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Title:  Handling Manual for MX19 /MX19A series connector	Rev.	DATE	DCN No.	By	CHKD	APRVD
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Handling Manual						
Originating Dept.: Connector Div. 3rd Engineering Dept.						

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1. Purpose

This document provides the handling on MX19 / MX19A series connectors.

2. Applicable items

2.1 Housing

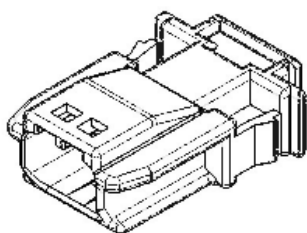
Table2-1 MX19/MX19A Connector Housing

Terminals No.	Type	Product Name	Body Color	Matseal color
2 (Fig.2-1)	Pin housing	MX19002P51	Black	Brown (Fig.2-4)
		MX19002P52	Gray	
	Socket housing	MX19002S51	Black	
		MX19002S52	Gray	
4 (Fig.2-2)	Pin housing	MX19004P51	Black	Brown (Fig.2-4)
		MX19004P52	Gray	
	Socket housing	MX19004S51	Black	
		MX19004S52	Gray	
2 (Fig.2-1)	Pin housing	MX19A002P53	Gray	Green (Fig.2-4)
	Socket housing	MX19A002S53	Gray	
		MX19A002S54	Black	
3 (Fig.2-3)	Socket housing	MX19A003S51	Black	Green (Fig.2-4)
		MX19A003S52	Light Blue	
		MX19A003S53	Gray	

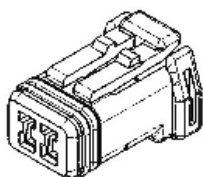
2.2 Contacts and Dummy plug

Table2-2 MX19 Contacts and Dummy plug

Type	Product Name	NOTE	
Pin contact	MX19P10K451	Sn plating	Fig.2-5
Socket contact	MX19S10K451	Sn plating	Fig.2-6
Dummy plug	MX19000XD1	Color: white	Fig.2-7

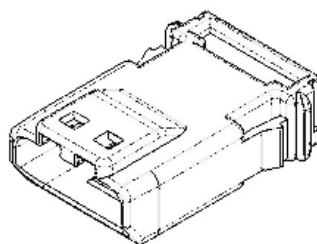


Pin housing

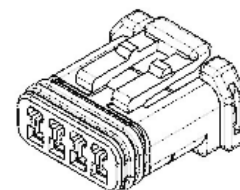


Socket housing

Fig.2-1 MX19 2-terminals type

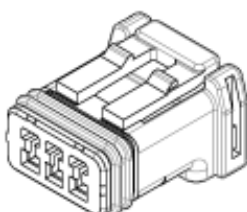


Pin housing

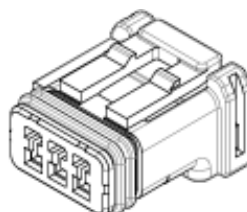


Socket housing

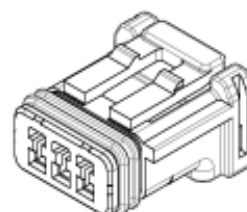
Fig.2-2 MX19 4-terminals type





MX19A003S51



MX19A003S52(Key type A)



MX19A003S53(Key type B)

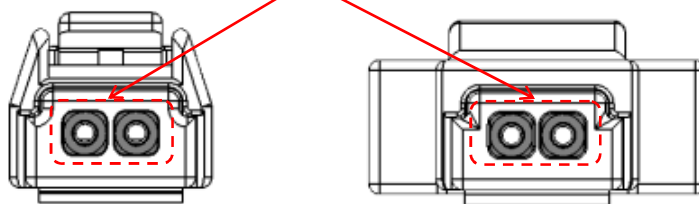
  Fig.2-3 MX19 3-terminals type

JAE Connector Div. Proprietary.

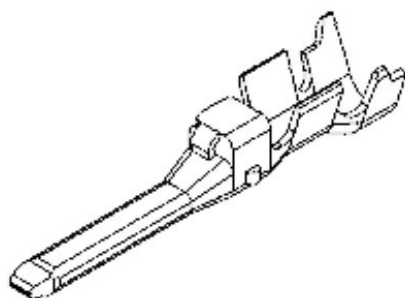
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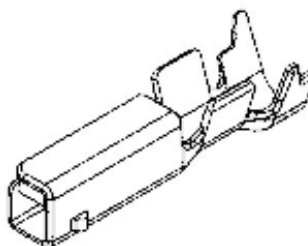
Check the matseal color from a housing back side.



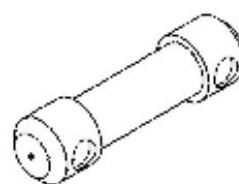
\triangle_7 \triangle_9 Fig.2-4 Matseal color confirmation



\triangle_7 \triangle_9 Fig.2-5 Pin contact



\triangle_7 \triangle_9 Fig.2-6 Socket contact



\triangle_7 \triangle_9 Fig.2-7 Dummy plug

3. Crimping \triangle_5

JAE's applicator is described on the following table.

