

APPLICATION SPECIFICATION

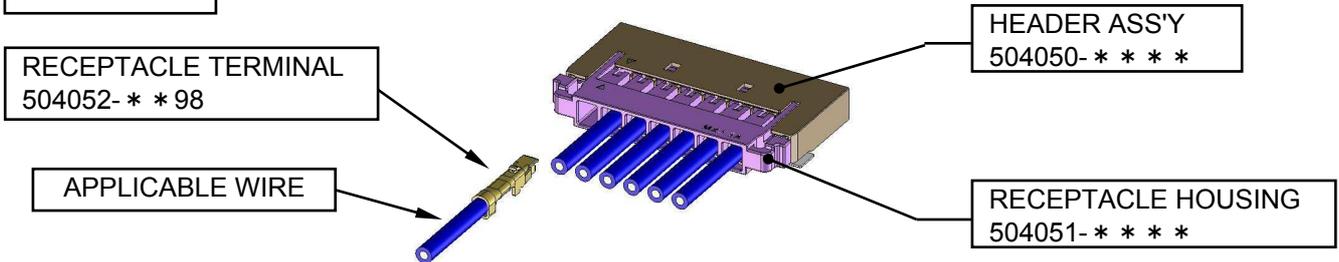
1.5mm PITCH W/B CONN. H=2mm R/A TYPE

[1.APPLICATION]

	Product Name		Part Number
HARNESS SIDE	RECEPTACLE HOUSING		504051 series PKG : Vinyl Bag
	RECEPTACLE TERMINAL		504052 series PKG : Chain & Loose
	APPLICABLE WIRE (※)	504052 series	AWG#24~32
	APPLICABLE CRIMP DIE MODEL No. (※)		578116-3000
ONBOARD SIDE	HADER ASS'Y	R/A TYPE	504050 series PKG : EMBOSS

※ Please refer to CS-504052-001/-002 for further details.

Structure



- Before using —
- Be sure to read the following precautions before using connector.
 - Keep this manual handy for later reference.
 - The displays and illustrations shown in this manual are for illustrative purposes only, and may differ somewhat from the actual items they represent.
 - The contents of this manual are subject to change without notice.

REV.	A	B												
SHEET	1~27	1~27												
REVISE ON PC ONLY						TITLE:								
B	変更 REVISED ECN No. J2012-1376 '12/05/07 T.HANYU					1.5mm PITCH W/B CONN. H=2mm R/A TYPE APPLICATION SPECIFICATION								
REV.	DESCRIPTION					THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION								
DESIGN CONTROL J			STATUS			WRITTEN BY: T.HANYU	CHECKED BY: K.ASAKAWA	APPROVED BY: Y.ITO	DATE: YR/MO/DAY '12/03/16					
DOCUMENT NUMBER AS-504051-002												FILE NAME AS-504051-002.doc	SHEET 1 OF 27	

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[2.Instructions]

2-1. Product exterior

- ① There is no influence in the product performance though the black spots or bubbles etc. might be confirmed to the plastic part of this product and the shade might be different (discoloration by secular distortion etc.).
- ② This product has some gold plating areas and marks can sometimes appear in gold plating, but this has no impact to the function of this product.
- ③ Resin and terminal plating can have some changes in color after reflow but this has no negative impact to the function of this product.
- ④ Connectors may be damaged by certain mounting machines. Please confirm before use.

2-2. Applicable wire and crimp tooling

- ① Guarantee is void when product is used with wire not conforming with product specifications.
- ② Guarantee is void when product is used with tooling not specified by Molex.
- ③ The recommended electric wire is tinned plating. Please confirm separately about the use of other electric wires.

2-3. About safekeeping before harness process and the surface mount process

- ① Please keep product with the delivery being in a state. And please safekeeping it under normal temperature and humidity where avoid direct sunlight.
- ② Please do not allow external force to be applied during product storage.
- ③ During handling avoid shocking or dropping products as it may result in product damaging.
- ④ First use of older manufacturing lots is recommended.
- ⑤ Keep product in original packaging before using.
- ⑥ This product should be inspected for appearance and solder performance when used after expiration date.

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2-4. Harness process and surface mount process instruction.

- ① Please confirm products and crimp machine, crimp condition, an applicable wire are equal to product drawing, crimp specifications before work.
- ② Beware of unintended damage caused by dust, debris, or foreign objects before using this product. It cause that cannot satisfy the insertion performance to the housing and electric performance.
- ③ Please do not touch the terminal by a direct hand.
- ④ When a terminal gets twisted or tangled before or after crimping, please do not pull it forcibly. The terminal may become damaged.
- ⑤ Avoid damaging product during work in process or in finishing goods. Product can get damaged and cannot function properly as a connector.
- ⑥ Please do not put a product and an harness half-finished goods in the following condition.
 - Garbage
 - Corrosive material
 - Corrosive gas
 - High temperature and high humidity
 - Direct sunlight

The above-mentioned condition causes poor contact and the corrosion of the terminal and the insulation performance deterioration of the housing.
Please keep for kind attention of the safekeeping to boxes.
- ⑦ Please do not add loads to connector and harness half-finished goods during production, packaging, transportation, or storage. It may cause damage and result in poor connector performance.
 - When pulling the electric wire of harness half-finished goods, it may cause contact defectiveness by adding load to contacts, crimp parts and lock parts. When performing the guidance wiring of the electric wire, don't exceed forces the connector can't withstand.
- ⑨ Do not damage receptacle crimp housing and a crimp terminal intentionally. Product performance can be affected by this condition.
- ⑩ When opened packing, please use it up on the day. Moisture absorption or drying cause the deterioration of materials by neighboring atmospheres. When cannot use it up, please do sealing of a bag again, and keep it in a box.
- ⑪ Please be careful to injuries in the edges part such as metal parts when handling a connector.
- ⑫ To avoid injury please be careful in handling of paper between terminals and metal carrier on reels.
- ⑬ Our evaluation is with the use of standard rigid PCB. When to be used on flexible printed circuits (FPC) please evaluate first.

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- ⑭ Please solder it in all terminal departments and the nail part. A non-soldered part may become a cause of defect.
- In the case of changing our recommended board pattern size or design, please consult in advance because such changes may cause defects.
- ⑮ Please do not load the connector. For example, movement of PCB in the state where connector mating was carried out causes damage.
- ⑯ Please do not stack PCB after connector has been soldered to PCB.
- ⑰ Please follow the conditions of specifications, when connecting connector with a soldering iron. For conditions beyond specifications, the connector may be damaged.
- ⑱ When use solder iron, please do not use excessive solder and flux. It cause poor in contact performance by solder rise and flux rise.
- ⑳ There may be changes in color of the resin part and the case that occurs due to twisting in the terminal plating parts due to flow conditions, but there no degradation in product performance.
- 21 Do not coil electric wires around the housing or the gap of the housing lock during harness processing and harness product packing. In addition, please do not pull an electric wire by force when an electric wire has coiled itself around the housing and the gap of the housing lock. If wire becomes tangled this may cause terminal damage. Please remove wires in such a way that load is not applied to housing lock.

2-5. About use in the machinery.

- ① Vibration of an electric wire or printed circuit board due to machinery vibration or rotation must be avoided to prevent connector damage at the connector point of contact. Decrease in contact performance due to abrasion may be caused. Therefore, please fix electric wires and printed circuit boards in machinery and arrange for measures to hold resonances in check.
- ② Do not fix printed circuit boards only using connectors. They must be fixed or supported by other means.
- ③ Please do not touch a terminal, fitting nails in board mount front and back.
- ④ Please perform the connector an insertion withdrawal along a fixed axis. The diagonal insertion withdrawal causes the damage of the connector.
- After mating, do not intentionally apply force to or rotate a connector. Such force may cause connector destruction or solder cracking.

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- ⑥ If an electric wire is pulled after mating a connector, it may damage contact or crimping points or the lock region and result in contact defectiveness. When performing the guidance wiring of the electric wire, the external force that it is impossible for a connector to do please do not increase it. Keep wire loose to avoid excessive stress.
- ⑦ When withdrawing the connector, please hold wire lightly and remove the lock securely using the entire finger.
- ⑧ Plastic lances can be damaged after removing crimp terminals. Without fail please use a new crimp housing when repairing a connector.

2-6. About rating / a performance standard.

- ① Please use it within the rating / the standard of product specifications.
- ② Product is not designed for usage in “hot-plug” applications where power is on.
- ③ When considering use of the connector, please confirm that machinery design standards are satisfied.
- ④ In order to avoid short circuits, please do not allow connectors to contact metal objects.
- ⑤ Current more than the rated amount should not be used.

