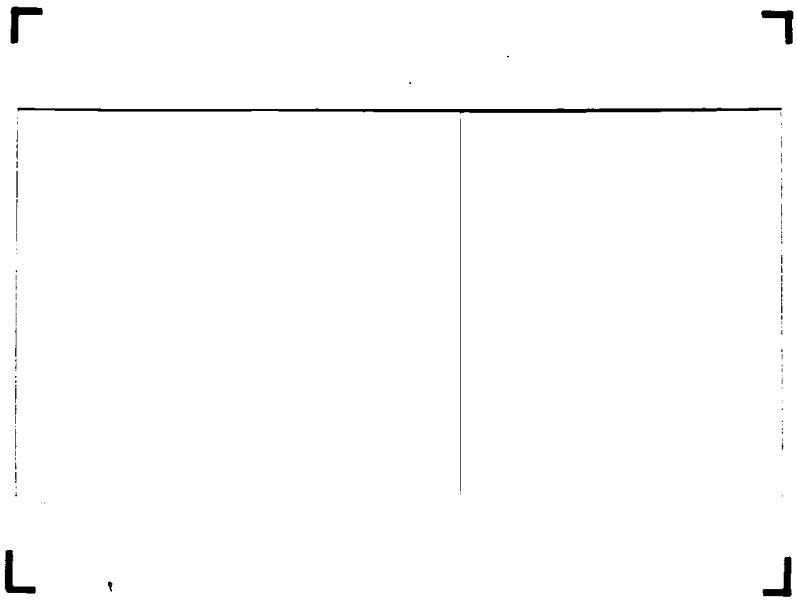
MP

Mechanical Products, Inc.



FACILITY FORM 602

N69-12183
(ACCESSION NUMBER)

(THRU)

187
(PAGES)

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(CODE)

CR-92402
(NASA CR OR TMX OR AD NUMBER)

09
(CATEGORY)



CODE IDENT. 76574

MECHANICAL PRODUCTS, INC.
1824 River St.
Jackson, Michigan

N69-12183

SUMMARY REPORT OF THE 4040 SERIES CIRCUIT BREAKER

R. A. Bell, et al

20 November 1968

CLEARINGHOUSE
FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

NASA CR 92402

Mechanical Products
Division of Aiken Industries, Inc.
Jackson, Michigan 49204

SUMMARY REPORT

OF THE

4040 SERIES CIRCUIT BREAKER

Report No. 68-4040-001
November 20, 1968

R. A. Bell
R. A. Bell, Manager
Aeronautical & Environmental
Test Laboratory

R. W. Filchak
R. W. Filchak
Director of Engineering

Test Witnessed By:

O. J. Bradshaw
O. J. Bradshaw
GCQAR
DCASR, Detroit, Michigan

Subscribed and sworn to
before me this 21st day
of November, 1968.

E. J. Stauff
E. J. Stauff, Notary Public
Jackson County, Michigan
My Commission Expires
August 13, 1972

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Appendix	Description
A	Individual Acceptance Test Record
B	Letter Progress Report
C	Product Specification, Document No. 50-072
D	Test Procedure, Report No. 68-0000-003 with List of Test Equipment, Report No. 67-0000-005

4040 SERIES - SUMMARY REPORT

1.0 ADMINISTRATIVE DATA

1.1 Purpose of Test -

To supply NASA with a small, light weight, fireproof circuit breaker for evaluation testing per Mechanical Products Proposal No. 6802, dated February 2, 1968.

1.2 Manufacturer -

Mechanical Products, 1824 River Street, Jackson, Michigan 49204.

1.3 Manufacturer's Type or Model Number -

Mechanical Products, Part No. 4040-001- (amp rating).

1.4 Applicable Documents -

1.4.1 NASA Documents -

1.4.1.1 Contract No. NAS9-7850, Purchase Request No. 8066002.

1.4.2 Mechanical Products Documents -

1.4.2.1 Product Specification 50-072, Revision A.

1.4.2.2 Outline Drawing, Mechanical Products, Part No. 4040-001, Circuit Breaker, Trip-Free, Push-Pull, 1 thru 35 amp.

1.4.2.3 Test Procedure, Report No. 68-0000-003, dated November 6, 1968.

1.4.2.4 Test Equipment List, Report No. 67-0000-005, dated August 23, 1967.

1.5 Quantity of Items Tested -

Ten (10)	4040-001-1	1 amp
Ten (10)	4040-001-2	2 amp
Ten (10)	4040-001-3	3 amp
Ten (10)	4040-001-5	5 amp
Ten (10)	4040-001-705	7 1/2 amp
Ten (10)	4040-001-10	10 amp
Ten (10)	4040-001-15	15 amp
Ten (10)	4040-001-20	20 amp
Ten (10)	4040-001-25	25 amp
Ten (10)	4040-001-35	35 amp

1.6 Security Classification of Items -

None.

1.7 Date Tests Completed -

November 4, 1968.

1.8 Tests Conducted By -

All tests were conducted in the Aeronautical and Environmental Test Laboratory of Mechanical Products.

1.9 Disposition of Specimens -

Circuit breakers shipped to the Transportation Officer, Building 420, NASA, Manned Spacecraft Center, Texas 77058.

1.10 Abstract -

This report covers the acceptance test program established and conducted by Mechanical Products to verify functional acceptability of the 4040-001, 1 thru 35 ampere circuit breaker (Figure 1) for shipment to NASA for evaluation testing. This test program follows the procedures of Product Specification 50-072, Revision A contained in Appendix C. Section 1.0 of this report covers administrative data about the program. Section 2.0 presents the discussion of design and test results. Section 3.0 includes details of the test equipment, test conditions, and test procedures. Appendix A contains the Individual Acceptance Test Record for each circuit breaker shipped. Appendix B contains the Letter Progress Reports. Appendix D contains the Test Procedure, Report No. 68-0000-003 and Test Equipment List, Report No. 67-0000-005.

2.0 TEST RESULTS AND DISCUSSION -

The following paragraphs cover the results of tests conducted according to the procedures of Section 3.1. This discussion is based on the data which was obtained during the test program. The Individual Acceptance Test Record is contained in Appendix A for detailed reference.

2.1 Vibration -

2.1.1 All units successfully passed the random vibration program with 100 percent current applied and chatter monitored at 100 microseconds. The random program has a maximum spectrum of $0.04g^2/Hz$ with a program level of 8.9g RMS per Product Specification 50-072, Revision A.

2.1.2 Special note should be made that all circuit breakers are torqued, when mounted, at 20 ± 2 pound inch. The terminal torque should not exceed 15 pound inch maximum.

2.2 Dielectric Strength -

2.2.1 All samples met the requirements of 1,500 volts, AC, 60 Hz for 60 seconds. Numerical values of leakage measured on each unit revealed no leakage current greater than six and one-half (6.5) microamperes.

2.2.2 A problem was encountered in the original design proposal as inadequate clearances, between the button and the actuator stem, caused a dielectric breakdown problem. The units shipped incorporated a fix for the problem consisting of a nylon pin and epoxy between the button and actuator stem. During ambient effect tests the fix used as an expedient in these units may cause some problem resulting from the effect of the temperature upon the nylon and epoxy.

2.2.3 A design change has been incorporated, for future units, that will eliminate the possibility of dielectric strength breakdown.

2.3 Operating Force -

2.3.1 All units successfully met the pullout and reset requirements of the Product Specification. The maximum average pullout was 6.0 pounds and the maximum average reset was 7.2 pounds.

2.3.2 A word of caution to be noted at this point is that a shock type force (20 - 30 pounds) on the end of the button could push through the plunger stem and break the bottom of the case.

2.3.3 A change to the mold and related components will solve this problem by increasing the thickness and strength at the bottom of the case.

2.4 Trip-Free -

2.4.1 All units satisfactorily passed the 200 percent trip-free test by breaking the electrical circuit and upon release of button showing the indication of trip. The units all relatched when actuated.

2.5 Overload Calibration -

2.5.1 All units successfully met the Product Specification requirements of 200 percent trip within 2 - 20 seconds. All units tripped within a range of from 7.0 seconds to 15.5 seconds with the majority of units tripping between 10 seconds to 12 seconds.

2.6 Maximum Limit of Ultimate Trip -

2.6.1 All units successfully tripped in less than one (1) hour at 145 percent load.

2.7 Minimum Limit of Ultimate Trip -

2.7.1 All units met the requirements of carrying 115 percent load for a minimum of one (1) hour.

2.8 Voltage Drop -

2.8.1 All units were checked for voltage drop and were within the Product Specification requirements. The maximum average voltage drop per rating is as noted in Table I.

TABLE I
VOLTAGE DROP COMPARISON

Rating (Amps)	Maximum Allowable Millivolt Drop	Maximum Average Millivolt Drop Obtained
1	1100	1037
2	700	692
3	500	382
5	250	165
7 1/2	200	145
10	200	158
15	150	148
20	150	110
25	150	130
35	150	120

2.9 Examination of Product -

2.9.1 All units met the requirements of Mechanical Products Drawing No. 4040-001.

2.9.2 The Mykroy 1301 case material, which meets MIL-I-23264 specification, has certain characteristics being:

1. Not a hard skin surface as in thermosets, but a consistent molecular structure.
2. As the material is a form of glass, it is relatively brittle and can be broken easier than thermosets.
3. A normal discoloration is typical of the material as a result of the mold release agent which has to be used.
4. The material is slightly abrasive and may have a wearing effect upon internal components.

2.9.3 The units were sealed using Stycast 190 from Emerson Cummings and catalyst 24L with a mix ratio of 19 to 1. From tests, reported by Grumman, the sealing material appears to be resistant to burning in a 20 psi oxygen atmosphere.

2.9.4 All future units should reflect any 4001 basic design changes as applicable to ensure the maximum performance characteristics.

3.0 FACTUAL DATA -

3.1 Test Procedure -

3.1.1 Test as applicable were performed in accordance with Product Specification, Document No. 50-072, Revision A, dated November 20, 1968, see Appendix C. For specific methods of tests as applicable with test equipment, except for random vibration, see Appendix D, Test Procedure, Report No. 68-0000-003 dated November 6, 1968.

3.2 Test Sequence -

3.2.1 All tests were performed in accordance with the test sequence as shown on the Individual Acceptance Test Record, Form MP 9-157.

3.3 Test Equipment -

3.3.1 The Test Equipment List is contained in Test Procedure, Report No. 68-0000-003. See Appendix C.

BRUNING

NOTES:

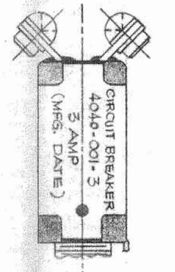
1. INTERPRET DRAWING IN ACCORDANCE WITH USAS1 Y14.5 - 1966.
2. MARK SIDES AS SHOWN (TYPICAL) IN INK.

FOLDOUT FRAME

FOLDOUT FRAME

FOLDOUT FRAME

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



.750

.0935±.002

.375±.005

.100

.705 TRIPPED

.045±.005

BLACK BUTTON

WHITE TRIP INDICATOR
.125 MIN. EXPOSED

.329±.010

1.526 MAX.

1.851 MAX

1.718

S/N 0000 0000 L/N

TERMINAL NUT, SELF LOCKING

45°

.352

.704

TERMINAL SCREW, AN515C8R4
M.P.I. P/N 787
LOCKWASHER, M.S.-35338-80
M.P.I. P/N 5000-056-1
2 EACH REQUIRED

.426 DIA.

.482 CLOSED

THREAD 15/32 UNS-2A, BLACK FINISH
NUT, BLACK FINISH
M.P.I. P/N 5000-063-1
FLATWASHER, M.P.I. P/N 5000-106-2
LOCKWASHER, BLACK FINISH, MPI P/N 5000-070-1

.600

EPOXY SEALED DARK AREAS AS SHOWN

±.005
.125 DIA. HOLE

±.005
.484 DIA. HOLE

.375±.005

RECOMMENDED MOUNTING HOLES FOR MODEL 4040-001

B

	- 35	35	.20
	- 25	25	.15
	- 20	20	.15
	- 15	15	.15
	- 10	10	.15
	- 705	7½	.20
	- 5	5	.25
	-		
	- 3	3	0.5
	- 2	2	0.7
4040-001 - 1		1	1.1
MECH. PROD. INC. P/N'S		AMP RATING	MAX. VOLT. DROP

MECHANICAL PROPERTIES
YP
TS
EL 2
RA
BH
RH

NEXT ASS'Y | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
DECIMALS ± .031
ANGLES ± 2°

MATERIAL

DFTM.	TJ Carr	5/20/68
CHECK.	[illegible]	5/21/68
PROJ. ENG.	[illegible]	[illegible]
DIR. OF ENG.	[illegible]	[illegible]
MFG.		/ /

MECHANICAL PRODUCTS, INC.
SUBSIDIARY OF HOWARD AIKEN INDUSTRIES, INC.
JACKSON, MICHIGAN, U.S.A.

CIRCUIT BREAKER, TRIP FREE
PUSH-PULL, 1 THRU 35 AMP

SIZE	CODE IDENT. NO.	
C	76374	4040-001

SCALE FULL | WEIGHT: 45.3 GMS. MAX. | SHEET 1 OF 1

4040-001

APPENDIX A

INDIVIDUAL ACCEPTANCE TEST RECORD

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 100268-2240-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 3 T_2-Mtg. 1 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.00 / 1.90 / 1.85 / 1.92 (1 2 3 Avg.) Reset Force 2.95 / 2.95 / 2.95 / 2.95 (1 2 3 Avg) Performed By R. Reeve	✓	
Trip-Free 200%= 2 Amps. Trip Time (Sec.) 10.88 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 2 Amps. Trip Time 8.77 145%= 1.45 Amps. Trip Time 41.85 115%= 1.15 Amps. Trip Time NT 3600 Performed By J. Matz	✓	
Voltage Drop Test (Millivolts) 1050 / 1030 / 1030 / 1037 (1 2 3 Avg.) Performed By J. Matz	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	2/2	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 100268-2241-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Beall	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 3 T_2-Mtg. 1 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.20 / 2.20 / 2.10 / 2.17 (1 2 3 Avg.) Reset Force 2.75 / 2.75 / 2.80 / 2.77 (1 2 3 Avg) Performed By R. Reeve	✓	
Trip-Free 200%= 2 Amps. Trip Time (Sec.) 9.70 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 2 Amps. Trip Time 8.85 145%= 1.45 Amps. Trip Time 33.38 115%= 1.15 Amps. Trip Time NT 360. Performed By D. Graf	✓	
Voltage Drop Test (Millivolts) 1020 / 1020 / 1020 / 1020 (1 2 3 Avg.) Performed By D. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT-BREAKER

Part No. 4040-001-1 Rev. _____ S/N 100265-2243-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 1 T_2-Mtg. 3 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.65 / 1.55 / 1.55 / 1.58 (1 2 3 Avg.) Reset Force 2.65 / 2.65 / 2.65 / 2.65 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 2 Amps. Trip Time (Sec.) 9.07 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 2 Amps. Trip Time 10.23 145%= 1.45 Amps. Trip Time 39.78 115%= 1.15 Amps. Trip Time NT3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 1050 / 1020 / 1020 / 1037 (1 2 3 Avg.) Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 100268-2299-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 1 T_2-Mtg. 3 T-Other Points —— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.10 / 2.35 / 2.00 / 2.15 (1 2 3 Avg.) Reset Force 2.95 / 2.75 / 2.80 / 2.83 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 2 Amps. Trip Time (Sec.) 8.13 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 2 Amps. Trip Time 8.12 145%= 1.45 Amps. Trip Time 32.00 115%= 1.15 Amps. Trip Time NT 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 1020 / 1020 / 1020 / 1020 (1 2 3 Avg.) Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 100268-2245-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ~ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 3 T_2-Mtg. 3 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.85 / 1.70 / 1.65 / 1.53 (1 2 3 Avg.) Reset Force 2.50 / 2.55 / 2.50 / 2.52 (1 2 3 Avg) Performed By L. Lindy	✓	
Trip-Free 200%= 2.0 Amps. Trip Time (Sec.) 9.97 Trip-Free YES Performed By J. Lorensen	✓	
Performance (All Trip Time in Seconds) 200%= 2.0 Amps. Trip Time 8.82 145%= 1.45 Amps. Trip Time 55.5 115%= 1.15 Amps. Trip Time N.T. 3600 Performed By J. Lorensen	✓	
Voltage Drop Test (Millivolts) 930 / 930 / 930 / 930 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ~	4/2	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 100368-1645-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Sorensen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 6.0 T_2-Mtg. 6.0 T-Other Points ——— Impressed Voltage 1500 Performed By RE Sullivan	✓	
Operating Force (Pounds) Pullout Force 2.75 / 2.35 / 2.20 / 2.43 (1 2 3 Avg.) Reset Force 1.35 / 1.85 / 1.90 / 1.70 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 2 Amps. Trip Time (Sec.) 7.22 Trip-Free Yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 2 Amps. Trip Time 11.01 145%= 1.45 Amps. Trip Time 85.36 115%= 1.15 Amps. Trip Time NT 3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 970 / 970 / 970 / 970 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings M.P. OK Case OK Workmanship OK Performed By ✓	2/15	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 101468-1700-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 7 T_2-Mtg. 11 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 2.00 / 1.90 / 1.95 / 1.95 (1 2 3 Avg.) Reset Force 2.30 / 2.25 / 2.25 / 2.27 (1 2 3 Avg) Performed By R. Reeve	✓	
Trip-Free 200%= 2.0 Amps. Trip Time (Sec.) 12.47 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 2.0 Amps. Trip Time 10.46 145%= 1.45 Amps. Trip Time 30.2 115%= 1.15 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 935 / 940 / 940 / 938. (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	W/L	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 101768-1653-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 4.5 T_2-Mtg. 4.5 T-Other Points — Impressed Voltage 1500 Performed By J. Lorensen	✓	
Operating Force (Pounds) Pullout Force 2.10 / 2.05 / 1.90 / 2.02 (1 2 3 Avg.) Reset Force 2.25 / 2.25 / 2.20 / 2.23 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 2.0 Amps. Trip Time (Sec.) 6.51 Trip-Free YES Performed By J. Lorensen	✓	
Performance (All Trip Time in Seconds) 200%= 2.0 Amps. Trip Time 11.25 145%= 1.45 Amps. Trip Time 69.4 115%= 1.15 Amps. Trip Time N.T. 3600 Performed By J. Lorensen	✓	
Voltage Drop Test (Millivolts) 945 / 940 / 940 / 941 (1 2 3 Avg.) Performed By J. Lorensen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 101768-1654-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. — Performed By R. Bell	V	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 4.5 T_2-Mtg. 5.0 T-Other Points — Impressed Voltage 1500 Performed By J. Lorencen	V	
Operating Force (Pounds) Pullout Force 2.10 / 1.70 / 1.75 / 1.85 (1 2 3 Avg.) Reset Force 2.35 / 2.35 / 2.35 / 2.35 (1 2 3 Avg) Performed By R. Reeve	✓	
Trip-Free 200%= 2.0 Amps. Trip Time (Sec.) 13.28 Trip-Free YES Performed By J. Lorencen	✓	
Performance (All Trip Time in Seconds) 200%= 2.0 Amps. Trip Time 10.68 145%= 1.45 Amps. Trip Time 1Ø4.6 115%= 1.15 Amps. Trip Time N.T.3600 Performed By J. Lorencen	V	
Voltage Drop Test (Millivolts) 940 / 940 / 940 / 940 (1 2 3 Avg.) Performed By J. Lorencen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By V	S/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-1 Rev. _____ S/N 101868-1640-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ~ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 2.95 / 2.75 / 2.50 / 2.73 (1 2 3 Avg.) Reset Force 2.25 / 2.25 / 2.25 / 2.25 (1 2 3 Avg) Performed By R Reave	✓	
Trip-Free 200%= 2.0 Amps. Trip Time (Sec.) 7.55 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 2.0 Amps. Trip Time 10.62 145%= 1.45 Amps. Trip Time 287.9 115%= 1.15 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 945 / 940 / 945 / 943 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: · All tests run in sequence as shown.

