

P3K-AL-0392-A01

REV. NO. (1)

TITLE TEST INSTRUCTIONS

CONT ON SHEET 2 SH NO. 1

P3K-AL-0392-A01

FOR MECHANICAL/ELECTRICAL TRIP TEST
CIRCUIT BOARD 1TM2-B001 ASS'Y DRAWING 118D1575
FIRST MADE FOR EHC MARK II

CONT ON SHEET 2 SH NO. 1

I. CIRCUIT DESCRIPTION

CIRCUIT BOARD REV. #0

REVISIONS

This circuit board contains the logic circuits associated with the mechanical trip test, the oil trip test and the electrical trip test. Each of these tests is initiated by a corresponding pushbutton input. Each test involves a number of steps taken sequentially; this is accomplished automatically, and if the system responds as it is supposed to do the tests are completed and the circuit is reset without further human intervention. A fourth pushbutton provides the option to interrupt the tests before their completion.

The control outputs of the board are 115 VAC to the mechanical and electrical lockout valves and the oil trip and oil reset solenoid valves, 125 VDC to the mechanical trip system and 24 VDC to the electrical trip system.

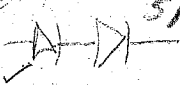


Additional outputs provide 24V to lamps and indicate the status of the system and any existing malfunction.

A number of limit and pressure switches in the front standard provide inputs to the board that depend upon the state of the mechanical and hydraulic components of the emergency trip system.

II. CIRCUIT SPECIFICATIONS

1. Permanent Continuity:

Each terminal of the following sets of terminals is permanently connected to all other terminals of the same set.

- a. 45-47-50-60-70-75
- b. 91-92-99-~~100~~-101
- c. 90-96 ✓
- d. 3-4 ✓
- e. 5-6 ✓
- f. 7-8 ✓
- g. 10-11 ✓ 
- h. 51-52 ✓
- i. 56-57 ✓
- j. 72-73 ✓ 
- k. 26-27 ✓
- l. 28-29 ✓
- m. 30-31 ✓
- n. 79-80 ✓
- o. 82-83 ✓
- p. 32-33 ✓
- q. 38-39 ✓ 

9336
5/19/90

273-2

273-12

273-71

273-138

273-221

273-227

PRINTS TO

MADE BY J. Polacek Sept. 19, 1977

APPROVALS

Steam Turbine

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P3K-AL-0392-A01

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Schenectady, N.Y.

LOCATION

CONT ON SHEET

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SH NO.

1

810

REV NO. 0
P3K-AL-0392-A01
CONT ON SHEET 3 SH NO. 2

TITLE TEST INSTRUCTIONS
FOR MECHANICAL/ELECTRICAL TRIP TEST
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II. CIRCUIT SPECIFICATIONS (continued)

2. Diode Rundancy

Each diode on the circuit board should be checked to insure redundancy is effective.

3. Lamp Test Circuits

With 24 VDC at terminal 41 and 24 VDC common at terminal 2 a 24V voltage should appear at the following terminals:

10, 13, 14, 15, 16, 17, 34, 35, 36, 37.

4. Logic

Power supply connections:

24 VDC:	Terminal 1
24 VDC common:	Terminal 2
125 VDC :	Terminal 45
125 VDC common:	Terminal 46
115 VAC:	Terminal 90
115 VAC common:	Terminal 91

The circuits on the board should comply with logic tables 1, 2, 3, 4, and 5. In general each step in these tables does not have any functional significance; all steps in the tables taken together form a set of sufficient conditions that insure that every contact on the board opens and closes as it should and that all test points are properly connected. The division of these conditions into five tables instead of one large table has been done for practical reasons.

REVISIONS

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Steam Turbine

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LOCATION

P3K-AL-0392-A01

CONT ON SHEET 3 SH NO. 2

REV NO. 0

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CONT ON SHEET

4

SH NO.

3

[illegible]

FOR MECHANICAL/ELECTRICAL TRIP TEST
CIRCUIT BOARD 1TM2-B001 ASS'Y DRAWING 118D1575

FIRST MADE FOR EHC MARK II

[illegible]