Table3-1 JAE Crimping Applicator

Type	Automatic applicator	Semi-automatic applicator
Product name	350-MX19-3B	350-MX19-2

3.1 Applicable wire type \triangle_5 \triangle_7 \triangle_8 \triangle_9 \triangle_{10}

Table3-2 Applicable wire for MX19 / MX19A connector

Wire type	Conductor construction (No./Shape or size)	Calc. Conductor of cross-section [mm ²]	Wire insulator [mm]	Applicable housing
CAVS 0.3mm ²	7 / Round compressed	0.3717	$\phi 1.4 \sim 1.5$	MX19002P5* MX19002S5* MX19004P5* MX19004S5* MX19A002P5* MX19A002S5* MX19A003S5*
CPTL 22	7 / $\phi 0.13$	0.3717	$\phi 1.57$ (Ref.)	
CAVS 0.5mm ²	7 / Round compressed	0.563	$\phi 1.6 \sim 1.7$	
AVSS 0.3mm ²	7 / $\phi 0.26$	0.3717	$\phi 1.4 \sim 1.5$	
AVSS 0.5mm ²	7 / $\phi 0.13$	0.563	$\phi 1.6 \sim 1.7$	
FLRY-B 0.5mm ²	16 / $\phi 0.196$	0.4536	$\phi 1.4 \sim 1.7$	
FLRY-A 0.35mm ²	7 / $\phi 0.245$	0.33	$\phi 1.2 \sim 1.3$	MX19A002P5* MX19A002S5* MX19A003S5*
FLRY-B 0.35mm ²	12 / $\phi 0.191$	0.3402	$\phi 1.2 \sim 1.4$	

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3.2 Stripping length of wire insulators

Check the stripping length of wire insulators (refer to Fig.3-2.) On the wire treatment, must check the damaged insulator, damaged, missing and/ or disordered conductor (refer to Fig. 3-1.)

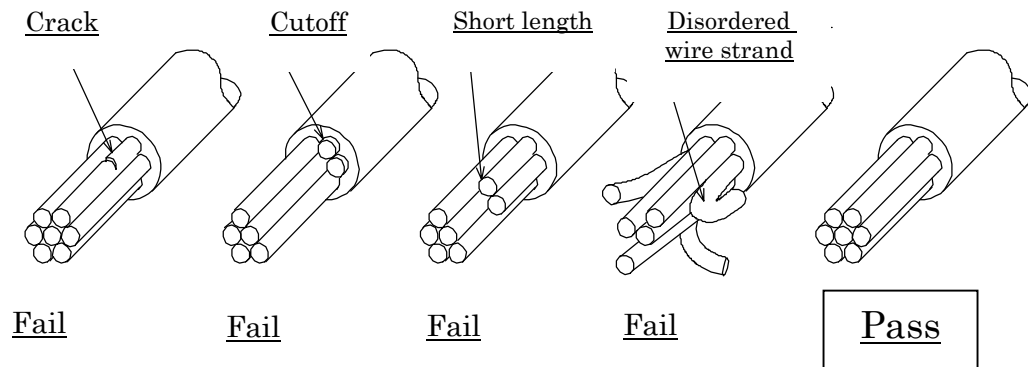
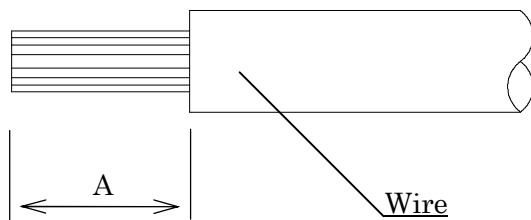


