SPECIFICATION

宏致電子股份有限公司

桃園縣中壢市東園路13號

No.13, Dongyuan Rd., Jhongli City,

Taoyuan County 320, Taiwan (R.O.C.)

TEL: +886-3-463-2808
FAX: +886-3-463-1800

SPEC. NO.: PS-92413-XXXXX-XXX **REVISION:** O

PRODUCT NAME: 2..54MM PITCH FEMALE CONN

PRODUCT NO: 92413 SERIES

PREPARED:	CHECKED:	APPROVED:
Huang Feng	**Lee Kuang En**	**Lee Kuang En**
DATE: **2017/11/05**	DATE: **2017/11/05**	DATE: **2017/11/05**

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
1	ECN-1712256	NEW SPEC	Huang Feng	17'/11/05

2 SCOPE

This specification covers performance, tests and quality requirements for 2.54 mm pitch WTW connector.
The applicable product descriptions and part numbers are as below:
Plug Conn. P/N: 92413-XXXXX-XXX
Rcpt. Conn. P/N: 92208-XXXXX-XXX
TAB Contact P/N: 92508-TXXX
REC Contact P/N: 92208-T7XX、92208-T8XX
.

3 APPLICABLE DOCUMENTS

EIA-364 ELECTRONICS INDUSTRIES ASSOCIATION
QJD 19202012
GMW 3191_Dec 2007
USCAR-2_rev-5

4 REQUIREMENTS

4.1 Design and Construction

4.1.1 Product shall be of design, construction and physical dimensions specified on applicable product drawing.

4.1.2 All materials conform to R.o.H.S. and the standard depends on TQ-WI-140101.

4.2 Materials

4.2.1 Contact: High performance copper alloy (Brass)

4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-HB

4.3 Ratings

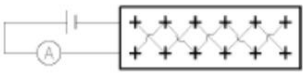
4.3.1 Voltage: 14 Volts AC (per pin)

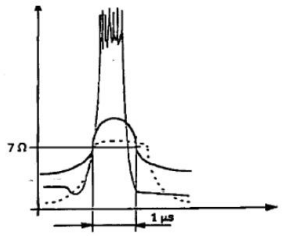
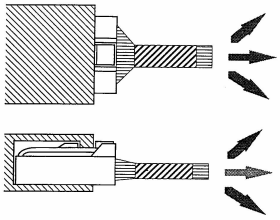
4.3.2 Current: see Fig. 6 (per pin)

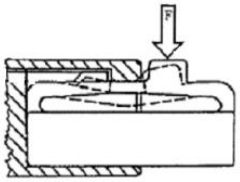
4.3.3 Operating Temperature : -40℃ to +100℃

5 PERFORMANCE

5.1. Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Product shall meet requirements of applicable product drawing and specification.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Item	**Requirement**	**Standard**
Termination Resistance (Low Level)	5 mΩ Max. (Initial) 10 mΩ Max. (Final)	Subject mated contacts assembled in housing to 20 mV Max. Open circuit at 10 mA. Fig. 1
Voltage Drop	50mΩMax.(Initial&Final)	Mated connectors, measure by dry circuit. Testing Voltage: 14V. Testing Current:5A. (USCAR-2_rev-5)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 3 mA max.	Impressed voltage 1600 VAC for 1 min. Mated connector. Fig. 2
Insulation Resistance	100 MΩ Min. (Initial) 100 MΩ Min. (Final)	Impressed voltage 500 VDC Mated connector for 15 sec,Fig. 2
Current Leakage	3 mA Max.	Impressed voltage 14 VDC 
Temperature Rise	60℃ Max.	Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25℃ Fig. 6
Over Current Loading	No ignition is allowed during the test.	Apply the current to only one position. Applied Current : Fig. 3
MECHANICAL		
Connector and/or Terminal Cycling	10cycles.	None (USCAR-2_rev-5)

Shock	No electrical discontinuity greater than 1 μsec. shall occur.	Acceleration : 980 m/s² Waveform : Half sine wave Duration : 6 m/sec.Velocity Number of Drops: 3 drops each directions of X,-X, Y,-Y,Z and -Z axes, totally 18 drops Mounting : Fig. 4 
Vibration (High Frequency)	No electrical discontinuity greater than 1 μsec. shall occur.	Vibration Frequency : 20→200→20 Hz/3 min. Acceleration : 44.1 m / s² Vibration Direction : X, Y, Z Duration : 3 hours each Voltage : 12V Current : 1A Mounting: Fig. 4
Connector Mating Force	70 N Max.	Operation Speed： 100 mm/minute. Measure the force required to mate connector.
Connector Unmating Force	70 N Max.	Operation Speed： 100 mm/min. Measure the force required to unmate connectors. (without housing lock)
Connector Locking Strength	100 N Min.	Fit a male housing to female one and fix the one side of the housing with the housing lock operated. When the other housing is pulled at a constant speed of approximately 100 mm/min, measure a load at which the locking system is detached or broken. However, pull the housing in the five directions shown below. Additional measurements shall be made in the directions where are onsidered to be necessary in terms of the connector structure (NDS05-3.2.8, DATE:JUN.14.2008) 

