

SINGLE PHASE WIRING FOR ASCO 7000 SERIES AUTOMATIC TRANSFER & BYPASS-ISOLATION SWITCHES TYPE J7ATB RATED 150-600 AMPERES

FEATURES, SETTINGS, OPERATION, ACCESSORIES & NOTES

THE FOLLOWING FEATURES AND RELATED SETTINGS ARE PART OF THE GROUP 5 CONTROL PANEL'S USER CONFIGURABLE PARAMETERS. FOR DETAILED INFORMATION REGARDING THE CONFIGURATION OF THESE PARAMETERS AND OTHER FEATURES OF THE GROUP 5 CONTROL PANEL, REFER TO THE GROUP 5 CONTROL PANEL FOR ASCO 7000 SERIES AUTOMATIC TRANSFER SWITCHES USER'S GUIDE (PART NO. 381333-126) PROVIDED WITH EVERY 7000 SERIES AUTOMATIC TRANSFER SWITCH.

THE NOMINAL OPERATING VOLTAGE & FREQUENCY IS PRE-PROGRAMMED AT THE FACTORY BASED ON THE NAMEPLATE DATA PRINTED ON THE TRANSFER SWITCH & CONTROL PANEL NAMEPLATES.

VOLTAGE & FREQUENCY SENSING

THE FOLLOWING SETTINGS ARE EXPRESSED AS A PERCENTAGE OF THE CONTROL PANEL'S NOMINAL VOLTAGE SETTING UNLESS STATED OTHERWISE. ALL SETTINGS ARE ADJUSTABLE IN INCREMENTS OF 1%.

A. RMS VOLTAGE SENSING ON ALL PHASES OF THE NORMAL & EMERGENCY SOURCES.

PARAMETER	RANGE OF SETTINGS	DEFAULT SETTING
NORMAL VOLTAGE DROPOUT	70-98%	85%
NORMAL VOLTAGE PICKUP	85-100%	90%
NORMAL OVER VOLTAGE TRIP	102-115%	OFF
NORMAL VOLTAGE UNBALANCE	YES/NO	NO
NORMAL VOLTAGE UNBALANCE DROPOUT	5-20% OF AVG. NORMAL VOLTAGE	20% (if ON)
NORMAL VOLTAGE UNBALANCE PICKUP	3-18% OF AVG. NORMAL VOLTAGE	10% (if ON)
EMERGENCY VOLTAGE DROPOUT	70-98%	75%
EMERGENCY VOLTAGE PICKUP	85-100%	90%
EMERGENCY OVER VOLTAGE TRIP	102-115%	OFF
EMERGENCY VOLTAGE UNBALANCE	YES/NO	NO
EMERGENCY VOLTAGE UNBALANCE DROPOUT	5-20% OF AVG. EMERGENCY VOLTAGE	20% (if ON)
EMERGENCY VOLTAGE UNBALANCE PICKUP	3-18% OF AVG. EMERGENCY VOLTAGE	10% (if ON)

B. FREQUENCY SENSING OF THE NORMAL & EMERGENCY SOURCES.

PARAMETER	RANGE OF SETTINGS	DEFAULT SETTING
NORMAL FREQUENCY DROPOUT	85-98%	90%
NORMAL FREQUENCY PICKUP	90-100%	95%
NORMAL OVER FREQUENCY TRIP	102-110%	OFF
EMERGENCY FREQUENCY DROPOUT	85-98%	90%
EMERGENCY FREQUENCY PICKUP	90-100%	95%
EMERGENCY OVER FREQUENCY TRIP	102-110%	OFF

TIME DELAYS

THE FOLLOWING TIME DELAY SETTINGS ALL HAVE AN ADJUSTABLE RANGE OF 0-60 min 59 sec UNLESS STATED OTHERWISE. ADJUSTABLE IN INCREMENTS OF 1 sec.
NOTE: SOME TIME DELAYS MAY BE EFFECTED BY CUSTOMER REQUESTED ACCESSORIES PROVIDED WITH THE UNIT. REFER TO THE DESCRIPTIONS PROVIDED UNDER THE "ACCESSORIES" NOTES ON THIS PAGE.

FEATURE	NAME	DEFAULT SETTING
1C	NORMAL SOURCE FAILURE TO ENGINE START	1 sec
2B	TRANSFER TO EMERGENCY ON AVAILABILITY OF EMERGENCY SOURCE	0 sec
1F	EMERGENCY SOURCE FAILURE RETRANSFER (NORMAL SOURCE AVAILABLE)	0 sec
2E	ENGINE COOLDOWN FOLLOWING RETRANSFER TO NORMAL	5 min
3A	RETRANSFER TO NORMAL (NORMAL FAILURE MODE)	30 min
3A	RETRANSFER TO NORMAL (TEST MODE)	30 sec
-	DELAYED TRANSFER (LOAD "OFF" TIME), [0-5 min 59 sec]	3 sec

DESCRIPTIONS OF TIME DELAYS:

FEAT. 1C - DELAY ON NORMAL SOURCE OUTAGE. STARTS ON FAILURE OF NORMAL SOURCE. RESETS IF NORMAL SOURCE IS ACCEPTED BEFORE EXPIRATION. INHIBITS ENGINE STARTING AND AUTOMATIC TRANSFER UNTIL EXPIRATION.

FEAT. 2B - DELAY PRIOR TO TRANSFER TO THE EMERGENCY SOURCE. DELAY STARTS ON EXPIRATION OF FEAT. 1C AND WHEN THE EMERGENCY SOURCE HAS BEEN ACCEPTED. DELAY RESETS IF THE EMERGENCY SOURCE FAILS PRIOR TO EXPIRATION. ON EXPIRATION, TRANSFER TO EMERGENCY IS INITIATED UNLESS THE NORMAL SOURCE HAS RECOVERED AND THE "COMMIT TO TRANSFER" FEATURE IS SET TO "NO" COMMIT. PROVIDES A PERIOD FOR EMERGENCY SOURCE STABILIZATION OR STAGING OF MULTIPLE TRANSFER SWITCH CONTROLLED LOADS TO THE EMERGENCY SOURCE.

FEAT. 1F - DELAY ON RETRANSFER TO NORMAL IN THE EVENT OF EMERGENCY SOURCE FAILURE. DELAY BEGINS ON FAILURE OF THE EMERGENCY SOURCE IF THE NORMAL SOURCE IS ACCEPTABLE. ON EXPIRATION, RETRANSFER TO NORMAL WILL BE INITIATED.

FEAT. 2E - DELAY ON ENGINE SHUTDOWN (ENGINE COOL DOWN PERIOD). DELAY STARTS FOLLOWING RETRANSFER TO THE NORMAL SOURCE. PROVIDES A PERIOD FOR THE ENGINE-GENERATOR SET TO RUN UNLOADED PRIOR TO SHUTDOWN.

FEAT. 3A - RETRANSFER TO NORMAL DELAY (NORMAL FAILURE MODE)
DELAY STARTS WHEN NORMAL SOURCE IS ACCEPTED (FOLLOWING IT'S FAILURE) AND WHILE THE LOAD IS CONNECTED TO EMERGENCY. RESETS IF NORMAL FAILS PRIOR TO EXPIRATION OR IF THE EMERGENCY SOURCE FAILS BEFORE EXPIRATION AND FEAT. 1F EXPIRES (AUTOMATIC BYPASS ON EMERGENCY SOURCE FAILURE). PROVIDES A PERIOD FOR THE NORMAL SOURCE TO STABILIZE PRIOR TO RETRANSFER.

FEAT. 3A - RETRANSFER TO NORMAL DELAY (TEST MODE)
DELAY STARTS WHEN THE "TRANSFER TEST" SWITCH IS RESET TO "AUTO" (FOLLOWING A USER INITIATED TRANSFER TEST) AND WHILE THE LOAD IS CONNECTED TO EMERGENCY. RESETS IF NORMAL FAILS PRIOR TO EXPIRATION OR IF THE EMERGENCY SOURCE FAILS BEFORE EXPIRATION AND FEAT. 1F EXPIRES (AUTOMATIC BYPASS ON EMERGENCY SOURCE FAILURE).

MOTOR LOAD TRANSFER FEATURE

FEAT. 27 - INPHASE TRANSFER CONTROL LOGIC TO INITIATE AN INPHASE TRANSFER OF LOADS BETWEEN LIVE SOURCES. USED TO PREVENT NUISANCE TRIPPING OF CIRCUIT BREAKERS AND POSSIBLE DAMAGE TO MECHANICAL LOADS CAUSED BY OUT OF PHASE TRANSFER.

ACTIVATED VIA THE GROUP 5 CONTROL PANEL USER INTERFACE (TRANSFER CONTROL CENTER) BY SELECTING "IN-PHASE MONITOR ENABLE" = YES. AN ADJUSTABLE DELAY (0.0-3.0 sec, FACTORY SET TO 1.5 sec, IN INCREMENTS OF 0.1 sec) DELAYS SENSING TO PERMIT STABILIZATION OF THE SOURCES PRIOR TO SENSING. FACTORY SETTING IS DISABLED UNLESS SPECIFIED TO BE FACTORY ACTIVATED AT THE TIME OF ORDER.

ENGINE EXERCISER

THE ENGINE EXERCISER FEATURE PROVIDES A MEANS TO PERFORM AUTOMATIC EXERCISING OF THE ENGINE-GENERATOR SET EITHER WITH OR WITHOUT LOAD TRANSFER.