2-7. About for use.

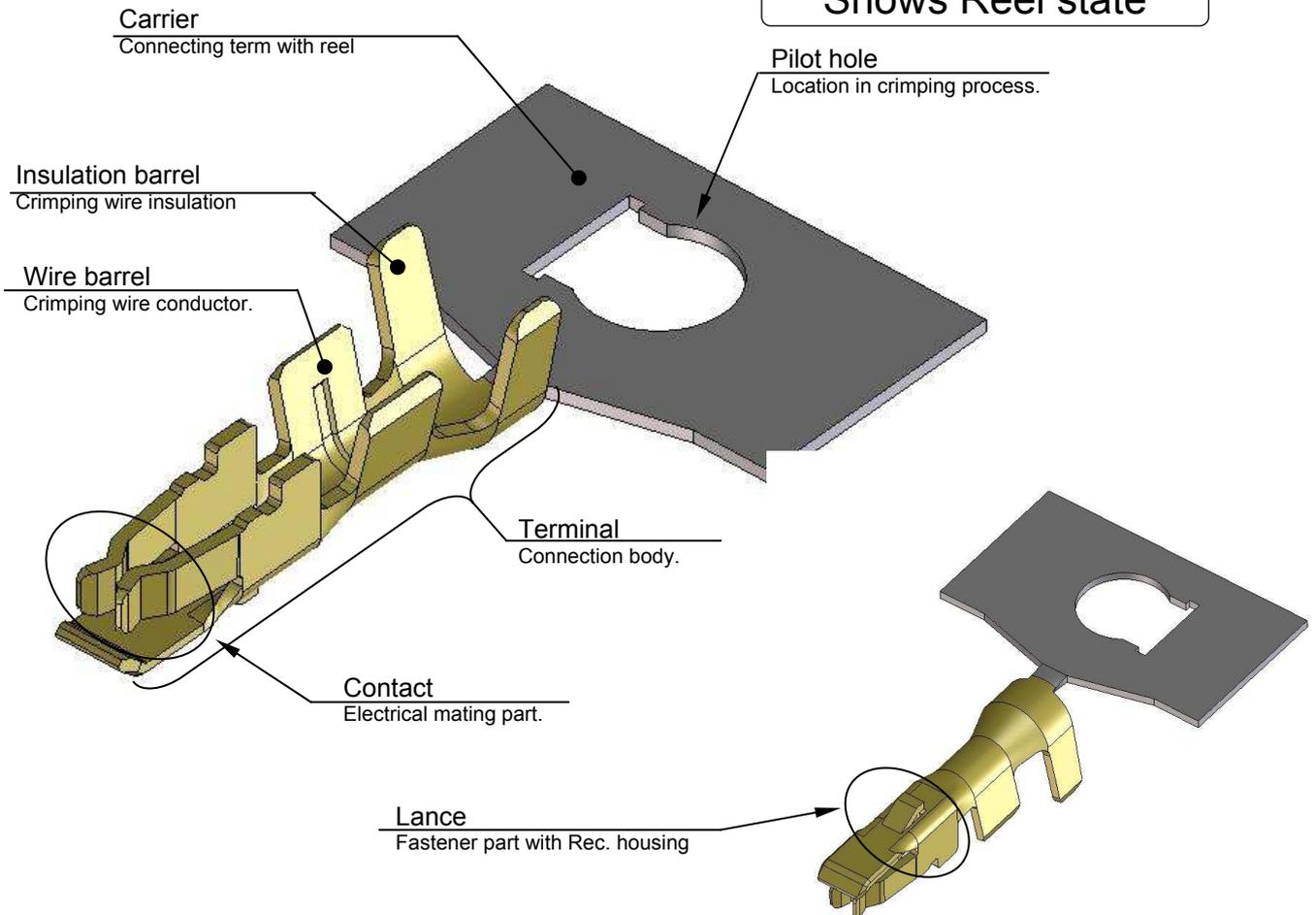
- ① This product is not designed and produced for the machine used under the condition concerning life or for using to system. If you use this product for special use for example medicine, aeronautics space and atomic power etc., please confirm us before using.
- ② Please contact us without fail before using if you plan to using to automobile and ship etc. (We will consider that the product can be applied to specification condition.)
- ③ Please avoid using outside the room or under similar environment.

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【3. The name of each part & explanation】

3-1. Receptacle crimp terminal: 504052 series.

Shows Reel state



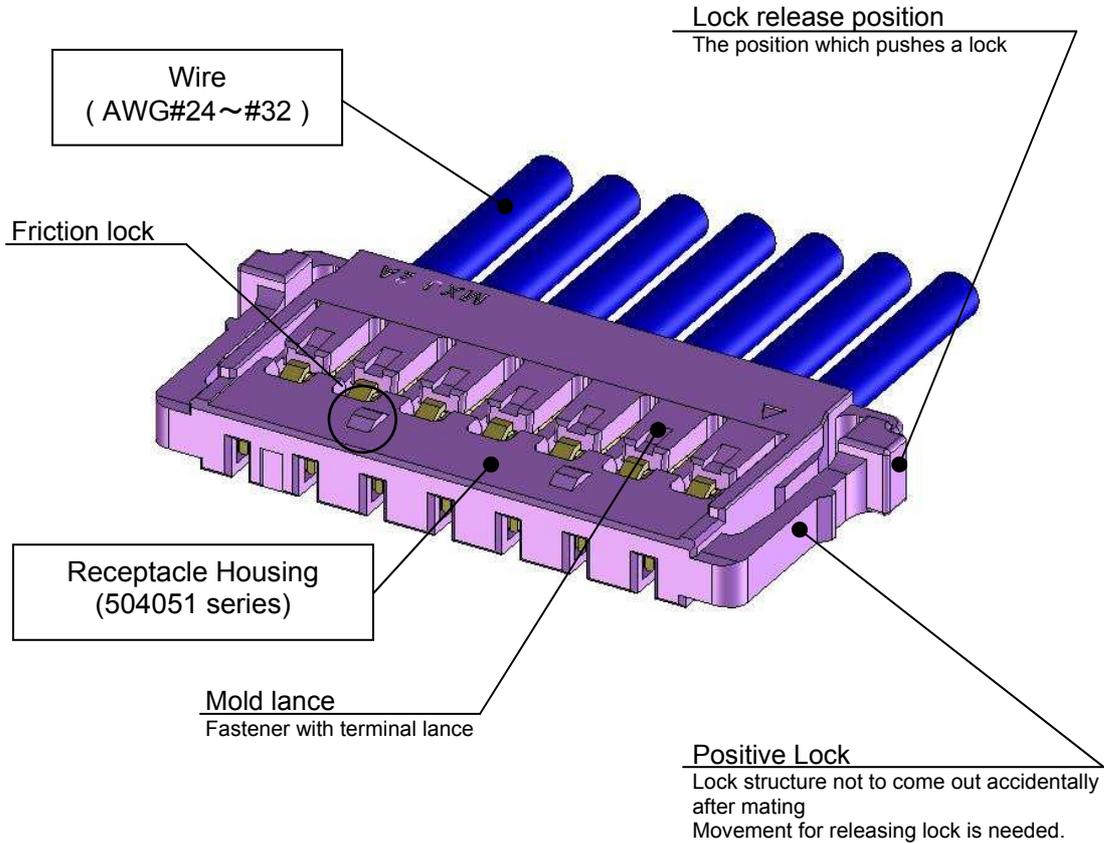
※ Please refer to sales drawing (SD/RSD-504052-001/-002) for product form and its

—APPLICABLE WIRE AND APPLICABLE CRIMP DIE MODEL—

Part Number	WIRE SIZE	CONDUCTOR SPEC.
5040520098	AWG#24~28	TINNED COPPER WIRE
5040520298	AWG#30~32	
APPLICABLE CRIMP DIE MODEL No.		578116-3000

