INCH-POUND

MIL-PRF-6106L
AMENDMENT 5
29 July 2003
SUPERSEDING
AMENDMENT 4
1 July 2003

PERFORMANCE SPECIFICATION

RELAYS, ELECTROMAGNETIC,
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-PRF-6106L, dated 10 November 2000, and is approved for use by all Departments and Agencies of the Department of Defense.

The attached insertable replacement pages as listed below are replacements for stipulated pages. When the new pages have been entered in the document, insert the amendment as the cover sheet to the specification.

Replacement page	Page replaced	Item(s) changed
31	31	Continuous current moved from C3 to Group C9 Life (highest rated dc, 50% of rated life) Group C6 moved from page 32
32	32	Moved Group C6 to page 31 Group C9 added

PAGE 13

Table IV, Sea level, delete: "Test voltage (2-5 seconds)" and substitute "Test voltage (2 to 5 seconds)".

Footnote 3/, delete and substitute: "3/ For performing conformance inspection on production samples, the 2 to 5 second test may be used by the manufacturer only in lieu of the 1 minute test. The 1 minute test shall be used for qualification, group B, and group C inspections or when defects are discovered in conformance inspection.".

Footnote 5/, delete: "2-5 seconds" and substitute "2 to 5 seconds".

3.13.3, delete and substitute: “3.13.3 Static contact resistance or contact voltage drop (see 4.7.8.3). Unless otherwise specified (see 3.1), the static contact resistance shall not exceed 0.05 ohm or the contact voltage drop shall not exceed 0.100 volt (after life tests 0.125 volt) maximum for relays not fully rated at 25 amperes and below. Contact voltage drop for relays fully rated at 25 amperes and above shall not exceed 0.125 volt maximum (after life tests 0.150 volt).”

PAGE 23

Table VI, Q2, Test method paragraph, delete “4.7.29” located after “4.7.9” and move remaining references up one line.

PAGE 29

Table VIII, footnote 4, second sentence, delete and substitute: “A two piece sample of each lot shall be mechanically inspected and visually inspected for cracked glass.”

PAGE 35

4.7.7.1c., delete: "5 seconds minimum" and substitute "2 seconds minimum to 5 seconds maximum".

4.7.8.3, delete and substitute: "4.7.8.3 Static contact resistance or contact voltage drop (see 3.13.3). The static contact resistance or static contact voltage drop shall be required for each pair of contacts. If both contact voltage drop and static contact resistance are specified in the documents the manufacturer has the choice of which to run for the contacts. However, each contact must be tested.

4.7.8.3.1 Static contact resistance (see 3.13.3). Relays shall be tested in accordance with method 307 of MIL-STD-202. The following details and exception shall apply:

a. Method of connection: The point of measurement shall be on leads external to the case. Suitable jigs and fixtures shall be used.

b. Test load: Test current shall be 100 mA at a voltage equal to or below rated voltage, except those rated for low level. See 6.1.1 for low level voltage rating. For low level, the current shall be 10 mA maximum. (dc or peak ac).

c. Post test current: Load current and voltage shall be 100 mA maximum at a voltage equal to or below rated voltage, unless life tests are specified in the grouping. When life tests are specified in the grouping, the same current at a maximum of rated voltage as the life test, or 100mA maximum at 28vdc maximum, shall be used.

d. Points of measurements:

   (1) Between all normally closed mated contacts.

   (2) Between all normally open mated contacts, with the coil energized with rated coil voltage (or current) for non-latch type relays, or in the latch/reset position for magnetic latch type relays, with or without coil energized.

e. Number of activations prior to measurement: During static resistance tests, the number of activation prior to measurement is none.

f. Number of test activations: Maximum of three activations in each closed contact position for qualification Q1. For all remaining groups in the Qualification table, group A, group B, and group C, one activation in each closed contact position.

g. Number of measurements per activation: One in each closed contact position. The readings shall be taken after the circuit has stabilized and within a maximum time of 10 seconds after activation.

