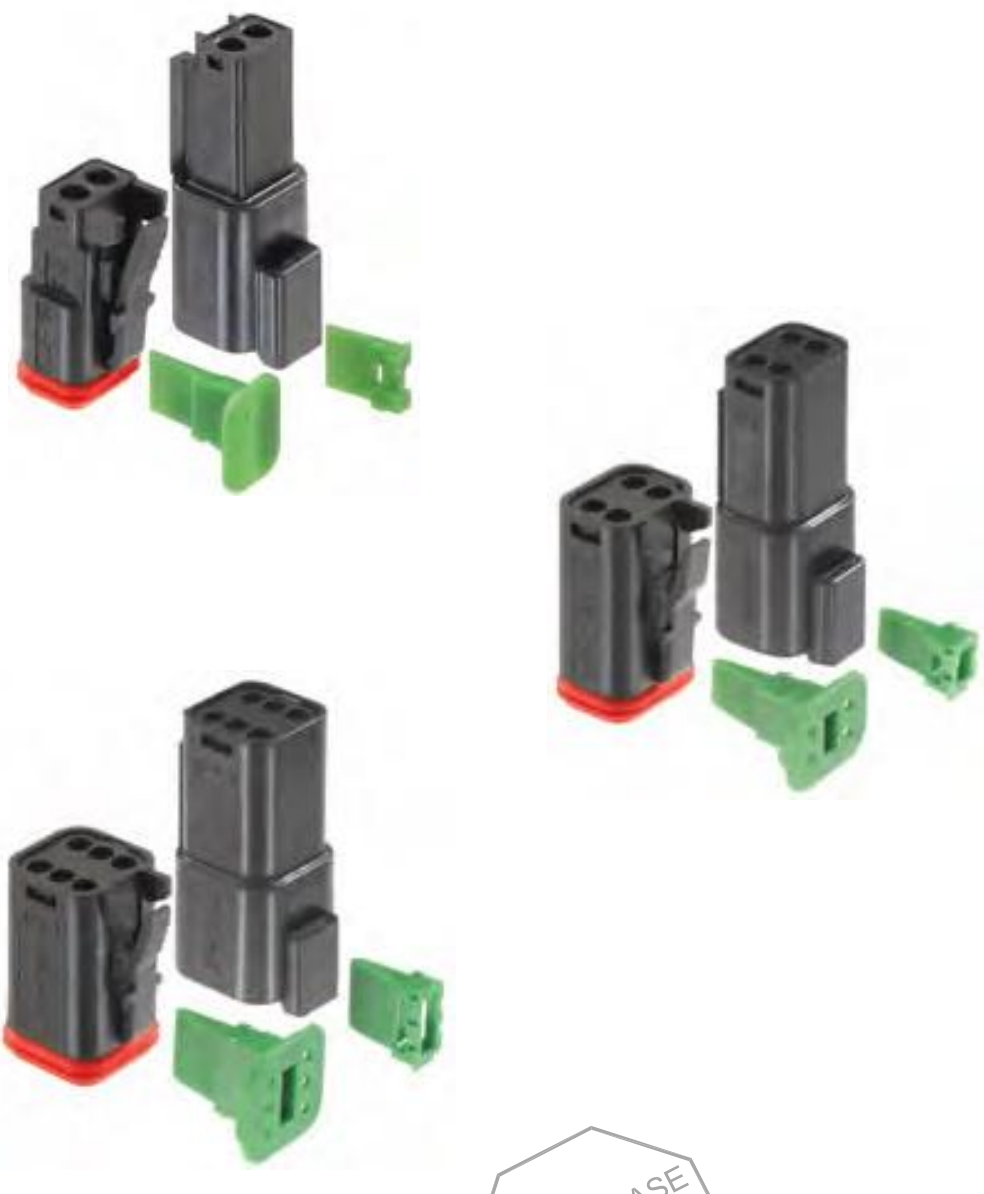
APPLICATION SPECIFICATION

ML-XT™ Sealed connector system



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REVISION:	EC INFORMATION:	TITLE:	SHEET No.
A5	EC No: **622866** DATE:	**ML-XT ASSEMBLY GUIDE**	**1** of **17**

DOCUMENT NUMBER:	DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
934430010	**PS**	**A**	**JFLETCHER**		

1.0 SCOPE

This document describes the correct procedure for the assembly of the ML-XT connector system, including contact insertion, wedgelock insertion/withdrawal, contact removal and connector mating/unmating.

2.0 PRODUCT INFORMATION

DESIGN CHARACTERISTICS	PERFORMANCE CHARACTERISTICS
One-piece plug housing and seal design, permanently bonded by two-shot LSR (liquid silicone rubber) molding technology	Prevents fluid ingress; system is IP68-rated and J2030 power-wash test capable Prevents loss/ misalignment of seal; ensures repeatable retention during unmating and mating of plug and receptacle
Drop in replacement for de-facto industry standard connectors	Achieves superior reliability without the need for costly re-design
Rear seals made from HCR (high consistency rubber)	Provides greater tear-resistance over LSR material; prevents damage to rear seal during terminal insertion/ extraction
Latched rear covers	Locks in rear HCR seals Allows for flexible cable exits and cable movement whilst maintaining optimum seal position to prevent leak paths
Plug and receptacle housings are supplied pre-assembled with internal HCR rear seals locked-in by rear covers	Reduces inventory, assembly time and costs for harness manufacturers and prevents loss of rear seals for a cost-competitive mated system
Utilises Molex proven XRC™ terminals with current ratings up to 13.0A	Supports tooling widely used at harness makers
High terminal retention force; exceeds 111N (Subject to use of cable with sufficient tensile strength to sustain 111N load)	Withstands high axial pull-out forces per J2030 specification
Wedgelock / TPA (Terminal Position Assurance) loaded after terminals	Locks terminals in position for secure electrical contact
Plug housing features integral locking latch	Ensures secure mating of plug and receptacle
9 colour-coded housings available	Enables easy visual mating of harnesses to prevent mis-mating
Keying options available across multiple circuit sizes	Prevents mis-mating of different circuits
Unmating features present on terminal retention fingers	Enables easy extraction of terminals