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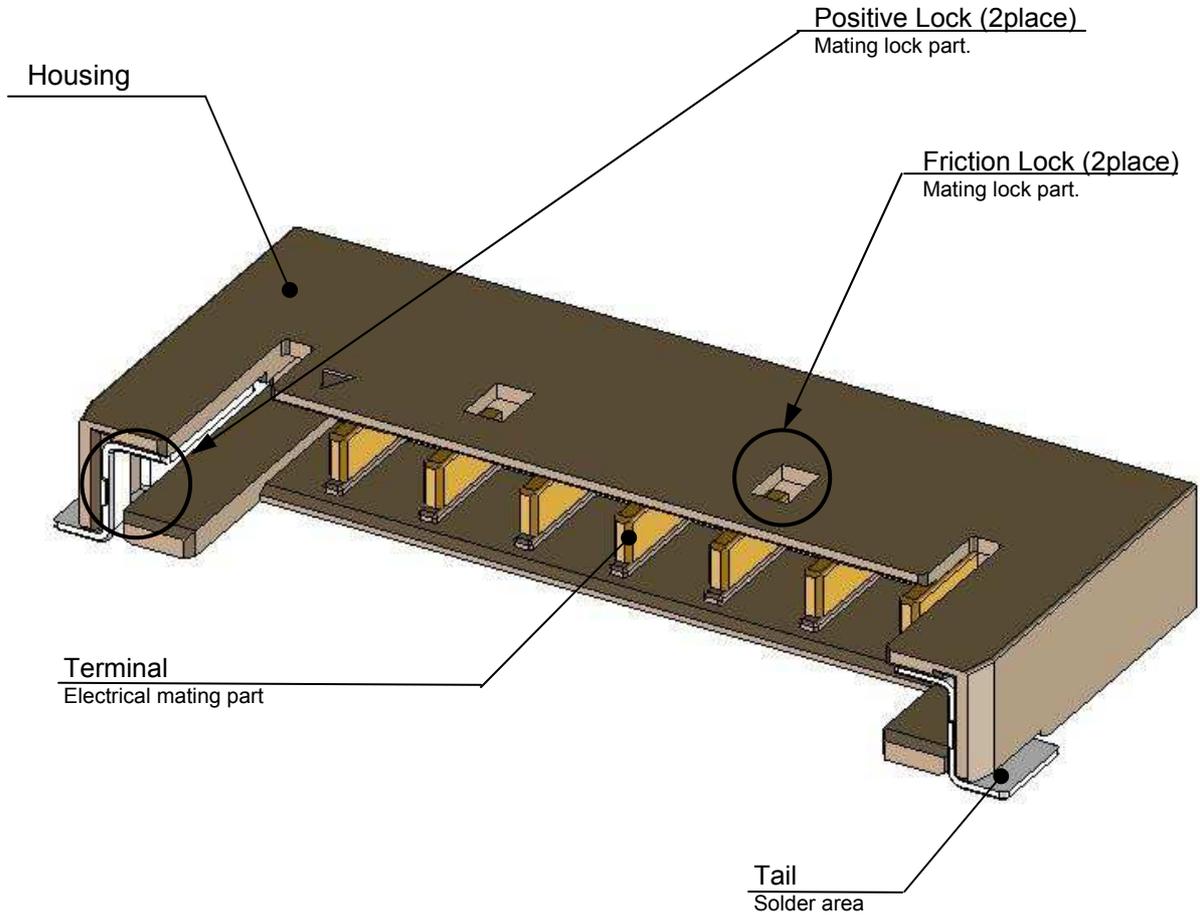
3-2. Receptacle housing: 504051 series



※ Please refer to sales drawing (SD/RSD-504051-001/-002) for product form

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3-3. Header Assembly: 504050 series (RAIGHT ANGLE TYPE)



※ Please refer to sales drawing (SD/RSD-504050-001) for product form and its

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【4. The confirmation item of crimping wire】

4-1. The appearance before crimping.

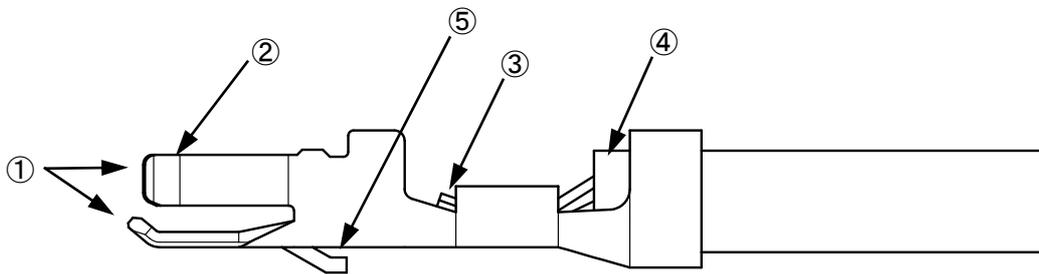
When using the loose terminals products before crimping, please make sure that there is no deformation of the crimp Terminal.

If you have something caught between the terminals, please do not remove them forcibly.

Please refer to sales drawing (SD/RSD-504052-001/-002) for product form and its dimensions.

4-2. The appearance after crimping.

Shows the after crimping confirmation item as follows. Please refer to CS-504052-001/-002 for Specified crimp height, pull testing, and applicable wire specifications.



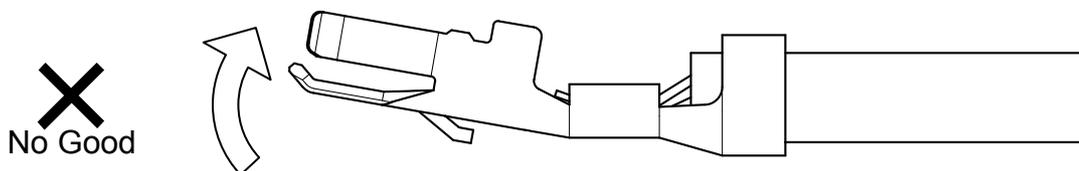
- No visible terminal damage.
- ② No visible spring contact area damage or deformation.
- ③ All wire strands are in conductor barrel.
- ④ The insulator part of the electric wire is located wire barrel and insulation barrel midway.
- ⑤ No damage with terminal lance.
- ⑥ No damage with appearance. (Dirt / foreign objects)

4-3. The non-conformity item.

Please warn the arrival crimping delinquent to show as follows in particular. It affect the insertion work and affect a product function.

① Bend up

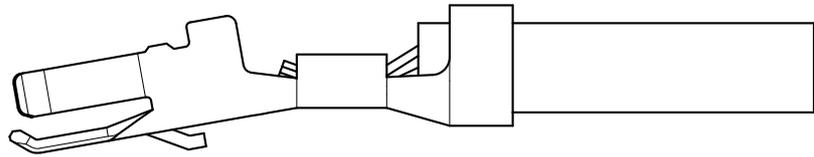
This makes difficult to insert the terminal into the housing and may cause terminal butting, decrease of terminal retention force or contact failure.



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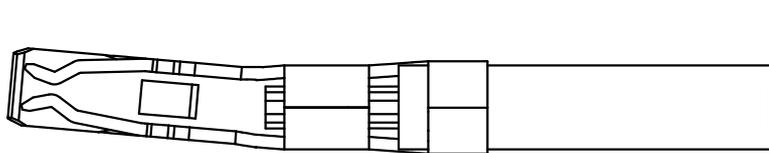
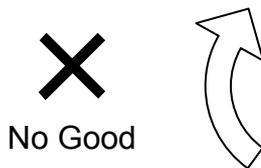
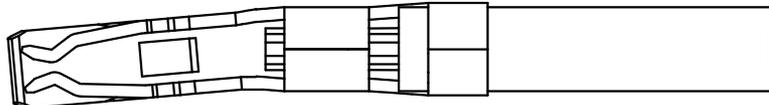
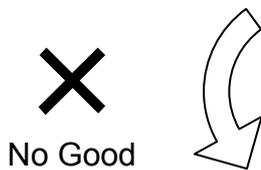
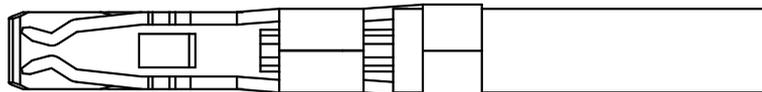
② Bend down

This makes difficult to insert the terminal into the housing and may cause terminal butting, decrease of terminal retention force or contact failure.



③ Twist

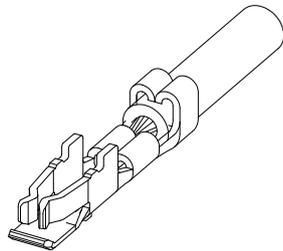
This makes difficult to insert the terminal into the housing and may cause terminal butting, decrease of terminal retention force or contact failure.