THE USER CAN PROGRAM UP TO SEVEN DIFFERENT EXERCISE ROUTINES. EACH ROUTINE INCLUDES:
1. ENABLE OR DISABLE THE ROUTINE
2. ENABLE OR DISABLE TRANSFER OF THE LOAD DURING THE ROUTINE
3. SET START TIME OF ROUTINE -
- TIME OF DAY
- DAY OF WEEK
- WEEK OF MONTH (1st, 2nd, 3rd, 4th, ALTERNATE OR ALL)
4. SET THE DURATION OF THE ROUTINE

PARAMETER		RANGE OF SETTING												DEFAULT SETTING
MONTH	(CLOCK SET)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	CURRENT DATE
DAY		1-31												
YEAR		00-99												
HOUR		0-23												
MINUTE		0-59												
ENABLE ROUTINE (ROUTINE 1-7)		YES/NO												
TRANSFER LOAD		YES/NO												
START HOUR		0-23												
START MINUTE		0-59												
RUN WEEK		ALL, ALTERNATE, 1st, 2nd, 3rd, 4th, 5th												
RUN DAY		SUN MON TUE WED THU FRI SAT												
DURATION HOURS		0-23												
DURATION MINUTES		0-59												

SIGNALS & AUXILIARIES

- A. FEATURE 7 - ENGINE START SIGNAL
SIGNAL INITIATED BY DROPOUT OF CONTROL PANEL RELAY (NR) FOLLOWING EXPIRATION OF THE FEATURE 1C TIME DELAY (DELAY TO OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES). FEATURE 7 CLOSSES TO SIGNAL ENGINE START. ENGINE STARTING SIGNAL RESETS FOLLOWING RETRANSFER TO THE NORMAL SOURCE AND EXPIRATION OF THE FEATURE 2E (ENGINE COOL DOWN) TIME DELAY.
FEATURE 7 CONSISTS OF A FORM A CONTACT CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB). CONTACTS RATED 5 AMPS AT 32VDC/120VAC RESISTIVE.
- B. FEATURES 14AG & 14BG - TRANSFER SWITCH AUXILIARY POSITION INDICATING CONTACTS. EIGHT (8) FORM C CONTACTS TO INDICATE CONNECTION OF THE TRANSFER SWITCH TO NORMAL (14A) AND EIGHT (8) FOR EMERGENCY (14B). CONTACTS CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB). CONTACTS RATED 10 AMPS, 32 VDC, 250 VAC.

- C. FEATURE 17 - REMOTE TRANSFER TO EMERGENCY.
REQUIRES A CUSTOMER SUPPLIED NORMALLY OPEN CONTACT. CLOSING OF THE CONTACT CAUSES ENGINE START AND TRANSFER TO THE EMERGENCY SOURCE. OPENING OF THE CONTACT ACTIVATES THE FEATURE 3A (RETRANSFER TO NORMAL) DELAY PRIOR TO RETRANSFER. IN THE EVENT THE EMERGENCY SOURCE FAILS WHILE THE TRANSFER SWITCH IS CONNECTED TO EMERGENCY AND THE REMOTE CONTACT IS CLOSED, THE TRANSFER SWITCH WILL RETRANSFER TO THE NORMAL SOURCE. CONNECTED TO THE FIELD CONNECTIONS TERMINAL BLOCK (TB).
- OPERATION

IF THE NORMAL SOURCE FAILS, THE TRANSFER SWITCH INITIATES STARTING OF THE ENGINE-GENERATOR SET. WHEN PROPER VOLTAGE AND FREQUENCY HAVE BEEN ATTAINED, THE LOAD WILL BE TRANSFERRED TO THE EMERGENCY SOURCE.

WHEN THE NORMAL SOURCE IS RESTORED FOR THE DURATION OF THE FEATURE 3A (RETRANSFER TO NORMAL) TIME DELAY SETTING, THE LOAD WILL BE RETRANSFERRED TO THE NORMAL SOURCE.

THE ENGINE WILL CONTINUE TO RUN FOR THE ENGINE COOL DOWN PERIOD, FEATURE 2E.

USER CONTROLS AND INDICATIONS

- A. FEATURES 5 & 6B - TRANSFER TEST/RETRANSFER TIME DELAY BYPASS CONTROLS.
TRANSFER TEST:
OPERATION CAUSES A NORMAL SOURCE FAILURE SEQUENCE. ACTIVATE AND HOLD FOR AT LEAST 15 SECONDS TO ALLOW TIME FOR THE ENGINE-GENERATOR TO START.
RETRANSFER TIME DELAY BYPASS:
OPERATION WILL BYPASS THE FEATURE 3A (RETRANSFER TO NORMAL DELAY).
- B. FEATURES 9A & 9B - TRANSFER SWITCH POSITION INDICATORS.
FEATURE 9A: TRANSFER SWITCH CLOSED ON NORMAL (GREEN LED)
FEATURE 9B: TRANSFER SWITCH CLOSED ON EMERGENCY (RED LED)
- C. FEATURES 9C & 9D - SOURCE ACCEPTANCE INDICATORS.
FEATURE 9C: NORMAL SOURCE ACCEPTED (GREEN LED)
FEATURE 9D: EMERGENCY SOURCE ACCEPTED (RED LED)

BYPASS SWITCH & ISOLATION USER CONTROLS & INDICATIONS

A. BYPASS / ISOLATION DISPLAY INDICATORS - LED TYPE, COMMON LAMP TEST

NORMAL SOURCE AVAILABLE - GREEN
EMERGENCY SOURCE AVAILABLE - RED

TRANSFER SWITCH CONNECTED TO NORMAL - GREEN
TRANSFER SWITCH CONNECTED TO EMERGENCY - RED

BYPASS SWITCH CONNECTED TO NORMAL - GREEN
BYPASS SWITCH CONNECTED TO EMERGENCY - RED

LOAD CONNECTED - AMBER

TS IN CONNECTED POSITION - AMBER
TS IN TEST POSITION - AMBER
TS ISOLATED - AMBER

UNIT NOT IN AUTOMATIC - AMBER

- B. BYPASS / ISOLATION DISPLAY ENGINE CONTROL SWITCH
TWO (2) POSITION
"AUTO" - ENGINE STARTING CONTROLLED BY TRANSFER SWITCH CONTROL PANEL
"RUN" - SIGNALS ENGINE TO START

BASE CATALOG NUMBER				CATALOG NUMBER SUFFIXES		
CATALOG TYPE	NEUTRAL TYPE	PHASE POLES	AMPS	VOLT CODE	CONTROLLER	ENCLOSURE CODE
J7ATB	A	2	150 200 230 260 400 600	A	5	X
				B		
				C		
				D		
				E		
				F		
				G		
				H		
				I		
				J		
				K		
				L		
				M		
				N		
				P		
				Q		
				R		
	BLANK FOR NONE				BLANK FOR NONE	BLANK FOR OPEN TYPE

EXPLANATION OF CATALOG NUMBER CODES									
NEUTRAL TYPE		VOLTAGE CODES 1 PHASE (2 OR 3 WIRE) 50 OR 60 Hz		ENCLOSURE CODES					
CODE	DESCRIPTION	CODE	NOMINAL VOLTAGE	CODE	TYPE	DESCRIPTION			
BLANK	NONE	A	115	BLANK		OPEN TYPE (NO ENCLOSURE)			
A	SOLID	B	120	C	1	GENERAL PURPOSE, INDOOR			
B	SWITCHING	C	208	E	2	INDOOR, WATER & DUST RESISTANT			
C	OVERLAPPING	D	220	F	3R	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT			
		E	230	G	4	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT			
		F	240	H	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)			
		G	277	J	4X	TYPE 4 PLUS CORROSION RESISTANCE (FIBERGLASS)			
		H	380	K	7	EXPLOSION PROOF			
		I	400	L	12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT			
		J	415						
		K	440						
		L	460	M	3R	(SECURE ENCLOSURES)			
		M	480	N	4	OUTDOOR, RAINPROOF, SLEET & ICE RESISTANT			
		P	550	P	4X	INDOOR/OUTDOOR, WATERTIGHT & DUSTTIGHT			
		Q	575	Q	4X	TYPE 4 PLUS CORROSION RESISTANCE (STAINLESS STEEL)			
		R	600		12	INDOOR, INDUSTRIAL ENVIRONMENTS, OILTIGHT & DUSTTIGHT			

- C. BYPASS / ISOLATION INTERLOCKS (SOLENOID ACTUATED)
SL1: INTERLOCKS THE TRANSFER SWITCH ISOLATION CRANK WITH THE TRANSFER AND BYPASS SWITCHES TO INSURE THAT:

THE TRANSFER SWITCH CANNOT BE DISCONNECTED WITHOUT BEING BYPASSED.

THE TRANSFER SWITCH CANNOT BE RECONNECTED UNLESS IT IS IN THE SAME POSITION AS THE BYPASS SWITCH.

- SL2: INTERLOCKS THE BYPASS SWITCH OPERATOR WHEN THE TRANSFER SWITCH IS IN THE CONNECTED POSITION TO INSURE THAT THE BYPASS SWITCH CANNOT BE OPERATED TO A SOURCE OTHER THAN THAT WHICH THE TRANSFER SWITCH IS CONNECTED TO.

GENERAL NOTES

- SWITCH SHOWN DE-ENERGIZED AND CONNECTED TO THE NORMAL SOURCE. THE BYPASS SWITCH OPERATOR IS IN THE "OFF" (AUTOMATIC) POSITION WITH THE ISOLATION CRANK (TS) IN THE FULLY CONNECTED POSITION.
- DEVICE SYMBOLS AND DESIGNATIONS ARE IN ACCORDANCE WITH NEMA PUBLICATION ICS 1-1983, PART 1-101A.
- ALL WIRING IS #16 AWG, TINNED, STRANDED COPPER UNLESS OTHERWISE INDICATED.
- O ON TERMINAL BLOCKS INDICATES AVAILABLE FIELD CONNECTION POINT.
- ON TERMINAL BLOCKS INDICATES FACTORY CONNECTION POINT.
- CONTROL AND ACCESSORY WIRING IS ROUTED IN ACCORDANCE WITH ASCO ASSEMBLY PROCEDURE GS451261.
- AN OPERATOR'S MANUAL IS FURNISHED WITH EACH AUTOMATIC TRANSFER SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE UNIT.