Force to release latch from prestage position	20 N Max.	Take a pair of connectors that are full of terminals and, after mating, apply a load to the connector at the point where unlocking of the locking structure is most likely to occur according to the connector locking structure, and measure the load required to unlock the lock at the moment. 
Contact Insertion Force	10 N Max. per contact	Measure the force required to insert contact into housing.
Contact Retention Force (Secondary Lock)	100 N Min.	Measure contact retention force with secondary lock set it effect. Operation Speed : 100 mm/min.
Repeat mating	Satisfy requirements of test item on the “6 sequence”.	Repeated mating-unmating by hand in up-down and right-left directions for 50 cycles.
Handling Ergonomics	No abnormalities allowed in manual mating/unmating handling.	Manually operated.
Retention Force of Tab	≥40 N	Measure the retention force between housing and tab contact. Operation speed : 100 mm/min

ENVIRONMENTAL

Item	Requirement	Standard
Thermal Shock	See Product Qualification and Test Sequence Group 6.	40℃/30min., 100℃/30min. Making this a cycle, repeat 300 cycles. Monitor Monitor resistance-variation at closed circuit current of 10 mA during the test.
Humidity (Steady State)	See Product Qualification and Test Sequence Group 7 Current Leakage: 3mA Max.	Mated Connector 80℃, 90~95% R.H. , 96 hours. (EIA-364-31,Condition A, Method II)
High Temperature Exposure	See Product Qualification and Test Sequence Group 8.	Temperature: +85 ℃for 1008hrs (USCAR-2_Rev.5)
Resistance to Cold	See Product Qualification and Test Sequence Group 9.	Subject mated connectors to temperature life at -40℃ for 96 hours. Measure Signal. (EIA-364-59)
Humidity-Temperature Cycling	Satisfy requirements of test item on the “6 sequence”.	Condition : Fig.5 Making this condition a cycle, Repeat 10 cycles. Monitor resistance-variation at closed circuit current of 10 mA during the test.
Temperature Humidity Cycling	See Product Qualification and Test Sequence Group 13	Mate module and subject to follow condition for 40cycles. 1 cycle: Temperature and Humidity curve shown in Fig 8 (USCAR-2_Rev.5)

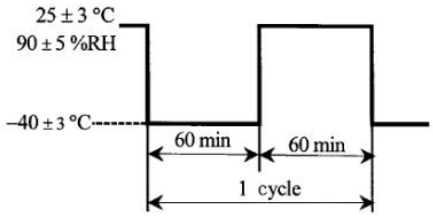
Compound Environment Resistance	Satisfy requirements of test item on the “6 sequence”. No electrical discontinuity greater than 1 μsec. shall occur.	Temperature : 80℃ Vibration Frequency : 20→200→20Hz/ 3 Min. (Log) Acceleration : 44.1m/s² Vibration Direction : X, Y, Z Duration : 300 hours Test Current : Fig. 7 Mounting : Fig. 4 Monitor resistance-variation, and after this test check if instant cutoff occurs for an hour on “vibration”
Condensation	Satisfy requirements of test item on the “6 sequence”.	-40℃/60 min.,25℃/90~95%/60 min. Making this a cycle, repeat 48 cycles. Monitor current leakage during the test. 

Fig. 1

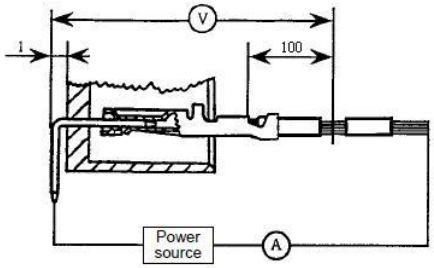
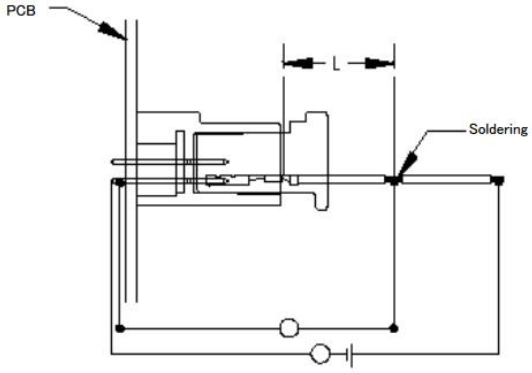


