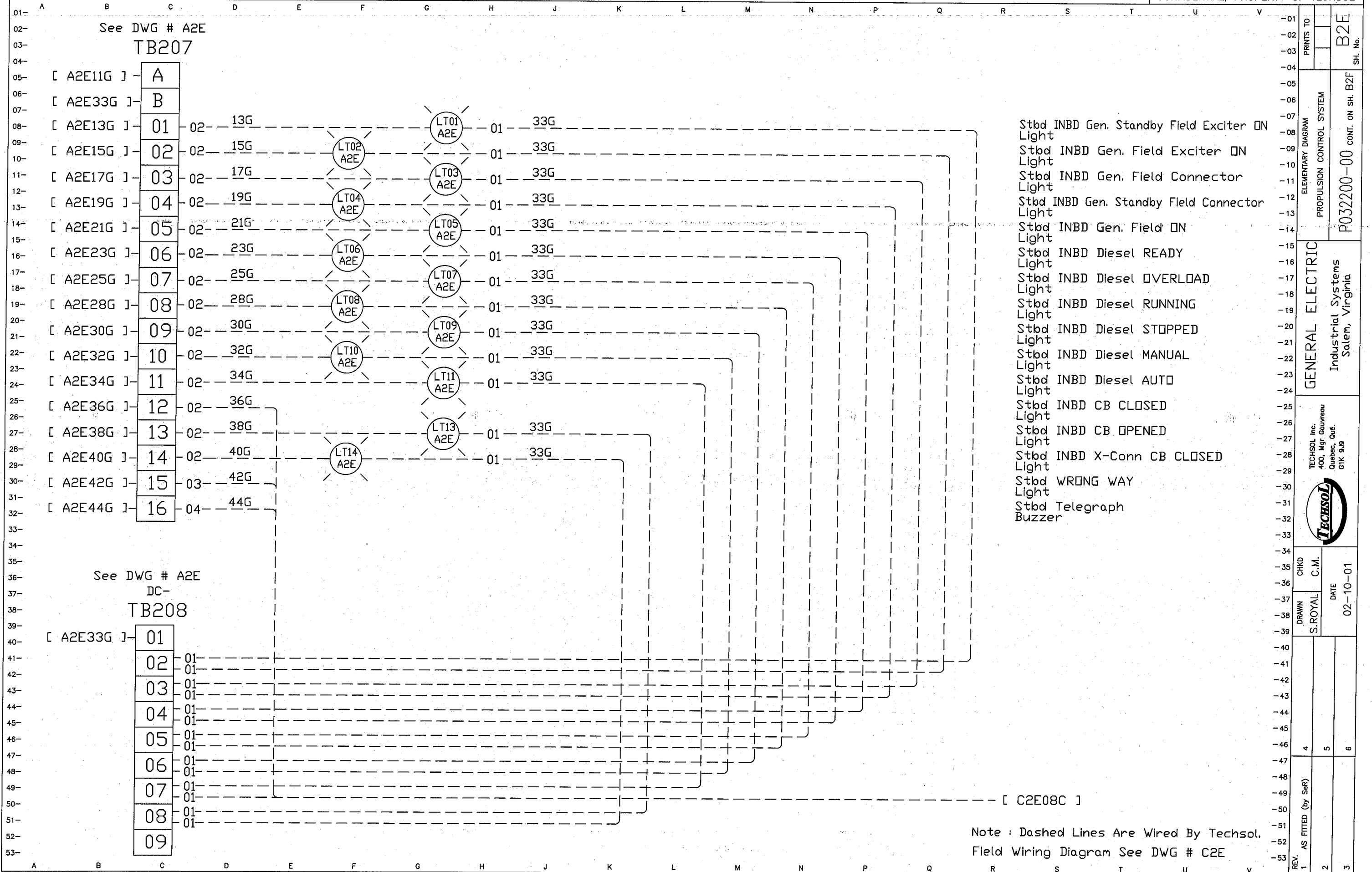
PROPULSION CONTROL SYSTEM, CCGS GRIFFON



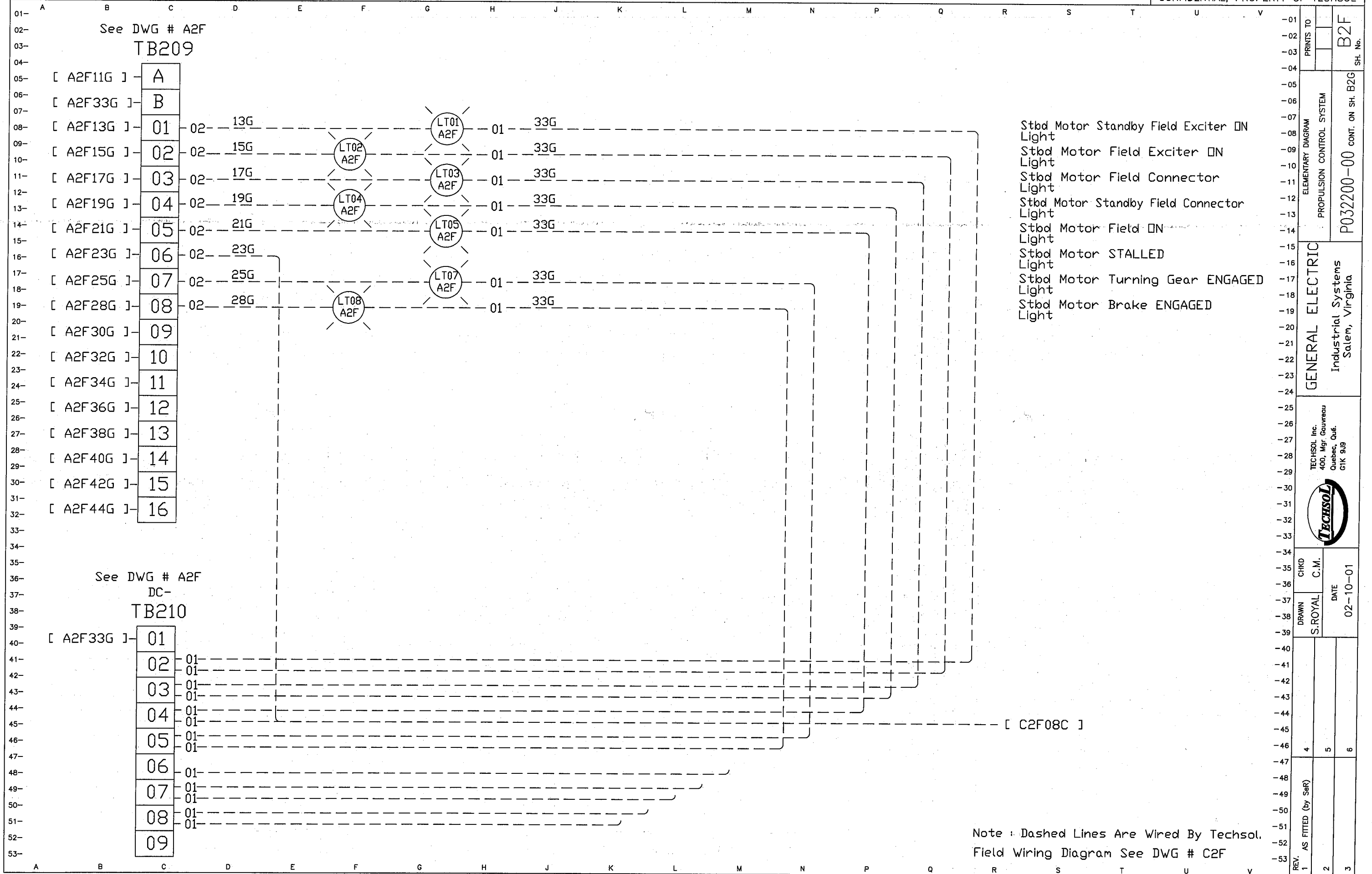




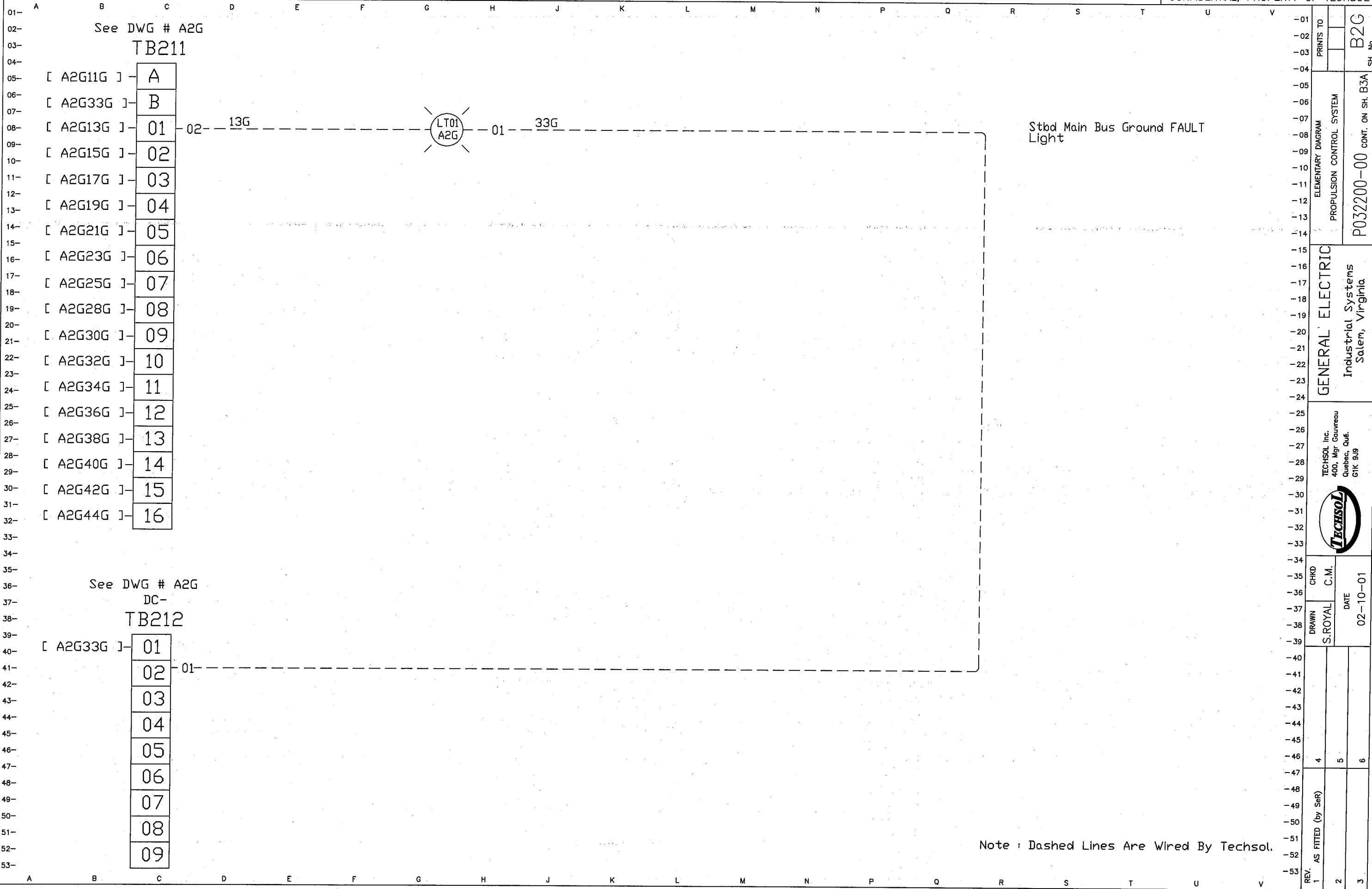




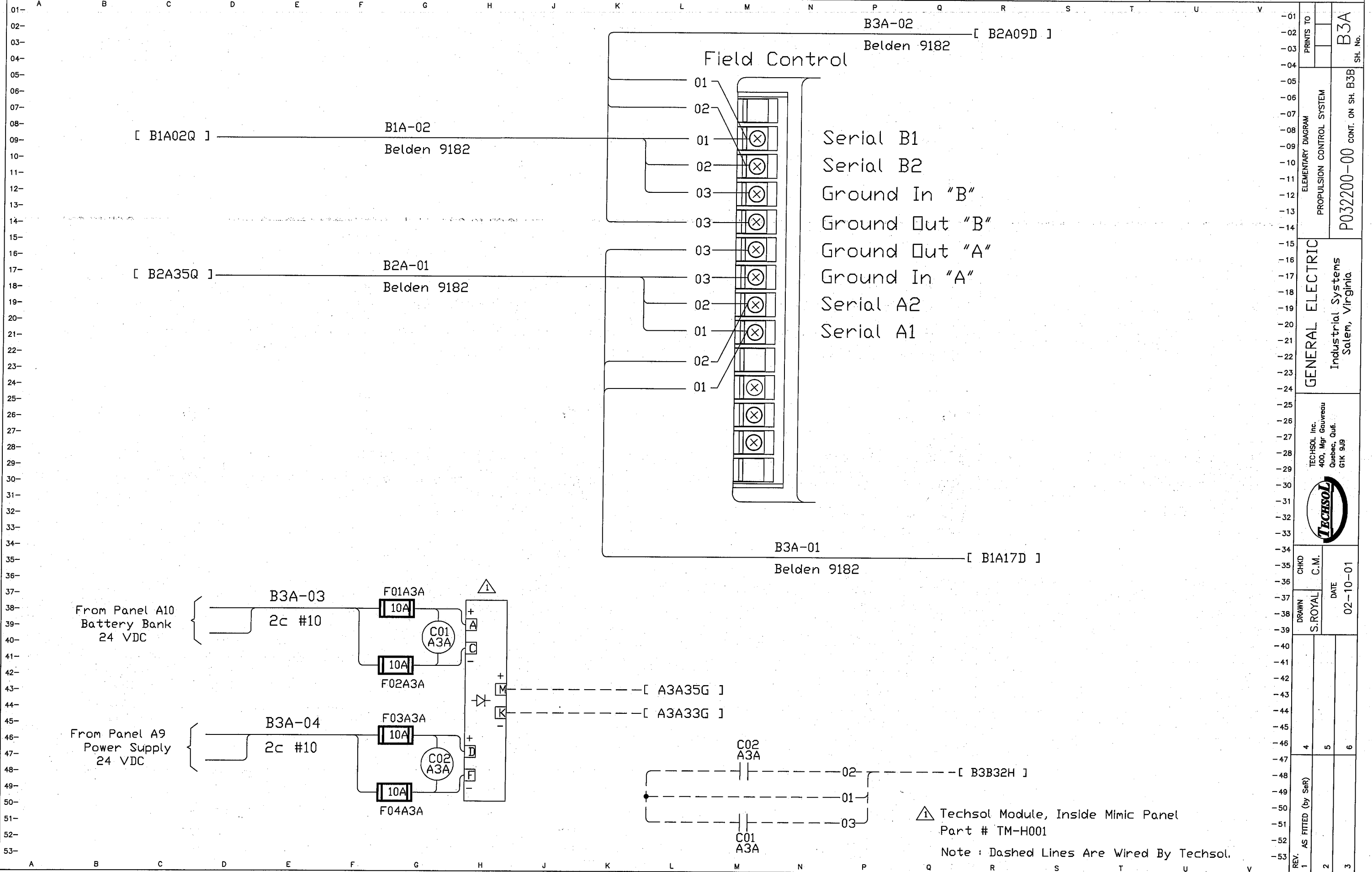
PRINTS TO	B2E	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. B2F
GENERAL ELECTRIC	Industrial Systems	Salem, Virginia
TECHSOL Inc.	400, Mgr Gouveau	Quebec, Que.
CHKD	C.M.	DATE
DRAWN	S. ROYAL	02-10-01
REV.	1 AS FITTED (by Ser)	2 3



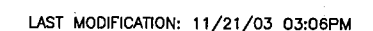
Note : Dashed Lines Are Wired By Techsol.
Field Wiring Diagram See DWG # C2F

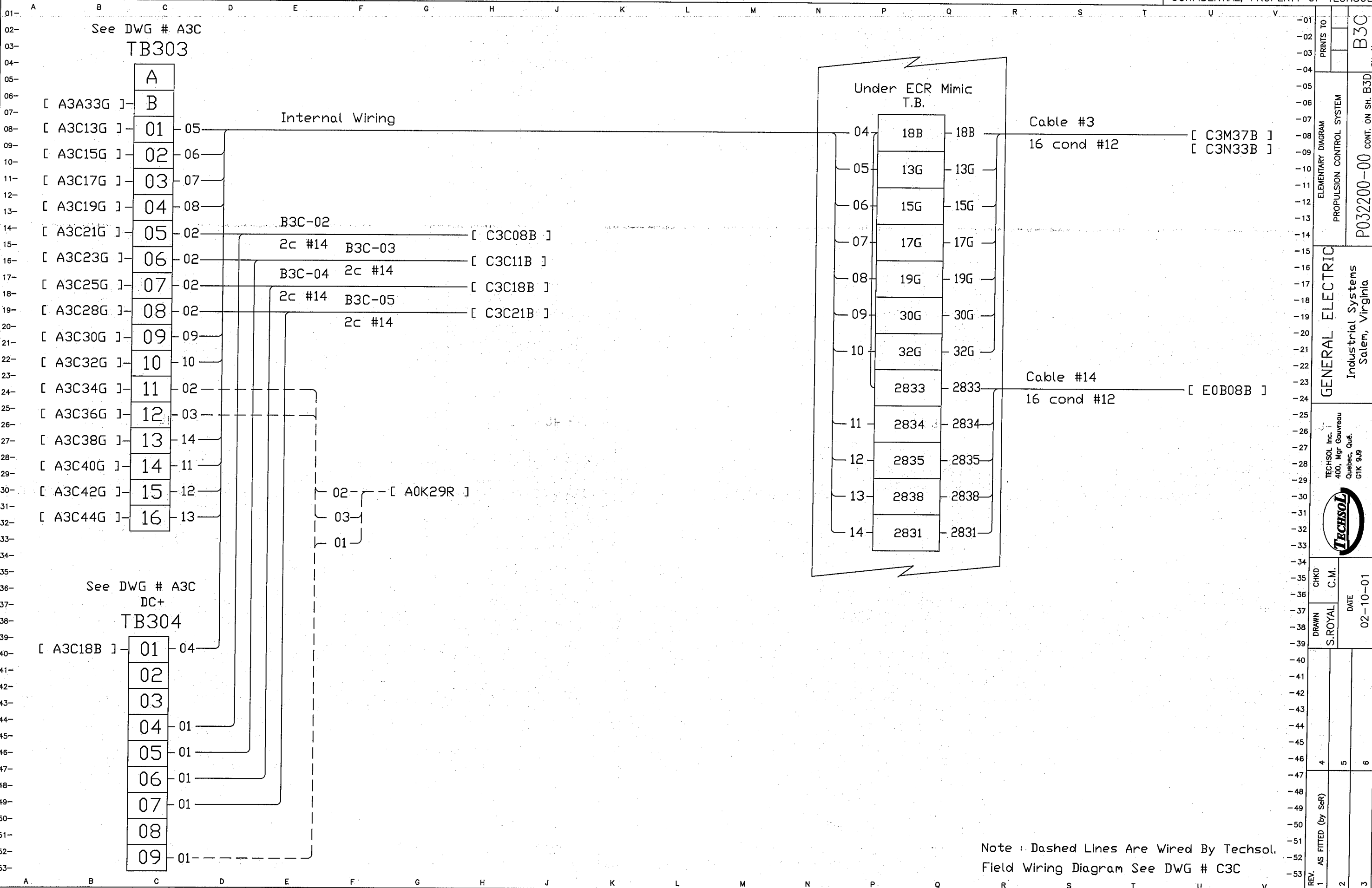


PRINTS TO	B2G	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. B3A
GENERAL ELECTRIC	Industrial Systems	Salem, Virginia
TECHSOL Inc.	400, Mgr. Gauthier	Quebec, Que.
TECHSOL	CHKD	C.M.
DRAWN	S.ROYAL	DATE
1	4	02-10-01
2	5	
3	6	

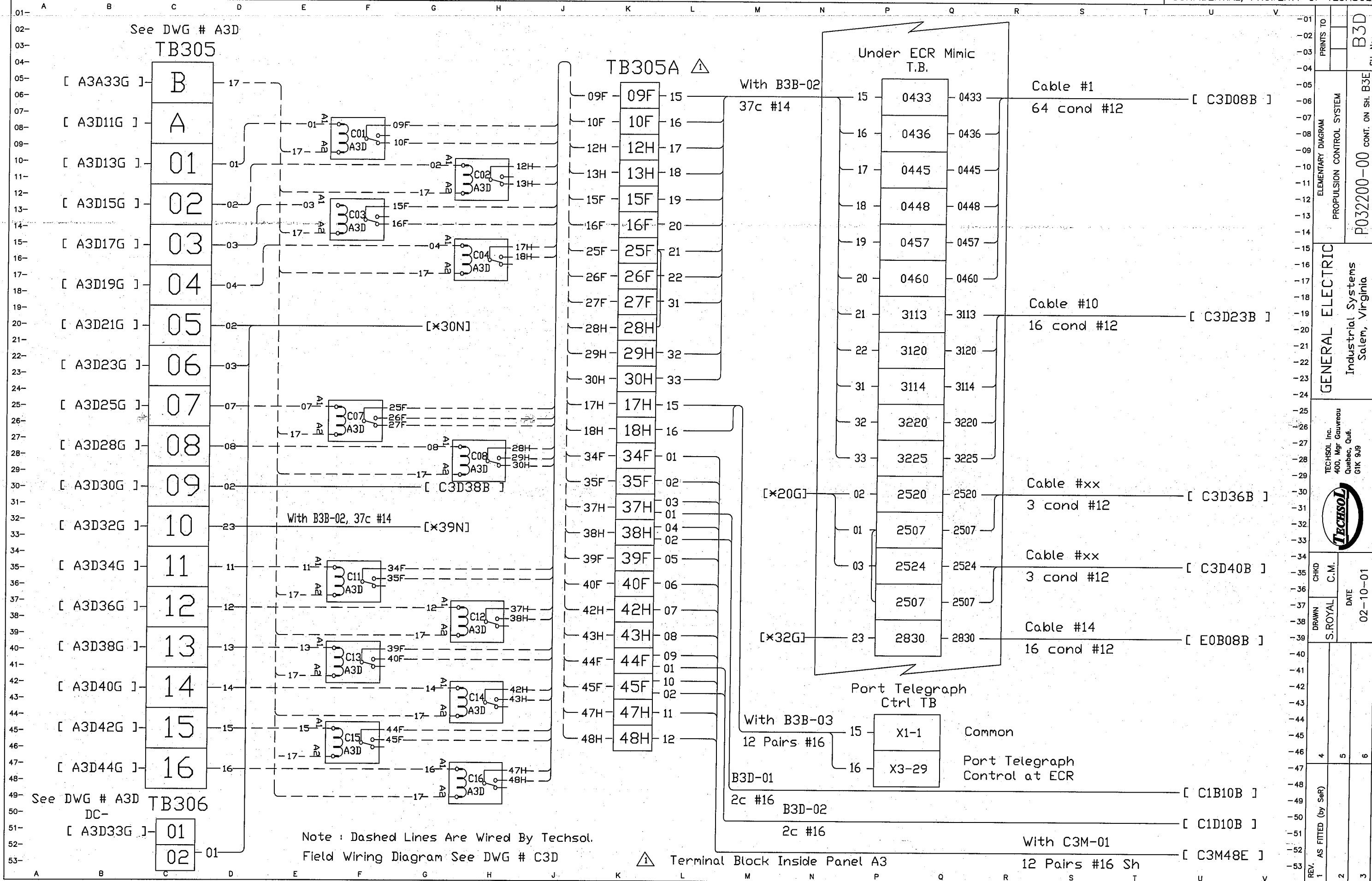


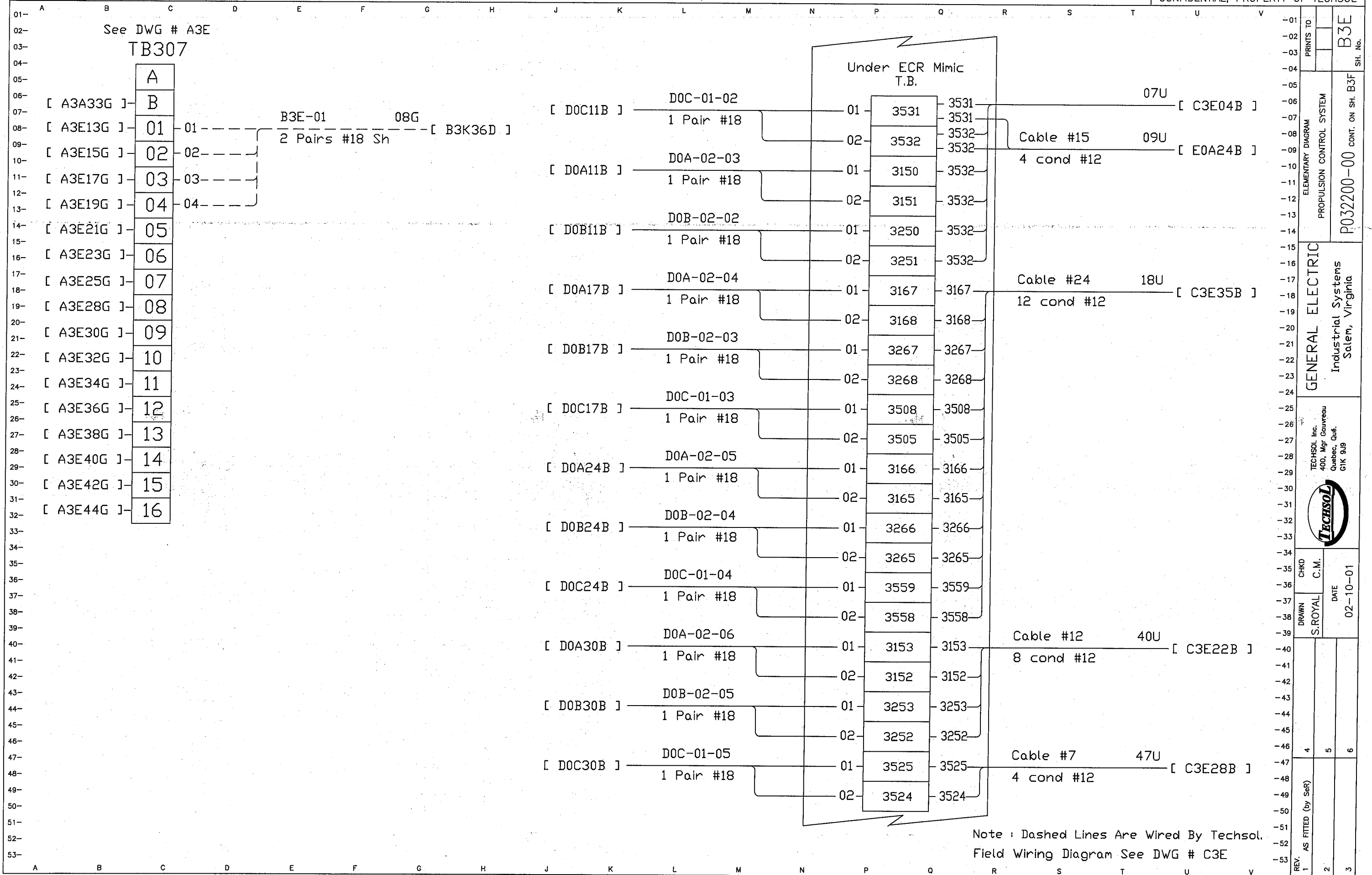
REV.	1	2	3	AS FITTED (by SeR)	4	5	6	DATE	02-10-01	CHKD	C.M.	S.ROYAL	DATE	ELEMENTARY DIAGRAM	PRINTS TO	B3A	SH. No.																
														GENERAL ELECTRIC																			
														Industrial Systems																			
														Salem, Virginia																			
														TECHSOL Inc.																			
														400, Mgr Gauthreau																			
														Quebec, Que.																			
														G1K 909																			
														P032200-00 cont. on SH. B3B																			