Quality Control _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100168-2001-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 6.5 T_2-Mtg. 6.5 T-Other Points ——— Impressed Voltage 1500 Performed By J. Lorensen	✓	
Operating Force (Pounds) Pullout Force 2.75 / 2.40 / 1.75 / 2.30 (1 2 3 Avg.) Reset Force 2.25 / 2.25 / 2.25 / 2.25 (1 2 3 Avg) Performed By J Lorensen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 17.04 Trip-Free YES Performed By J. Lorensen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 11.95 145%= 2.9 Amps. Trip Time 217.81 115%= 2.3 Amps. Trip Time NT36sec Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 610 / 600 / 600 / 603 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100168-2003-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. .5 T_2-Mtg. .5 T-Other Points —— Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 1.60 / 1.40 / 1.45 / 1.48 (1 2 3 Avg.) Reset Force 2.40 / 2.40 / 2.40 / 2.40 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 6.54 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 12.76 145%= 2.9 Amps. Trip Time 177.72 115%= 2.3 Amps. Trip Time NT3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 600 / 590 / 590 / 593 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	6/6.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100168-2004-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 1 T_2-Mtg. 1 T-Other Points — Impressed Voltage 1500 1 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 1.30 / 1.10 / 1.25 / 1.22 (1 2 3 Avg.) Reset Force 3.75 / 3.00 / 3.00 / 3.25 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 17.32 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 9.07 145%= 2.9 Amps. Trip Time 39.15 115%= 2.3 Amps. Trip Time NT 3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 590 / 580 / 580 / 583 (1 2 3 Avg.) Performed By RReeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	9/6.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100168-2005-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 1 T_2-Mtg. 1 T-Other Points ——— Impressed Voltage 1500 Performed By J. Lorensen	✓	
Operating Force (Pounds) Pullout Force 1.50 / 1.50 / 1.50 / 1.50 (1 2 3 Avg.) Reset Force 1.80 / 2.00 / 2.00 / 1.93 (1 2 3 Avg) Performed By J. Lorensen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 13.82 Trip-Free YES Performed By J. Lorensen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 10.94 145%= 2.9 Amps. Trip Time 98.12 115%= 2.3 Amps. Trip Time NT 36" Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 610 / 600 / 600 / 603 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 10016 8-2006-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. .5 T_2-Mtg. .5 T-Other Points ——— Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 1.60 / 1.60 / 1.50 / 1.56 (1 2 3 Avg.) Reset Force 2.10 / 2.00 / 2.00 / 2.03 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 10.67 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 12.25 145%= 2.9 Amps. Trip Time 237.65 115%= 2.3 Amps. Trip Time NT 3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 590 / 580 / 570 / 580 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/3	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 10016-2008-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. .5 T_2-Mtg. .5 T-Other Points ——— Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 2.00 (1) / 2.00 (2) / 2.00 (3) / 2.00 Avg. Reset Force 2.40 (1) / 2.30 (2) / 2.40 (3) / 2.36 Avg Performed By J. Lorenzen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 10.86 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 14.81 145%= 2.9 Amps. Trip Time 188.20 115%= 2.3 Amps. Trip Time 1136.5 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 600 (1) / 600 (2) / 600 (3) / 600 Avg. Performed By R. Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/4	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100168-2009-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. .5 T_2-Mtg. .5 T-Other Points ——— Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 1.50 / 1.50 / 1.50 / 1.50 (1 2 3 Avg.) Reset Force 2.25 / 2.30 / 2.25 / 2.26 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 12.02 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 11.37 145%= 2.9 Amps. Trip Time 92.75 115%= 2.3 Amps. Trip Time >T36.0 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 580 / 580 / 570 / 577 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/4	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100168-2010-80

	Acc.	Rej.
Vibration Trip ok Contact Chatter ok Visual Exam. ✓ Performed By R. Belf	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. .5 T_2-Mtg. 1 T-Other Points —— Impressed Voltage 1500 Performed By J. Lorneen	✓	
Operating Force (Pounds) Pullout Force 1.50 / 1.25 / 1.25 / 1.33 (1 2 3 Avg.) Reset Force 1.50 / 1.50 / 1.50 / 1.50 (1 2 3 Avg) Performed By J. Lorneen	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 11.23 Trip-Free YES Performed By J. Lorneen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 8.12 145%= 2.9 Amps. Trip Time 52.95 115%= 2.3 Amps. Trip Time NTBeeo Performed By R. Reeve	✓	
Voltage Drop Test (Millivolts) 580 / 580 / 560 / 560 (1 2 3 Avg.) Performed By R. Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	A/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100269-1301-20

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By K. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 1 T_2-Mtg. 3 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.45 / 1.40 / 1.20 / 1.35 (1 2 3 Avg.) Reset Force 2.20 / 2.15 / 2.15 / 2.17 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 4 Amps. Trip Time (Sec.) 10.36 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 4 Amps. Trip Time 10.42 145%= 2.9 Amps. Trip Time 77.3 115%= 2.3 Amps. Trip Time NT 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 695 / 690 / 690 / 691.7 (1 2 3 Avg.) Performed By J Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/12	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-2 Rev. _____ S/N 100268-1303-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.80 / 1.75 / 1.75 / 1.70 (1 2 3 Avg.) Reset Force 1.85 / 1.80 / 1.85 / 1.83 (1 2 3 Avg) Performed By J. Dratz	✓	
Trip-Free 200%= 4.0 Amps. Trip Time (Sec.) 11.36 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 4.0 Amps. Trip Time 10.28 145%= 2.90 Amps. Trip Time 55.9 115%= 2.30 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 610 / 600 / 600 / 603 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	S/S	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040001-3 Rev. _____ S/N 100268-2231-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 1 T_2-Mtg. 3 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.55 / 1.00 / 1.35 / 1.30 (1 2 3 Avg.) Reset Force 3.40 / 3.55 / 3.50 / 3.48 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6.0 Amps. Trip Time (Sec.) 18.14 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 6.0 Amps. Trip Time 12.10 145%= 4.35 Amps. Trip Time 244.8 115%= 3.45 Amps. Trip Time NT 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 360 / 360 / 360 / 360 (1 2 3 Avg.) Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	9/6	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 100268-2235-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 1 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.45 / 1.30 / 1.20 / 1.32 (1 2 3 Avg.) Reset Force 2.50 / 2.50 / 2.45 / 2.48 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6.0 Amps. Trip Time (Sec.) 11.85 Trip-Free YES Performed By J. Draft	✓	
Performance (All Trip Time in Seconds) 200%= 6.0 Amps. Trip Time 11.18 145%= 4.35 Amps. Trip Time 28.9 115%= 3.45 Amps. Trip Time NT 3600 Performed By J Draft	✓	
Voltage Drop Test (Millivolts) 365 / 365 / 360 / 361.7 (1 2 3 Avg.) Performed By J Draft	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 100268-2236-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 1 T_2-Mtg. 3 T-Other Points —— 1 —— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.25/1.15/1.05/1.15 (1 2 3 Avg.) Reset Force 2.50/2.50/2.50/2.50 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6.0 Amps. Trip Time (Sec.) 11.63 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 6.0 Amps. Trip Time 10.25 145%= 4.35 Amps. Trip Time 64.6 115%= 3.45 Amps. Trip Time NT 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 365/365/365/365 (1 2 3 Avg.) Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/6	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 100368-1302-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 3.5 T_2-Mtg. 3.5 T-Other Points — Impressed Voltage 1500 Performed By RReeve	✓	
Operating Force (Pounds) Pullout Force 2.25 (1) / 2.00 (2) / 1.95 (3) / 2.07 Avg. Reset Force 2.95 (1) / 2.30 (2) / 2.20 (3) / 2.48 Avg Performed By J. Chaf	✓	
Trip-Free 200%= 6.0 Amps. Trip Time (Sec.) 20.07 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 6.0 Amps. Trip Time 9.25 145%= 4.35 Amps. Trip Time 55.2 115%= 3.45 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 350 (1) / 340 (2) / 340 (3) / 343 Avg. Performed By RReeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 100768-1327-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.70 / 1.55 / 1.65 / 1.63 (1 2 3 Avg.) Reset Force 2.50 / 2.40 / 2.50 / 2.47 (1 2 3 Avg) Performed By L. Craig	✓	
Trip-Free 200%= 6.0 Amps. Trip Time (Sec.) 9.60 Trip-Free YES Performed By J. Sorensen	✓	
Performance (All Trip Time in Seconds) 200%= 6.0 Amps. Trip Time 8.86 145%= 4.35 Amps. Trip Time 81.2 115%= 3.45 Amps. Trip Time N.T. 3600 Performed By J. Sorensen	✓	
Voltage Drop Test (Millivolts) 340 / 330 / 330 / 333 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 101868-1645-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points — Impressed Voltage 1500 Performed By J. Lorencen	✓	
Operating Force (Pounds) Pullout Force 1.50 / 1.70 / 1.70 / 1.63 (1 2 3 Avg.) Reset Force 2.10 / 2.10 / 2.10 / 2.10 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6.0 Amps. Trip Time (Sec.) 14.87 Trip-Free YES Performed By J. Thiel	✓	
Performance (All Trip Time in Seconds) 200%= 6.0 Amps. Trip Time 10.71 145%= 4.35 Amps. Trip Time 60.3 115%= 3.45 Amps. Trip Time N.T. 3600 Performed By J. Lorencen	✓	
Voltage Drop Test (Millivolts) 385 / 380 / 380 / 381.6 (1 2 3 Avg.) Performed By J. Lorencen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By — JE	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 102468-1001-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTab	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points —— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.00 / 2.10 / 2.25 / 2.12 (1 2 3 Avg.) Reset Force 2.50 / 2.50 / 2.50 / 250 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6 Amps. Trip Time (Sec.) 14.26 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 6 Amps. Trip Time 12.13 145%= 4.35 Amps. Trip Time 93.38 115%= 3.45 Amps. Trip Time NT3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 360 / 355 / 350 / 355 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 102468-1002-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTpb	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 3.5 T_2-Mtg. 3.5 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.50 / 2.25 / 2.20 / 2.32 (1 2 3 Avg.) Reset Force 1.75 / 2.00 / 2.00 / 1.83 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6 Amps. Trip Time (Sec.) 10.75 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 6 Amps. Trip Time 10.66 145%= 4.35 Amps. Trip Time 409.50 115%= 3.45 Amps. Trip Time NT3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 360 / 360 / 360 / 360 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓ 4/5	4/5	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 102468-1125-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTpp	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 1.80 1.80 1.80 1.80 (1 2 3 Avg.) Reset Force 2.25 2.25 2.25 2.25 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6 Amps. Trip Time (Sec.) 16.87 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 6 Amps. Trip Time 10.73 145%= 4.35 Amps. Trip Time 2902.08 115%= 3.45 Amps. Trip Time NT 3600 Performed By J. Mast	✓	
Voltage Drop Test (Millivolts) 350 345 340 345 (1 2 3 Avg.) Performed By J. Mast	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By GHZ ✓	G/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-3 Rev. _____ S/N 102468-1126-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTA	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 3 T_2-Mtg. 3 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.20 2.00 2.10 2.10 (1 2 3 Avg.) Reset Force 2.25 2.35 2.30 2.30 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 6 Amps. Trip Time (Sec.) 3.78 Trip-Free yes Performed By R. Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 6 Amps. Trip Time 9.07 145%= 4.35 Amps. Trip Time 125.06 115%= 3.45 Amps. Trip Time NT360 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 360 340 340 347 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1651-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.50 / 3.45 / 3.25 / 3.73 (1 2 3 Avg.) Reset Force 5.05 / 5.10 / 5.50 / 5.31 (1 2 3 Avg) Performed By [signature]	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 10.46 Trip-Free YES Performed By J. Lorensen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 11.69 145%= 7.25 Amps. Trip Time 152.7 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorensen	✓	
Voltage Drop Test (Millivolts) 160 / 160 / 160 / 160 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	S/L	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1652-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.70 / 3.60 / 3.60 / 3.67 (1 2 3 Avg.) Reset Force 5.30 / 5.40 / 5.25 / 5.31 (1 2 3 Avg) Performed By [illegible]	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 6.90 Trip-Free YES Performed By J. Lorencen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 10.29 145%= 7.25 Amps. Trip Time 92.9 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorencen	✓	
Voltage Drop Test (Millivolts) 155 / 155 / 155 / 155 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK MP Case OK Workmanship OK Performed By ✓	E/C	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1654-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Lorenzen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 3.0 T_2-Mtg. 4.0 T-Other Points —— Impressed Voltage 1500 Performed By RKhlebosser	✓	
Operating Force (Pounds) Pullout Force 3.25/3.25/3.25/3.25 (1 2 3 Avg.) Reset Force 4.25/4.25/4.25/4.25 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 6.97 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 10.08 145%= 7.25 Amps. Trip Time 70.8 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 165/165/165/165 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By —	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1655-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. — Performed By J. Lorenzen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 4.0 T_2-Mtg. 4.0 T-Other Points — Impressed Voltage 1500 Performed By P.E. Adams	✓	
Operating Force (Pounds) Pullout Force 3.75 / 4.00 / 4.00 / 3.83 (1 2 3 Avg.) Reset Force 4.25 / 4.25 / 4.25 / 4.25 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 7.24 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 10.47 145%= 7.25 Amps. Trip Time 63.2 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 165 / 165 / 165 / 165 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/12	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1659-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Lorenzen	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 3.5 T_2-Mtg. 4.0 T-Other Points ——— Impressed Voltage 1500 Performed By R. Erbsen	✓	
Operating Force (Pounds) Pullout Force 4.75/5.00/4.75/4.83 (1 2 3 Avg.) Reset Force 5.00/5.00/5.00/5.00 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 8.02 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 10.48 145%= 7.25 Amps. Trip Time 109.8 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 165/165/165/165 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/4	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1660-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By K. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.80 / 3.75 / 3.50 / 3.71 (1 2 3 Avg.) Reset Force 4.35 / 4.40 / 4.40 / 4.37 (1 2 3 Avg) Performed By _____	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 7.11 Trip-Free YES Performed By J. Lorenson	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 9.26 145%= 7.25 Amps. Trip Time 28.6 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorenson	✓	
Voltage Drop Test (Millivolts) 160 / 160 / 160 / 160 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1661-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.45 / 3.30 / 3.41 (1 2 3 Avg.) Reset Force 4.20 / 4.25 / 4.30 / 4.28 (1 2 3 Avg) Performed By J. Graf	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 9.28 Trip-Free YES Performed By J. Sorensen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 9.31 145%= 7.25 Amps. Trip Time 59.5 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Sorensen	✓	
Voltage Drop Test (Millivolts) 160 / 160 / 160 / 160 (1 2 3 Avg.) Performed By R R C U C	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 100468-1662-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Lorencen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 3.5 T_2-Mtg. 4.0 T-Other Points — Impressed Voltage 1500 Performed By RG Eddleman	✓	
Operating Force (Pounds) Pullout Force 4.00 / 4.00 / 3.75 / 3.91 (1 2 3 Avg.) Reset Force 6.25 / 6.00 / 6.00 / 6.08 (1 2 3 Avg) Performed By J. Lorencen	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 10.43 Trip-Free YES Performed By J. Lorencen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 11.19 145%= 7.25 Amps. Trip Time 153.7 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorencen	✓	
Voltage Drop Test (Millivolts) 155 / 155 / 160 / 157 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 101868-1447-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2.5 T_2-Mtg. 2.5 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 2.95 / 2.75 / 2.50 / 2.73 (1 2 3 Avg.) Reset Force 3.40 / 3.40 / 3.40 / 3.40 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 10.0 Amps. Trip Time (Sec.) 8.03 Trip-Free Yes Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 10.0 Amps. Trip Time 10.06 145%= 7.25 Amps. Trip Time 92.2 115%= 5.75 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 160 / 160 / 160 / 160 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓/E.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-5 Rev. _____ S/N 102468-1715-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTG	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.30 / 4.00 / 3.00 / 3.43 (1 2 3 Avg.) Reset Force 3.75 / 4.00 / 4.00 / 3.92 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 10 Amps. Trip Time (Sec.) 7.40 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 10 Amps. Trip Time 9.51 145%= 7.25 Amps. Trip Time 54.10 115%= 5.75 Amps. Trip Time NT 3600 Performed By J. Mat	✓	
Voltage Drop Test (Millivolts) 150 / 152 / 151 / 151 (1 2 3 Avg.) Performed By J. Mat	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/6	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0701-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Lorenzen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 3.0 T_2-Mtg. 4.0 T-Other Points — Impressed Voltage 1500 Performed By [illegible]	✓	
Operating Force (Pounds) Pullout Force 3.1 / 3.3 / 3.1 / 3.16 (1 2 3 Avg.) Reset Force 7.1 / 7.0 / 6.8 / 6.96 (1 2 3 Avg) Performed By [illegible]	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 4.54 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 10.69 145%= 10.8 Amps. Trip Time 174.61 115%= 8.625 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 130 / 130 / 130 / 130 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK MP Case OK Workmanship OK Performed By ✓	4/6	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0703-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.60 / 2.80 / 3.10 / 2.87 (1 2 3 Avg.) Reset Force 5.00 / 5.0 / 5.00 / 5.00 (1 2 3 Avg) Performed By J. Mraz	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 9.46 Trip-Free OK Performed By R.W. Kirkby	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 9.81 145%= 10.87 Amps. Trip Time 97.89 115%= 8.625 Amps. Trip Time NT 3600 Performed By R. Kirby	✓	
Voltage Drop Test (Millivolts) 135 / 135 / 135 / 135 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0704-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Lorenzen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 4.0 T_2-Mtg. 4.0 T-Other Points ——— Impressed Voltage 1500 Performed By R E Schlosser	✓	
Operating Force (Pounds) Pullout Force 2.3 / 2.1 / 1.9 / 2.1 (1 2 3 Avg.) Reset Force 4.8 / 4.65 4.70 4.71 (1 2 3 Avg) Performed By R E Schlosser	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 8.97 Trip-Free YES Performed By R E Schlosser	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 9.09 145%= 10.87 Amps. Trip Time 39.04 115%= 8.62 Amps. Trip Time NT-3600 Performed By R E Schlosser	✓	
Voltage Drop Test (Millivolts) 135 / 130 / 130 / 132 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0705-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ✓ Impressed Voltage 1500 Performed By RReeve	✓	
Operating Force (Pounds) Pullout Force 4.00 / 3.50 / 3.75 / 3.75 (1 2 3 Avg.) Reset Force 6.00 / 6.00 / 6.00 / 6.00 (1 2 3 Avg) Performed By J. Graf	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 9.39 Trip-Free YES Performed By R. Kibby	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 10.81 145%= 10.87 Amps. Trip Time 48.29 115%= 8.625 Amps. Trip Time NT3600 Performed By R. W. Kibby	✓	
Voltage Drop Test (Millivolts) 135 / 130 / 130 / 132 (1 2 3 Avg.) Performed By RReeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	2/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0706-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Reeve	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ✓ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.66 / 3.36 / 3.20 / 3.37 (1 2 3 Avg.) Reset Force 4.15 / 4.30 / 4.30 / 4.25 (1 2 3 Avg) Performed By J. Mraz	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 9.46 Trip-Free YES Performed By R. Kirby	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 9.00 145%= 10.87 Amps. Trip Time 31.58 115%= 8.625 Amps. Trip Time NT3600 Performed By R. Kirby	✓	
Voltage Drop Test (Millivolts) 135 / 130 / 135 / 133 (1 2 3 Avg.) Performed By RReeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By [illegible]	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0707-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Rasmussen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 1.0 T_2-Mtg. 4.0 T-Other Points —— Impressed Voltage 1500 Performed By DEShlosser	✓	
Operating Force (Pounds) Pullout Force 3.25 / 3.15 / 3.10 / 3.16 (1 2 3 Avg.) Reset Force 4.95 / 5.10 / 5.15 / 5.06 (1 2 3 Avg) Performed By DEShlosser	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 7.68 Trip-Free YES Performed By DEShlosser	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 10.53 145%= 10.87 Amps. Trip Time 57.70 115%= 8.62 Amps. Trip Time NT-3600 Performed By DEShlosser	✓	
Voltage Drop Test (Millivolts) 130 / 130 / 130 / 130 (1 2 3 Avg.) Performed By RRreue	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0708-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Sorensen	✓	
Dielectric Test (Microamps) T_1-T_2 2.0 T_1-Mtg. 4.0 T_2-Mtg. 4.0 T-Other Points ——— Impressed Voltage 1500 Performed By R E Sahlstrom	✓	
Operating Force (Pounds) Pullout Force 3.55 / 3.40 / 3.60 / 3.51 (1 2 3 Avg.) Reset Force 7.55 / 7.75 / 7.60 / 7.63 (1 2 3 Avg) Performed By R E Sahlstrom	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 5.99 Trip-Free Yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 13.34 145%= 10.8 Amps. Trip Time 247.64 115%= 8.625 Amps. Trip Time N.T. 3600 Performed By J. Sorensen	✓	
Voltage Drop Test (Millivolts) 130 / 130 / 130 / 130 (1 2 3 Avg.) Performed By R. Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MD OK Case OK Workmanship OK Performed By ✓	2/6	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 100568-0709-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By J. Lorenzen	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 3.5 T_2-Mtg. 4.0 T-Other Points — Impressed Voltage 1500 Performed By R Schulmeyer	✓	
Operating Force (Pounds) Pullout Force 2.75 / 2.90 / 2.80 / 2.81 (1 2 3 Avg.) Reset Force 4.10 / 4.20 / 4.15 / 4.15 (1 2 3 Avg) Performed By R Schulmeyer	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) 11.26 Trip-Free YES Performed By R Schulmeyer	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 9.88 145%= 10.87 Amps. Trip Time 62.18 115%= 8.62 Amps. Trip Time NT-3600 Performed By R Schulmeyer	✓	
Voltage Drop Test (Millivolts) 135 / 135 / 135 / 135 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 101868-1449-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 1.5 T_2-Mtg. 2.5 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenson	✓	
Operating Force (Pounds) Pullout Force 3.60 (1) 3.35 (2) 3.30 (3) 3.42 Avg. Reset Force 3.75 (1) 3.75 (2) 3.75 (3) 3.75 Avg Performed By R Reeve	✓	
Trip-Free 200%= 15.0 Amps. Trip Time (Sec.) 8.54 Trip-Free yes Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 15.0 Amps. Trip Time 10.06 145%= 10.87 Amps. Trip Time 512.8 115%= 8.62 Amps. Trip Time NT 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 145 (1) / 145 (2) / 145 (3) / 145 Avg. Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-705 Rev. _____ S/N 102468-1123-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTP	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg: 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.60 (1) 3.30 (2) 2.00 (3) 2.97 Avg. Reset Force 5.50 (1) 5.50 (2) 5.75 (3) 5.58 Avg Performed By R Reeve	✓	
Trip-Free 200%= 15 Amps. Trip Time (Sec.) .703 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 15 Amps. Trip Time 9.71 145%= 10.87 Amps. Trip Time 39.32 115%= 8.625 Amps. Trip Time NT 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 138 (1) 138 (2) 137 (3) 138 Avg. Performed By J Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 100768-1731-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2.5 T_2-Mtg. 2.5 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.05 / 3.00 / 2.60 / 2.88 (1 2 3 Avg.) Reset Force 3.25 / 3.25 / 3.90 / 3.63 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 20 Amps. Trip Time (Sec.) 10.54 Trip-Free YES Performed By R. Kibby	✓	
Performance (All Trip Time in Seconds) 200%= 20 Amps. Trip Time 10.01 145%= 145 Amps. Trip Time 247.9 115%= 11.5 Amps. Trip Time NT3600 Performed By R. Kibby	✓	
Voltage Drop Test (Millivolts) 156 / 155 / 155 / 155 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	5/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