Fig.3-1 Defective wire treatment for crimping



Contact	Length A [mm]
MX19P10K451	2 ~ 2.5mm
MX19S10K451	
M19P09K3F2	
M19S09K3F2	

△ 7 Fig.3-2 Stripping length for MX19 contact crimping

3.3 Part description

3.3.1 Pin contact

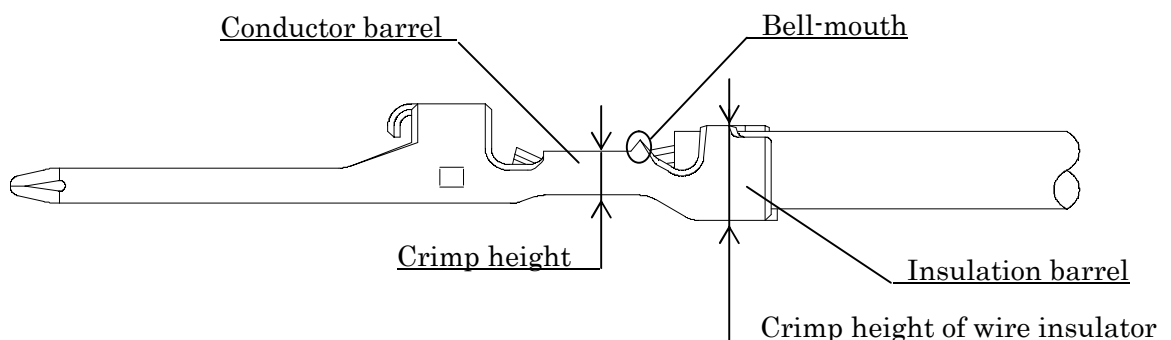


Fig.3-3 Part description of pin contact

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3.3.2 Socket contact

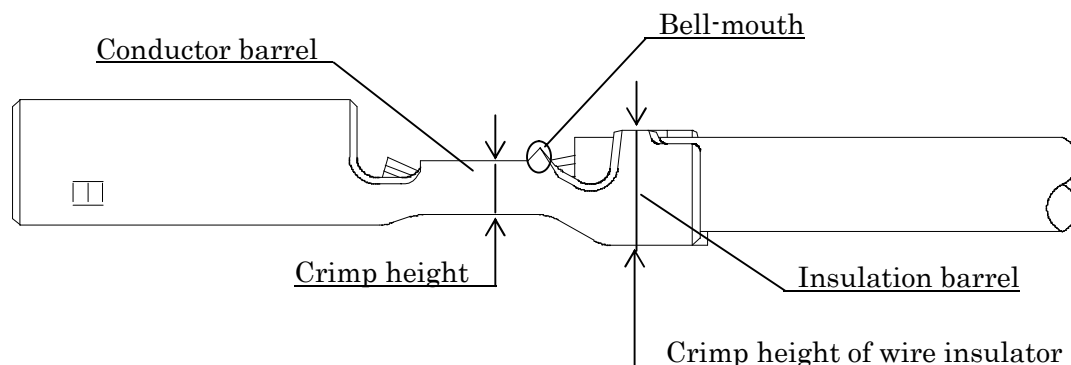


Fig.3-4 Part description of Socket contact

3.4 Criteria for crimping items \triangle_3 \triangle_4 \triangle_7 \triangle_{10}

"Properly crimped contact" is as follows:

1. Meet the crimp height shown in **Table 3-3**.
2. The bell-mouth (no crimping on conductor) is attached.
3. The tip of conductor sticks out 0.5mm (or less) from the conductor barrel.
4. All conductor of wire is within the conductor barrel.
5. Any wire insulator is **NOT crimped** into the conductor barrel.
6. No cracks and/ or burrs etc. is in crimping area.

Table3-3 Appropriate crimp height

Wire type	Crimp height [mm]	Crimp wide [mm] (Ref.)	Crimp height of wire insulator [mm]
CAVS0.3mm ²	0.73~0.83	1.48~1.54	1.6~1.7
CPTL 22	0.73~0.83	1.48~1.54	1.7~1.9
CAVS 0.5mm ²	0.75~0.85	1.52~1.58	1.7~1.9
AVSS 0.3mm ²	0.73~0.83	1.48~1.54	1.55
AVSS 0.5mm ²	0.75~0.85	1.52~1.58	1.7~1.9
FLRY-A 0.35mm ²	0.73~0.83	1.48~1.54	1.55
FLRY-B 0.35mm ²	0.73~0.83	1.48~1.54	1.4
FLRY-B 0.5mm ²	0.75~0.85	1.52~1.58	1.6

NOTE 1: Crimp height dimension is formed by JAE's applicator.

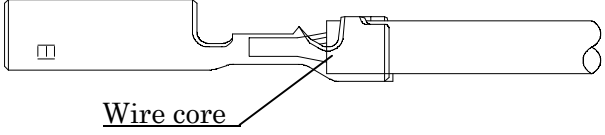
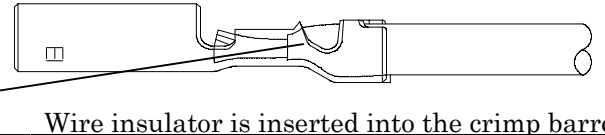
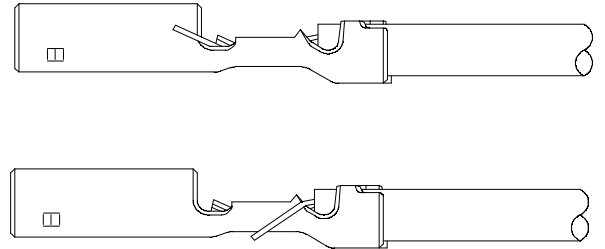
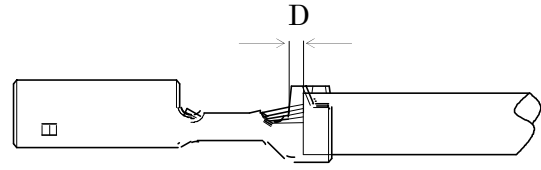
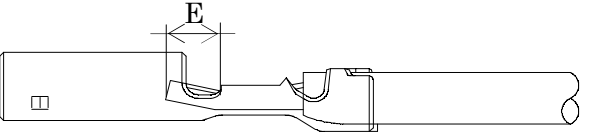
NOTE 2: Crimp width/ height and crimp height of wire insulators are reference values only.

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3.4 Criteria for crimping items \triangle_4 \triangle_5

If a crimped MX19 contact has any following defective item, the crimping work is failure. DON'T use the failure crimping contact.