Fig. 2



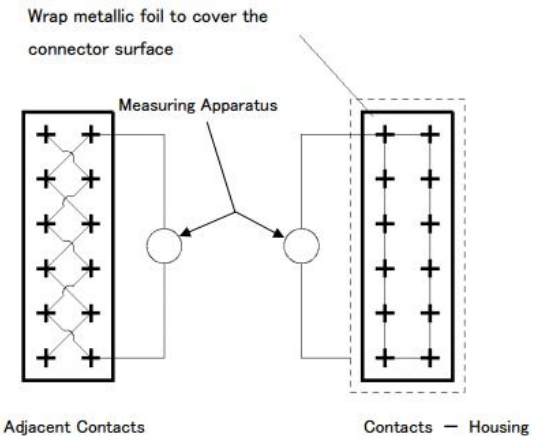


Fig. 3

Wire Size (mm2)	Test Current (A)	Duration
0.5	16.5	60 min
	20.5	200 sec
	22.5	10sec
	30.0	1 sec

Fig. 4

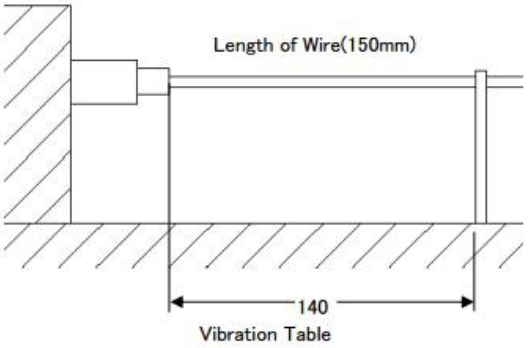


Fig. 5

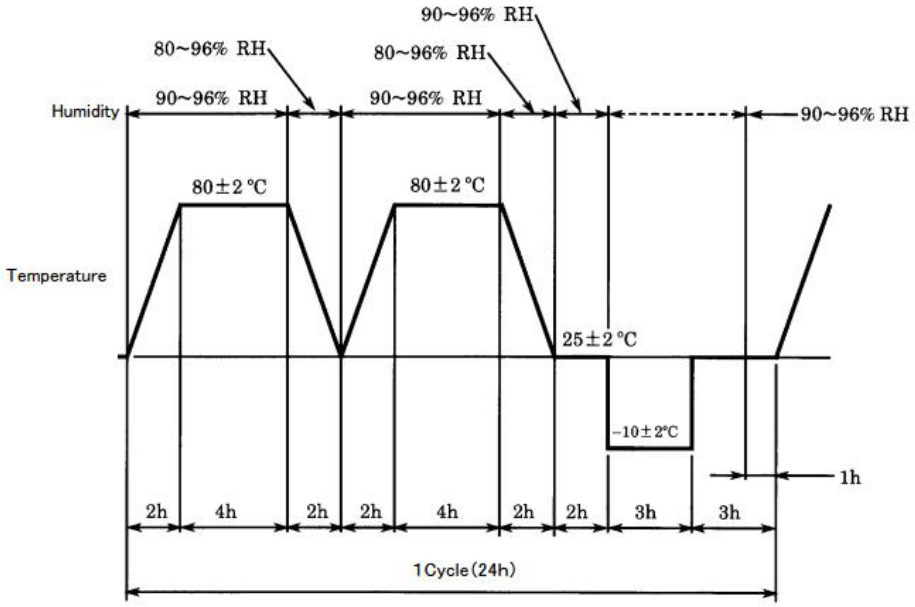
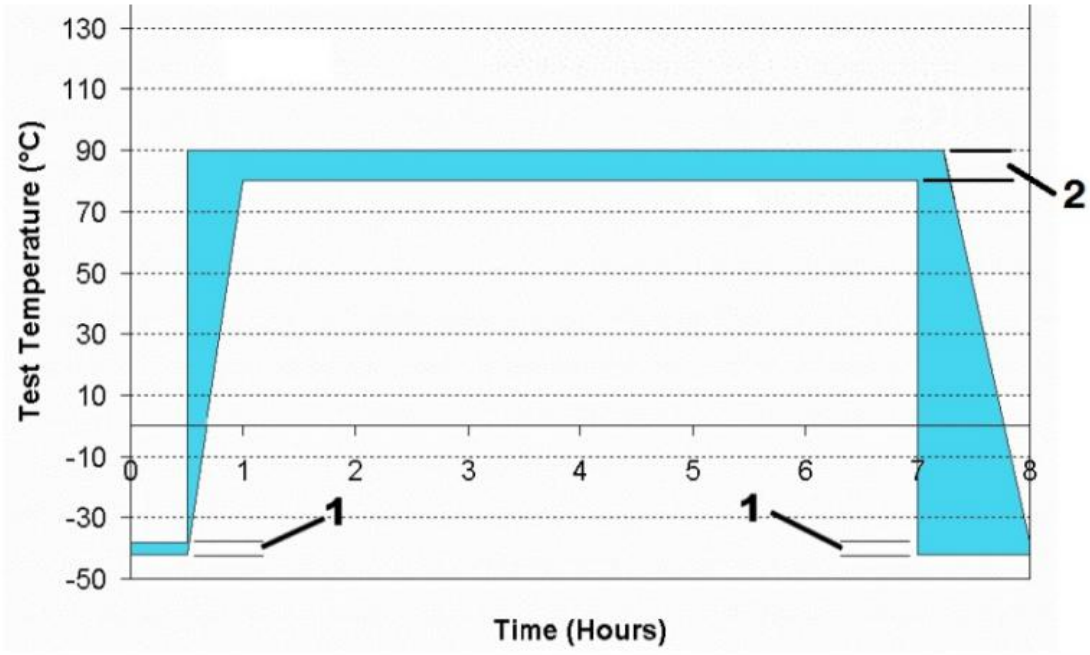