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MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 100768-1733-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Beck	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 3.5 T_2-Mtg. 3.5 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.25 / 4.75 / 4.75 / 4.42 (1 2 3 Avg.) Reset Force 6.25 / 6.25 / 6.25 / 6.25 (1 2 3 Avg) Performed By J. Lorenzen	✓	
Trip-Free 200%= 20 Amps. Trip Time (Sec.) 10.72 Trip-Free YES Performed By R. Kirkby	✓	
Performance (All Trip Time in Seconds) 200%= 20 Amps. Trip Time 10.66 145%= 1450 Amps. Trip Time 126.6 115%= 115 Amps. Trip Time NT.3600 Performed By R. Kirkby	✓	
Voltage Drop Test (Millivolts) 155 / 155 / 155 / 155 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	4/6.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 100768-1734-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.50 (1) 4.75 (2) 4.75 (3) 4.67 Avg. Reset Force 5.00 (1) 5.00 (2) 5.00 (3) 5.00 Avg Performed By J. Rossman	✓	
Trip-Free 200%= 20 Amps. Trip Time (Sec.) 9.23 Trip-Free YES Performed By R. Kirkby	✓	
Performance (All Trip Time in Seconds) 200%= 20 Amps. Trip Time 10.91 145%= 14.50 Amps. Trip Time 235.9 115%= 11.5 Amps. Trip Time NT3600 Performed By R. Kirkby	✓	
Voltage Drop Test (Millivolts) 160 (1) 160 (2) 155 (3) 158 Avg. Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By J/E ✓	J/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 100768-1737-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By Reeve	✓	
Operating Force (Pounds) Pullout Force 4.75 / 4.75 / 4.50 / 4.67 (1 2 3 Avg.) Reset Force 3.00 / 3.00 / 3.00 / 3.00 (1 2 3 Avg) Performed By J. Rasmussen	✓	
Trip-Free 200%= 20 Amps. Trip Time (Sec.) 12.38 Trip-Free YES Performed By R. Kirby	✓	
Performance (All Trip Time in Seconds) 200%= 20 Amps. Trip Time 14.17 145%= 14.50 Amps. Trip Time 213.3 115%= 11.5 Amps. Trip Time NT3600 Performed By R. Kirby	✓	
Voltage Drop Test (Millivolts) 160 / 153 / 154 / 155.7 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK MP Case OK Workmanship OK Performed By ✓	✓/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 100768-1740-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ~ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 5.00 (1) / 5.00 (2) / 5.00 (3) / 5.00 Avg. Reset Force 5.25 (1) / 5.25 (2) / 5.25 (3) / 5.25 Avg Performed By J. Sorensen	✓	
Trip-Free 200%= 20 Amps. Trip Time (Sec.) 8.60 Trip-Free YES Performed By R. Kirby	✓	
Performance (All Trip Time in Seconds) 200%= 20 Amps. Trip Time 9.37 145%= 14.50 Amps. Trip Time 42.28 115%= 11.5 Amps. Trip Time NT3600 Performed By R. Kirby	✓	
Voltage Drop Test (Millivolts) 145 (1) / 145 (2) / 145 (3) / 145 Avg. Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ~	✓ 6.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 100768-1741-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.00 / 4.00 / 3.50 / 3.83 (1 2 3 Avg.) Reset Force 5.00 / 5.00 / 5.00 / 5.00 (1 2 3 Avg) Performed By J. Sorensen	✓	
Trip-Free 200%= 20 Amps. Trip Time (Sec.) 9.36 Trip-Free YES Performed By R. Kibby	✓	
Performance (All Trip Time in Seconds) 200%= 20 Amps. Trip Time 9.56 145%= 14.50 Amps. Trip Time 46.70 115%= 11.5 Amps. Trip Time NT.3600 Performed By Roger Kibby	✓	
Voltage Drop Test (Millivolts) 145 / 145 / 145 / 145 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By —	2/6.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 10 1868-1451-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. — Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 2.5 T_2-Mtg. 2.5 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.25 / 3.35 / 3.37 (1 2 3 Avg.) Reset Force 4.35 / 4.50 / 4.50 / 4.45 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 20.0 Amps. Trip Time (Sec.) 8.02 Trip-Free YES Performed By J. Metz	✓	
Performance (All Trip Time in Seconds) 200%= 20.0 Amps. Trip Time 10.37 145%= 14.5 Amps. Trip Time 62.3 115%= 11.5 Amps. Trip Time NT.3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 135 / 142 / 142 / 139 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By —	4/6	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 101868-1452-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ~ Performed By R. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1.0 T_1-Mtg. 1.5 T_2-Mtg. 1.5 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 3.80 / 4.10 / 4.10 / 4.00 (1 2 3 Avg.) Reset Force 4.40 / 4.40 / 4.40 / 4.40 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 20.0 Amps. Trip Time (Sec.) 9.91 Trip-Free YES Performed By J. Duch	✓	
Performance (All Trip Time in Seconds) 200%= 20.0 Amps. Trip Time 11.20 145%= 14.5 Amps. Trip Time 210.7 115%= 11.5 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 149 / 148 / 148 / 148.3 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	E/E.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 101868-1453-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By K. Bell	✓	
Dielectric Test (Microamps) T_1-T_2 1.5 T_1-Mtg. 1.5 T_2-Mtg. 1.5 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 3.60 / 3.50 / 3.80 / 3.63 (1 2 3 Avg.) Reset Force 6.00 / 6.00 / 6.00 / 6.00 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 20.0 Amps. Trip Time (Sec.) 9.74 Trip-Free YES Performed By J. Mata	✓	
Performance (All Trip Time in Seconds) 200%= 20.0 Amps. Trip Time 10.46 145%= 14.5 Amps. Trip Time 182.8 115%= 11.5 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 148 / 145 / 145 / 146 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	w/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-10 Rev. _____ S/N 102468-1003-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RT,GB	✓	
Dielectric Test (Microamps) T_1-T_2 0.5 T_1-Mtg. 2.0 T_2-Mtg. 2.0 T-Other Points — Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.25 / 4.40 / 4.55 / 4.40 (1 2 3 Avg.) Reset Force 5.00 / 5.00 / 5.00 / 5.00 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 20 Amps. Trip Time (Sec.) 6.06 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 20 Amps. Trip Time 11.48 145%= 14.5 Amps. Trip Time 112.39 115%= 11.5 Amps. Trip Time NT3600 Performed By D. Craft	✓	
Voltage Drop Test (Millivolts) 65 / 65 / 65 / 65 (1 2 3 Avg.) Performed By D. Craft	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings MP OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 102468-1005-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. — Performed By RTAS	✓	
Dielectric Test (Microamps) T_1-T_2 2 T_1-Mtg. 3 T_2-Mtg. 3 T-Other Points _____ Impressed Voltage 1500 Performed By J. Graf	✓	
Operating Force (Pounds) Pullout Force 3.50/3.00/3.00/3.16 (1 2 3 Avg.) Reset Force 5.00/5.00/5.00/5.00 (1 2 3 Avg) Performed By J. Graf	✓	
Trip-Free 200%= 30.0 Amps. Trip Time (Sec.) 10.30 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 30.0 Amps. Trip Time 10.60 145%= 21.75 Amps. Trip Time 199.7 115%= 17.25 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 85 / 84 / 85 / 84.7 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By SJE	SJE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 102468-1006-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTP	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points _____ Impressed Voltage 1500 Performed By J. Graf	✓	
Operating Force (Pounds) Pull-out Force 2.75 / 2.50 / 2.75 / 2.66 (1 2 3 Avg.) Reset Force 5.00 / 5.00 / 5.00 / 5.00 (1 2 3 Avg) Performed By J. Graf	✓	
Trip-Free 200%= 30.0 Amps. Trip Time (Sec.) 10.53 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 30.0 Amps. Trip Time 12.41 145%= 21.75 Amps. Trip Time 241.6 115%= 17.25 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 84 / 85 / 85 / 85.3 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	EJE.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 102468-1393-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTJ	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 3 T_2-Mtg. 3 T-Other Points _____ Impressed Voltage 1500 Performed By J Draft	✓	
Operating Force (Pounds) Pullout Force 4.75 / 3.50 / 3.25 / 3.83 (1 2 3 Avg.) Reset Force 6.25 / 6.25 / 6.00 / 6.16 (1 2 3 Avg) Performed By J Draft	✓	
Trip-Free 200%= 30.0 Amps. Trip Time (Sec.) 12.17 Trip-Free YES Performed By J. Lorensen	✓	
Performance (All Trip Time in Seconds) 200%= 30.0 Amps. Trip Time 11.46 145%= 21.75 Amps. Trip Time 373.3 115%= 17.25 Amps. Trip Time N.T. 3600 Performed By J. Lorensen	✓	
Voltage Drop Test (Millivolts) 82 / 82 / 83 / 82.3 (1 2 3 Avg.) Performed By J. Lorensen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By EJE	EJE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 102468-1700-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTM	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By J. Grant	✓	
Operating Force (Pounds) Pullout Force 3.00 / 3.00 / 5.00 / 3.00 (1 / 2 / 3 / Avg.) Reset Force 5.50 / 5.60 / 5.75 / 5.58 (1 / 2 / 3 / Avg) Performed By J. Grant	✓	
Trip-Free 200%= 30.0 Amps. Trip Time (Sec.) 11.62 Trip-Free YES Performed By J. Grant	✓	
Performance (All Trip Time in Seconds) 200%= 30.0 Amps. Trip Time 12.39 145%= 21.75 Amps. Trip Time 209.6 115%= 17.25 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 86 / 84 / 84 / 84.7 (1 / 2 / 3 / Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 102568-1535-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By J. Lorences	✓	
Operating Force (Pounds) Pullout Force 2.70 / 3.75 / 3.50 / 3.32 (1 2 3 Avg.) Reset Force 5.25 / 5.50 / 5.30 / 5.42 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 30 Amps. Trip Time (Sec.) 19.06 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 30 Amps. Trip Time 11.81 145%= 21.75 Amps. Trip Time 304.93 115%= 1725 Amps. Trip Time NT 3600 Performed By [signature]	✓	
Voltage Drop Test (Millivolts) 89 / 89 / 89 / 89 (1 2 3 Avg.) Performed By [signature]	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By [signature]	✓	✓

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040 - 0001-15 Rev. _____ S/N 102568-1536-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Farmer	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 2.50 / 3.70 / 3.60 / 3.60 (1 2 3 Avg.) Reset Force 5.25 / 5.30 / 5.50 / 5.35 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 30 Amps. Trip Time (Sec.) 8.46 Trip-Free Yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 30 Amps. Trip Time 11.29 145%= 21.75 Amps. Trip Time 154.81 115%= 17.25 Amps. Trip Time NT 3600 Performed By L. Gray	✓	
Voltage Drop Test (Millivolts) 94 / 94 / 94 / 94 (1 2 3 Avg.) Performed By L. Gray	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. 1

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 103068-1445-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 1 T_2-Mtg. 1 T-Other Points — Impressed Voltage 1500 Performed By R.W. Kirby	✓	
Operating Force (Pounds) Pullout Force 3.85 / 3.85 / 3.85 / 3.85 (1 2 3 Avg.) Reset Force 5.90 / 5.90 / 5.90 / 5.90 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 30 Amps. Trip Time (Sec.) 10.80 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 30 Amps. Trip Time 11.04 145%= 21.75 Amps. Trip Time 75.16 115%= 17.25 Amps. Trip Time NT 3600 Performed By L. Graf	✓	
Voltage Drop Test (Millivolts) 89 / 87 / 86 / 87.3 (1 2 3 Avg.) Performed By L. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 103168-1420-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K Performed By R.E. Kinnear	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points —— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.90 2.75 2.50 2.72 (1 2 3 Avg.) Reset Force 3.25 3.25 3.25 3.25 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 30 Amps. Trip Time (Sec.) 15.69 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 30 Amps. Trip Time 13.17 145%= 21.75 Amps. Trip Time 28.86 115%= 17.25 Amps. Trip Time NT 36.0 Performed By [illegible]	✓	
Voltage Drop Test (Millivolts) 93 / 105 / 110 / 102.7 (1 2 3 Avg.) Performed By [illegible]	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By [illegible]	✓	

Acceptance Test Procedure [illegible] Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 110168-0955-80

	Acc.	Rej.
Vibration Trip None Contact Chatter none Visual Exam. OK Performed By William E. Jenkins	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By William E Jenkins	✓	
Operating Force (Pounds) Pullout Force 4.00 / 3.50 / 4.50 / 4.00 (1 2 3 Avg.) Reset Force 5.25 / 5.00 / 5.25 / 5.16 (1 2 3 Avg) Performed By William E Jenkins	✓	
Trip-Free 200%= 30.0 Amps. Trip Time (Sec.) 16.67 Trip-Free yes Performed By William E Jenkins	✓	
Performance (All Trip Time in Seconds) 200%= 30.0 Amps. Trip Time 11.33 145%= 21.75 Amps. Trip Time 376.8 115%= 17.25 Amps. Trip Time NT3600 Performed By L. Hart	✓	
Voltage Drop Test (Millivolts) 92 / 91 / 91 / 91.3 (1 2 3 Avg.) Performed By L. Hart	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-15 Rev. _____ S/N 110168-0956-80

	Acc.	Rej.
Vibration Trip None Contact Chatter None Visual Exam. OK Performed By William E. Jenkins	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By William E. Jenkins	✓	
Operating Force (Pounds) Pullout Force 4.00 / 3.50 / 3.00 / 3.50 (1 2 3 Avg.) Reset Force 4.25 / 4.35 / 4.25 / 4.28 (1 2 3 Avg) Performed By William E. Jenkins	✓	
Trip-Free 200%= 30.0 Amps. Trip Time (Sec.) 11.61 Trip-Free yes Performed By William E. Jenkins	✓	
Performance (All Trip Time in Seconds) 200%= 30.0 Amps. Trip Time 12.56 145%= 21.75 Amps. Trip Time 278.8 115%= 17.25 Amps. Trip Time NT 3600 Performed By J. Dent	✓	
Voltage Drop Test (Millivolts) 145 / 140 / 160 / 148.3 (1 2 3 Avg.) Performed By J. Dent	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By OK	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-20 Rev. _____ S/N 102468-1009-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. — Performed By KTM	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.50 / 3.25 / 3.41 (1 2 3 Avg.) Reset Force 6.00 / 6.00 / 6.00 / 6.00 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 40.0 Amps. Trip Time (Sec.) 1.34 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 40.0 Amps. Trip Time 10.53 145%= 29.0 Amps. Trip Time 153.0 115%= 23.0 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 94 / 90 / 90 / 91.3 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By SE	4/6.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown. -

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-20 Rev. _____ S/N 102468-1011-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RT.GS	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.00 / 3.45 / 3.25 / 3.57 (1 2 3 Avg.) Reset Force 6.50 / 6.75 / 7.00 / 6.75 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 40.0 Amps. Trip Time (Sec.) 10.89 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%= 40.0 Amps. Trip Time 13.16 145%= 29.0 Amps. Trip Time #55.0 115%= 23.0 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 94 / 93 / 93 / 93.3 (1 2 3 Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	6/16.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-20 Rev. _____ S/N 102468-1012-80

	Acc.	Rej.
Vibration Trip OK Contact Chatter OK Visual Exam. ✓ Performed By RTabs	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2.5 T_2-Mtg. 2.5 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.50 / 4.60 / 4.70 / 4.60 (1 / 2 / 3 / Avg.) Reset Force 7.00 / 7.40 / 7.30 / 7.23 (1 / 2 / 3 / Avg) Performed By R Reeve	✓	
Trip-Free 200%= 46.0 Amps. Trip Time (Sec.) 8.90 Trip-Free YES Performed By J. Lorenzen	✓	
Performance (All Trip Time in Seconds) 200%=46.0 Amps. Trip Time 13.90 145%=29.0 Amps. Trip Time 710.0 115%=23.0 Amps. Trip Time N.T. 3600 Performed By J. Lorenzen	✓	
Voltage Drop Test (Millivolts) 92 / 88 / 90 / 90 (1 / 2 / 3 / Avg.) Performed By J. Lorenzen	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By J.L.	J.L.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-20 Rev. _____ S/N 102868 1330-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 4 T_2-Mtg. 3.5 T-Other Points ——— Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 5.95 / 6.00 / 5.90 / 5.95 (1 2 3 Avg.) Reset Force 5.50 / 5.50 / 5.40 / 5.47 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 40 Amps. Trip Time (Sec.) 9.48 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 40 Amps. Trip Time 11.67 145%= 29 Amps. Trip Time 178.04 115%= 23 Amps. Trip Time NT 3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 95 / 90 / 90 / 92 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	✓ 4/5.	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-20 Rev. . S/N 102868-1331-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 3.5 T_2-Mtg. 3.5 T-Other Points ——— Impressed Voltage 1500 Performed By J Lorenzen	✓	
Operating Force (Pounds) Pullout Force 3.60 / 3.00 / 3.00 / 3.20 (1 / 2 / 3 / Avg.) Reset Force 5.70 / 5.70 / 5.70 / 5.70 (1 / 2 / 3 / Avg) Performed By R Reeve	✓	
Trip-Free 200%= 40 Amps. Trip Time (Sec.) 2.42 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 40 Amps. Trip Time 10.09 145%= 29 Amps. Trip Time 128.93 115%= 23 Amps. Trip Time NT 300 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 95 / 95 / 95 / 95 (1 / 2 / 3 / Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. /

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-1120 amp Rev. _____ S/N 02868-1332-88

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.C. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By J. Lorencen	✓	
Operating Force (Pounds) Pullout Force 3.90 / 3.90 / 3.90 / 3.90 (1 2 3 Avg.) Reset Force 6.50 6.25 6.80 6.52 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 40 Amps. Trip Time (Sec.) 11.26 Trip-Free YES Performed By R. Kirby	✓	
Performance (All Trip Time in Seconds) 200%= 40 Amps. Trip Time 14.98 145%= 29 Amps. Trip Time 406.84 115%= 23 Amps. Trip Time NT3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 90 / 90 / 90 / 90 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By [illegible]	[illegible]	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-01-20 Amp. Rev. _____ S/N 102868-1333-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 4 T_2-Mtg. 4 T-Other Points _____ Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 4.25 / 4.20 / 4.40 / 4.28 (1 2 3 Avg.) Reset Force 7.40 / 7.20 / 7.20 / 7.27 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 40 Amps. Trip Time (Sec.) 7.99 Trip-Free YES Performed By R. Kirby	✓	
Performance (All Trip Time in Seconds) 200%= 40 Amps. Trip Time 11.37 145%= 29 Amps. Trip Time 658.80 115%= 23 Amps. Trip Time NT3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 88 / 87 / 86 / 87 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By RE	RE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-20 Rev. _____ S/N 02868-1334-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points —— Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 3.45 / 3.50 / 3.55 / 3.50 (1 2 3 Avg.) Reset Force 5.20 / 5.20 / 5.20 / 5.20 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 40 Amps. Trip Time (Sec.) 5.25 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%=40 Amps. Trip Time 11.10 145%= 29 Amps. Trip Time 129.00 115%=23 Amps. Trip Time NT 300 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 100 / 100 / 100 / 100 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By ✓	✓	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001 20 Amp Rev. _____ S/N 102868-1335-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 3 T_2-Mtg. 2.5 T-Other Points _____ Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 4.80 / 5.40 / 5.20 / 5.13 (1 2 3 Avg.) Reset Force 6.50 / 6.50 / 6.50 / 6.50 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free, 200%= 40 Amps. Trip Time (Sec.) 13.77 Trip-Free YES Performed By R. Kirkby	✓	
Performance (All Trip Time in Seconds) 200%= 40 Amps. Trip Time 10.17 145%= 29 Amps. Trip Time 87.51 115%= 23 Amps. Trip Time NT 360 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 91 / 91 / 96 / 93 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-20 Rev. _____ S/N 102868-1336-88

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points —— Impressed Voltage 1500 Performed By J. Lorenzen	✓	
Operating Force (Pounds) Pullout Force 4.20 (1) 3.80 (2) 3.70 (3) 3.90 Avg. Reset Force 3.40 (1) 3.35 (2) 3.45 (3) 3.40 Avg Performed By R Reeve	✓	
Trip-Free 200%= 40 Amps. Trip Time (Sec.) 9.54 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 40 Amps. Trip Time 10.30 145%= 29 Amps. Trip Time 17.16 115%= 23 Amps. Trip Time NT 36.0 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 110 (1) 110 (2) 110 (3) 110 Avg. Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By —/—	—/—	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001 25amp Rev. _____ S/N 102968-1501-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Kuenzel	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.60 / 5.20 / 4.60 / 4.47 (1 2 3 Avg.) Reset Force 5.00 / 6.00 / 6.30 / 6.10 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 50 Amps. Trip Time (Sec.) 15.62 Trip-Free YES Performed By R. Kirkby	✓	
Performance (All Trip Time in Seconds) 200%= 50 Amps. Trip Time 10.54 145%= 36.25 Amps. Trip Time 14.61 115%= 28.75 Amps. Trip Time NT 3600 Performed By R Reeve	✓	
Voltage Drop Test (Millivolts) 78 / 77 / 76 / 77 (1 2 3 Avg.) Performed By R Reeve	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By RE	RE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001 25 Amp Rev. _____ S/N 102968-1502-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Kümmel	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By P Reeve	✓	
Operating Force (Pounds) Pullout Force 4.00 / 4.05 / 3.20 / 3.75 (1 2 3 Avg.) Reset Force 5.00 / 5.00 / 5.20 / 5.18 (1 2 3 Avg) Performed By P Reeve	✓	
Trip-Free 200%=50.0 Amps. Trip Time (Sec.) 19.41 Trip-Free YES Performed By J. Smith	✓	
Performance (All Trip Time in Seconds) 200%=50 Amps. Trip Time 10.84 145%=36.25 Amps. Trip Time 44.8 115%=28.75 Amps. Trip Time NT 3600 Performed By J. Chandler	✓	
Voltage Drop Test (Millivolts) 88 / 113 / 99 / 100 (1 2 3 Avg.) Performed By J. Chandler	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By EJE	EJE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 103068-1448-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK. Performed By R.E. Turner R.K.	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By RRauc RK.	✓	
Operating Force (Pounds) Pullout Force 3.00 / 3.30 / 3.05 / 3.12 (1 2 3 Avg.) Reset Force 5.00 / 5.00 / 5.00 / 5.00 (1 2 3 Avg) Performed By RRauc RK.	✓	
Trip-Free 200%= 50 Amps. Trip Time (Sec.) 12.5 Trip-Free YES Performed By J Charles RK.	✓	
Performance (All Trip Time in Seconds) 200%= 50 Amps. Trip Time 10.73 145%=36.2 Amps. Trip Time 76.21 115%=28.75 Amps. Trip Time NT 3600 Performed By J Charles	✓	
Voltage Drop Test (Millivolts) 100 / 100 / 100 / 100 (1 2 3 Avg.) Performed By J Charles	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By GJE	GJE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 103068-1520-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By RReeve	✓	
Operating Force (Pounds) Pullout Force 3.25 / 3.25 / 3.25 / 3.25 (1 2 3 Avg.) Reset Force 3.50 / 3.50 / 3.50 / 3.50 (1 2 3 Avg) Performed By RReeve	✓	
Trip-Free 200%= 50 Amps. Trip Time (Sec.) 19.58 Trip-Free yes Performed By RReeve	✓	
Performance (All Trip Time in Seconds) 200%= 50 Amps. Trip Time 11.42 145%= 36.25 Amps. Trip Time 64.86 115%= 28.75 Amps. Trip Time NT 3600 Performed By [signature]	✓	
Voltage Drop Test (Millivolts) 155 / 120 / 115 / 130 (1 2 3 Avg.) Performed By [signature]	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By [signature]	[signature]	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 103068-1521-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K Performed By R. E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.10 / 3.00 / 2.80 / 2.97 (1 / 2 / 3 / Avg.) Reset Force 3.20 / 3.70 / 3.53 (1 / 2 / 3 / Avg) Performed By R Reeve	✓	
Trip-Free 200%= 50 Amps. Trip Time (Sec.) 7.16 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 50 Amps. Trip Time 9.53 145%= 36.25 Amps. Trip Time 122.3 115%= 28.75 Amps. Trip Time NT 3600 Performed By J. Mott	✓	
Voltage Drop Test (Millivolts) 100 / 94 / 90 / 94.7 (1 / 2 / 3 / Avg.) Performed By J. Mott	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By CJE	CJE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 103168-1030-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points —— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 270 / 320 / 310 / 333 (1 2 3 Avg.) Reset Force 6.00 / 6.00 / 6.00 / 6.00 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 50 Amps. Trip Time (Sec.) 12.53 Trip-Free yes Performed By R Reeve	✓	
Performance (All Trip Time in Seconds) 200%= 50 Amps. Trip Time 1554 145%= 36.25 Amps. Trip Time 226.0 115%= 28.75 Amps. Trip Time NT 3600 Performed By J. Graft	✓	
Voltage Drop Test (Millivolts) 86 / 83 / 87 / 85.3 (1 2 3 Avg.) Performed By J Graft	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By —/—	—/—	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ / _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 102168-1415-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By L.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 4.50 / 4.20 / 4.00 / 4.23 (1 2 3 Avg.) Reset Force 5.50 / 5.50 / 5.50 / 5.50 (1 2 3 Avg) Performed By RReeve	✓	
Trip-Free 200%= 50 Amps. Trip Time (Sec.) 6.56 Trip-Free yes Performed By RReeve	✓	
Performance (All Trip Time in Seconds) 200%= 50 Amps. Trip Time 8.60 145%= 36.25 Amps. Trip Time 84.66 115%= 28.75 Amps. Trip Time NT 3600 Performed By L. Graft	✓	
Voltage Drop Test (Millivolts) 93 / 97 / 94 / 94.7 (1 2 3 Avg.) Performed By L. Graft		
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 10316B-1416-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By RReeve	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.80 / 3.60 / 3.63 (1 2 3 Avg.) Reset Force 5.50 / 5.25 / 5.00 / 5.25 (1 2 3 Avg) Performed By RReeve	✓	
Trip-Free 200%= 50 Amps. Trip Time (Sec.) 10.50 Trip-Free yes Performed By RReeve	✓	
Performance (All Trip Time in Seconds) 200%= 50 Amps. Trip Time 13.42 145%= 36.25 Amps. Trip Time 240.0 115%= 28.75 Amps. Trip Time NC 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 92 / 89 / 97 / 92.7 (1 2 3 Avg.) Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 110168-0957-88

