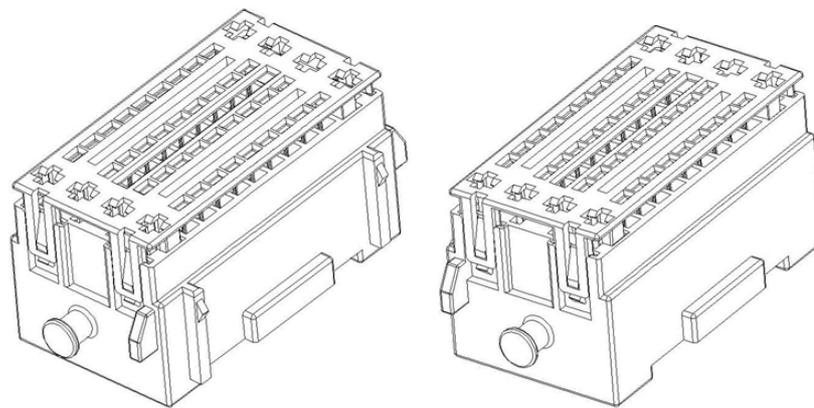


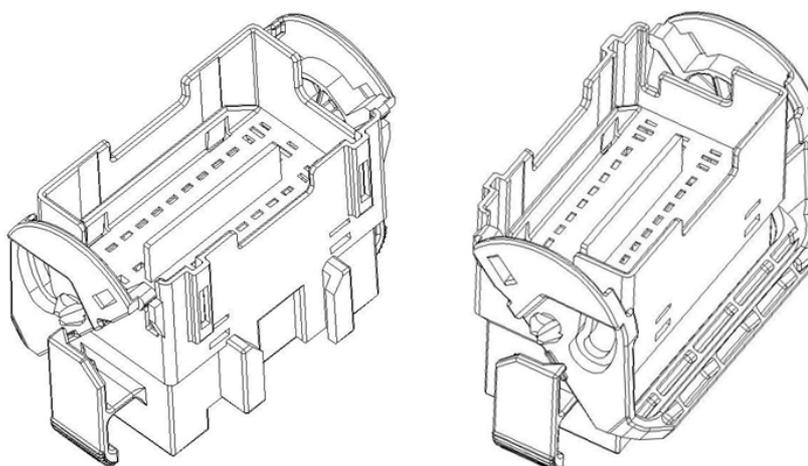
**Housing Ass'y 44P Hybrid Multilock / Jr. Power Timer Rec. & Tab**

**DESIGN OBJECTIVES**

*The product described in this document has not been fully tested to insure conformance to the requirements outlined below. Therefore, Tyco Electronics Brazil makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, Tyco Electronics Brazil may change these requirements based on the results of additional testing and evaluation. Contact Tyco Electronics Engineering for further details.*



**HOUSING ASS'Y 44 POS. HYBRID MULTILOCK / JR. POWER TIMER REC.**



**HOUSING ASS'Y 44 POS. HYBRID MULTILOCK /JR. POWER TIMER TAB.**

**Figure 1**

## 1. SCOPE

### 1.1 Content

This specification covers the requirements for product performance, test method and quality assurance provisions of:

TE P/N	TRADE MARK DESCRIPTION
1989065-1	HOUSING ASS'Y 44 POS. HYBRID MULTILOCK / JR. POWER TIMER REC.
1989068-1	HOUSING ASS'Y 44 POS. HYBRID MULTILOCK / JR. POWER TIMER TAB.
1989065-2	HOUSING ASS'Y 44 POS. HYBRID MULTILOCK / JR. POWER TIMER REC.
1989068-2	HOUSING ASS'Y 44 POS. HYBRID MULTILOCK / JR. POWER TIMER TAB.

TE P/N	TRADE MARK DESCRIPTION	WIRE RANGE (FOR CONTACTS ONLY)
282374-1	MULTILOCK .070 CONTACT REC.	0,35 – 0,5 mm <sup>2</sup>
282375-1		0,75 – 1,50 mm <sup>2</sup>
282376-1		1,50 – 2,50 mm <sup>2</sup>
282377-1	MULTILOCK .070 CONTACT TAB.	0,35 – 0,5 mm <sup>2</sup>
282378-1		0,75 – 1,50 mm <sup>2</sup>
282379-1		1,50 – 2,50 mm <sup>2</sup>
964284-2	JUNIOR POWER TIMER CONTACT REC.	0,50 – 1,0 mm <sup>2</sup>
965999-2		1,0 – 2,5 mm <sup>2</sup>
1241978-2		2,5 – 4,0 mm <sup>2</sup>
2-964294-1	JUNIOR POWER TIMER CONTACT TAB.	0,5 – 1,0 mm <sup>2</sup>
2-964296-1		1,0 – 2,5 mm <sup>2</sup>
1-968946-1		2,5 – 4,0 mm <sup>2</sup>

