



# **MX64 Single Row Sealed Connector Application Specification**

**REV 6 –Jun 14, 2016**

# Revision History

Revision Level	Change Information	Publication Date
Rev 1		9-27-04
Rev 2		11-22-05
Rev 2.11		3-17-06
Rev 2.12		9-9-10
Rev 3		4-28-14
Rev 4	Add TE Gen Y and JST AIT terminal information for series 31404	10-26-15
Rev 5	<ol style="list-style-type: none"><li>1. Update TE and Molex terminal information for series 31402/34975</li><li>2. Add terminal part number for series 31403/34977</li><li>3. Add 8 way assembly information</li></ol>	11-18-15
Rev 6	Add Yazaki FLX 0.64mm and TE 0.64mm Side Orientation terminal for 8 way	6-14-16



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- **Section 5: Service Instructions**
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- **Section 6: Electrical Continuity Checking**



# Section 1

## Product Introduction



# Section 1:

## **MX 64™ Connectors**

**This reference manual contains information pertaining to the Molex 0.64mm connection system. The connectors mate to various sensors among General Motors, Ford And Daimler Chrysler products**

**There are multiple color coded keying options as defined by USCAR or customer request. In addition there are 3 different terminal options for individual OEM terminal preferences. These preferences are defined by Series Numbers below.**

**Molex Series 31402/34975 = TE/Molex “GET”**

**Molex Series 31403/34977 = Molex MX64**

**Molex Series 31404 = Yazaki Kaizen 0.64 /Yazaki FLX 0.64 /TE Gen Y 0.64 /TE 0.64 Side Orientation /JST AIT 064**

**For product ordering information, please contact your Molex Inside Sales Representative at (800)786-6539.**



# Section 2

## Product Summary



# Section 2: MX 64™ Connectors

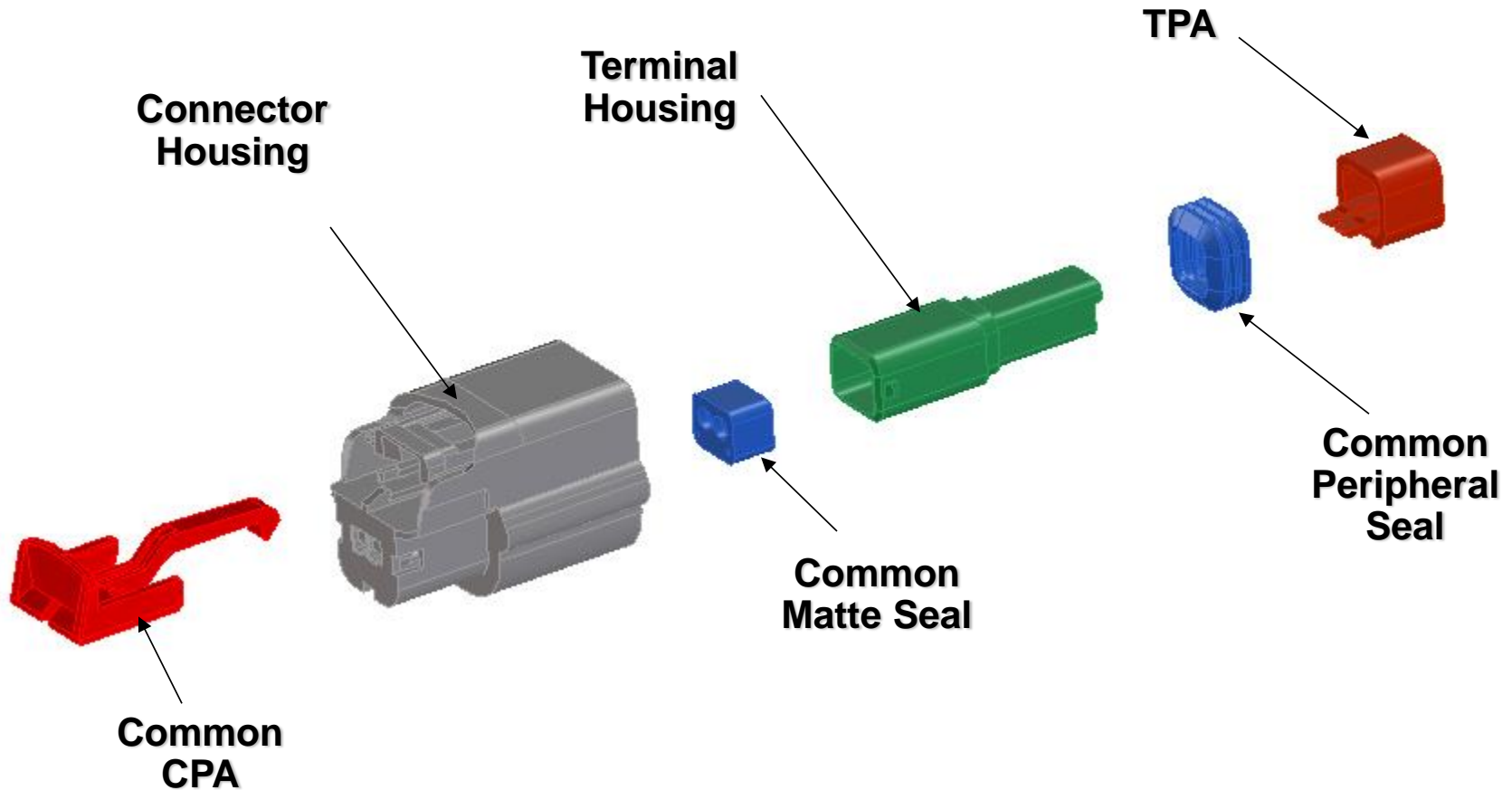
## Single Row Sealed

- Connector features
  - Available in circuit sizes
- 2, 3, 4, 5, 6, 8 way
  - Adopted as the new USCAR single row footprint
  - Will accommodate various terminal systems
    - MX64
    - Molex or TE GET
    - Yazaki Kaizen / Yazaki FLX / TE Gen Y / TE Side Orientation / JST AIT
  - 18-22 AWG and .36-.83 mm<sup>2</sup> Metric Wire
  - CPA option
  - 4 polarization options
  - Matte seal design
- Connector housing
  - Molded circuit pegs can be left in during the Molex assembly process to seal voided circuits
    - Eliminates separate rear seal cover



# Section 2: MX 64™ Connectors

## Single Row Sealed\_2-6 way





# Section 2: MX 64™ Connectors

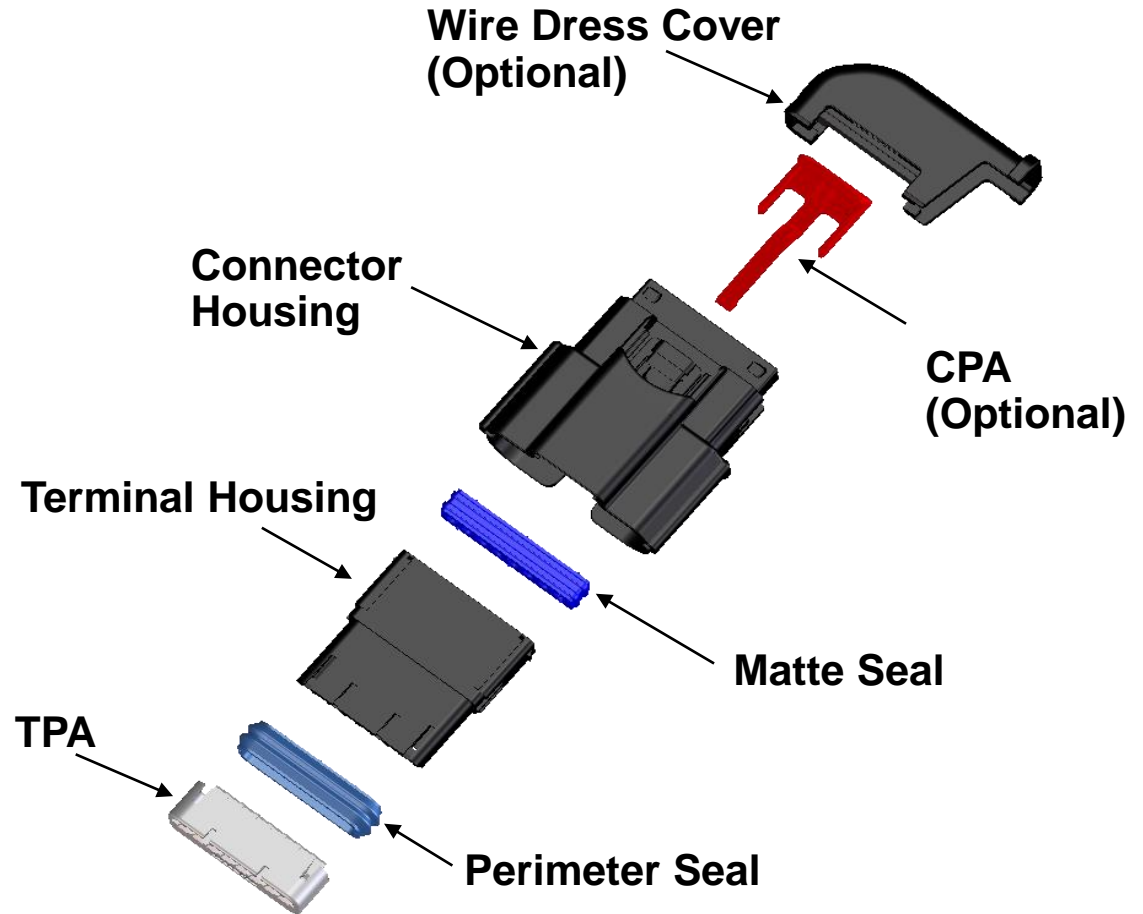
*Single Row Sealed \_8 way with wire dress cover*



Horizontal Direction



Vertical Direction



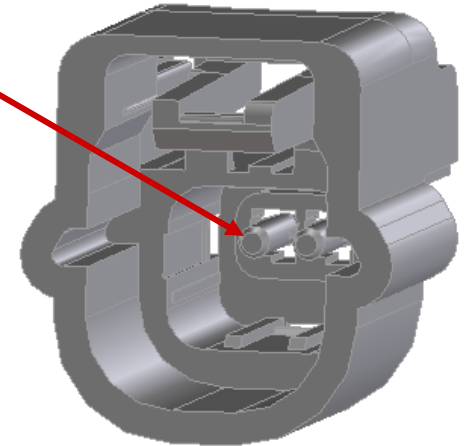
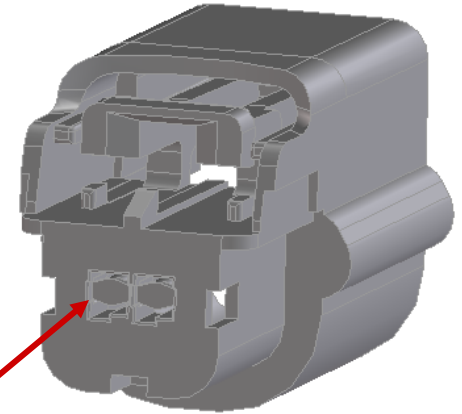
## Section 2:

# MX 64™ Connectors

## Single Row Sealed

### ■ Common connector housing

- Eliminates separate rear seal cover for the TE /Molex GET, Yazaki /TE /JST AIT or the Molex 0.64 terminal
- Can accept any terminal housing design
- Molded circuit pegs can be left in during the Molex assembly process to seal voided circuits.
  - Allows for customer specific sealing patterns



# Section 2: MX 64™ Connectors

## Product Identification

**MOLEX  
PART  
NUMBER**



**DATE CODE**

**XX XXX**

**DAY of the year  
001 to 365**

**YEAR (last 2 digits)**

Note: Product Identification may appear on either side of connector housing.