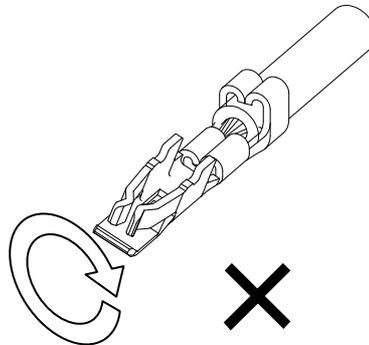
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④ Rolling

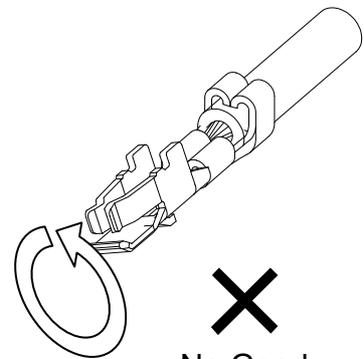
This makes difficult to insert the terminal into the housing and may cause terminal butting, decrease of terminal retention force or contact failure.



Good



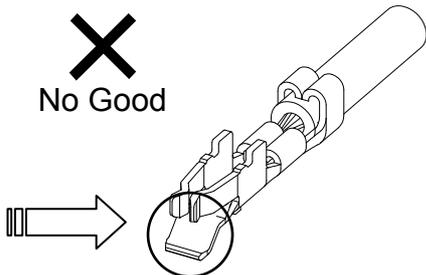
No Good



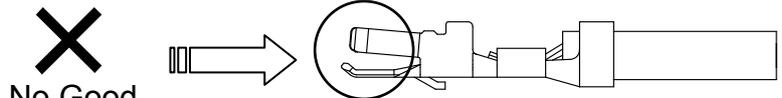
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⑤ Smashed and transformation with contact box

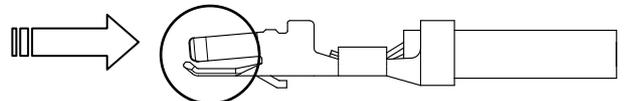
This makes difficult to insert the terminal into the housing and may cause terminal butting, decrease of terminal retention force or contact failure.



No Good

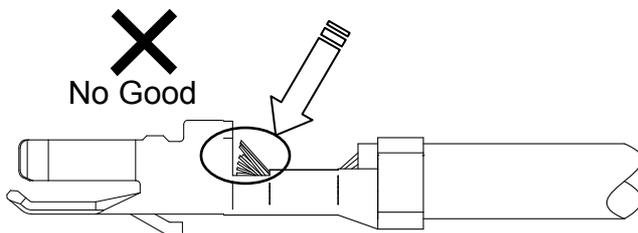


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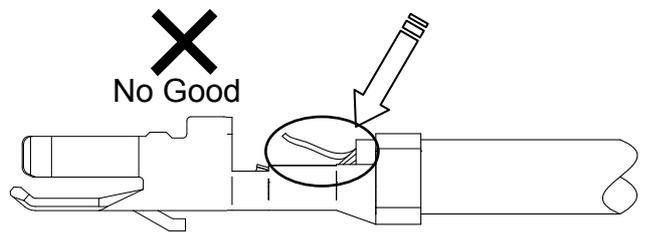


⑥ Wire strands are not in conductor barrel

This makes difficult to insert the terminal into the housing and may cause contact failure.



No Good



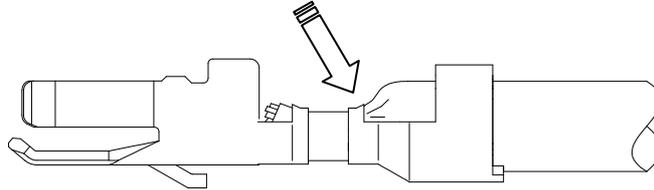
No Good

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⑦ Crimping position: Too front

This caused cutting conductor, decrease Wire crimping strength and disconnection by crimping insulator.

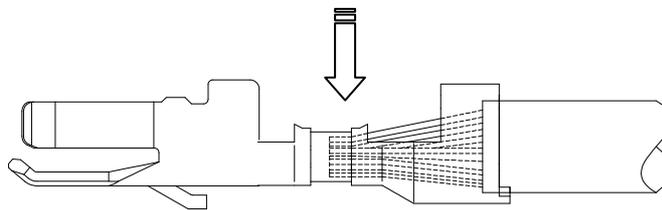
X
No Good



⑧ Crimping position: Too back

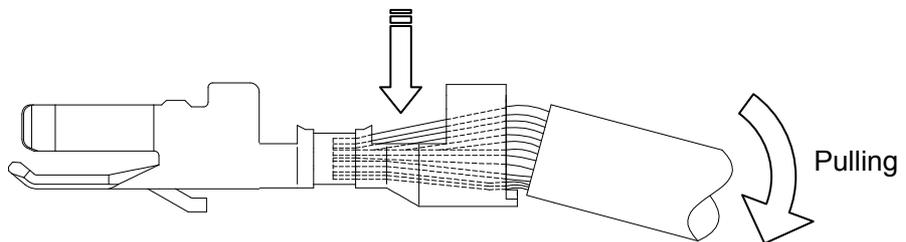
This caused decrease wire crimping strength and disconnection by not crimping margin.

X
No Good



Wire Insulation is not crimping completed, wire insulation fall out easily when wire is pulled.

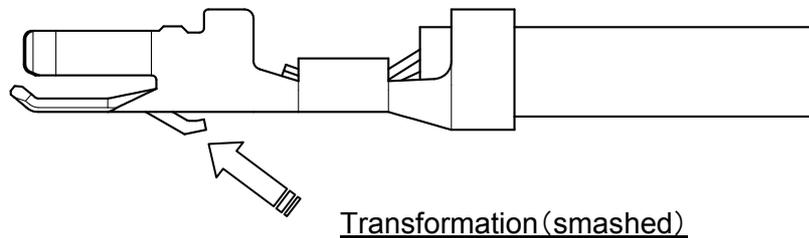
X
No Good



⑨ Not transformation with terminal lance

Fastener tension of the terminal become insufficient and causes the fall of the terminal retention-force.

X
No Good



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[5. Package for over crimping-wire and package]

Please check for damaged terminal and wire insulation. When bundle up wires.
 Please do enough examination about quantity of packing per 1packing-box.
 Do not over pack crimped wires in box as there is risk of damaging terminals.

Instruction

- ※When bundling wires, please be careful wire is not added excessive force constantly.
- ※When packing bundle of harness after processing in package box, in order that force etc. is not added to connector for long time by pile, please put product on the other side alternately (cross shape) fitting box. **(Fig.5-2)**
- ※ Please lay buffer etc. on package box underside. In order that force by piling package boxes etc. is not added to connector for long time, please lay buffer etc **(Fig.5-2)**