Table 1

### 1.2 Qualification

When tests are performed on the subject product line, the procedures specified in TE 109 Series Specifications shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

## 2. APPLICABLE DOCUMENTS

The following documents form part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

### 2.1 TE Documents

- |    |           |   |
|----|-----------|---|
| a) | 108-18013 | Product specification for Junior Power Timer Rec;     |
| b) | 108-18063 | Product specification for Junior Power Timer Tab;     |
| c) | 108-20148 | Product specification for .070 Multilock Rec;         |
| d) | 108-20158 | Product specification for .070 Multilock Tab;         |
| e) | 109-1     | General Requirements for Test Specifications;         |
| f) | 114-18050 | Application specification for Junior Power Timer Rec; |
| g) | 114-18051 | Application specification for Junior Power Timer Tab; |
| h) | 114-20056 | Application specification for .070 Multilock Rec;     |
| i) | 114-20057 | Application specification for .070 Multilock Tab.     |

## 2.2 Other Documents

- a) GMW 3191 - Connector Test Validation Specification. Rev. Aug, 2006 – General Motors.
- b) GMW 3232 - Connector Test Validation Specification. Rev. Feb, 2007 – General Motors.
- c) GMW 3059 - Restricted and Reportable Substance for Parts, Rev. Jun, 2006 – General Motors.

## 3. QUALITY ASSURANCE PROVISIONS

### 3.1 Sample Preparation

The test samples to be used for the tests shall be prepared by randomly selecting them from the current production, and the contacts shall be crimped in accordance with the relevant Application Specification. No sample shall be reused, unless otherwise specified.

### 3.2 Test conditions

All the tests shall be performed under the combination of the following test conditions, unless otherwise specified.

- Room Temperature:  $23 \pm 5^{\circ}\text{C}$
- Relative Humidity: 45-75%
- Atmospheric Pressure: 860 –1060 mbar

## 4. REQUIREMENTS

### 4.1 Design and Construction

Products shall be of the design, construction and physical dimensions specified on the applicable drawings.

### 4.2 Materials

- a) Housings PBT;
- b) Secondary Lock PBT;
- c) Lever P.A 6.6 + 25% GF.

### 4.3 Ratings

- a) Working Temperature: -40°C to 85°C ;
- b) Operating Voltage: 24Vdc;
- c) Continuous Current:

Junior Power Timer	–	30A Máx;
.070 Multilock	–	20A Máx;

- a) Vibration Level: On body or chassis.

### 4.4 Performance and Test Description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Tables. All tests are performed at ambient environmental conditions per GMW 3191 Specification (Connector Test Validation Specification. Rev. Aug, 2006 – General Motors) unless otherwise specified.