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3.0 REFERENCE DOCUMENTS

This instructions manual contains supplemental information pertaining to the Molex ML-XT sealed connector system. Additional information such as keying, colours etc… can be found on the Sales & Assembly drawings:

93443**** PSD (multiple documents)	Plug & Receptacle Sales Drawings
84525**** PSD (multiple documents)	Socket Contact, (Stamped & Formed), Sales Drawings
84524**** PSD (multiple documents)	Pin Contact, (Stamped & Formed), Sales Drawings
936400020 PSD	Socket Contact, (Solid), Sales Drawings
936410010 PSD	Pin Contact, (Solid), Sales Drawings
ATS-63824-5300	ML-XT Removal Tool Specification
934941000 PSD	ML-XT Blind Cavity Plug
845241000 PSA	XRC Terminal Application Specification

4.0 PRODUCT SUMMARY

4.1 CONNECTOR ASSEMBLY

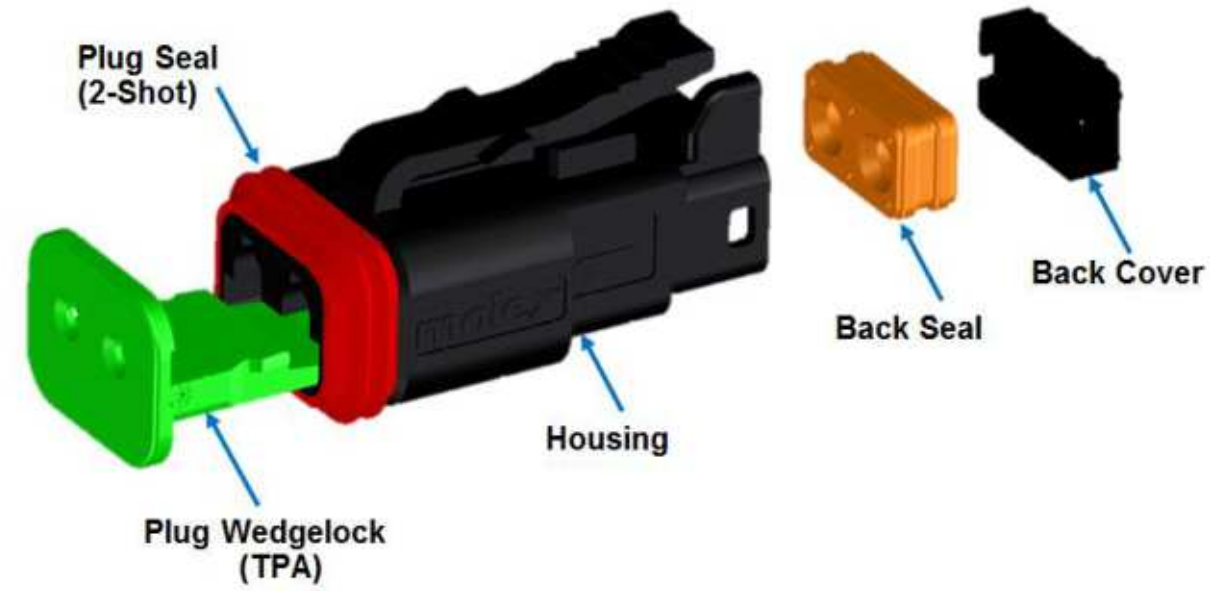


Figure 1: 2cct Plug Connector

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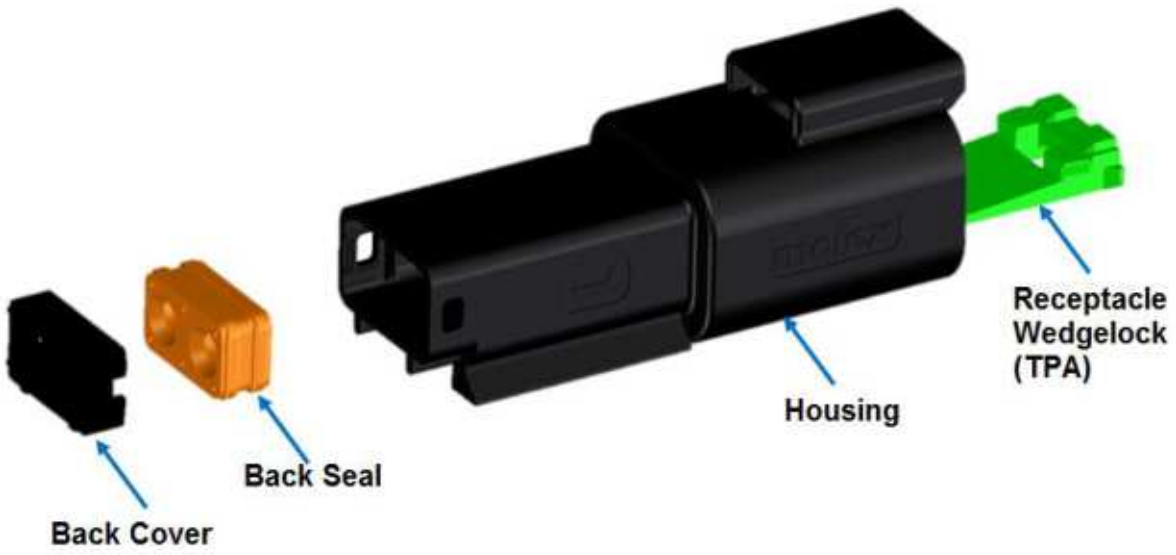