# Section 2: **MX 64™ Connectors**

## Part # legend single row sealed Female (2-6 way)

3497X-X X X X

3140X-X X X X

Seal Cover Configurations 0,1,2,3,4,5,6,7,8,9

CPA OPTION (0,1)

0 = Without CPA

1 = With CPA

Polarization Options (1,2,3,4)

1= USCAR Option A (BLACK)

2= USCAR Option B (GRAY)

3= USCAR Option C (BROWN)

4= USCAR Option D (GREEN)

5 = USCAR OPTION B, COLOR: BLACK

6 = USCAR OPTION C, COLOR: BLACK

7 = USCAR OPTION D, COLOR: BLACK

Circuit SIZE 2,3,4,5,6,8

Terminal System 2,3,4,5,7

2/5 = TE/Molex "GET"

3/7 = MOLEX 0.64mm

4 = Yazaki Kaizen /TE Gen Y 0.64 /JST AIT 064

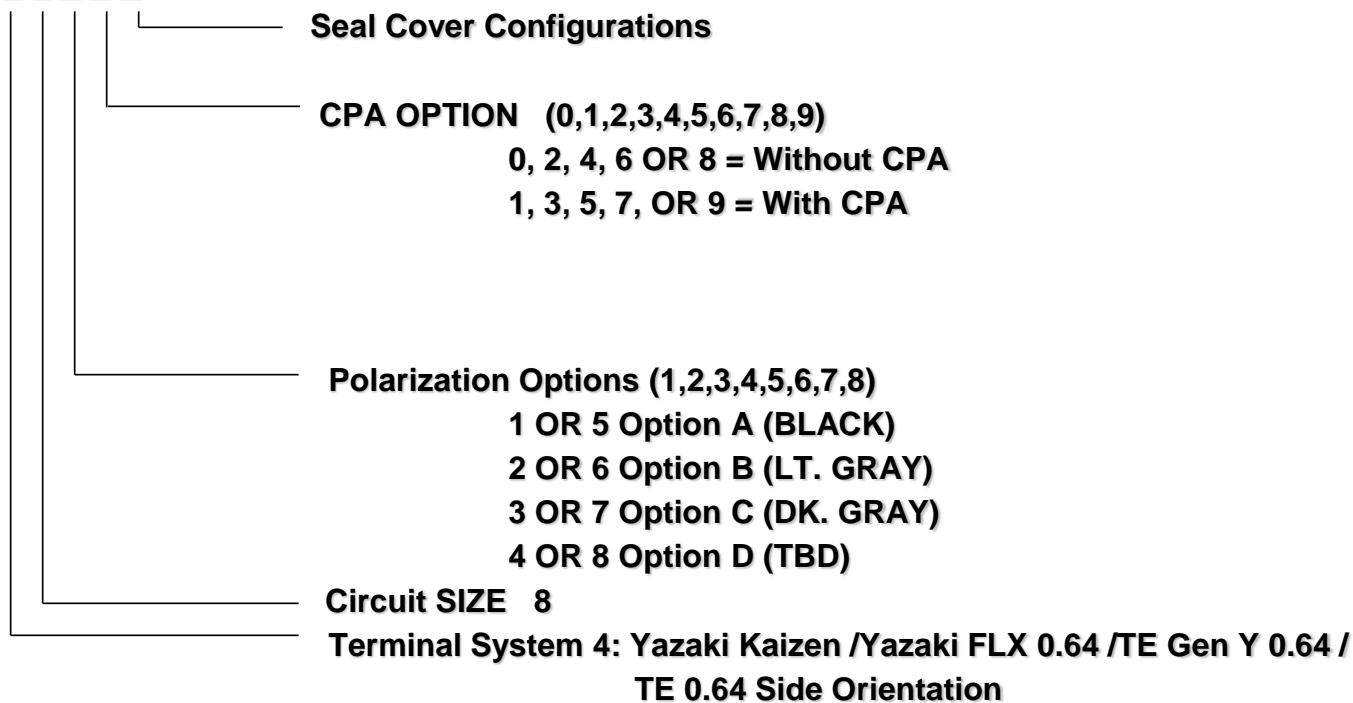


# Section 2:

## **MX 64™ Connectors**

### **Part # legend single row sealed Female (8 Way)**

**31404-8 X X X**



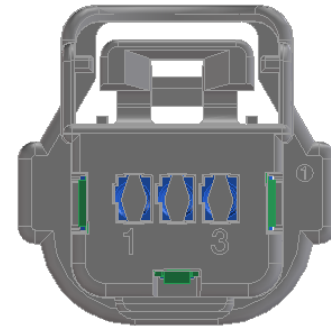
# Section 2: MX 64™ Connectors



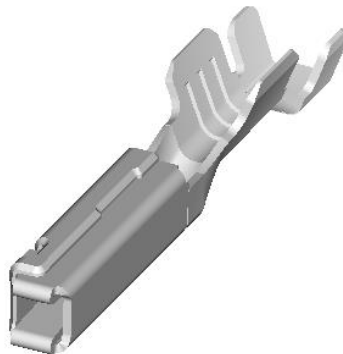
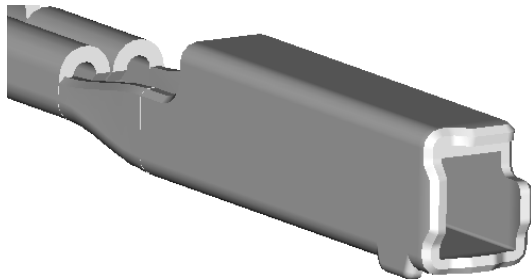
Molex MX64 0.64mm



TE/Molex "GET" 0.64mm



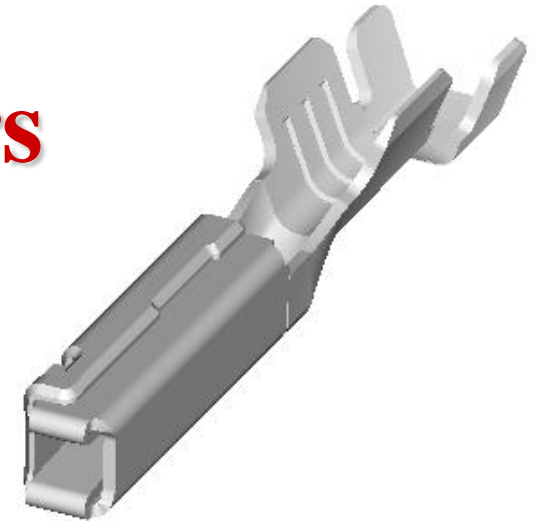
Yazaki Kaizen/Yazaki FLX 0.64  
TE Gen Y 0.64/TE 0.64 Side  
Orientation /JST AIT 0.64mm



# Section 2: **MX 64™ Connectors**

TE/Molex GET 0.64mm  
Female Terminal

## Series 31402/34975 Terminal Part Numbers



### Ford Part Number

18 & 20 AWG (0.5-0.75mm<sup>2</sup>)

TIN # 3F2T-14474-RA

GOLD # 1L2T-14474-CA

22 AWG (0.35mm<sup>2</sup>)

TIN # 3F2T-14474-SA

GOLD #1L2T-14474-DA

### TE Part Number

18 & 20 AWG (0.5-0.75mm<sup>2</sup>)

TIN # 1393366-1

GOLD # 1393365-1

22 AWG (0.35mm<sup>2</sup>)

TIN # 1393367-1

GOLD # 1393364-1

### Molex Part Number

18 & 20 AWG (0.5-0.75mm<sup>2</sup>)