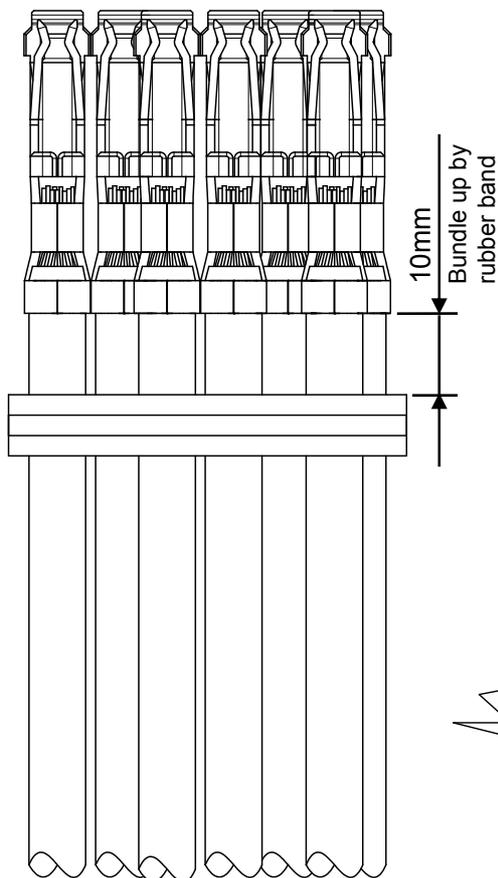


Fig. 5-1

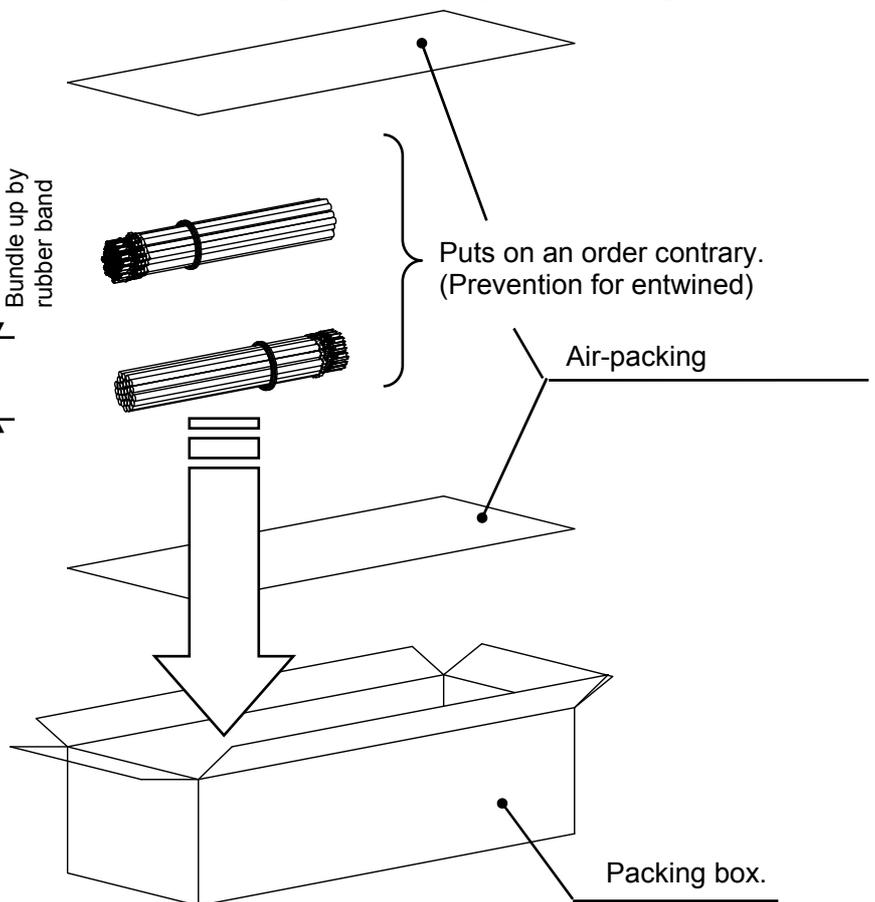


Fig. 5-2

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【6. Harness processing (crimping wire insertion method in Receptacle housing)】

Show insertion procedure and instructions (※) of the crimping wire as follows.

6-1. Insertion crimping wire

- ① Hold receptacle housing by pinching right and left side.
- ② Please pick up the cable at about 10mm position from the crimp-end with a finger lightly.

Instruction

- ※ It might be hard to insert terminal so that wire is easy to bend if wire is picked at distance from terminal.
- ※ Distance value depends on wire guage, UL, etc. Please confirm it with the wire that you chosen before you use it.

- ③ Picking with terminal lance part toward center of receptacle housing, please insert terminal slowly and straightly till the tip of terminal touch housing (with force of around 1.6~2.4N). (**Fig.6-1**)

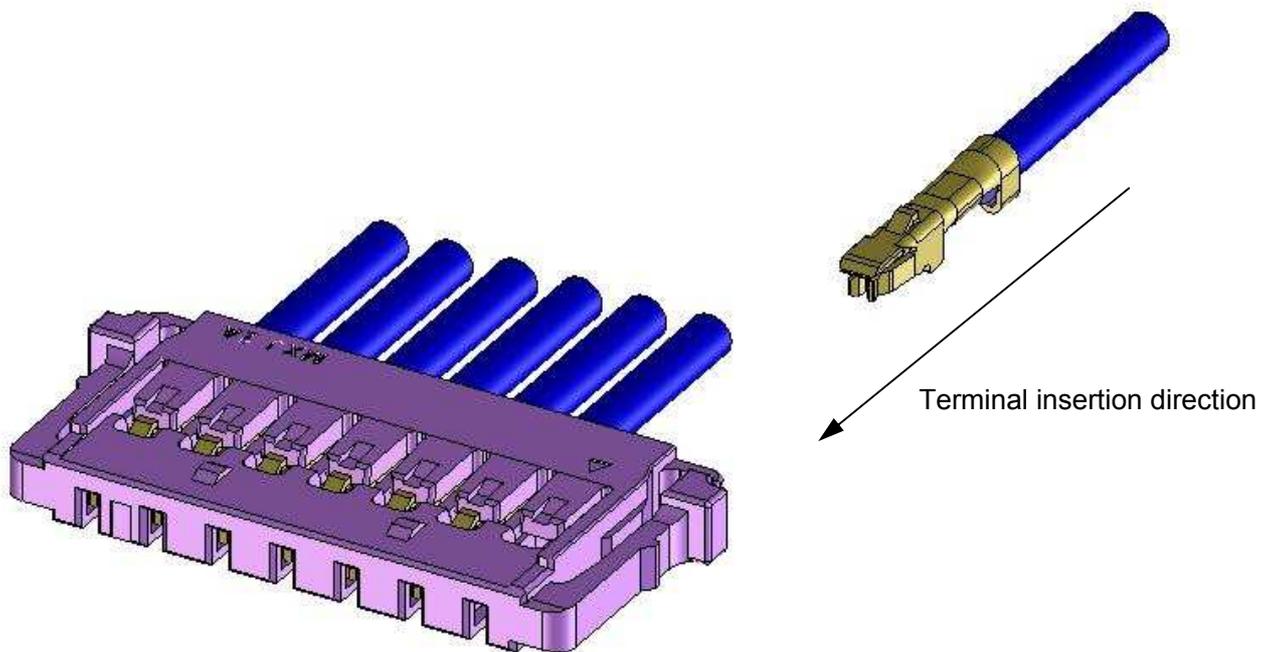
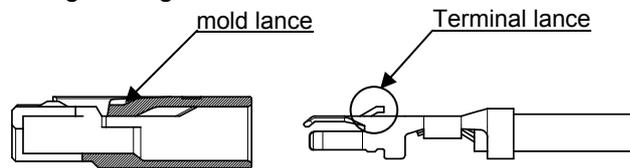


Fig. 6-1

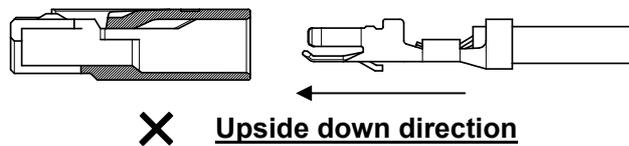
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Instruction

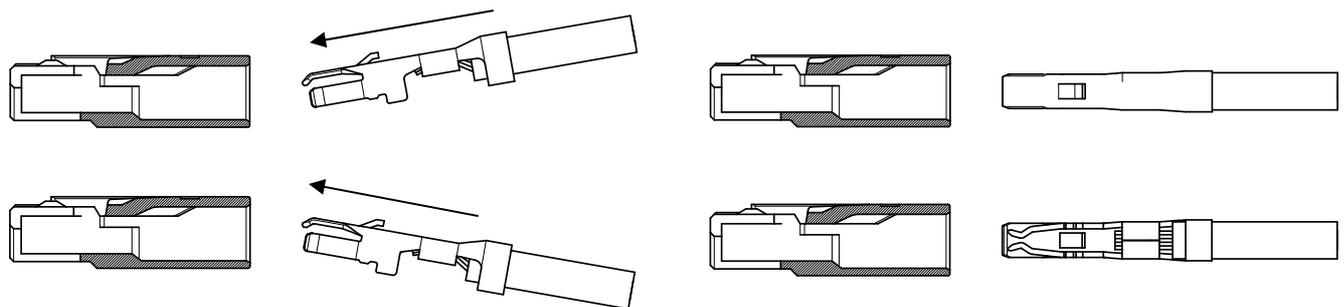
- ※ If crimping height and width are too large, there is a problem for the terminal insertion. Please work by prescribed crimping height. (Please refer to crimping specifications CS-504052-001/002)
- ※ If you feel unusual characteristics such as scratches on the way to insertion, please do not attach it forcibly. After confirming there is no damage of terminal or receptacle housing, it can be inserted again. If damaged, do not use the terminal and receptacle housing.
- ※ Please be careful of the terminal directions of insertion to receptacle housing. **(Fig.6-2,6-3)** Please be careful that the terminal is not upside down, not having angle, or not rotated to receptacle housing. These cause terminal deformation or receptacle housing damage.