Table3-4 Defective items for crimping work

No.	Defective item	Example
1	<u>Incomplete wire insertion</u> Not fully inserted conductor(s) into the crimp barrel.	 <u>Wire core</u>
2	<u>Shortage of wire stripping</u> Inserted the wire insulator into the crimp barrel.	 <u>Wire insulator is inserted into the crimp barrel.</u>
3	<u>Extrusion wire strand(s)</u> Conductor(s) on the outside of the crimp barrel.	 <u>Extrusion of conductor(s)</u>
4	<u>Failure treatment of wire stripping (too longer)</u> Not completely inserted wire insulator into an insulation barrel. (Dimension "D" over 0.3mm.) Over inserted (Dimension "E") the conductor(s) into the contact box. (Dimension "E" over 0.7mm from the conductor barrel end.)	 <u>Incompletely inserted of wire insulation</u>  <u>Over inserted of conductor</u>

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Table3-4 Defective items for crimping work

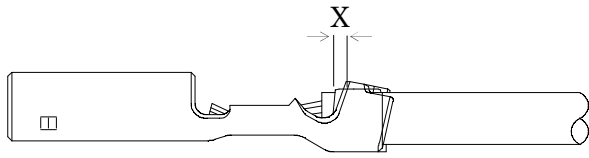
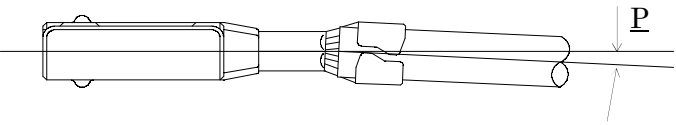
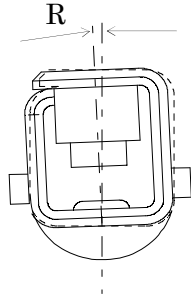
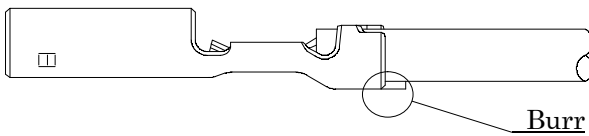
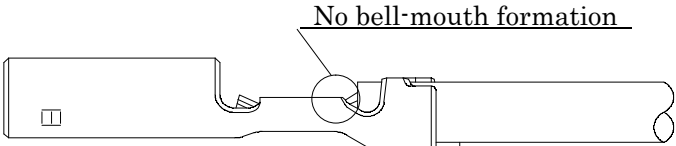
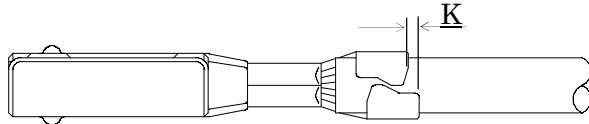

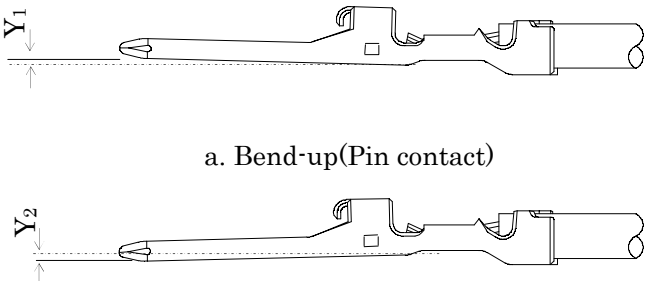
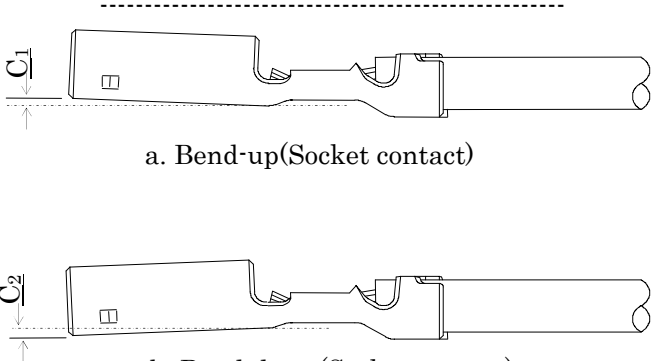
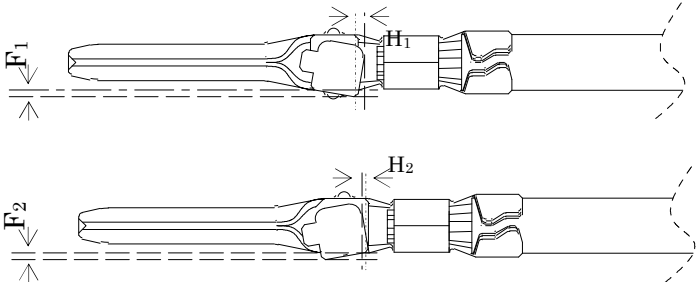
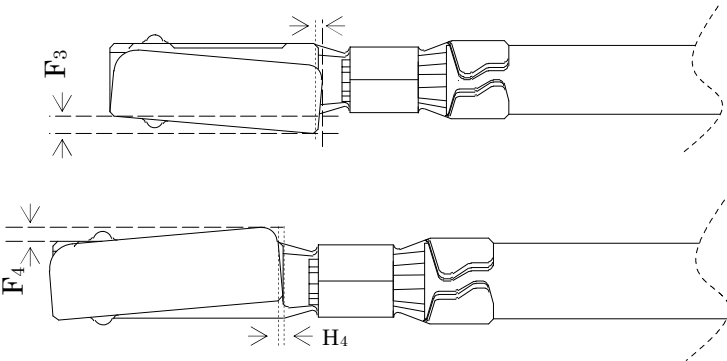
No.	Defective item	Example
5	<u>Inclined an insulator barrel</u> The incline over 0.3mm at any side.	
6	<u>Bended(On axis)</u> The angle P is over 3° bending, between crimping parts axis.	
7	<u>Twisted</u> The angle of a conductor barrel center to an insulator barrel center has over 2.5° twisted.	
8	<u>Burr after cut off the carrier</u> The burr after the cut off is over 0.2mm.	
9	<u>No bell-mouth formation</u> Failure of crimping, the bell-mouth is not formed.	
10	<u>Deformed of an insulator barrel</u> The deformation has the gap between insulator barrel parts over 0.3mm.	