TIN # 342300003

GOLD # N/A

22 AWG (0.35mm<sup>2</sup>)

TIN # 342300001

GOLD # N/A



# Section 2:

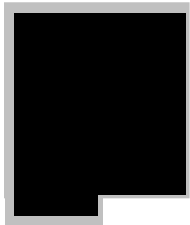
## MX 64™ Connectors

TE/Molex GET 0.64mm Female

Terminal Series 31402/34975



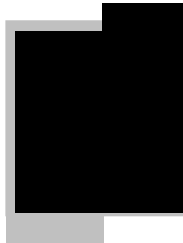
Orientation Tab



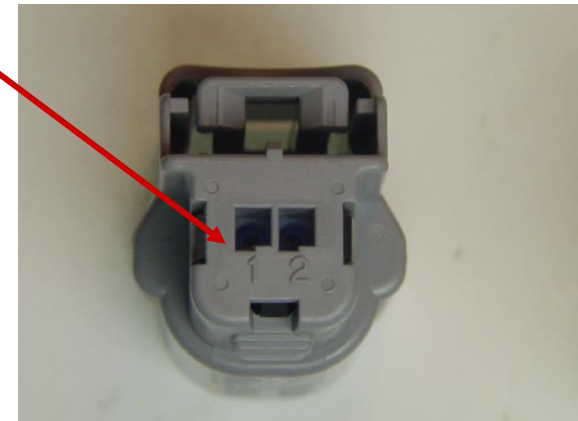
Correct Orientation



90 Misorientation  
Lock-out



180 Misorientation  
Lock-out



**Terminal Insertion Orientation to Grommet Seal Cover**





# Section 2: **MX 64™ Connectors**

Molex 0.64mm Female Terminal  
Series 31403/34977

## Series 31403/34977 Terminal Part Numbers

### MOLEX Part Number

18 & 20 AWG

TIN # 33468-0003

GOLD # 33467-0005

22 AWG

TIN # 33468-0001

GOLD # 33467-0003

0.5-0.75mm<sup>2</sup>

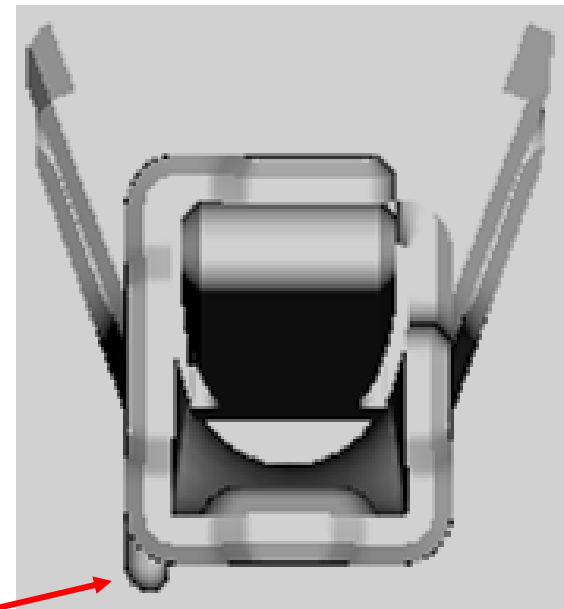
TIN # 33468-0024

GOLD # 33467-0024

0.35mm<sup>2</sup>

TIN # 33468-0022

GOLD # 33467-0022

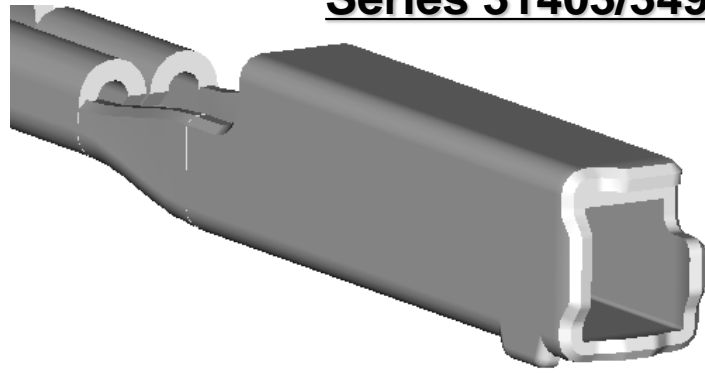


Orientation Tab

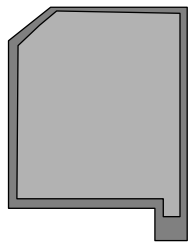


# Section 2: MX 64™ Connectors

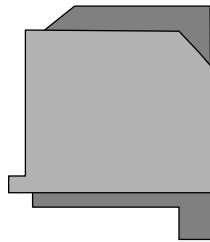
Molex 0.64mm Female Terminal  
Series 31403/34977



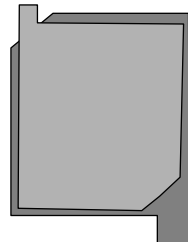
Orientation Tab



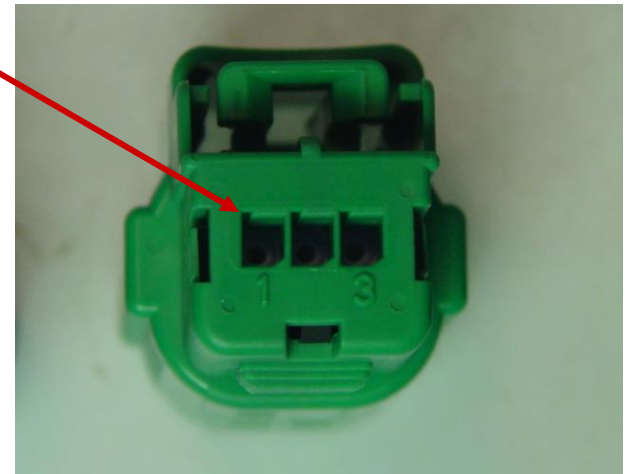
Correct Orientation



90° Misorientation  
Lock-out



180° Misorientation  
Lock-out

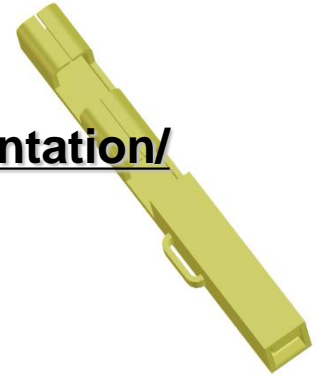


**Terminal Insertion Orientation to Grommet Seal Cover**



# Section 2: **MX 64™ Connectors**

Yazaki Kaizen/ Yazaki FLX/ TE Gen Y/ TE Side Orientation/  
JST AIT 0.64mm Female Terminal Series 31404



## Series 31404 Terminal Part Numbers

### Yazaki Kaizen 0.64mm

18 AWG

TIN # 7116-4619-02

GOLD # 7116-4619-08

20 & 22 AWG

TIN # 7116-4618-02

GOLD # 7116-4618-08

### TE Gen Y 0.64mm

18 AWG (0.75mm<sup>2</sup>)

TIN # 2035170-2

SILVER # 2035124-2

20 & 22 AWG (0.35-0.5mm<sup>2</sup>)

TIN # 2035170-1

SILVER # 2035124-1

### JST AIT 0.64mm

18 AWG (0.75-0.85mm<sup>2</sup>)

TIN # SAIT-A02T-M064

GOLD # SAIT-A02GF-M064

20 & 22 AWG (0.3-0.5mm<sup>2</sup>)

TIN # SAIT-A03T-M064

GOLD # SAIT-A03GF-M064

### Yazaki FLX 0.64mm

0.75mm<sup>2</sup>

TIN # 7116-7278-02

0.35-0.5mm<sup>2</sup>

TIN # 7116-7277-02

### TE 0.64mm Side Orientation

18 AWG (0.75mm<sup>2</sup>)

SILVER # 2138699-2

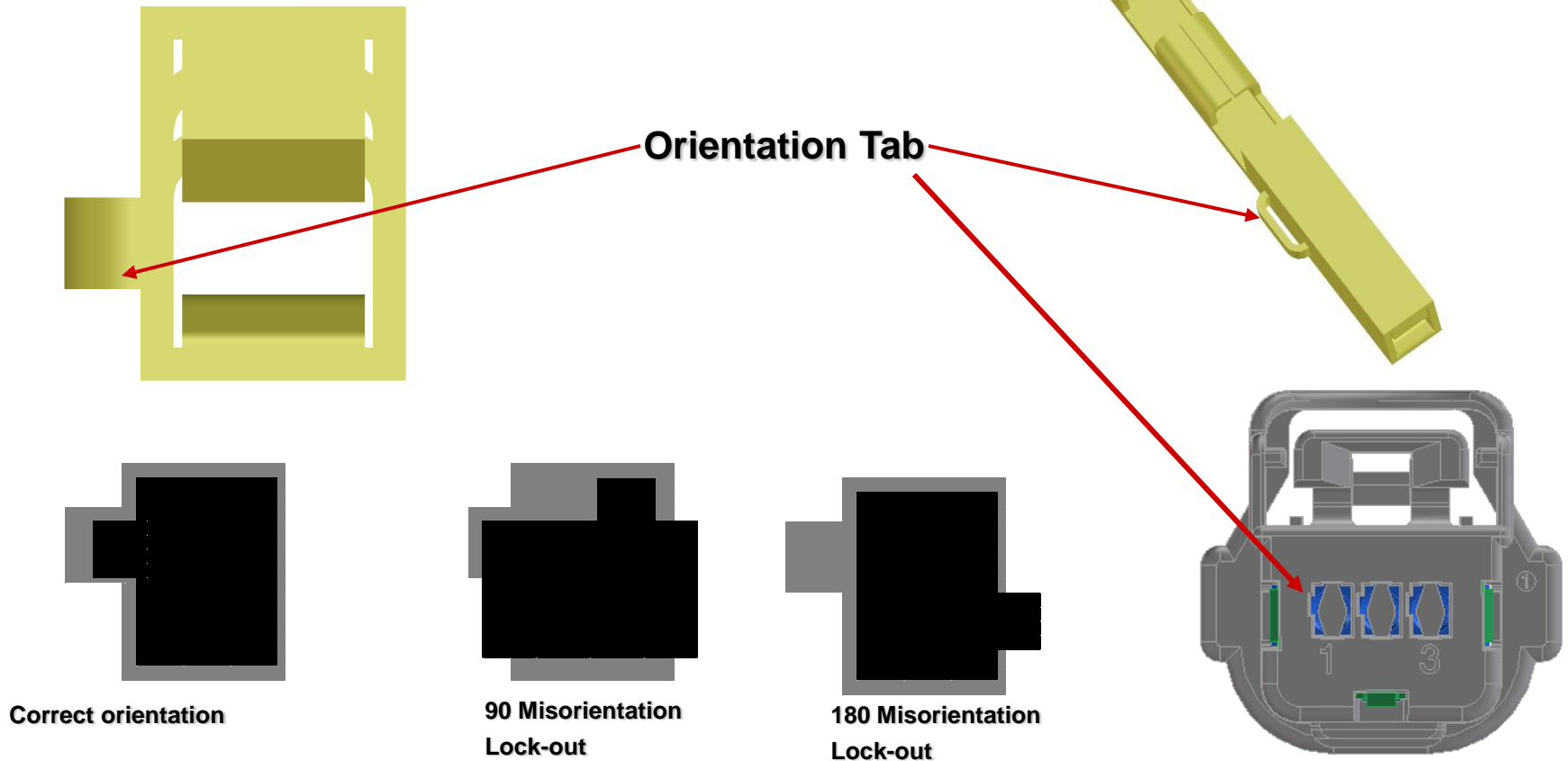
20 & 22 AWG (0.35-0.5mm<sup>2</sup>)

SILVER # 2138699-1



# Section 2: MX 64™ Connectors

Yazaki Kaizen/ Yazaki FLX/ TE Gen Y/ TE Side Orientation/  
JST AIT 0.64mm Female Terminal Series 31404



**Terminal Insertion Orientation to Grommet Seal Cover**



# Section 3

# Harness Assembly Instructions



# Section 3: Harness Assembly Instructions

- A. TPA shown in “As-Shipped” position (FIG. 3-1)
- TPA shown “LOCKED” position (FIG. 3-2)
- TPA to remain in pre-lock position (as shipped) until all circuits are loaded (Fig. 3-1)