○ **Fig.6-2 Right insertion direction**



✕ **Upside down direction**



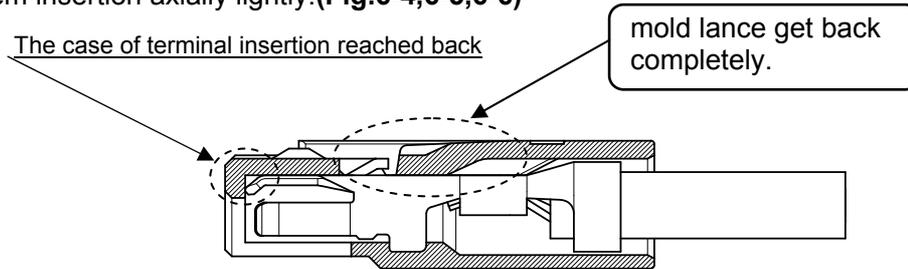
✕ **Having angle direction**

✕ **Rotated direction (Ex.: 90°)**

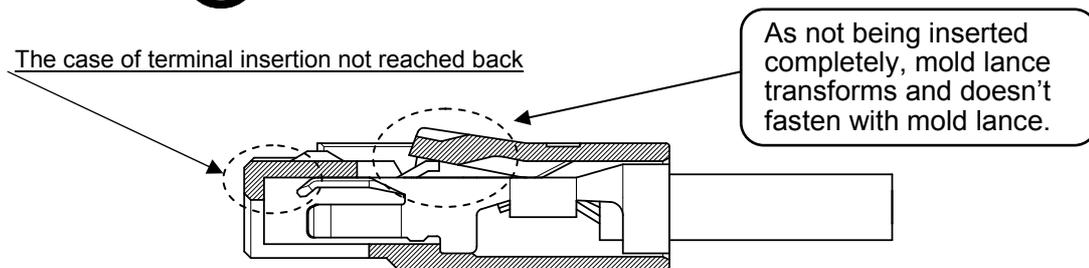
Fig.6-3 Inappropriate insertion direction

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- ④ After inserting terminal, please confirm by pulling wires lightly (with about 100g force) if terminals don't pull out from receptacle housing
(Confirmation by excessive tension might break connector.)
- ⑤ After inserting all terminals, please confirm the position of terminal lance part by seeing through window of receptacle mold lance. If they are inserted correctly, terminal lance is at the position where terminal lance get over mold lance properly and you can confirm clearance by shaking them insertion axially lightly.(Fig.6-4,6-5,6-6)



○ Fig.6-4 The case of correct insertion



✕ Fig.6-5 The case of incomplete insertion

※If they are inserted correctly, terminal lance is at the position where terminal lance get over mold lance properly and you can confirm clearance by shaking them insertion axially lightly.

Instruction

※If terminal is inserted incompletely, terminal lance doesn't fasten with mold lance and terminal is not retained.

※In the state of incomplete insertion(see Fig.6-5), terminal lance is transforming utmost. Therefore the retention of harness neglected in this situation might decline although you re-insert the terminal because terminal lance has transformed and not returned to correct position. In this case, please be sure to change new terminal.

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- ⑥ When checking harness after processing, please avoid bending wire excessively or using under tension. That might be reason for contact failure because force was added to terminal crimping part or receptacle housing lance part.
- ⑦ After conductivity testing, do not attach anything besides applicable mating connector. That might be reason for contact failure because of transformation of terminal etc.

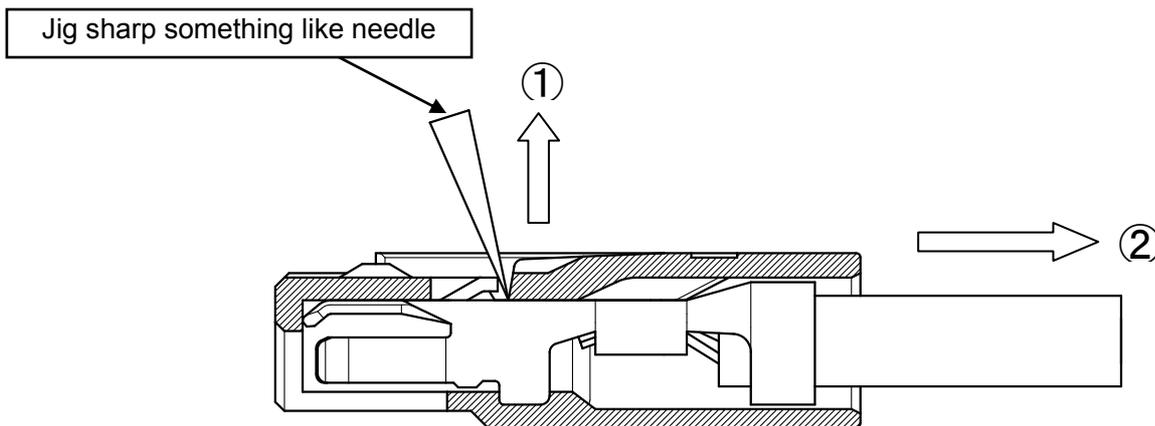
6-2. Repair of crimp terminal

When you withdraw the crimp terminal inserted once, please withdraw it raising mold lance with a sharp something like needle.

However, mold lance transforms by being raised. As strength of the transformed lance decreases extremely, the terminal might come out easily from housing if you insert it again. **Therefore please be sure to change the receptacle housing to new one when you repair crimp terminal.** And use an appropriate magnifying glass, please repair with caution.

※Please be sure to avoid with drawing terminal by force.

※When repairing, please be careful not to transform or scratch terminal lance.



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【7. Banding of harness】

When banding harness after processing, please be careful with the following point.

- ① Please band the wires at more than 35mm length from connector and equalize the force to each wires (**Fig.7-1**)
- ② Concerning harness, please consider that only one wire (or particular a few wires) is not added force. (**Fig.7-2**)

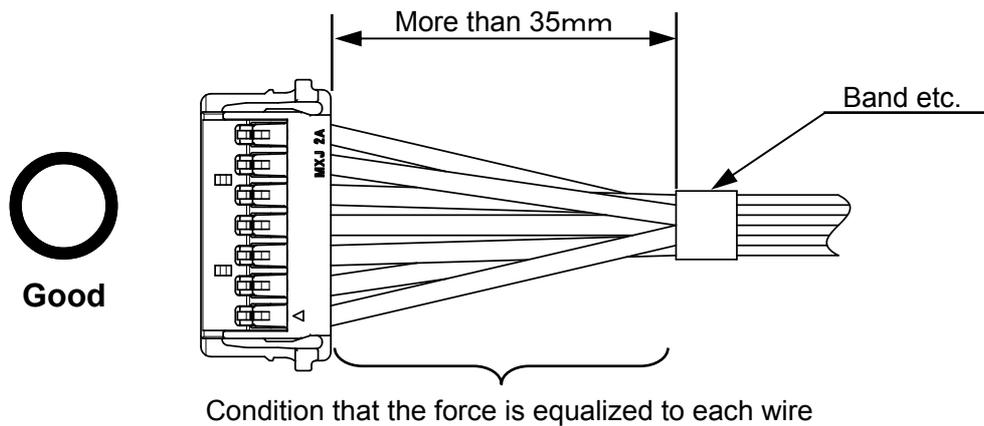


Fig.7-1 Condition that harness is banding properly

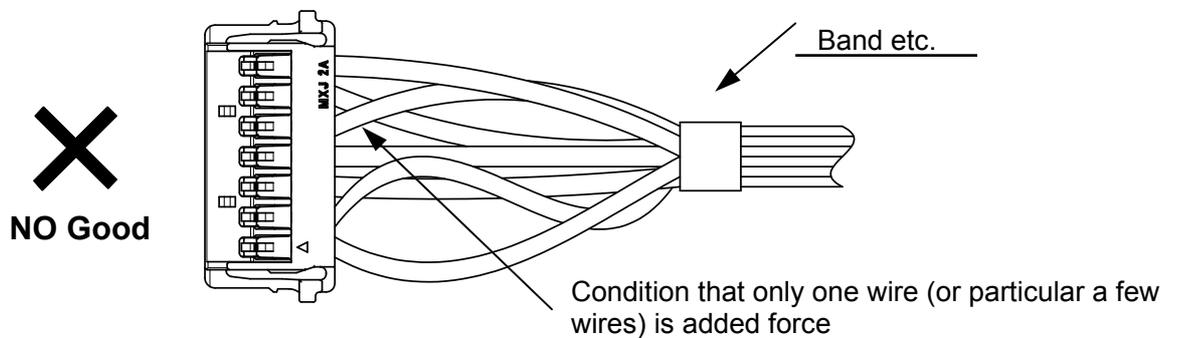


Fig.7-2 Condition that harness is banding improperly

Instruction

※When harness is in a tangle with each other, please do not pull them excessively. That might cause break of connector because extreme force is added to terminal and it comes out from connector.