TECHNICAL DATA

BYPASS SWITCH AUXILIARY CONTACTS

BP AUXILIARY CONTACT	STATUS (*)	BP SWITCH POSITION (AUX3)		
		EMERG	OFF	NORMAL
81-82	●			
83-84	●			
85-86	●			
87-88	●			
89-90	●			
91-92	●			
93-94	●			
101-102	●			
103-104	●			
105-106	●			
107-108	●			
109-110	●			
111-112	●			
113-114	●			
115-116	●			
117-118	●			
125-126	●			
127-128	●			

BYPASS SWITCH OPERATOR AUXILIARY CONTACTS

BP AUXILIARY CONTACT	STATUS (*)	BP SWITCH HANDLE POSITION			
		NORMAL (CCW)		OFF	EMERGENCY (CW)
		BYPASS (<±90°)	<> ±20°		<> ±20° BYPASS (<±90°)
(AUX4)	140-141	●			
	140-142	●			
	146-147	●			
	146-148	●			
(AUX5)	137-138	●			
	137-139	●			
	143-144	●			
	143-145	●			

ISOLATION (TRANSFER SWITCH CARRIAGE POSITION) AUXILIARY CONTACTS

IS AUXILIARY CONTACT	STATUS (*)	TRANSFER SWITCH CARRIAGE POSITION			
		CONNECT	>	TEST	> ISOLATE
1-2	●				
1-3	●				
4-5	●				
4-6	●				
7-8	●				
7-9	●				
10-11	●				
10-12	●				
13-14	●				
13-15	●				
16-17	●				
16-18	●				
19-20	●				
19-21	●				
22-23	●				
22-24	●				
25-26	●				
25-27	●				
28-29	●				
28-30	●				

(*) CONTACT AVAILABILITY STATUS:

● CONTACT PROVIDED & USED IN CIRCUITRY

"BLANK" CONTACT NOT USED. IF PHYSICALLY AVAILABLE, CONTACT IS FOR FACTORY USE ONLY!

CATALOG NUMBER _____

ASCO CERTIFIED TO

S.O. _____

BY: _____

DATE: _____

FORM REV D

PROJECT NAME: _____

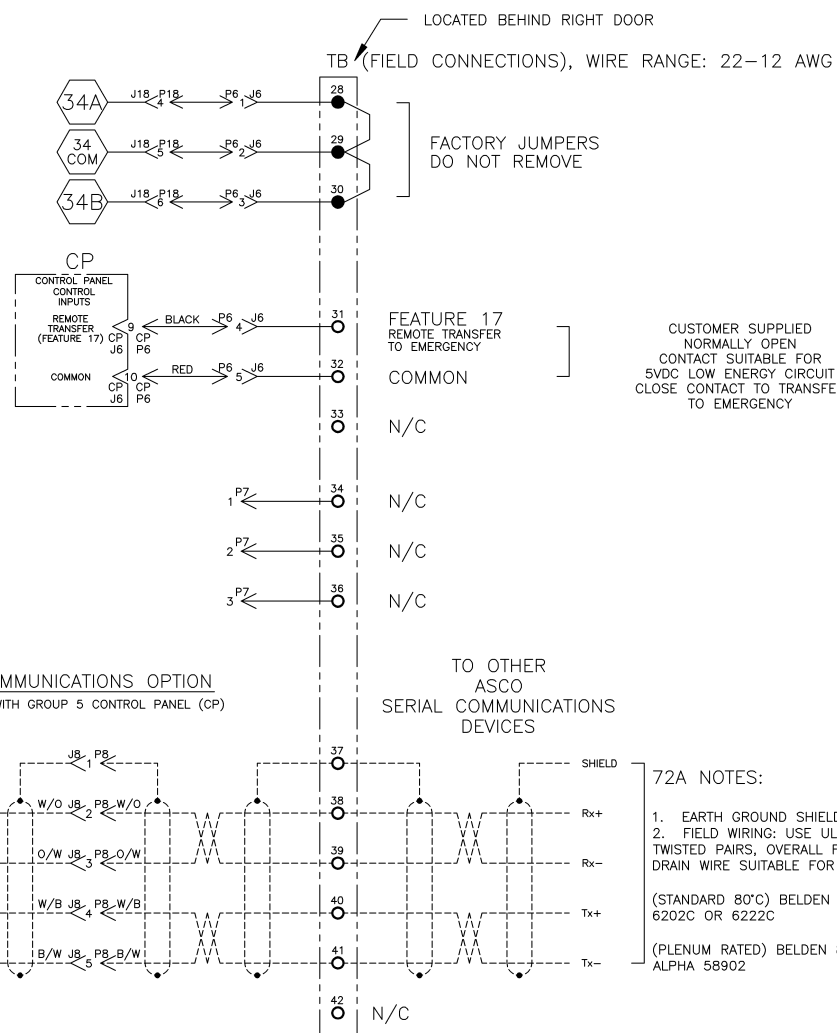
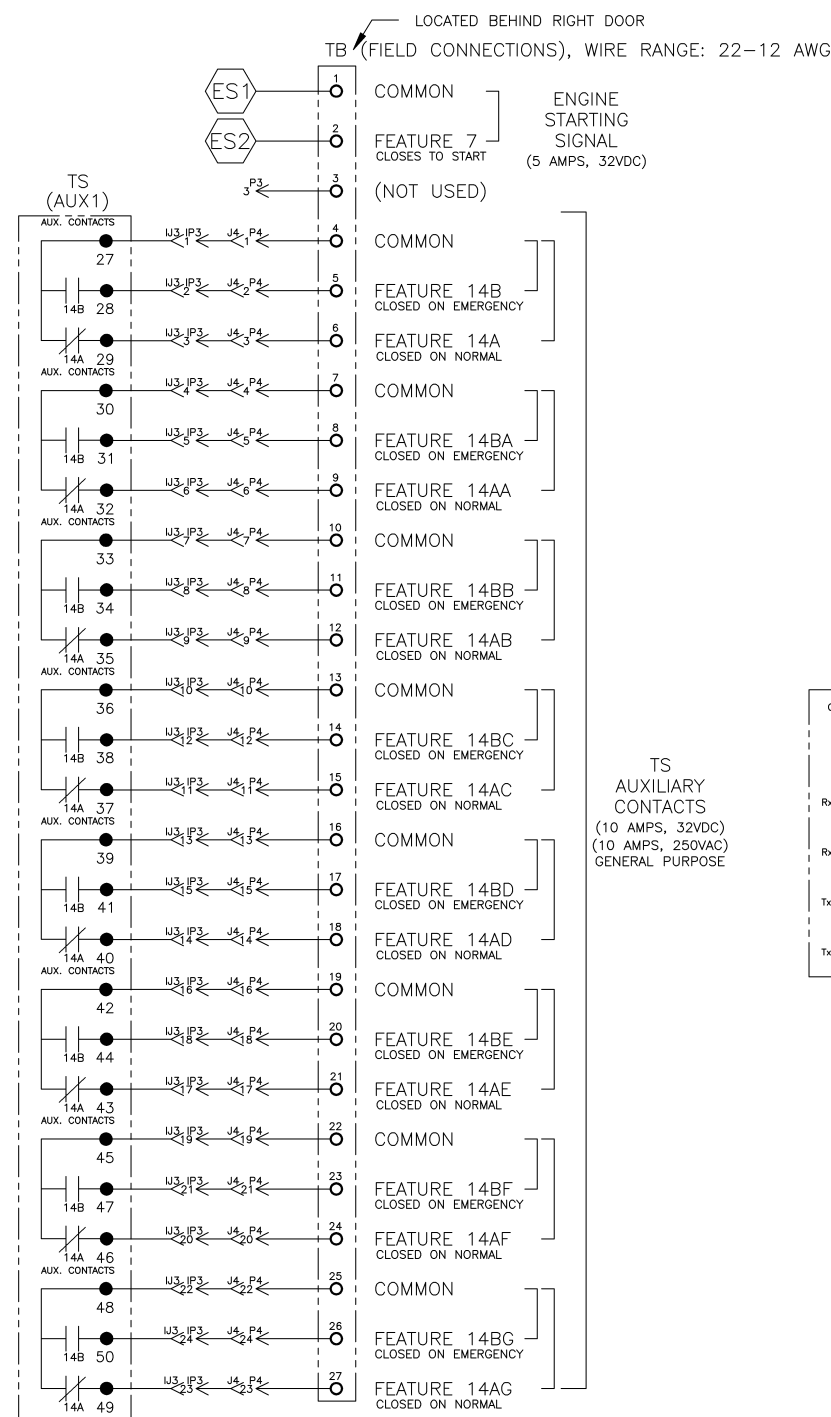
WIRING _____

DIAGRAM _____

7000 SERIES (J7ATB) 1PH 150-600 AMPS

"J" FRAME, GROUP 5 CONTROLS

FIELD CONNECTIONS



72A NOTES:

1. EARTH GROUND SHIELD AT HOST DEVICE ONLY.
2. FIELD WIRING: USE UL LISTED, STRANDED, TWISTED PAIRS, OVERALL FOIL SHIELD WITH STRANDED DRAIN WIRE SUITABLE FOR RS-422 EQUIVALENT TO:

(STANDARD 80°C) BELDEN 9842 OR 9829 OR ALPHA 6202C OR 6222C

(PLENUM RATED) BELDEN 89729 OR 82729 OR ALPHA 58902

				D		214353		WK	BK	07/24/07			
				REV. TO SHEET		ECN NO.		BY	APP.	DATE			
PROJECT NAME:													
WIRING				DIAGRAM						THIRD ANGLE PROJECTION			
7000 SERIES (J7ATB) 1PH 150-600 AMPS													
"J" FRAME, GROUP 5 CONTROLS													
BY		DATE		MANUFACTURING TOLERANCES TO BE, IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003.				ASSEM. REF. NO.					
DRAWN BY		MR		11/17/06		FOR PLASTIC PARTS SEE MP-1-005							
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES, USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				COMPUTER GENERATED DRAWING					
PROJECT APPROVAL								SCALE 1:1		SIZE DS			
								DWG. NO.		806094			
FINAL APPROVAL		JPB		11/17/06		 ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.							
						DRAWING REV D		ECN 214353		SHEET 2 OF 8			

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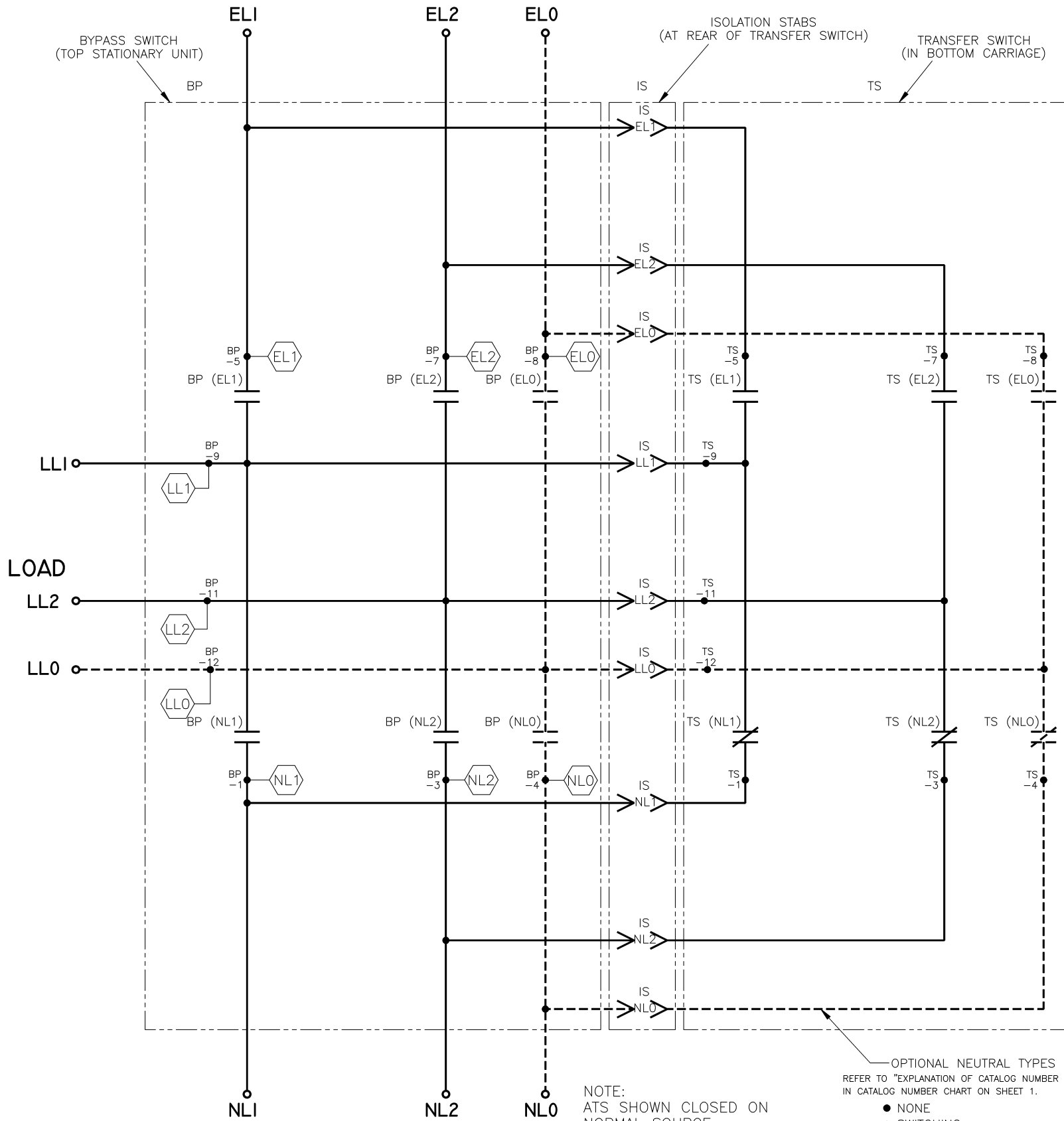
C

B

A

MAIN POWER POLES

EMERGENCY



NOTE:
ATS SHOWN CLOSED ON
NORMAL SOURCE.
BYPASS SWITCH IN
(AUTOMATIC) POSITION.

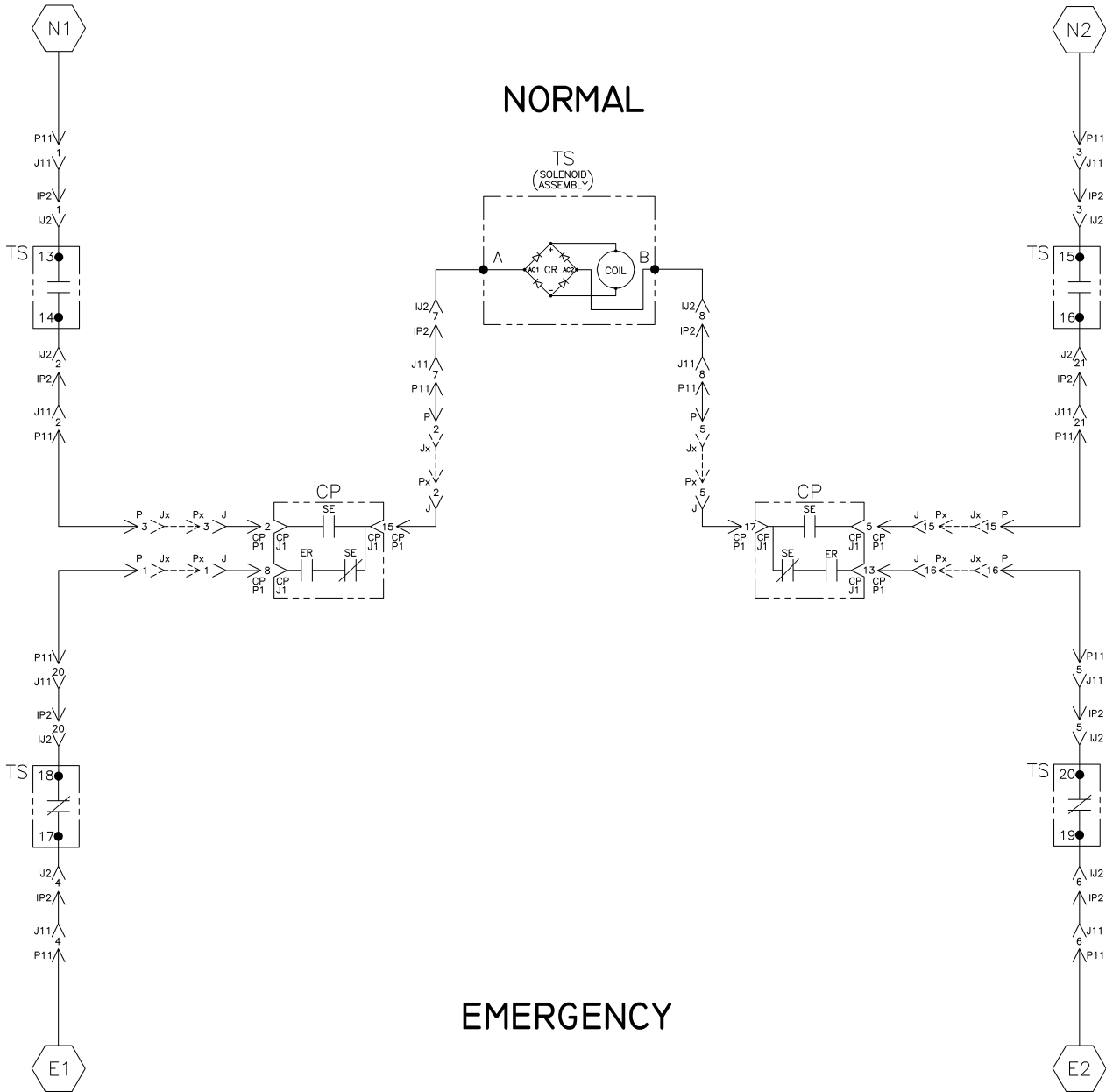
OPTIONAL NEUTRAL TYPES
REFER TO "EXPLANATION OF CATALOG NUMBER CODES"
IN CATALOG NUMBER CHART ON SHEET 1.

- NONE
- SWITCHING
- OVERLAPPING CONTACTS
- SOLID BUS PLATE

NORMAL

TS OPERATOR CIRCUIT

NORMAL



EMERGENCY

TS CONTROL CONTACTS		SOLENOID POSITION			
TS		CLOSED BEFORE NORMAL TDC		BEFORE CLOSED EMERG	
		>	<	<	>
13-14					
15-16					
17-18					
19-20					

TDC (TOP DEAD CENTER)
TRANSFER SWITCH TEST & ADJUSTMENT PROCEDURE
SPECIFIES CONTROL CUT-OFF (CONTACT OPENING)
SETTING.