Figure 2: 2cct Receptacle Connector

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4.2 PIN/SOCKET TERMINAL



Figure 3a: Pin Terminal, Stamped & Formed



Figure 1b: Pin Terminal, Solid

Terminal Features
Base Material - Copper Alloy
Plating Options - Nickel, Gold
Wire Sizes: 14, 16, 18, 20, 22 & 24 AWG
1.5, 1.0, 0.8, 0.75, 0.5, 0.35
& 0.22 mm^2



Figure 4a: Socket Terminal, Stamped & Formed



Figure 2b: Socket Terminal, Solid

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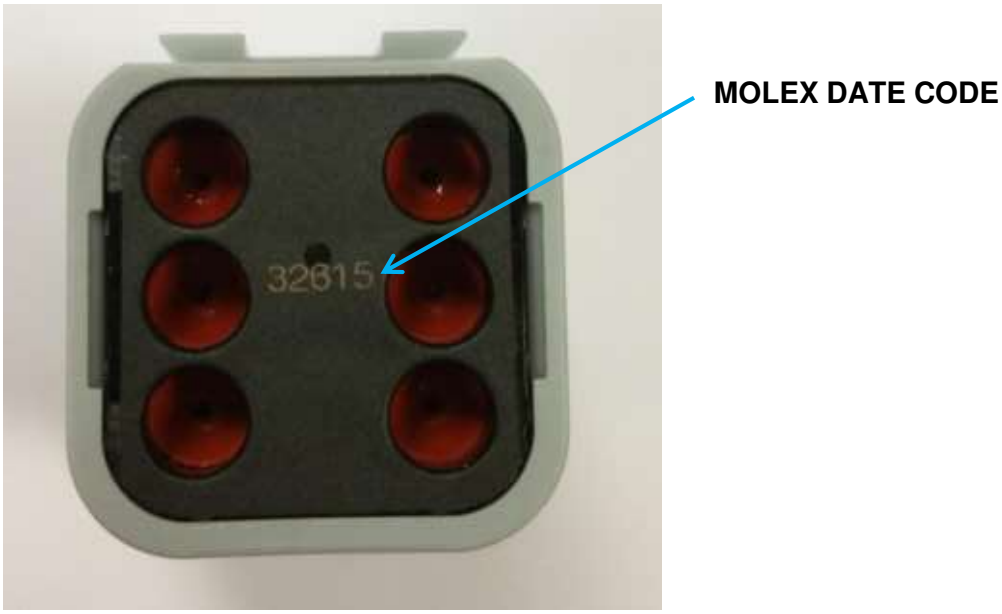
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4.3 PRODUCT IDENTIFICATION

All parts are laser etched with:

- Date Code (D WW YY)
  - D = DAY of the week (1 To 7)
  - WW = Week of the year (01 to 52)
  - YY = Last two digits of the Year (01 – 99)

Note – Location for Date Codes can be found on Customer Drawings



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4.4 CONNECTOR ASSEMBLY

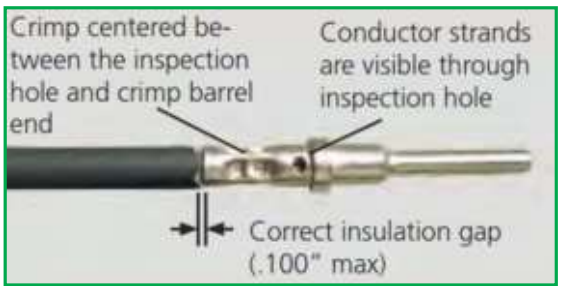
4.4.1 TERMINAL CRIMPING

Crimping tools provide lower total installation and maintenance costs. However, controls are required to help ensure that the proper crimp tools designed for the type and size contact are used, the pin or socket is properly inserted into the tool, the wire insulation is stripped properly, and the wire fully inserts into the contact.

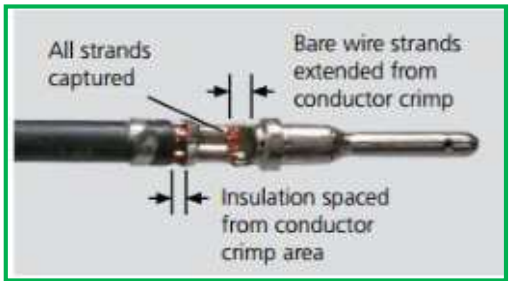
When a crimp is completed, the crimp can be visually inspected. The inspector should check for:

- The removed insulation should expose a conductor length that is specified in the application tooling specification.
- Wire strands intact.
- All wire strands are in the conductor crimp barrel.
- Wire is inserted to the correct depth in the terminal.
- The Insulation crimp heights and width should be equal to or less than that of the cable it is crimped to (Note: Poor Insulation crimps can lead to difficult terminal extraction)

ACCEPTABLE CRIMPS

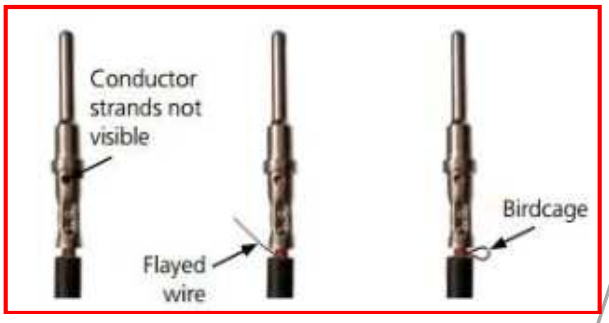


Solid Contact (Cable Strip Length 6.35 to 7.92mm Reference)