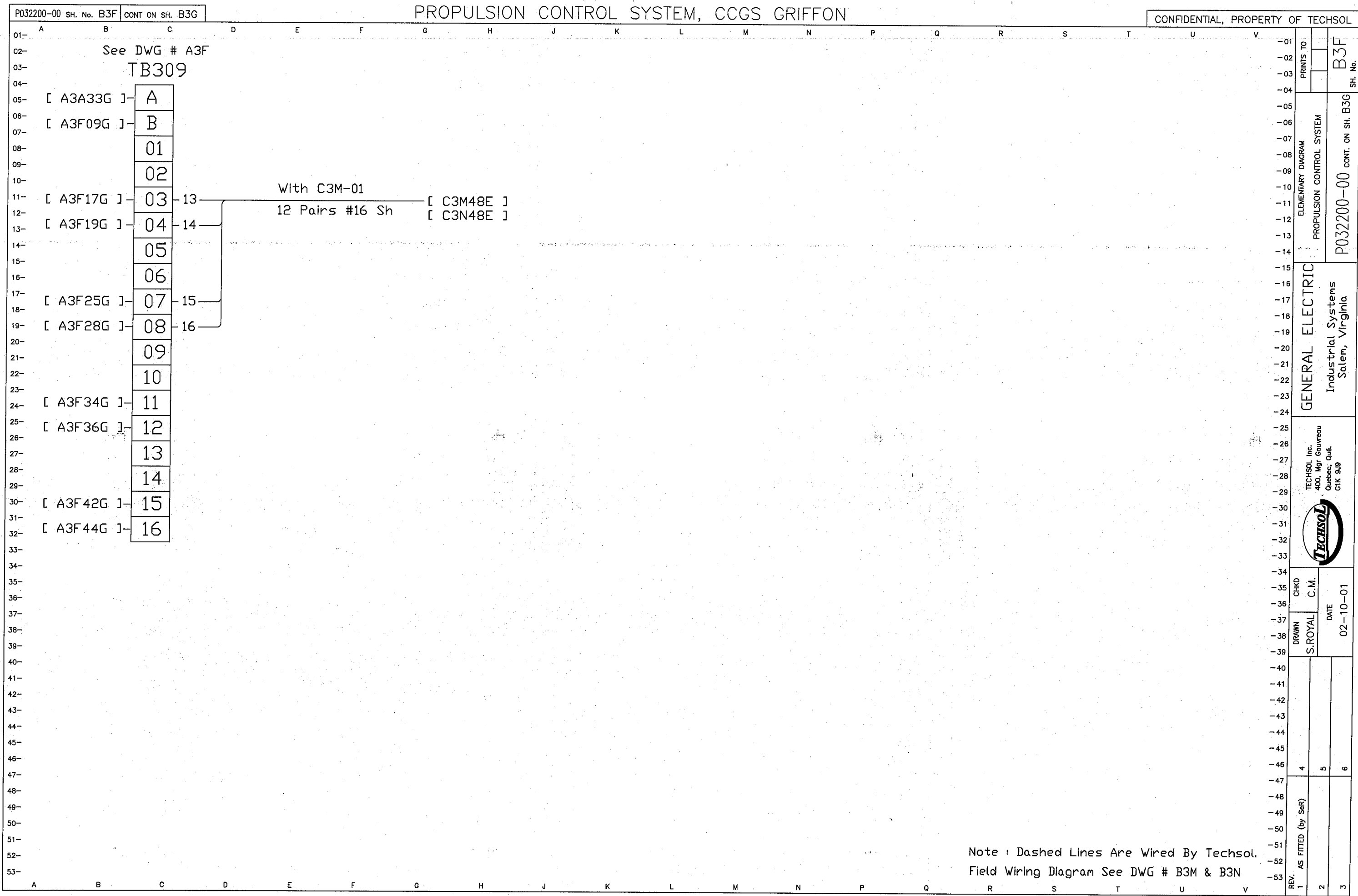


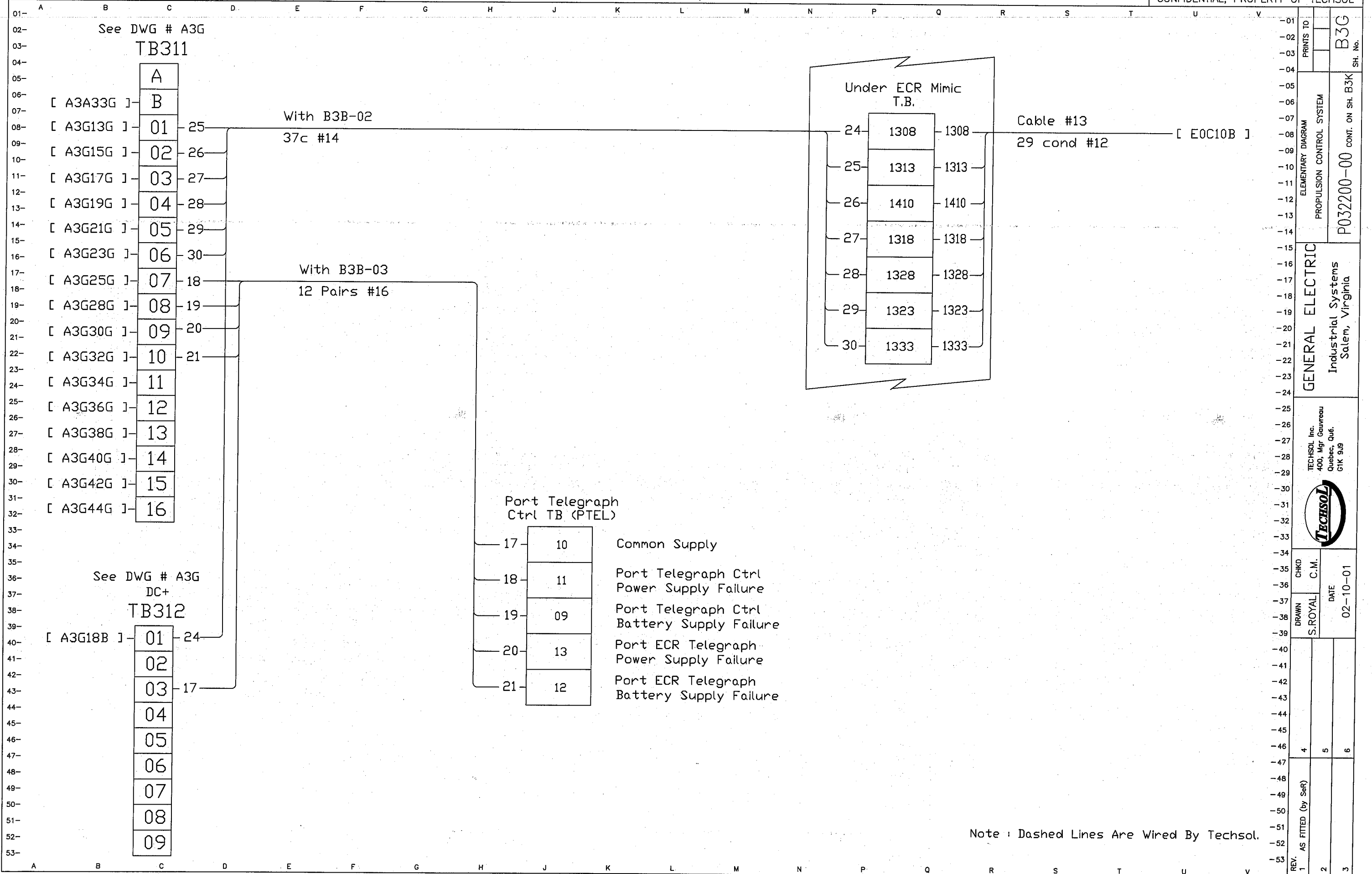


PRINTS TO	B3C	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. B3D
GENERAL ELECTRIC Industrial Systems Salem, Virginia		
TECHSOL Inc. 400, Mgr Gouveau Quebec, Qué. G1K 9J9		
CHKD	C.M.	DATE
DRAWN	S.ROYAL	02-10-01
REV.	1 AS FITTED (by Ser)	2 3
4	5	6

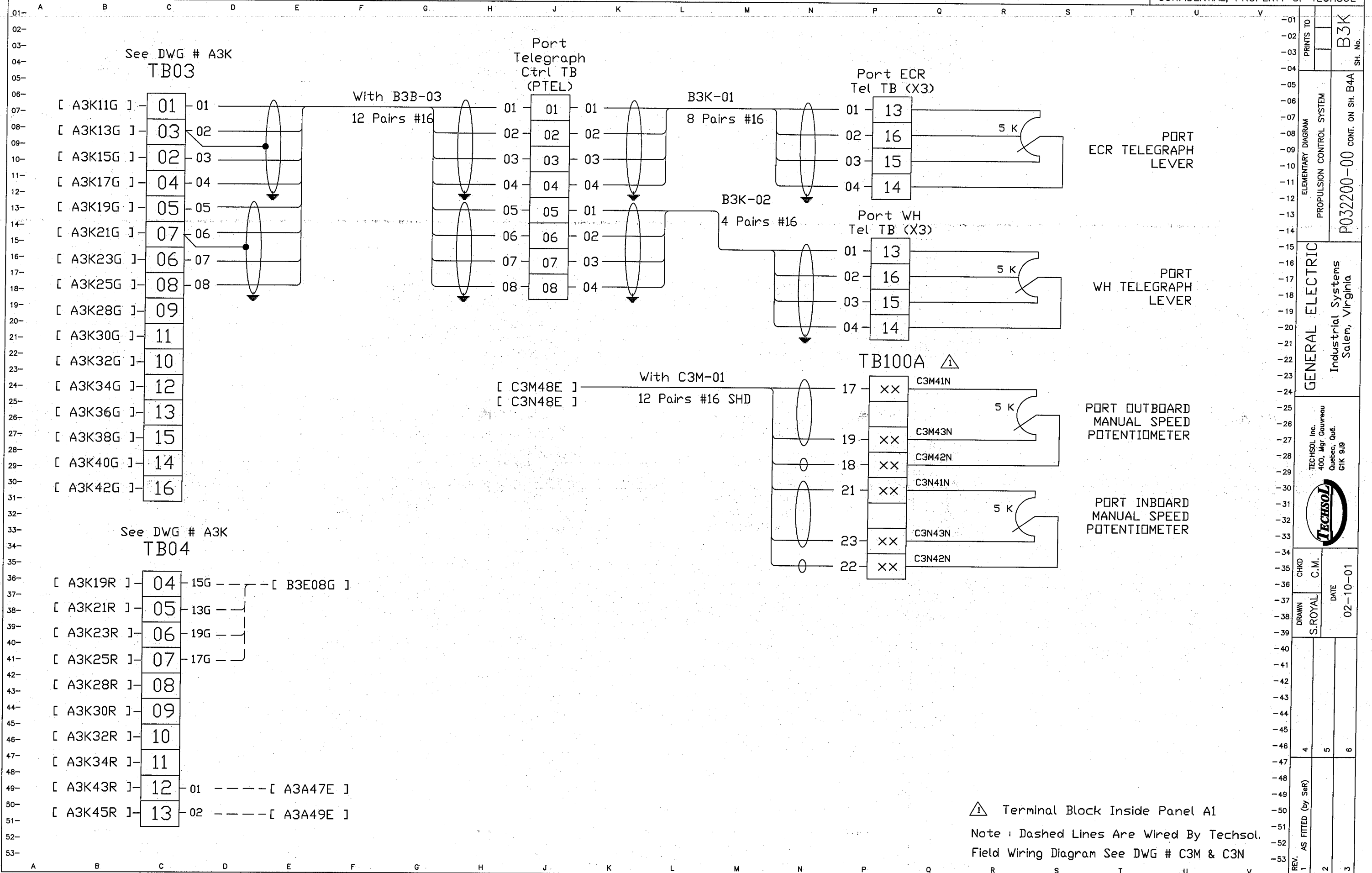




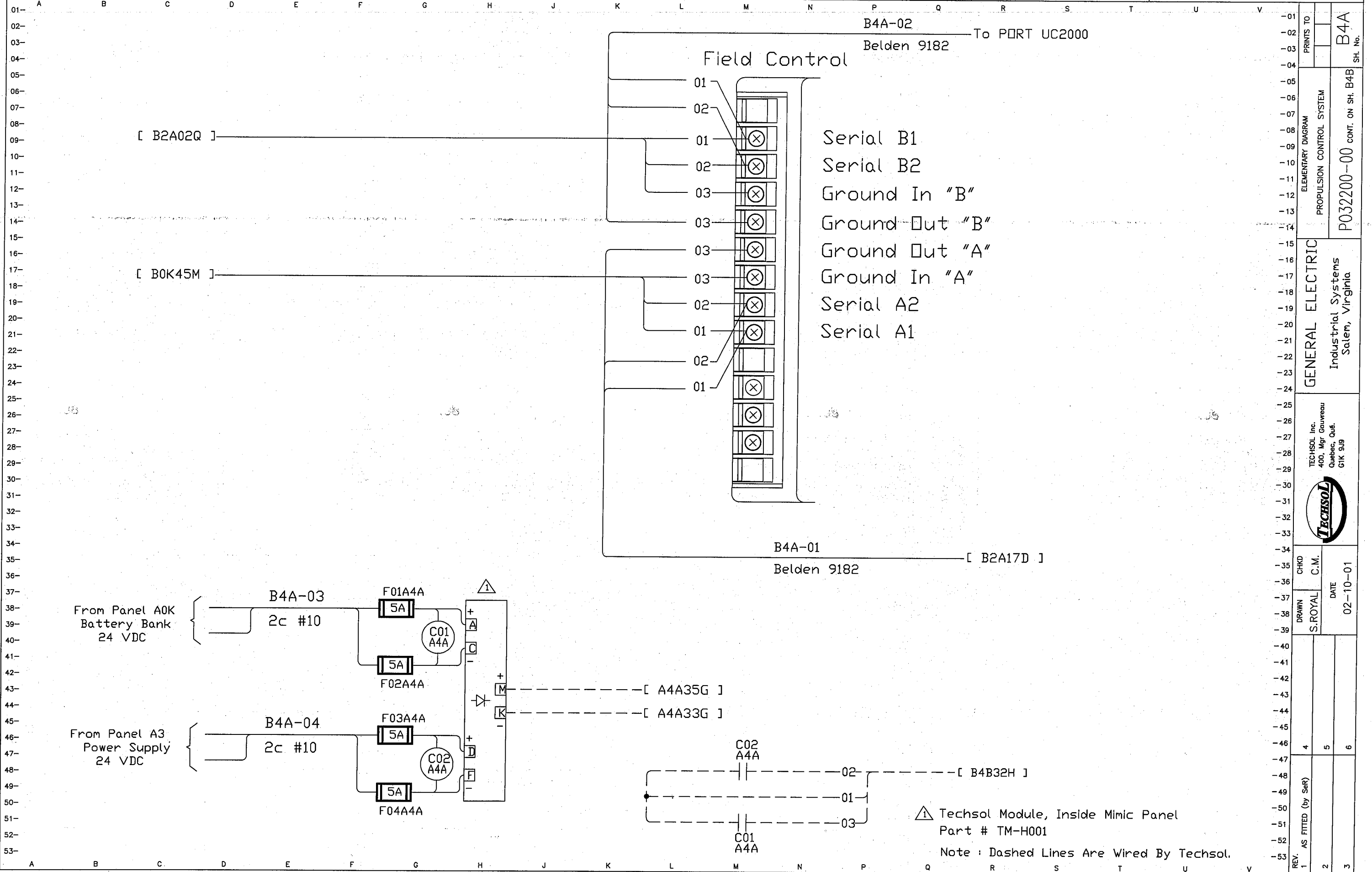




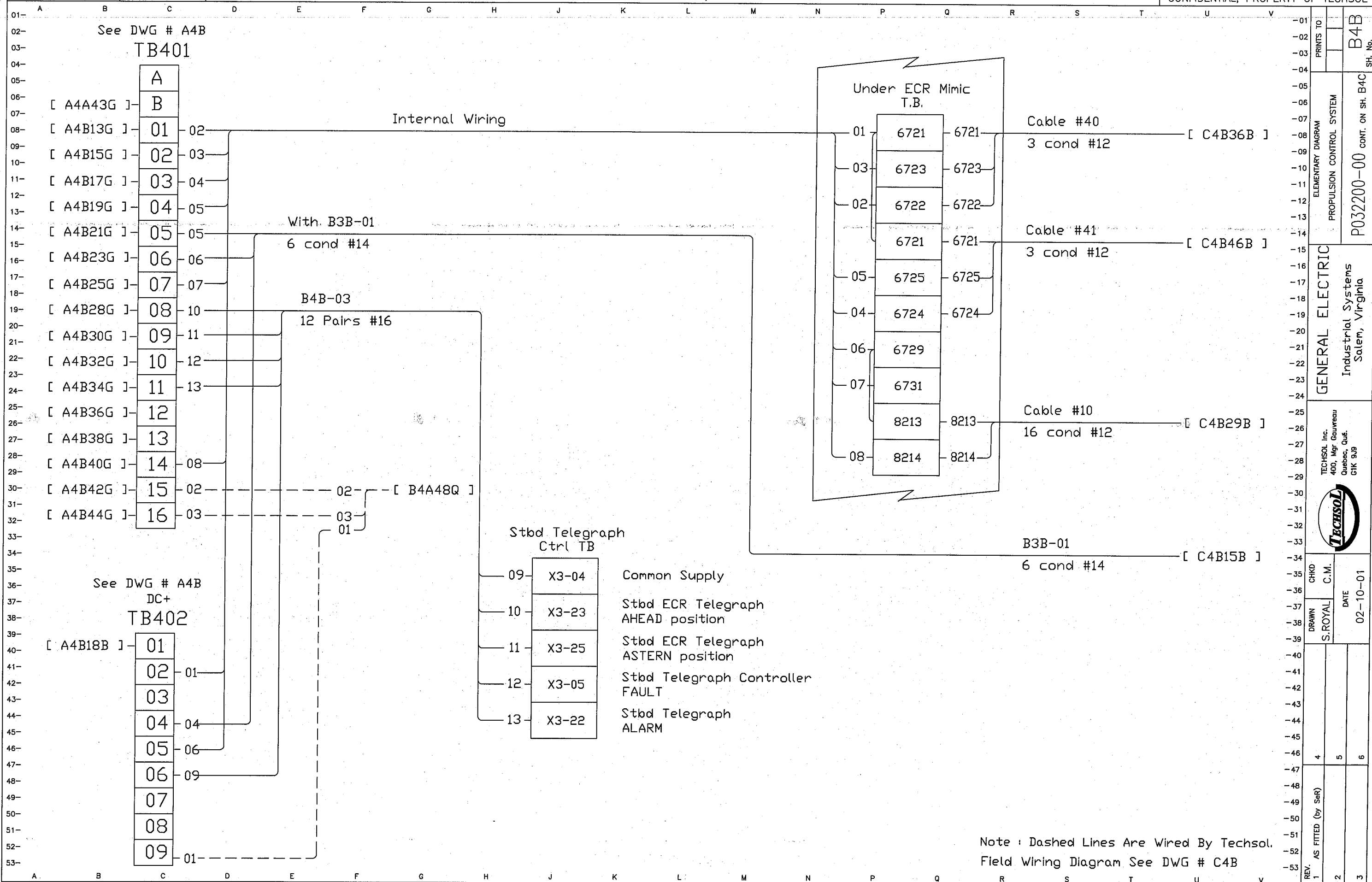
01	PRINTS TO	B3G
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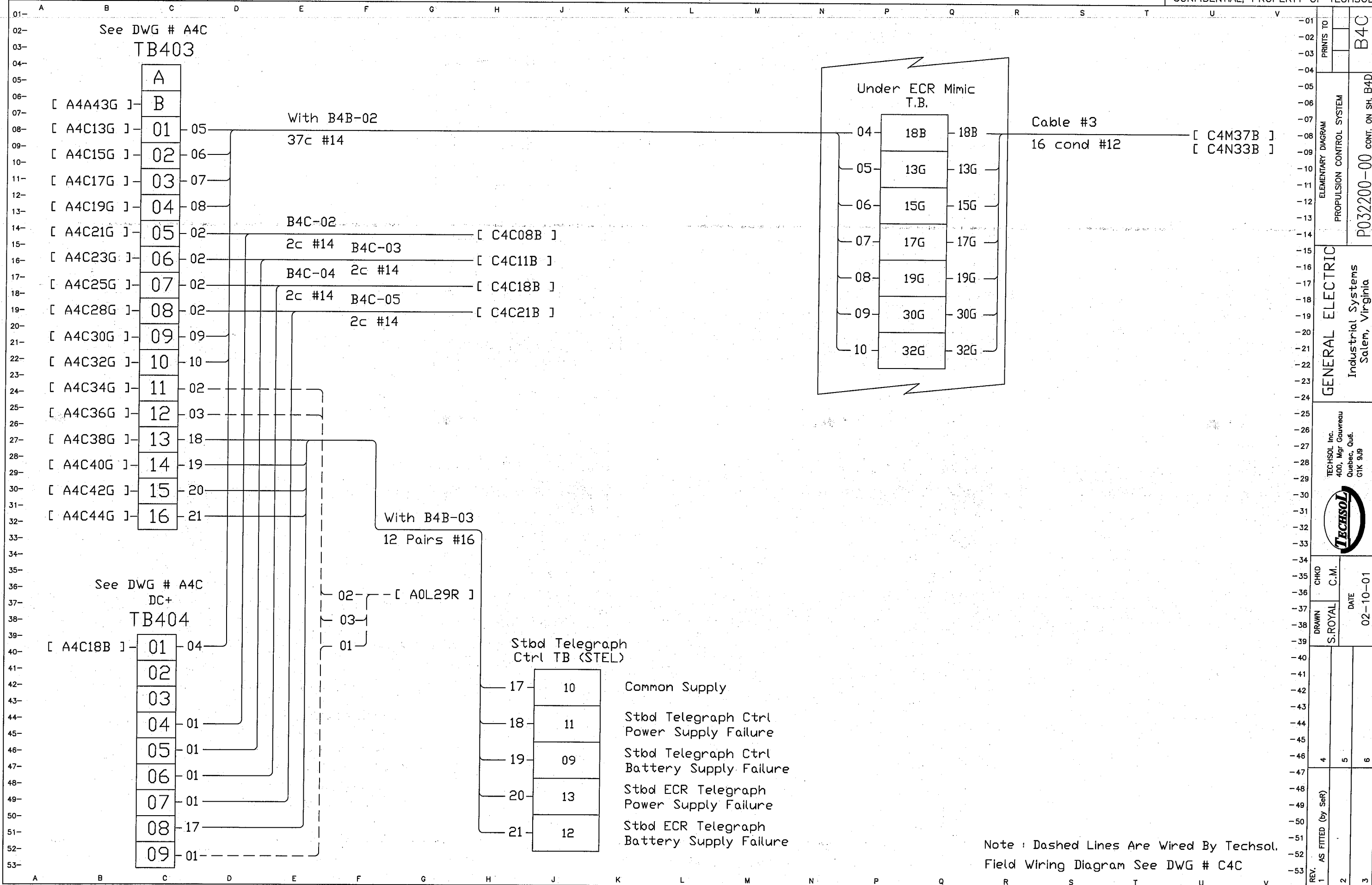


PRINTS TO			SH. No.		
01			B3K		
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REV.	AS FITTED (by Set)	DRAWN	CHKD	C.M.	DATE	PRINTS TO	ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
1		S. ROYAL			02-10-01				B4A
2									
3									





PRINTS TO			
01			
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B4C
SH. No.

P032200-00 CONT. ON SH. B4D

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

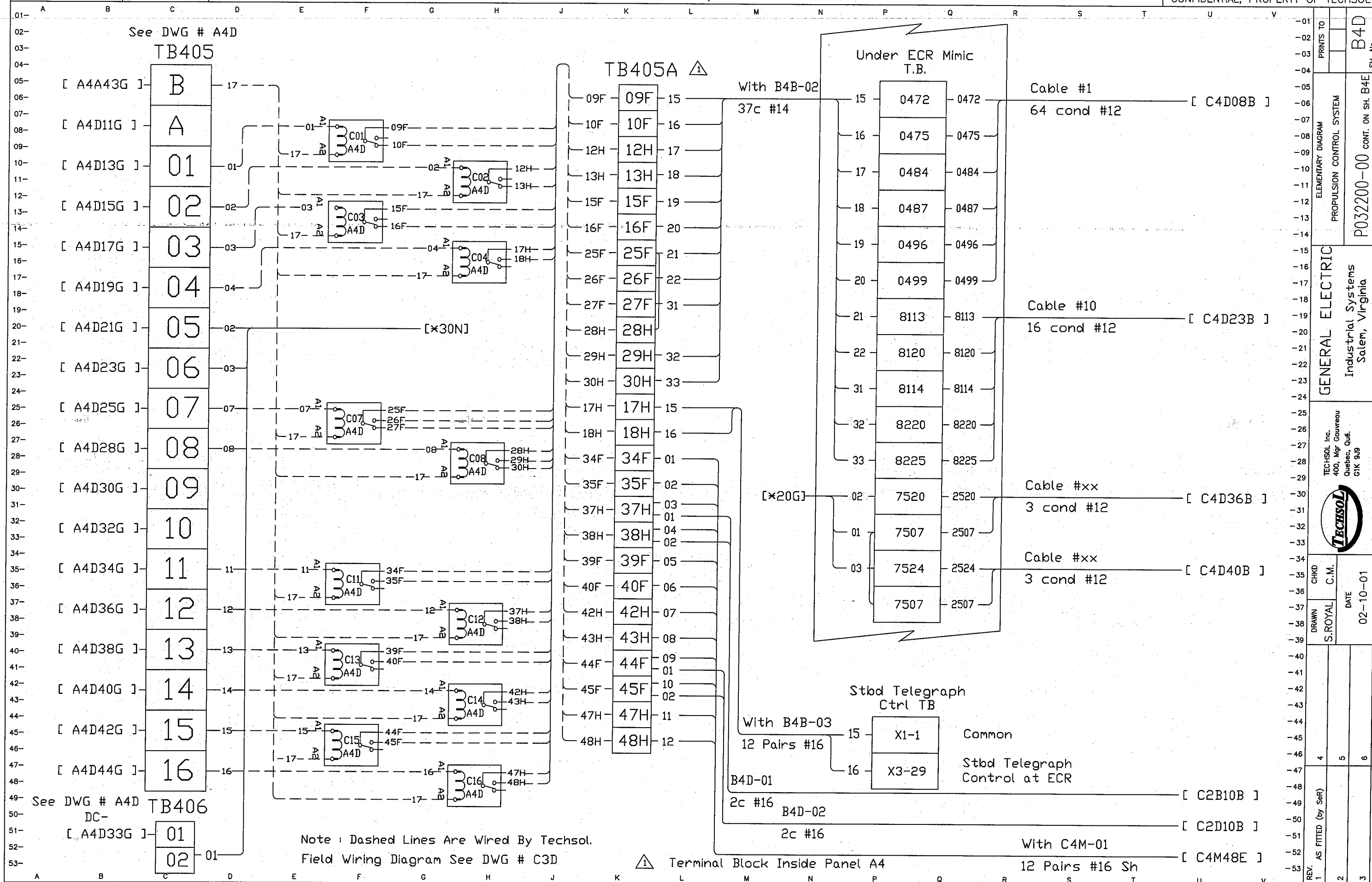
TECHSOL Inc.
400, Mgr Gouveau
Quebec, Que.
G1K 9J9

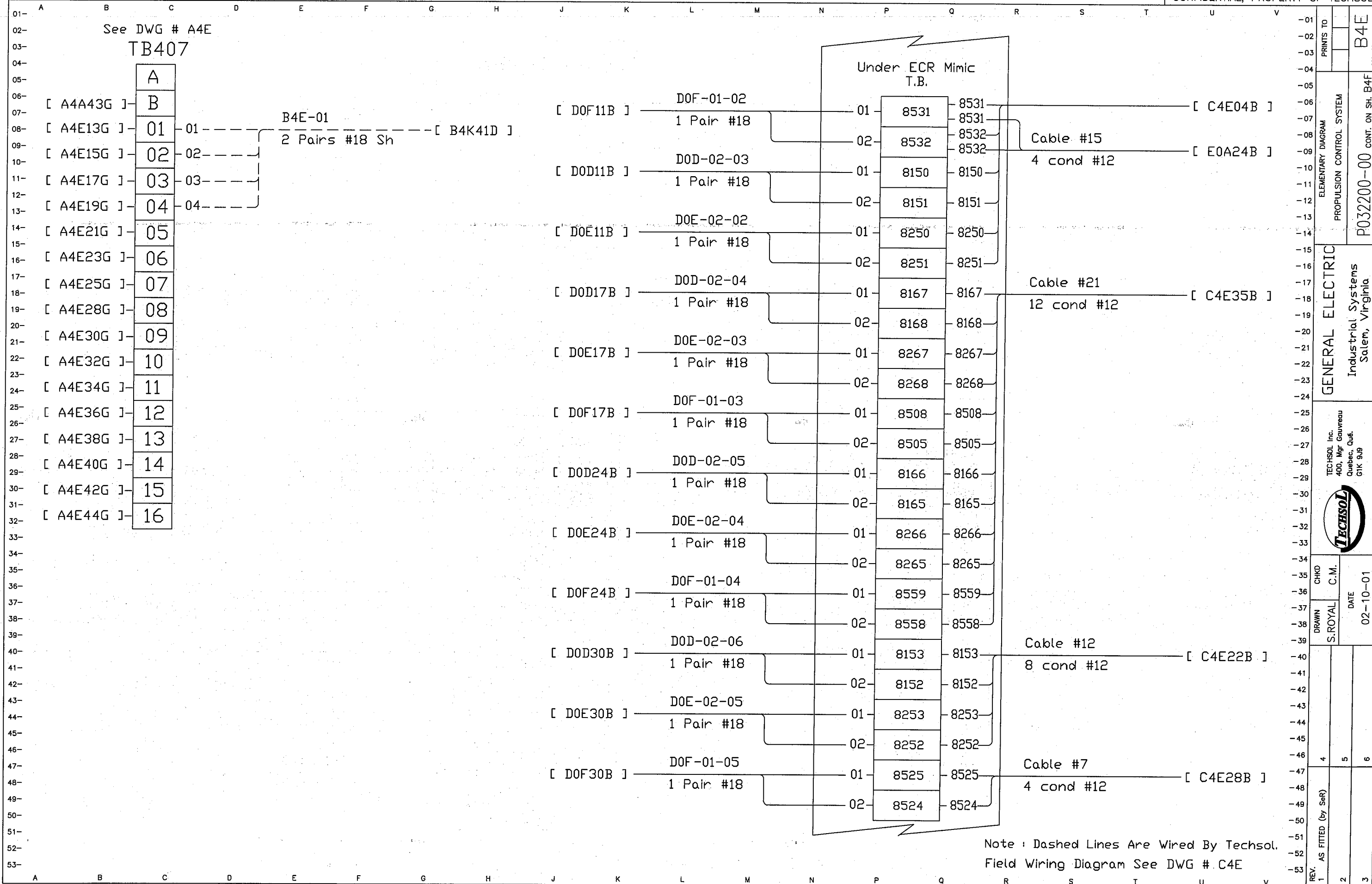


CHKD
C.M.
DATE
02-10-01

DRAWN
S. ROYAL
4
5
6

REV.
1 AS FITTED (by Ser)
2
3





PRINTS TO
B4E
SH. No.