TABLE I

3: After 3 sec. + 20%

Headings: terminal numbers or test point numbers

0:	0V
1:	24 VDC
2:	125 VDC
3:	115 VAC

REVISIONS

PRINTS TO

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APPROVALS

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P3K-AL-0392-A01

CONT ON SHEET

4

SH NO. 3

REV NO. 0

P3K-AL-0392-A01

CONT ON SHEET 6 SH NO. 5

TITLE	TEST INSTRUCTIONS
1. The following information is for your information only. It is not to be used in the test.	1. Read the test instructions carefully.
2. The test is to be completed in 15 minutes.	2. Write your answers in the space provided.
3. The test is to be completed in 15 minutes.	3. Write your answers in the space provided.
4. The test is to be completed in 15 minutes.	4. Write your answers in the space provided.
5. The test is to be completed in 15 minutes.	5. Write your answers in the space provided.
6. The test is to be completed in 15 minutes.	6. Write your answers in the space provided.
7. The test is to be completed in 15 minutes.	7. Write your answers in the space provided.
8. The test is to be completed in 15 minutes.	8. Write your answers in the space provided.
9. The test is to be completed in 15 minutes.	9. Write your answers in the space provided.
10. The test is to be completed in 15 minutes.	10. Write your answers in the space provided.

FOR MECHANICAL/ELECTRICAL TRIP TEST
CIRCUIT BOARD 1TM2-B001 ASS'Y DRAWING 118D1575
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REVISIONS

CORRECT OUTPUTS AT

INPUTS AT		CORRECT OUTPUTS AT																													
5	48	51	61	71	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP	TP			
					14	15	16	49	10	11	7	8	12	45	46	55	1	19	2	22	5	23	6	25	29	93	51	14	15	50	10
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
1	2	0	0	0	0	2	2	0	2	2	2	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0
0	2	0	0	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	1	0	0	0	0	1	3	3	0	0	1	0	0
0	2	0	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	0	0	3	3	2	0	1	0	0	0
0	2	2	0	2	0	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	1	1	1	1	1	0	0	1	0	0	0
0	2	2	0	2	0	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	1	1	1	1	1	0	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
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0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2	2	2	1	0	1	0	1	0	0	3	3	0	1	0	0	0
0	2																														

5: After 5 sec. + 20%

Headings: Terminal numbers or test point numbers

TABLE 3

0: 0v

1: 24 VDC

2: 125 VDC

3: 115 VAC

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APPROVALS

Steam Turbine

Schenectady, N.Y.

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P 3K-AL-0392-A01

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CODE IDENT NO.

REV NO. 0

TITLE

P3K-AL-0392-A01

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SH NO. 6

TEST INSTRUCTIONS
FOR MECHANICAL / ELECTRICAL TRIP TEST
CIRCUIT BOARD 1TM2-B001 ASS'Y DRAWING 118D1575
FIRST MADE FOR EHC MARK II

REVISIONS

INPUTS AT				CORRECT OUTPUTS AT								NOTES
51	53	54	7	27	29	31	TP 17	TP 18	TP 20	TP 21		
0	0	0	0	0	0	0	0	0	0	0		
125	0	0	0	24	0	0	125 Pulse	24	24	24		
0	0	0	0	24	0	0	0	0	24	24		
0	125	0	0	24	0	0	125	0	24	24		
0	0	0	0	24	0	0	0	0	24	24		
0	0	125	0	24	0	0	125	0	24	24		
0	0	0	0	24	0	0	0	0	24	24		
0	0	0	24	0	0	0	0	0	0	0		Resistance between TP20, 21: above 1M Ohm
125	0	0	24	0	0	0	0	0	0	0		
0	0	0	24	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0		
0	125	0	0	0	24	0	125 Pulse	24	24	24		
0	0	0	0	0	24	0	0	0	24	24		
0	0	0	24	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0		
0	0	125	0	0	0	24	125 Pulse	24	24	24		
0	0	0	0	0	0	24	0	0	24	24		
0	0	0	24	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0		

TABLE 4

Headings: Terminal numbers or test point numbers
Entries: Volts DC

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SH NO. 6

REV NO. 0

TITLE

TITLE TEST INSTRUCTIONS

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CIRCUIT BOARD 1TM2-B001 ASS'Y DRAWING 118D1575

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TABLE 5

CORRECT OUTPUTS AT

INPUTS AT

[illegible]

Headings: Terminal numbers or test point numbers

*Resistance between TP42 and pin 10 longer than 1m Ohms

3: after 3 sec. + 20%

pulse of short duration

0:	0V	2:	125 VDC
1:	24VDC	3:	115 VAC

REVISIONS

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P3K-AL-0392-A01

CONT ON SHEET

SH NO. 8

REVISIONS

PREPARED BY

Dimitri Economou

DATE

10/26/1973

D. Economou

EHC DESIGN ENGINEERING

APPROVED BY

P.C. Callan

DATE

9-6-77

P.C. Callan - MANAGER

EHC DESIGN ENGINEERING

TEST PROCEDURE

REVIEWED BY

R. Debertolis

DATE

11/6/77

R. Debertolis

EHC TEST ENGINEER

PRINTS TO

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