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By William E. Jenkins	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 1 T_2-Mtg. 2 T-Other Points — Impressed Voltage 1500 Performed By William E. Jenkins	✓	
Operating Force (Pounds) Pullout Force 4.75 (1) 4.25 (2) 4.25 (3) 4.44 Avg. Reset Force 3.35 (1) 3.50 (2) 3.50 (3) 4.45 Avg Performed By William E. Jenkins	✓	
Trip-Free 200%= 50.0 Amps. Trip Time (Sec.) 7.58 Trip-Free yes Performed By William E. Jenkins	✓	
Performance (All Trip Time in Seconds) 200%= 50.0 Amps. Trip Time 12.80 145%= 3625 Amps. Trip Time 126.7 115%= 28.75 Amps. Trip Time Nr 3600 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 115 (1) / 105 (2) / 120 (3) / 113.3 Avg. Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JG	JG	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-25 Rev. _____ S/N 110168-1540-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By William E. Jenkins	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By William E Jenkins	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.00 / 3.00 / 3.16 (1 2 3 Avg.) Reset Force 4.00 / 4.00 / 4.00 / 4.00 (1 2 3 Avg) Performed By William E. Jenkins	✓	
Trip-Free 200%= 50.0 Amps. Trip Time (Sec.) 12.08 Trip-Free yes Performed By William Jenkins	✓	
Performance (All Trip Time in Seconds) 200%= 50.0 Amps. Trip Time 10.60 145%= 36.25 Amps. Trip Time 47.1 115%= 28.75 Amps. Trip Time NT 3600 Performed By J. Draft	✓	
Voltage Drop Test (Millivolts) 115 / 110 / 110 / 111.7 (1 2 3 Avg) Performed By J. Draft	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By C/E	C/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 103068-1452-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 2.70 / 2.50 / 2.60 / 2.60 (1 2 3 Avg.) Reset Force 6.00 / 4.50 / 5.00 / 5.17 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 15.78 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 70.0 Amps. Trip Time 15.00 145%= 50.75 Amps. Trip Time 272.7 115%= 40.25 Amps. Trip Time NT 3600 Performed By J Charles	✓	
Voltage Drop Test (Millivolts) 81 / 80 / 79 / 80 (1 2 3 Avg.) Performed By J Charles	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By J/E	J/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 103068-1454-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reaux	✓	
Operating Force (Pounds) Pullout Force 3.75 / 3.75 / 3.75 / 3.75 (1 2 3 Avg.) Reset Force 6.00 / 5.75 / 5.75 / 5.83 (1 2 3 Avg) Performed By J. Graf	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 15.06 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%=70.0 Amps. Trip Time 9.11 145%=50.75 Amps. Trip Time 77.6 115%=40.25 Amps. Trip Time NT 3600 Performed By J Chandler	✓	
Voltage Drop Test (Millivolts) 86 / 92 / 88 / 88.6 (1 2 3 Avg.) Performed By J Chandler	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	J/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 103068-1455-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 .5 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.25 / 3.50 / 3.42 (1 2 3 Avg.) Reset Force 5.00 / 5.25 / 5.00 / 5.08 (1 2 3 Avg) Performed By J. Craft	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 17.32 Trip-Free YES Performed By J. Craft	✓	
Performance (All Trip Time in Seconds) 200%= 70.0 Amps. Trip Time 11.32 145%= 50.75 Amps. Trip Time 215.4 115%= 40.25 Amps. Trip Time NT 3600 Performed By J. Charles	✓	
Voltage Drop Test (Millivolts) 90 / 88 / 89 / 88 (1 2 3 Avg.) Performed By J Charles	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. - S/N 103068-1522-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K Performed By R.E. Tanner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.50 / 3.75 / 3.58 (1 2 3 Avg.) Reset Force 4.75 / 5.00 / 5.00 / 4.92 (1 2 3 Avg) Performed By J. Graf	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 12.41 Trip-Free YES Performed By D. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 70.0 Amps. Trip Time 13.12 145%= 50.75 Amps. Trip Time 382.8 115%= 40.25 Amps. Trip Time NT 3600 Performed By J Charles	✓	
Voltage Drop Test (Millivolts) 89 / 86 / 88 / 87.6 (1 2 3 Avg.) Performed By J Charles	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By E/E	E/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 103068-1523-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK. Performed By R.E. Thomas R.K.	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points —— Impressed Voltage 1500 Performed By R Reed R.K.	✓	
Operating Force (Pounds) Pullout Force 3.25 / 3.25 / 3.25 / 3.25 Reset Force 6.00 / 5.25 / 5.75 / 5.83 1 2 3 Avg. 1 2 3 Avg Performed By J. Hratz R.K.	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 8.96 Trip-Free YES Performed By R. Hinkley	✓	
Performance (All Trip Time in Seconds) 200%= 70 Amps. Trip Time 12.3 145%= 50.75 Amps. Trip Time 70.9 115%= 40.25 Amps. Trip Time NT 3600 Performed By J. Charles	✓	
Voltage Drop Test (Millivolts) 100 / 96 / 100 / 98 1 2 3 Avg. Performed By J Charles	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By E/E	E/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 103068-1525-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By R.E. Turner R.K.	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By M Reeves R.K.	✓	
Operating Force (Pounds) Pullout Force 3.50 / 3.75 / 4.00 / 3.75 (1 2 3 Avg.) Reset Force 5.50 / 5.75 / 5.50 / 5.58 (1 2 3 Avg) Performed By J Duty R.K.	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 9.56 Trip-Free YES Performed By R. Kirby	✓	
Performance (All Trip Time in Seconds) 200%= 70 Amps. Trip Time 7.0 145%= 50.75 Amps. Trip Time 74.0 115%= 40.25 Amps. Trip Time NT 3600 Performed By J. Chandler	✓	
Voltage Drop Test (Millivolts) 100 / 99 / 98 / 99 (1 2 3 Avg.) Performed By J Chandler	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By [illegible]	2/2	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 103168-1036-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. O.K. Performed By R.E. Turner	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points _____ Impressed Voltage 1500 Performed By R Reeve	✓	
Operating Force (Pounds) Pullout Force 3.90 / 3.40 / 3.50 / 3.60 (1 2 3 Avg.) Reset Force 6.00 / 6.00 / 6.60 / 6.20 (1 2 3 Avg) Performed By R Reeve	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 11.19 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 70.0 Amps. Trip Time 9.73 145%= 50.75 Amps. Trip Time 48.58 115%= 40.25 Amps. Trip Time NT 3600 Performed By J Charles	✓	
Voltage Drop Test (Millivolts) 115 / 125 / 120 / 120 (1 2 3 Avg.) Performed By J Charles	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By C/E	C/E	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MP 9-157

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 110168-[redacted]1405-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By William E. Jenkins	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By William E. Jenkins	✓	
Operating Force (Pounds) Pullout Force 2.00 / 3.50 / 3.50 / 3.00 (1 2 3 Avg.) Reset Force 4.00 / 4.00 / 4.25 / 4.06 (1 2 3 Avg) Performed By William E. Jenkins	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 13.35 Trip-Free YES Performed By J. Hart	✓	
Performance (All Trip Time in Seconds) 200%= 70.0 Amps. Trip Time 9.47 145%= 50.75 Amps. Trip Time 100.2 115%= 40.25 Amps. Trip Time NT 360 Performed By J. Hart	✓	
Voltage Drop Test (Millivolts) 86 / 92 / 110 / 92 (1 2 3 Avg.) Performed By J. Hart	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By WE	WE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 10168-1406-80

	Acc.	Rej.
Vibration Trip None Contact Chatter None Visual Exam. OK Performed By William A. Jenkins	✓	
Dielectric Test (Microamps) T_1-T_2 / T_1-Mtg. / T_2-Mtg. / T-Other Points —— Impressed Voltage 1500 Performed By William A Jenkins R. Kleinberg	✓	
Operating Force (Pounds) Pullout Force 3.75 3.50 3.25 3.50 (1 2 3 Avg.) Reset Force 6.00 5.50 5.25 5.33 (1 2 3 Avg) Performed By William A Jenkins	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 11.21 Trip-Free yes Performed By J. Urata	✓	
Performance (All Trip Time in Seconds) 200%= 70.0 Amps. Trip Time 12.36 145%= 50.75 Amps. Trip Time 86.6 115%= 40.25 Amps. Trip Time NT 3600 Performed By J Urata R Kleinberg	✓	
Voltage Drop Test (Millivolts) 88 / 92 / 92 / 90.6 (1 2 3 Avg.) Performed By J. Urata	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By SJE	SJE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. 4040-001-35 Rev. _____ S/N 110168-1541-80

	Acc.	Rej.
Vibration Trip NONE Contact Chatter NONE Visual Exam. OK Performed By William E Jenkins	✓	
Dielectric Test (Microamps) T_1-T_2 1 T_1-Mtg. 2 T_2-Mtg. 2 T-Other Points ——— Impressed Voltage 1500 Performed By William E Jenkins	✓	
Operating Force (Pounds) Pullout Force 2.75 / 3.00 / 2.90 / 2.88 (1 2 3 Avg.) Reset Force 2.85 / 2.85 / 2.85 / 2.85 (1 2 3 Avg) Performed By William E Jenkins	✓	
Trip-Free 200%= 70.0 Amps. Trip Time (Sec.) 14.49 Trip-Free YES Performed By J. Graf	✓	
Performance (All Trip Time in Seconds) 200%= 70.0 Amps. Trip Time 11.77 145%= 50.75 Amps. Trip Time 54.0 115%= 41.35 Amps. Trip Time NT 300 Performed By J. Graf	✓	
Voltage Drop Test (Millivolts) 103 / 106 / 105 / 104.6 (1 2 3 Avg.) Performed By J. Graf	✓	
Examination of Product Terminals & Hardware OK Mounting Hardware OK Identification Markings OK Case OK Workmanship OK Performed By JE	JE	

Acceptance Test Procedure 50-072 Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

APPENDIX B

LETTER PROGRESS REPORT

Mechanical Products, Inc.
DIVISION OF HOWARD AIKEN INDUSTRIES, INC.

1824 RIVER ST., P.O. BOX 729, JACKSON, MICH. 49204—PHONE 517-782-0391
FACTORY BRANCH: 8155 VAN NUYS BLVD., PANORAMA CITY, CALIF. 91402 — PHONE 213-781-8966

May 29, 1968

National Aeronautics and Space Administration
R & D Procurement Branch
Houston, Texas 77058

Reference: Contract No. NAS 9-7850, Item No. 1

Attention: D. Hull/BG731 (52)

Gentlemen:

Subject: Letter Progress Report

The first phase of this project consisted of selecting a vendor and the exact material for the glass bonded mica case for the lightweight flameproof circuit breakers required by Contract No. NAS 9-7850. The circuit breaker mechanism to be used was specified in M.P. Proposal Number 6802 as was the general type of material to be used for the case. In Paragraph 4.1 of the proposal we specified a glass bonded mica material such as Mycallex 410. Upon receipt of the contract we immediately contacted a number of manufacturers of this material. We selected Molecular Dielectrics, Inc. of Clifton, New Jersey and their Mykroy 1301 as the material. It was felt that they demonstrated the most technical competence in their approach to the problem of adapting their material to the requirements of the breaker design. The material was selected for two (2) reasons. It has a thermal endurance 400°F higher than other glass bonded formulations, and secondly, Molecular Dielectrics has under development a lightweight version of the same material which although not available now, is very encouraging. They have high hopes of solving the remaining problems and having it available within a year.

As an appendix to this letter I am enclosing a letter to me from Mr. DuBois of Molecular Dielectrics dated May 17, 1968, plus an article entitled "Arcing Tests on Plastics", a picture, and sales literature. This information should acquaint you with the vendor and his material.

Adapting the glass bonded mica material to the requirements of the circuit breaker has been completed and a case design mutually acceptable has been arrived at. The case mold is being built and first samples are expected late in June or early in July. It is anticipated that some mold shakedown will be required before any quantity of parts are available.

Settling of the case design has permitted completion of a layout. A model drawing of the 4040-001 circuit breaker, the number assigned by us to the breaker is enclosed herewith. It will be noted that several changes have been required in the proposed breaker drawing contained in Proposal 6802. The distance from the mounting surface to the end of the terminal has been increased from a maximum of 1.812 to a maximum of 1.851. The width of the breaker has changed from .562 to .600. These are the only differences which do influence the envelope size of the breaker. You will note that the mounting area has been modified. The tang washer has been replaced with a plate which is riveted to the case and assembled directly to the mounting sleeve. In addition, the dimension from the top of the button to the top of the mounting bushing was reduced with the breaker in both open and closed position. These changes will probably not require an increase in the maximum weight reported in the proposal. However, the safety factor no longer exists.

The design of all detail parts have been completed and are in the hands of Industrial Engineering for tooling and ordering of parts. Tooling will consist of model shop or hammer dies, or short run tooling from one of the many concerns specializing in this type of production. Parts lists are to be complete by June 1 and all assembly drawings are to be complete by June 10.

The only unresolved problem is that of the sealant to be used. We are currently investigating several materials and will resolve this problem within the next month. We are investigating tapes, silicone rubbers and Fluorel per our telephone discussion.

During the next month the design will be completed, parts will be ordered and fixturing will be designed and built.

At this time we are still on schedule and have encountered no delays which will effect the completion date of the contract.

Very truly yours,

R. W. Filchak
Chief Product Engineer

sc

enc.

MP
Mechanical Products, Inc.
DIVISION OF HOWARD AIKEN INDUSTRIES, INC.
1824 RIVER ST., P.O. BOX 729, JACKSON, MICH. 49204—PHONE 517-782-0391
FACTORY BRANCH: 8155 VAN NUYS BLVD., PANORAMA CITY, CALIF. 91402 — PHONE 213-781-8966

August 16, 1968

N.A.S.A. Manned Spacecraft Center
Instrumentation & Electronic System Division
General Instrumentation Branch
EE4/Bob Hendrix
Houston, Texas 77058

Reference: Contract No. NAS9-7850, Item No. 1

Dear Mr. Hendrix:

Subject: Letter Progress Report

The period of time since our last letter report of May 29, 1968 has been spent in building and accumulating the necessary parts and subassemblies from which the circuit breaker will be built to satisfy Contract No. NAS9-7850. The mold for the case material has been finished, parts have been molded, the dimensional analysis has been completed and the mold has been accepted. Parts are being shipped and should be here the week of August 19. Two (2) case halves will be enclosed with this letter report for your inspection. You will note that there is some discoloration of the material. Our vendor has reported that this is normal for this type of material and cannot be eliminated. This condition has been found acceptable by the Military according to MIL-I-23264, a copy of which is attached. This discoloration is a result of the mold release material which has been used. Because of the nature of the Mycalex material it is absolutely imperative that a mold release be used.

All parts and subassemblies are scheduled for delivery to Mechanical Products during the week of August 19. Our plans include the start of building or final breaker assembly starting the week of August 26. This then means that delivery of final parts should take place

.... continued ....

during the last week in September. At this time we foresee no major problems which will prevent meeting this schedule.

Very truly yours,

R. W. Filchak
Chief Product Engineer

sc

enc.

cc: D. Neill
C. White
F. Myers
E. Eden

Mo[illegible]nical Products, Inc.
DIVISION OF HOWARD AIKEN INDUSTRIES, INC.

1824 RIVER ST., P.O. BOX 729, JACKSON, MICH. 49204—PHONE 517-782-0391
FACTORY BRANCH: 8155 VAN NUYS BLVD., PANORAMA CITY, CALIF. 91402 — PHONE 213-781-8966

September 12, 1968

N.A.S.A. Manned Spacecraft Center
Instrumentation & Electronic System Division
General Instrumentation Branch
EE4/Bob Hendrix
Houston, Texas 77058

Reference: Contract No. NAS9-7850, Item No. 1

Dear Mr. Hendrix:

Subject: Letter Progress Report

Since our progress report of August 16, 1968 we have developed a problem with the cases received from our vendor which required that they be remade. Upon receipt of the cases a complete dimensional analysis was made along with a functional analysis. Upon this basis the parts were accepted. However, later inspection with a low power magnification indicated a lack of fill in a critical area which can cause dielectric problems. For this reason the parts were returned to the vendor who concurred with our findings. Unfortunately in an effort to expedite cases they were molded before the mold was chrome plated. This is the probable explanation for the break-out of material. New cases have been promised us by September 20. Assembly will require the period from September 23 through October 4. Acceptance testing will commence September 30. Breakers will be shipped on or before October 18.

All major subassembly work has been completed and the assemblies are ready for insertion into the case halves. The only problem which has not been completely resolved to our satisfaction is the sealent. We have worked with Emerson Cummings with their Eccoceram material. This material has been satisfactory with the exception that the binder became water soluble at elevated temperatures. The vendor has shipped additional binders which they report will not be soluble in water. We can complete our evaluation before the sealent is required by breaker assembly.

... continued ...

If we cannot find a satisfactory material at this time we do propose to supply breakers with an epoxy sealent. Stycast 190 from Emerson Cummings with catalyst 24L does appear to be resistant to burning in a 20 psi oxygen atmosphere based upon tests reported by Grumman.

Very truly yours,

R. W. Filchak
Chief Product Engineer

sc

APPENDIX C

PRODUCT SPECIFICATION
Document No. 50-072

PRODUCT SPECIFICATION

Approved Engineering	Approved Quality Control	Approved Industrial Engineering

1.0 ENGINEERING ACCEPTANCE TEST

FUNCTIONAL TESTING OF CIRCUIT BREAKERS MANUFACTURED TO DRAWING NO. 4040. ENGINEERING TESTING ONLY.

2.0 APPLICABLE DOCUMENTS

2.1 Mechanical Products Drawing No. 4040, Circuit Breaker

2.2 MIL-C-5809D, "Circuit Breakers, Trip-Free, Aircraft, General Specification For".

2.3 MIL-STD-105, "Sampling Procedures and Tables for Inspection by Attributes".

3.0 DETAIL TEST PROCEDURE (AT 25° ± 2°C)

3.1 Test on each item and to be run in sequence as shown.

3.1.1 Examination of Product - Ensure that the item conforms to print, markings are legible and no evidence of physical damage. Items that do not meet requirements shall be rejected.

3.1.2 Operating Force - While the item is mounted, take three (3) sets of operating forces and average same. The average pullout or reset force shall not exceed 8.0 pounds or be less than one (1) pound or they shall be rejected. (Tests to be run with no electrical load applied.)

3.1.3 Vibration - The item with 100% current shall be vibrated in the lateral axis as noted below:

Random Spectrum - 20 to 80 Hz. increasing at the rate of 3 db/octave to $0.04g^2/Hz$; 80 to 2,000 Hz. constant at $0.04g^2/Hz$.
Program Level - 8.9g RMS ±10%
Duration - 2-1/2 minutes
Chatter - Not in excess of 100 microseconds
Circuit breaker shall be torqued at $20^{\pm}2$ inch pounds to vibration fixture

Items that exhibit chatter in excess of 100 microseconds or trip shall be rejected.

PRODUCT SPECIFICATION

Approved Engineering Approved Quality Control Approved Industrial Engineering

3.1.4 Dielectric Test - Apply 1500 volts rms, AC, 60 Hz. for 60 seconds; shall be checked in the following positions:

a. Terminal to terminal - breaker open
b. Terminal to mounting bushing - breaker closed
c. Opposite terminal to mounting bushing - breaker closed
d. Terminal to calibration screw area of case - breaker closed
e. Terminal to spring retainer area of case - breaker closed
f. Terminal to plunger spring captivation area of case - breaker closed.

Items which exhibit flashover or current flow in excess of 1,0 millamperes shall be rejected.

3.1.5 Maximum limit of ultimate trip - Make one (1) run to determine that the item will trip in 3600 seconds or less at 145%. Items that do not trip at 145% load shall be rejected.

3.1.6 Minimum limit of ultimate trip - Make one (1) run to determine that the item will carry 115% load for 3600 seconds. Items that trip shall be rejected.

3.1.7 Overload Calibration - Perform a calibration check on items at 200% load and trip times shall be within established calibration limits of 2 - 20 seconds. Items that are out of limits shall be rejected.

3.1.8 Trip-Free - Perform the test of 3.1.7 with the actuator held in the "closed" position. The actuator shall be held in for 30 seconds after trip. Failure to trip automatically within 2 - 20 second limits, intermittent contact, failure of actuator to show indication of trip after release, or failure to relatch shall constitute rejection of the item.

3.1.9 Voltage Drop Test - The item shall have three (3) consecutive voltage drop checks while carrying 100% current and readings averaged (readings to be in millivolts). The millivolt drop shall not exceed the values stated in Table I or the item shall be rejected.

TABLE I

Rating (Amps)	Maximum Millivolt Drop
1	1100
2	700
3	500
5	250
7-1/2	200
10	200
15	150
20	150
25	150
35	150

MECHANICAL PRODUCTS
INDIVIDUAL ACCEPTANCE TEST RECORD
4040 SERIES CIRCUIT BREAKER

Part No. _____ Rev. _____ S/N _____

	Acc.	Rej.
Vibration Trip _____ Contact Chatter _____ Visual Exam. _____ Performed By _____		
Dielectric Test (Microamps) T_1-T_2 _____ T_1-Mtg. _____ T_2-Mtg. _____ T-Other Points _____ Impressed Voltage _____ Performed By _____		
Operating Force (Pounds) Pullout Force ___ / ___ / ___ / ___ Reset Force ___ / ___ / ___ / ___ 1 2 3 Avg. 1 2 3 Avg Performed By _____		
Trip-Free 200%= _____ Amps. Trip Time (Sec.) _____ Trip-Free _____ Performed By _____		
Performance (All Trip Time in Seconds) 200%= _____ Amps. Trip Time _____ 145%= _____ Amps. Trip Time _____ 115%= _____ Amps. Trip Time _____ Performed By _____		
Voltage Drop Test (Millivolts) ___ / ___ / ___ / ___ 1 2 3 Avg. Performed By _____		
Examination of Product Terminals & Hardware _____ Mounting Hardware _____ Identification Markings _____ Case _____ Workmanship _____ Performed By _____		

Acceptance Test Procedure _____ Rev. _____

Note: All tests run in sequence as shown.