ELEMENTARY DIAGRAM
PROPULSION CONTROL SYSTEM
P032200-00 CONT. ON SH. B4F

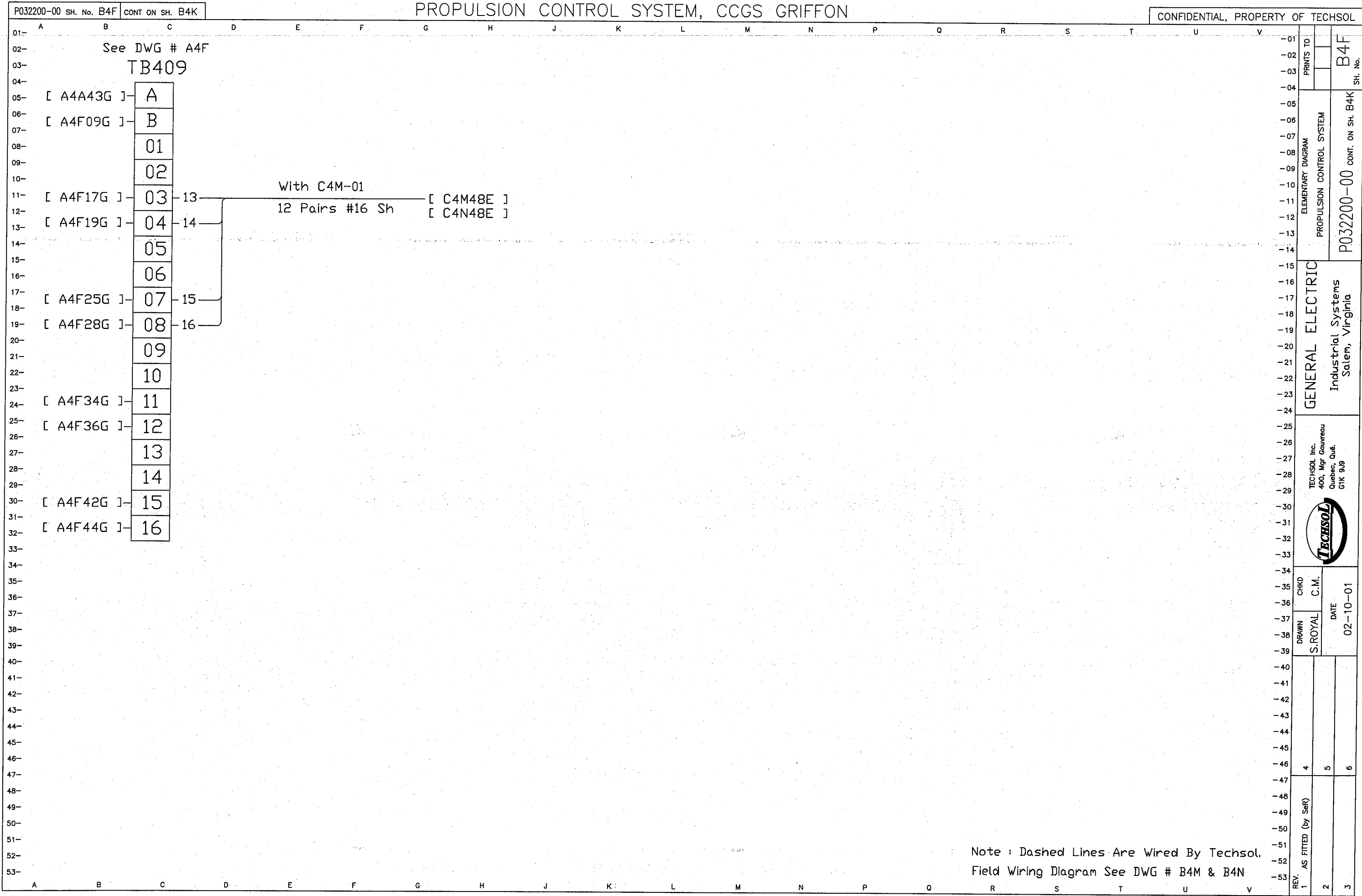
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

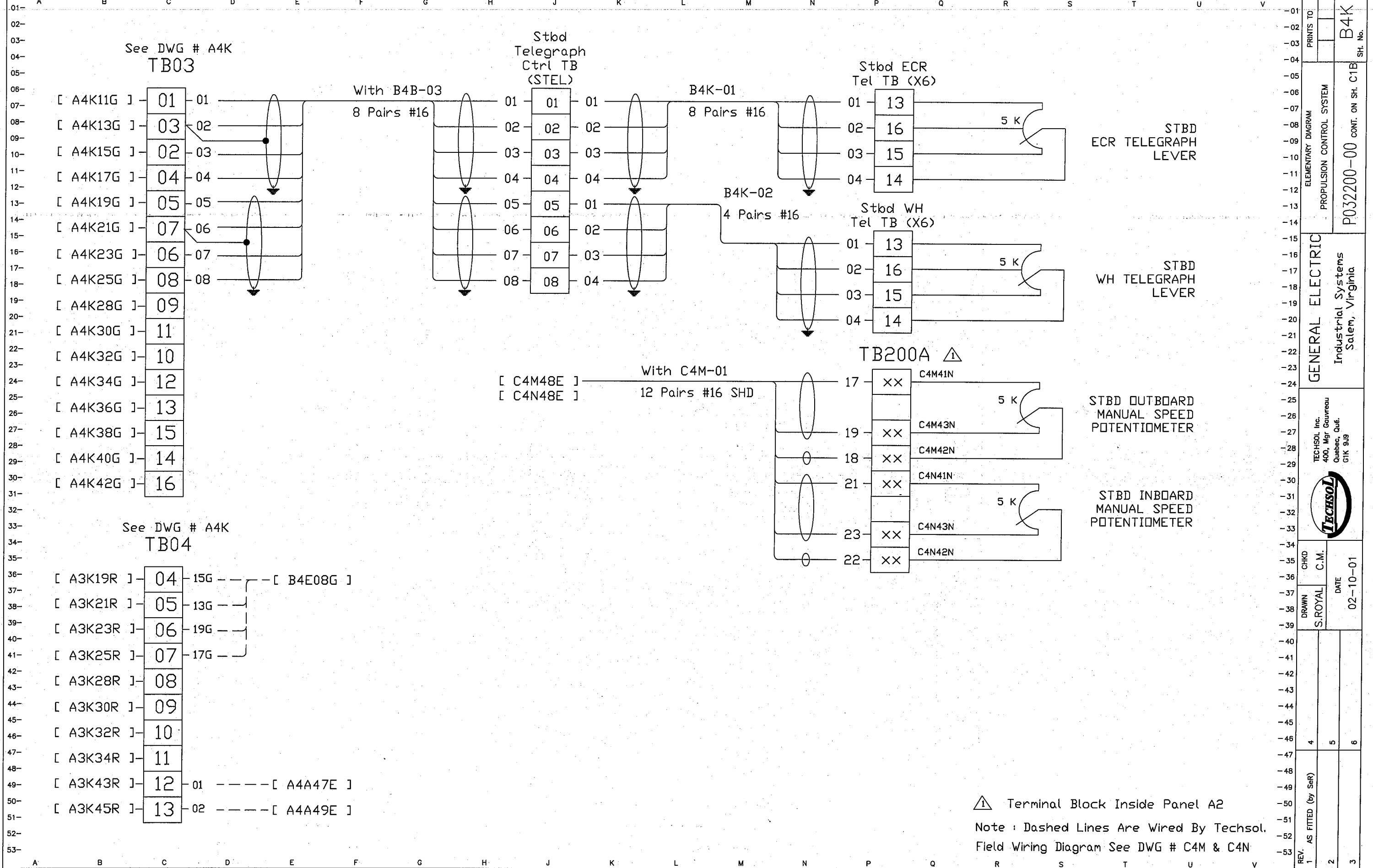
TECHSOL Inc.
400, Mgr Gouveau
Quebec, Que.
G1K 9J9


CHKD
C.M.
DATE
02-10-01

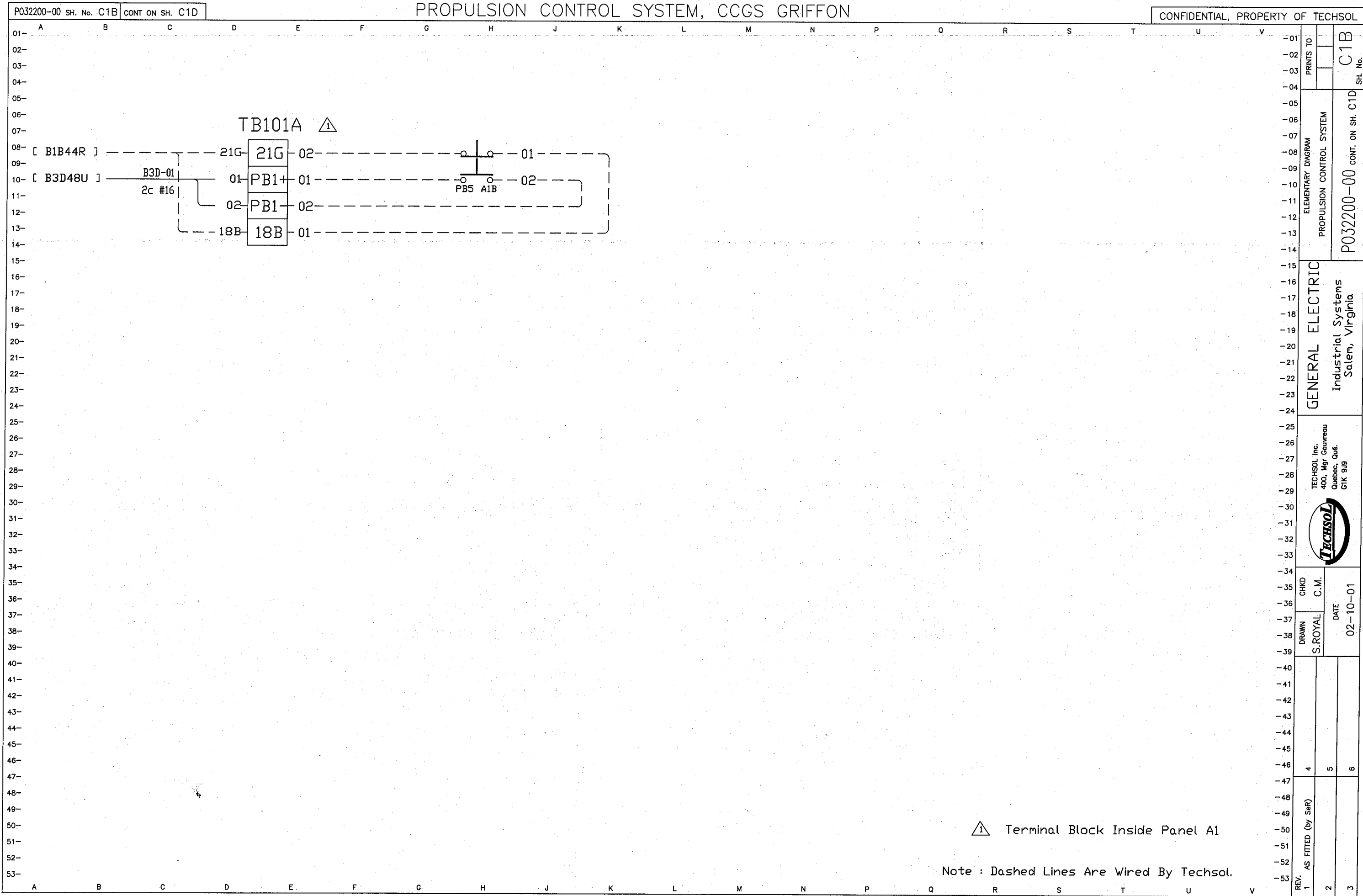
DRAWN
S. ROYAL
DATE
02-10-01

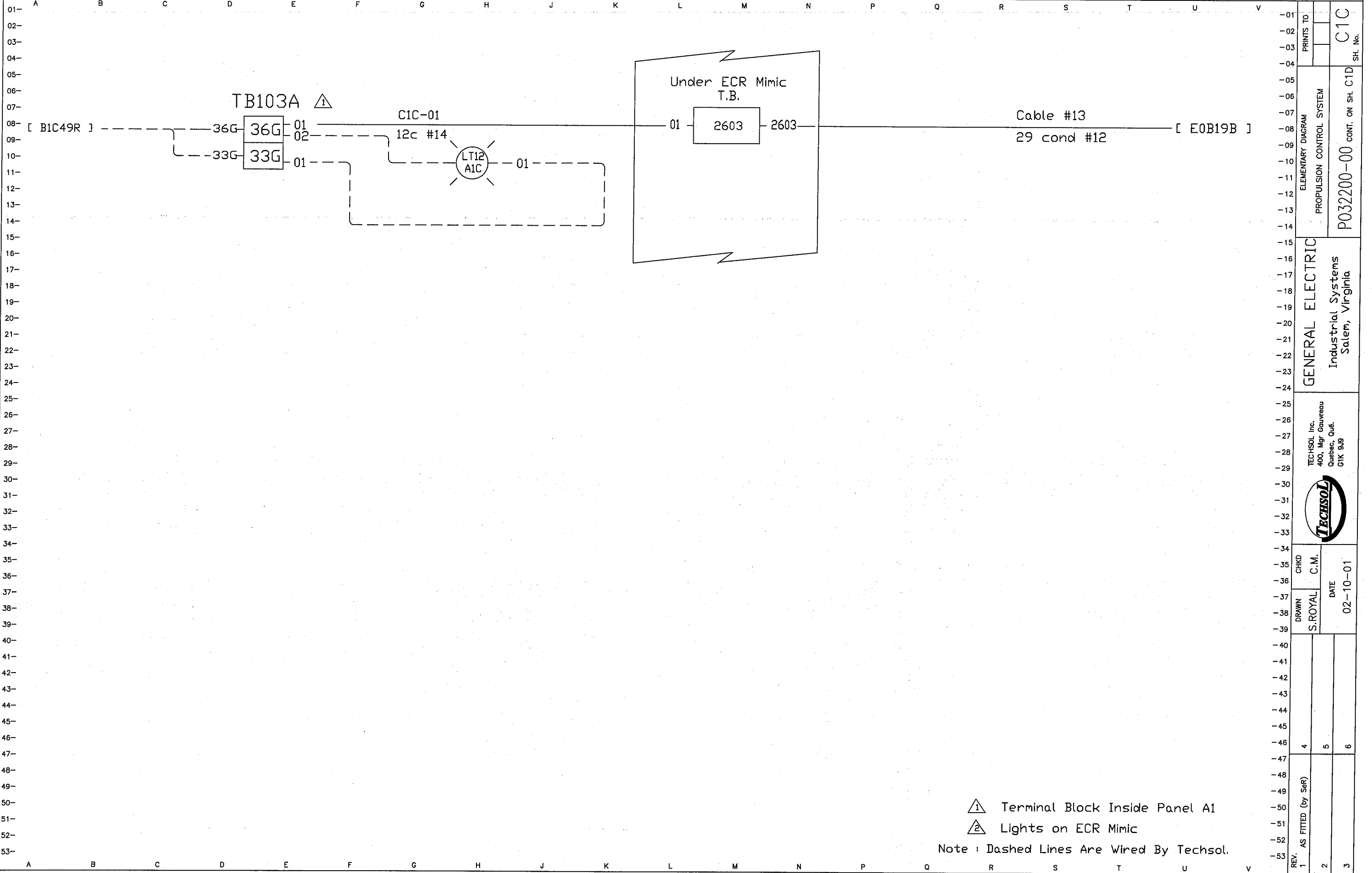
REV. 1 AS FITTED (by Ser) 2 3





REV.		AS FITTED (by Ser)		4	DRAWN S.ROYAL	CHKD C.M.	 TECHSOL Inc. 400, Mgr Gouveau Quebec, Qué. G1K 9J9	GENERAL ELECTRIC Industrial Systems Salem, Virginia	ELEMENTARY DIAGRAM PROPULSION CONTROL SYSTEM	PRINTS TO	
1											
2											
3				6					P032200-00	CONT. ON SH. C1B	B4K SH. No.





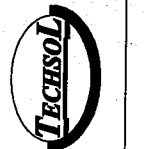
△ Terminal Block Inside Panel A1

△ Lights on ECR Mimic

Note : Dashed Lines Are Wired By Techsol.

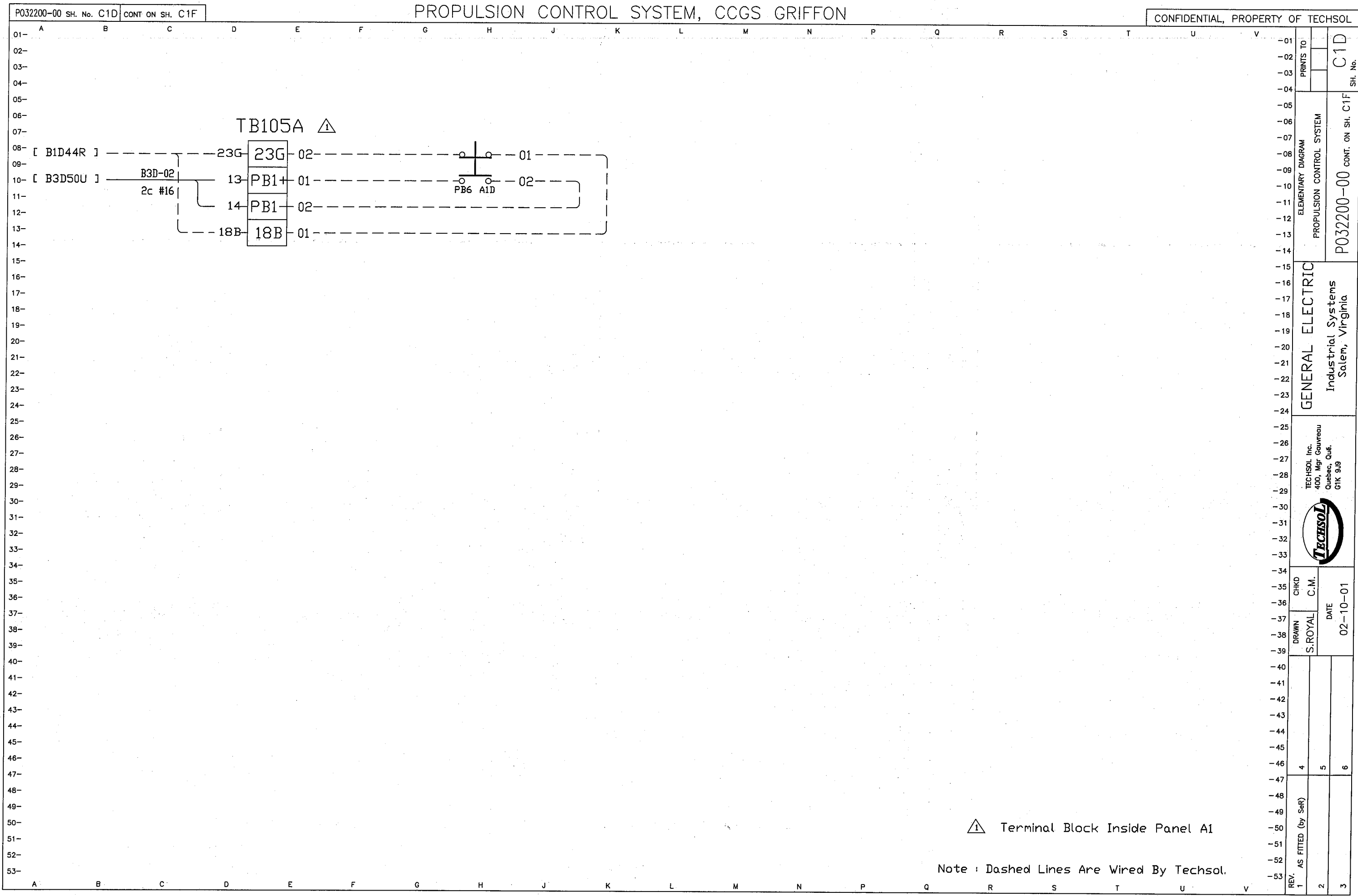
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gouveau
Quebec, Que.
G1K 9J8

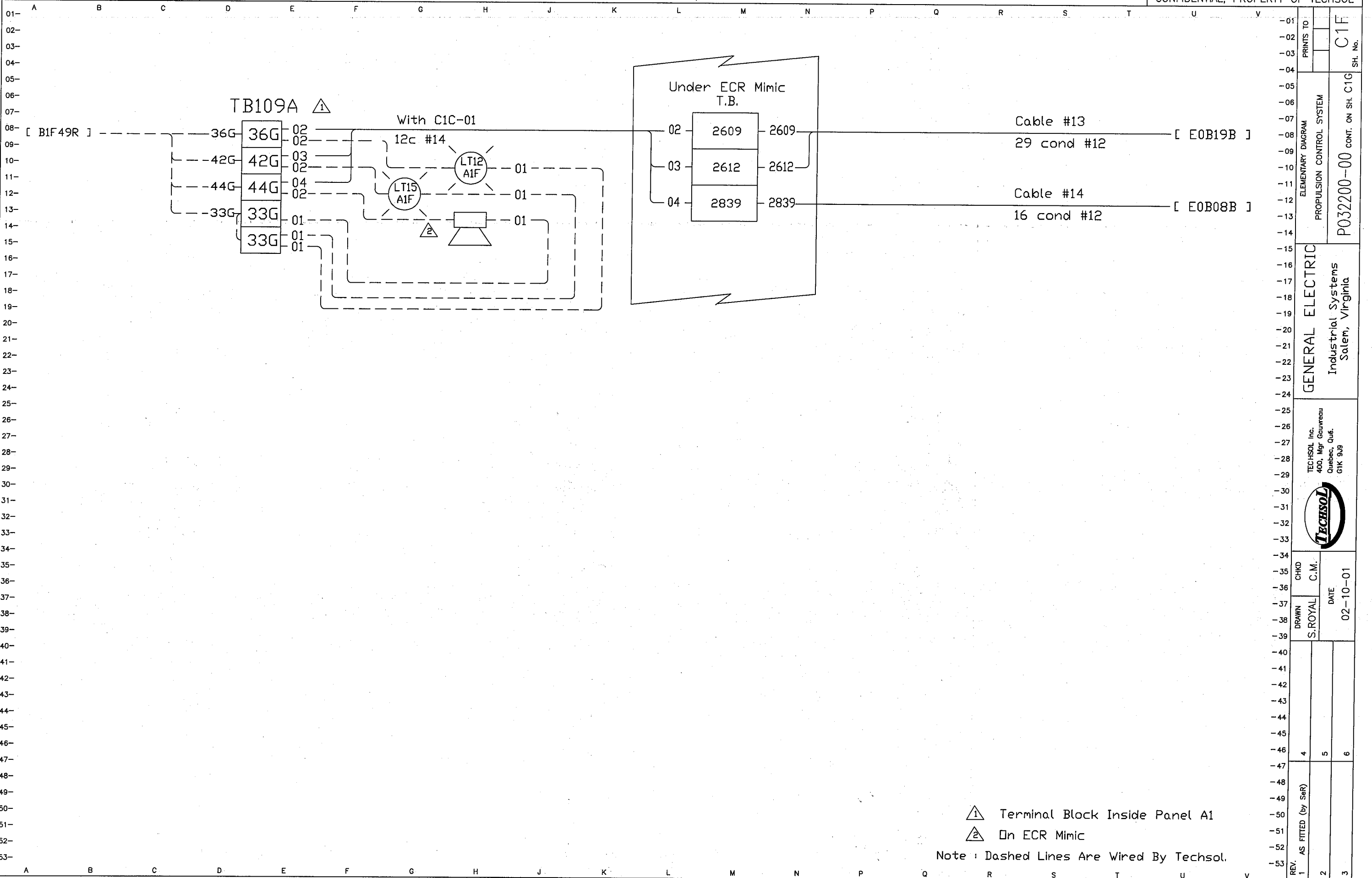


CHKD
C.M.
DATE
02-10-01

REV.	AS FITTED (by Ser)	DATE
1	4	5
2	5	6
3		

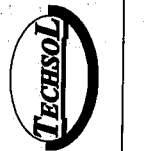


PRINTS TO	C1D	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. C1F
GENERAL ELECTRIC	Industrial Systems	Salem, Virginia
TECHSOL Inc.	400, Mgr Gouvreau	Quebec, Qu.
GTK 9J9		
CHKD	C.M.	DATE
S. ROYAL	02-10-01	
REV.	1 AS FITTED (by Ser)	2
		3
		4
		5
		6



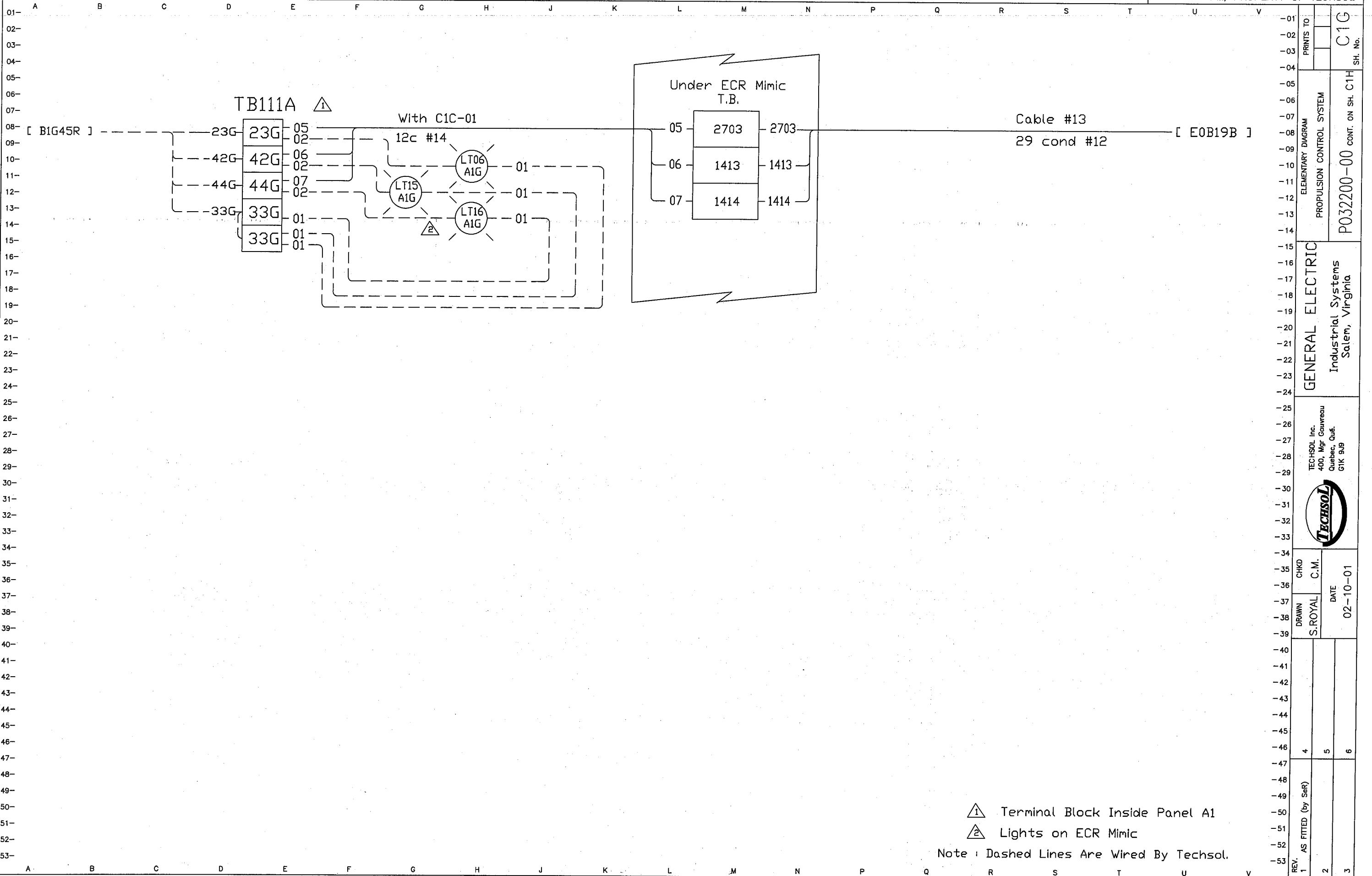
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gouveau
Quebec, Que.
G1K 9J9



CHKD
C.M.
DATE
02-10-01

REV.	AS FITTED (by Ser)	DATE
1	4	5
2	5	6
3		



△ Terminal Block Inside Panel A1

△ Lights on ECR Mimic

Note : Dashed Lines Are Wired By Techsol.