Fig. 6

Kind of Connectors	Wire Size(mm^2)	Test Current(A)	Temperature Rise
8 POS.	0.5	6.05	60°C max.
12 POS.	0.5	5.5	
16 POS.	0.5	4.4	
24 POS.	0.5	3.3	
28 POS.	0.5	3.3	
32 POS.	0.5	2.2	
40 POS.	0.5	2.2	

Fig. 7

Kind of Connectors	Wire Size(mm^2)	Test Current(A)	Test Time
8 POS.	0.5	3.3	45min.ON、15min.OFF 300cycles
12 POS.	0.5	3	
16 POS.	0.5	2.4	
24 POS.	0.5	1.8	
28 POS.	0.5	1.8	
32 POS.	0.5	1.2	
40 POS.	0.5	1.2	


Test Temperature (°C)
130
110
90
70
50
30
10
-10
-30
-50
0
1
2
3
4
5
6
7
8
1
1
2
Time (Hours)

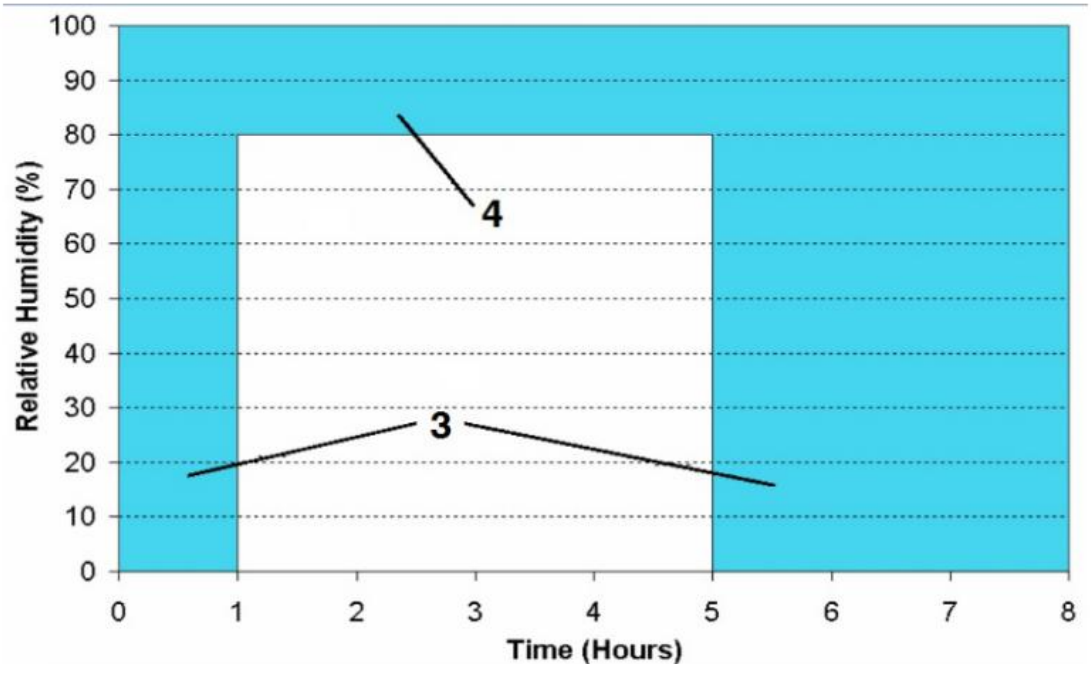

Relative Humidity (%)
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
4
3
Time (Hours)