4.7.8.3.1 Contact voltage drop (see 3.13.3). Relays shall be tested in accordance with method 307 of MIL-STD-202. The following details and exception shall apply:

a. Method of connection: The point of measurement shall be on leads external to the case. Suitable jigs and fixtures shall be used.

b. Test load: Test current shall be rated resistive current at rated voltage or less. See 6.1.1 for low level voltage rating. If a lower test current is used, the millivolt drop shall be adjusted according to Ohm's law.

c. Post test loads for intermediate current and life: When intermediate current is specified in the grouping, the same current as intermediate current, or 100 mA, at a voltage equal to or below rated voltage shall be used. When life tests are specified in the grouping, the same current as the high level life test, or 100 mA, at a voltage equal to or below rated voltage shall be used. If a lower test current is used, the millivolt drop shall be adjusted according to Ohm's law.

d. Points of measurements:

(1) Between all normally closed mated contacts.

(2) Between all normally open mated contacts, with the coil energized with rated coil voltage (or current) for non-latch type relays, or in the latch/reset position for magnetic latch type relays, with or without coil energized.

e. Number of activations prior to measurement: During contact voltage drop tests, the number of activation prior to measurement is none.

f. Number of test activations: Maximum of three activations in each closed contact position for qualification Q1. For all remaining groups in the Qualification table, group A, group B, and group C, one activation in each closed contact position.

g. Number of measurements per activation: One in each closed contact position. The readings shall be taken after the circuit has stabilized and within a maximum time of 10 seconds after activation."

PAGE 37

4.7.8.5, third sentence, delete "Contact load conditions shall be 6 V dc to 28 V dc maximum or peak ac at 100 mA maximum." and substitute "Contact load conditions shall be 28 V dc maximum or peak ac at 100 mA maximum."

PAGE 39

4.7.8.6, fourth sentence, delete "Contacts shall be loaded with 6 V dc to 28 V dc maximum or peak ac at 100 mA maximum." and substitute "Contact load conditions shall be 28 V dc maximum or peak ac at 100 mA maximum."

PAGE 42

* 4.7.11.1 e. first sentence, delete, "The test voltage shall be between 12 volts and 35 volts with a series non-inductive resistor of suitable substance to limit the closed circuit current to some value between 5 milliamperes and 10 milliamperes." and substitute: "The test voltage shall be 35 volts maximum with a series non-inductive resistor of suitable substance to limit the closed circuit current to some value between 5 mA and 10 mA for relays not fully rated at 25 amperes. For relays fully rated at 25 amperes and above, the value shall be a maximum of 100 mA."

* Custodians, add "NASA - NA"

The margins of this amendment are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

Custodians:
Army - CR
Navy - AS
Air Force - 11
DLA - CC

Review activities:
Navy - EC
Air Force - 99

Preparing activity:
DLA - CC

(Project 5945-1219)

TABLE X. Group C inspection.

Inspection	Requirement paragraph	Test method paragraph	Number of sample units for inspection
C1 (monthly) 5/			
Internal moisture (when specified)	3.33	4.7.27	1
Intermediate current (when specified)	3.32	4.7.26	
Dielectric withstanding voltage	3.12	4.7.7	
Insulation resistance	3.11	4.7.6	
Electrical characteristics	3.13	4.7.8	
Visual inspection (external)	3.1,3.35,3.37	4.7.1	
C2 (every 36 months)			
Low temperature operation	3.36	4.7.29	1
Thermal shock	3.14	4.7.9	
Shock (specified pulse) 1/	3.15	4.7.10	
Vibration 1/	3.16	4.7.11	
Terminal strength	3.18	4.7.13	
Dielectric withstanding voltage 2/	3.12	4.7.7	
Insulation resistance 2/	3.11	4.7.6	
Electrical characteristics 2/	3.13	4.7.8	
Visual inspection (external)	3.1,3.35,3.37	4.7.1	
Seal	3.10	4.7.5	
C3 (every 36 months)			
Mechanical Interlock (when specified)	3.31	4.7.25	1
Overload (highest ac or dc resistive load) 3/	3.24	4.7.19	
Life (highest rated dc, 50% of rated life)	3.28	4.7.22	
Dielectric withstanding voltage 2/	3.12	4.7.7	
Insulation resistance 2/	3.11	4.7.6	
Electrical characteristics 2/	3.13	4.7.8	
Visual inspection (external)	3.1,3.35,3.37	4.7.1	
C4 (every 36 months)			
Salt spray/corrosion	3.19	4.7.14	1
Acceleration (when specified)	3.17	4.7.12	
Resistance to soldering heat	3.9	4.7.4	
Resistance to solvents	3.29	4.7.23	
Dielectric withstanding voltage 2/	3.12	4.7.7	
Insulation resistance 2/	3.11	4.7.6	
Electrical characteristics 2/	3.13	4.7.8	
Visual inspection (external)	3.1,3.35,3.37	4.7.1	
Seal	3.10	4.7.5	
C5(every 36 months)			
Mechanical life	3.27	4.7.28	1
Moisture resistance	3.21	4.7.16	
Electrical characteristics	3.13	4.7.8	
Seal	3.10	4.7.5	
C6(every 36 months)			
Time current relay characteristics (when specified)	3.26	4.7.21	1
Dielectric withstanding voltage	3.12	4.7.7	
Insulation resistance	3.11	4.7.6	
Electrical characteristics	3.13	4.7.8	
Seal	3.10	4.7.5	