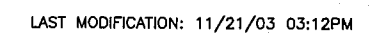
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gauthier
Quebec, Que.
G1K 9J9

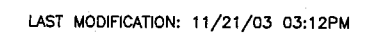


CHKD
C.M.
DATE
02-10-01

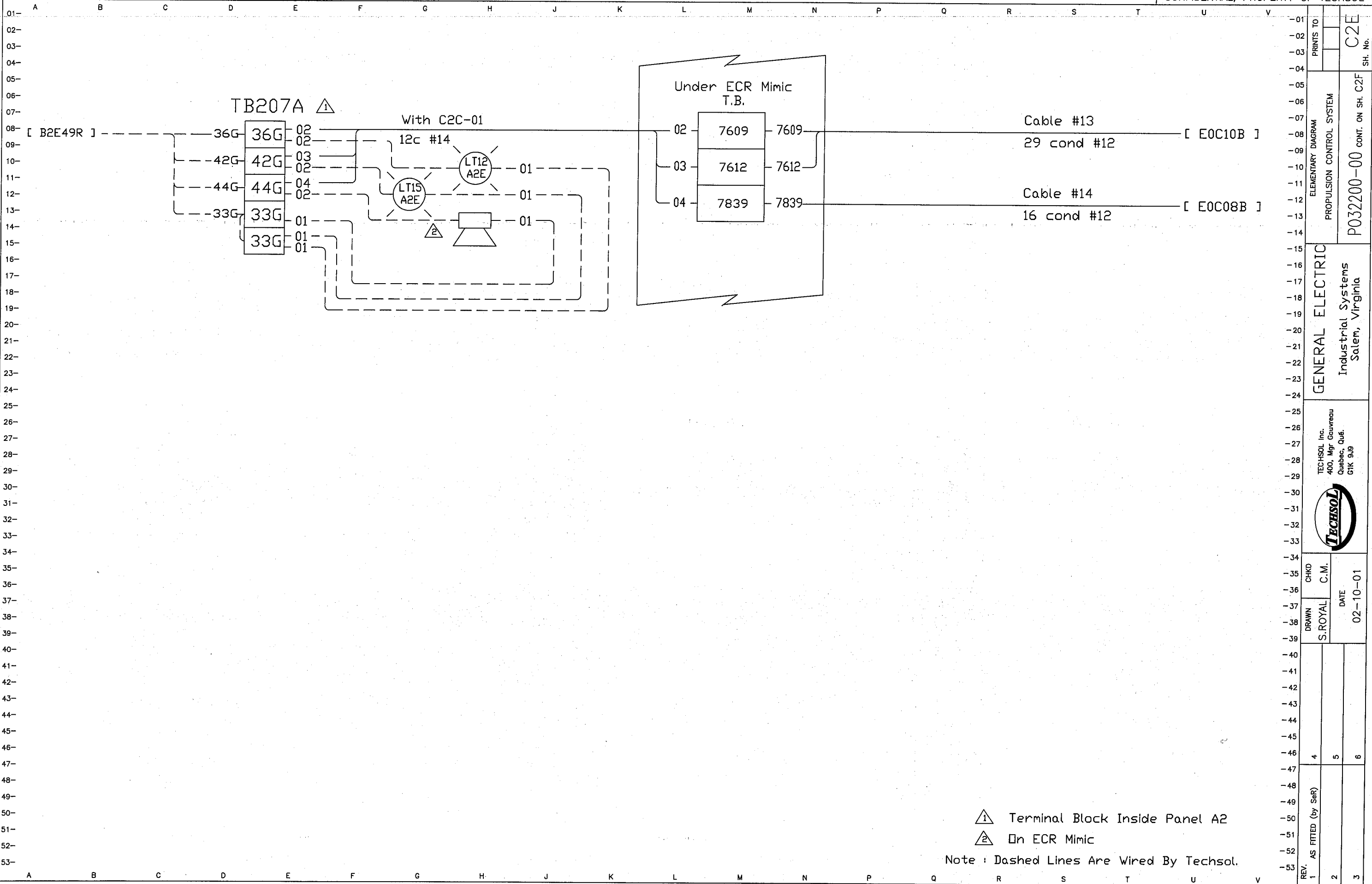
REV.	AS FITTED (by Ser)	DRAWN	CHKD
1		S. ROYAL	C.M.
2			
3			











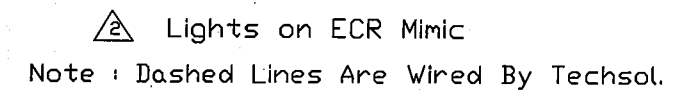
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

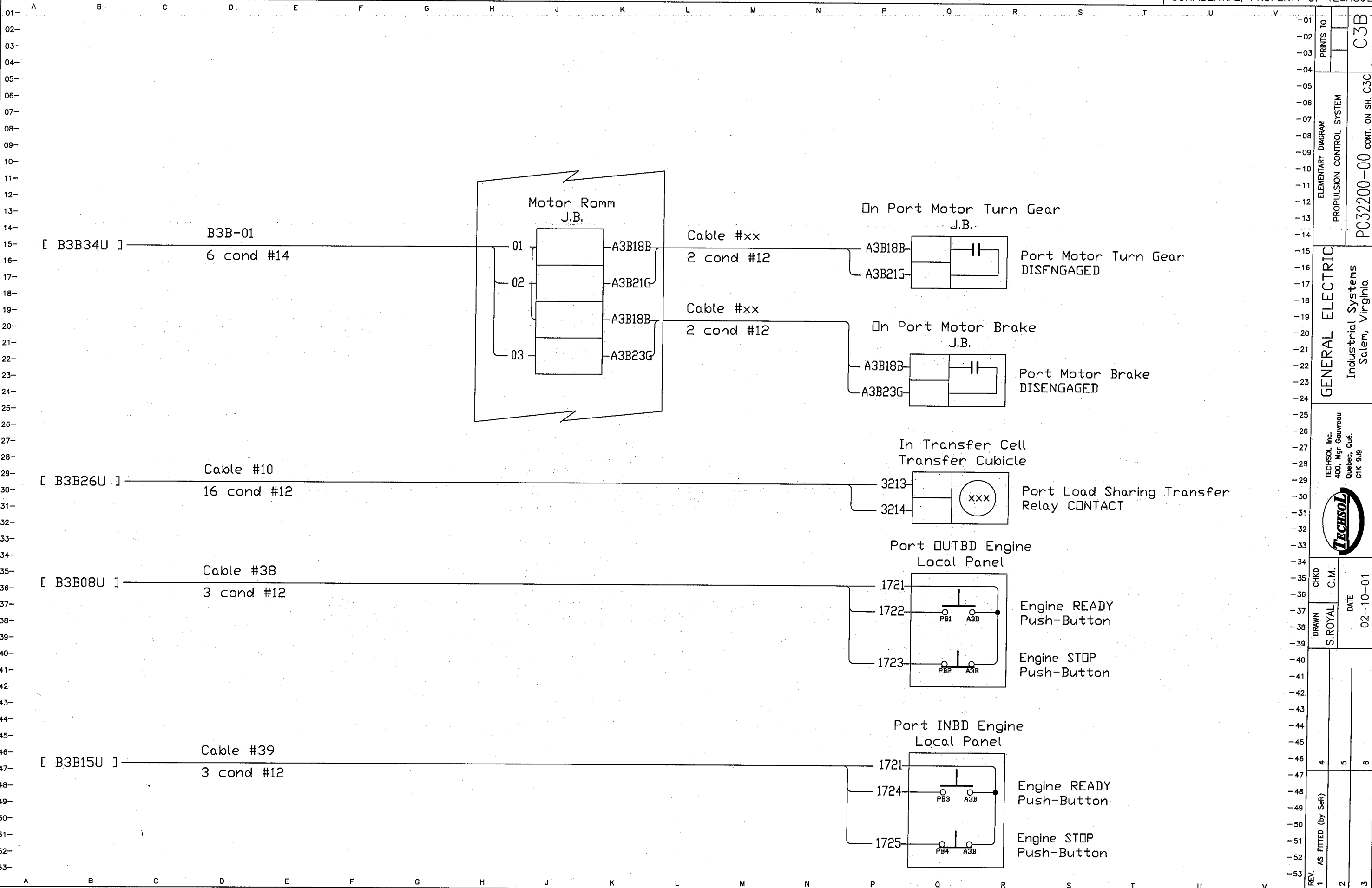
TECHSOL Inc.
400, Mgr Gouveau
Quebec, Que.
G1K 9J9



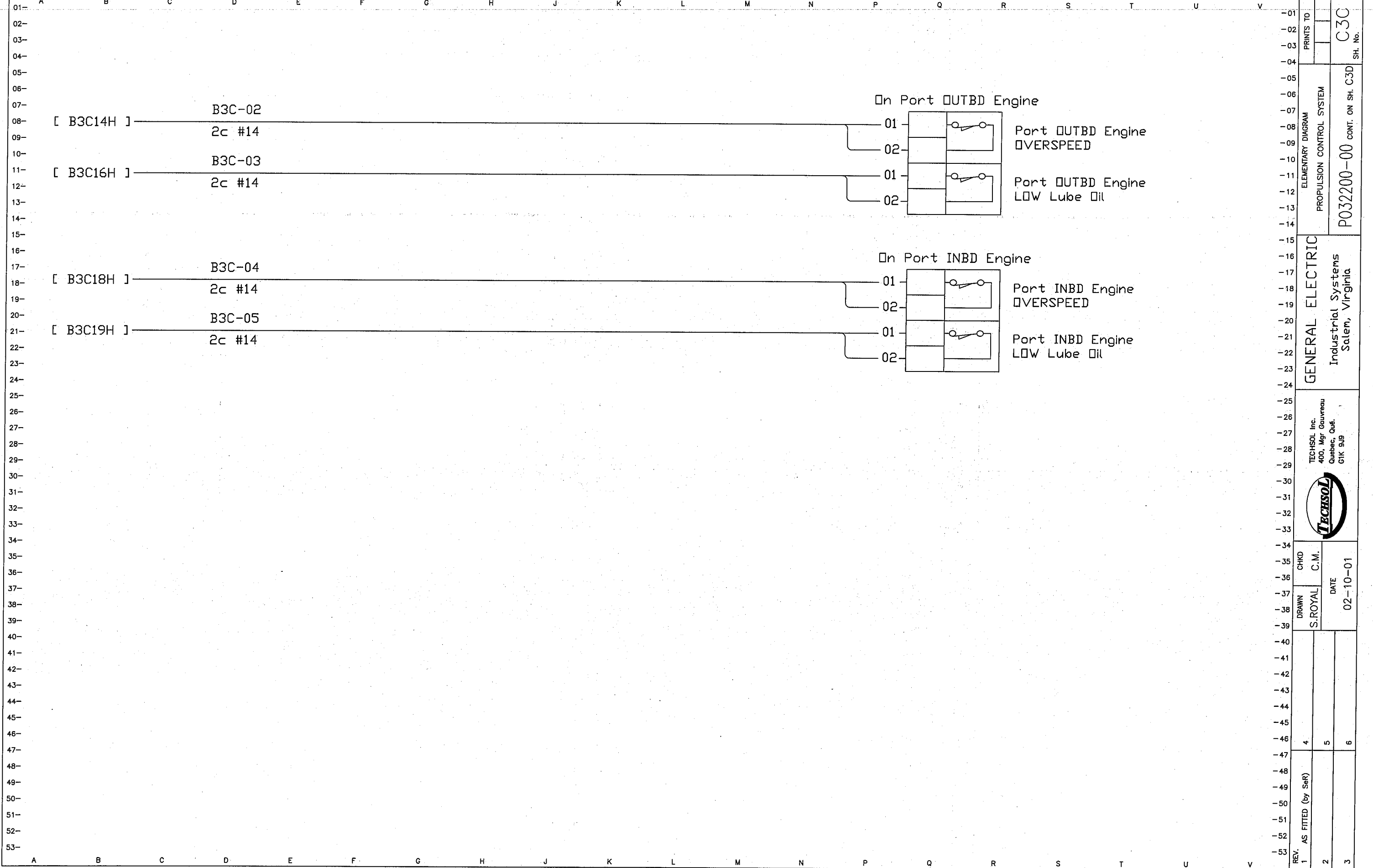
CHKD
C.M.
DATE
02-10-01


REV.	AS FITTED (by Ser)	1	2	3
1				
2				
3				

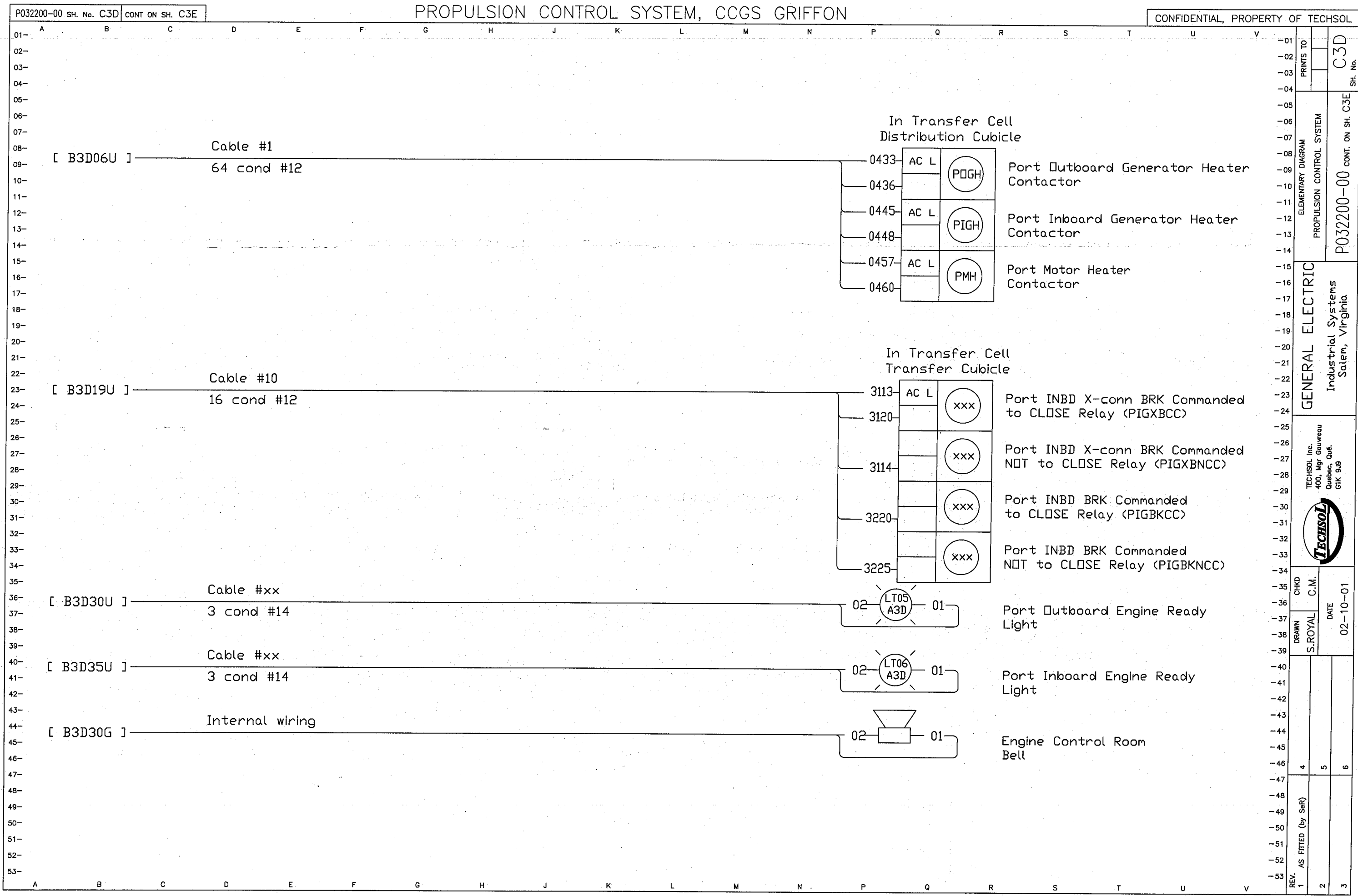


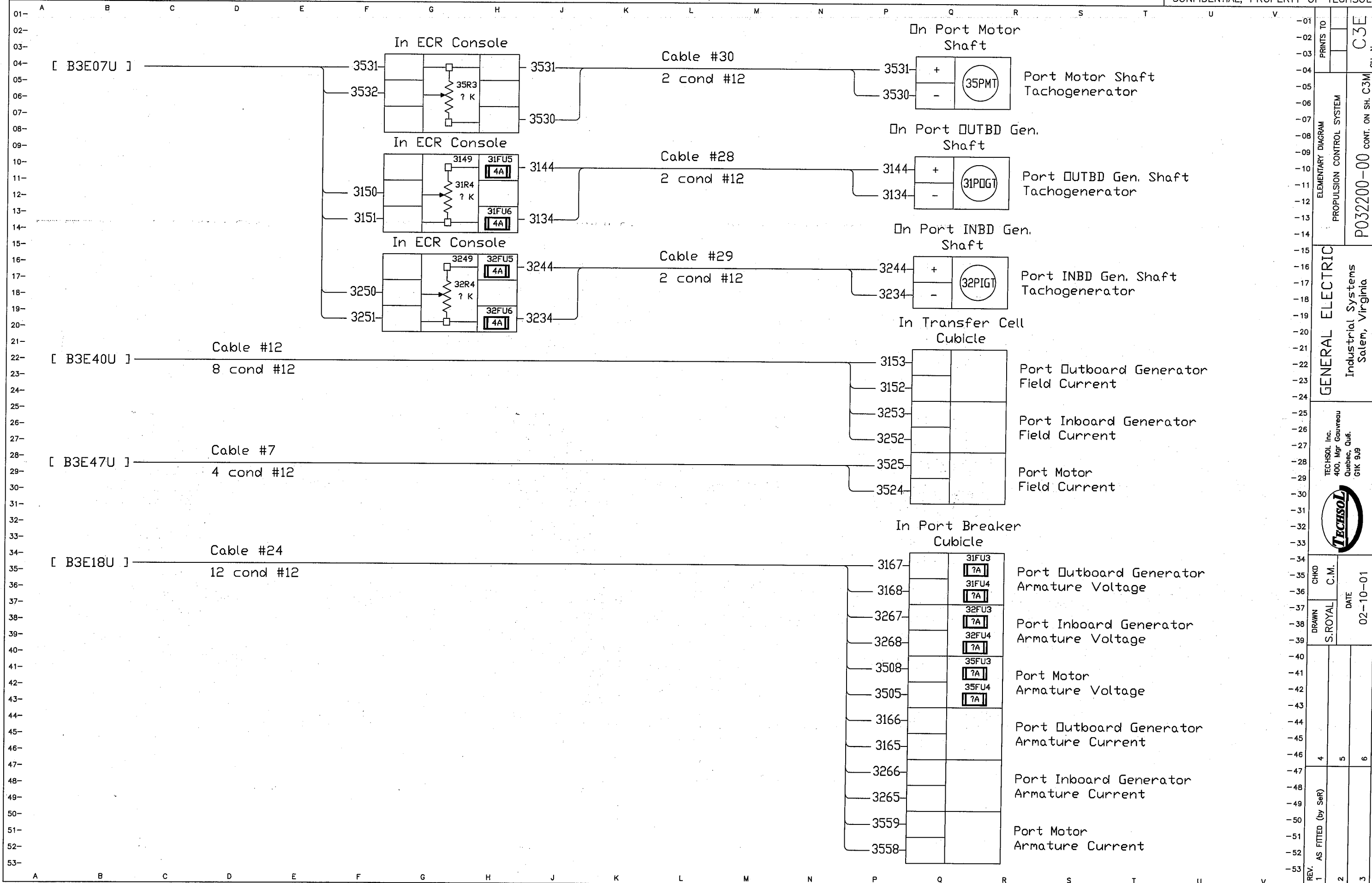


PRINTS TO	C3B	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. C3C
GENERAL ELECTRIC	Industrial Systems	Salem, Virginia
TECHSOL Inc.	400, Mgr Gauthier	Quebec, Que.
CHKD	C.M.	DATE
DRAWN	S.ROYAL	02-10-01
REV. 1	AS FITTED (by Ser)	4
2		5
3		6



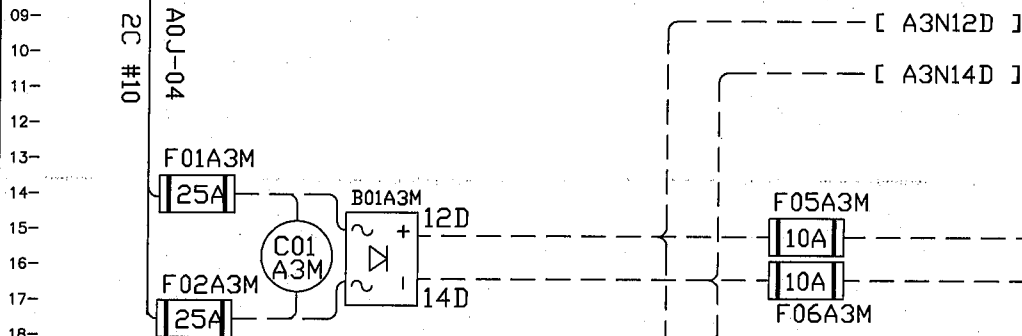
PRINTS TO	C3C	SH. No.
ELEMENTARY DIAGRAM		
PROPULSION CONTROL SYSTEM		
P032200-00 CONT. ON SH. C3D		
GENERAL ELECTRIC		
Industrial Systems Salem, Virginia		
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9		
		
CHKD	C.M.	DATE
DRAWN	S.ROYAL	02-10-01
REV.	1 AS FITTED (by Ser)	2
		3
		4
		5
		6



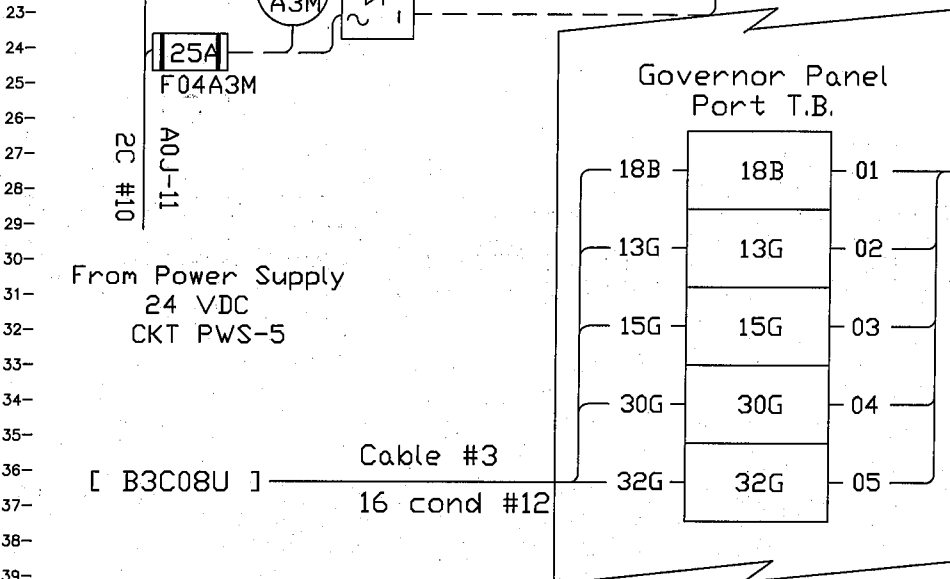


See DWG # A3M
DC 402-01-IP00 Speed Controller StG40-01 Actuator

From Battery Bank
24 VDC
CKT BATT-5



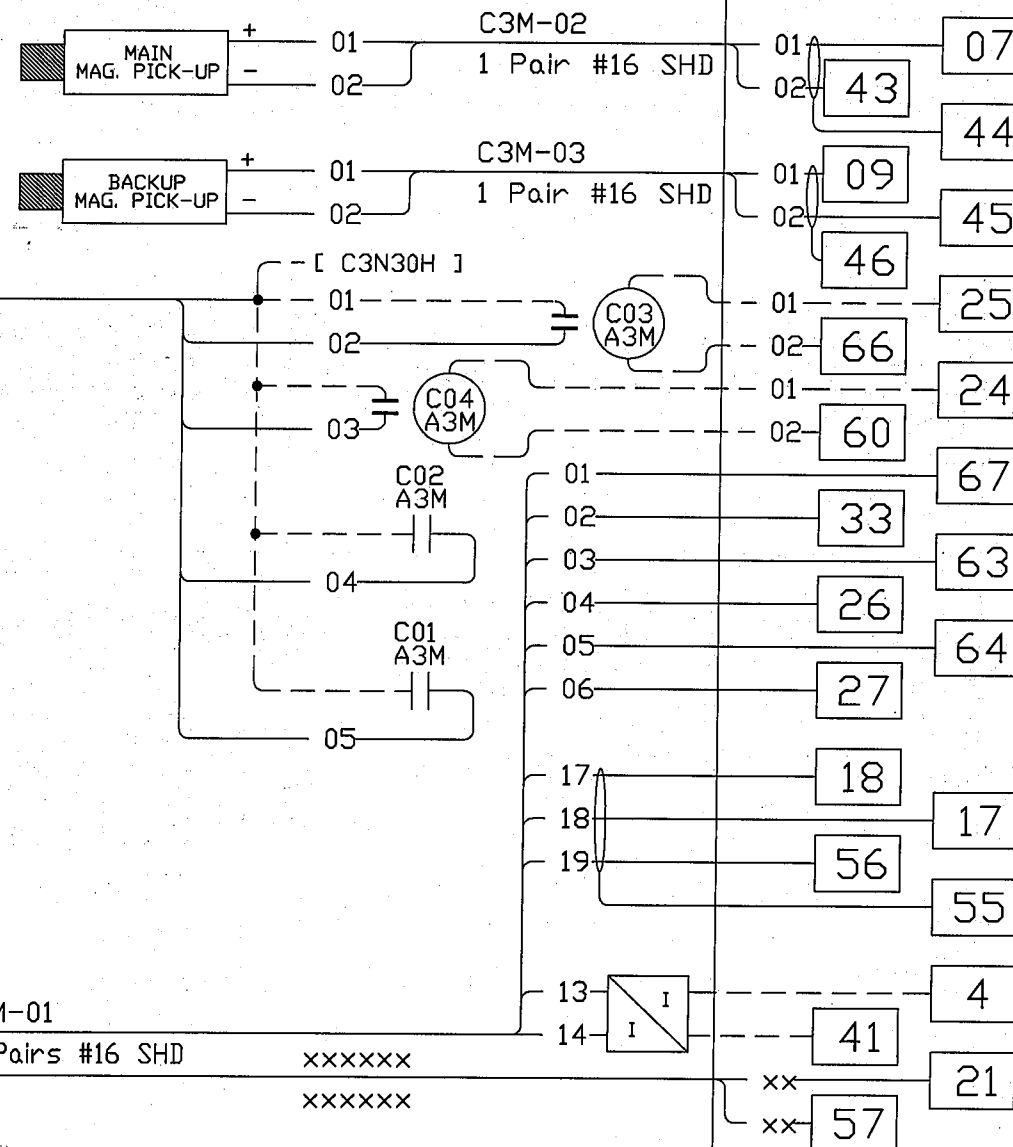
From Power Supply
24 VDC
CKT PWS-5



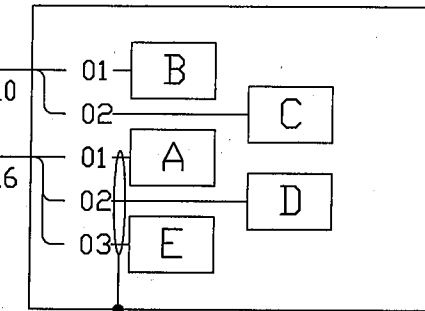
[B3C08U]
Cable #3
16 cond #12

[B3D52U]
[B3F11E]
[B3K24J]
[C1B10C]

C3M-01
12 Pairs #16 SHD
To A&M

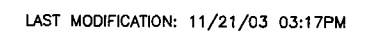


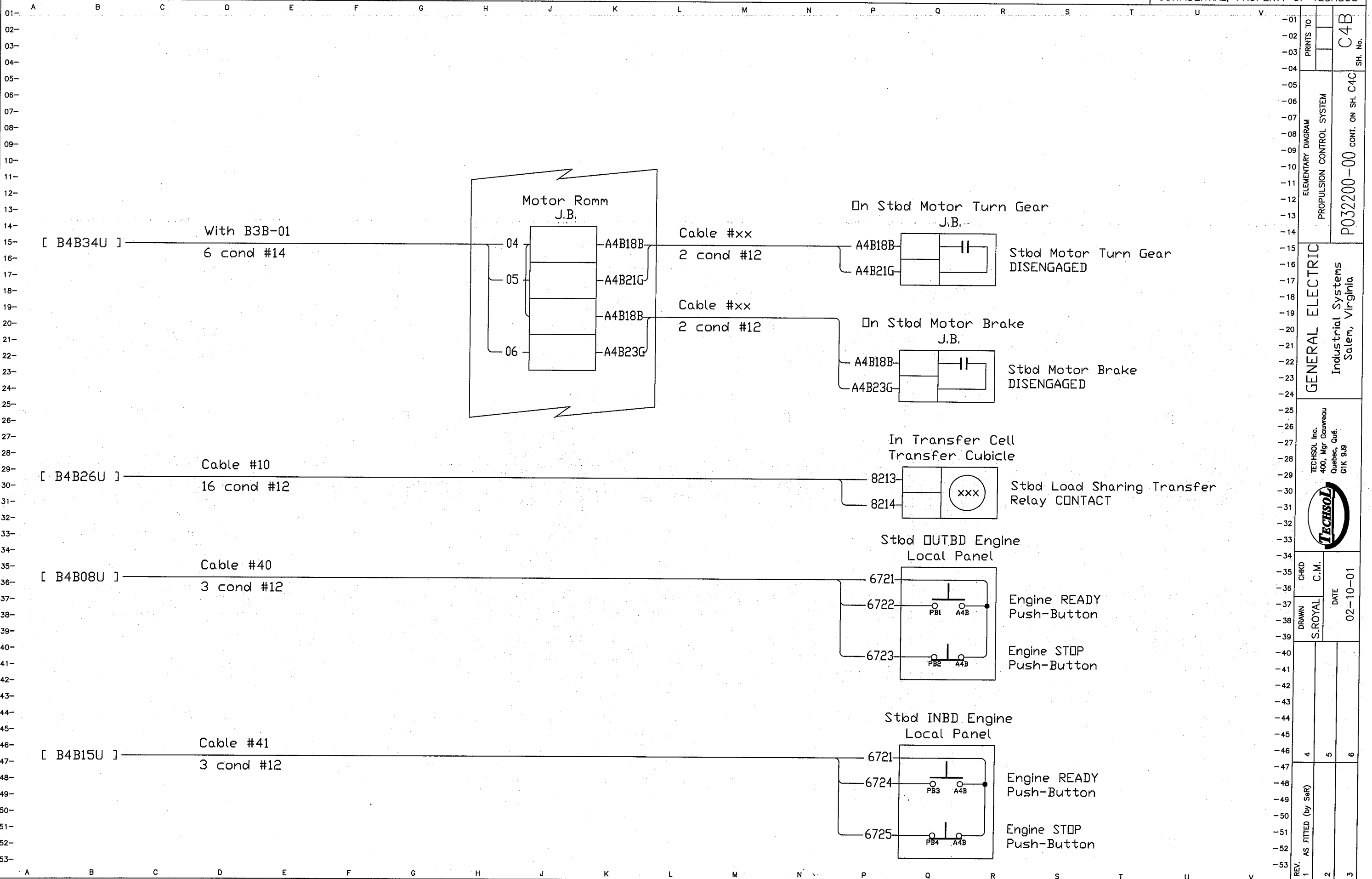
C3M-04
2 cond #10
C3M-05
1 triad #16



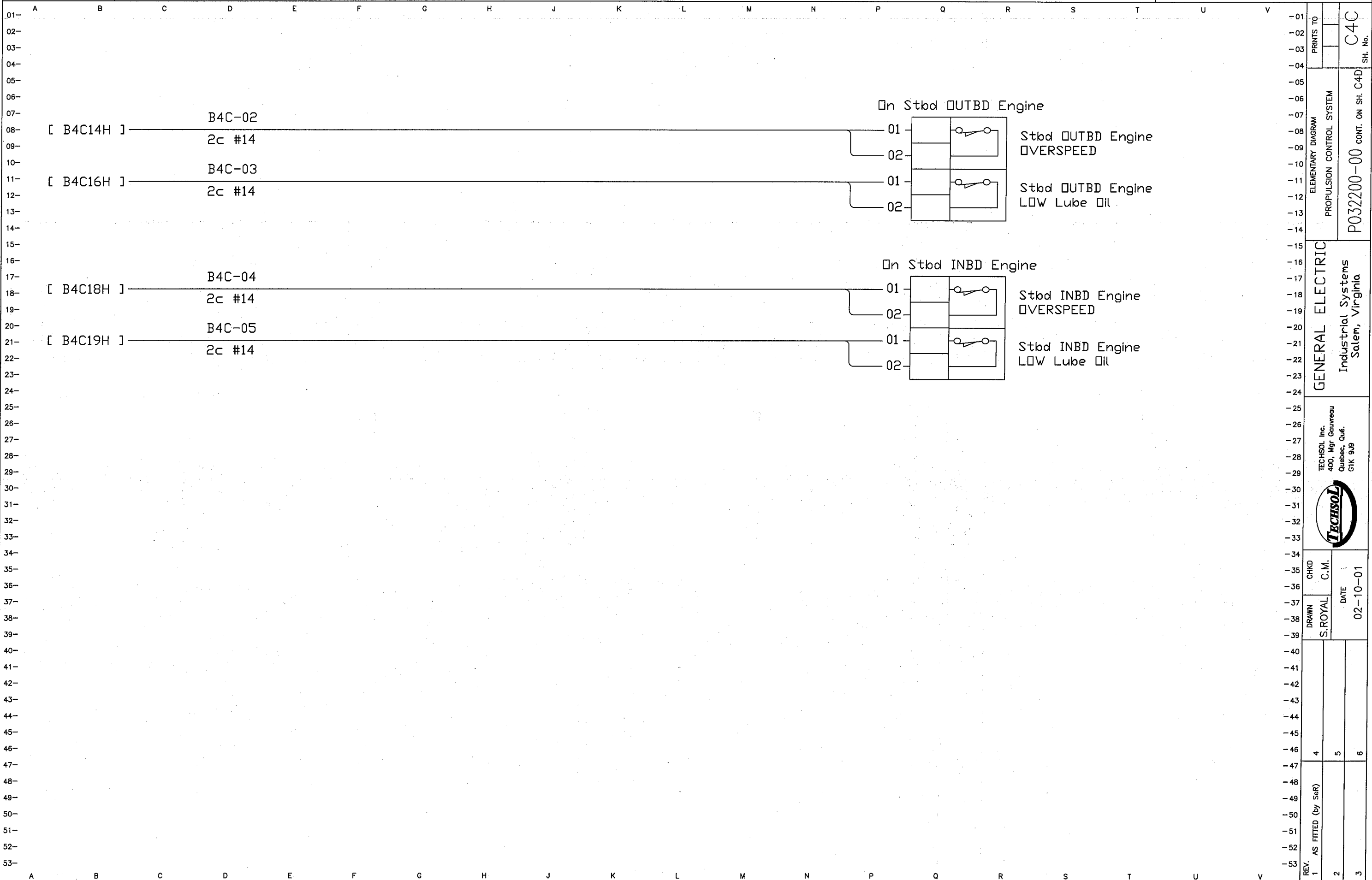
Dashed Lines Are Wired By Techsol.