PROJECT NAME:		214353 WK BK 07/24/07	
WIRING		DIAGRAM	
7000 SERIES (J7ATB) 1PH 150-600 AMPS			
"J" FRAME, GROUP 5 CONTROLS			
DRAWN BY	MR	DATE	11/17/06
CHECKED		DATE	
PROJECT APPROVAL		DATE	
FINAL APPROVAL	JPB	DATE	11/17/06
ASCO POWER TECHNOLOGIES, L.P.		FLORHAM PARK, NEW JERSEY 07932 U.S.A.	
DWG. NO. 806094		SCALE 1:1 SIZE DS	
DRAWING D		ECON. NO. 214353	
REV		SHEET 3 OF 8	

D

C

B

A

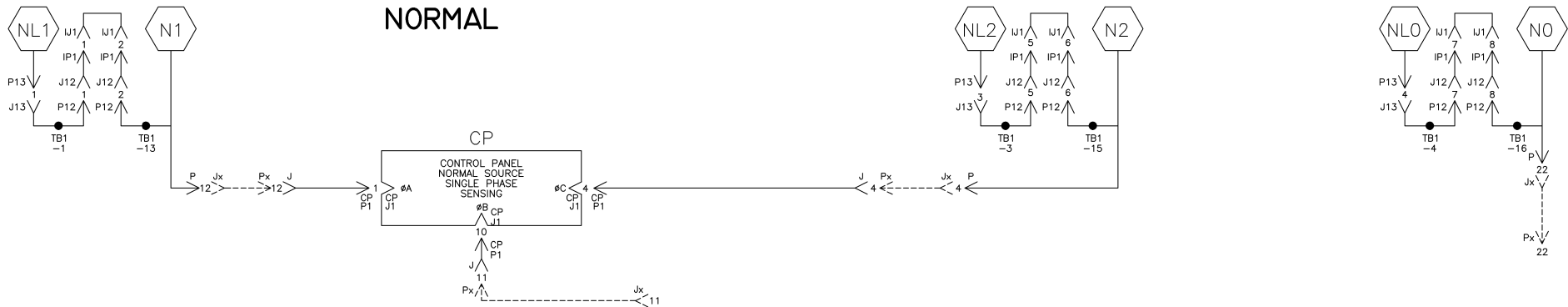
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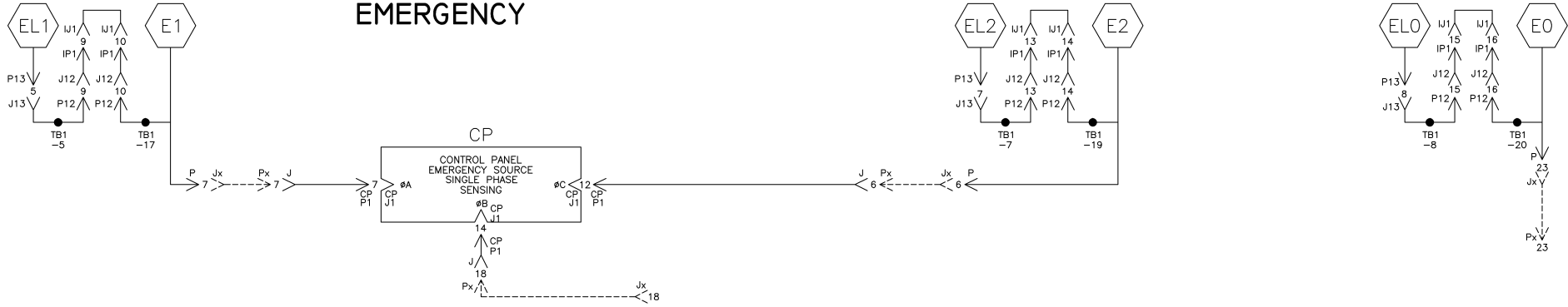
B

A

NORMAL SOURCE CIRCUITS



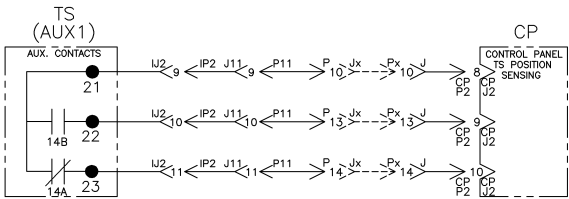
EMERGENCY SOURCE CIRCUITS



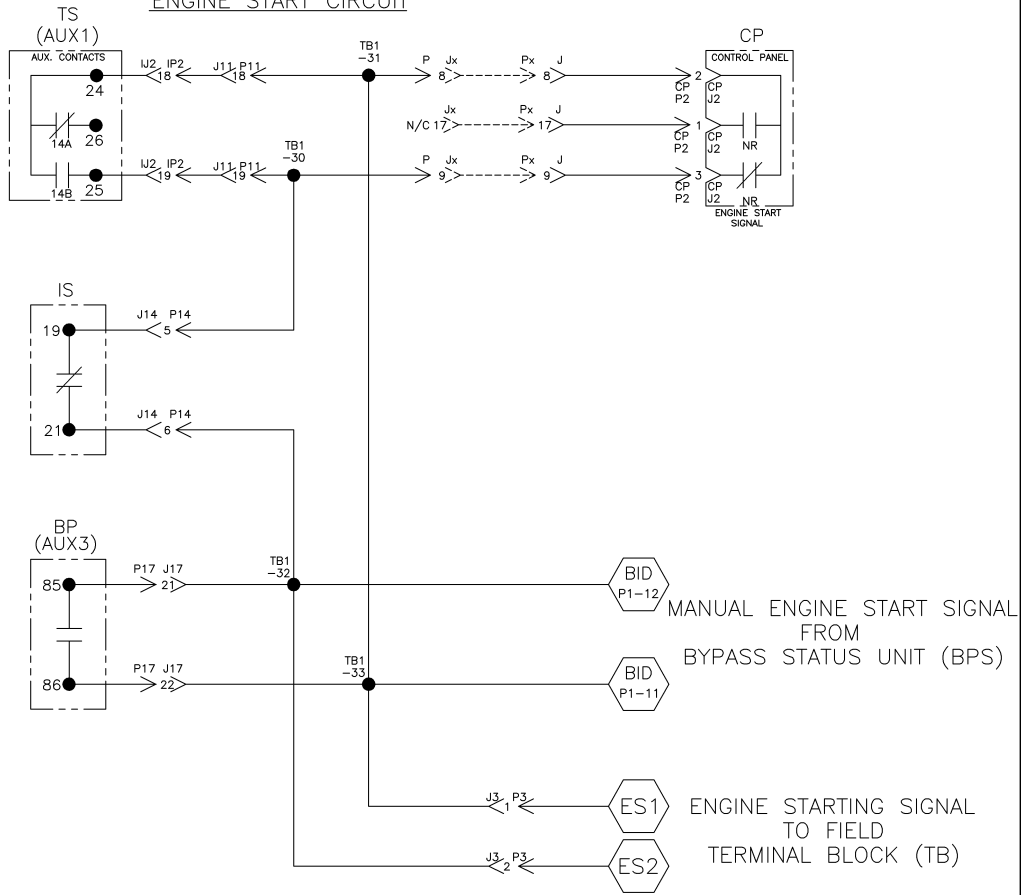
LOAD TERMINAL CIRCUITS



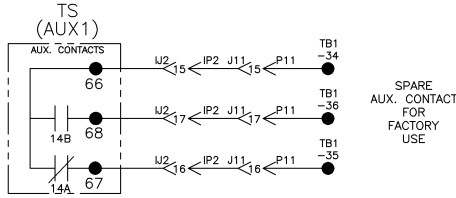
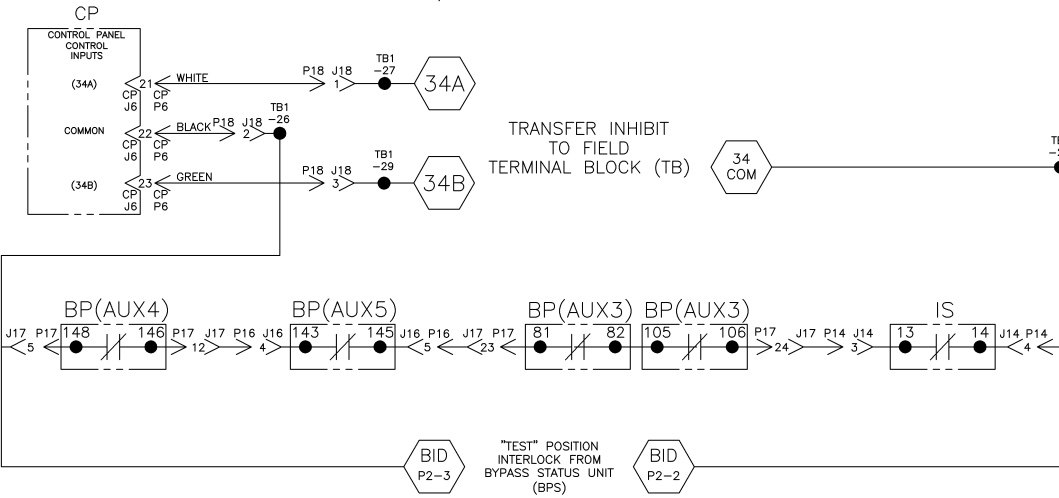
CONTROL SIGNALS & INDICATION