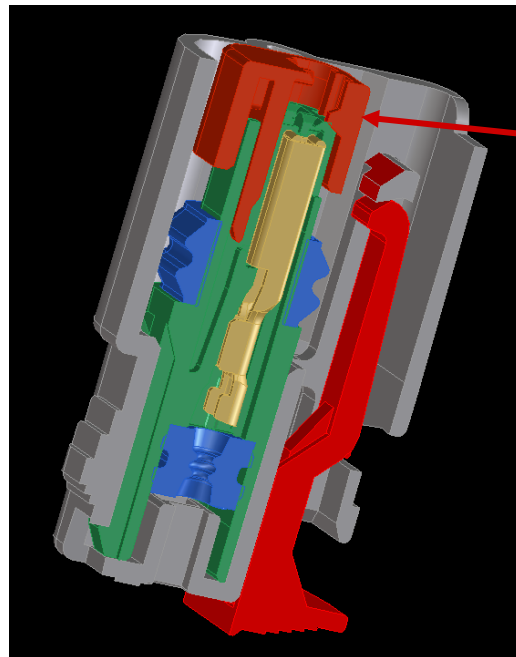


Fig. 3-1

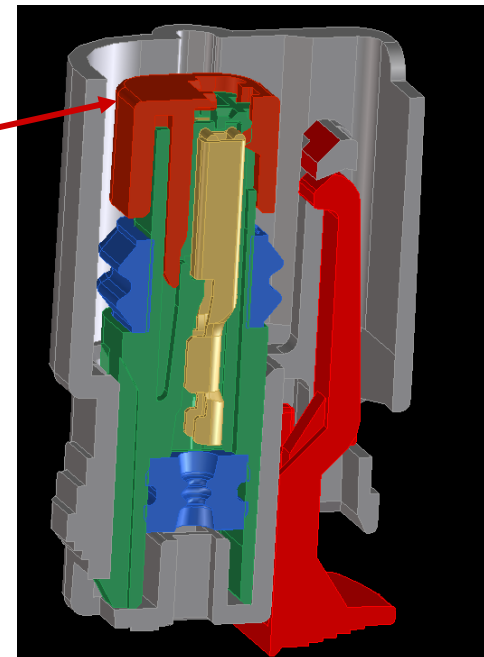


Fig. 3-2

## Section Views of TPA in “Pre-Lock” and “Lock” Positions



# Section 3: Harness Assembly Instructions

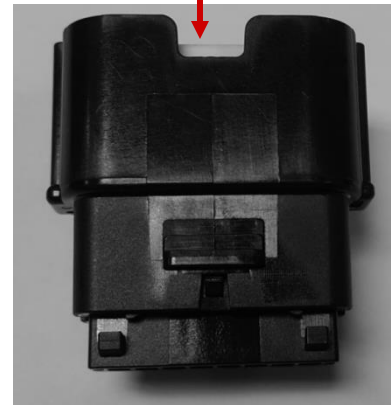
**TPA must be in pre-lock position to install terminals!**

**AS SHIPPED**  
**TPA in prelock**



**Fig. 3-3**

**TPA locked**



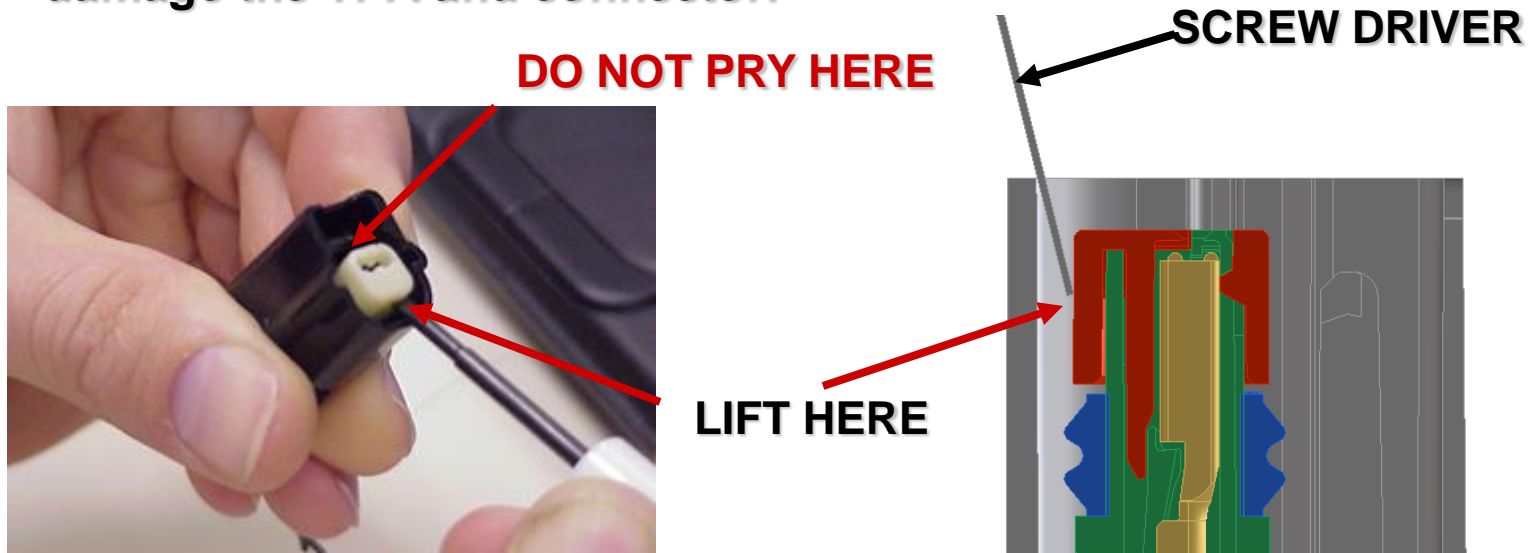
**Fig. 3-4**



# Section 3: Harness Assembly Instructions

## 2-3 way connectors

- TPA must be in pre-lock position to install terminals!
- If TPA is locked you must move it to the pre-lock position by carefully lifting up on the upper side of the TPA using a 3.5 mm flat blade screw driver. This must be done as shown in FIG. 3-5
- **DO NOT PRY ON THE LATCH SIDE OF THE CONNECTOR** This will damage the TPA and connector!





# Section 3: Harness Assembly Instructions

## 4-8 way connectors

- TPA must be in pre-lock position to install terminals!
- If TPA is locked you must move it to the pre-lock position by carefully lifting up on the upper side of the TPA by inserting a 3.5 mm flat blade screw driver into the TPA access window as shown
- **DO NOT PRY ON THE LATCH SIDE OF THE CONNECTOR** .This will damage the TPA and connector!



Fig. 3-7

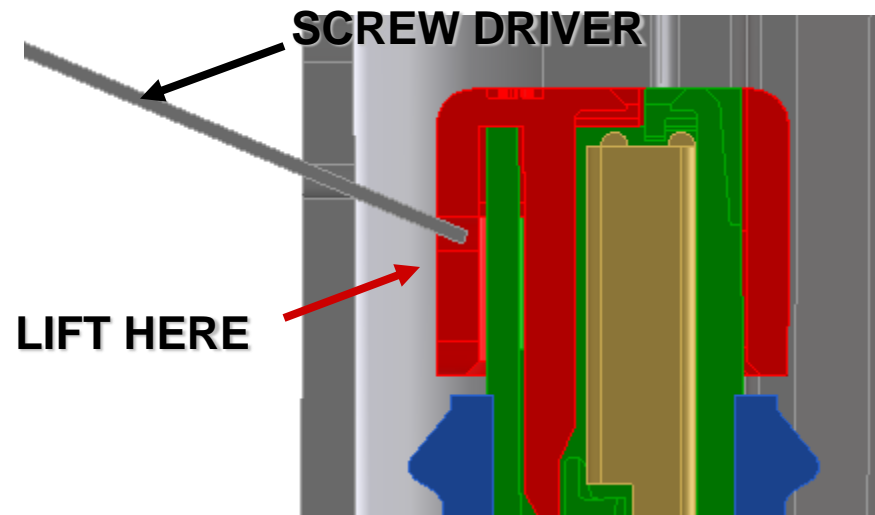


Fig. 3-8



# Section 3: Harness Assembly Instructions

## B. 0.64mm Terminal Installation (continued)

- With TPA still in pre-lock position, orient terminal to rear of connector.
- Grip the wire, (Fig. 3-9) and insert through appropriate circuit opening (Fig. 3-10). If resistance is encountered, retract the terminal and adjust the angle of insertion. Continue inserting the terminal until it stops and locks on the lock finger with an audible click, then pull the wire to ensure terminal is locked. (PUSH CLICK PULL)

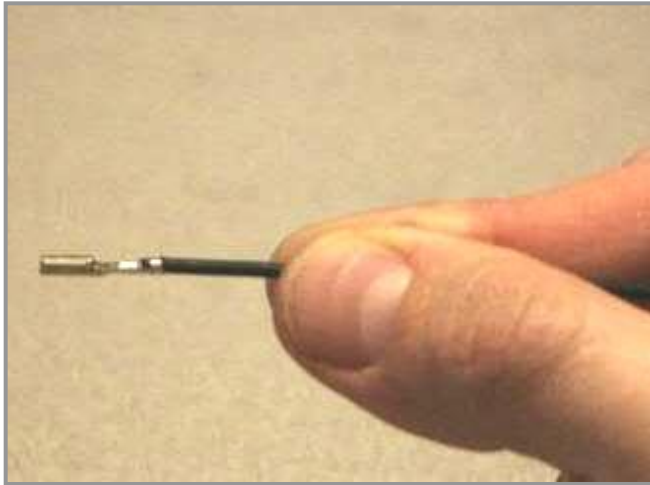


Fig. 3-9

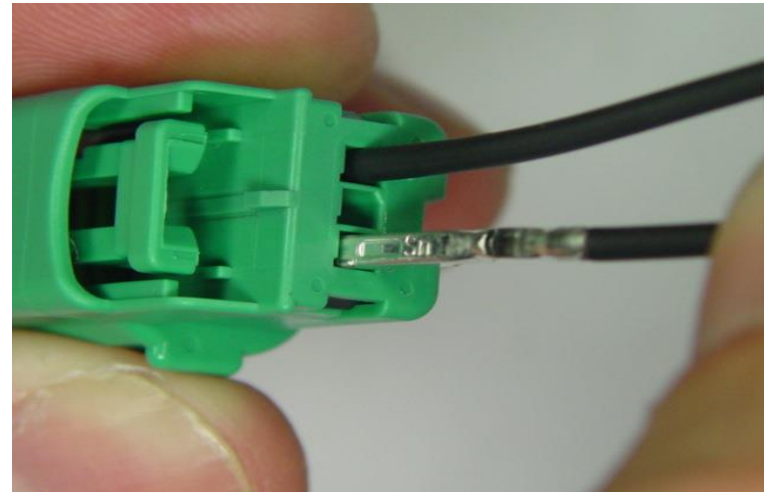


Fig. 3-10



# Section 3: Harness Assembly Instructions

## C. Seating TPA with the 0.64mm Terminal

- With the terminals fully installed, the TPA can be seated into its final lock position by applying an even force (Fig. 3-11) until it comes to a stop and you hear an audible click from the locking finger locking in place. If the TPA resists it may be detecting a partially installed terminal. Pull the TPA back into its pre-lock position and make sure all terminals are fully installed. Upon completion, the TPA can be seated.