REV.	1	AS FITTED (by Set)	4	5	6	DATE	02-10-01	TECHSOL Inc. 400, Mgr Gauthier Quebec, Que. G1K 9J9	GENERAL ELECTRIC Industrial Systems Salem, Virginia	ELEMENTARY DIAGRAM PROPULSION CONTROL SYSTEM	PRINTS TO C3M	SH. No. P032200-00 CONT. ON SH. C3N





REV.	1	2	3	DATE	02-10-01	CHKD	C.M.	DRAWN	S.ROYAL	DATE	02-10-01	TECHSOL Inc. 400, Mgr Gauthier Quebec, Que. G1K 9J9	GENERAL ELECTRIC Industrial Systems Salem, Virginia	ELEMENTARY DIAGRAM PROPULSION CONTROL SYSTEM	PRINTS TO	C4B SH. No.



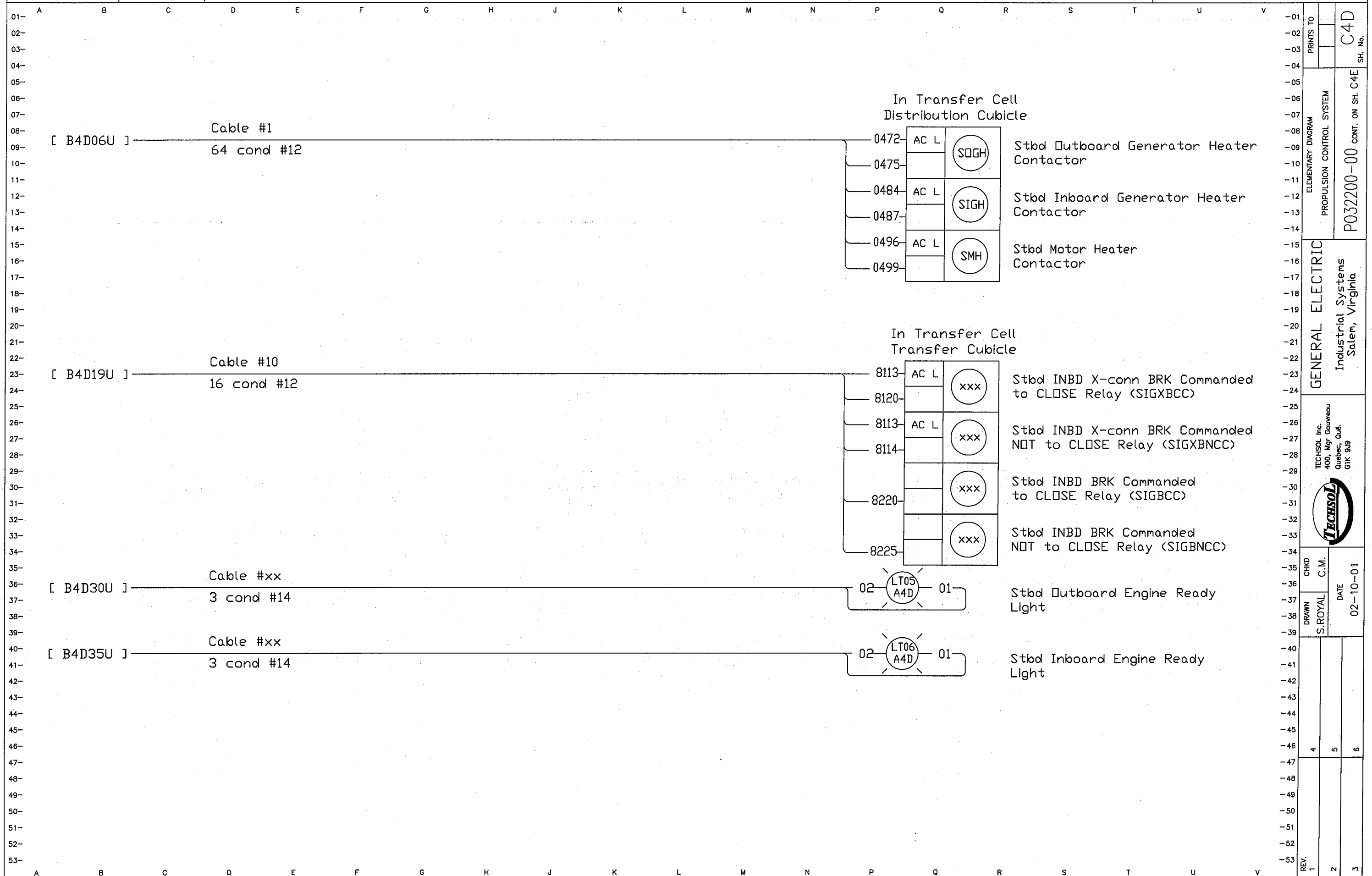
PRINTS TO
C4C
SH. No.

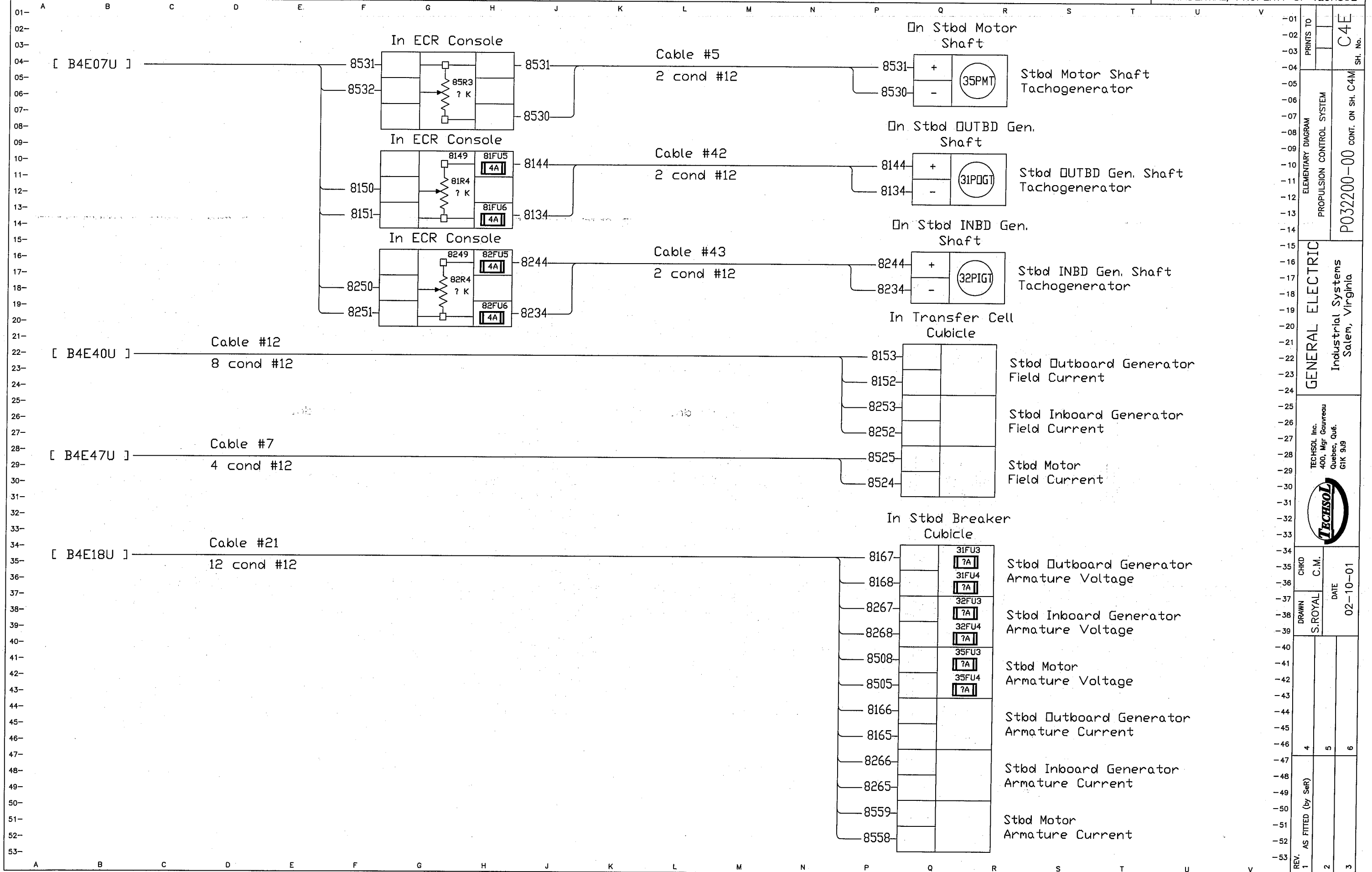
ELEMENTARY DIAGRAM
PROPULSION CONTROL SYSTEM
P032200-00 CONT. ON SH. C4D

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

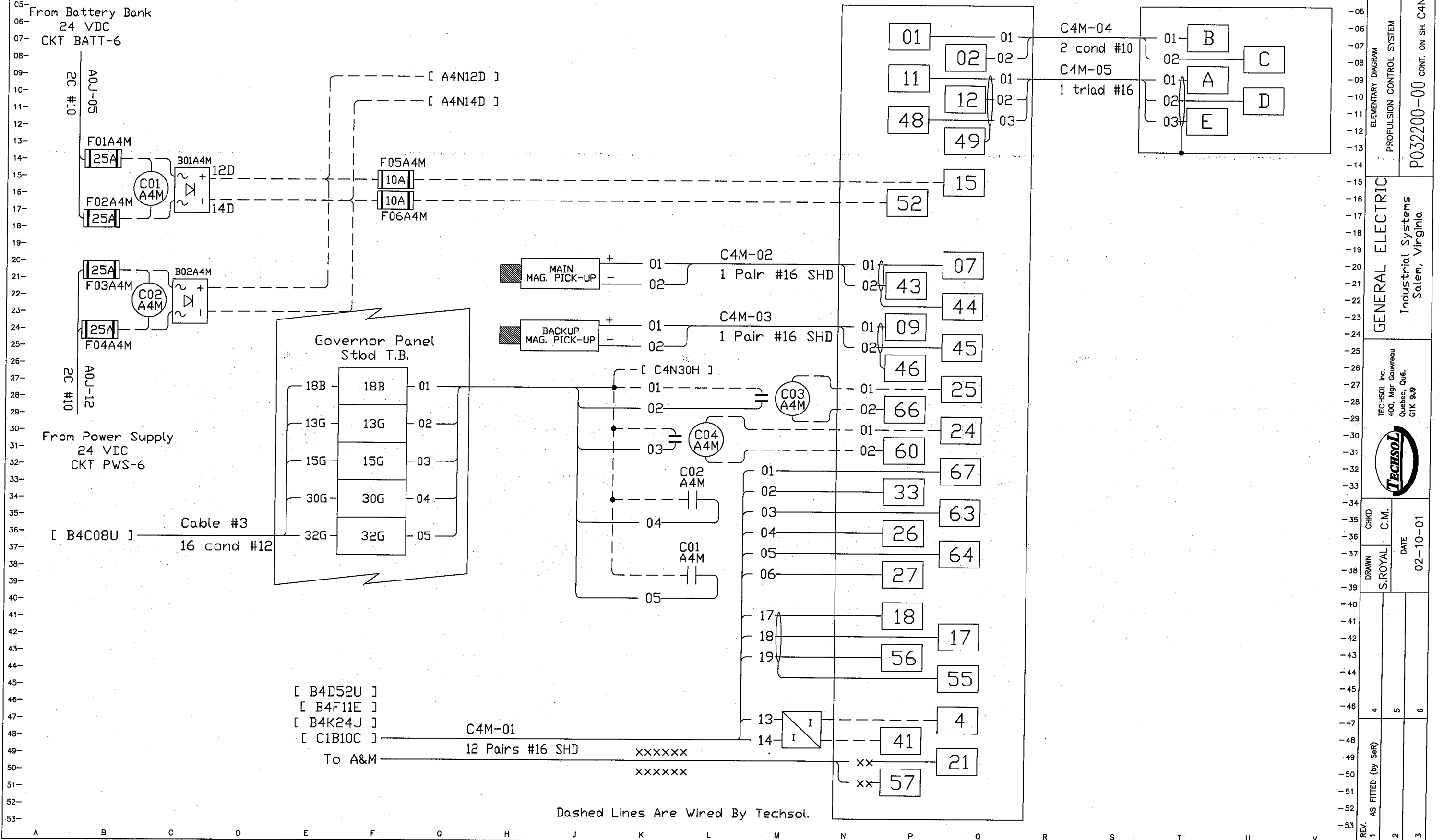
TECHSOL Inc.
400, Mgr Gouveau
Quebec, Que.
G1K 9J9

REV.	AS FITTED (by Ser)	DRAWN	CHKD	C.M.	DATE
1		S.ROYAL			02-10-01
2					
3					



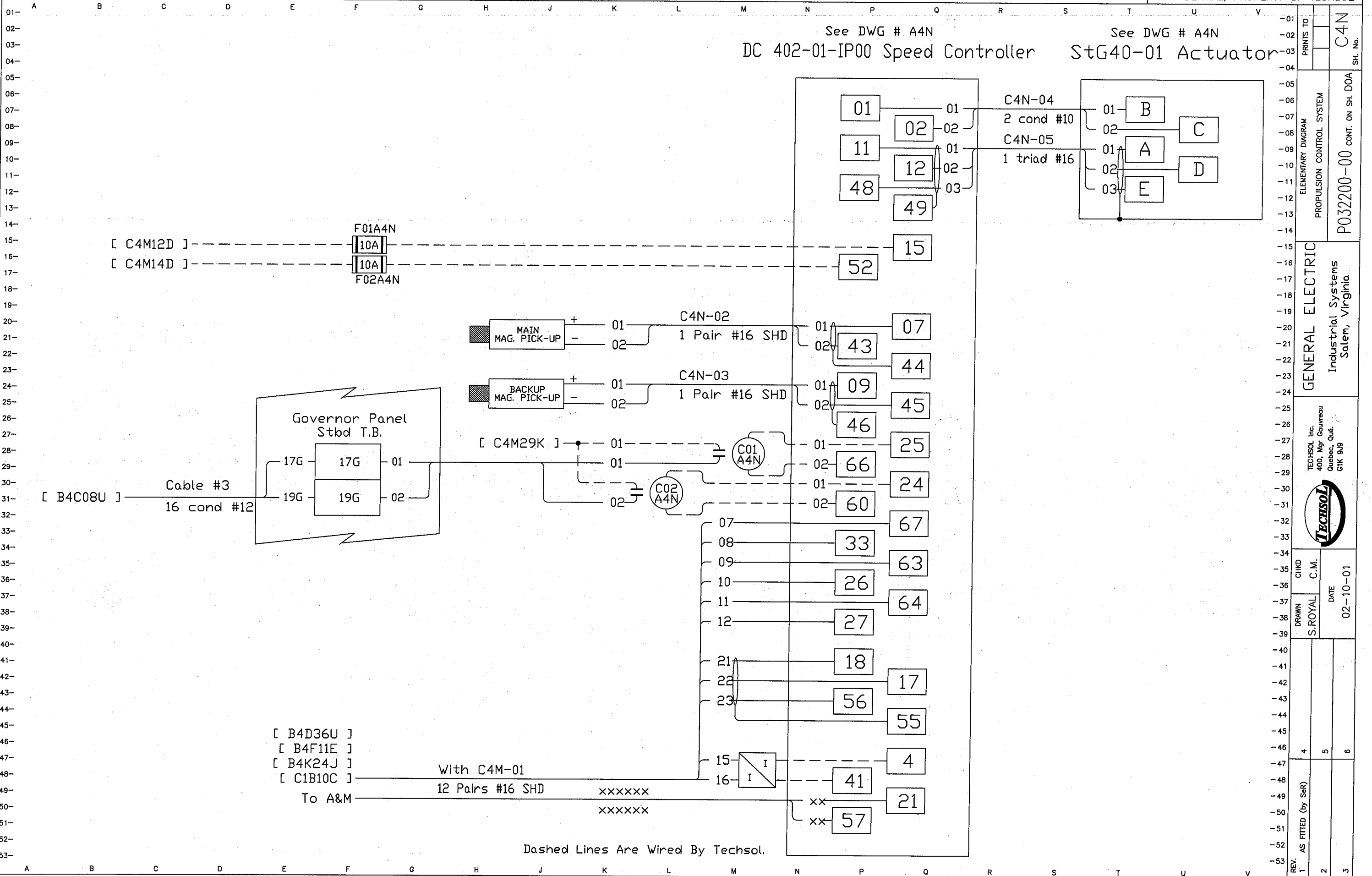


See DWG # A4M
DC 402-01-IP00 Speed Controller StG40-01 Actuator

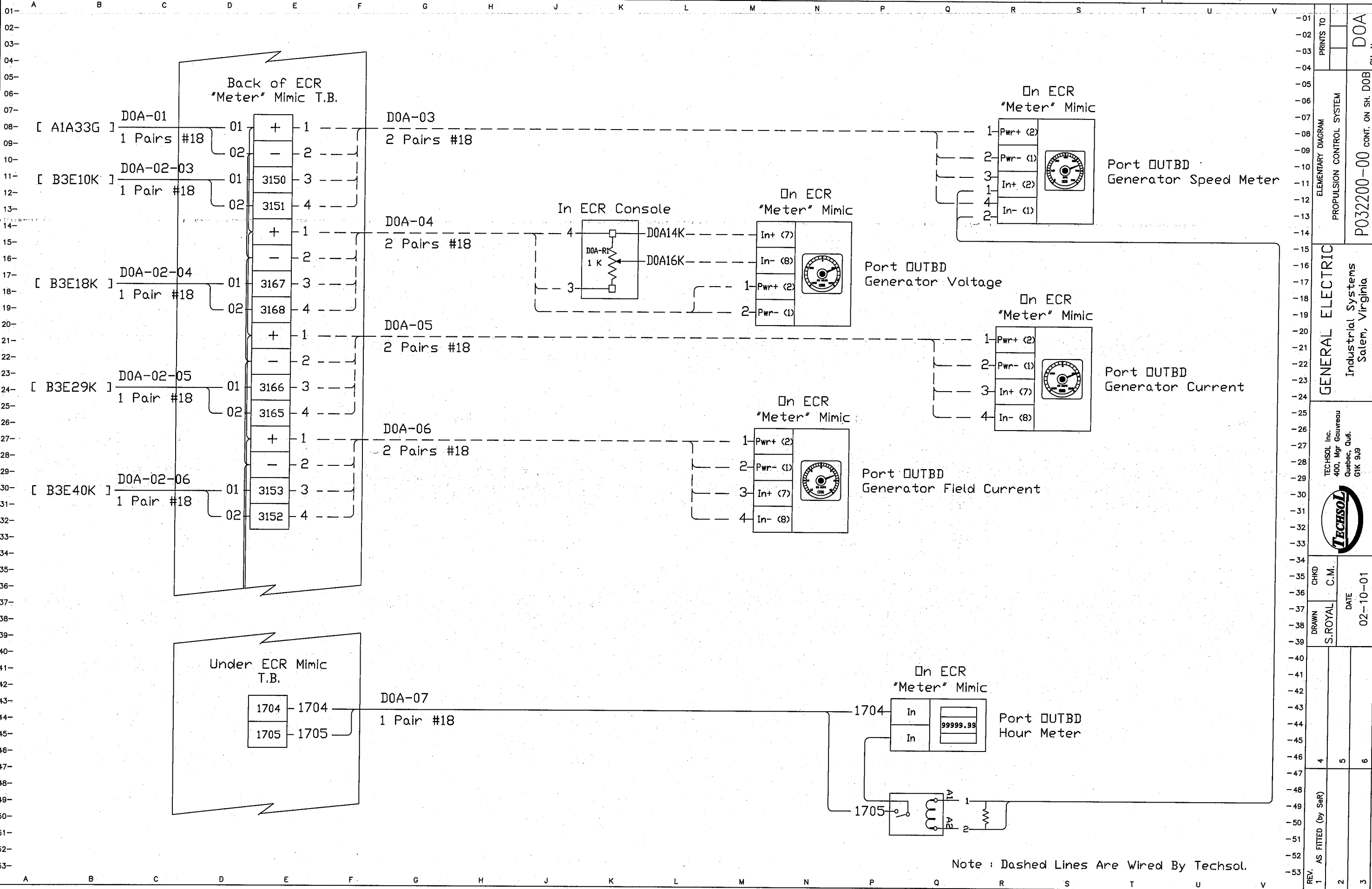


PRINTS TO		C4M	
ELEMENTARY DIAGRAM		PROPULSION CONTROL SYSTEM	
GENERAL ELECTRIC		Industrial Systems	
Salem, Virginia		P032200-00 CONT. ON SH. C4N	
TECHSOL Inc.		400, Mgr Gaurreau	
Quebec, Que.		G1K 9J9	
CHKD		C.M.	
DRAWN		S. ROYAL	
DATE		02-10-01	
REV.		AS FITTED (by Ser)	
1		4	
2		5	
3		6	

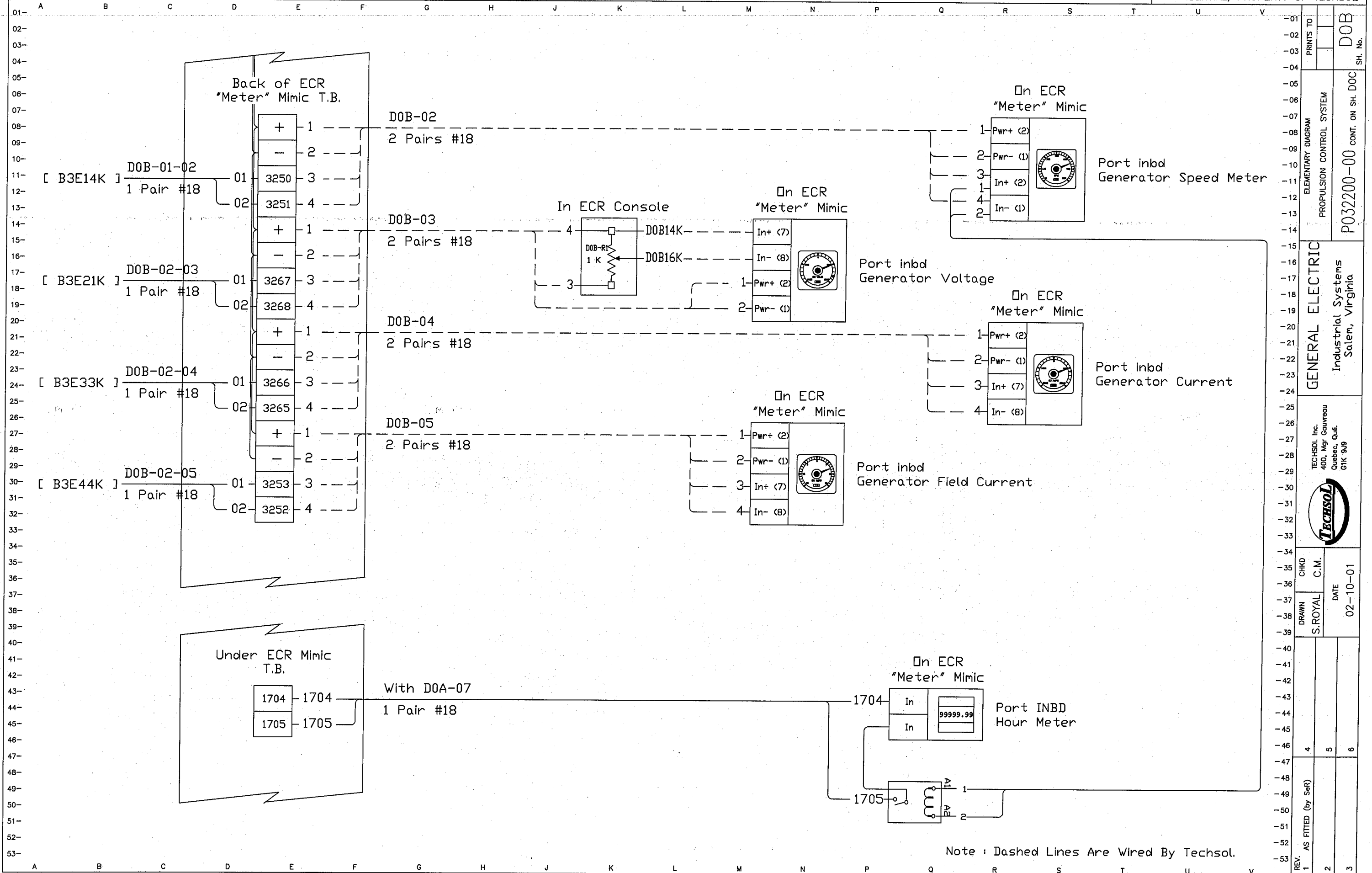
See DWG # A4N
DC 402-01-IP00 Speed Controller StG40-01 Actuator



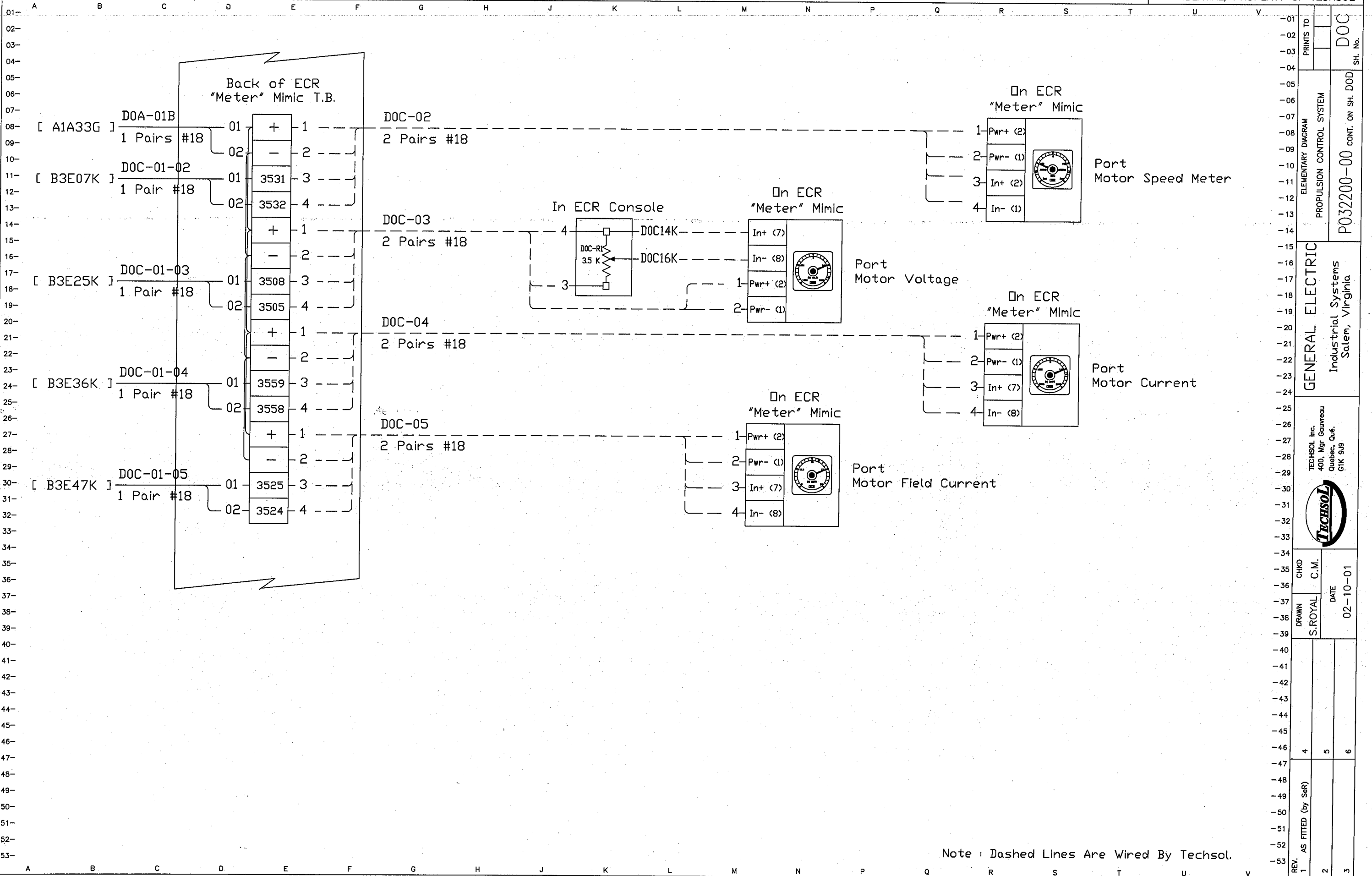
REV.	1	AS FITTED (by Ser)	4	5	6
	2				
	3				
DATE 02-10-01					
DRAWN S. ROYAL					
CHKD C.M.					
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9					
GENERAL ELECTRIC Industrial Systems Salem, Virginia					
ELEMENTARY DIAGRAM PROPULSION CONTROL SYSTEM					
PRINTS TO C4N					
P032200-00 CONT. ON SH. DOA					



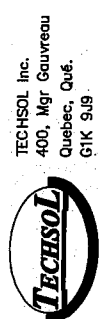
REV.	1	AS FITTED (by Self)	4	5	6	DATE	02-10-01	C.M.	S. ROYAL	CHKD	TECHSOL Inc. 400, Mgr Gouveau Quebec, Qu.	GENERAL ELECTRIC Industrial Systems Salem, Virginia	ELEMENTARY DIAGRAM PROPULSION CONTROL SYSTEM	PRINTS TO	DOA	SH. No.