Fig. 8

6 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	Test Sequence												
Examination of Product	1	1	1、5	1、7	1、5	1、5	1、8	1、6	1、3	1、7	1、7	1、5	1、8
Termination Resistance (Low Level)	3		2、6	2、8			2、9	2、7		2、8	2、8		3、5
Voltage drop	4		3、7	3、9	2、7	2、6	3、10	3、8		3、9	3、9		6
Dielectric Withstanding Voltage	7				3、8	3、7	5、12			5、11			
Insulation Resistance	6						4、11			4、10		2、6	7
Current Leakage							7					4	
Temperature Rise	5							4、9			5		
Connector and/or Terminal Cycling													2
Over Current Loading			4										
Shock				6									
Vibration (High Frequency)				5							6		
Connector Mating Force	2												
Connector Unmating Force	8												
Connector Locking Strength		5				10	14	11	5	14			
Force to release latch from prestage position		4											
Contact Insertion Force		2											
Contact Retention Force(Secondary Lock)		3			10	9	13	10		13			
Repeat mating					4								
Handling Ergonomics					9	8			4	12			
Retention Force of Tab			8										
Thermal Shock						4							
Humidity (Steady State)							6						
High Temperature Exposure				4				5					
Resistance to Cold									2				
Humidity-Temperature Cycling										6			
Humidity-Temperature Cycling (USCAR-2_rev-5)													4
Compound Environment Resistance					6						4		
Condensation												3	
	5	5	5	5	5	5	5	5	5	5	5	5	5

7. Assembly Procedures

7 .1Contact and Connector Assembly

Crimped socket contacts shall be manually loaded into the plug connectors. Insert the contacts into the connector with the information as follows:

(1) Verify that the TPA is in the pre--staged position (un--locked). Prior to installing the contacts, the TPA and the front of the connector should be almost flush with each other. See Fig 8.

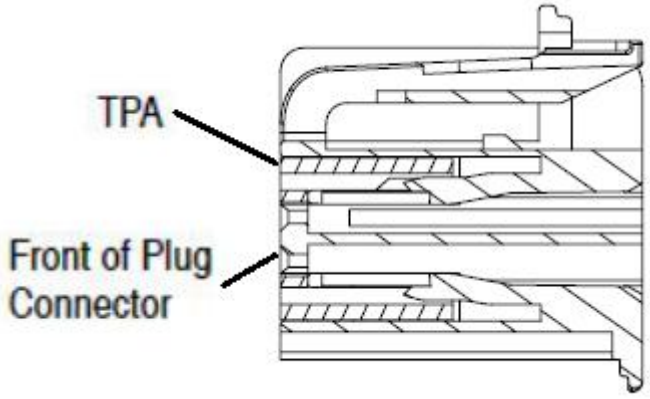


Fig 8.

(2) Locate the desired circuit into which the individual socket contact will be loaded. The contact must be inserted from the wire end (rear) of the plug connector until it bottoms (there should be an audible and tactile “click”). Each socket contact must be locked in place. Gently pull on the wire to ensure proper contact locking and retention with a force of 4.5 to 8.9 N [1 to 2 lbf]. See Fig 9.

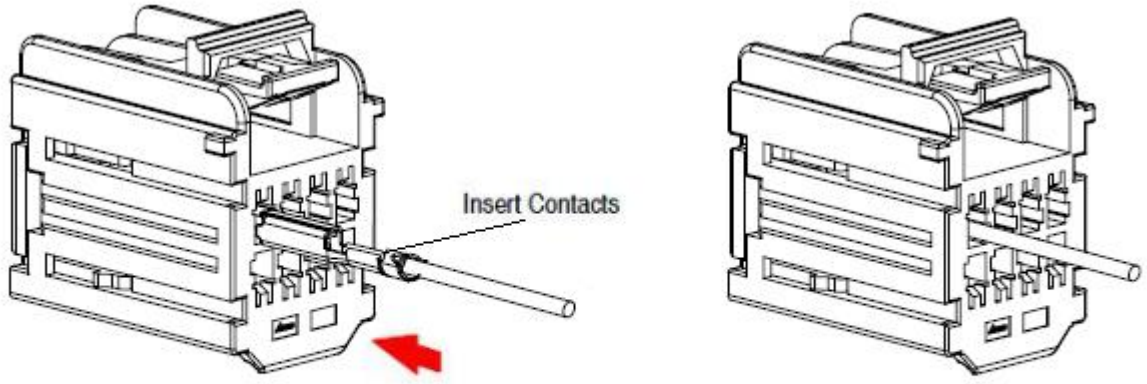


Fig 9.