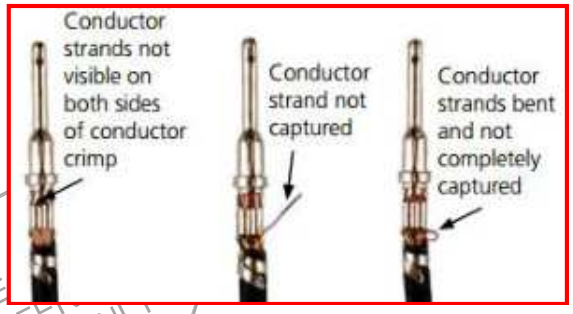


Stamped & Formed Contact

UNACCEPTABLE CRIMPS



Solid Contact



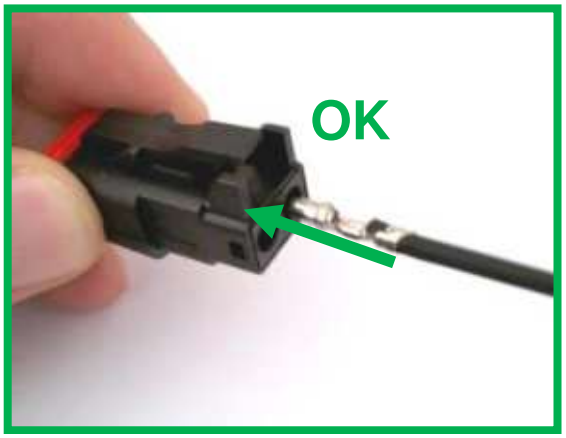
Stamped & Formed Contact

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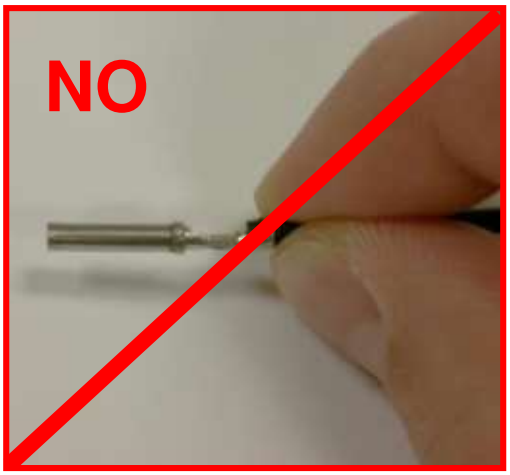
4.4.2 TERMINAL INSTALLATION

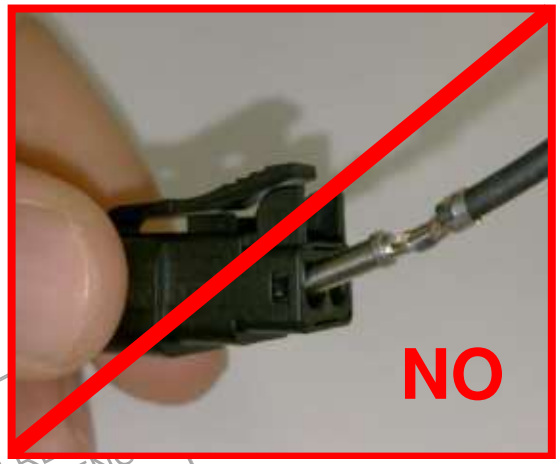
Grip the wire no less than 10mm for smaller diameter cable (1.2mm to 2.4mm) & no less than 20mm for larger diameter cable (2.4mm to 3.6mm) from the terminal insulation crimp align terminal on centre with the appropriate opening in the back cover and insert through the circuit opening in the back seal. For insertion of flexible cables see section 4.4.3.
If resistance is encountered, retract the terminal and adjust the angle of insertion. Continue inserting the terminal until it stops and locks up on the lock finger with an audible click. Once the connector is fully populated insert the wedgelock/TPA. The wedgelock should 'click' into position. Plug Connector/Socket Terminal shown – use same method for Receptacle/Pin.





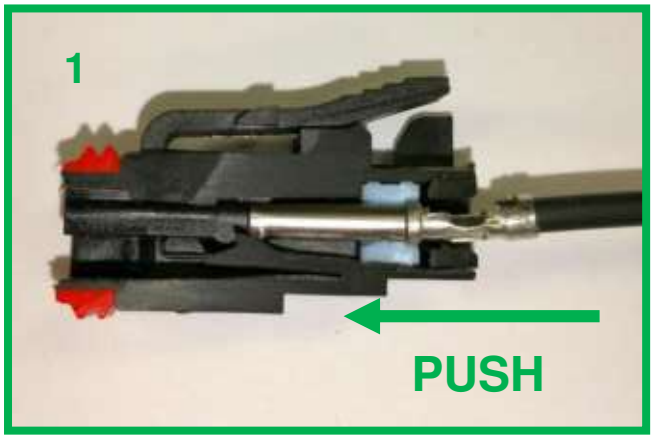
!!!!!!!DO NOT INSTALL THE TERMINATED CABLES AT AN ANGLE!!!!!!!