Note : Dashed Lines Are Wired By Techsol.

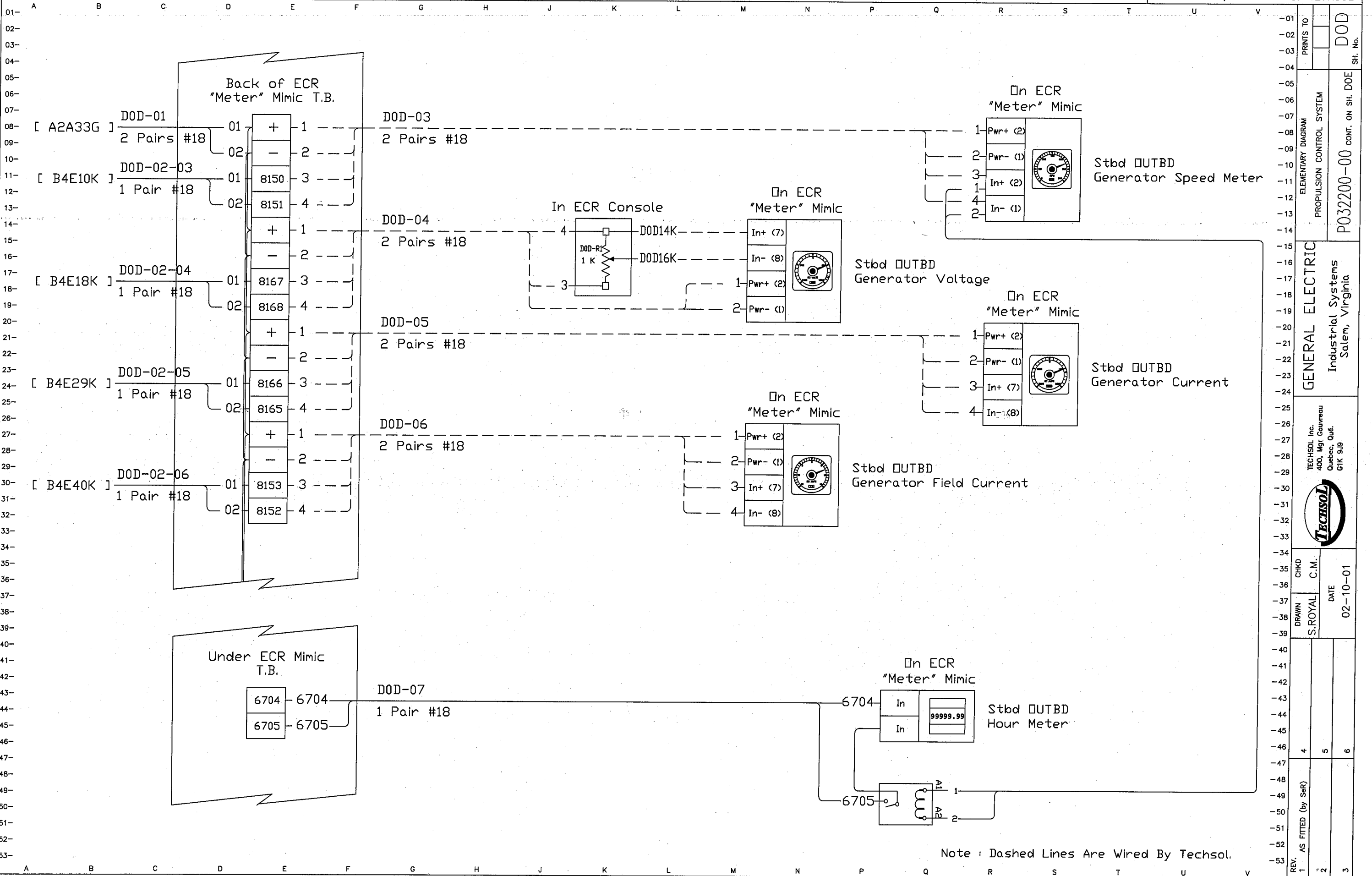


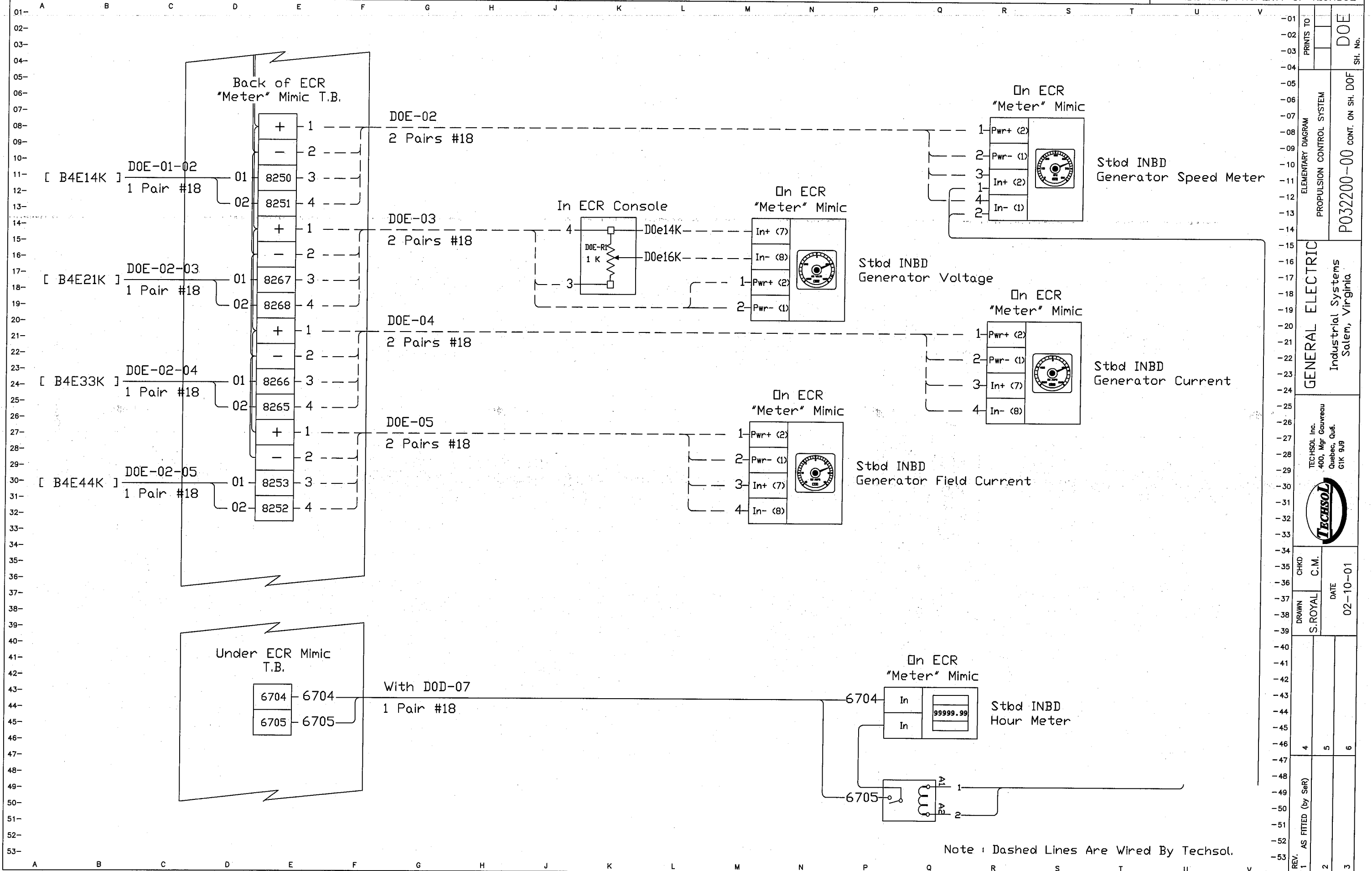
REV.	AS FITTED (by Ser)	DRAWN	CHKD	C.M.	DATE	SH. No.	DOC	CONT. ON SH. DOD	ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	PRINTS TO
1		S. ROYAL			02-10-01		P032200-00				
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3											
4											
5											
6											



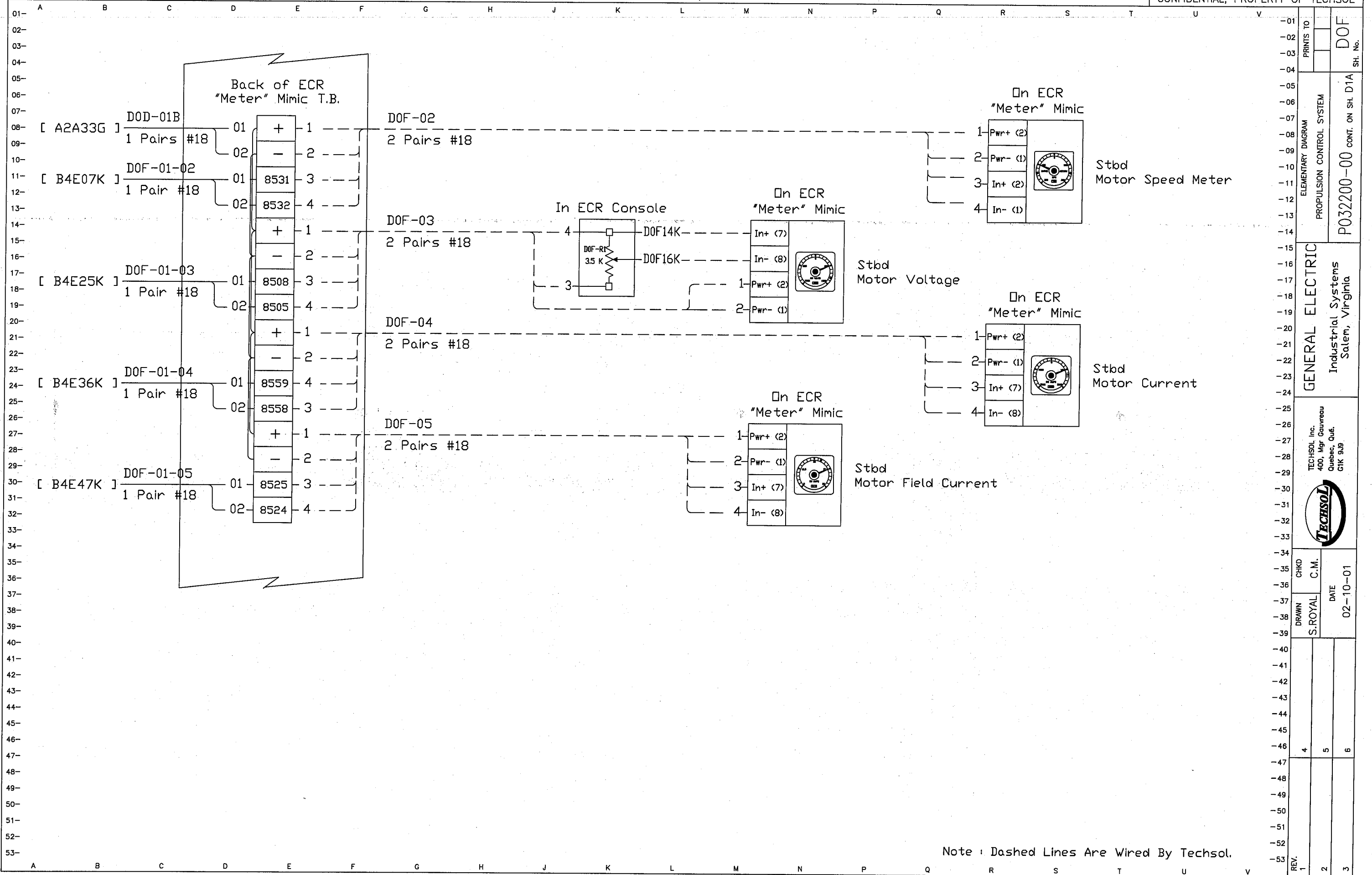
TECHSOL Inc.
400, Mgr Gauthier
Quebec, Que.
G1K 9J9

GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

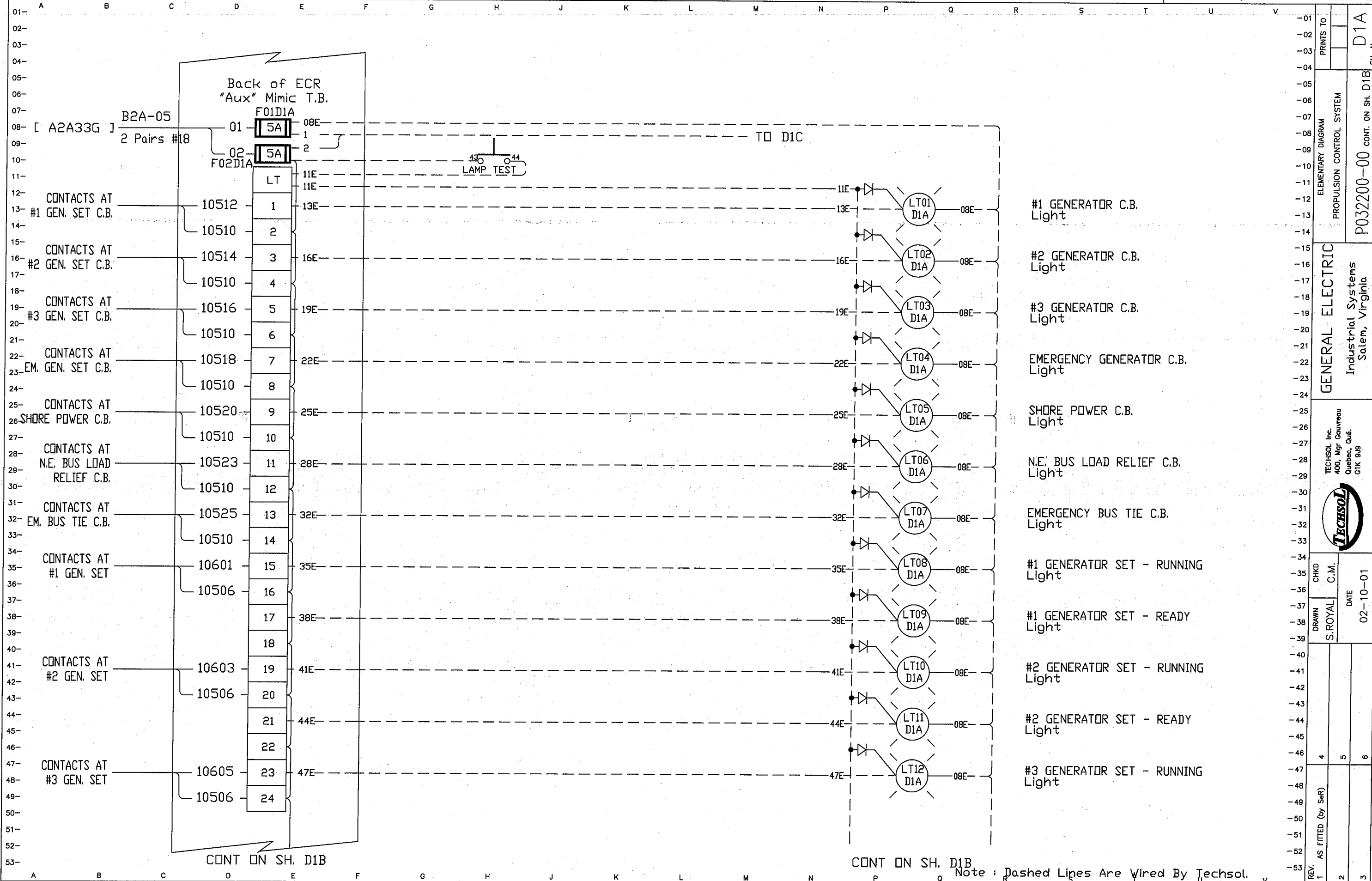




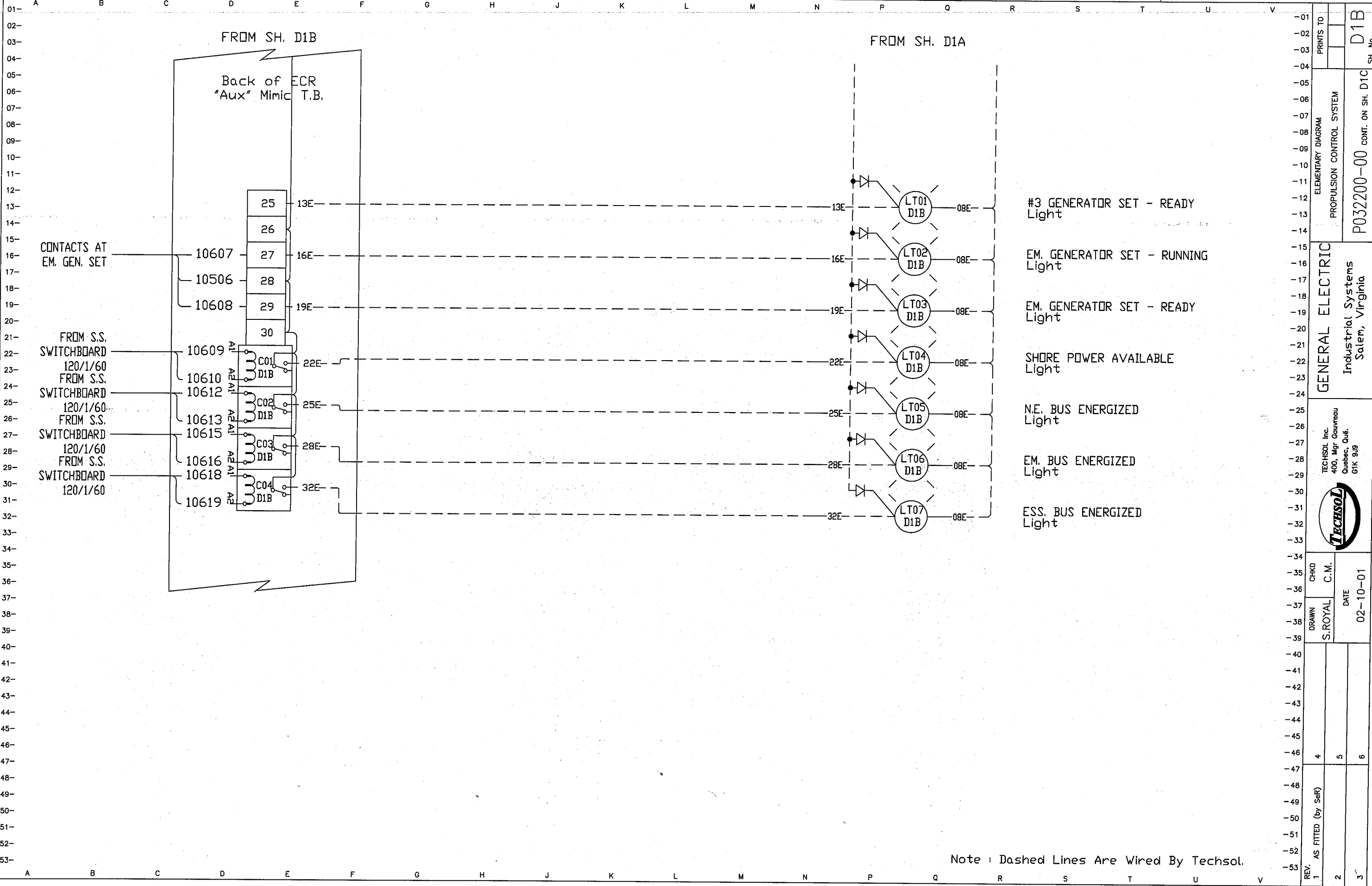
REV.	1	AS FITTED (by Ser)	4	5	6
	2				
	3				
DATE 02-10-01					
DRAWN S. ROYAL					
CHKD C.M.					
TECHSOL Inc. 400, Mgr Gauthier Quebec, Que. G1K 9J9					
GENERAL ELECTRIC Industrial Systems Salem, Virginia					
ELEMENTARY DIAGRAM PROPULSION CONTROL SYSTEM					
PRINTS TO					
P032200-00 CONT. ON SH. DOF					
DOE SH. No.					

TECHSOL Inc.
400, Mgr Gauthier
Quebec, Que.
G1K 9J9DRAWN
S. ROYAL
CHKD
C.M.
DATE
02-10-01

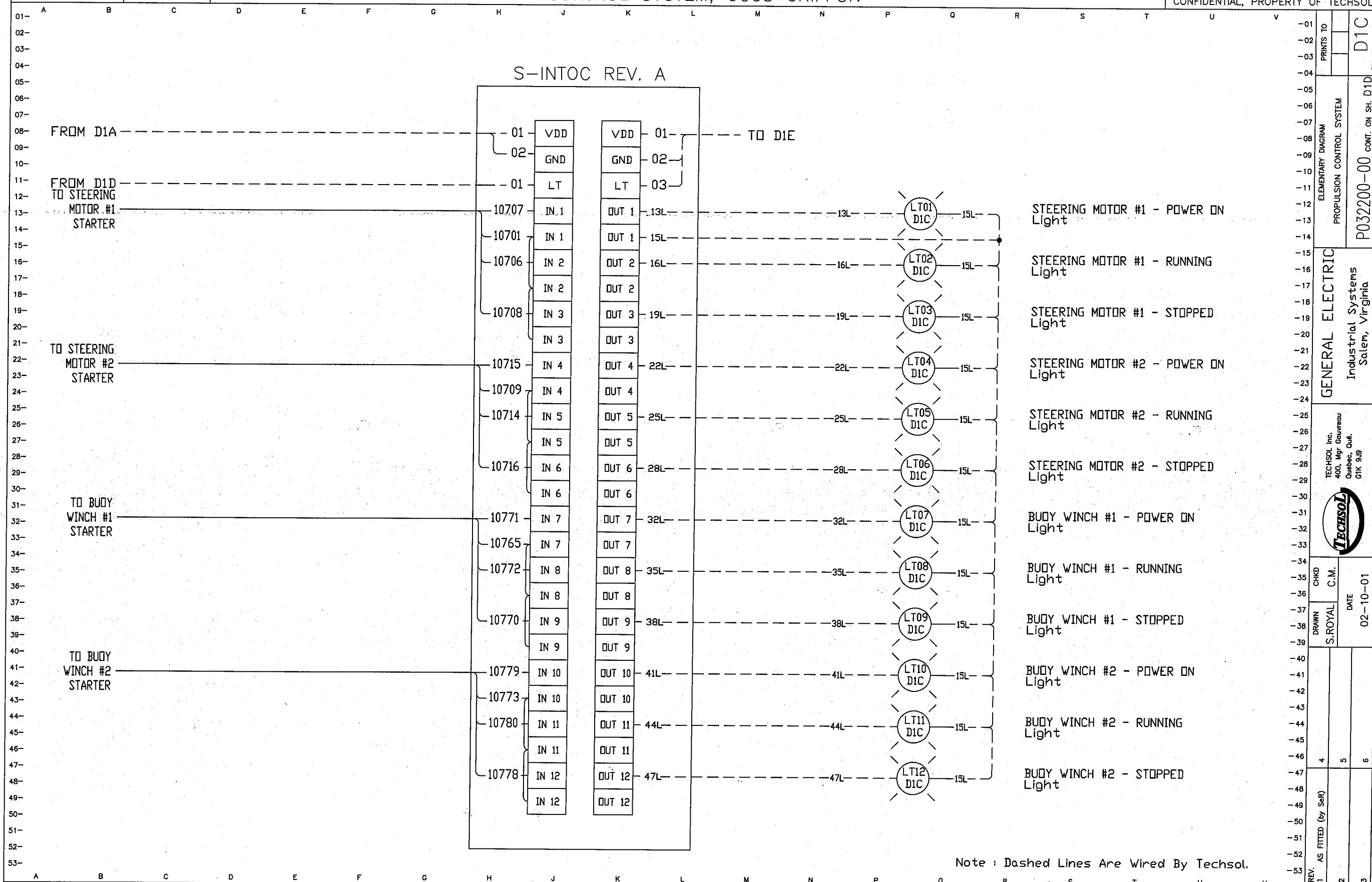
REV. 1 2 3



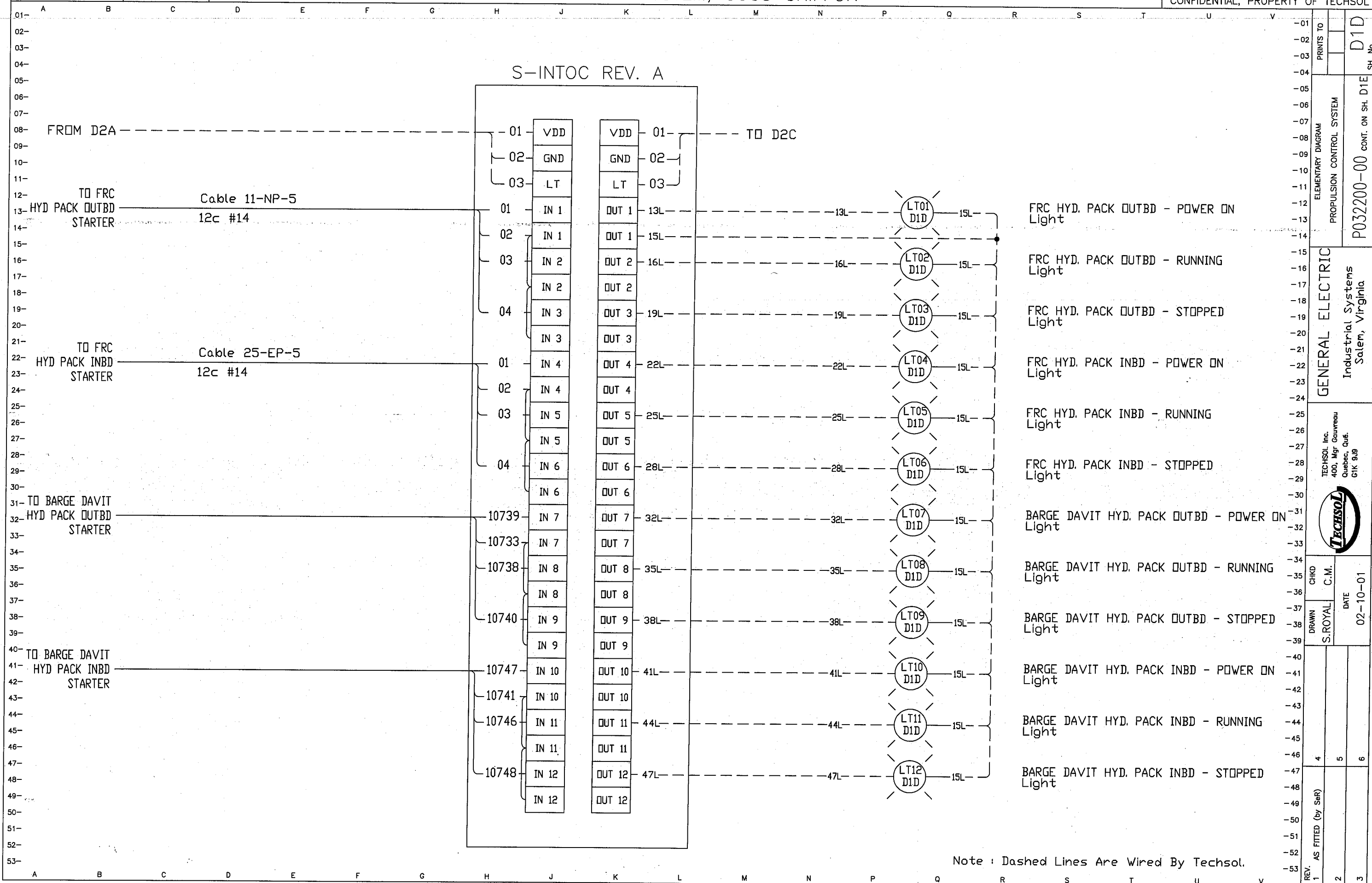
PRINTS TO	D1A
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr Gouveau Quebec, Qué. G1K 9J9	
CHKD	C.M.
DRAWN	S.ROYAL
DATE	02-10-01
REV. 1	AS FITTED (by Set)
2	
3	