ENGINE START CIRCUIT



CONTROL PANEL/BYPASS-ISOLATION INTERLOCKS

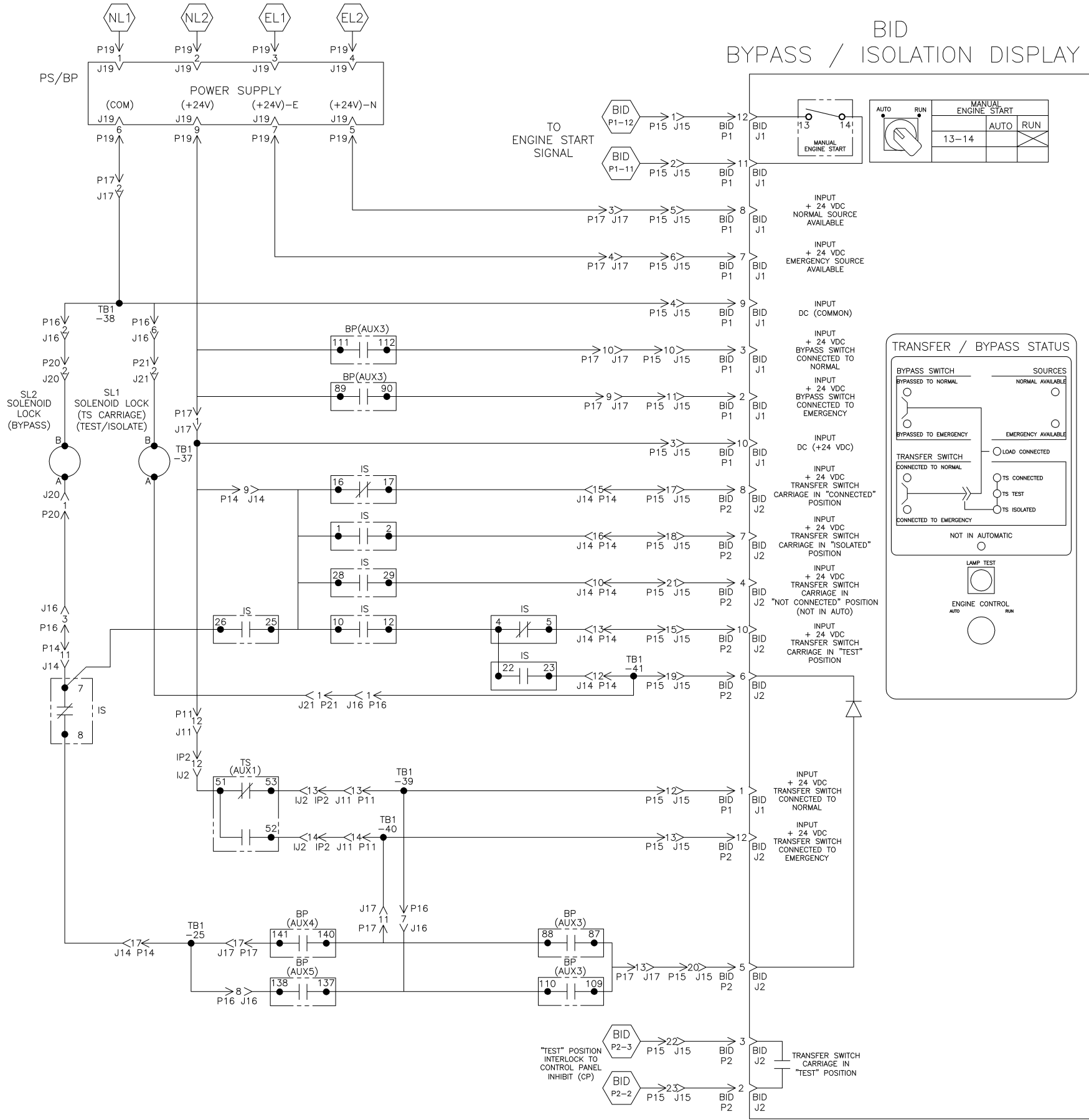


PROJECT NAME:		REV. TO SHEET	ECON NO.	BY	APP.	DATE
WIRING		SEE ECON				
7000 SERIES (J7ATB) 1PH 150-600 AMPS						
"J" FRAME, GROUP 5 CONTROLS						
DRAWN BY	MR	DATE	11/17/06	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-005.	ASSEM. REF. NO.	COMPUTER GENERATED DRAWING
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE 1:1 SIZE DS
PROJECT APPROVAL						DWG. NO. 806094
FINAL APPROVAL	JPB	11/17/06		ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DRAWING REV. D ECON NO. 214353 SHEET 4 OF 8

BYPASS / ISOLATION INTERLOCKING & INDICATION

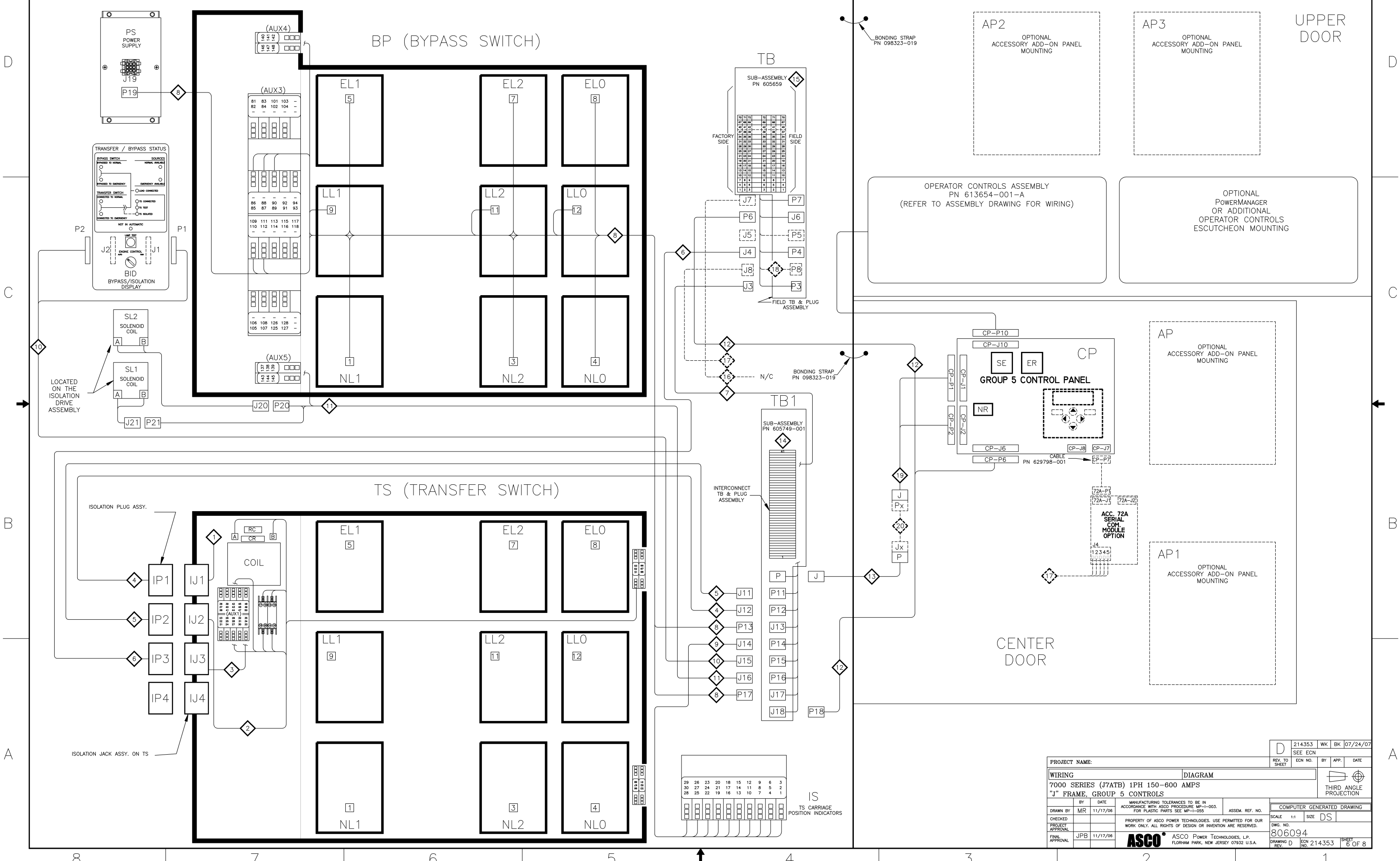
ADDITIONAL CIRCUITS

BID
BYPASS / ISOLATION DISPLAY



PROJECT NAME:		REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING		DIAGRAM				
7000 SERIES (J7ATB) 1PH 150-600 AMPS						
"J" FRAME, GROUP 5 CONTROLS						
DRAWN BY	MR	DATE	11/17/06	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005.	ASSEM. REF. NO.	COMPUTER GENERATED DRAWING
CHECKED				PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		SCALE 1:1 SIZE DS
PROJECT APPROVAL						DWG. NO. 806094
FINAL APPROVAL	JPB	11/17/06		ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DRAWING D ECN NO. 214353 SHEET 5 OF 8

PHYSICAL DIAGRAM



PROJECT NAME:		WIRING		DIAGRAM	
7000 SERIES (J7ATB) 1PH 150-600 AMPS				THIRD ANGLE PROJECTION	
"J" FRAME, GROUP 5 CONTROLS					
BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005		COMPUTER GENERATED DRAWING	
DRAWN BY	MR	11/17/76	ASSEM. REF. NO.		SCALE 1:1 SIZE DS
CHECKED		PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		DWG. NO. 806094	
PROJECT APPROVAL					
FINAL APPROVAL	JPB	11/17/76	 ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.		DRAWING NO. 214353 SHEET 6 OF 8