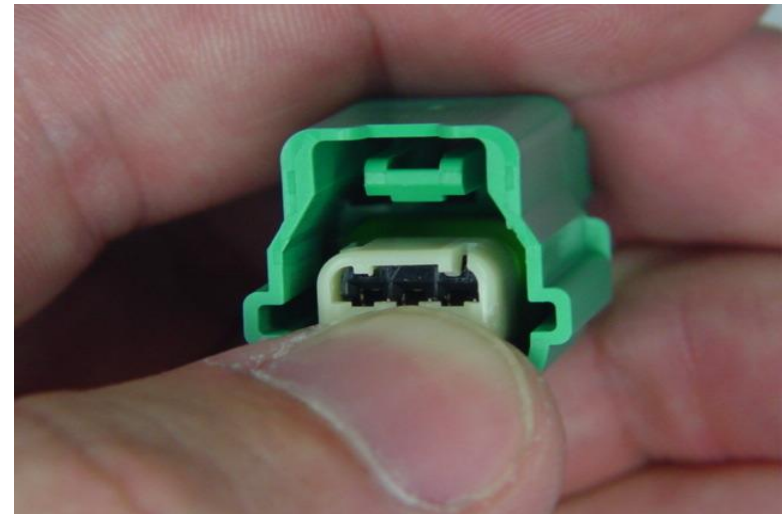
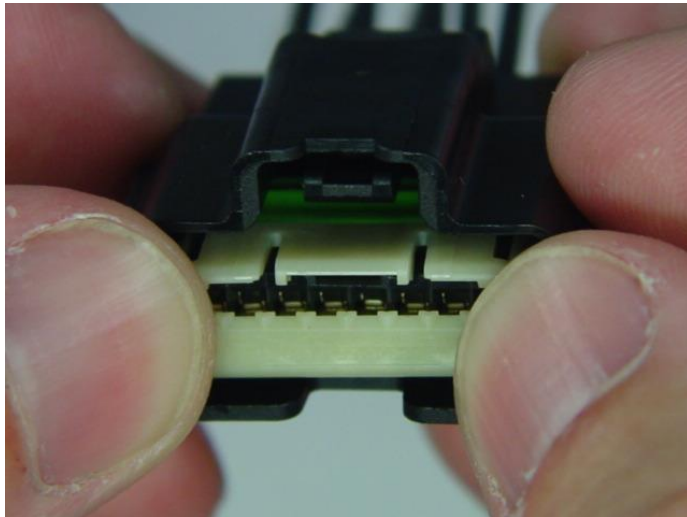
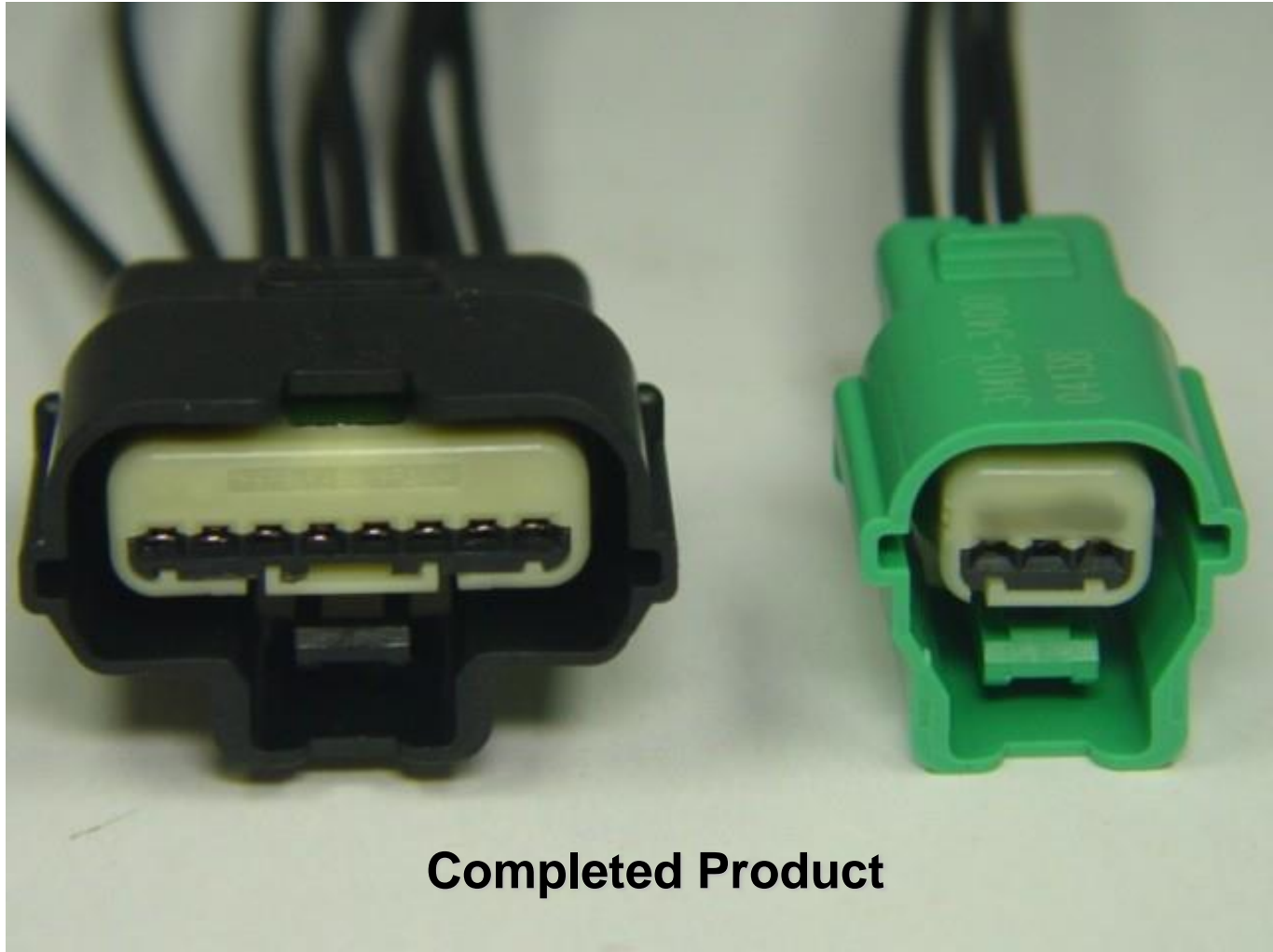


Fig. 3-11 A&B



# Section 3: Harness Assembly Instructions



Completed Product



# Section 3A: 8 way Wire Dress Cover assembly Instructions

## ■ Wire Dress Cover (WDC) Installation

- Step1: Bend the wire toward the required direction (Fig.3A-1)
- Step2: Put the WDR to the position that showed in fig.3A-2 , then Push it to the stopped position along Dir.\_1 (Fig. 3A-2). **Don't assembly like Fig.3A-5**
- Step3: Push WDC along Dir.\_2 to the final lock position with an audible click (Fig. 3A-3). then slightly pull WDC along Dir.\_3 to ensure it is locked (Fig.3A-4)

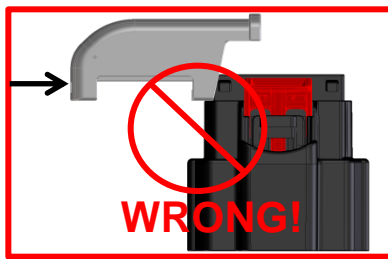
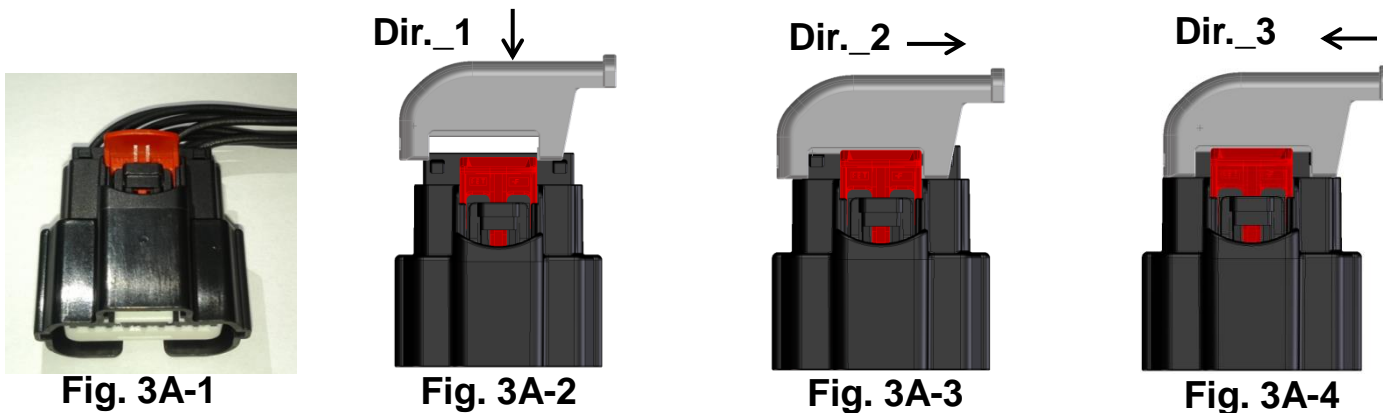


Fig. 3A-5

**PUSH CLICK PULL**



# Section 4

## Connector Mating Instructions



# Section 4: Connector Mating Instructions

## A. Connector polarization options & color identification

- 2, 3, 4, 5, 6 way
  - USCAR Option A (BLACK)
  - USCAR Option B (GRAY)
  - USCAR Option C (BROWN)
  - USCAR Option D (GREEN)
  
- 8 way
  - Option A (BLACK)
  - Option B (LIGHT GREY)
  - Option C (DARK GREY)

Special request Option refer to related drawing

For updated polarization options consult.  
[HTTP://WWW.USCARTEAMS.ORG](http://www.uscarteams.org)



# Section 4: Connector Mating Instructions

## B. Connector mating

- Correctly orient the connector (align keying features) onto the mating connector (Fig. 4-1) Then evenly push the connector onto the mating connector until it locks with an audible click. (Fig. 4-2).