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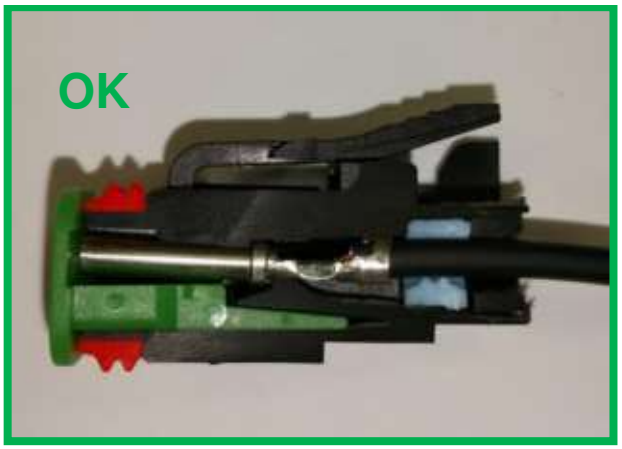
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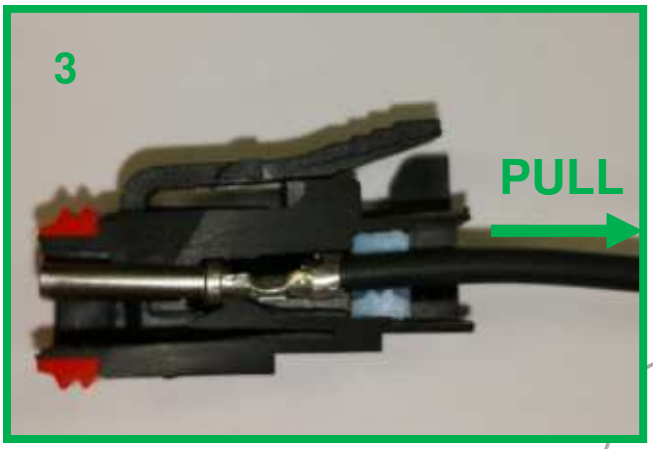


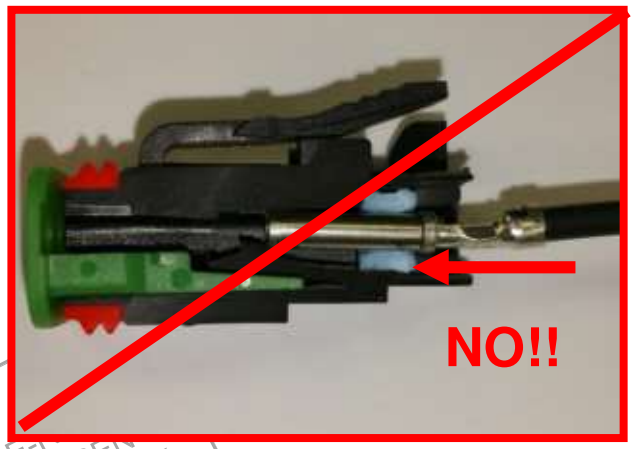
To ensure secure terminal insertion: Follow the Push, Click, Pull Method of terminal insertion

Never try insert the terminal when wedgelock (TPA) is already in position.









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4.4.3 TERMINAL INSERTION WITH FLEXIBLE CABLE

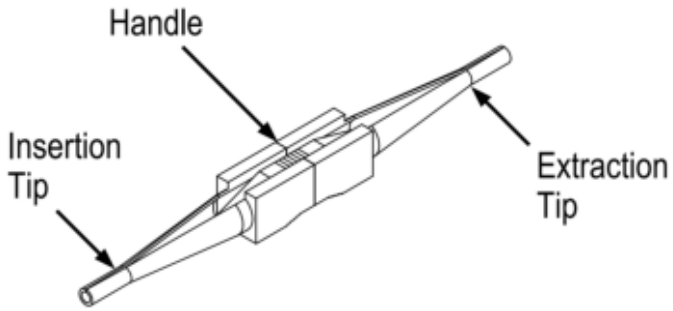
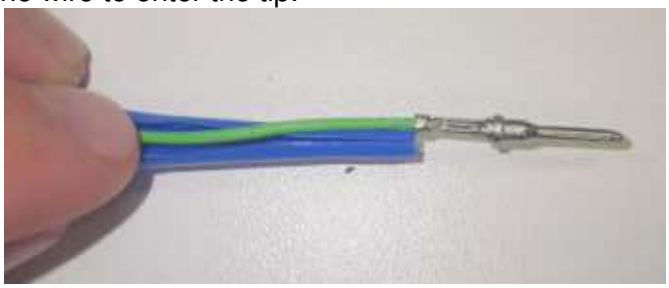


Figure 5: M81969/14-03 Insertion/Extraction Tool for size 16 contacts

Some cables can be difficult to insert into the connector cavities as they tend to bend, to avoid seal damage it is recommended that, on flexible cables, the M81969/14-03 Insertion/Extraction Tool is used to aid the installation of the contact.
To avoid any damage and ensure correct installation follow the below steps:

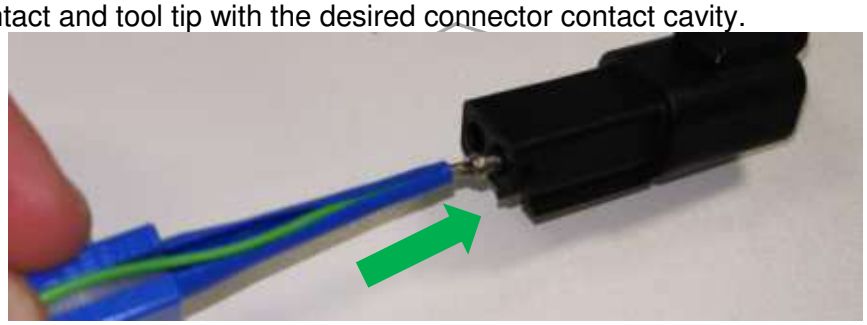
1. Place the wire over the slot in the tool tip. Apply light pressure on the wire until the tip spreads and allows the wire to enter the tip.