Table3-4 Defective items for crimping work

No.	Defective item	Example
11	<p><u>Bend up/ down</u> </p> <p>“Bend-up (or down)” is based on the crimp barrel area.</p> <p>Y₁ (or Y₂): Pin contact's Bend up (or down) C₁ (or C₂): Socket contact's Bend up (or down)</p> <p>Bend-up : < 0.1mm Bend-down: < 0.2mm</p>	 <p>a. Bend-up(Pin contact) b. Bend-down(Pin contact)</p>  <p>a. Bend-up(Socket contact) b. Bend-down(Socket contact)</p>
12	<p><u>End-face deformation</u></p> <p>If you find a contact deformation (H_{1~4}) of following, as shown in right figures, never use such as a crimped contact.</p> <p>Check and adjust (or repair) a crimping machine (or a device.)</p> <p>In the case of a deformation is within 0.15mm but having dimensions F_{1~4} over 0.05 on a side, the crimping work is failed.</p> <p>F_{1~4} > 0.05mm H_{1~4} > 0.15mm</p>	 <p>Pin Contact</p>  <p>Socket Contact <u>Deformation of contact rear end</u></p>

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4. Contact and dummy plug insertion

4.1 Contact insertion

1. Visual inspection, the connector has no breakage, deformation, discoloration, and/or damage etc.
2. Aligned the axis and direction between a contact and a cavity.
3. Handling the wire of the near position of contact for not to be occurred bending.
4. Contact insertion is completely done until the contact locking part sounded.

(Check the terminal insertion by pulling the wire with little force.)

NOTE: If the contact insertion is tight or incapable, DON'T force to insert, check the direction of contact.
Tight (or incapable) insertion will cause a contact deformation, crack and/or disconnection.