WIRE RUN LISTING

 HARNESSED WIRE LOCATOR		BOX CHECKED IF HARNESSED WIRE IS MOVED ☐	
WIRE No.	HARNESSED WIRE 605674-001 (W1) TS	CLR	AWG
1	W1-1, W1-2		16
2	W1-3, W1-4		
3	W1-5, W1-6		
4	W1-7, W1-8		
5	W1-9, W1-10		
6	W1-11, W1-12		
7	W1-13, W1-14		
8	W1-15, W1-16		
9	W1-17, W1-18		
10	W1-19, W1-20		
11	W1-21, W1-22		
12	W1-23, W1-24		

 HARNES LOCATOR		BOX CHECKED IF HARNES IS MODIFIED	☐
WIRE No.	HARNES 806064--001 (U2) TS	CLR	AWG 16
1	U2-1,TS-13		
21	U2-2,TS-14		
3	U2-3,TS-15		
5	U2-4,TS-17		
24	U2-5,TS-20		
7	U2-6,TS-19		
14	U2-7,TS-CR-AC1		
15	U2-8,TS-CR-AC2		
28	U2-9,TS(AUX1)-21		
32	U2-10,TS(AUX1)-22		
29	U2-11,TS(AUX1)-23		
31	U2-12,TS(AUX1)-51		
32	U2-13,TS(AUX1)-53		
33	U2-14,TS(AUX1)-52		
34	U2-15,TS(AUX1)-66		
35	U2-16,TS(AUX1)-67		
36	U2-17,TS(AUX1)-68		
120	U2-18,TS(AUX1)-24		
38	U2-19,TS(AUX1)-25		
39	U2-20,TS-18		
40	U2-21,TS-16		

[illegible]

3 HARNESS LOCATOR		BOX CHECKED IF HARNESS IS WORN	
WIRE No.	HARNESS 806064-002 (U3) TS STD. AUX. CONTACTS	CLR	AWG
50	U3-1,TS(AUX1)-27		16
51	U3-2,TS(AUX1)-28		
52	U3-3,TS(AUX1)-29		
53	U3-4,TS(AUX1)-30		
54	U3-5,TS(AUX1)-31		
55	U3-6,TS(AUX1)-32		
56	U3-7,TS(AUX1)-33		
57	U3-8,TS(AUX1)-34		
58	U3-9,TS(AUX1)-35		
59	U3-10,TS(AUX1)-36		
60	U3-11,TS(AUX1)-37		
61	U3-12,TS(AUX1)-38		
62	U3-13,TS(AUX1)-39		
63	U3-14,TS(AUX1)-40		
64	U3-15,TS(AUX1)-41		
65	U3-16,TS(AUX1)-42		
66	U3-17,TS(AUX1)-43		
67	U3-18,TS(AUX1)-44		
68	U3-19,TS(AUX1)-45		
69	U3-20,TS(AUX1)-46		
70	U3-21,TS(AUX1)-47		
71	U3-22,TS(AUX1)-48		
72	U3-23,TS(AUX1)-49		
73	U3-24,TS(AUX1)-50		

[illegible][illegible]

6		HARNESS LOCATOR	BOX CHECKED IF HARNESS IS WOODED	☐
WIRE No.	HARNESS 605674-006-C (IP3,J4) STATIONARY FRAME		CLR	AWG
50	IP3-1,J4-1			16
51	IP3-2,J4-2			
52	IP3-3,J4-3			
53	IP3-4,J4-4			
54	IP3-5,J4-5			
55	IP3-6,J4-6			
56	IP3-7,J4-7			
57	IP3-8,J4-8			
58	IP3-9,J4-9			
59	IP3-10,J4-10			
60	IP3-11,J4-11			
61	IP3-12,J4-12			
62	IP3-13,J4-13			
63	IP3-14,J4-14			
64	IP3-15,J4-15			
65	IP3-16,J4-16			
66	IP3-17,J4-17			
67	IP3-18,J4-18			
68	IP3-19,J4-19			
69	IP3-20,J4-20			
70	IP3-21,J4-21			
71	IP3-22,J4-22			
72	IP3-23,J4-23			
73	IP3-24,J4-24			

[illegible]

8 — HARNESS LOCATOR		BOX CHECKED IF HARNESS IS MODIFIED	☒
WIRE No.	HARNESS 806064-004 (P13, P17, P19, BP) BP	CLR	AWG
1	P13-1, BP-1		16
1	BP-1, P19-1		
2	P13-2, BP-2		
3	P13-3, BP-3		
3	BP-3, P19-2		
4	P13-4, BP-4		
5	P13-5, BP-5		
5	BP-5, P19-3		
6	P13-6, BP-6		
7	P13-7, BP-7		
7	BP-7, P19-4		
8	P13-8, BP-8		
9	P13-9, BP-9		
10	P13-10, BP-10		
11	P13-11, BP-11		
12	P13-12, BP-12		
31	P17-1, BP(AUX3)-111		
170	P17-2, P19-6		
171	P17-3, P19-5		
172	P17-4, P19-7		
191	P17-5, BP(AUX4)-148		
177	P17-9, BP(AUX3)-90		
176	P17-10, BP(AUX3)-112		
33	P17-11, BP(AUX3)-88		
33	BP(AUX3)-88, BP(AUX4)-140		
173	P17-12, BP(AUX4)-146		
32	BP(AUX3)-110, BP(AUX5)-137		
149	P17-13, BP(AUX3)-87		
149	BP(AUX3)-87, BP(AUX3)-109		
190	P17-17, BP(AUX4)-141		
121	P17-21, BP(AUX3)-85		
120	P17-22, BP(AUX3)-86		
31	P19-9, BP(AUX3)-89		
31	BP(AUX3)-89, BP(AUX3)-111		
501	BP(AUX3)-82, BP(AUX3)-105		
500	P17-23, BP(AUX3)-81		
150	P17-24, BP(AUX3)-106		
	REMOVE WIRES		
2	P13-2, BP-2		
6	P13-6, BP-6		
10	P13-10, BP-10		
	ADD WIRES		
26	P13-13		
140	P13-14		
27	P13-15		
340	P13-16		
341	P13-17		
342	P13-18		
343	P13-19		
344	P13-20		
345	P13-21		
346	P13-22		
347	P13-23		
348	P13-24		

[illegible]

9 HARNESS LOCATOR		BOX CHECKED IF HARNESS IS WOODED	
WIRE No.	HARNESS 806064-007 (J14,IS) ISOLATION AUX. CONTACTS		CLR AWG
150	J14-3,IS-13		
151	J14-4,IS-14		
38	J14-5,IS-19		
121	J14-6,IS-21		
31	J14-9,IS-10		
152	J14-10,IS-29		
153	J14-11,IS-26		
154	J14-12,IS-23		
155	J14-13,IS-5		
157	J14-15,IS-17		
158	J14-16,IS-2		
190	J14-17,IS-8		
31	IS-10,IS-1		
31	IS-1,IS-16		
31	IS-16,IS-25		
31	IS-25,IS-28		
159	IS-12,IS-22		
159	IS-12,IS-4		
153	IS-7,IS-26		
REMOVE WIRES			
ADD WIRES			
507	J14-1		
160	J14-2		
169	J14-7		
168	J14-8		
156	J14-14		
161	J14-18		
162	J14-19		
163	J14-20		
164	J14-21		
165	J14-22		
166	J14-23		
167	J14-24		

HARNESS LOCATOR		BOX CHECKED IF HARNESS IS MODIFIED	☐
WIRE No.	HARNESS 736883 (J15, BID-P1, BID-P2) BYPASS ISOLATION DISPLAY	CLR	AWG
121	J15-1,BID-P1-12		22
120	J15-2,BID-P1-11		
31	J15-3,BID-P1-10		
170	J15-4,BID-P1-9		
171	J15-5,BID-P1-8		
172	J15-6,BID-P1-7		
176	J15-10,BID-P1-3		
177	J15-11,BID-P1-2		
32	J15-12,BID-P1-1		
33	J15-13,BID-P2-12		
155	J15-15,BID-P2-10		
157	J15-17,BID-P2-8		
158	J15-18,BID-P2-7		
154	J15-19,BID-P2-6		
149	J15-20,BID-P2-5		
152	J15-21,BID-P2-4		
191	J15-22,BID-P2-3		
151	J15-23,BID-P2-2		
ADD WIRES			
389	J15-7		
390	J15-8		
391	J15-9		
395	J15-14		
508	J15-16		
405	J15-24		

[illegible][illegible][illegible]

				D 214353 WK BK 07/24/07 SEE ECN	
PROJECT NAME:				REV. TO SHEET ECN NO. BY APP. DATE	
WIRING DIAGRAM				THIRD ANGLE PROJECTION	
7000 SERIES (J7ATB) 1PH 150-600 AMPS "J" FRAME, GROUP 5 CONTROLS					
BY DATE		MANUFACTURING TOLERANCES TO BE IN		COMPUTER GENERATED DRAWING SCALE 1:1 SIZE DS	
DRAWN BY MR 11/17/06		ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-005.			
CHECKED PROJECT APPROVAL		PROPERTY OF ASCO POWER TECHNOLOGIES. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		DWG. NO. 806094	
FINAL APPROVAL JPB 11/17/06				DRAWING D ECN 214353 SHEET 7 OF 8	