2. Slide the contact wire barrel into the insertion (blue) end of the tool tip until the tip butts against the shoulder of the contact.

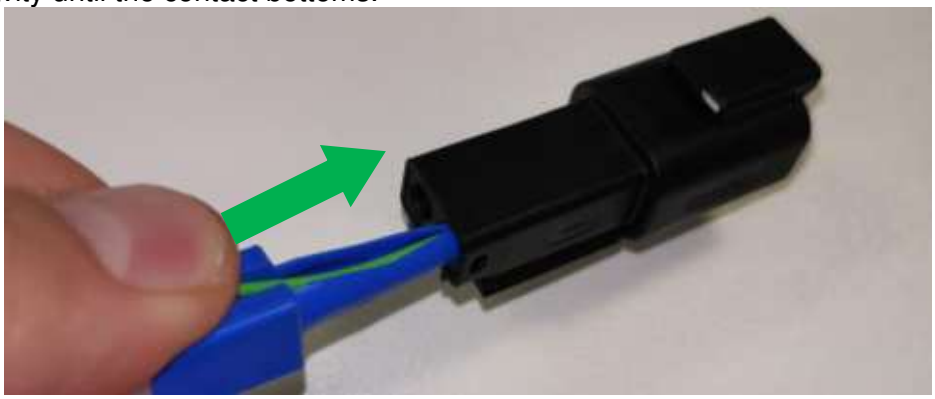


3. Align the contact and tool tip with the desired connector contact cavity.

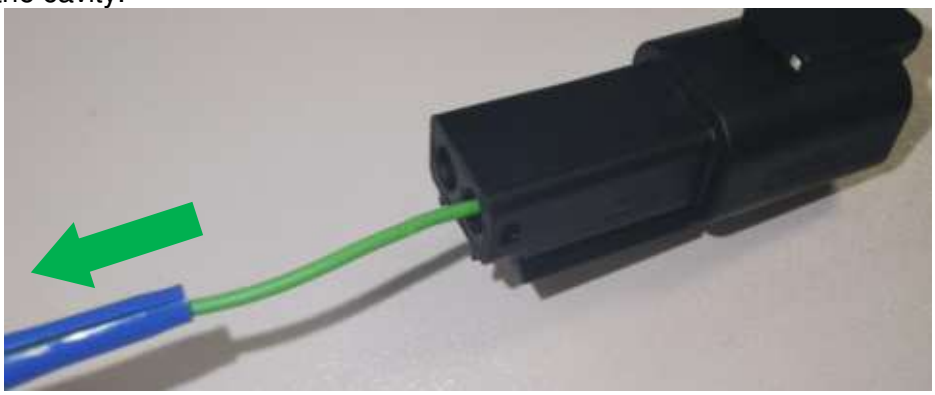


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4. Hold the wire against the serrations in the tool handle and push the tool straight into the contact cavity until the contact bottoms.



5. Remove the tool from the contact. Pull back lightly on the wire to ensure that the contact is secure in the cavity.



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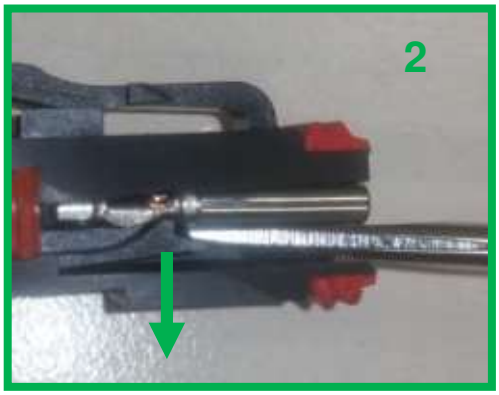
4.4.4 TERMINAL EXTRACTION

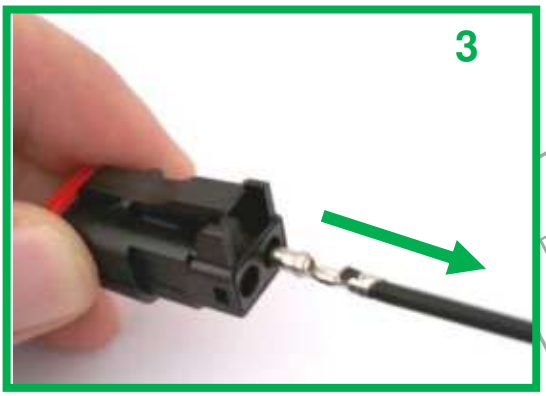
1. Lever the Wedgelock from the housing using the flathead screwdriver end of the removal tool (63824-5300) – Take care not to damage the 2-shot seal (For Receptacle wedgelock use hooked end of tool).
2. To remove the contacts, gently pull the cable backwards while at the same time releasing the locking finger by moving it away from the terminal/contact with the flathead screwdriver end of the removal tool. (For 3cct Receptacle wedgelock removal use needle nose pliers)
3. Simply pull out the terminated cable slowly and on centre.
   DO NOT PULL OUT CABLES AT AN ANGLE – ONLY EXTRACT ONE CABLE AT A TIME!