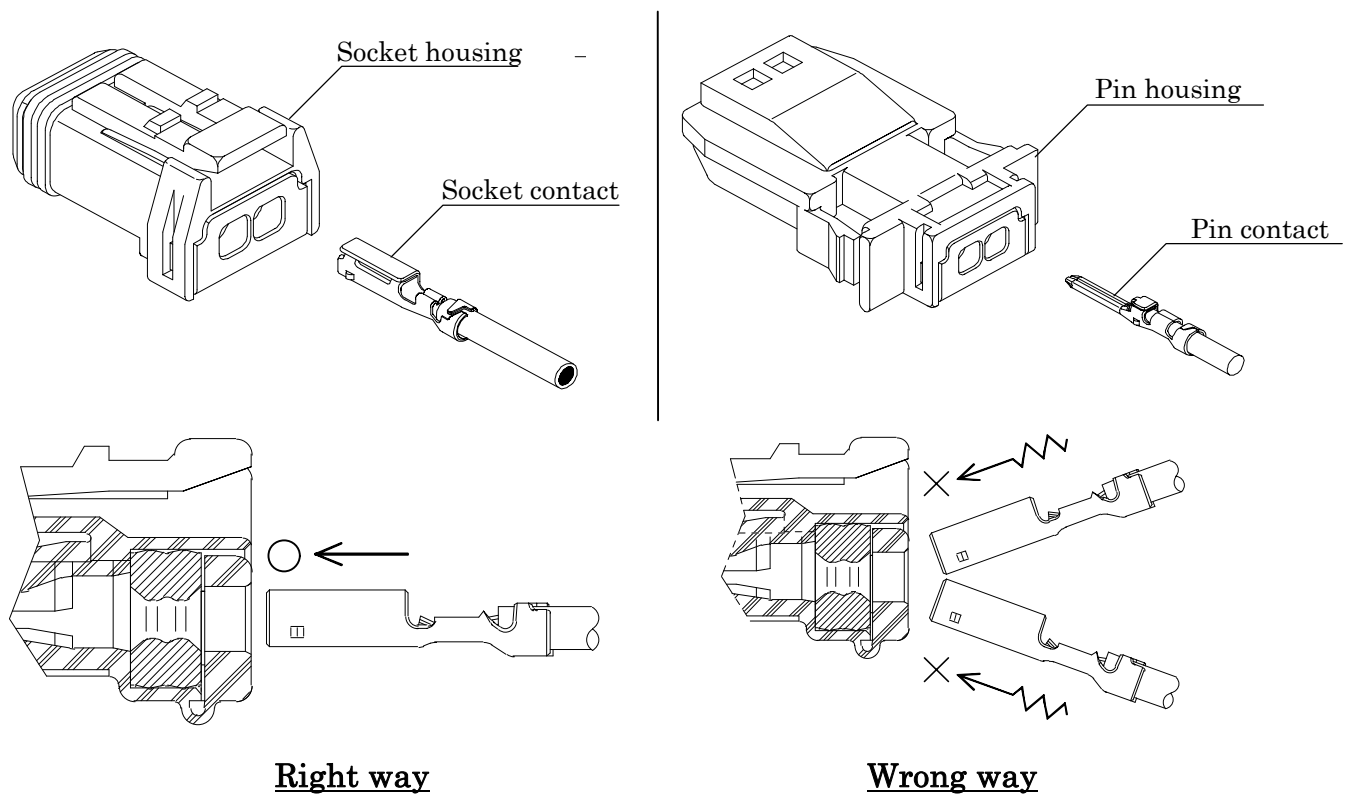


Fig.4-1 Contact insertion

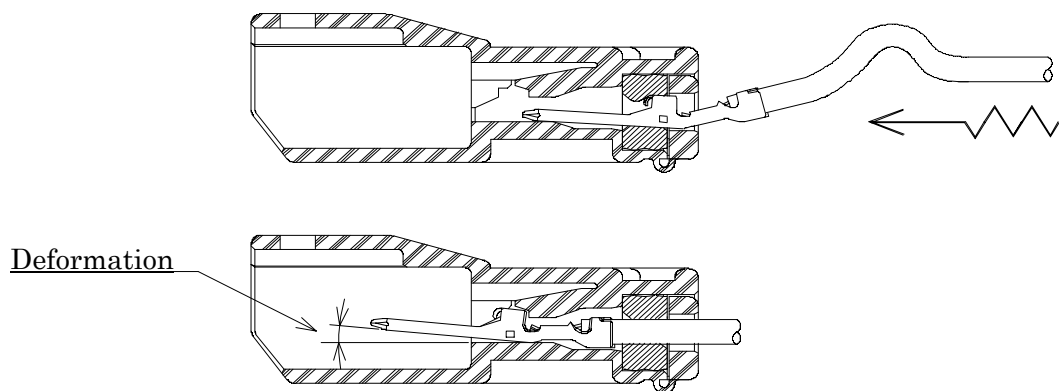


Fig.4-2 Example of contact deformation by wrong contact insertion

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4.2 Dummy plug insertion

1. Check by visual inspection, the connector has no breakage, deformation, discoloration, and/or damage etc.
2. Aligned the axis between a dummy plug and a cavity.
3. Inserting a dummy plug into cavity, insertion is the end-face of dummy-plug by connector's.
Acceptance Criteria: Base on the housing end-face, Dummy plug's end-face is within $0 +0.5/-0.5\text{mm}$.

NOTE: DON'T apply unnecessary force to on inserting dummy plug.

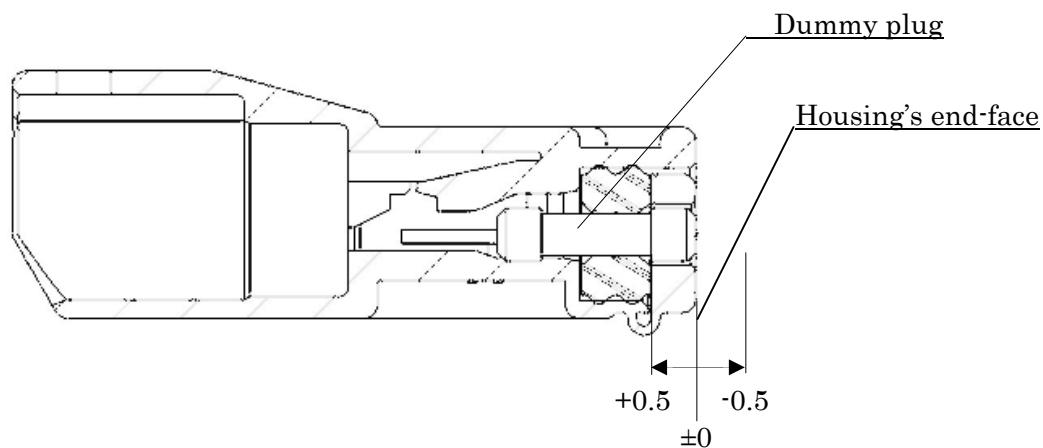


Fig.4-3 Dummy plug insertion

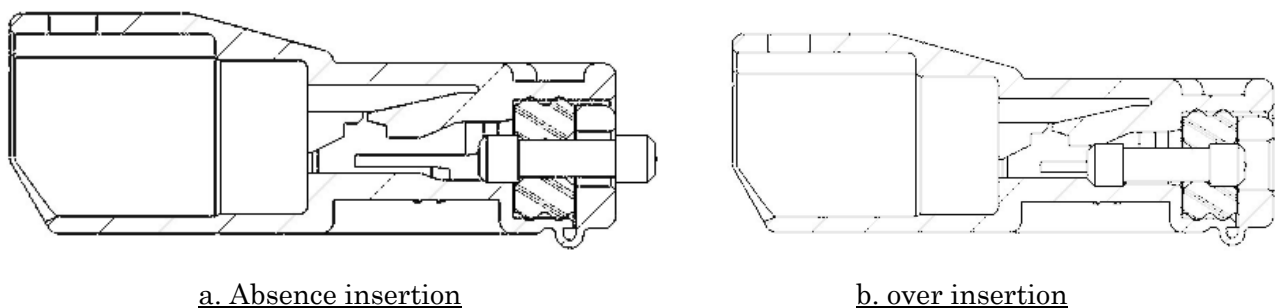


Fig.4-4 Failure dummy plug insertion

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5. Contact withdraw

1. Visual inspection, the connector has no breakage, deformation, discoloration, and/or damage etc.
2. Push lightly the wire with crimping contact.
3. Insert a withdrawing tool into a tool cavity, as following Fig.6-2 and Fig.6-3.
4. When the toe of withdrawing tool met the molding lance, release contact locking.
5. Withdraw the wire on straight axis.