## 4.5 Test Requirements and Procedures Summary

CONNECTOR ELECTRICAL TESTS			
ITEM	TEST	REQUIREMENTS	PROCEDURES
4.5.1	Visual Examination	There shall be no corrosion, discoloration, cracks, etc., which could affect the functionality of the part. Swelling or physical distortion shall not exceed the tolerances specified on the part drawing.	Visually, dimensionally and functionally inspected per applicable quality inspection plan.
4.5.2	Connector and/or Terminal Cycling	Store test samples at an ambient temperature of $+23 \pm 5$ °C for at least 24 hours.	Completely mate and unmate each connector or terminal pair 10 times.
4.5.3	Dry Circuit Resistance	For terminal size $\leq 1,5$ mm Multilock: 8,0m $\Omega$ , maximum; For terminal size $\leq 2,8$ mm Junior Power Timer: 5,0m $\Omega$ , maximum.	Micro-ohmmeter which limits the open circuit voltage to 20 mV and limits the current applied to 100 mA.
4.5.4	Mechanical Shock	Item 4.5.1; Samples are evaluated only after completion of the Vibration with Thermal Cycling Test.	Item 4.5.1; Test N <sup>o</sup> . 01: 25 Acceleration (g) - Number of shocks per axis, (positive and negative) = 792; Test N <sup>o</sup> . 02: 100 Acceleration (g) - Number of shocks per axis, (positive and negative) = 18.
4.5.5	Heavy Duty Test	$\Delta t$ of 50°C maximum, during each cycle; Item 4.5.3.	5 cycles: 5 hours of 80°C, 10A for terminal Micro Timer size 1,0mm <sup>2</sup> ; and 30A for terminal Jr. Power Timer size 2,5mm <sup>2</sup> . 5 cycles: 2 hours of -40°C, off current.
4.5.6	Vibration	Item 4.5.1 and 4.5.3; There shall be no loss of electrical continuity, i.e., resistance greater than 7 Ohms for longer than 1 $\mu$ s, throughout the entire Mechanical Shock and Vibration with Thermal Cycling Tests; Discontinued $\leq 7\Omega/1\mu$ s; Test samples shall not have any base metal apparent at the contact surface, or evidence of fretting corrosion, when viewed under 10 to 40X magnification.	To apply the profiles of vibration and temperature; Monitoring of discontinuities during the assay; Measure the contact resistance low level (dry circuit) before and after the assay; Body (sprung masses) random vibration schedule" (acceleration of 20,9m/s <sup>2</sup> RMS) – duration 24h/eixo; +85 a -40°C in cycle of 480 minute.

Table 2

<b>CONNECTOR ELECTRICAL TESTS</b>			
<b>ITEM</b>	<b>TEST</b>	<b>REQUIREMENTS</b>	<b>PROCEDURES</b>
4.5.7	Thermal Aging	Item 4.5.1 and 4.5.3;  All mechanical assists and/or other elements required to separate connectors for service must function without breakage.	To submit the samples during 1008h/85°C.
4.5.8	Thermal Shock	Item 4.5.1 and 4.5.3;  There shall be no loss of electrical continuity (resistance $>7 \Omega > 1 \mu s$ ) during this test;  All mechanical assists and/or other elements required to separate connectors for service must function without breakage.	100 cycles: 30 minute -40°C 30 minute +85°C
4.5.9	Temperature Humidity Cycling	Item 4.5.1 and 4.5.3;  All mechanical assists and/or other elements required to separate connectors for service must function without breakage.	To submit the samples 10 cycles of 24 hours (T. -40°C to 85°C);  With the relative humidity between 45% and 75%.

**Table 2 (cont.)**

CONNECTOR SYSTEM MECHANICAL TESTS			
ITEM	TEST	REQUIREMENTS	PROCEDURES
4.5.10	Terminal to Connector Body Engagement Force	For terminal with size < 1,0mm <sup>2</sup> : 15N maximum;  For terminal with size >1,0mm <sup>2</sup> : 30N maximum.	To insert the terminal in housing with a speed of 50±10mm/minute.
4.5.11	Terminal from Connector Extraction Force	<b>Primary Lock Only:</b>  For terminal ≤1,5mm <sup>2</sup> Multilock: 50N minimum;  For terminal ≤2,8mm <sup>2</sup> Junior Power Timer: 60N minimum.  <b>With Sec. Lock Actuated; and After conditioned by being exposing to 95-98% Relative Humidity at +40°C for 6 hours:</b>  For terminal ≤1,5mm <sup>2</sup> Multilock: 80N minimum;  For terminal ≤2,8mm <sup>2</sup> Junior Power Timer: 100N minimum.  <b>With Sec. Lock Actuated Measurement; After 1008 hours / 85°C - Thermal Aging; and After Temperature Humidity Cycling:</b>  For terminal ≤1,5mm <sup>2</sup> Multilock: 70N minimum;  For terminal ≤2,8mm <sup>2</sup> Junior Power Timer: 90N minimum.	To extraction the terminal in housing with a speed of 50±10mm/minute.
4.5.12	Connector to Connector Engagement Force	75N maximum. (with all the inserted terminals)	Mate connectors together at a uniform rate of 50±10mm/min until fully seated and locked.
4.5.13	Locked Connector Disengagement Force	120N minimum.	To extraction the terminal in housing with a speed of 50±10mm/minute.
4.5.14	Un-Locked Connector Disengagement Force	100N maximum.	To extraction the terminal in housing with a speed of 50±10mm/minute.
4.5.15	Connector Polarization Feature Effectiveness	It does not have to allow assembly;  Electric continuity does not have to occur;  Damages do not have to occur that harm a correct assembly.	To try to mount the connectors male and female, with terminals in all the ways, guiding them in incorrect way. To apply a force of 150N.