Quality Control _____ Date _____

APPENDIX D

TEST PROCEDURE
Report No. 68-0000-003

Mechanical Products
Division of Aiken Industries, Inc.
Jackson, Michigan 49204

TEST PROCEDURE

FOR TESTING IN COMPLIANCE WITH

MIL-C-5809D

Report No. 68-0000-003

November 6, 1968

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A	Test Equipment, Report No. 67-0000-005
B	Standard Data Forms
C	Order for Laboratory Work

1.0 ADMINISTRATIVE DATA -

1.1 Purpose -

The purpose of this document is to outline the general procedures to be followed in testing circuit breakers in accordance with Military Specification MIL-C-5809D (ASG) of 2 February 1965 and Amendments 1 and 2.

1.2 Applicable Documents -

The following documents of the issue in effect on date of invitation for bid or request for proposal form a part of this specification to the extent specified herein:

1.2.1 Military -

1.2.1.1	MIL-M-14	Molding Plastics and Molded Plastic Parts, Thermosetting
1.2.1.2	MIL-P-997	Plastic Material; Laminated, Thermosetting, Electrical Insulating; Sheets, Glass Cloth, Silicone Resin
1.2.1.3	MIL-W-5086	Wire, Electrical, 600-Volt, Copper, Aircraft
1.2.1.4	MIL-S-7742	Screw Threads, Standard, Optimum Selected Series; General Specification for
1.2.1.5	MIL-T-7928	Terminals, Lug and Splice, Crimp-Style, Copper
1.2.1.6	MIL-P-15037	Plastic Sheet, Laminated, Thermosetting, Glass-Cloth, Melamine-Resin
1.2.1.7	MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of
1.2.1.8	MIL-N-25027	Nut, Self-Locking, 250°F, 450°F and 800°F, 125 KSI FTU, 60 KSI FTU, and 30 KSI FTU
1.2.1.9	MIL-D-70327	Drawings, Engineering and Associated Lists
1.2.1.10	MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification for.
1.2.1.11	MIL-STD-104	Limits for Electrical Insulation Color
1.2.1.12	MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
1.2.1.13	MIL-STD-130	Identification Marking of US Military Property

1.2.1.14 MIL-STD-143 Specifications and Standards, Order of Precedence for the Selection of

1.2.1.15 MIL-STD-202 Test Methods for Electronic and Electrical Component Parts

1.2.1.16 MIL-STD-704 Electric Power, Aircraft, Characteristics and Utilization of

1.2.1.17 MIL-STD-831 Test Reports, Preparation of

1.2.1.18 MS20659 Terminal, Lug, Crimp Style, Copper, Uninsulated, Class 1

1.2.1.19 MS25036 Terminal, Lug, Crimp Style, Copper, Insulated, Class 1

1.2.1.20 MS33586 Metals, Definition of Dissimilar

1.3 General

1.3.1 The requirements as given in the applicable Military Standard (MS) and/or customer specification are to be used for specific values. Where there is a conflict between the specifications given in this document, MIL-C-5809D, and the applicable MS and/or customer specification, the requirements of the MS and/or customer specification shall govern.

1.4 Standard Test Conditions -

1.4.1 Unless otherwise specified, all tests shall be conducted under the following standard ambient conditions:

Temperature - 25°C±3°C
Relative Humidity - Less than 80%
Barometric Pressure - Local atmospheric

1.4.2 All circuit breakers are to be mounted during any test. When circuit breakers are mounted by their normal mounting provisions, mounting screws or nuts shall be tightened as prescribed in Table I.

TABLE I

MOUNTING SPECIFICATIONS

Screw or Nut Threads	Torque
15/32 - 32 NS	20±2 pound inch
8/32 NC	7±2 pound inch

1.4.3 Wire length shall be 36 inches and wire size shall be in accordance with Table II.

TABLE II

Circuit Breaker Current Rating (Amps)	Wire Size (AN Designation)
1 and below	20
2 to 6 inclusive	18
7 to 10 inclusive	16
11 to 15 inclusive	14
16 to 20 inclusive	12
21 to 25 inclusive	10
26 to 40 inclusive	8
41 to 50 inclusive	6
51 to 60 inclusive	6
61 to 90 inclusive	4
91 to 120 inclusive	2
121 to 150 inclusive	0
151 to 200 inclusive	00

NOTE: For circuit breakers between steps of the above table, use the AN wire of the next larger physical wire size.

1.5 Test Equipment

1.5.1 A list of test equipment to be used in conducting these tests is found in Appendix A.

1.5.2 The standard forms used in these tests are found in Appendix B.

1.5.3 The applicable MS or customer specification will be noted on the Order for Laboratory Work, Form Eng 021. A copy of same is included in Appendix C.

1.5.4 Each specimen entering the test lab will have a serial number affixed to it consisting of the following:

Date - Day received
Time - Noted as per a 24 hour clock
Report Number - Last two digits of number

Example: 90668-0945-00 and 111268-1700-00

2.0 TEST EQUIPMENT LIST

The Test Equipment List is found in Report No. 67-0000-005, latest edition at time of testing.

3.0 TESTS

3.1 Examination of Product -

3.1.1 Test Equipment - Vernier Calipers (Item 81), Micrometers (Item 82), Gram Scale (Item 83).

3.1.2 Test Set-up - Mount specimen as required to obtain measurements.

3.1.3 Requirement - The test specimen shall conform to the requirements of the applicable MS or customer specification.

3.1.4 Test - Check and record all measurements, weight, and markings per the applicable MS or customer specification.

3.2 Dielectric Strength -

3.2.1 Test Equipment - High Pot Tester (Item 48).

3.2.2 Test Set-up - Connect output of High Pot Tester to specimen terminals.

3.2.3 Requirement - The specimen shall witstand 1500 volts rms and shall show no evidence of breakdown, flashover, or current flow in excess of 1.0 milliampere. Where the dielectric strength is called for following an environmental test, the dielectric voltage shall be 1125 volts rms (75 percent of original value specified).

3.2.4 Test -

3.2.4.1 Manually trip specimen.

3.2.4.2 Apply voltage beginning at 0 and increase at a maximum rate of 250 volts rms per second until 1500 volts is attained. Maintain for one (1) minute.

3.2.4.3 Remove test voltage.

3.2.4.4 Record leakage current.

3.2.4.5 Close test specimen.

3.2.4.6 Repeat steps 3.2.4.2 through 3.2.4.4 with High Pot Tester connected to one terminal and to mounting plate.

3.3 Insulation Resistance -

3.3.1 Test Equipment - Megohmer (Item 47).

3.3.2 Test Set-up - Connect Megohmer to specimen terminals.

3.3.3 Requirement - Insulation resistance between terminals of open specimen and between terminals and the case of a closed specimen shall not be less than 100 megohms.

3.3.4 Test -

3.3.4.1 Manually trip circuit breaker.

3.3.4.2 Apply 500±10 volts for 30 seconds or until megohmer stabilizes.

3.3.4.3 Record resistance.

3.3.4.4 Remove voltage.

3.3.4.5 Close specimen.

3.3.4.6 Repeat steps 3.3.4.2 through 3.3.4.4 with megohmer connected to one terminal and to the mounting plate.

3.4 Maximum Ultimate Trip -

3.4.1 Test Equipment - Power Supply (Item 1 or 2).

3.4.2 Test Set-up - Mount specimens on a panel and connect specimens in series with a switch across the terminals.

NOTE

No more than four (4) specimens to be run at any one time.

3.4.3 Requirement - All specimens shall trip within one (1) hour when subjected to the percent of current per the applicable MS or customer specification.

3.4.4 Test -

3.4.4.1 Open switches.

3.4.4.2 Apply current at applicable percent of rated load for a maximum of one (1) hour.

3.4.4.3 Record all specimens that fail to trip within one (1) hour. Record elapsed time for all specimens.

3.4.4.3 (Continued)

NOTE:

If a specimen trips within one (1) hour, immediately close its associated switch and readjust the current to the percentage of rated load per applicable MS or customer specification. These steps must be accomplished within 15 seconds to preclude invalidation of the test for remaining specimens.

3.5 Minimum Limit of Ultimate Trip -

3.5.1 Test Equipment - Power Supply (Item 1 or 2), Thermocouples (Item 42), Pyrometer (Item 38).

3.5.2 Test Set-up - Mount specimens on panel and connect specimens in series with a switch across the terminals. Attach thermocouples to terminals.

3.5.3 Requirement - All specimens shall carry the percent of rated current, as specified on the applicable MS or customer specification, for a minimum of one (1) hour without tripping. The terminal temperature rise shall not exceed 75°C. The terminal temperature rise shall be taken only during the first Group I tests.

3.5.4 Test -

3.5.4.1 Open all switches.

3.5.4.2 Apply current at applicable percent of rated load; maintain for one (1) hour.

3.5.4.3 Record any specimens that trip within one (1) hour. Record elapsed time of all specimens.

NOTE:

If a specimen trips within one (1) hour, immediately close its associated switch and readjust the current to the percent of rated current per applicable MS or customer specification. These steps must be accomplished within 15 seconds to preclude invalidation of the test for remaining specimens.

3.5.4.4 Record temperature rise of terminals.

3.6 Overload Calibration -

3.6.1 Test Equipment - Power Supply (Item 1 or 2).

3.6.2 Test Set-up - Mount specimens on a panel and connect specimens in series with a switch across the terminals.

NOTE:

Not more than one (1) specimen to be run at any one time.

3.6.3 Requirement - The specimen shall trip within the time limits shown on the applicable MS or customer specification.

3.6.4 Test -

3.6.4.1 Apply current at percents of rated load as per applicable MS or customer specification

3.6.4.2 Record elapsed time to specimen trip, or failure to trip within maximum allowable time.

3.7 Operating Force -

3.7.1 Test Equipment - Power Supply (Item 1 or 2), Force Gague (Item 75), Parallel Bars (Item 77).

3.7.2 Test Set-up -

3.7.2.1 Mount specimen on panel with parallel bars for force gauge guide.

3.7.2.2 Connect force gauge to button so that force will be applied parallel to the line of travel of the actuator.

3.7.3 Requirement - The pullout forces shall be as specified in the applicable MS or customer specification. If only a maximum force is specified on the applicable MS or customer specification, the minimum operating forces shall not be less than 15 percent of this specified maximum values

3.7.4 Test -

3.7.4.1 Apply rated current.

3.7.4.2 Manually open and close circuit breaker and measure forces

3.7.4.3 Record both pullout and reset forces.

3.7.4.4 Repeat steps 3.7.4.2 through 3.7.4.3 for a total of five (5) readings. Average and record same.

3.8 Voltage Drop -

3.8.1 Test Equipment - VTVM (Item 20 or 21), Power Supply (Item 1 or 2).

3.8.2 Test Set-up -

3.8.2.1 Connect VTVM to monitor voltage drop across terminals of specimen.

3.8.3 Requirement - Average voltage drop shall not exceed the limits as specified on the applicable MS or customer specification. The power dissipation shall not exceed 15 watts.

3.8.4 Test -

3.8.4.1 Apply rated current for 30 minutes.

3.8.4.2 Manually open and close specimen and record voltage drop for closure.

3.8.4.3 Repeat step 3.8.4.2 five (5) times. Calculate and record average.

3.8.4.4 Calculate power dissipation from the maximum voltage drop reading and formula:

I X E = W
I - is current in amps
E - is voltage in volts
W - is watts

NOTE:

If voltage drop is checked following Minimum Ultimate Trip, the procedure shall be to reduce the current to 100 percent and stabilize briefly before checking voltage drop.

3.9 Acceleration -

3.9.1 Test Equipment - Centrifuge (Item 49), Intermittency Detector (Item 63), Power Supply (Item 1 or 2).

3.9.2 Test Set-up -

3.9.2.1 Mount specimen in the most likely position to cause contacts to close. Specimen contacts are to be open.

3.9.2.2 Connect electrical test equipment.

3.9.3 Requirement - The specimen contacts shall not close when open or open when closed for a period exceeding 500 microseconds while at 10g acceleration for one (1) minute in the most sensitive axes. The specimen must pass limits of 200 percent overload calibration.

3.9.4 Test -

3.9.4.1 Apply 100 percent rated current for one-half (1/2) hour prior to test.

3.9.4.2 The specimen, in the centrifuge, shall be brought up to the radial speed required to produce a radial acceleration of 10g. Hold for at least one (1) minute and reduce speed to zero.

3.9.4.3 Record results of the specimen.

3.9.4.4 Repeat test with the contacts closed and most likely position to cause the contacts to open.

3.9.4.5 Check 200 percent overload calibration per paragraph 3.6 and record data.

3.10 Ambient Effect -

3.10.1 Test Equipment - Temperature Chamber (Item 43), Power Supply (Item 1 or 2).

3.10.2 Test Set-up -

3.10.2.1 Place specimens, mounted on a panel, in temperature chamber. The temperature will be monitored with a thermal couple and/or a thermometer located in the proximity of the specimens.

3.10.2.2 Connect electrical test equipment.

3.10.3 Requirement - The specimens shall trip within the time limits in the applicable MS or customer specification and the current values in the applicable MS or customer specification for the maximum and minimum ultimate trip tests and 200 percent overload test when applicable.

3.10.4 Test -

3.10.4.1 Adjust chamber temperature to high temperature as specified on applicable MS or customer specification.

3.10.4.2 Latch specimen and conduct maximum and minimum ultimate trip tests and 200 percent overload test when applicable per applicable MS or customer specification.

3.10.4.3 Record results.

3.10.4.4 Adjust chamber temperature to low temperature as specified in applicable MS or customer specification.

3.10.4.5 Latch specimen and conduct maximum and minimum ultimate trip tests and 200 percent overload test when applicable per applicable MS or customer specification.

3.10.4.6 Record results.

3.11 Corrosion -

3.11.1 Test Equipment - Corrosion Chamber (Item 50).

3.11.2 Test Set-up -

3.11.2.1 Prepare salt solution by dissolving 5±0.1 parts by weight of sodium cloride to 95 parts of distilled water.

3.11.2.2 Prepare specimen for test by removing any oil, dirt, and grease from their surfaces.

NOTE:

Solvents shall not include corrosives or abrasives and shall not be of the types which deposit corrosives or protective films.

3.11.2.3 Place latched specimens in test chamber.

3.11.3 Requirement - After exposure, the specimen shall show no signs of corrosion, illegibility of markings, or other damage. Upon completion the specimens shall satisfactorily clear an overload equal to 200 percent of the rated current and then shall meet the requirements for calibration at room ambient with 200 percent of rated current, except that the tripping time shall be within 80 percent of the lower limit and 120 percent of the upper limit as specified in the applicable MS or customer specification.

3.11.4 Test -

3.11.4.1 Expose specimen to salt spray for not less than 48 hours.

3.11.4.2 Remove specimen from test chamber.

3.11.4.3 Within ten (10) minutes after the test, the specimen shall be washed for five (5) minutes under running water not warmer than 38.7°C accompanied by a slight brushing, and dried for six (6) hours in a forced-draft oven at approximately 57°C.

3.11.4.4 Inspect specimens for signs of corrosion, illegibility and other damage, record findings.

3.11.4.5 Perform a 200 percent overload per Paragraph 3.6 to clear specimen. No time limits except 200 percent must clear. Record data.

3.11.4.6 Perform a 200 percent overload per Paragraph 3.6 except that the time limit may be 80 percent of the lower limit and 120 percent of the upper limit specified in the applicable MS or customer specification.

3.12 Endurance - Electrical and Mechanical -

3.12.1 Test Equipment - Endurance Cycling Machine (Item 51), Inductors (Item 67), Power Supply (Item 1 or 2).

3.12.2 Test Set-up -

3.12.2.1 Mount specimens on Endurance Cycling Machine.

3.12.2.2 Connect test equipment.

3.12.3 Requirement - The specimen shall satisfactorily complete the required number of cycles per applicable MS or customer specification. Upon completion the specimen shall successfully pass within the limits of 90 percent of the specified minimum ultimate trip current and 110 percent of the specified maximum ultimate trip current shown on the applicable MS or customer specification.

3.12.4 Test Inductive AC -

3.12.4.1 Subject specimen to rated load for number of cycles specified on applicable MS or customer specification at a power factor of 0.6 to 0.7 (lagging).

3.12.4.2 The rate of cycling is six (6) per minute with an ON to OFF time ratio of 1 to 5.

3.12.4.3 Check operating force per Paragraph 3.7 at mid-point and end of number of cycles specified in applicable MS or customer specification.

3.12.4.4 Conduct maximum and minimum ultimate trip tests per Paragraph 3.4 and 3.5 with values from MS or customer specification derated as noted in Paragraph 3.12.3.

3.12.5 Test - Inductive DC -

3.12.5.1 Subject specimens of 10-amp rating or less to rated load and specimens of higher than 10-amp rating to 10-amps only for number of cycles as specified in applicable MS or customer specification at a power factor of 0.6 to 0.7 (lagging).

3.12.5.2 The rate of cycling is six (6) per minute with an ON to OFF time ratio of 1 to 5.

3.12.5.3 Check operating force per Paragraph 3.7 at mid-point and end of number of cycles specified in applicable MS or customer specification.

3.12.5.4 Conduct maximum and minimum ultimate trip tests per Paragraph 3.4 and 3.5 with values from MS or customer specification derated as noted in Paragraph 3.12.3.

3.12.6 Test - Resistive, AC or DC -

3.12.6.1 Subject specimens to rated load at power factor from 0.9 to 1.0 for the number of cycles specified on the applicable MS or customer specification.

3.12.6.2 For Resistive AC, use AC Power Supply and for Resistive DC use DC Power Supply.

3.12.6.3 The rate of cycling is six (6) per minute with an ON to OFF ratio of 1 to 5.

3.12.6.4 Check operating force per Paragraph 3.7 at mid-point and end of number of cycles specified in applicable MS or customer specification.

3.12.6.5 Conduct maximum and minimum ultimate trip tests per Paragraph 3.4 and 3.5 with values from MS or customer specification derated as noted in Paragraph 3.12.3.

3.12.7 Test - Mechanical - No Load -

NOTE:

Overtravel is the amount of travel from electrical contact to maximum mechanical engagement. The mechanical overtravel shall be limited to the minimum amount to insure latching of the specimen.

3.12.7.1 Subject specimen to mechanical no load, cycles for the number of cycles specified on the applicable MS or customer specification.

3.12.7.2 The rate of cycling is six (6) per minute with an ON to OFF time ratio of 1 to 5.

3.12.7.3 Check operating force per Paragraph 3.7 at mid-point and end of number of cycles specified in applicable MS or customer specification.

3.12.7.4 Conduct maximum and minimum ultimate trip tests per Paragraph 3.4 and 3.5 with values from MS or customer specification derated as noted in Paragraph 3.12.3.

3.13 Moisture Resistance -

3.13.1 Test Equipment - Hunidity Chamber (Item 52).

3.13.2 Test Set-up -

3.13.2.1 Ascertain that the chamber temperature is between 20°C and 38°C with uncontrolled humidity.

3.13.2.2 Place latched specimens mounted on stainless steel panel in test chamber.

3.13.3 Requirement -

3.13.3.1 The specimen shall show no evidence of breaking, cracking, spalling, corrosion or loose terminals and shall pass the required performance tests.

3.13.4 Test -

3.13.4.1 Three (3) specimens shall be selected and designated as test samples 1, 2, and 3.

3.13.4.2 Determine contact resistance of samples 2 and 3, as per Paragraph 3.14.

3.13.4.3 Specimens shall be maintained in a closed position before, during, and after the moisture resistance test.

3.13.4.4 Place all three (3) specimens in test chamber.

3.13.4.5 Humidity Test -

a. Gradually increase chamber temperature and humidity, over a two (2) hour period, to 71°C (160°F) and 95 percent humidity.
b. Maintain these conditions for six (6) hours.
c. Maintain the humidity at 95 percent, gradually reduce the temperature over a 16 hour period, to 20° to 38°C.

3.13.4.5 (Continued)

d. Repeat steps a, b, and c nine (9) times.
e. At the conclusion of the tenth cycle, remove specimens from chamber.

3.13.4.6 Manually shake specimens to remove excess water and allow 45 minutes for specimen to stabilize at room ambient conditions.

3.13.4.7 Inspect specimen for visible damage, corrosion, or loose terminals. Record findings.

3.13.4.8 Subject sample 1 to the following test:

a. Conduct a normal trip test per Paragraph 3.6 with 500 percent rated load. Failure to trip within 10 seconds shall constitute failure.
b. Stabilize for one (1) hour at room temperature.
c. Conduct a trip-free test per Paragraph 3.23 with 300 percent rated load. Specimen must trip-free only at 300 percent load.
d. Stabilize for two (2) hours at room temperature.
e. Conduct the overload calibration trip test per Paragraph 3.6 with 200 percent rated load, except that tripping time may vary within ±10 percent of the specified limits. See applicable MS or customer specification
f. Stabilize for four (4) hours at room temperature.
g. Conduct the dielectric strength test at 1125 volts per Paragraph 3.2.

3.13.4.9 Without disturbing the contacts subject samples 2 and 3 to the storage test described in Paragraph 3.15.

3.14 Contact Resistance -

3.14.1 Test Equipment - Power Supply (Item 2), DC Voltmeter (Item 21).

3.14.2 Test Set-up - Connect electrical equipment to specimen.

3.14.3 Requirement - None.

3.14.4 Test -

3.14.4.1 Manually operate specimen to interrupt and make a test circuit having a DC resistive load of one-half (1/2) the current rating or 200 milliamperes, whichever is less, at 26±2 volts.

3.14.4.2 Open and close contacts 10 consecutive times, measure and record contact resistance. Measurements shall be made across the external electrical terminals.

3.14.4.3 Contact resistance chall be specified as millivolt drop. Compute the average of the 10 measurements and record.

3.15 Storage Test -

3.15.1 Test Equipment - A cabinet or area free from chemicals which give off vapors known to be reactive with metals.

3.15.2 Test Set-up - None.

3.15.3 Requirement - Upon completion of 10 days storage, specimens shall be subjected to contact resistance test per Paragraph 3.14. The contact resistance shall not exceed the initial contact resistance by more than 250 millivolts. The specimen shall then pass a 200 percent overload with limits within ±20 percent of limits of applicable MS or customer specification.

3.15.4 Test -

3.15.4.1 Within 24 hours of completing prior applicable tests, specimens shall be stored in an area free from chemicals which give off vapors known to be reactive with metals. Minimum temperature will be 20°C and relative humidity not less than 40 percent.

3.15.4.2 Specimens shall be stored for 10 days. Maintain specimens in closed position throughout storage.

3.15.4.3 Perform contact resistance test per Paragraph 3.14.

3.15.4.4 Perform 200 percent overload per Paragraph 3.6 with trip limits within ±20 percent of limits of applicable MS or customer specification.

3.16 Overload Cycling -

3.16.1 Test Equipment - Power Supply (Item 1 or 2).

3.16.2 Test Set-up -

3.16.2.1 Mount specimen on panel and connect electrical test equipment.

3.16.3 Requirement - The specimen shall complete 100 cycles of 200 percent trips within applicable MS or customer specification limits and shall meet minimum and maximum ultimate trip test requirements upon completion.