Fig. 4-1

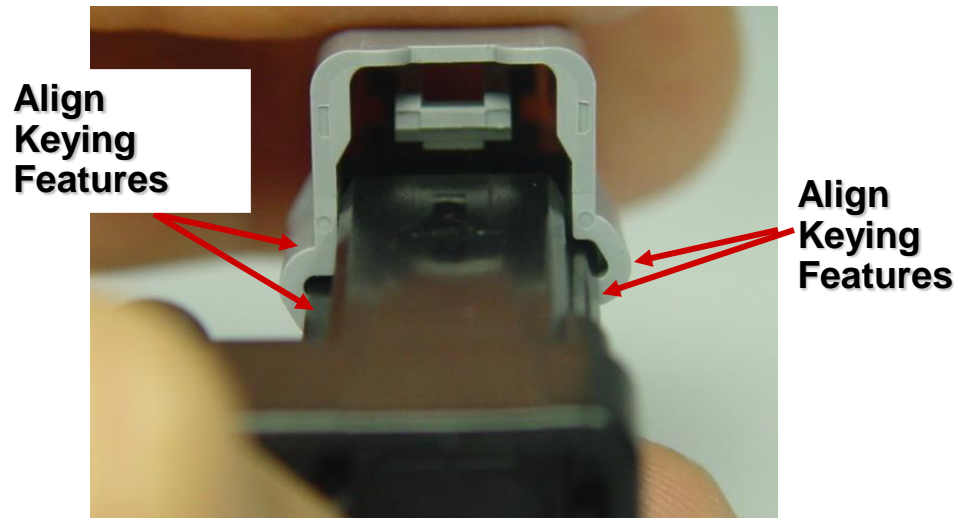
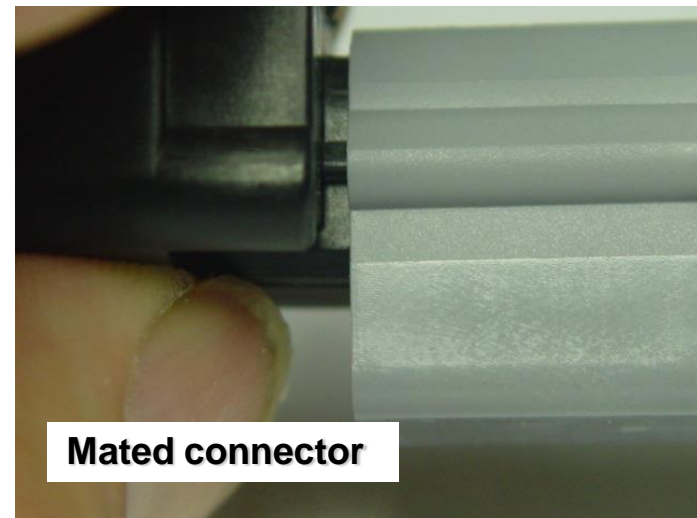


Fig. 4-2





# Section 4: Connector Mating Instructions

## C. Optional Connector Position Assurance (CPA)

- With the connector mated the CPA can now be engaged. Push the CPA toward the mating surface until it clicks into its locked position (Fig. 4-3).

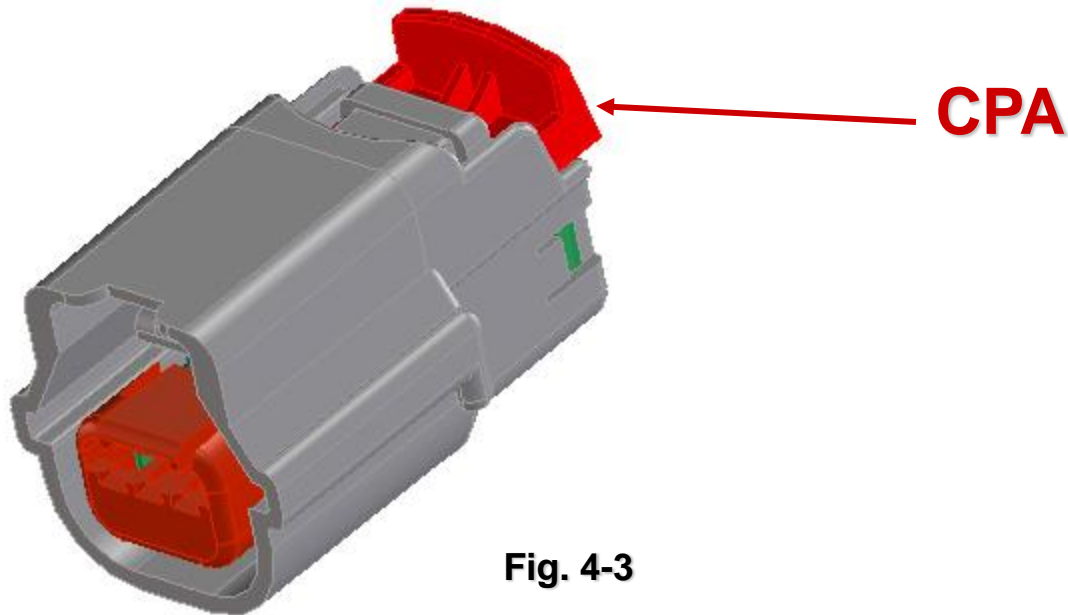


Fig. 4-3

# Section 5

## Service Instructions



# Section 5: Service Instructions

## A. Connector removal from sensor

- To un-mate the connector from the sensor, push the CPA (if equipped) away from mating surface (Fig. 5-1) Then depress the latch on the top of the connector so the lock releases.
- Grip the connector and evenly pull straight away from the sensor. (Fig. 5-2)

Fig. 5-1

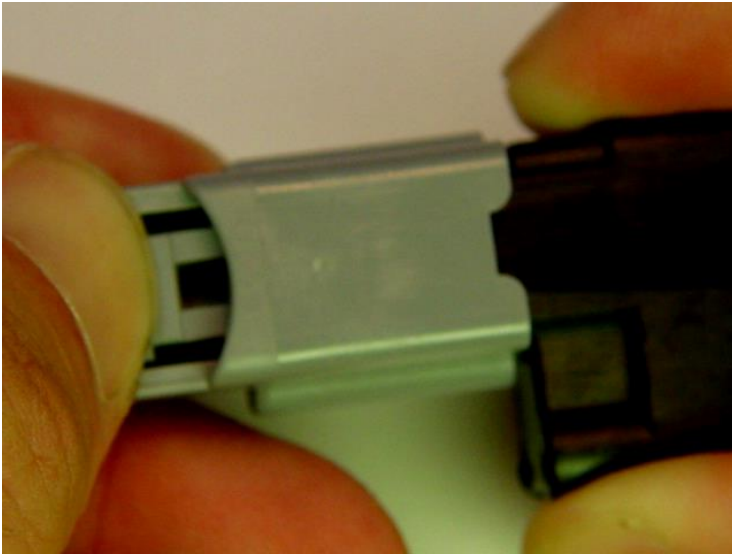
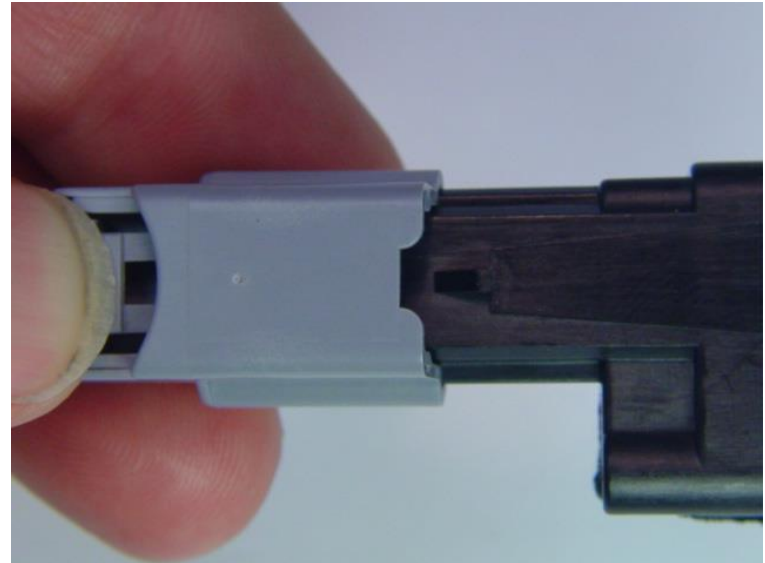


Fig. 5-2



# Section 5: Service Instructions

## B. TPA Servicing

- **Step 1: To add additional circuits move the TPA from locked to pre-lock as shown in section 3. Stop pulling when pre-lock is reached.**
- **Step 2: To remove circuits that have been populated you must remove the TPA from the connector by raising it into pre-lock and then continue raising until the TPA has been removed.**

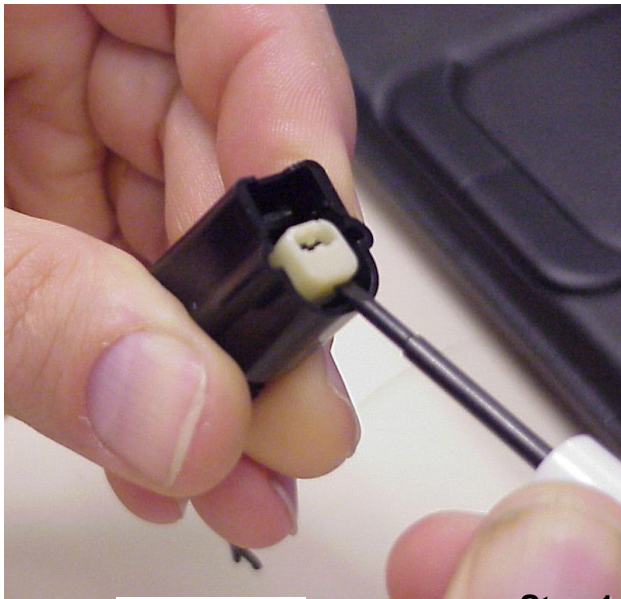


Fig. 5-3

Step 1: Pry Up TPA

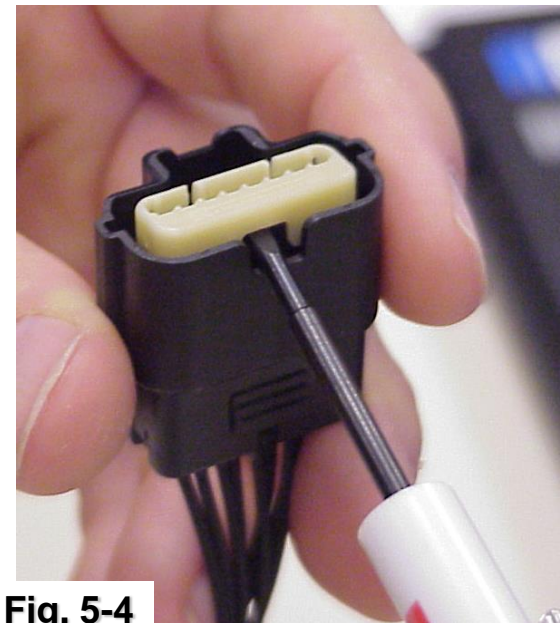


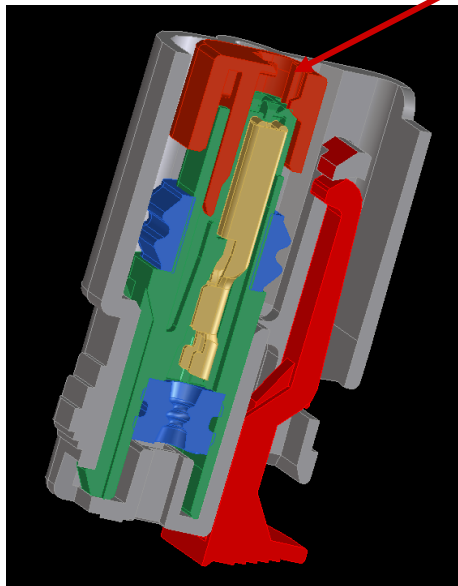
Fig. 5-4



# Section 5: Service Instructions

## B. TPA Servicing (continued)

TPA



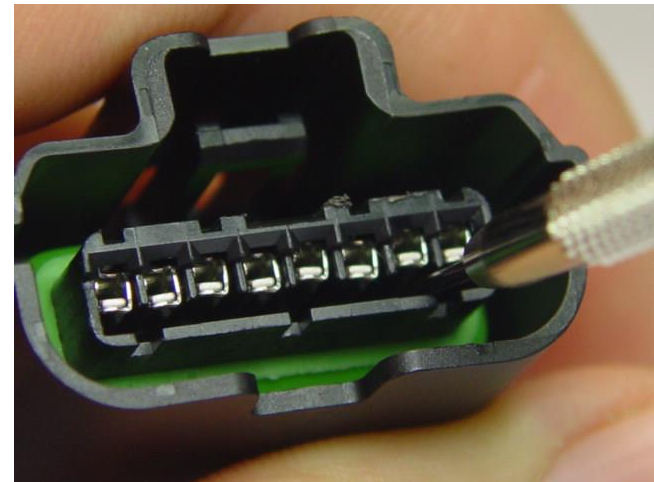
Views of TPA in “Pre-Lock” Position



# Section 5: Service Instructions

## C. 0.64mm Terminal Removal

- After removing the TPA, Push up on the wire and carefully displace the locking finger using 1mm blade screwdriver. Once the locking finger has been displaced gently pull on the wire to remove the terminal.
- Do not use excessive force. Excessive force can damage the lock finger.
- Once the required terminals have been removed, Replace the TPA and lock if terminal population is complete.