Table 3

CONNECTOR SYSTEM MECHANICAL TESTS			
ITEM	TEST	REQUIREMENTS	PROCEDURES
4.5.16	Terminal Position Assurance	<p><b>TPA Pre-Lock Force:</b> 20N minimum.</p> <p><b>TPA closing force with correct assembled terminals:</b> 30N maximum.</p> <p><b>TPA closing force with one improperly inserted terminal:</b> The closing force with one improperly or partially inserted terminal shall be greater than 60 N for all terminal sizes.</p> <p><b>Closed TPA locking force:</b> 25N minimum;</p>	To extraction the TPA in housing with a speed of 50±10mm/minute.
4.5.17	Flammability	The burn rate of the material test samples when tested according to GMW 3232 shall be less than 100 mm/min.	Perform the flammability test per GMW 3232.
4.5.18	Lever and Slide "Open" Position Retention	50N maximum;	To extraction the terminal in housing with a speed of 50±10mm/minute.
4.5.19	Mechanical Assist Integrity	<p>The lever/slide must withstand a 100N force in the open and closed positions without separation or damage;</p> <p>The lever/slide must withstand a 60N force in the midpoint position without separation or damage.</p>	To apply force the Lever of some direction with a speed of 50±10mm/minute.

Table 3 (cont.)

UNSEALED CONNECTOR ENVIRONMENTAL TESTS			
ITEM	TEST	REQUIREMENTS	PROCEDURES
4.5.20	Isolation Resistance	100 Mega-Ohms minimum.	To condition the samples during 3 to 23 hours $\pm 5^{\circ}\text{C}$ , with relative humidity between 45-70%; 500VDC / 15 seconds.
4.5.21	Dielectric Strength	No dielectric breakdown or flash-over shall occur between cavities at any time during the test;  No dielectric breakdown or flash-over shall occur between the cavities and the outside of a connector at any time during the test.	1000Vac / 1 minute.
4.5.22	Corrosion	Item 4.5.1 and 4.5.3;  <b>Terminal from Connector Extraction Force:</b>  For terminal $\leq 1,5\text{mm}^2$ Multilock: 70N minimum;  For terminal $\leq 2,8\text{mm}^2$ Junior Power Timer: 90N minimum;	6 cycle: 8 hours to the exposition of salt spray;  16 hours to the ambient temperature;  The samples in the only horizontal position.

Table 4



Tested products shall be conforming to the requirements of the visual inspection without physical damage, also meeting the requirements of the additional tests specified in the sequence tests specified in table 5.

4.6 Test Sequence

ITEM	TEST	TEST GROUP																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
		TEST SEQUENCE																				
4.5.1	Visual Examination	1,9	1,7	1,7	1,7	1,7	1,3	1,3	1,5	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,7	1,9	1,7	1,7	
4.5.2	Connector and/or Terminal Cycling	3	3	3	3	3												2	2	2	2	
4.5.3	Dry Circuit Resistance	2, 4, 6, 8	2, 4, 6	2, 4, 6	2, 4, 6	2, 4, 6													7			
4.5.4	Mechanical Shock	5																				
4.5.5	Heavy Duty Test					5																
4.5.6	Vibration	7																				
4.5.7	Thermal Aging		5						2									4				
4.5.8	Thermal Shock			5																4		
4.5.9	Temperature Humidity Cycling				5				3												4	
4.5.10	Terminal to Connector Body Engagement Force						2															
4.5.11	Terminal from Connector Extraction Force							2	4										8			
4.5.12	Connector to Connector Engagement Force									2												
4.5.13	Locked Connector Disengagement Force										2											
4.5.14	Un-Locked Connector Disengagement Force											2										
4.5.15	Connector Polarization Feature Effectiveness												2									
4.5.16	Terminal Position Assurance													2								
4.5.17	Flammability														2					1		
4.5.18	Lever and Slide "Open" Position Retention															2						
4.5.19	Mechanical Assist Integrity																2					
4.5.20	Isolation Resistance																		3,5	3,5	3,5	3,5
4.5.21	Dielectric Strength																		6	6	6	6
4.5.22	Corrosion																			4		

Table 5



The numbers in the columns indicate the sequence in which the tests are performed.

History					
Rev.	Date	Description	Prepared	Checked	Approved
A	15-Feb-2011	Released	G. Oliveira	D. Oliveira	A. Metzker