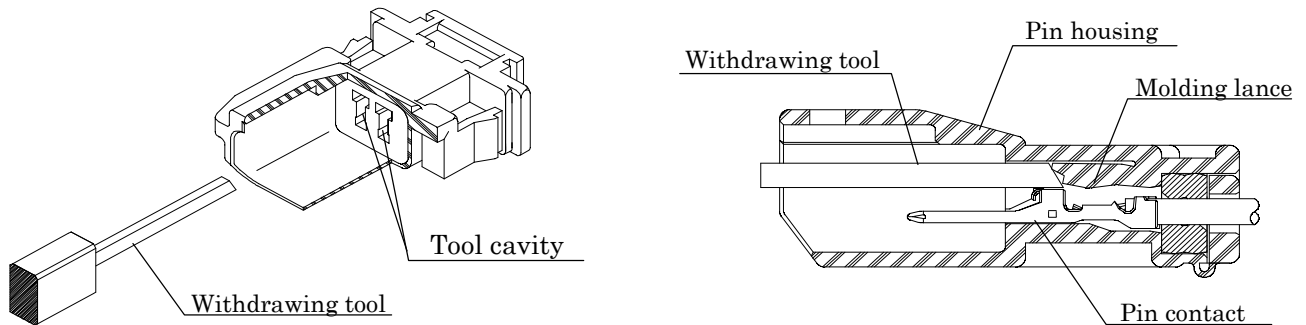


Fig.5-1 Pin contact withdraw

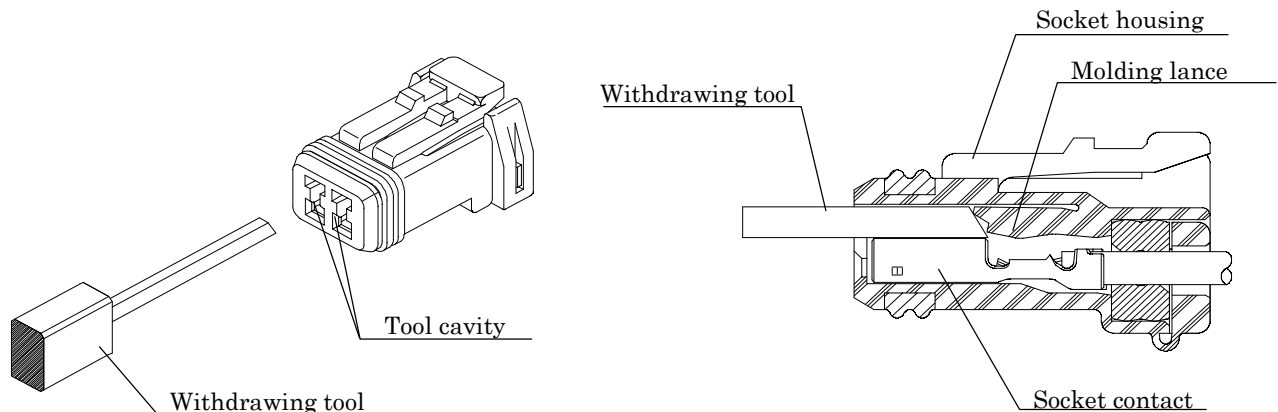
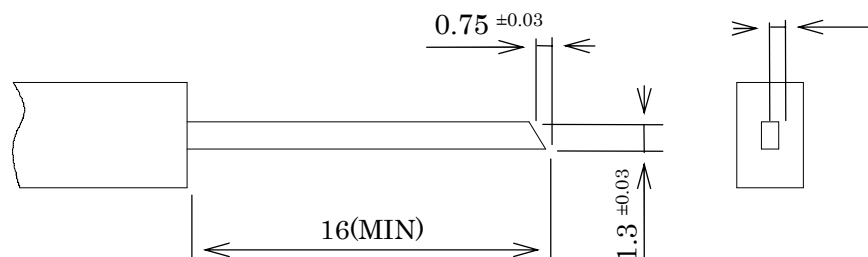


Fig.5-2 Socket contact withdraw

NOTE: Suitable dimension for withdrawing tool (JAE's withdrawing tool is "ET-MX19.")



NOTE: DON'T snag a contact on grommet by forcedly withdrawing.

NOTE: The limitation frequency for withdrawing at one cavity is 3 times. If you find any damage and deformation, DON'T use it, change to the new one.

NOTE: DON'T apply unnecessary force on withdrawing.

NOTE: Withdrawing tool insertion is only a "tool cavity," never inserting the contact cavity.