※Please do not drop the product or hit it against other things.

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【8. Recommended packing of cable harness and assemblies】

When packing harness after processing, procedure and instruction (※) are shown below.

- ① Band harness after processing. Please band at most about 20 in one bunch.

Instruction

※When banding them, in order that wire is not added excessive force constantly please do not use something to constrict strongly, ex. rubber band. Please band the center (one place) with vinyl string. Please take measure to protect connector from shock or load by wrapping each bunch of connector with air packing. (Fig.8-1)

When some harness is banded, each connector contact and part of lock might be loaded. In that case, conformation of lock part etc. might cause defective performance because of the situation that lock is down all time.

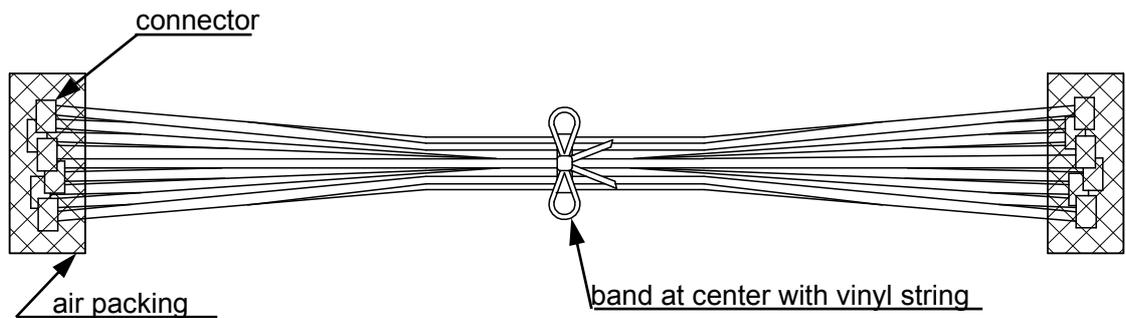


Fig.8-1 1bunch of harness

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- ② Put banded harness into exterior carton.
Below figure (Fig 8-2) is one of examples recommended reference. Please take measure not to add force to connector for long time by stacking if you pack with another packing method for long harness.

Instruction

※When packing bundle of harness after processing in package box, please follow suggested packaging order and avoid applying excessive weight or force to harnesses. (cross shape) (Fig.8-2 ①)

※Please lay air packing etc. on package box underside. In order that force by piling package boxes etc. is not added to connector for long time, please lay air packing etc. (Fig.8-2 ②)

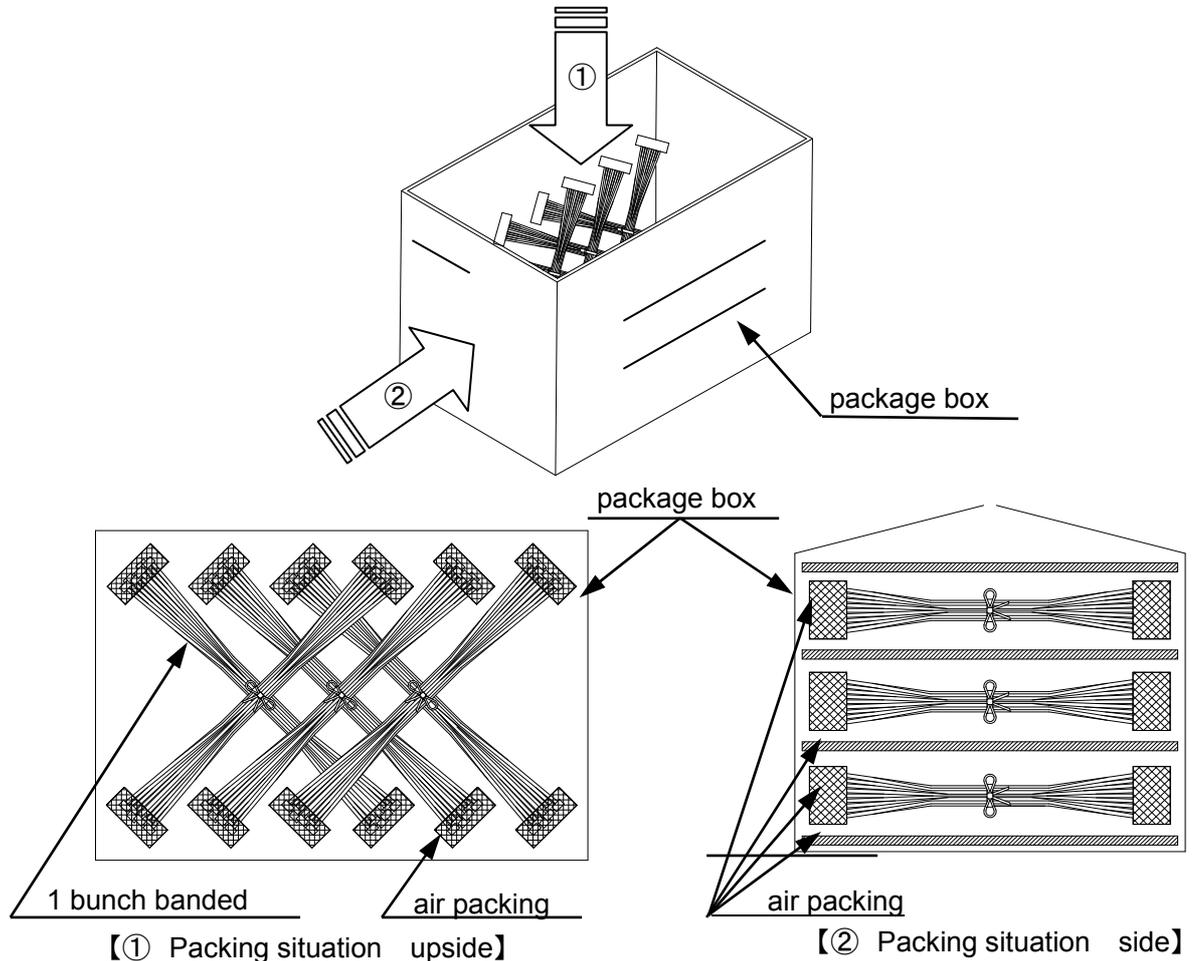


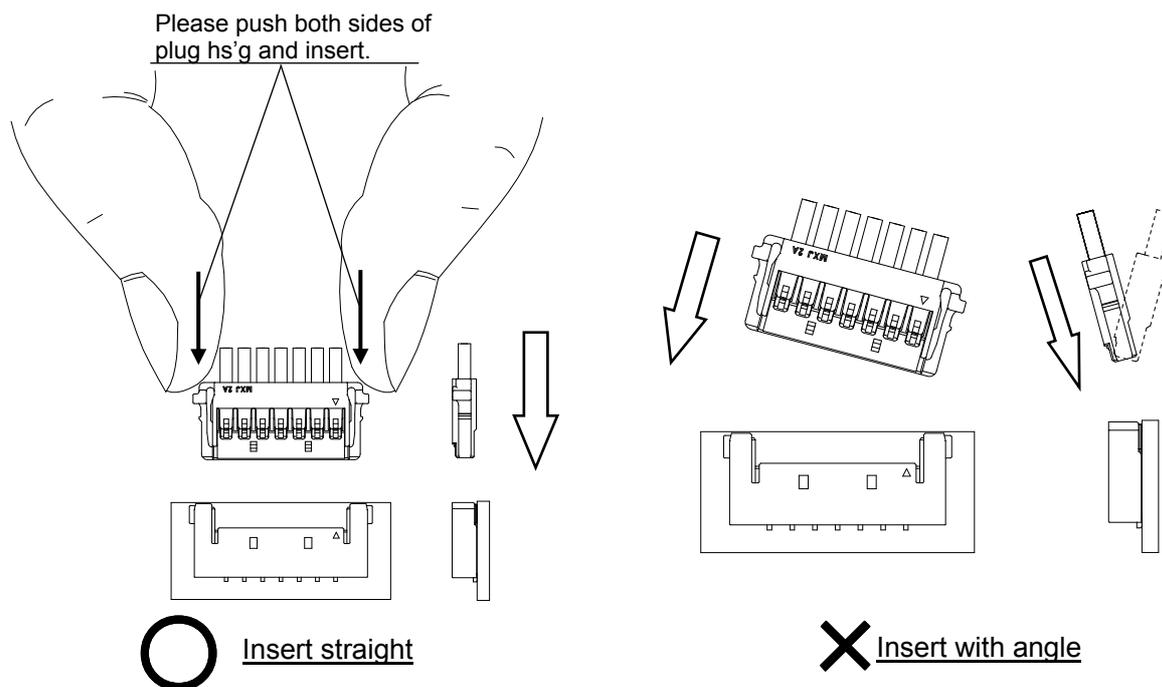
Fig.8-2 Packing situation

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[9. Instruction when mating with HDR connector]

9-1. Mating process method

Please meet both mating direction of receptacle housing (harness side) and plug housing (header side), and push receptacle housing both sides of pitch direction (part shown with arrows) **until both connectors strikes each other (complete mating position)**. And after mating, please confirm that 2 friction locks are fastened completely.