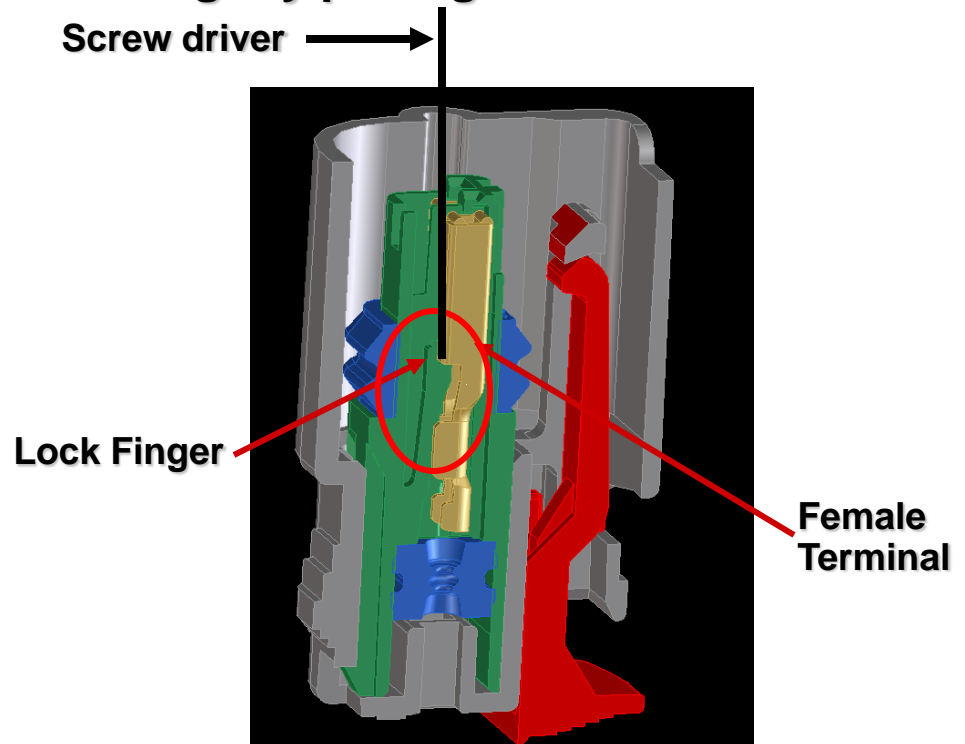
# Section 5: Service Instructions

## D. 0.64mm Terminal Removal (continued)

- Do not use excessive force. Excessive force can damage the lock finger.
- Deflect the top of locking finger to unlock it from the terminal. Apply light pressure on lock finger while lightly pulling terminal wire.



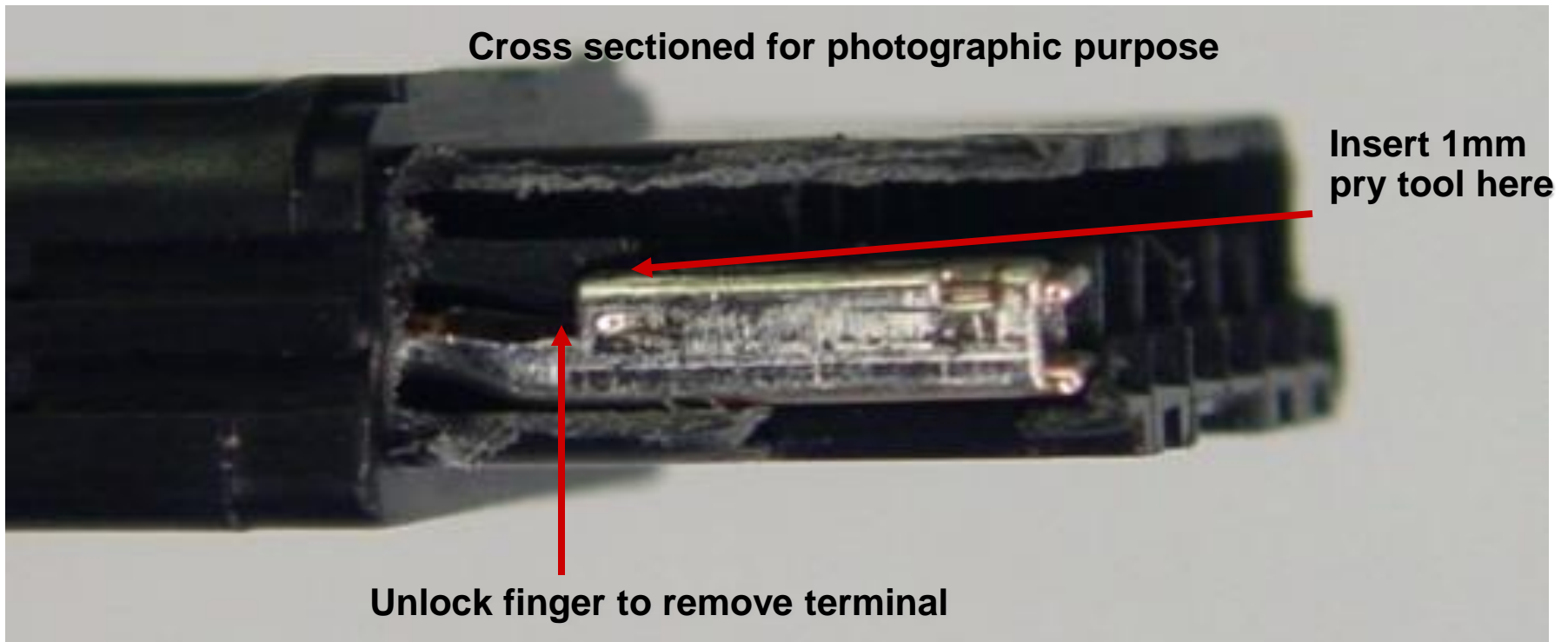
Fig. 5-9



# Section 5: Service Instructions

## E. 0.64mm Terminal Removal (continued)

- Carefully displace the locking finger by prying the lock finger up to unlock it from the terminal. Use care not to over deflect the lock finger to avoid damage.





# Section 5: Service Instructions

## F. 0.64mm Terminal Removal (continued)

- Once the terminal lock finger is disengaged, pull on the wire (Fig. 5-12) to release the terminal.

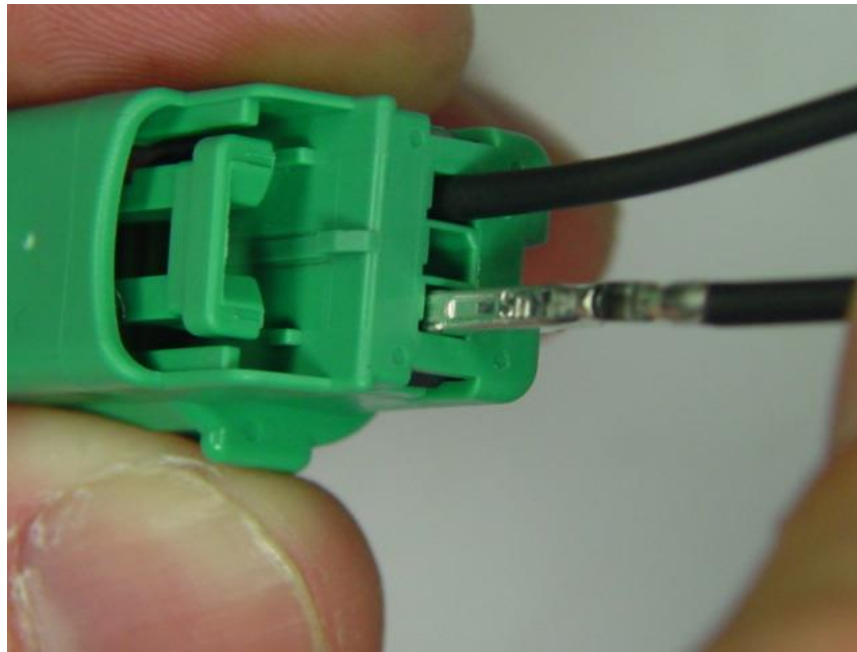


Fig. 5-12

# Section 5: Service Instructions

## G. MX0.64 Terminal Crimping

- If the 0.64mm terminal needs to be replaced, a new one can be hand crimped using the Molex Crimp Tool Number 63811-4200. Contact Molex for terminal drawings, hand crimp instructions and crimp height requirements.

## H. TE/Molex “GET” Terminal Crimping

- If the TE/Molex “GET” terminal needs to be replaced, a new one can be hand crimped using the Molex crimp tool number . 63811-4500 for the wire range: 0.22-0.35 mm<sup>2</sup> & 22 awg. And 63811-4600 for the wire range: 0.50-0.75 mm<sup>2</sup> & 20-18 awg. Contact Molex for terminal drawings, hand crimp instructions and crimp height requirements.

## I. Yazaki Kaizen/ Yazaki FLX/ TE Gen Y/ TE Side Orientation/ JST AIT terminal crimping

- If the Yazaki Kaizen/ Yazaki FLX/ TE Gen Y/ TE Side Orientation/ JST AIT terminal needs to be replaced please consult Yazaki/TE/JST for crimp tool information.