3.16.4 Test -

3.16.4.1 Apply current at 200 percent of rated load per Paragraph 3.6 and record trip time. Perform 50 cycles of normal trip-outs with two (2) to three (3) minutes between cycles.

3.16.4.2 Apply current at 200 percent of rated load, trip free, per Paragraph 3.23 and record trip times plus whether trip free. Perform 50 cycles trip-free operation with two (2) to three (3) minutes between cycles.

3.16.4.3 Perform maximum ultimate trip test per Paragraph 3.4.

3.16.4.4 Perform minimum ultimate trip test per Paragraph 3.5.

3.17 Rupture - AC, CO and OCO -

3.17.1 Test Equipment - Power Supply (Item 7), Shunt (Item 24), Visicorder (Item 32), Altitude Chamber (Item 44), Pressure Gauge (Item 45 and/or 46), Test Control Console (Item 73).

3.17.2 Test Set-up -

3.17.2.1 Set-up test equipment according to Figure 1.

3.17.2.2 Check out operation of equipment and set value of current required at specimen terminals as per applicable MS or customer specification.

3.17.2.3 Connect specimen to leads in chamber.

3.17.3 Requirement - The specimen shall be subjected to the rupture capacity per the applicable MS or customer specification and shall pass the afterchecks of 200 percent overload within ±20 percent of limits and dielectric strength at 75 percent of value.

3.17.4 Test -

3.17.4.1 Apply rupture current as specified in the applicable MS or customer specification for either a short circuit rupture (CO) or a close in rupture (OCO) for the number of times required at sea level and/or altitude as required in the applicable MS or customer specification.

3.17.4.2 Check specimen for electrical continuity prior to next rupture.

3.17.4.3 There shall be sufficient cooling time between each rupture test. Under no circumstances shall a rupture test be repeated within five (5) minutes of the previous test.

3.17.4.4 Failure of the specimen to reset after 10 minutes shall be cause for failure.

3.17.4.5 Following the last rupture test on each specimen, the specimen shall be checked as follows:

a. Perform 200 percent overload per Paragraph 3.6 with time limits within ±20 percent of applicable MS or customer specification.
b. Perform dielectric strength test per Paragraph 3.2 at 1125 volts (75 percent of value).

3.18 Rupture - DC, CO and OCO -

3.18.1 Test Equipment - Power Supply (Item 7), Transformer Rectifier (Item 8), Shunt (Item 24), Visicorder (Item 32), Altitude Chamber (Item 44), Pressure Gauge (Item 45 and/or 46), Test Control Console (Item 73).

3.18.2 Test Set-up -

3.18.2.1 Set-up test equipment according to Figure 2.

3.18.2.2 Check out operation of equipment and set value of current required at specimen terminals as per applicable MS or customer specification.

3.18.2.3 Connect specimen to leads in chamber.

3.18.3 Requirement - The specimen shall be subjected to the rupture capacity per the applicable MS or customer specification and shall pass the afterchecks of 200 percent overload within ±20 percent of limits and dielectric strength at 75 percent of value.

3.18.4 Test -

3.18.4.1 Apply rupture current as specified in the applicable MS or customer specification for either a short circuit rupture (CO) or a close in rupture (OCO) for the number of times required at sea level and/or altitude as required in the applicable MS or customer specification.

3.18.4.2 Check specimen for electrical continuity prior to next rupture.

3.18.4.3 There shall be sufficient cooling time between each rupture test. Under no circumstances shall a rupture test be repeated within five (5) minutes of the previous test.

3.18.4.4 Failure of the specimen to reset after 10 minutes shall be cause for failure.

3.18.4.5 Following the last rupture test on each specimen, the specimen shall be checked as follows:

a. Perform 200 percent overload per Paragraph 3.6 with time limits within ±20 percent of applicable MS or customer specification.
b. Perform dielectric strength test per Paragraph 3.2 at 1125 volts (75 percent of value).

3.19 Explosion - AC or DC -

3.19.1 Test Equipment - Explosion Proof Chamber (Item 403), Power Supply as set-up from Paragraph 3.17 or Paragraph 3.18 or equivalent.

3.19.2 Test Set-up -

3.19.2.1 Set up power supply with electrical termination in explosion proof chamber.

3.19.2.2 Connect specimen.

3.19.3 Requirement - The specimen when actuated and current applied shall not ignite the explosive mixture in the chamber.

3.19.4 Test -

3.19.4.1 Test according to Method 109 of MIL-STD-202, except that the test shall be conducted only at sea level.

3.20 Sand and Dust -

3.20.1 Test Equipment - Test Chamber (Item 401).

3.20.2 Test Set-up -

3.20.2.1 Place latched specimen, mounted on a panel, inside the test chamber.

3.20.2.2 The sand and dust used in the test shall be of angular structure and shall have the following characteristics: 100 percent of the sand and dust shall pass through a 100 mesh screen; 98±2 percent shall pass through a 140 mesh screen; 90±2 percent shall pass through a 200 mesh screen; 75±2 percent shall pass through a 325 mesh screen. (All screens refered to are U.S. standards sieve series.) Chemical analysis of the dust shall be as follows:

3.20.2.2 (Continued)

Substance	Percent By Weight
SiO_2	97 to 99
Fe_2O_3	0 to 2
Al_2O_3	0 to 2
TiO_2	0 to 2
MgO	0 to 1
Inorganic Losses	0 to 1

3.20.3 Requirement - The specimen will show no sign of erosion or other damage and shall clear a 400 percent trip-free test. The specimen shall also successfully pass maximum ultimate trip and 200 percent overload calibration tests and be within the requirements of the applicable MS or customer specification.

3.20.4 Test -

3.20.4.1 Raise sand and dust density to between 0.1 and 0.25 gram/cu. feet.

NOTE:

Sand and dust density shall be measured in at least three (3) locations within the test chamber. Relative humidity within the chamber shall not be permitted to exceed 30 percent at any time during the test.

3.20.4.2 For the first two (2) hours of the test, maintain the following conditions within the test chamber:

a. Density: 0.1 to 0.25 grams/cu. ft.
b. Temperature: 25°C
c. Air Velocity: 100 to 500 feet per minute

3.20.4.3 Following this two (2) hour period, increase chamber temperature to 71°C; maintain these conditions for two (2) hours.

3.20.4.4 Remove specimens from test chamber, and remove accumulated sand and dust by brushing, wiping, or shaking.

CAUTION:

Care should be exercised to avoid introduction of additional dust into the specimen. Cleaning by air blast or vacuum is not permitted.

3.20.4.5 Inspect specimens for visible damage.

3.20.4.6 Perform a 400 percent trip-free per Paragraph 3.23. Record time and if specimen tripped free.

NOTE:

The specimen must not be manually tripped after sand and dust test is performed. They must be cleared by the above 400 percent trip-free test.

3.20.4.7 Perform maximum ultimate trip at value from applicable MS or customer specification per Paragraph 3.4. Record data.

3.20.4.8 Perform 200 percent overload test per Paragraph 3.6 with time limits per applicable MS or customer specification. Record data.

3.21 Shock - Mechanical -

3.21.1 Test Equipment - Power Supply (Item 1 or 2), Test Machine (Item 205), Mounting Fixture (Item 80), Intermittency Detector (Item 63), Accelerometer (Item 56), Accelerometer Amplifier (Item 57), Oscilloscope (Item 33), Recording Camera (Item 34).

3.21.2 Test Set-up -

3.21.2.1 Mount specimen on Shock Tester Machine.

NOTE:

The specimen shall be rigidly mounted and its regular mounting means shall be used. The shock input shall be accomplished at the mounting interface.

3.21.2.2 Connect electrical test equipment.

3.21.3 Requirement - During 25g testing no open contact shall be caused to close and no closed contact shall be caused to open in excess of 0.5 millisecond. After completion of shock testing, specimens shall show no visible signs of damage and shall pass the 200 percent overload calibration test.

3.21.4 Test -

3.21.4.1 With rated load applied to specimen, apply three (3) shocks of 25g's with a duration of 11±1 millisecond when decelerated by resilient impact in each of three (3) orthogonical axes according to the following:

3.21.4.1 (Continued)

a. With specimen contacts open.
b. With specimen contacts closed.

3.21.4.2 Perform 200 percent overload calibration test per Paragraph 3.6. Record results.

3.22 Strength -

3.22.1 Test Equipment - Force gauge (Item 75), Torque Wrench (Item 74), Torque and Force Fixture (Item 76).

3.22.2 Test Set-up - Secure specimens and apply Force Gauge or Torque Wrench as required.

3.22.3 Requirement - There shall be no evidence of malfunctioning, breakage or other damage resulting from the test.

NOTE:

The applicable MS or customer specification may change the values in Table III.

3.22.4 Test -

3.22.4.1 Strength of Actuator -

a. Mount specimen on Torque and Force Fixture.
b. Using Force Gauge, apply a 25-pound force for one (1) minute to the Push Button of each specimen under test as follows:

(1) In both directions, along the line of push button travel.
(2) In the fully extended position perpendicular with the direction of travel and applied at the end of the Push Button in each of two (2) mutually perpendicular axes. The force to be generated in a plane perpendicular to the sides of the specimen.

c. Inspect specimen for visible damage and record findings.

3.22.4.2 Terminal Strength -

a. With specimen securely clamped in Torque and Force Fixture check the terminals for each specimen using the Tensile and Torque values specified in Table III.

3.22.4.2 (Continued)

TABLE III

STRENGTH OF THREADED PARTS

	Terminals	
Screw Threads	Tensile Load (Lb.)	Torque (Lb. - In.)
8-32 NC	25	15
5/16-24 UNF	70	80
	Mounting Means	
Screw Threads	Tensile Load (Lb.)	Torque (Lb. - In.)
6-32 NC	30	10
8-32 NC	35	20
15/32-32 NS	--	50
7/16-32 NS	--	40
3/8-32 NEF	--	40

b. The tensile load will be generated from the center of the threaded terminal, parallel to the center line of the specimen and perpendicular to the mounting force. This is to be performed on each terminal. See diagram 1 below.

c. The torque shall be applied to the terminal screw assembled with normal hardware and shall be screwed into the threaded portion of the terminal with the torque applied along the same axis as the center line of the terminal screw. See diagram 2.

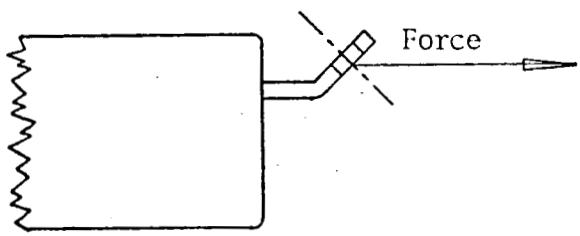


DIAGRAM 1

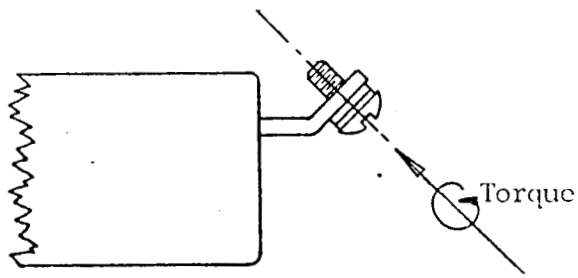


DIAGRAM 2

3.22.4.2 (Continued)

d. Inspect specimen for visible damage and record findings.

3.22.4.3 Mounting Means Strength - As applicable to type of specimen mounting.

a. Apply axial load specified in Table III for one (1) minute using hardened steel screws.
b. Apply torque specified in Table III to the mounting means with a mounting nut in such a manner as to give a true torque.
c. Inspect specimen for visible damage and record findings.

3.22.4.4 Housing Strength - As applicable to type of specimen mounting.

a. In order to measure housing strength, use mounting screws long enough to bottom within the specimen. Torque mounting screws to between 6 to 11 pound inch and hold for one (1) minute.
b. Inspect specimen for visible damage and record findings.

3.23 Trip Free Calibration -

3.23.1 Test Equipment - Power Supply (Item 1 or 2).

3.23.2 Test Set-up - Mount specimens on a panel and connect specimens in series with a switch across the terminals.

NOTE:

Not more than one (1) specimen to be run at any one time.

3.23.3 Requirement - The specimen shall trip within limits and shall not close momentarily during a 10 minute waiting period while actuator is held in after tripping has occurred and specimen is subjected to the maximum ultimate trip and overload values per applicable MS or customer specification.

3.23.4 Test -

3.23.4.1 Apply maximum ultimate trip current and overload current at percents of rated load as per applicable MS or customer specification.

3.23.4.2 Hold specimen in closed position for 10 minutes after tripping, release actuator. Record elapsed time to specimen trip, or failure to trip within maximum allowable time and whether or not specimen tripped free.

3.24 Vibration -

3.24.1 Test Equipment - Sinusoidal System (Item 210), Charge Amplifier (Item 212), Sensing Accelerometer (Item 213), Control Accelerometer (Item 214), X-Y Recorder (Item 215), Logarithmic Converter (Item 216), Oscilloscope (Item 33), Vibration Adapter Plate (Item 78), Vibration Test Fixture (Item 79), Intermittancy Detector (Item 63), Power Supply (Item 1 or 2).

3.24.2 Test Set-up -

3.24.2.1 Program vibration system to applicable program per MS, customer specification, or Method 204, Test Condition A, of MIL-STD-202.

3.24.2.2 Mount specimen to vibration test fixture and fixture to vibration system.

3.24.2.3 Connect electrical equipment as applicable.

3.24.3 Requirement - The specimen shall show no damage caused by vibration cycling and no contact shall open in excess of 500 microseconds. Following the test, the specimen shall pass the 200 percent overload test within applicable MS or customer specification limits.

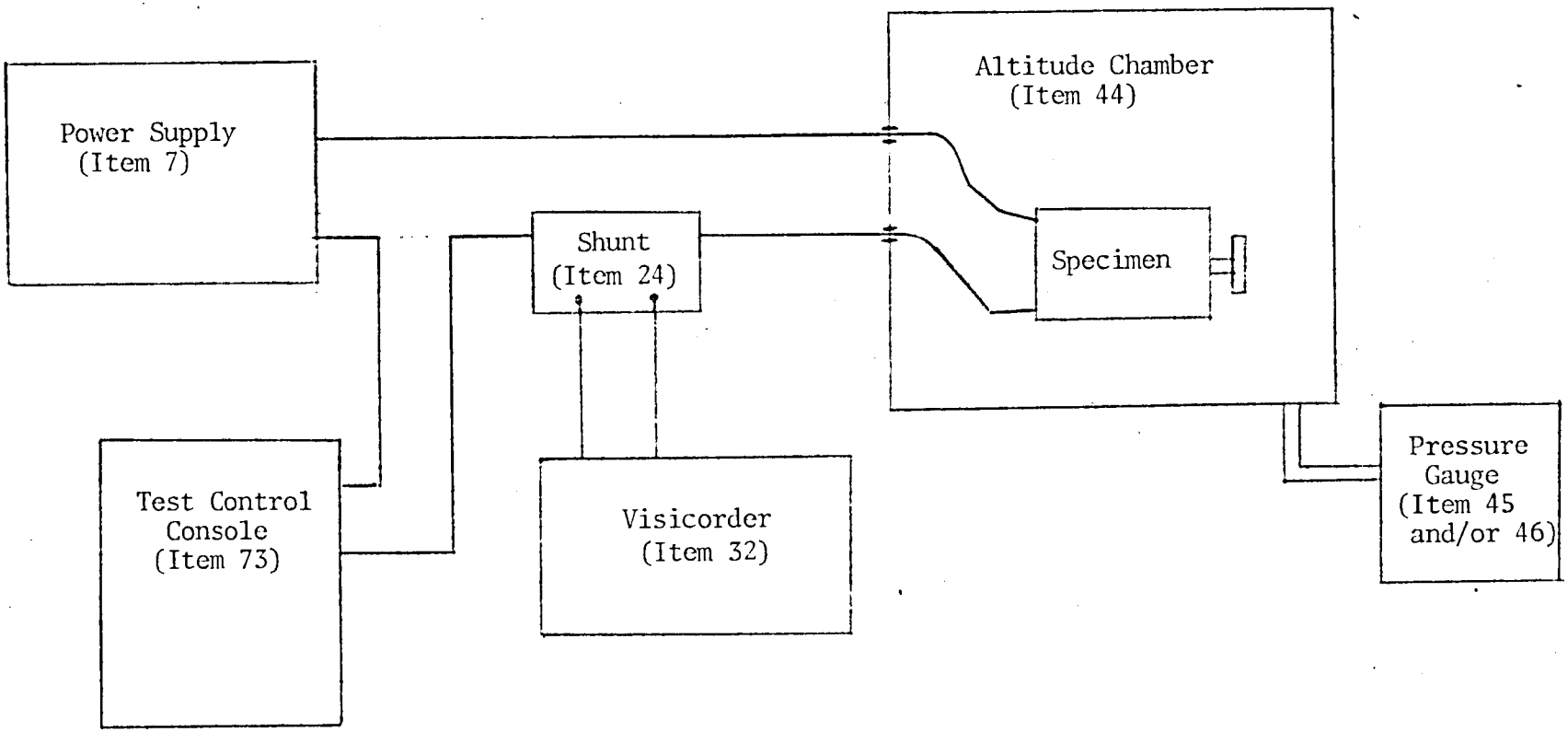
3.24.4 Test -

3.24.4.1 Apply rated current.

3.24.4.2 Vibrate specimen, with contacts closed, in each of three (3) mutually perpendicular axes at the applicable program as defined by the MS, customer specification, or Method 204, Test Condition A, of MIL-STD-202. The rate of cycling shall be in 15 minute scans with a total of three (3) hours per axis or a total of nine (9) hours through all three (3) axes.

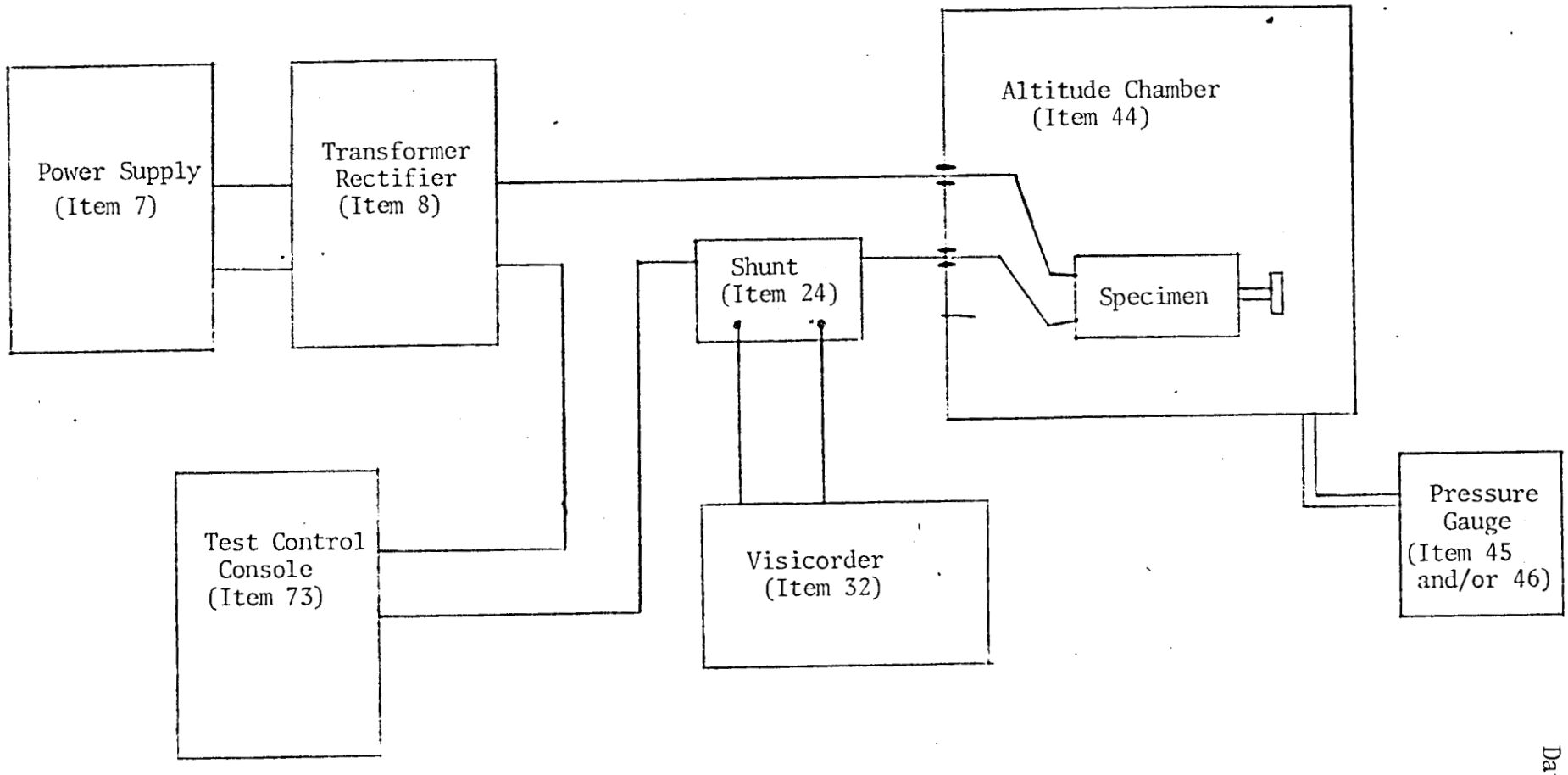
3.24.4.3 Record trip or chatter (contact interruption) greater than 500 microseconds.

3.24.4.4 Following the vibration cycling perform a 200 percent overload test per Paragraph 3.6 with trip time values as per applicable MS or customer specification.



AC RUPTURE SCHEMATIC

FIGURE 1



DC RUPTURE SCHEMATIC

FIGURE 2

APPENDIX A

TEST EQUIPMENT
Report No. 67-0000-005

TEST EQUIPMENT

MECHANICAL PRODUCTS

JACKSON, MICHIGAN

Report No. 67-0000-005

August 23, 1967

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Director of Engineering

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TEST EQUIPMENT

1.0 GENERAL TEST EQUIPMENT -

All Equipment will be as listed herein, equivalent items, or better.