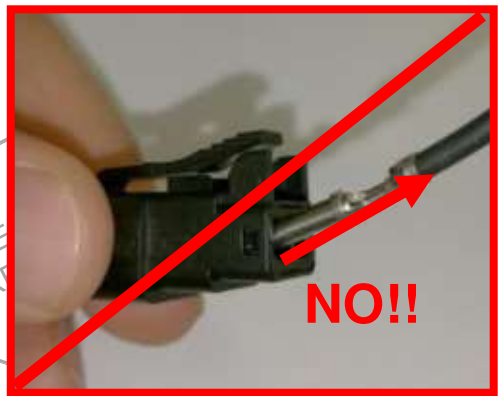






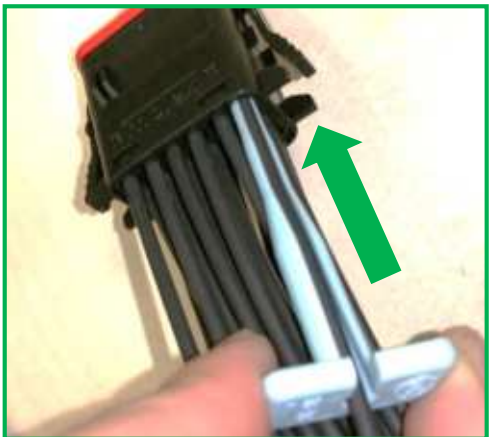


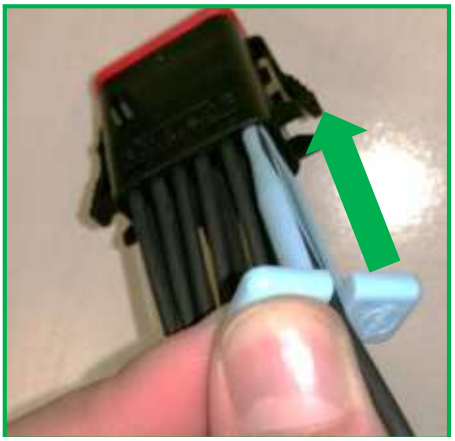




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4.4.5 TERMINAL EXTRACTION – 18cct CONNECTOR

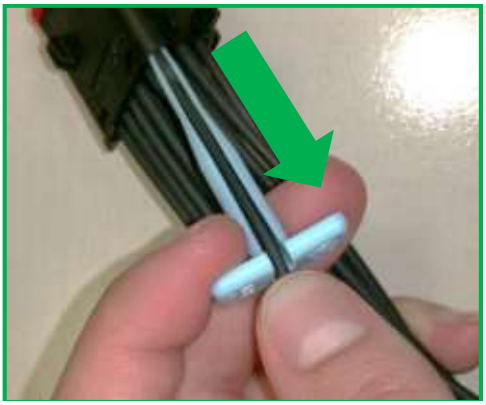


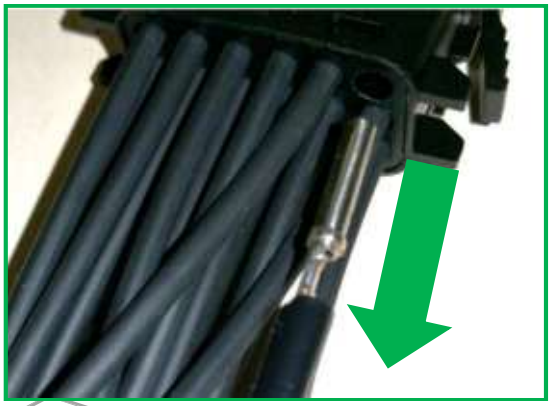


STEP 1:
With rear of connector pointed towards you, snap the removal tool (p/n: 63813-1900*) over the cable of the contact to be removed

STEP 2:
Slide tool along the wire and carefully insert the tool into the cavity until it engages contact and resistance is felt.

NOTE: DO NOT TWIST OR INSERT TOOL AT AN ANGLE





STEP 3:
Keeping the cable pressed against the removal tool gently pull out the cable.

STEP 4:
Pull contact wire assembly out of connector, taking care not to pull too quickly.

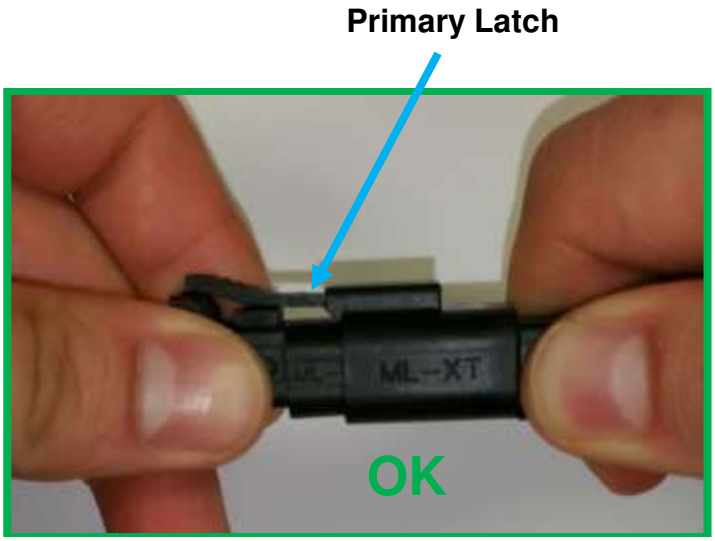
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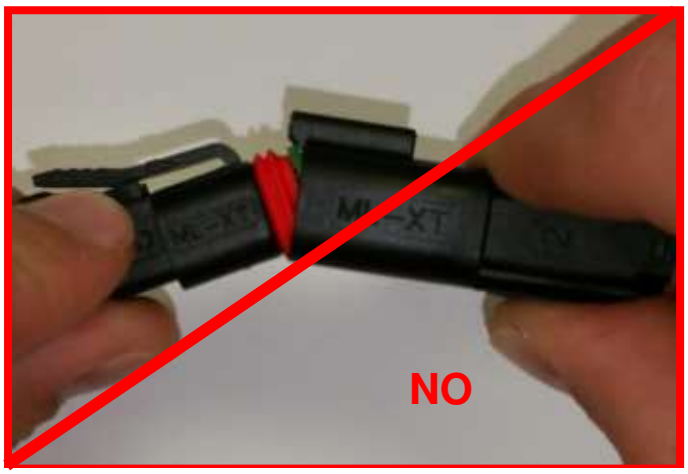
** M81969/14-03 Insertion/Extraction Tool may also be used*