PRINTS TO	D1B
ELEMENTARY DIAGRAM	
PROPULSION CONTROL SYSTEM	
P032200-00 CONT. ON SH. D1C	
GENERAL ELECTRIC	
Industrial Systems	
Salem, Virginia	
TECHSOL Inc.	
400, Mgr Gauthier	
Quebec, Que.	
G1K 9/9	
CHKD	C.M.
DRAWN	S.ROYAL
DATE	02-10-01
REV.	1
AS FITTED (by Set)	2
	3

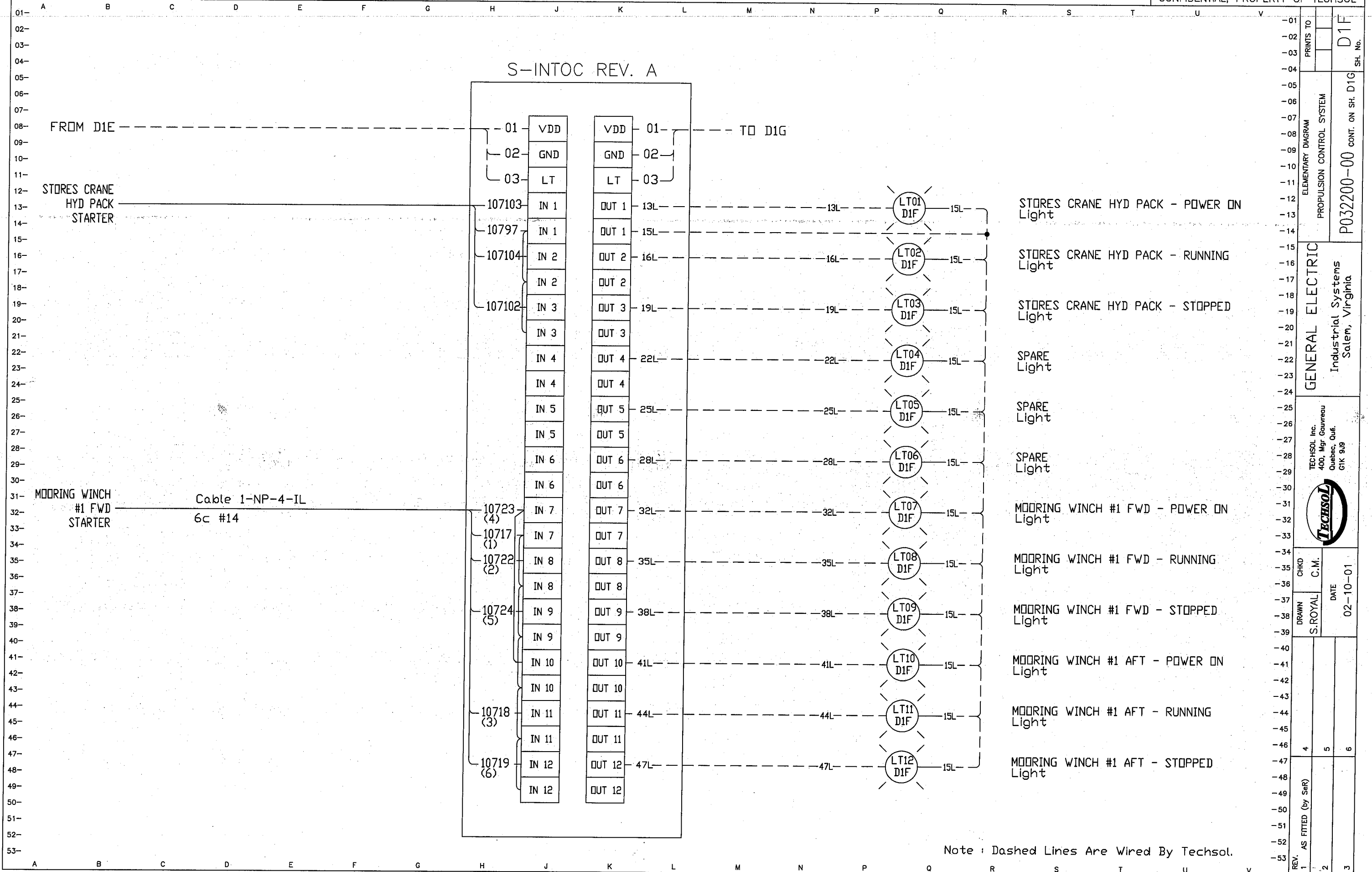


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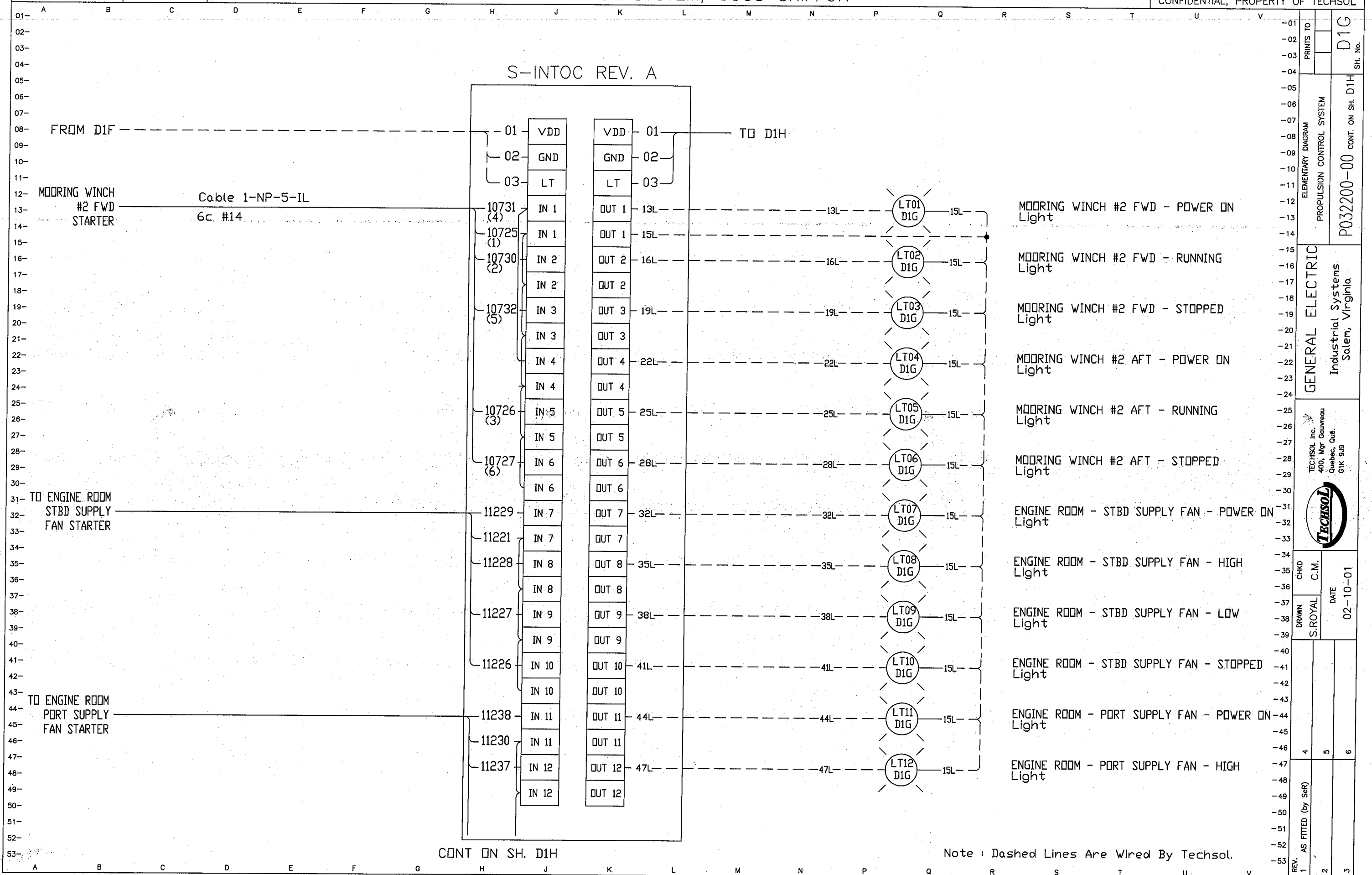


PRINTS TO	D1D
SH. No.	
ELEMENTARY DIAGRAM	
PROPULSION CONTROL SYSTEM	
P032200-00 CONT. ON SH. D1E	
GENERAL ELECTRIC	
Industrial Systems	
Salen, Virginia	
TECHSOL Inc.	
400, Mgr Gauthreau	
Quebec, Que.	
G1K 9J9	
CHKD	
C.M.	
DATE	02-10-01
DRAWN	
S.ROYAL	
REV. 1	
AS FITTED (by Set)	
2	
3	



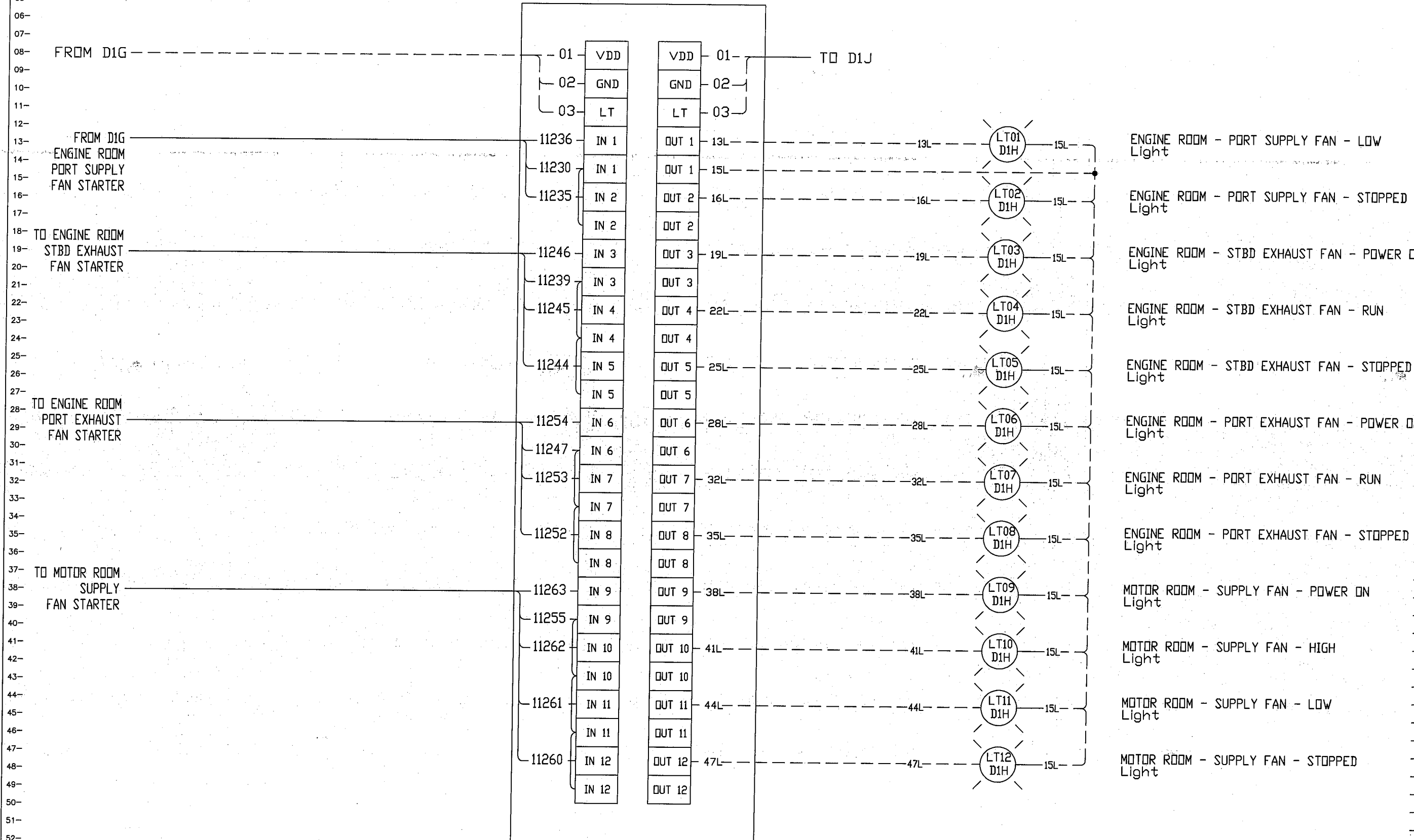


PRINTS TO	D1F	
SH. No.	P032200-00 CONT. ON SH. D1G	
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	
GENERAL ELECTRIC	Industrial Systems Salem, Virginia	
TECHSOL Inc. 400, Mgr. Gauthier Quebec, Que. G1K 9J9	DATE 02-10-01	
CHKD C.M.	DATE	
DRAWN S. ROYAL	DATE	
REV. 1 AS FITTED (by Ser)	2	3



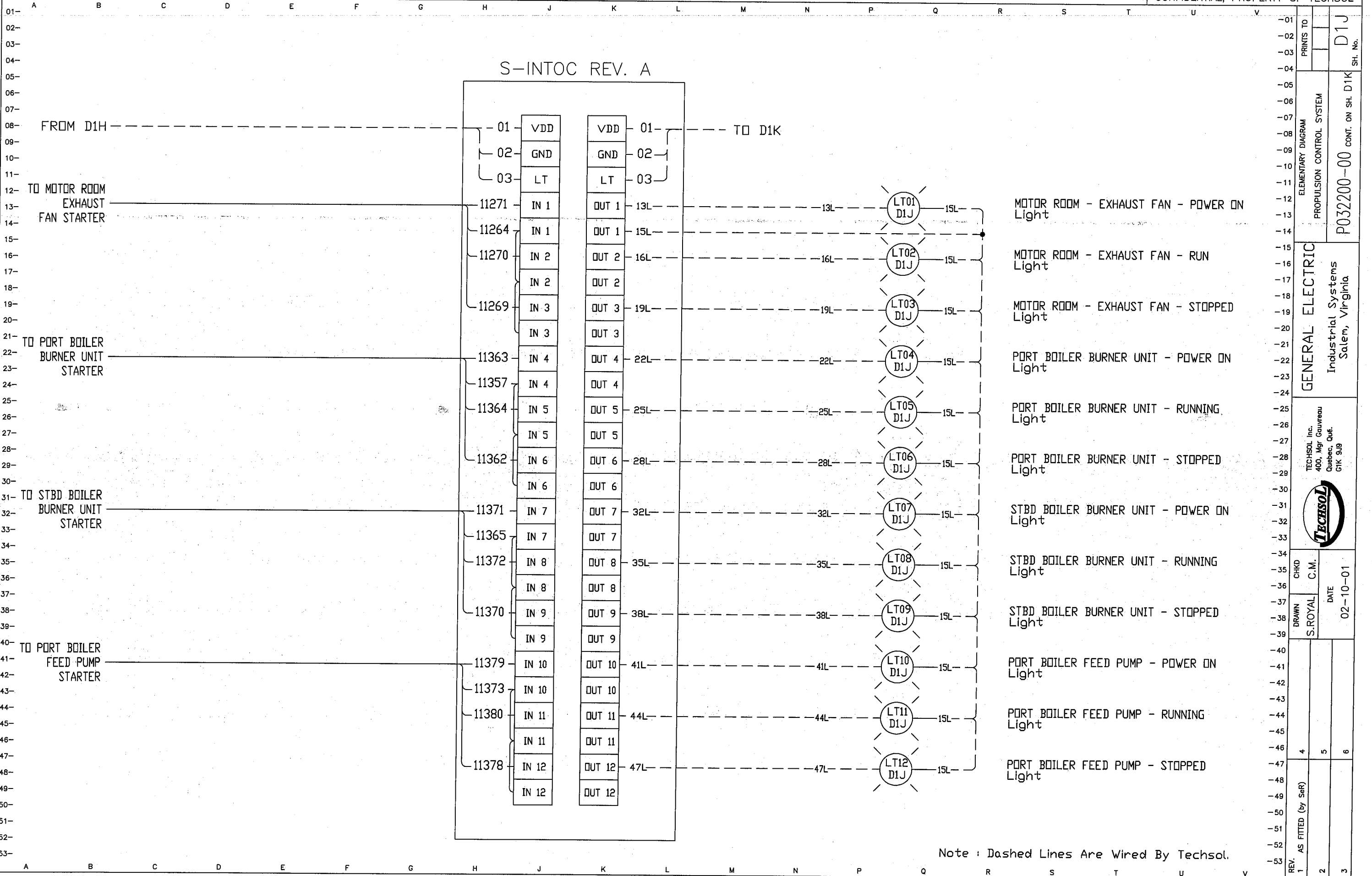
PRINTS TO	D1G
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
P032200-00 CONT. ON SH. D1H	
GENERAL ELECTRIC	
Industrial Systems Salem, Virginia	
TECHSOL Inc. 400, Mgr Gauthier Quebec, Que. G1K 9J9	
CHKD	C.M.
DRAWN	DATE
S. ROYAL	02-10-01
REV. 1	AS FITTED (by Ser)
2	
3	

S-INTOC REV. A



Note : Dashed Lines Are Wired By Techsol.

PRINTS TO	D1H
ELEMENTARY DIAGRAM	P032200-00 CONT. ON SH. D1J
PROPULSION CONTROL SYSTEM	
GENERAL ELECTRIC	Industrial Systems Salen, Virginia
TECHSOL Inc. 400, Mgr Gauthier Quebec, Que. G1K 9J9	
CHKD	C.M.
DRAWN	S.ROYAL
DATE	02-10-01
REV. 1	AS FITTED (by Set)
2	
3	



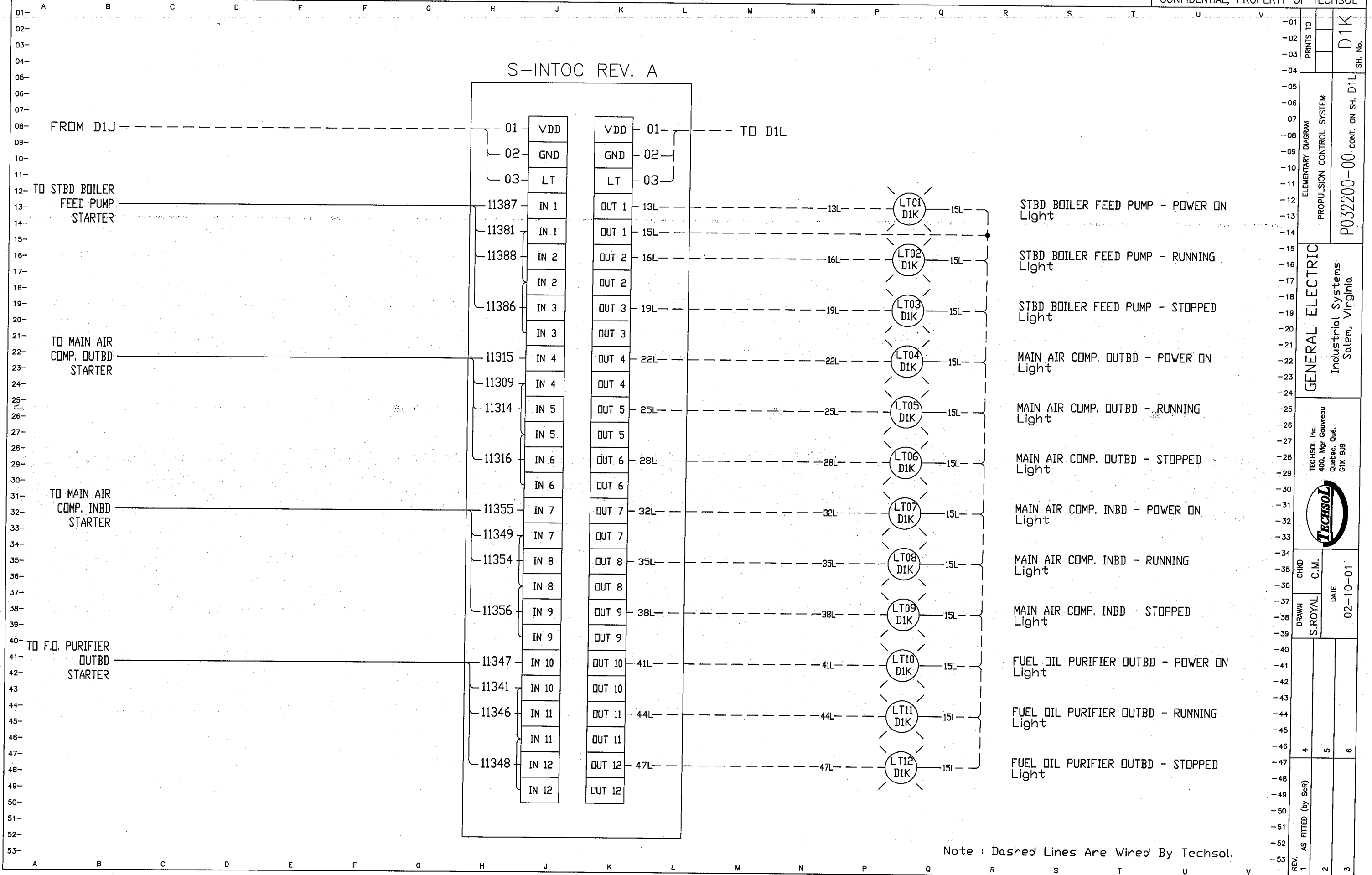
GENERAL ELECTRIC
Industrial Systems
Salem, Virginia

TECHSOL Inc.
400, Mgr Gauvreau
Quebec, Qué.
G1K 9J9



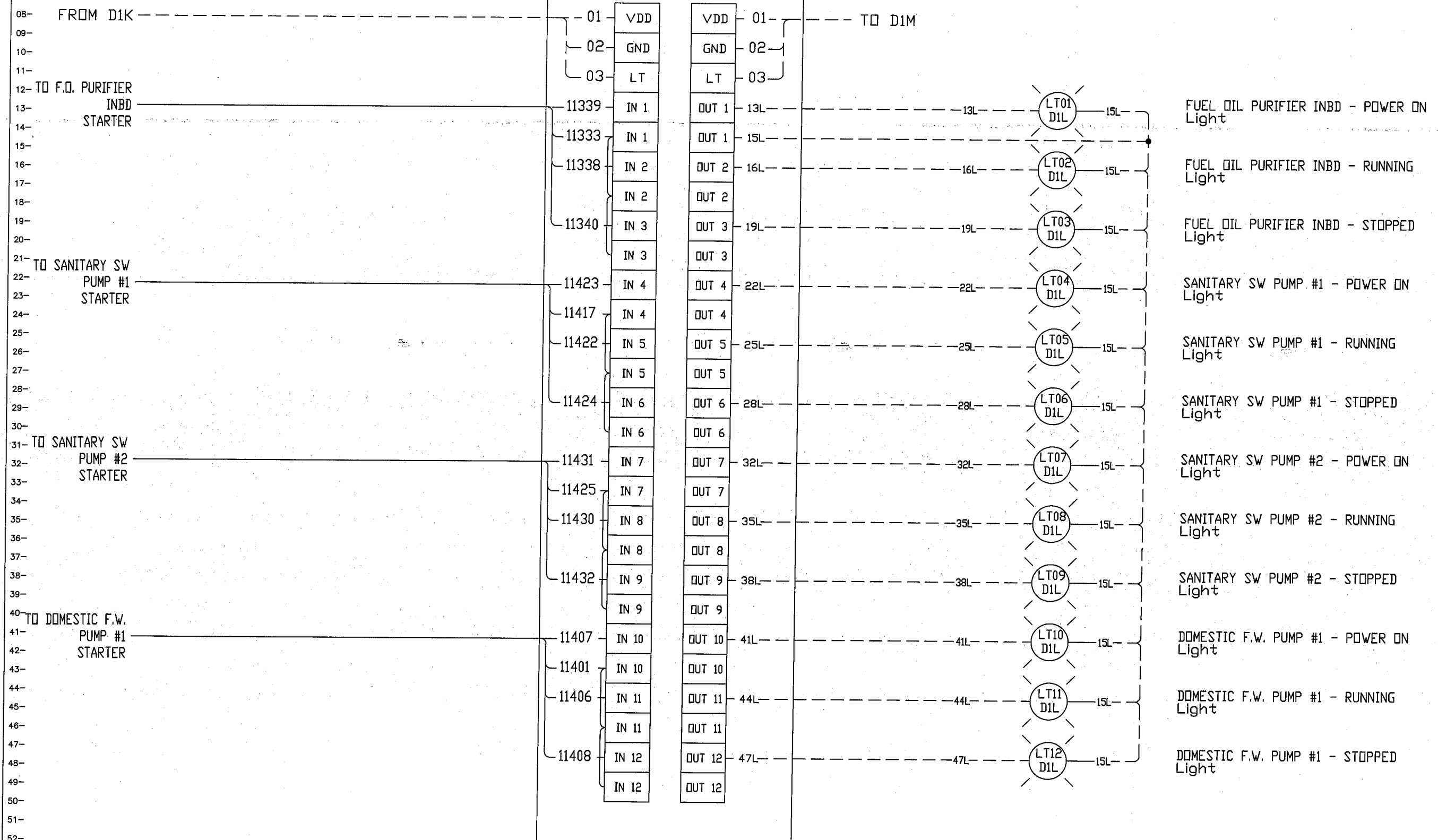
CHKD C.M.
DATE 02-10-01

REV.	1	2	3
AS FITTED (by Self)			
DRAWN	S.ROYAL		
DATE			
4	5	6	



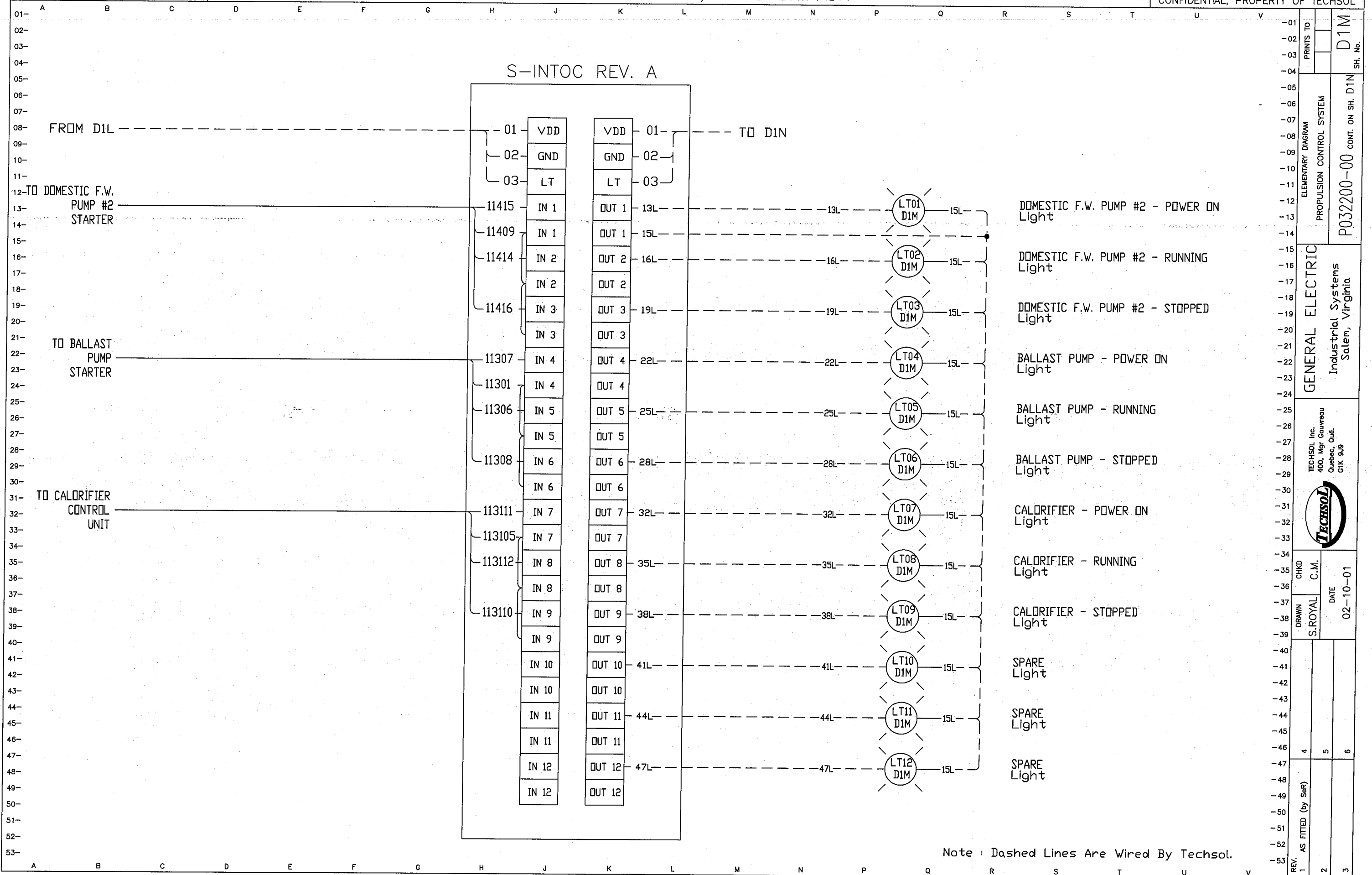
PRINTS TO	D1K
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
P032200-00 CONT. ON SH. D1L	
GENERAL ELECTRIC	
Industrial Systems Salem, Virginia	
TECHSOL Inc. 400, Mgr. Gauthier Quebec, Que. G1K 9J9	
CHKD	C.M.
DRAWN	DATE
S. ROYAL	02-10-01
REV. 1	AS FITTED (by Self)
2	
3	