1.1 M.P.I. Owned Equipment

Item 1 - Power Supply, AC (Figure 1)
Data: Includes Voltage Regulator (Item 11); Power Stat (Item 12); Loading Transformer (Item 10); Current Transformer (Item 9); Ammeter (Item 16); Knife Switch (Item 14); Cables (Item 15); Timer Trigger (Item 13); Timer (Item 27).
Calibration: N/A

Item 2 - Power Supply, DC (Figure 2)
Data: Includes DC Power Supply (Item 4); Meter (Item 19); Shunts (Item 24);Load Bank (Item 26); Knife Switch (Item 14); Cables (Item 15); Timer (Item 27).
Calibration: N/A

Item 3 - Commercial Power Supply
Data: 125 Volt, 60 Cycle, 8000 Ampere Capability Calibrated Circuits, 150 Amp. -50% P.F.; 180 Amps.-50% P.F., 5000 Amps. -50% P.F. ; 200 Amp. through 1500 Amp.-100% P.F. in increments of 100 Amp. Variable circuit 0-500 Amp. Calibrated with current transformers to 800 Amp., above with an oscillograph.
Calibration: Every 12 months

Item 4 - Direct Current M-G Set --Motor Generator Corporation
Data: Model 231
Range -- 30 volt, 1000 amp., 30 KW
Calibration: N/A

Item 5 - Generator -- G.E.
Data: 28-35 volts regulated - 500 amps.
Calibration: N/A

Item 6 - Power Supply, AC, 400 Cycle -- Bendix Aviation Corp.
Data: Type 1518 - Style H, Model 1
115 volt regulated, 3 phase, 2000 volt - amp.
Calibration: N/A

Item 7 - AC Aircraft Generator -- Westinghouse
Data: 3 phase, 75% power factor, 120/208 volts 360/440 Hz, 5400/6600 rpm, 60 KVA Alternator Drive Stand - Size 3 -- U.S.Electric Motors, Inc.
Calibration: N/A

TEST EQUIPMENT

Item 8 - Transformer Rectifier -- Westinghouse
Data: Type ATR-200LA
208 Volts, 400 Hz Input
27.5 volt, 200 amp. DC Output
Calibration: N/A

Item 9 - Current Transformer -- Weston
Data: Model 461, Type 1
Range: 10-, 20-, 50, 100-, 200-, 400-, 800-5 amps.
Calibration: Every 12 months

Item 10- Loading Transformer -- Sorgel
Data: Type UTIL
9/5/4 volt, 500 amps. Single Phase 60 Hz
Calibration: N/A

Item 11- Voltage Regulator -- Sola
Data: Type CVI
115 V, 100 VA
Calibration: N/A

Item 12- Power Stat -- Superior Electric Company
Data: 115 VAC, 7.5 Amp., 2 KVA
Calibration: N/A

Power Stat -- Superior Electric Company
Data: 115 VAC, 15 Amp., 2 KVA
Calibration: N/A

Item 13- Timer Trigger -- MPI
Data: Operation - 0.5 to 5.0 amps.
Calibration: N/A

TEST EQUIPMENT

Item 14- Knife Switch
Data: 115 Volts @ 50 amp. capacity
Calibration: N/A

Item 15- Cables
Data: Silver-plated copper stranded, qualified to MIL-W-5086, various AWG sizes and lengths as required by test specifications.
Calibration: N/A

Item 16- Ammeter, AC -- Weston
Data: Model 904
Accuracy: ± 0.25% full scale
Range: 0-2.5/5 amps.
Calibration: Every 3 months

Item 17- Ammeter, DC -- Weston
Data: Model 1
Accuracy: ± 0.25% full scale
Range: 0-100 amps. (50 mv)
Calibration: Every 3 months

Shunt -- Weston
Data: Precision Multiple Range, Type 8
Accuracy: ± 0.25%
Range: 1, 2, 5, 10, 20, 50, 100 amps. (50 mv)
Calibration: Every 3 months

TEST EQUIPMENT

Item 18 - Watt meter -- Weston
Data: Model 905
Accuracy: ± 0.5%
Range: 500, 1000, 2000 watts
Calibration: Every 12 months

Item 19 - DC Meter -- Weston
Data: Model 931
Accuracy: ± 0.5%
Range: 0-50 mv
Calibration: Every 3 months

Item 20 - AC Voltmeter -- Weston
Data: Model 904
0-150/300 volts
Accuracy: ± 0.5% full scale
Calibration: Every 3 months

AC Voltmeter -- G.E.
Data: Model AP-12
0-150/300/750 volts
Accuracy: ± 0.25% full scale
Calibration: Every 3 months

Item 21 - DC Voltmeter -- Weston
Data: Model 901
0-15/75/150 volts
Accuracy: ± 0.5% full scale
Calibration: Every 3 months

Item 22 - Standards Ammeter -- Sensitive Research
Data: Model L and Transformer
Accuracy: ±0.1% full scale
Ranges: 2-1/2, 5, 10, 20, 50, 100, 200, 400,800 amps
Calibration: Every 6 months

Item 23 - Potential Transformer -- Weston
Data: Type 311
Range: 2400 - 120 volts
1200 - 120 volts
Calibration: Every 12 months

Item 24 - Shunts -- Ram Meter, Inc.
Data: 50 mv
5, 10,20,25,50,100, 150, 250, 500 amp selections
Accuracy: ± .25%
Calibration: Every 12 months

Item 24 (Continued)

Shunt -- Weston
Data: 1000 amp, 50 mv
Accuracy: ± 0.5%
Calibration: Every 12 months

Item 25 - AC Load Bank -- Ohmweve
Data: 115 VAC, 0-20 amp, continuously variable
Calibration: N/A

AC Load Bank -- Ohmspun
Data: 115 VAC, 0-60 amp, continuously variable
Calibration: N/A

Item 26 - DC Load Bank -- Ohmweve
Data:30VDC,0-100 amp, continuously variable
Calibration: N/A

Item 27 - Timers -- Standard Electric Time
Data: Type S1
Accuracy: ± .01 seconds
Range: 0-60/.01 seconds graduations
Calibration: Every 6 months

Item 28 - Interval Time Meter -- Berkeley
Data: Model 500 C
0-0.1/1/10/100 milliseconds
0- 999,999 seconds
Accuracy: ±1 millisecond
Calibration: Every 12 months

Item 29 - Frequency Meter (EPUT) -- Berkeley
Data: Model 7150-B
Accuracy: Mfg. specification
Calibration: As required.

Item 30 - Voltmeter -- Ballantine
Data: Model 302 B
Accuracy: ± 1%
Range: 0.0001 to 0.001/0.01/0.1/1/10/100 volts
Calibration: Every 3 months

Item 31 - Vacuum Tube Voltmeter -- Hewlett-Packard
Data: Model 412A
Calibration: Every 3 months

Item 32 - Oscillograph (Visicorder) -- Minneapolis Honeywell
Data: Model 906B-1
Channels: 12 data, 2 timing
Galvanometer Response: 0-600 Hz
Sensitivity: 2.81 milliamps per inch
104.0 millivolts per inch
Maximum writing speed: 10,000 ips
Maximum paper speed: 50 ips
Calibration: Every 6 months

Timing Unit -- Minneapolis Honeywell
Data: Model 901336
Timing Marks: .01 -0.1 - 1 second
Calibration: Every 6 months

Item 33 - Oscilloscope -- Tektronix
Data: Model 564 with 3A 72 and 3 B 3 Preamps
Dual Trace, Storage
Time Base: 0.5 μs to 1 sec. per cm
Vert. Amplifier: 10 mv to 20 volts per cm
Frequency Response: DC to 650 KHz
Calibration: Every 6 months

Oscilloscope -- Tektronix
Data: Model 561 with 3A 74, 2 B 67 and 3 A 75 Preamps
Calibration: Every 6 months

Oscilloscope -- Tektronix
Data: Model 514 AD
Calibration: Every 6 months

Item 34 - Oscilloscope Recording Camera -- Tektronix
Data: Model C-12, Utilizing Polaroid Roll Film Pack
3000 speed, f 1.9 lens
Calibration: N/A

Item 35 - Temperature Recorder -- Honeywell
Data: Model 1530-5846-24-02-1-000-015-10
24 point temperature recording
-60°F to +500°F
Chart speed: 30, 60, 90, 120 inches/hour
Accuracy: ± 2°F
Calibration: Every 3 months

Item 36 - a) Multirange VOM -- Simpson
Data: Model 260
Accuracy: ± 3 %
Calibration: Every 6 months

TEST EQUIPMENT

Item 36 (continued)

b) Multirange VTVM -- RCA
Data: Model WV 77E and WV 98A
Accuracy: ± 3%
Calibration: Every 6 months

Item 37 - Potentiometer -- Bristol Co.
Data: Model 98
0 to 1100 millivolts
Accuracy: ± 1%
Calibration: Every 6 months

Item 38 - Pyrometer/Potentiometer -- Lewis
Data: Model 14 P_O
-75°F to +800°F
Accuracy: ± 2°F
Calibration: Every 6 months

Item 39 - Surface Pyrometer -- Alnor
Data: Model 4000
Range: 0-400°F
Calibration: Every 12 months

Item 40 - Radiation Pyrometer -- Ircon
Data: Model 300
Accuracy: 2%
Range: 230° to 5000°F
Calibration: As Required

Item 41 - Differential Voltmeter (Fluke) -- John Fluke Co.
Data: Model 883A
Accuracy: AC 0.1% -DC 0.01%
Range: 0 to 1100 volts
Calibration: Every 6 months

Item 42 - Thermocouples
Data: Iron/Constantan, Type J

Thermocouples
Data: Chromel/Alumel, Type K

Item 43 - Temperature Chamber -- Conrad
Data: Model TR-24V-09-09
Range: -90°F to +300°F ± 2°F
Size: 24" x 24" x 24"
Calibration: Every 6 months

Item 43 (Continued)

Temperature Chamber -- Aminco
Data: Model 4-3521
Range: Ambient to 230°C
Size: 18" x 36" x 24"
Calibration: Every 6 months

Item 44 - Temperature Altitude Chamber -- Conrad
Data: Model TRH-19-1-1
-100°F to +400°F ± 2°F
Size: 19" x 19" x 19"
Altitude: Prevailing to max. 100,000 ft.
Calibration: Every 6 months

Item 45 - Absolute Pressure Gauge -- Wallace and Tiernan
Data: Model FA160
0 to 50 mm Hg (Mercury)
Calibration: As required.

Item 46 - Manometer -- Meriam Instrument Co.
Data: Model 30F D 10
35 inches max.
Calibration: As required

Item 47 - Megohmer - General Radio
Data: Model 1862C
Accuracy: ± 5%
Range: 100 or 500 volts, 0.5 megohm to 2×10^6 megohms
Calibration: Every 6 months

Item 48 - High Pot Test Set -- Slaughter Company
Data: Model 103 and 106
Accuracy: 5% of full scale
Range: 0 to 5 MA, 0 to 2500 volts
Calibration: Every 6 months

Item 49 - Centrifuge -- MPI
Data: Maximum of 50 amp current capacity
Maximum of 35g acceleration with a one (1) lb. mass
Calibration: As Required

Item 50 - Corrosion Chamber -- Industrial Filter and Pump Company
Data: Type CA-3
Adjustable Program
Calibration: Every 12 months

Item 51 - Endurance Cycling Machine -- MPI
Data: Adjustable stroke
6 cycles per minute
ON to OFF time ratio of 1 to 1
Capacity: Three test specimens

TEST EQUIPMENT

Item 51 (Continued)

Endurance Cycling Machine -- MPI
Data: Adjustable stroke, 6 cycles per minute with selectable on-to-off ratio of 1:1 through 1:5
Capacity: 8 test specimens

Item 52 - Humidity Chamber -- American Instrument Company
Data: Model 4-5296
Adjustable Program
Calibration: Every 12 months

Item 53 - Shock Machine -- Haines
Data: Model STM-B (Jan-S-44)
To meet requirements of MIL-C-5809D
Calibration: N/A

Item 54 - MB Vibration Equipment -- MB Manufacturing Co.
Data: Model C10, Exciter
Model C1E, Vibrator
Model T151, Control Console
Force: 1200 lb·sine vector
Acceleration: 66g
Velocity: 70 in. per sec. max.
Displacement: 1.0 peak-to-peak max.
Frequency: 5-3000 Hz
Frequency Response: ± 1 db from 5-3000 Hz
Calibration: Every 3 months

Item 55 - Vibration Pickup -- MB Manufacturing Co.
Data: Type 115
Model M3 - Vibration Meter
Calibration: As used

Item 56 - Quartz Accelerometer -- Kistler
Data: Model 808A
Range: 0-1000g ± 5%, 5-25000 Hz
Calibration: Every 6 months

Item 57 - Charge Amplifier -- Kistler
Data: Model 565
Sensitivity: 100 mv/g ± 5%
Calibration: Every 6 months

Item 58 - X-Y Recorder -- Moseley
Data: Model 135
Paper Size 8-1/2 x 11 inches
DC voltage (each axis): 16 ranges, 0.5 mv per inch to 50 volts per inch ± 0.2% full scale
Time base: 7 calibrated sweeps, 0.5-50 sec. per inch ± 5% full scale
Calibration: Every 6 months

Item 59 - Sweep Sync -- Chadwick-Helmuth
Data: Model 201
Frequency Range: 5-100 KHz
Calibration: Synchronized by control equipment

Item 60 - Slip-Sync -- Chadwick-Helmuth
Data: Model 103A
Frequency addition: 3 to 1/3 Hz
Frequency Range: 5-10 K Hz
Calibration: Synchronized by control equipment

Item 61 - Strobex Lamp and Power Supply -- Chadwick-Helmuth
Data: Model 121
100 flashes per sec. @ .4 x 10^6 candles peak
Calibration: Synchronized by control equipment.

Item 62 - Stroboscopic Tachometer (Strobotac) -- General Radio
Data: Type 631B
Range: 600-14,400 per minute
Calibration: Synchronized to Power Line

Item 63 - Intermittency Detector -- MPI
Data: Selectable to indicate intermittancies exceeding
10, 50, 500 or 1000 µsec or 20 Msec.
Accuracy: 10 µsec ±20%
50 µsec ±20%
500 µsec ±20%
1000 µsec ±20%
20 Msec ±10%
Calibration: Every 6 months

Item 64 - Transducer (Displacement) -- Daytronic
Data: Model 103A-80
Range: ± .040" Linear Displacement
Calibration: Each Use

Item 65 - Transducer (Force) -- Daytronic
Data: Model 125A-5
Range Force ± 5.0 lbs.
Calibration: Each Use

Item 66 - Ultrasonic Cleaner -- National Ultrasonic Corp.
Data: Model G-200 Generator
Model T-200 and T-240 Tank
Calibration: As Required

Item 67 - Inductors -- Cutler Hammer
Data: Type AN 3179
Range: 0-6, 0-12. 0-25, 0-50 amp
Calibration: Yearly

Inductor -- Cutler Hammer
Data: Type 7000K3
Range: 0-25 amp
Calibration: Yearly

Item 68 - Kelvin Bridge -- Leeds & Northrup
Data: Model 4286
0.0001/11 ohms
Accuracy: 1%
Calibration: Every 6 months

Item 69 - Wheatstone Bridge -- Leeds & Northrup
Data: Model 5305
Calibration: Every 6 months

Item 70 - Decade Resistor -- General Radio
Data: Model 1432U and 1432Q
Calibration: Every 12 months

Item 71 - Comparison Resistors -- Rohde and Schwarz
Data: Type CR499 through CR504
Ranges: 10 megohms through 1 tera-ohm
Calibration: Every 12 months

Item 72 - Fuses
Data: Type AGC, various ratings 0.05 to 5 amp
as required

Item 73 - Test Control Console
Data: 1. Oscillograph input attenuators
2. Event timing circuits
3. Switching function circuits
Calibration: Every 6 months

Item 74 - Torque Wrenches - Snap-on Tools Corp.
Data: Model TQ-3-FU
Range: 0-30 in/lb. in 1 in/lb. increments
Accuracy: ± 1 in/lb.
Calibration: Every 6 months

Item 74 (Continued)

Torque Wrenches -- Snap-on Tools Corp.
Data: Model TQ-4-FU
Range: 0-50 in/lb. in 1 in/lb. increments
Accuracy: ± 1 in/lb.
Calibration: Every 6 months

Torque Wrenches -- Snap-on Tools Corp.
Data: Model TQ-8-FU
Range: 0-100 in/lb. in 2 in/lb. increments
Accuracy: ± 2 in/lb.
Calibration: Every 6 months

Torque Wrenches -- Snap-On Tools Corp.
Data: Model TQ-25-FU
Range: 0-300 in/lb. in 5 in/lb. increments
Accuracy: ± 5 in/lb.
Calibration: Every 6 months

Torque Wrenches -- Snap-on Tools Corp.
Data: Model TQ-56-FU
Range: 0-75 in/lb. in 1 in/lb. increments
Accuracy: ± 1 in/lb
Calibration: Every 6 months

Item 75 - Force Gages
Data: Chattilon Model DPP-25
Range: 0-25 lbs. in 0.25 lb. increments
Accuracy: ± 0.50%
Calibration: Every 6 months

Force Gages
Data: Chattilon Model DPPH-100
Range: 0-100 lb. in 1 lb. increments
Accuracy: ± 0.50%
Calibration: Every 6 months

Item 76 - Force and Torque Test Fixture -- MPI

Item 77 - Test Specimen Mounting Fixture and Parallel Bars for Force Gages as required by test.

Item 78 - Vibration Adapter Plate -- MPI

Item 79 - Vibration Test Fixture -- MPI
As required to mount test item

Item 80 - Shock Mounting Fixture -- MPI
As required to mount test item

TEST EQUIPMENT

Item 81 - Vernier Calipers
Data: Graduated in 0.001 inch, with an 0.0001 indicator
Accuracy: 10%
Calibration: As used or every 3 months

Item 82 - Micrometers
Data: Graduated in 0.0001 inch
Accuracy: 10%
Calibration: As used or every 3 months

Item 83 - Gram Scale
Data: Weights traceable to the National Bureau of Standards
Calibration: As Required

Item 84 - Capacitor Substitution Box -- Aerovox and Heath
Data: Model ACD-13, 23, 33,1N22
.001 - 3000 mfd
Calibration: N/A

Item 85 - Resistor Substitution Box -- Heath
Data: Model IN-11
Various Ranges
Calibration: N/A

Item 86 - Audio Oscillator -- Hewlett Packard
Data: Model 202-D
Range: 2 to 70 KHz
Calibration: As required

Item 87 - Thermometers
Data: Recording in °C and °F as required by tests

Item 88 - Optical Comparator -- Jones and Lamson
Data: Model TC-14
10 and 20 X magnification
Readings to ten thousandth inch

Item 89 - Hardness Tester (Tukon) -- Wilson
Data: Model LL
Knopp Hardness

Item 90 - Electronic Thickness Tester -- Kocour
Data: Model 955
Used for testing of plating thickness

Item 91 - Hunter Spring Tester -- Wiedemann Baldwin
Data: Model HST-SA

1.2 Government Owned Equipment Available at M.P.I.

Item 201 - AC Generator
Data: Master Type F-3
5 KVA 50 amp 115v, 400 Hz
Calibration: N/A

Item 202 - Generator -- Marathon
Data: Output - 28 volts DC nominal, 1000 amp
Calibration: N/ A

Item 203 - Nobatron Power Supply - DC
Data: Model DCR40-60
Voltage Output: 0-40 VDC
Current Output: 0-60 ADC
Constant Voltage or Current Regulation
Calibration: N/A

Item 204 - Temperature Chamber -- Thermotron
Data: Model F-8-CHV-CO_2
8 Cu. ft. internal size
-50°F to +300°F
Accuracy: ± 3°F
Calibration: Every 6 months

Item 205 - Shock Test Machine -- LAB Corp.
Data: Model SD-16-42-100S
100 lb. Load Max.
50g peak 11 ms, 1/2 sine shock; 25g 11 ms, 1/2 sine shock, or up to 85g 11 ms terminal peak sawtooth or other shock programs as required.
Calibration: N/A

Item 206 - Intermittancy Detector -- Continental Testing
Data: Model TM 5100 10 Channel
Selectable to indicate intermittancy within the range of 1 through 100 microseconds
Accuracy: ± 3%
Calibration: Once per shift and every 6 months

TEST EQUIPMENT

Item 207 - High Vacuum Test Station -- Veeco
Data: Model VEM-775
Work space 18 in. dia. x 30 in. high
Pump: 7-3/4 in. diffusion pump with 15 cfm roughing pump
Feedthroughs:
14 - 400 amp, 115v current feedthroughs
2 - 1/4 in. Liquid feedthroughs
6 - Octal header feedthroughs
1 - Rotary push-pull mechanical feedthrough equipped with:
a) Granville-Phillips automatic pressure controller
b) Veeco Model TG-6 thermocouple gage, 1-1000 microns ± 5%
c) Veeco Model RGLL-6 ionization gage 10^{-3} to 10^{-12} torr range ± 5% accuracy
Calibration: Checked at every use and complete calibration every 12 months

Item 208 - Thermal Vacuum Sample Mounting and Cycling Fixture -- MPI
Data: 24 Sample capacity, 12 mechanically cycled
Mounting plate temperature controlled by external liquid
Mechanical cycle rate of 6 cycles per minute with ON to OFF ratio of 1:1 through 1:5
Calibration: N/A

Item 209 - Heat Exchanger -- Conrad
Data: Model LB C2C-10-30
-50°F to 300°F, Circulation Silicone oil
Can be programmed to meet temperature cycling requirements
Calibration: Every 6 months

Item 210 - Sinusoidal System -- Ling
Data: Frequency: 5-3000 Hz
Frequency Response: ± 1 db from 5-3000 Hz
Power: 10 KVA
Force Rating: 4000 lb. sine vector
Acceleration: 100g vector max.
Displacement: 1.0 in. peak-to-peak max.
Composed of:
Vibration Amplifier - Model RP-10/16
Accelerometer Normalizing Amp - Model ANA-101
Servo Cycling Oscillator - Model SCO-3
Vibration Exciter - Model 330
Electronic Voltmeter - Model VTVM-2
Calibration: Every 3 months

TEST EQUIPMENT

Item 211 - Random Accessory -- Ling
Composed of:
Random Equalizer/Analyzer - Model ASDE-40
Channels: 45 equalizer
46 analyzer
Frequency range: 10-2050 Hz

Tracking Filter -- Model RFA-130
Frequency: 5-10,000 Hz
Frequency Response: ± 0.5 db
Linearity: ± 2.5% over 40 db operating range
10 Hz filter:
shape factor - 4
rejection: 25 db from 10-5000 Hz
100 Hz filter
shape factor - 4
rejection: 25 db from 15-5000 Hz
Clipper Mixer Amplifier - Model CMA-10A
Clipping level: 1.5-3.0 volts peak-to-peak
Frequency range: 5-5000 Hz
Calibration: Every 3 months

Item 212 - Charge Amplifier -- Endevco
Data: Model 2710 A and Power Supply Model 2627 A
Range: 1 to 3000g
Frequency Response: 20 to 20,000 Hz
Accuracy: ± 2%
Calibration: Every 6 months

Item 213 - Accelerometer -- Endevco
Data: Model 2226
Range: 1 to 1000g in Vibration
Frequency Response: ± 5 to 5000 Hz
Temperature Range: -65°F to 350°F
Calibration: Every 6 months and checked every time used

Item 214 - Accelerometer-- Endevco
Data: Model 2221D
Range: 1 to 1000g in Vibration
Frequency Response: ± 5% 2-6000 Hz
Temperature Range: -65°F to +350°F
Calibration: Every 6 months and checked every time used

Item 215 X-Y Recorder -- Ling
Data: Model RXY-100 (Moseley Model 135A)
DC Voltage, each axis: 11 ranges 0.5 mv/inch to 50 volts/inch ± 0.2% full scale
Time Base; 5 calibrated sweeps 0.5-50 seconds/inch ± 5% full scale
Calibration: Every 6 months