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6. How to engage connector

6.1 Engaging

1. Check the contact insertion.
2. Check by visual inspection, the connector has no breakage, deformation, discoloration, and/or damage etc. in contacts and housing.
3. Aligned the direction with the engagement aperture.
4. Insert the connector into the housing until the lock parts sounded.

NOTE: DON'T apply unnecessary force to connector on inserting/separating connector.

NOTE: If housings insertion is tight or incapable, DON'T force to insert, check the direction of contact.

Tight (or incapable) insertion will cause a connector deformation, crack and/or disconnection.

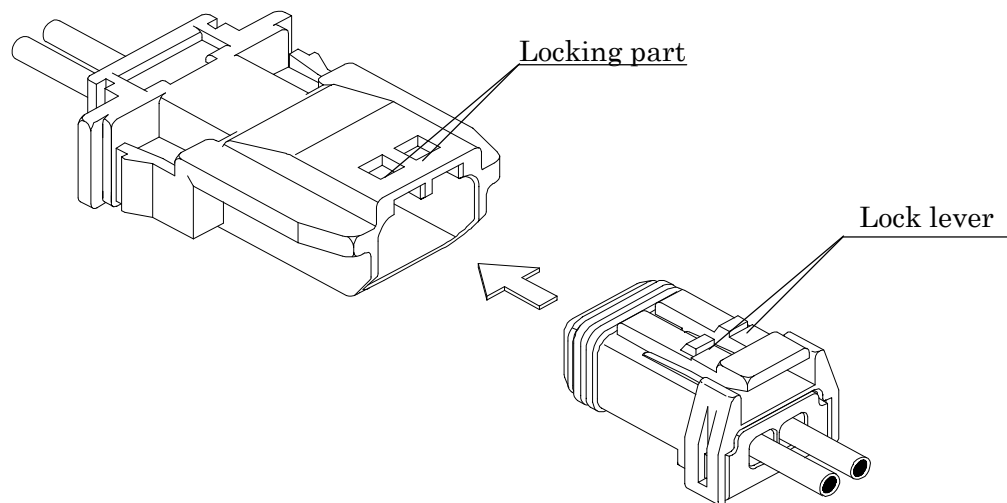


Fig.6-1 Connector insertion

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6.2 Connector separation method

Hold socket housing, and pull out the connector straightly;

- 1: Depressing the lock arm of socket housing.
- 2: Releasing the engagement lock.

NOTE: On separating the connector, DON'T pulling only wires and prying the connector.

NOTE: In case of incapable of separation, DON'T force it to pull out.

Check the engagement lock is released.

NOTE: DON'T apply unnecessary force to connector on inserting/separating connector.

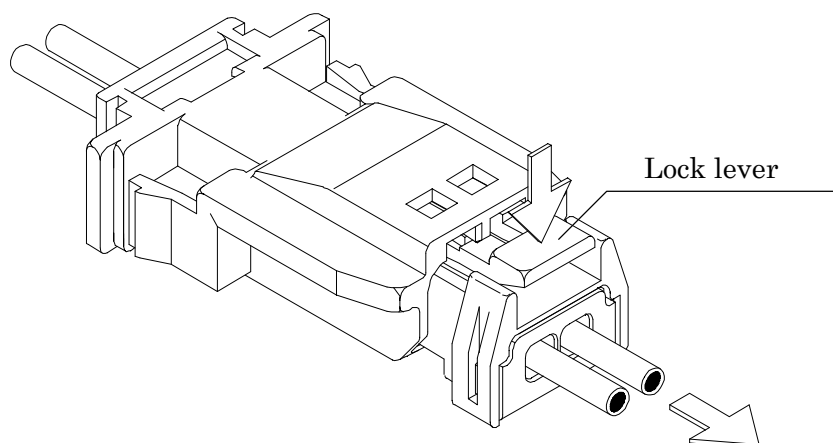


Fig.6-2 Connector separation

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7. Cautionary Statements

7.1 Sealing rubber set

Care must be taken when handling MX19 and MX19A series connector body to avoid rotation of the seal. Once the seal has been rotated, twisted, turned or displaced, JAE cannot take liability for loss or displacement of seal in any post-JAE operations, and can offer no guarantee on the performance of the connector.”

NOTE. Extreme care is to be exercised when using rubber, latex or rubber coat fabric gloves. These gloves are designed to have high tactile adhesion & will cause displacement of the seal if mis-handled.



(a) Rotated



(b) Twisted / Turned



(c) Displaced

Fig.7-1 Examples for failure state of seal ring

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7. Cautionary Statements

7.2 Caution



Caution

Comply strictly with the following matters because of possibility of physical damage and/or connector failures.

- Perform the engagement of connector straightly until the "click" sound.
- Be careful not to slide and/or pinch your fingers accidentally because some force may be applied to your fingers at the time of connector insertion/withdrawal. Moreover, DON'T pull a cable at the time of withdrawal.
- DON'T touch the contact area, or adhere any foreign materials on.
- When withdrawing a contact from the connector, be sure to use an exclusive tool.
- Exercise care to avoid injuring at the time of cable treatment, pre-mounting, soldering and using other tools.
- Care must be taken to prevent excessive current (over load) as this might be cause overheating and fire.
- DON'T disassemble each component of housing.
- DON'T insert anything other than the specified contacts to housing.
- For handling on connectors and contacts, comply with the provisions in this document. Unreasonable handling is not permissible.