(3) When all of the required socket contacts have been inserted, complete the assembly by pushing the TPA into the fully locked position. The TPA may be fully locked by holding the rear of the plug connector assembly and pushing the TPA toward the rear of the connector. See Fig 10.

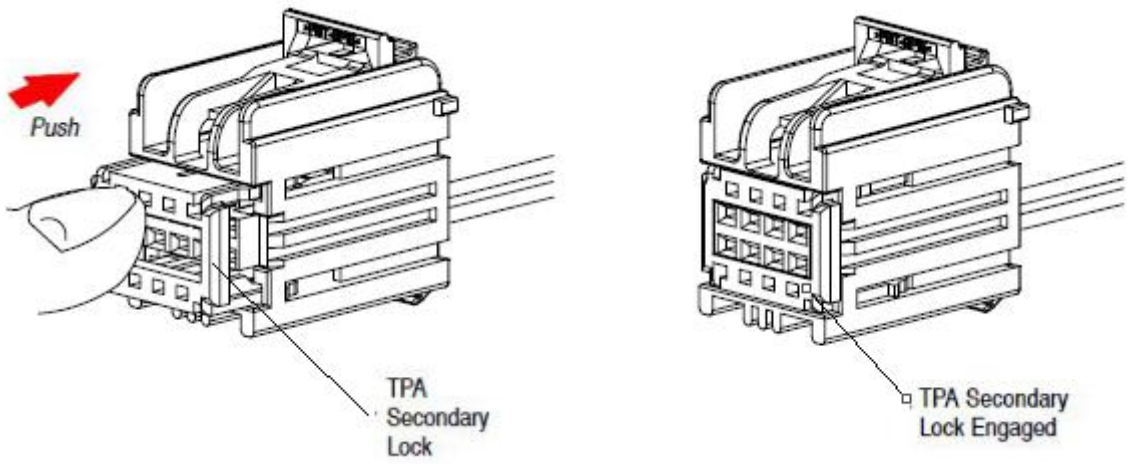


Fig 10.

7.2 Contact and Plug Connector Dissembly

In order to remove the contacts for any reason, the following steps must be followed.

(1) To disengage the TPA, insert Extraction Tool 3--1579007--6 in the side of the plug connector housing cutout on the TPA. Press the extraction tool toward the front of the connector to disengage the TPA. See Fig11 .

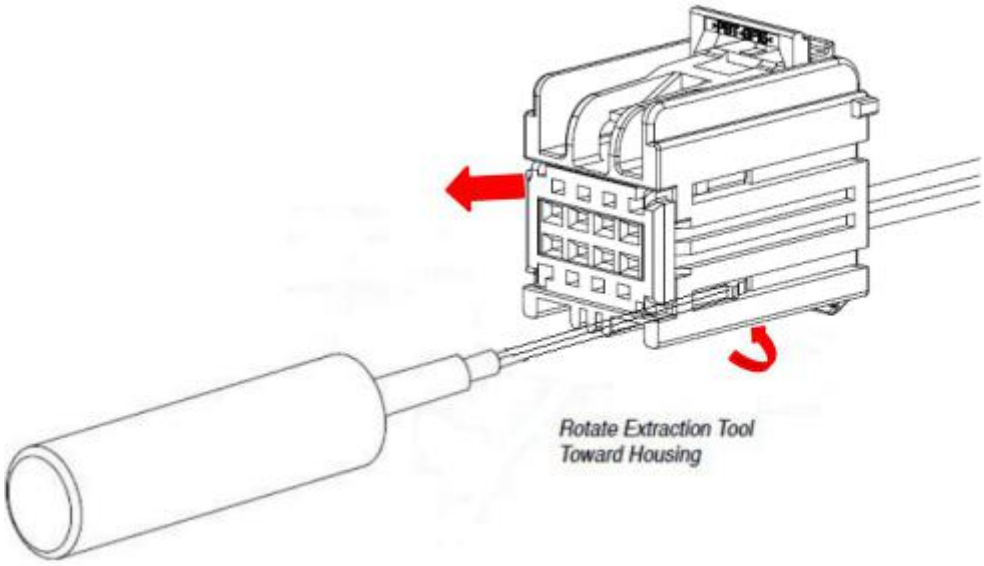


Fig 11.

(2) Place the extraction tool under the beam that holds the contact in place as shown in Fig 12.