TEST EQUIPMENT

Item 216 - Logarithmic Converter -- Ling
Data: Model LOG-100 (Moseley Model 60D)
Frequency: 20-20,000 Hz
Dynamic Range: 60 db, AC or DC
Calibration: Every 3 months

Item 217 - Tape Recorder - Ampex
Data: Model SP-300
FM and Direct Recording - 4 channel input
Calibration: Every 12 months

1.3 Outside Test Sources Available Through MPI

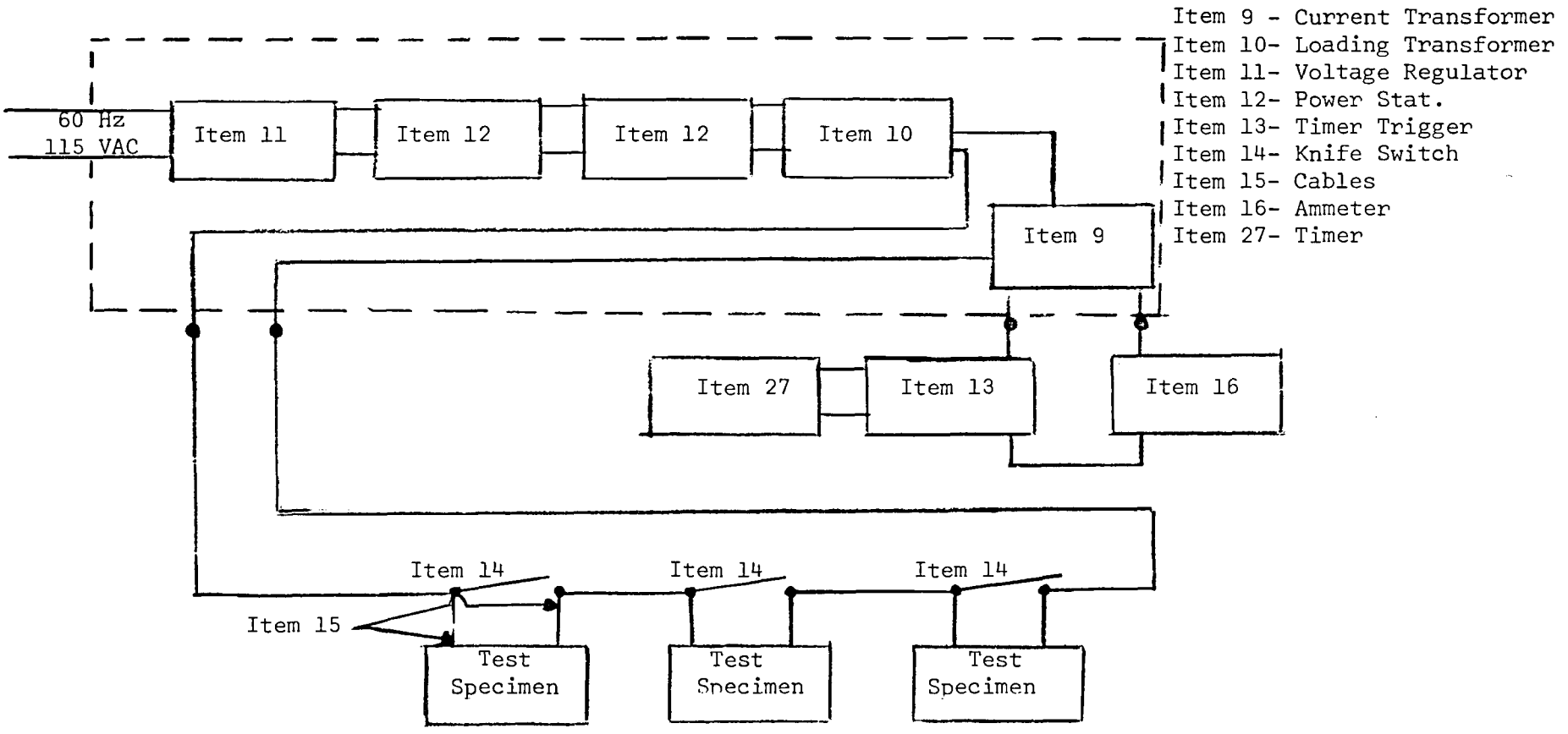
Item 401 - Sand and Dust Chamber
Capable of maintaining the required criterion during duration of test.

Item 402 - Fungus Chamber
Capable of maintaining the required criterion during duration of test.

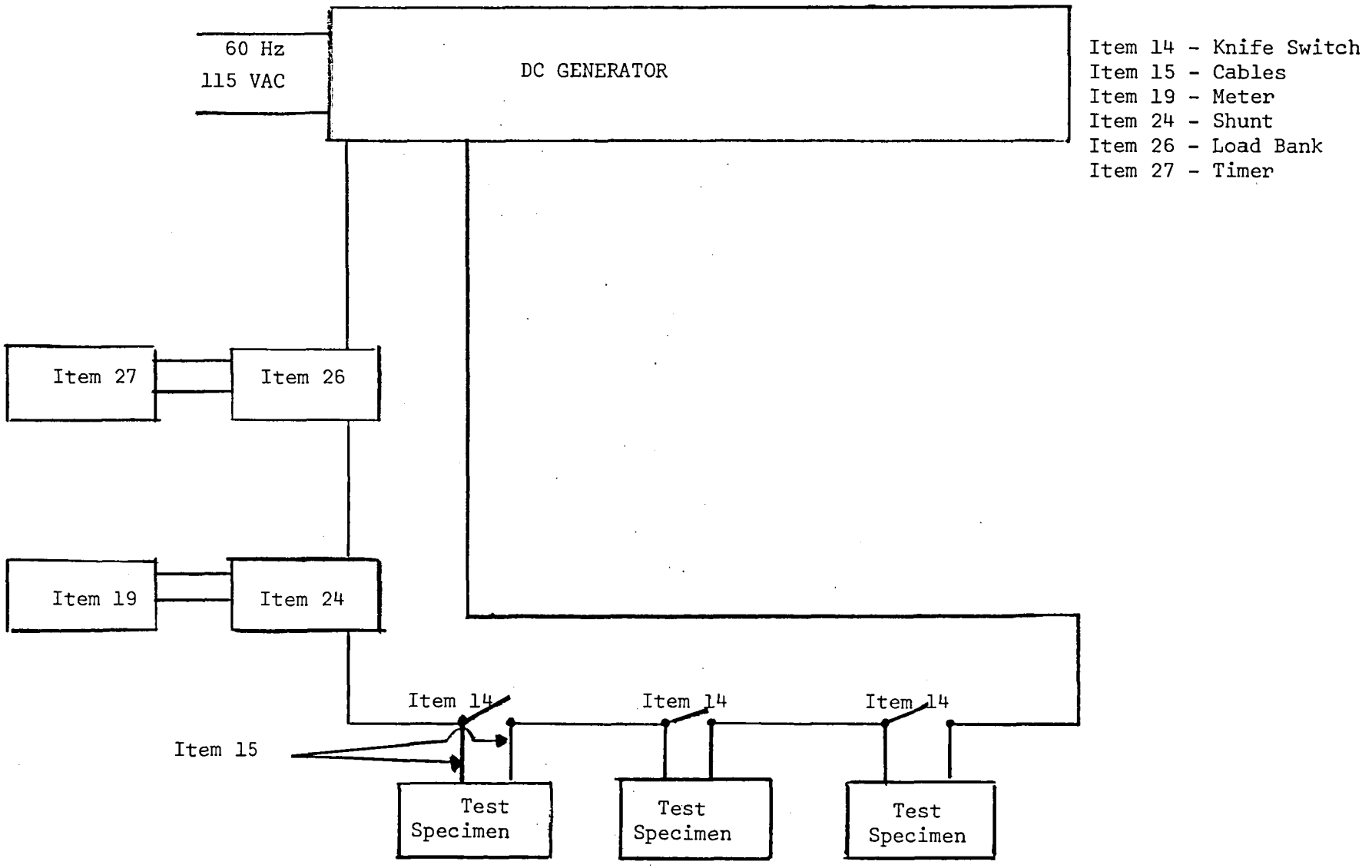
Item 403 - Explosion Proof Chamber
Capable of maintaining the required criterion during duration of test.

Item 404 - High Current Interruption Capacity
Capable of maintaining the required criterion during duration of test.

Item 405 - Altitude Chamber
Capable of maintaining the required criterion during duration of test.



AC POWER SUPPLY SET-UP
Figure 1 (Item 1)



DC POWER SUPPLY SET-UP
Figure 2 (Item 2)

APPENDIX B

STANDARD DATA FORMS

AERONAUTIC AND ENVIRONMENTAL TEST LABORATORY
MECHANICAL PRODUCTS, INC., JACKSON, MICHIGAN.
LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____W. O. NO._____DATE_____
REPORT TITLE: SPECIAL GROUP I
ITEM UNDER TEST: _____ Series _____ Amp S/N _____
TEST PERFORMED BY:
EQUIPMENT USED: P.S.#_____

4.6.2	DIELECTRIC STRENGTH @ _____ VOLTS(in micro amps)								
		T_1-T_2	T_1-MP	T_2-MP					
	Open								
	Closed	- - -							
4.6.3	INSULATION RESISTANCE(in megohms)								
		T_1-T_2	T_1-MP	T_2-MP					
	Open								
	Closed	- - -							
4.6.7.3	OVERLOAD CALIBRATION - _____ % ONLY(if no previous calibration)								
					seconds				
4.6.7.2	MAXIMUM ULTIMATE TRIP (in seconds)								
		%		%					
4.6.7.1	MINIMUM ULTIMATE TRIP (in seconds)						Terminal	Temp.	Rise-°C
		%					T_1		
							T_2		
4.6.6	OPERATING FORCE (pounds)								
		1	2	3	4	5	Average		
	Pullout								
	Reset								
4.6.21	VOLTAGE DROP (millivolts)								
		1	2	3	4	5	Average		
4.6.7.3	OVERLOAD CALIBRATION (in seconds)								
		%		%		%			
4.6.7.4	TRIP FREE (Only if requested on report)						%		
								seconds	

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LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____W. O. NO._____DATE_____
REPORT TITLE: ACCELERATION
ITEM UNDER TEST:_____Series_____Amp___S/N_____
TEST PERFORMED BY:
EQUIPMENT USED: P.S.#_____

Contact Opening or Closing monitored @_____micro seconds

Position Mounted	Contact Position	Chatter	% Current Applied	Acceleration Level g's	Duration in seconds
Lateral	Open				
	Closed				
Vertical	Open				
	Closed				
Horizontal	Open				
	Closed				
AFTERCHECK 200%					

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LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____W. O. NO._____DATE_____
REPORT TITLE: AMBIENT EFFECT
ITEM UNDER TEST:_____ Series _____ Amp S/N_____
TEST PERFORMED BY:_____
EQUIPMENT USED: P.S.#_____

Temperature in Centigrade								
(Plus Temp)		(Max. Ult)			(Min. Ult)			
°		%			%		200%	
			seconds			seconds		seconds
25°		200%						
			seconds					
(Minus Temp)		(Max. Ult)			(Min. Ult)			
°		%			%		200%	
			seconds			seconds		seconds
25°		200%						
			seconds					

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SHEET_____OF_____

REPORT NO._____ W. O. NO._____ DATE_____
REPORT TITLE: CORROSION and AFTERCHECKS
ITEM UNDER TEST:_____ Series_____ Amp S/N_____
TEST PERFORMED BY:
EQUIPMENT USED: P.S.#

4.6.16	Corrosion		IN			OUT			
		Date	Time		Date	Time			
	Forced Air Dry								
Afterchecks									
4.6.7.3	200% only to clear(seconds)								
4.6.7.3	200% only - must pass within				limits	(seconds)			
4.6.6	Operating Forces								
		1	2	3	4	5	Average		
	Pullout								
	Reset								

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LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____W. O. NO._____DATE_____
REPORT TITLE: ENDURANCE
ITEM UNDER TEST: _____ Series _____ Amps S/N _____

TEST PERFORMED BY:_____
EQUIPMENT USED: P.S. #
Endurance Cycling Machine - Rate of Cycling @ _____ cycles/minute
Ratio of ON to OFF time @ _____ to _____

4.6.8.	.				Load	Number of Cycles Reqd			
	C/B set-up with					Total Travel			
	C/B removed with					Total Travel			
	4.6.6 Operating Force @			Cycles					
		1	2	3	4	5	Avg.		
	Pullout								
	Reset								
	C/B set-up with					Total Travel			
	C/B removed with					Total Travel			
	4.6.6 Operating Force @			Cycles					
		1	2	3	4	5	Avg.		
	Pullout								
	Reset								
Remarks:									
Afterchecks -									
4.6.7.2	Max. Ult. Trip								
		%							
				seconds					
4.6.7.1	Min. Ult. Trip								
		%							
				seconds					

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LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____W. O. NO._____DATE_____
REPORT TITLE: MOISTURE RESISTANCE - AFTERCHECKS
ITEM UNDER TEST: _____ Series _____ Amp S/N _____
TEST PERFORMED BY:_____
EQUIPMENT USED: P.S.#_____

4.6.17	Moisture Resistance							
	Time IN & DATE			Time OUT & DATE				
Afterchecks- (after 45 minutes)								
	500% (Trip with/in 10 seconds)							
	(Stabilize for 1 hour.)							
	300% Trip Free							
	(Stabilize for 2 hours.)							
	200% (Limits within plus or minus 10 percent of requirement for trip.)							
	(Stabilize for 4 hours.)							
	Dielectric Strength at 1125 volts (Values in microamps)							
	T_1-T2			- - -				
	T1-MP							
	T_2-MP							
		Open		Closed				
4.6.6	Operating Forces							
		1	2	3	4	5	Average	
	Pullout							
	Reset							

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LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____ W. O. NO._____ DATE_____
REPORT TITLE: MOISTURE RESISTANCE & STORAGE - AFTERCHECKS
ITEM UNDER TEST:_____ Series _____ Amp S/N_____
TEST PERFORMED BY:_____
EQUIPMENT USED: P.S.#_____

4.6.18	Contact Resistance (Value in millivolts)								
		1	2	3	4	5			
	T_1-T_2								
		6	7	8	9	10	Average		
	T_1-T_2								
4.6.17	Moisture Resistance								
	Time IN & DATE				Time OUT & DATE				
4.6.19	Storage (10 day)								
	Time IN & DATE				Time OUT & DATE				
4.6.18	Contact Resistance (Value in millivolts)								
		1	2	3	4	5			
	T_1-T_2								
		6	7	8	9	10			
	T_1-T_2								
4.6.7.3	200% (Limits within plus or minus 20 percent of requirement for trip								
4.6.6	Operating Forces								
		1	2	3	4	5	Average		
	Pullout								
	Reset								

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SHEET_____OF_____

REPORT NO._____W. O. NO._____DATE_____
REPORT TITLE: OVERLOAD CYCLING
ITEM UNDER TEST:_____Series_____Amp S/N_____
TEST PERFORMED BY:_____
EQUIPMENT USED: P.S.#_____

All time is in seconds. All trips are performed at 3 minute intervals.

- - - - NORMAL TRIPS		- - - -				- - - - TRIP-FREE TRIPS		- - -	
Cycle	200%	Cycle	200%			Cycle	200%	Cycle	200%
1		26				51		76	
2		27				52		77	
3		28				53		78	
4		29				54		79	
5		30				55		80	
6		31				56		81	
7		32				57		82	
8		33				58		83	
9		34				59		84	
10		35				60		85	
11		36				61		86	
12		37				62		87	
13		38				63		88	
14		39				64		89	
15		40				65		90	
16		41				66		91	
17		42				67		92	
18		43				68		93	
19		44				69		94	
20		45				70		95	
21		46				71		96	
22		47				72		97	
23		48				73		98	
24		49				74		99	
25		50				75		100	
AFTERCHECKS									
Max. Ult. Trip				Min. Ult. Trip					
%	%			%					
		seconds			seconds				

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SHEET_____OF_____

REPORT NO._____ W. O. NO._____ DATE_____
REPORT TITLE: RUPTURE -
ITEM UNDER TEST: Series Amp S/N

TEST PERFORMED BY:
EQUIPMENT USED: P.S.#
LEGEND - I in amps, E in volts, T in seconds

4.6.14	(____) RUPTURES								
Fault		amps taken @				Voltage			
Number	Type	Altitude	I	E	T	Continuity	Remarks		
1									
Fault		amps taken @				Voltage			
AFTERCHECKS -									
	4.6.7.3	200% (Time in seconds)							
	4.6.2	Dielectric @		volts					
			Open	Closed					
		$T_1 - T_2$		- - -					
		T_1 - MP							
		T_2 - MP							

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SHEET_____OF_____

REPORT NO._____W. O. NO._____DATE_____
REPORT TITLE: SAND & DUST - Afterchecks
ITEM UNDER TEST:_____Series_____Amp___S/N_____
TEST PERFORMED BY:_____
EQUIPMENT USED: P.S.#_____

4.6.15	Sand and Dust								
		Where Performed							
		When Performed							
		Report Number					dated		
	-Afterchecks-		NOTE:	All time in seconds.					
Test I		400%		Trip Free					
Test II		200%							
Test III	Maximum Ultimate	%		Trip					
Test IV	Minimum Ultimate	%		Trip					

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SHEET_____OF_____

REPORT NO._____ W. O. NO._____ DATE_____
REPORT TITLE: SHOCK
ITEM UNDER TEST:_____ Series _____ Amp S/N_____
TEST PERFORMED BY:_____
EQUIPMENT USED: P.S.#_____ _____% Current Applied
Shock Machine, Kistler Accelerometer, Kistler Charge Amplifier, Oscilliscope

PROGRAM: Theoretical _____ g, _____ milliseconds
Type waveform _____, Velocity _____

PROGRAM: Actual _____ g, _____ milliseconds
Actual Velocity _____

Axis	Drop #	Breaker Closed 1	2	3	Breaker Open 1	2	3	Photo # When Req'd.
Vertical Plus								
Vertical Minus								
Lateral Plus								
Lateral Minus								
Horizontal Plus								
Horizontal Minus								
	NOTE:	1-OK means one drop with NO TRIP or CHATTER with chatter monitored at _____ microseconds.						
PROGRAM: Actual _____ g, _____ milliseconds Actual Velocity _____								
AFTERCHECKS:		200% (time in seconds)						

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LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____ W. O. NO._____ DATE_____
REPORT TITLE: STRENGTH OF ACTUATOR (PUSHBUTTON)
ITEM UNDER TEST: _____ Series _____ Amp S/N _____
TEST PERFORMED BY:
EQUIPMENT USED: P.S.

4.6.4.2 Strength of Pushbutton								
A.	Force		lbs. (push) along the line of pushbutton travel					
	for 60	seconds.						
		REMARKS: Damage						
B.	Force		lbs. (pull) along the line of pushbutton travel					
	for 60	seconds.						
		REMARKS: Damage						
C.	Force		lbs. applied at extremity of pushbutton side and					
	perpendicular to pushbutton travel for 60 seconds. Circuit breaker							
	oriented with locator facing force applied.							
		REMARKS: Damage						
D.	Force		lbs. applied at extremity of pushbutton side and					
	perpendicular to pushbutton travel for 60 seconds. Circuit breaker							
	oriented 90 degrees to location noted in C. above.							
		REMARKS: Damage						

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LABORATORY DATA SHEET

SHEET_____OF_____

REPORT NO._____ W. O. NO._____ DATE_____
REPORT TITLE: STRENGTH OF THREADED PARTS
ITEM UNDER TEST: _____ Series _____ Amp S/N _____
TEST PERFORMED BY: _____
EQUIPMENT USED: P.S.# _____

4.6.5.1 Strength of Terminals

A. Force of _____ lb. (pull) applied to terminal and perpendicular to mounting plate of circuit breaker for 60 seconds.

RESULTS: Damage T_1
T_2

B. Torque of _____ lb-in applied to screw head of terminal screw about the threaded axis of terminal for 60 seconds.

RESULTS: Damage T_1
T_2

4.6.5.2 Strength of Mounting (As Applicable)

A. Torque of _____ lb-in applied to mounting nut for 60 seconds.

RESULTS: Damage

B. Tensile of _____ lb (pull) applied to each mounting screw (Axial Load) for 60 seconds.

RESULTS: Damage to screw opposite T( )
Damage to screw opposite T( )

C. Torque of _____ lb-in applied to each mounting screw for 60 seconds

RESULTS: Damage to screw opposite T( )
Damage to screw opposite T( )

4.6.5.3 Strength of Housing (As Applicable)

A. Torque of 6 to 11 lb-in applied to both mounting screws that are long enough to bottom within the mounting means.

RESULTS: Damage to screw opposite T( )
Damage to screw opposite T( )

AERONAUTIC AND ENVIRONMENTAL TEST LABORATORY
MECHANICAL PRODUCTS, INC., JACKSON, MICHIGAN
LABORATORY DATA SHEET

SHEET ________ OF ________

REPORT NO. ____________________ W. O. NO. ____________________ DATE ____________________
REPORT TITLE: TRIP FREE
ITEM UNDER TEST: ____________ Series ____________ Amp S/N ____________

TEST PERFORMED BY: ____________________
EQUIPMENT USED: P.S.# ____________________

MAXIMUM ULTIMATE TRIP VALUE (Time in seconds)									
	%			Trip-Free					
				Yes	No	Remarks:			
OVERLOAD CALIBRATION VALUES (Time in seconds)									
	%			Trip-Free					
				Yes	No	Remarks:			
	%			Trip-Free					
				Yes	No	Remarks:			
	%			Trip-Free					
				Yes	No	Remarks:			

MECHANICAL PRODUCTS, INC., JACKSON, MICHIGAN
LABORATORY DATA SHEET

SHEET ____ OF ____

REPORT NO. ____________ W.O. NO. ____________ DATE ____________
REPORT TITLE Vibration Cycling ____________ SPEC. ____________ PARA. ____________
ITEM UNDER TEST: ____________ RATING ____________ AMPS. S/N ____________

TEST PERFORMED BY: ____________
EQUIPMENT USED: Vibration System, Control Accelerometer Model No.
S/N ____________

PROGRAM ____________

CONTACT CHATTER MONITORED AT ____________ SECONDS. CURRENT APPLIED ____________ %
CIRCUIT BREAKER TORQUED AT ____________ INCH POUNDS

Temp. °C	Axis	Resonant Freq.	Time @ Res/Freq	Time Cycling @ Program	Trip	Contact Chatter	Remarks

APPENDIX C

ORDER FOR LABORATORY WORK

MECHANICAL PRODUCTS JACKSON, MICHIGAN

ORDER FOR LABORATORY WORK

REPORT #_____CHARGE W. O._____SHEET_____OF_____

MODEL #_____CUSTOMER_____

REPORT TITLE_____

_____

WORK TO BE DONE (Use Extra Sheets If Necessary):

TYPE OF REPORT REQUIRED: DATA SHEET_____MEMO_____FORMAL_____

REQUESTED BY:_____DATE_____

APPROVED BY:_____DATE_____

COMPLETED (DATE)_____BY_____