Instruction

※When mating, please do not push positive lock of receptacle housing. It might cause damage by excessive load as correct movement that lock part get over catching part of mating is avoided.

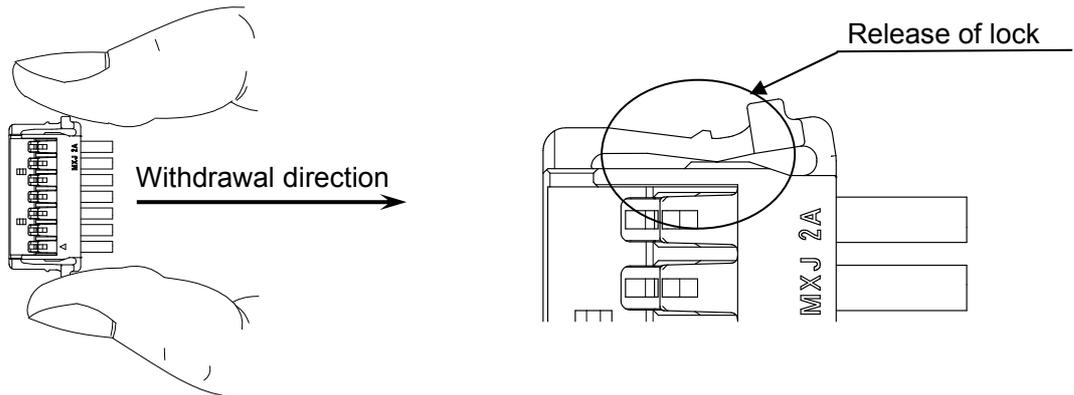
※Please push receptacle housing and insert it straightly until they strike each other. This product is designed as follows. Connectors mating should end up in straight direction even if started insertion with an angle. However if you insert it gradually with angle and maintaining the situation artificially, this situation might make the case that only one side lock is fastened because elastic receptacle housing is inserted conformed. (Especially in multiple circuits)

※If you can not insert smoothly, please insert again after confirming transformation of terminal and receptacle housing etc.

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9-2. Un-mating process method

Please hold wires all together lightly. After releasing lock completely attaching fingers at pushing both bar for releasing lock using flat part of finger, please withdraw receptacle housing gradually, axially and straightly. And please avoid withdrawing them diagonally and roughly. That might cause break of connector.



Instruction

※ Please do not withdraw with holding only particular a few wires. As excessive force concentrates at particular terminals, connector might be damaged or terminal might come out.

※ When releasing lock, Please push bar for releasing lock with flat part of finger not only fingertip(nail tip). If nail is long, nail might catch lock protection wall.

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9-3. Consideration after mating

Instruction

- ※If you plan pulling around wires inside machine, please take measures to it for example wires have enough curve, and be careful force is not added to connectors directly.(Fig.9-3-1)
- ※When pulling wires around inside actual machine, please do not use under the condition that wires are bent excessively or tension is added. That might be reason for terminal pull out because force is added to terminal crimping zone or terminal insertion portion of receptacle by wire tension. Especially, please be careful force is not added to only particular wire. (Fig.9-3-2)
- ※If force is added to one particular wire, wire(crimp terminal) might pull out.
- ※Wire routing inside customer's device needs to avoid excessive stress. Please avoid pulling them toward more than 2 direction.(Fig.9-3-3)
- ※If wire routing specially inside customer's device, please confirm our company before using. (Fig9-3-2/9-3-3 etc.)

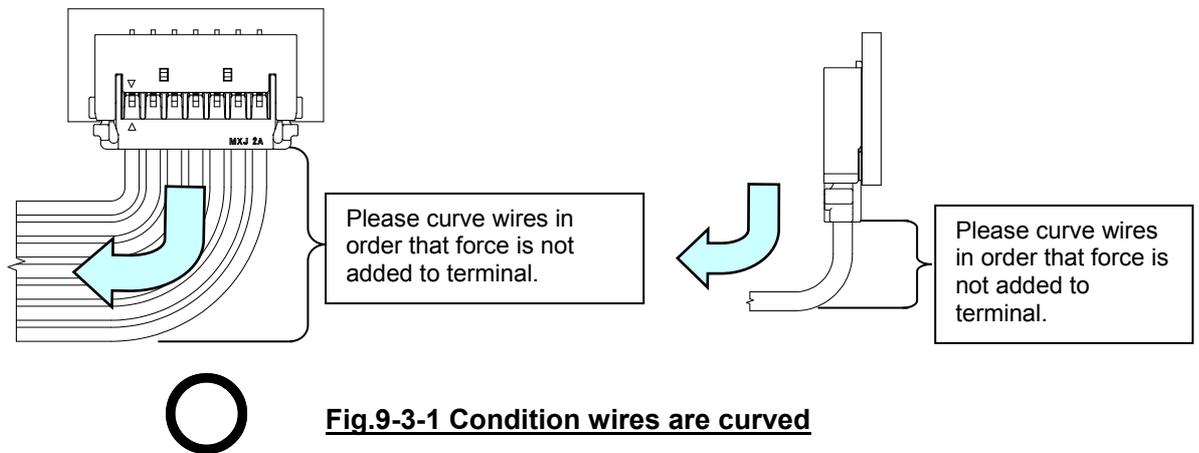


Fig.9-3-1 Condition wires are curved

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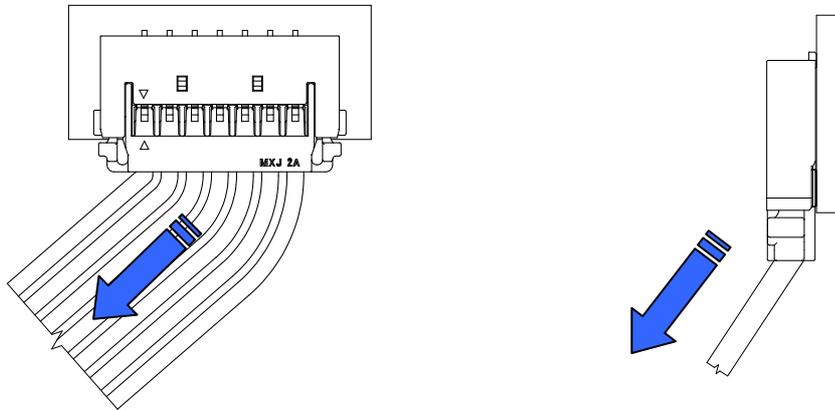


Fig.9-3-2 Condition wires are bent excessively or tension is added

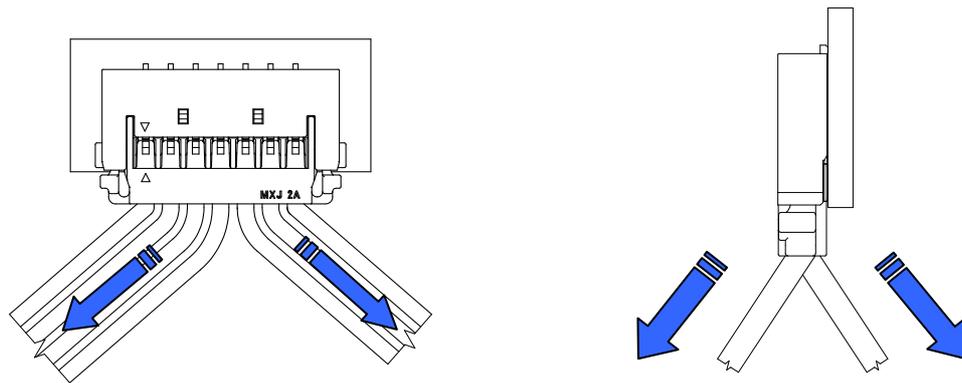


Fig.9-3-3 Pulling around wires toward more than 2 direction.

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