See footnotes at end of table.

TABLE X. Group C inspection - Continued.

Inspection	Requirement paragraph	Test method paragraph	Number of sample units for inspection
C7(every 36 months)			
Sand and dust	3.20	4.7.15	
Dielectric withstanding voltage 2/	3.12	4.7.7	1
Insulation resistance 2/	3.11	4.7.6	
Electrical characteristics 2/	3.13	4.7.8	
C8(every 36 months)			
Rupture 4/	3.25	4.7.20	
Dielectric withstanding voltage	3.12	4.7.7	1
Insulation resistance	3.11	4.7.6	
Seal	3.10	4.7.5	
C9 (every 36 months)			
Continuous current	3.30	4.7.24	
Dielectric withstanding voltage	3.12	4.7.7	
Insulation resistance	3.11	4.7.6	1
Electrical characteristics	3.13	4.7.8	
Visual inspection (external)	3.1, 3.35, 3.37	4.7.1	
Seal	3.10	4.7.5	

1/ Each mounting configuration to which a manufacturer is qualified will be represented during the normal continuous periodic testing period. It will usually take more than one periodic testing period to achieve testing of all of the applicable mountings.
2/ Testing sequence is optional for insulation resistance and dielectric withstanding voltage prior to electrical characteristics.
3/ Applicable to high level load ratings.
4/ Rupture testing loads and contacts shall be rotated every three years.
5/ Applicable to MIL-PRF-6106/12, MIL-PRF-6106/13, MIL-PRF-6106/19, MIL-PRF-6106/20, MIL-PRF-6106/38, MIL-PRF-6106/39, MIL-PRF-6106/40, and MS27742.

4.7 Methods of inspection.

4.7.1 Visual and mechanical. Relays shall be inspected to verify that the design, physical dimensions, and weight (3.1), materials (3.4), interface and construction (3.5), marking (3.5.10.4 and 3.34), header glass (3.35) and workmanship (3.37) are in accordance with the applicable requirements.

4.7.2 Run-in screening (when specified; see 3.7).

a. High temperature. For qualification inspection only; relays shall be subjected to +125°C with rated voltage or current on the coil circuit for one hour for nonlatching relays; for latching relays, one coil shall be energized for 30 minutes. At the end of this period, the pickup value (voltage), or latch and reset voltage, shall be measured to determine compliance to 3.1. For latching relays, repeat the test after the other coil has been energized for 30 minutes. For group A testing, relays shall be subjected to +125°C; the test chamber shall stabilize at +125°C after the specimens have been inserted into the test chamber. The test shall be performed with rated voltage or current on the coil for 15 minutes minimum for nonlatching relays weighing one ounce or less and 30 minutes minimum for relays weighing over one ounce. At the end of each period, the specified pickup value (voltage) shall be measured to determine compliance with 3.1. For latching relays, one of the two coils shall be energized with rated voltage or current for 7.5 minutes