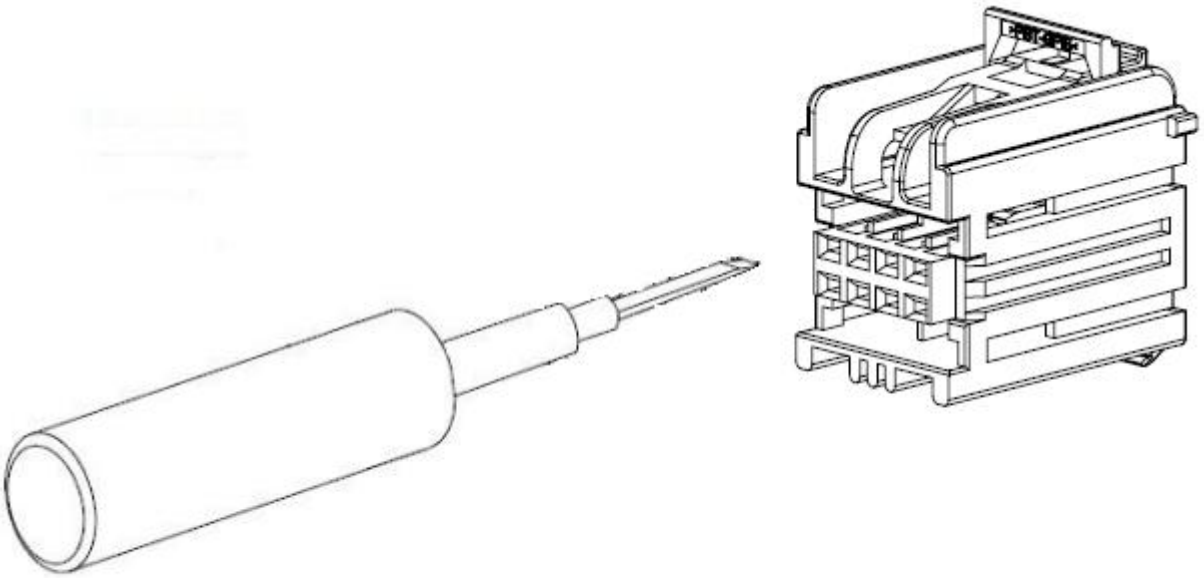


Fig 12.

(1) Refer to Fig 13A, 13B, 13C, and 13D for contact removal process.