WIRE RUN LISTING

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	SUB-ASSEMBLY (TB1,P,P11,P12,J13,P14,P15,P16,J17,J18) MAIN INTERCONNECT ASSEMBLY	CLR	AWG	
14	P-2,P11-7		16	
21	P-3,P11-2			
3	P-4,TB1-15			
15	P-5,P11-8			
7	P-6,TB1-19			
5	P-7,TB1-17			
120	P-8,TB1-31			
38	P-9,TB1-30			
28	P-10,P11-9			
2	P-11,TB1-14			
1	P-12,TB1-13			
30	P-13,P11-10			
29	P-14,P11-11			
24	P-16,P11-5			
6	P-18,TB1-18			
9	P-19,TB1-21			
10	P-20,TB1-22			
11	P-21,TB1-23			
4	P-22,TB1-16			
8	P-23,TB1-20			
12	P-24,TB1-24			
1	P11-1,TB1-13			
3	P11-3,TB1-15			
5	P11-4,TB1-17			
7	P11-6,TB1-19			
31	P11-12,TB1-37			
32	P11-13,TB1-39			
33	P11-14,TB1-40			
34	P11-15,TB1-34			
35	P11-16,TB1-35			
36	P11-17,TB1-36			
120	P11-18,TB1-31			
38	P11-19,TB1-30			
39	P11-20,P-1			
40	P11-21,P-15			
1	P12-1,TB1-1			
1	P12-2,TB1-13			
2	P12-3,TB1-2			
2	P12-4,TB1-14			
3	P12-5,TB1-3			
3	P12-6,TB1-15			
4	P12-7,TB1-4			
4	P12-8,TB1-16			
5	P12-9,TB1-5			
5	P12-10,TB1-17			
6	P12-11,TB1-6			
6	P12-12,TB1-18			
7	P12-13,TB1-7			
7	P12-14,TB1-19			
8	P12-15,TB1-8			
8	P12-16,TB1-20			
9	P12-17,TB1-9			
9	P12-18,TB1-21			
10	P12-19,TB1-10			
10	P12-20,TB1-22			
11	P12-21,TB1-11			
11	P12-22,TB1-23			
12	P12-23,TB1-12			
12	P12-24,TB1-24			
1	J13-1,TB1-1			
2	J13-2,TB1-2			
3	J13-3,TB1-3			
4	J13-4,TB1-4			
5	J13-5,TB1-5			
6	J13-6,TB1-6			
7	J13-7,TB1-7			
8	J13-8,TB1-8			
9	J13-9,TB1-9			
10	J13-10,TB1-10			
11	J13-11,TB1-11			
12	J13-12,TB1-12			
151	P14-4,TB1-28			
38	P14-5,TB1-30			
121	P14-6,TB1-32			
31	P14-9,TB1-37			
153	P14-11,P16-3			
154	P14-12,TB1-41			
155	P14-13,P15-15			
157	P14-15,P15-17			
158	P14-16,P15-18			
190	P14-17,J17-17			
121	P15-1,TB1-32			
120	P15-2,TB1-33			
31	P15-3,TB1-37			
170	P15-4,TB1-38			
171	P15-5,J17-3			
172	P15-6,J17-4			
176	P15-10,J17-10			
177	P15-11,J17-9			
32	P15-12,TB1-39			
33	P15-13,TB1-40			
154	P15-19,TB1-41			
149	P15-20,J17-13			
152	P15-21,P14-10			
191	P15-22,TB1-26			
151	P15-23,TB1-28			
154	P16-1,TB1-41			
170	P16-2,TB1-38			
191	P16-4,TB1-26			
170	P16-6,TB1-38			
31	J17-1,TB1-37			
170	J17-2,TB1-38			
32	J17-11,TB1-39			
33	J17-12,TB1-40			
121	J17-21,TB1-32			
120	J17-22,TB1-33			
500	J17-23,P16-5			
150	J17-24,P14-3			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	SUB-ASSEMBLY (TB1,P,P11,P12,J13,P14,P15,P16,J17,J18) MAIN INTERCONNECT ASSEMBLY (CONTINUED)	CLR	AWG	
210	J18-1,TB1-27		16	
191	J18-2,TB1-26			
211	J18-3,TB1-29			
210	J18-4,TB1-27			
151	J18-5,TB1-28			
211	J18-6,TB1-29			
120	TB1-31,TB1-33			
REMOVE WIRES				
190	P14-17,J17-17			
191	P16-4,TB1-26			
33	J17-12,TB1-40			
32	J17-11,TB1-39			
ADD WIRES				
312	P-17			
41	P11-22			
42	P11-23			
43	P11-24			
26	J13-13			
140	J13-14			
27	J13-15			
340	J13-16			
341	J13-17			
342	J13-18			
343	J13-19			
344	J13-20			
345	J13-21			
346	J13-22			
347	J13-23			
348	J13-24			
507	P14-1			
160	P14-2			
169	P14-7			
168	P14-8			
156	P14-14			
190	P14-17,TB1-25			
161	P14-18			
162	P14-19			
163	P14-20			
164	P14-21			
165	P14-22			
166	P14-23			
167	P14-24			
389	P15-7			
390	P15-8			
391	P15-9			
395	P15-14			
508	P15-16			
405	P15-24			
173	P16-4,J17-12			
32	P16-7,TB1-39			
190	P16-8,TB1-25			
524	P16-9			
525	P16-10			
526	P16-11			
527	P16-12			
528	P16-13			
529	P16-14			
530	P16-15			
531	P16-16			
532	P16-17			
533	P16-18			
534	P16-19			
535	P16-20			
536	P16-21			
537	P16-22			
538	P16-23			
539	P16-24			
191	J17-5,TB1-26			
174	J17-6			
504	J17-7			
175	J17-8			
33	J17-11,TB1-40			
178	J17-14			
505	J17-15			
189	J17-16			
190	J17-17,TB1-25			
506	J17-18			
420	J17-19			
421	J17-20			
215	J18-7			
216	J18-8			
217	J18-9			
218	J18-10			
219	J18-11			
220	J18-12			
221	J18-13			
222	J18-14			
324	J18-15			
325	J18-16			
36	J18-17			
35	J18-18			
228	J18-19			
229	J18-20			
320	J18-21			
322	J18-22			
321	J18-23			
323	J18-24			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	SUB-ASSEMBLY (P3,P4,J6,P7,TB) STD. FIELD TB	CLR	AWG	
120	TB-1,P3-1		16	
121	TB-2,P3-2			
122	TB-3,P3-3			
50	TB-4,P4-1			
51	TB-5,P4-2			
52	TB-6,P4-3			
53	TB-7,P4-4			
54	TB-8,P4-5			
55	TB-9,P4-6			
56	TB-10,P4-7			
57	TB-11,P4-8			
58	TB-12,P4-9			
59	TB-13,P4-10			
61	TB-14,P4-12			
60	TB-15,P4-11			
62	TB-16,P4-13			
64	TB-17,P4-15			
63	TB-18,P4-14			
65	TB-19,P4-16			
67	TB-20,P4-18			
69	TB-21,P4-17			
68	TB-22,P4-19			
70	TB-23,P4-21			
69	TB-24,P4-20			
71	TB-25,P4-22			
73	TB-26,P4-24			
72	TB-27,P4-23			
210	TB-28,J6-1			
151	TB-29,J6-2			
211	TB-30,J6-3			
243	TB-31,J6-4			
244	TB-32,J6-5			
270	TB-34,P7-1			
271	TB-35,P7-2			
272	TB-36,P7-3			
JUMPERS				
	TB-28,TB-29			
	TB-29,TB-30			
ADD WIRES				
123	P3-4			
245	J6-6			
246	J6-7			
247	J6-8			
248	J6-9			
249	J6-10			
250	J6-11			
251	J6-12			
252	J6-13			
253	J6-14			
254	J6-15			
255	J6-16			
256	J6-17			
257	J6-18			
258	J6-19			
259	J6-20			
260	J6-21			
261	J6-22			
262	J6-23			
263	J6-24			
273	P7-4			
274	P7-5			
275	P7-6			
276	P7-7			
277	P7-8			
278	P7-9			
279	P7-10			
280	P7-11			
281	P7-12			
282	P7-13			
283	P7-14			
284	P7-15			
285	P7-16			
286	P7-17			
287	P7-18			
288	P7-19			
289	P7-20			
290	P7-21			
291	P7-22			
292	P7-23			
293	P7-24			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	HARNESS (J7) OPTIONAL FIELD OUTPUTS	CLR	AWG	
270	J7-1		16	
271	J7-2			
272	J7-3			
273	J7-4			
274	J7-5			
275	J7-6			
276	J7-7			
277	J7-8			
278	J7-9			
279	J7-10			
280	J7-11			
281	J7-12			
282	J7-13			
283	J7-14			
284	J7-15			
285	J7-16			
286	J7-17			
287	J7-18			
288	J7-19			
289	J7-20			
290	J7-21			
291	J7-22			
292	J7-23			
293	J7-24			

HARNESS LOCATOR				BOX CHECKED IF HARNESS IS MODIFIED
WIRE No.	HARNESS 605454-005 (J8) OPTIONAL SERIAL I/O	CLR	AWG	
300	J8-1,72A-5	SHLD	22	
301	J8-2,72A-1	WHT/ORG	4 COND	
302	J8-3,72A-2	ORG/WHT	SHEATHED	
303	J8-4,72A-3	WHT/BLU	TP	
304	J8-5,72A-4	BLU/WHT		
305	J8-6			
306	J8-7			
307	J8-8			
308	J8-9			

18 HARNESS LOCATOR		BOX CHECKED IF HARNESS IS MODIFIED ☐	
WIRE NO.	HARNESS 605454-007 (P8,TB) OPTIONAL SERIAL I/O	CLR	AWG
300	P8-TB-37	SHLD	22 (4 COND) SHIELD T/P
301	P8-2,TB-38	WHT/ORG	
302	P8-3,TB-39	ORG/WHT	
303	P8-4,TB-40	WHT/BLU	
304	P8-5,TB-41	BLU/WHT	
305	P8-6		
306	P8-7		
307	P8-8		
308	P8-9		