# Section 5A: 8 way WDC Service Instructions

## ■ WDC Removal

- Carefully Push down and displace the lock finger using 1.5mm flat blade screw driver. Apply light pressure on lock finger while lightly Push WDC with the thumb (Fig. 5A-4). Once the locking finger has been displaced gently, push the WDC to remove it along Dir.\_4. (Fig. 5A-6)
- Remove the WDC gently along Dir.\_5. (Fig. 5A-7)
- Do not use excessive force. Excessive force can damage the lock finger. (Fig. 5A-5)



Fig. 5A-4



Lock Finger  
Fig. 5A-5

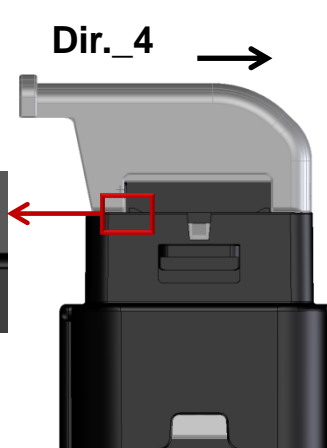


Fig. 5A-6

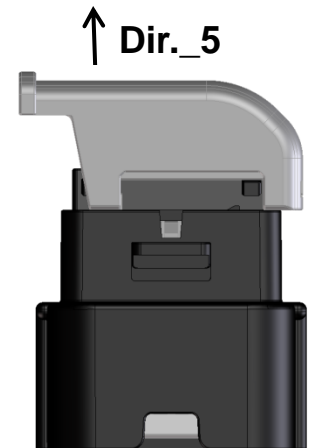


Fig. 5A-7



# Section 6

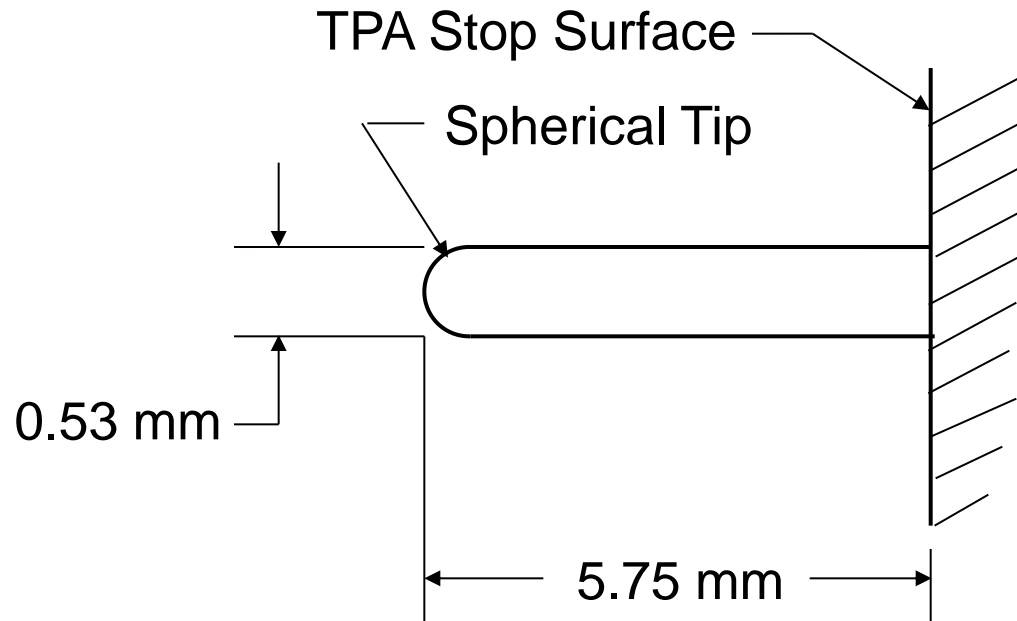
## Electrical Continuity Checking



# Section 6: Electrical Continuity Checking

## A. Pogo Pin Recommendation -MX 0.64mm Terminal

- Pogo Pin Specification – See next page.



# Section 6: Electrical Continuity Checking

## A. Pogo Pin Recommendation - 0.64mm Terminal (continued)

### Probe Pin Details (0.64mm terminal)

**Manufacturer:** Lone Star Industrial

**Part number:** LS040RS-ELW-277-N-4.7

**Pin diameter:** 0.020" (0.53 mm)

**Tip shape:** Spherical

**Tel:** (915) 779-7255

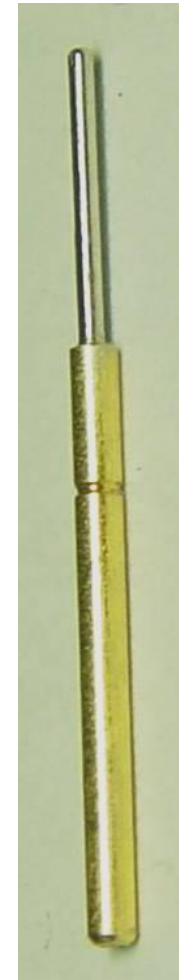
Ordering Example: LS040RS-ELW-277-N-4.7  
Plunger Plating - Spring Force \_\_\_\_\_

TECHNICAL DATA		
Minimum Centers:	.075 (1.91)	
Working Travel:	.070 (1.78)	
Current Rating:	3 Amps	

MATERIALS		G	N
Plunger:	Heat Treated BeCu, Gold or Nickel Plated.		
Barrel:	Brass, Gold Plated.		
Spring:	Stainless Steel or Music Wire.		
Seal Ball:	Chrome Steel.		
Receptacle:	Nickel Silver, Gold Plated.		

SPRING FORCE		PRELOAD
	OZ. (GRM) at .070 (1.78) Travel	
Standard	4.7 (133)	1.4 (40)

Dimensions in inches (millimeters)



POGO PIN



# Section 6: Electrical Continuity Checking

## B. Recommendations

**When testing the connector for continuity, it is imperative that you do not damage the terminals!**

**Pogo pins should be checked for damage or sticking several times a shift:**

- **First, a visual inspection of all the pins for damage should be performed.**
- **Next, a testing block should be used to depress all the pogo pins up into the barrel. If there is a bent or sticking pin, it should remain stuck in the barrel of the pogo pin. A damaged or stuck pin should be replaced before any additional testing is performed.**



# Section 6: Electrical Continuity Checking

## B. Recommendations (continued)

### Probing damage can occur...

- If a sharp-ended probe is inserted into the terminal. This may damage the plating and increase contact resistance.
- If an oversized diameter probe is inserted into the terminal. This will overstress the beam in the terminal, creating an environment for intermittent contact and/or increased electrical resistance.
- If a probe is inserted into the terminal at an angle or off center. This may damage the terminal and/or the connector.





# Section 6: Electrical Continuity Checking

## C. Manual Probing of the Connector

- If the connector must be probed off-line, please use:
  - GM probe tool # J-35616-64A for the 0.64mm terminal (Fig. 6-1).
- Insert the probe through the terminal opening as shown in Fig. 6-2.

Fig. 6-1

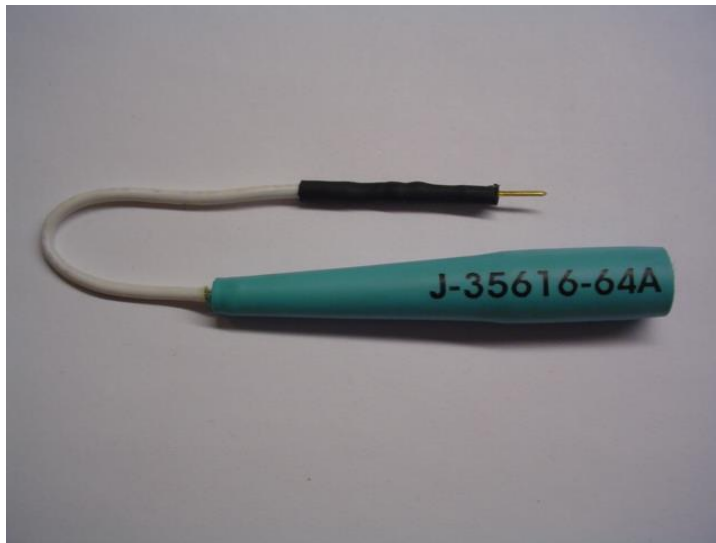
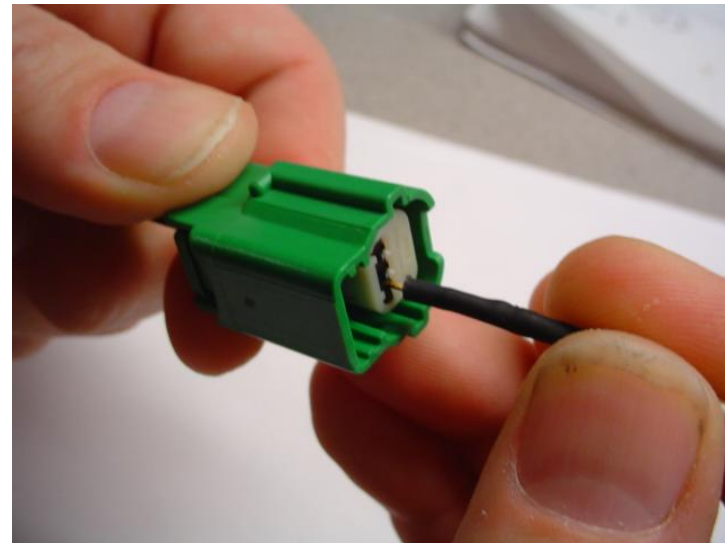


Fig. 6-2

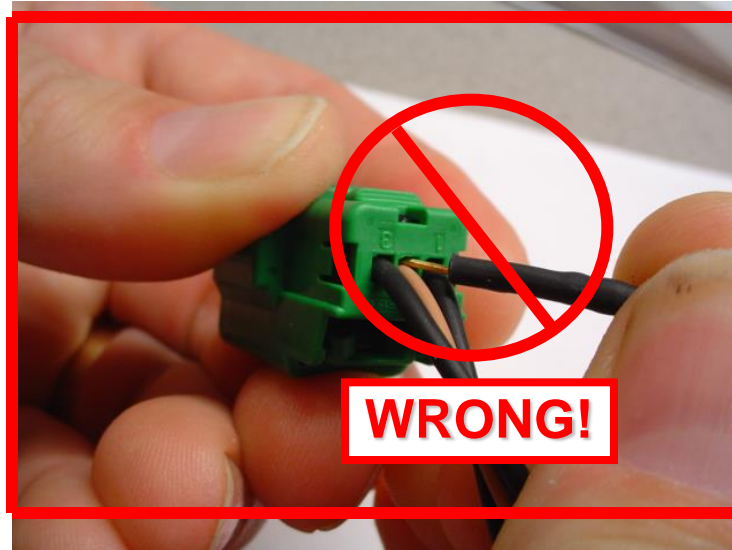


# Section 6: Electrical Continuity Checking

## C. Manual Probing of the Connector

### Manual probing damage can occur...

- If a probe is inserted into the back of the connector. This may damage the wire seal, creating an environment for fluid ingress.



- If the wire insulation is pierced or chafed. This may create a leak-path for fluid ingress and/or wire corrosion.