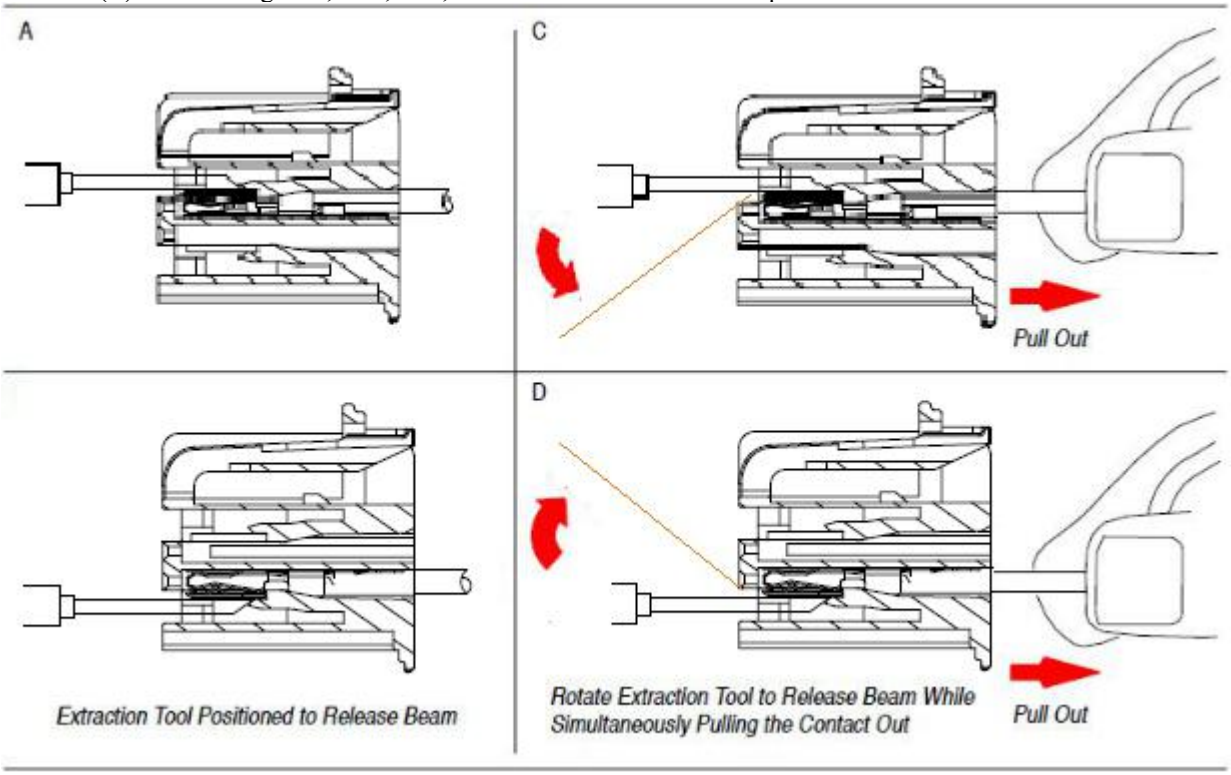


Fig 13.

7.3 Contact and Plug Connector Dissembly

A variety of customer supplied receptacle connectors may be available for mating with the GET Sealed Market Plug Connector Assembly. Refer to ACES Electronics Interface Drawings as provided in Drawing 92208 for specific dimensions on these receptacle connectors or contact the ACES Electronics Product.

(1) Connectors are mated and the primary connector latch is mated with an audible and tactile “click” and engages. Refer to Fig 14.

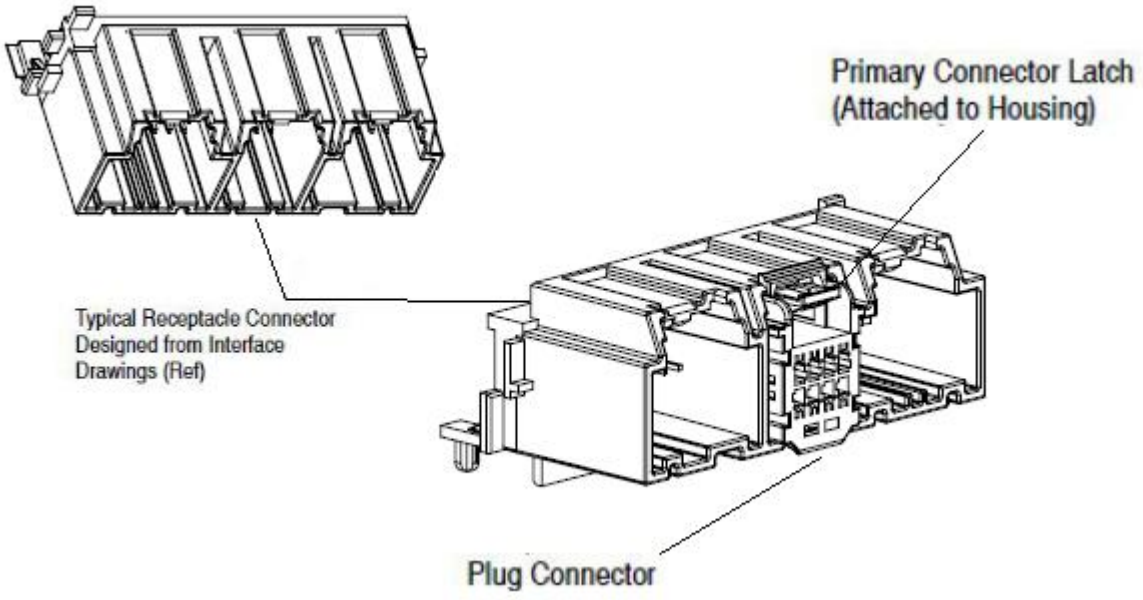


Fig 14.

7.4 Unmating of Receptacle and Plug Connector Assembly

Depress the primary connector latch, then simultaneously pull the connectors/wires while gripping the housing with the thumb, index finger, and palm if using the wire bundle. See Fig 15A.

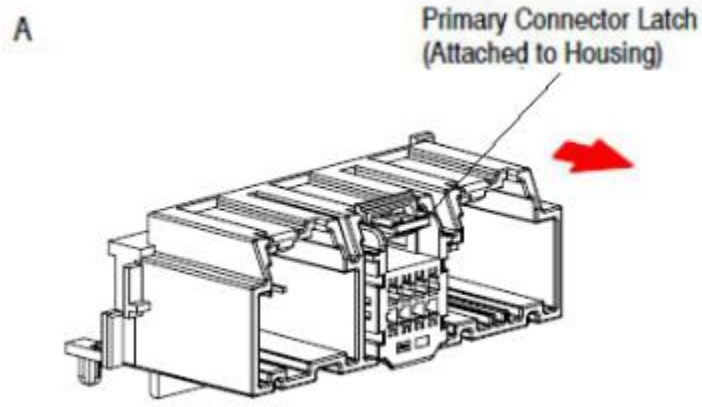


Fig 15.