S-INTOC REV. A

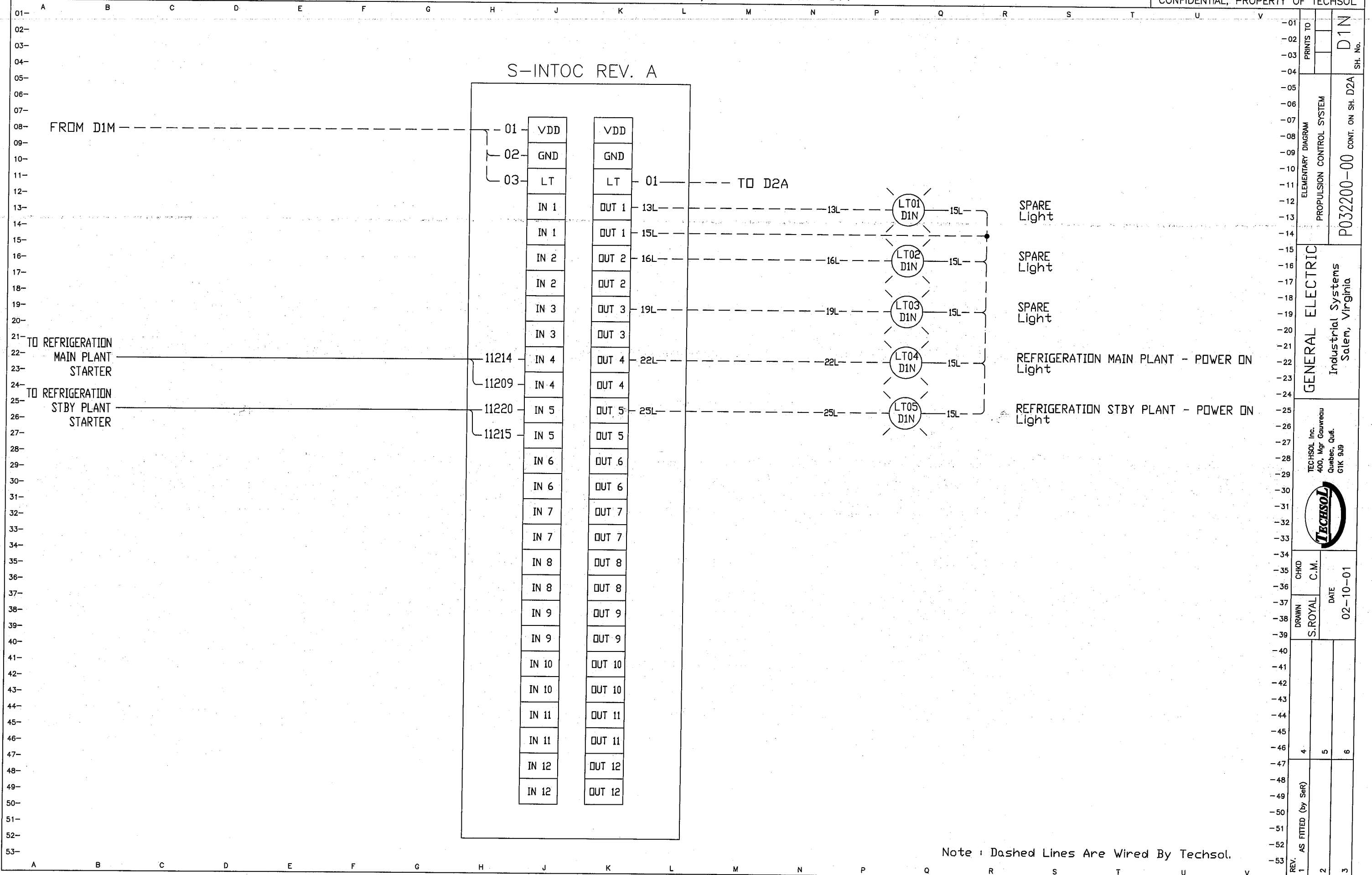


Note : Dashed Lines Are Wired By Techsol.

PRINTS TO	D1L
ELEMENTARY DIAGRAM	
PROPULSION CONTROL SYSTEM	
GENERAL ELECTRIC	
Industrial Systems	
Salem, Virginia	
TECHSOL Inc.	
400, Mgr Gaurneau	
Quebec, Que.	
G1K 919	
CHKD	C.M.
DRAWN	DATE
S.ROYAL	02-10-01
AS FITTED (by SeR)	
1	2
3	6

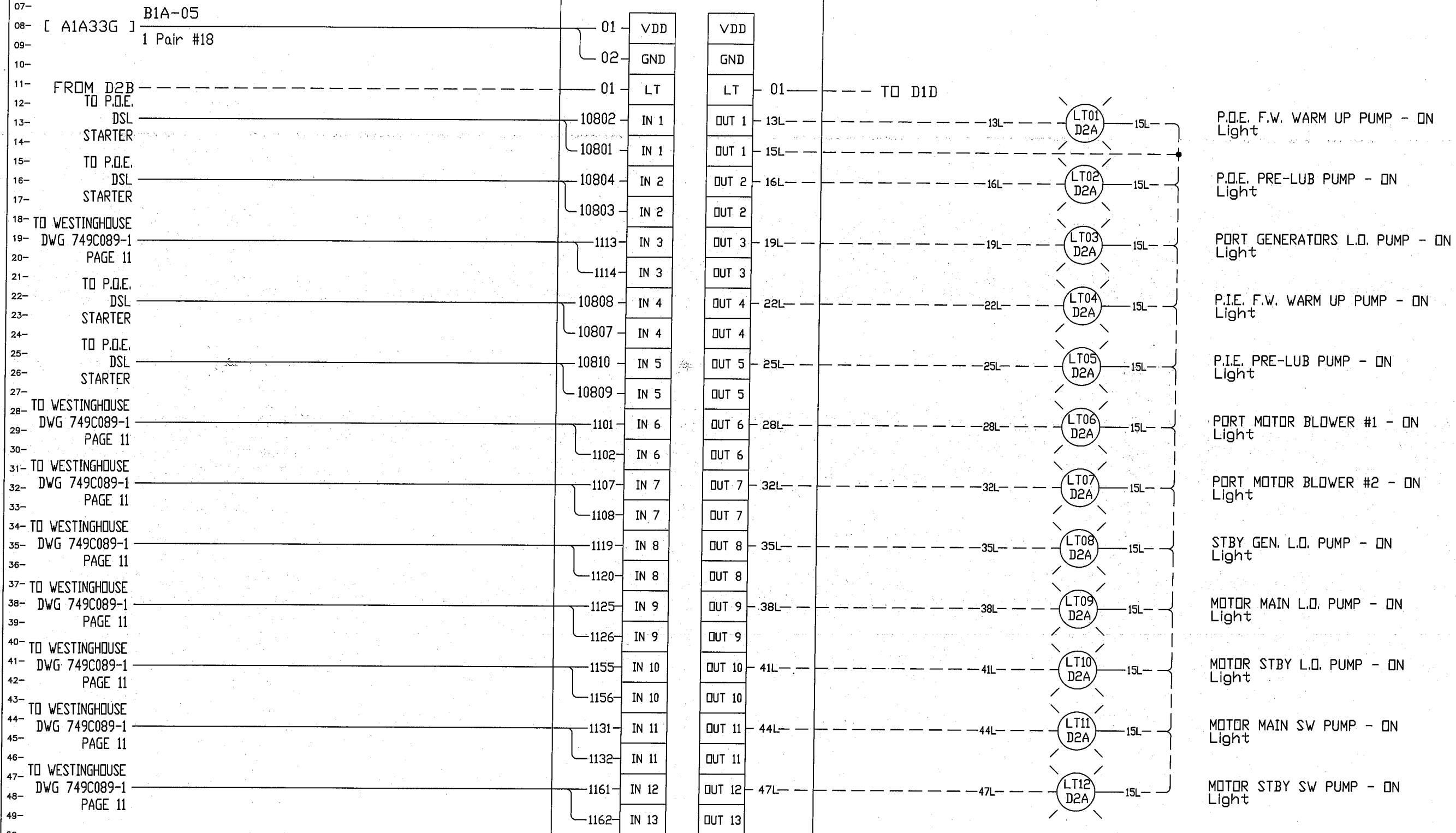


REV.	AS FITTED (by Ser)	DRAWN	CHKD	C.M.	DATE	PRINTS TO	ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	SH. No.
1		S. ROYAL			02-10-01	4			D1M
2						5			
3						6			

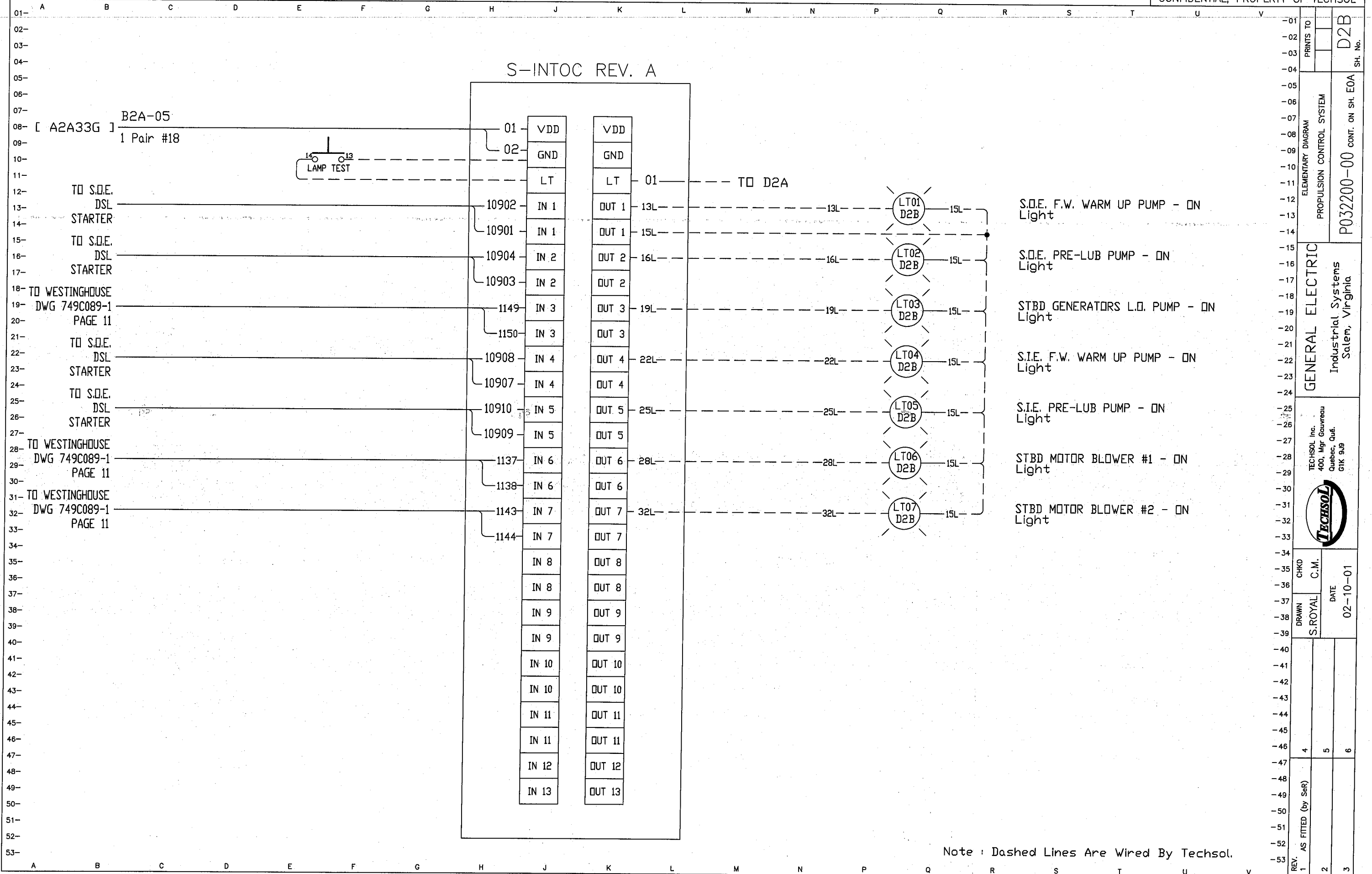


PRINTS TO	D1N	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. D2A
GENERAL ELECTRIC Industrial Systems Salem, Virginia		
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9		
CHKD	C.M.	DATE
DRAWN	S.ROYAL	02-10-01
REV.	AS FITTED (by Ser)	
1	4	5
2		6
3		

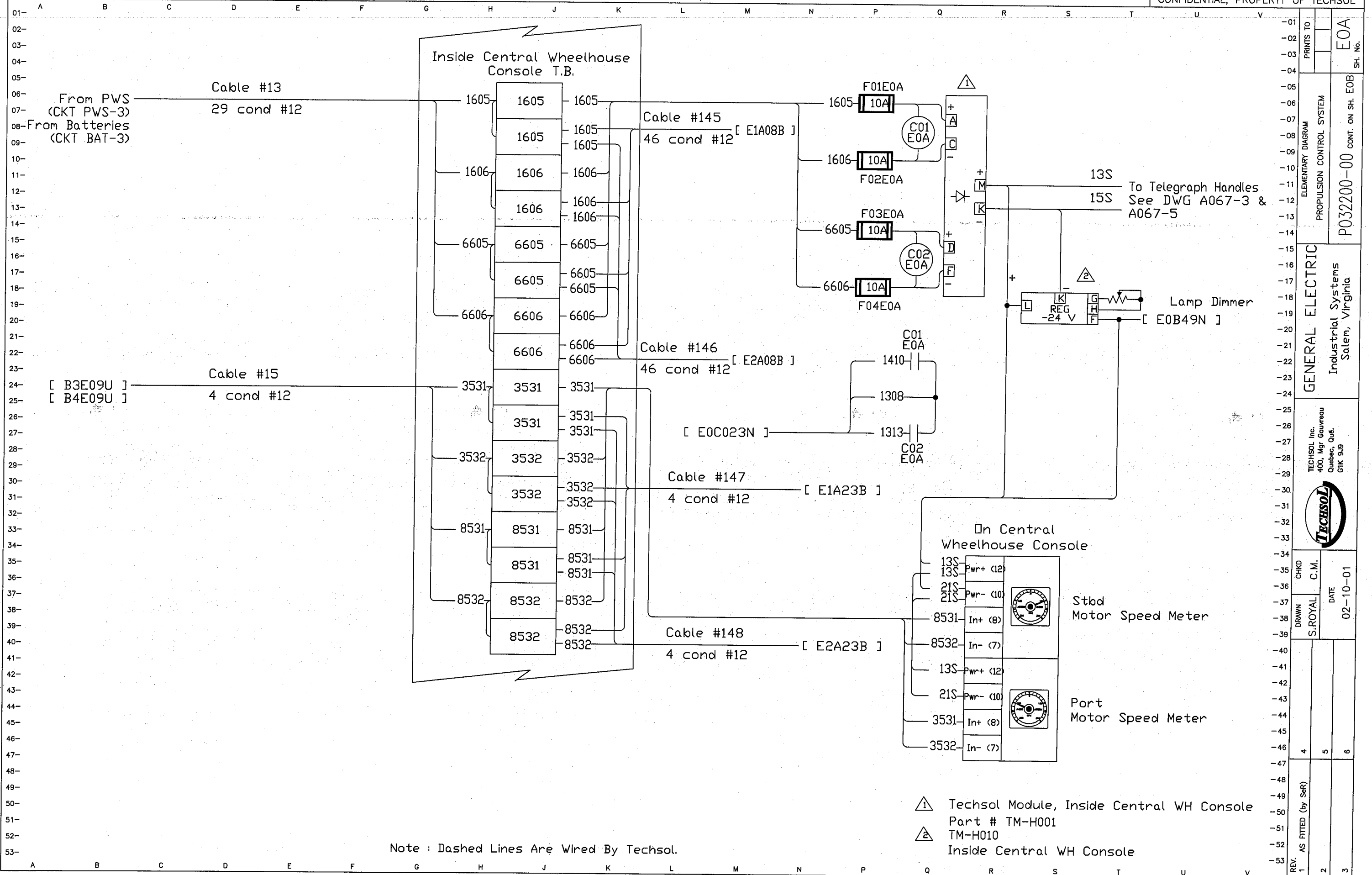
S-INTOC REV. A



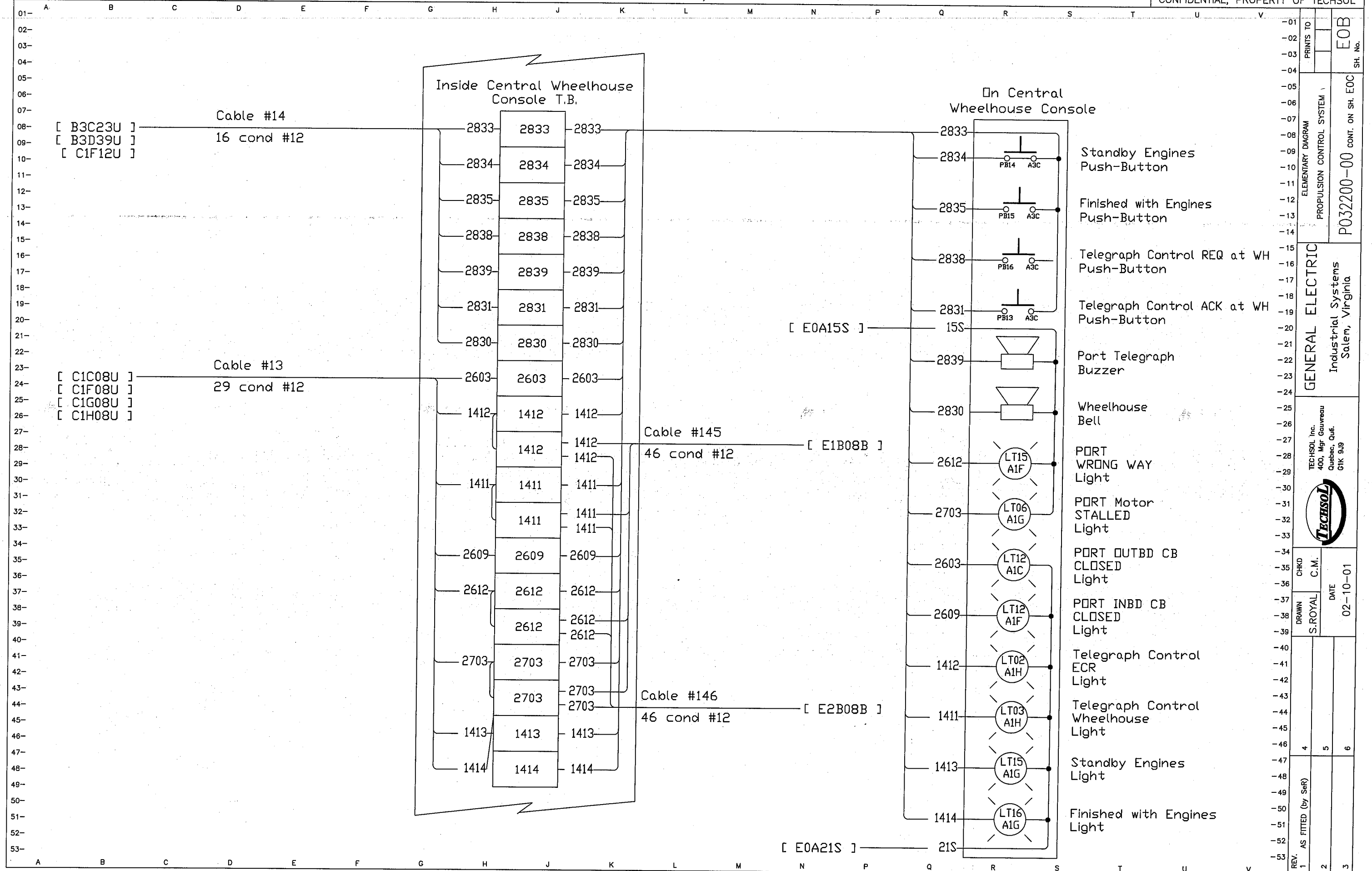
Note : Dashed Lines Are Wired By Techsol.

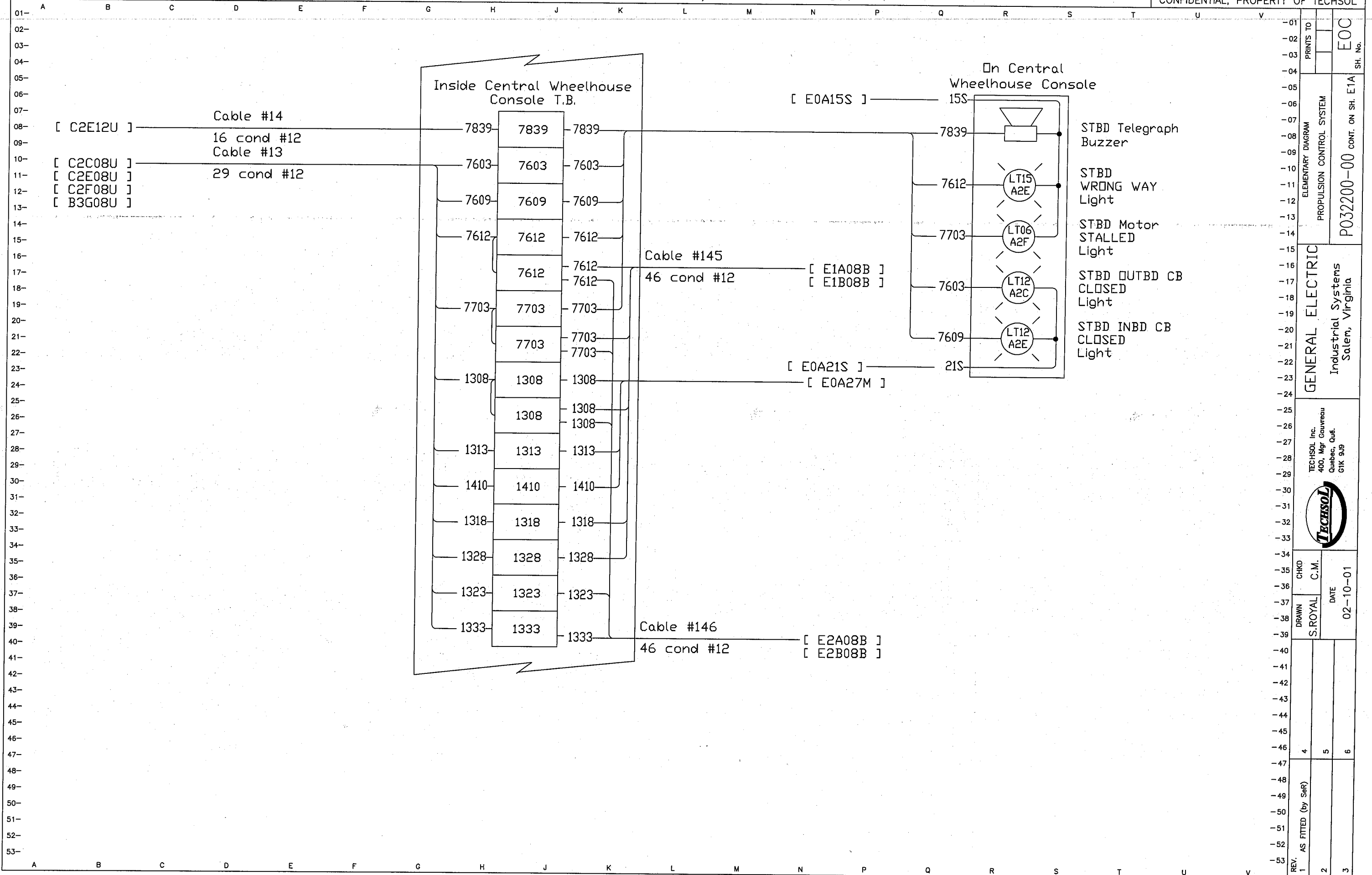


PRINTS TO	D2B	SH. No.
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM	P032200-00 CONT. ON SH. EOA
GENERAL ELECTRIC		
Industrial Systems Salem, Virginia		
TECHSOL Inc. 400, Mgr Gauthier Quebec, Que. G1K 9J9		
CHKD	C.M.	DATE
DRAWN	S.ROYAL	02-10-01
REV.	AS FITTED (by Ser)	
1	4	5
2		6
3		

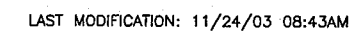


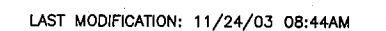
PRINTS TO	EA	SH. No.
ELEMENTARY DIAGRAM		
PROPULSION CONTROL SYSTEM		
P032200-00	CONT. ON SH. EOB	
GENERAL ELECTRIC	Industrial Systems	Salem, Virginia
TECHSOL Inc.	400, Mgr Gaurreau	Quebec, Que.
61K 9/9		
CHKD	C.M.	DATE
DRAWN	S.ROYAL	02-10-01
REV. 1	AS FITTED (by Sef)	
2		
3		

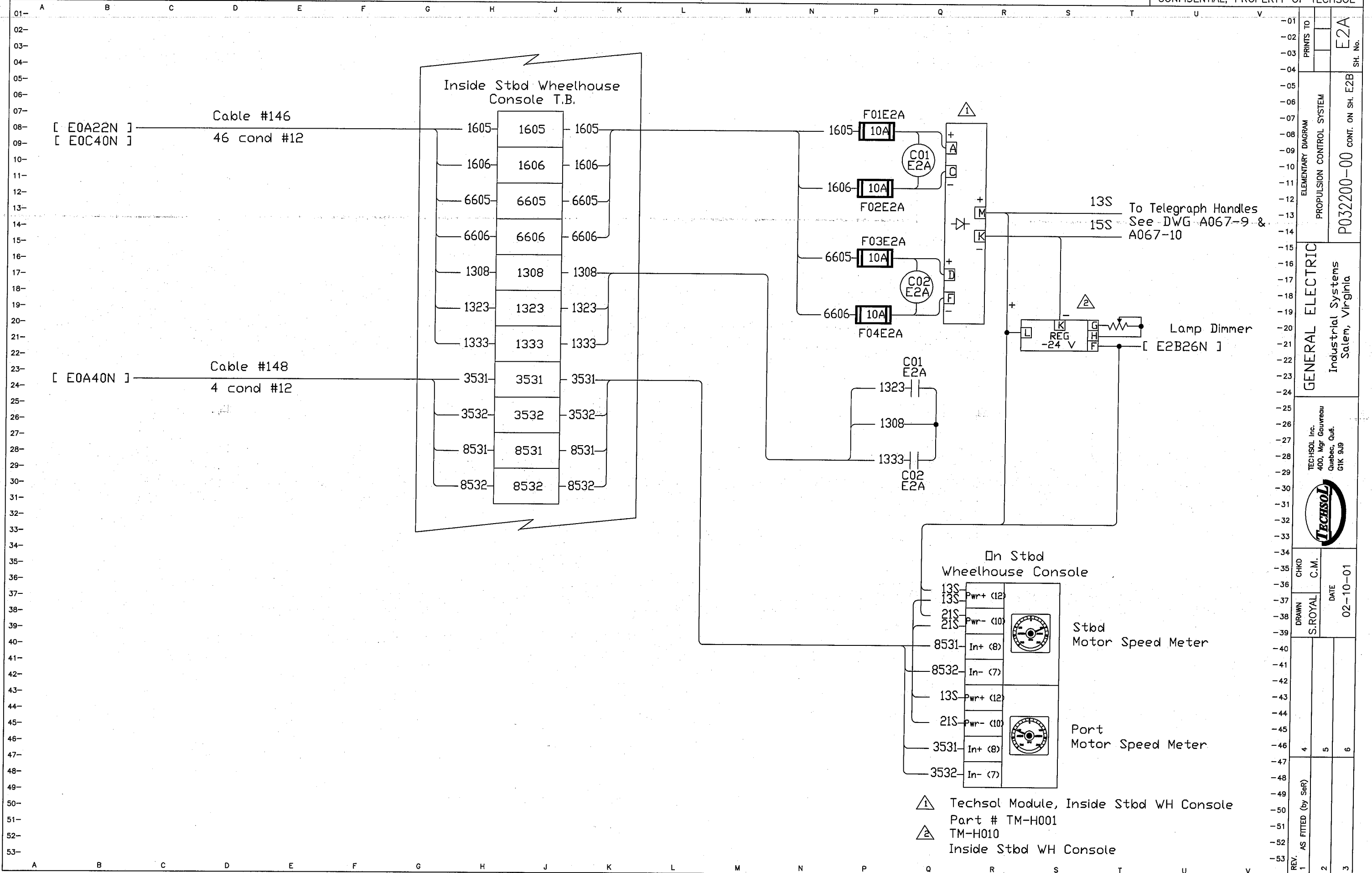




PRINTS TO	EOC
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9	
CHKD C.M.	DATE 02-10-01
DRAWN S. ROYAL	
REV. 1 AS FITTED (by Set)	
2	
3	







PRINTS TO	E2A
ELEMENTARY DIAGRAM	PROPULSION CONTROL SYSTEM
GENERAL ELECTRIC	Industrial Systems Salem, Virginia
TECHSOL Inc. 400, Mgr Gouveau Quebec, Que. G1K 9J9	
CHKD	C.M.
DRAWN	S. ROYAL
DATE	02-10-01
REV.	AS FITTED (by Set)
1	2
2	3
3	4
4	5
5	6