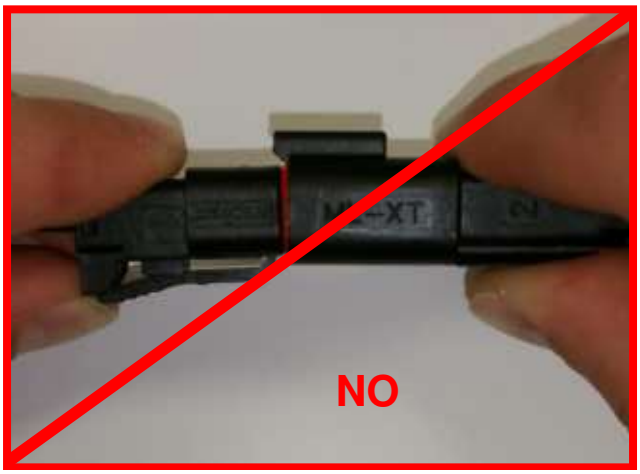
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4.5 CONNECTOR MATING

Note and align both plug and receptacle connectors and keying features (if present). Begin mating procedure by sliding the two connectors together, press firmly until you hear an audible click from the primary latch.





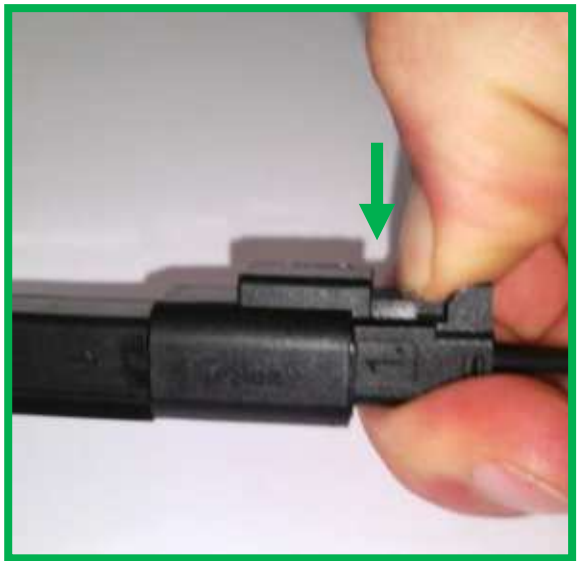


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4.6 CONNECTOR UNMATING

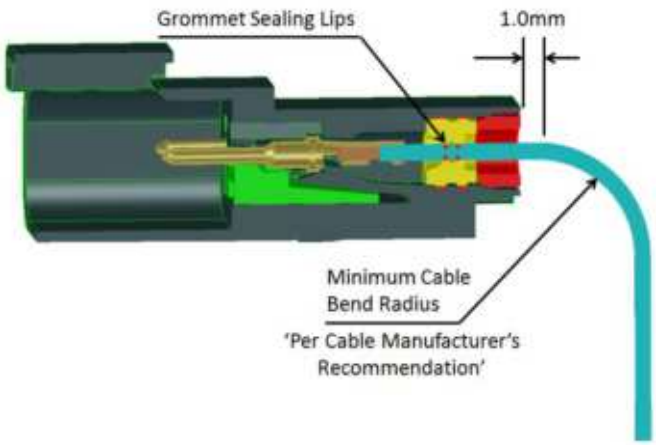
Depress the primary latch on the plug connector to fully disengage locking mechanism and then pull the plug connector out from the receptacle connector while keeping the primary latch depressed.





4.7 HARNESS ROUTING

The cable shall exit 1.0mm beyond the connector housing, co-axial with the grommet sealing lips. Bending of the cable shall be performed beyond this point to the recommended cable manufacturer's bend radius.



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4.8 SEALING PLUG INSTALLATION AND REMOVAL

Step 1:
Holding the sealing plug with large diameter end away from the connector, gently apply downward pressure to force the sealing plug into the cavity.



Step 2: With perpendicular motion, apply downward pressure to the large diameter end of the sealing plug.



Step 3: Apply pressure until sealing plug is forced to stop by contact with the back cover. Visually inspect the sealing plug large diameter end to confirm it is flush with cavity opening. If multiple sealing plugs are used close together, the large ends may not sit flush due to tight spacing. Maximum allowable distance from top of sealing plug to grommet surface is 5.00mm.





Step 4: To remove sealing plug from connector, grasp the large diameter end with fingers or small long nose pliers and pull until sealing plug is removed.

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4.9 HEATSHRINK TUBING APPLICATION

1. When using the heatshrink adaptor option of the ML-XT connector, heatshrink tubing may be used to add extra strain relief to the system. Firstly, ensure all crimped cables are latched in place as outlined in section 4.4.2.



2. Slide the heatshrink tubing over the heatshrink housing adaptor as shown below.





3. Apply heat and allow the heatshrink tubing to shrink around the housing and cables.



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