Title of Document:	HANDLING MANUAL	Issue No. CHM-1-106	Rev. 5
Customer:	GENERAL	Issue date: June 26, 1995	
Title subject:	EH Connector Series	Revision date: October 15, 2019	

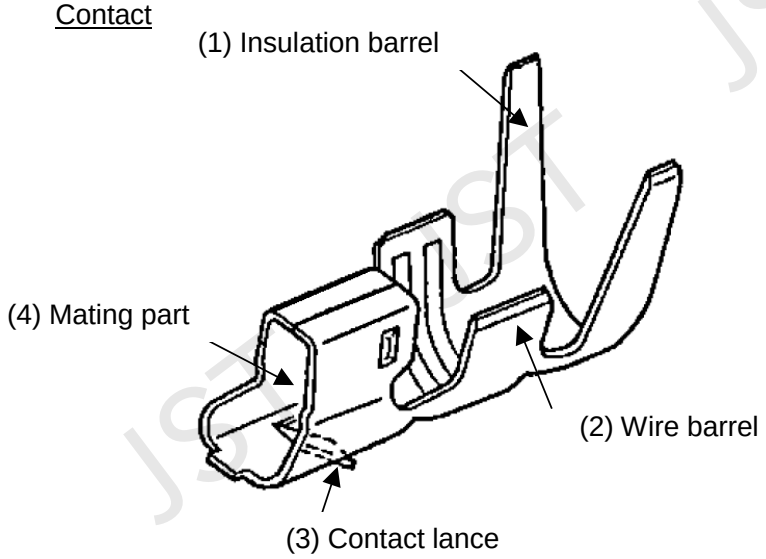
EH connector is designed to be compact wire-to-PC board connector to meet the demand for high density mounting and for flexible designing for PC board of all electronic products.
This handling manual describes operation points of crimping and assembling for enhancing further reliability and Making the most of the connector's features.

C O N T E N T S

1. Parts Identification

EH connector consists of the contact, the housing and the header.
On processing and assembling, understand each structure and name.

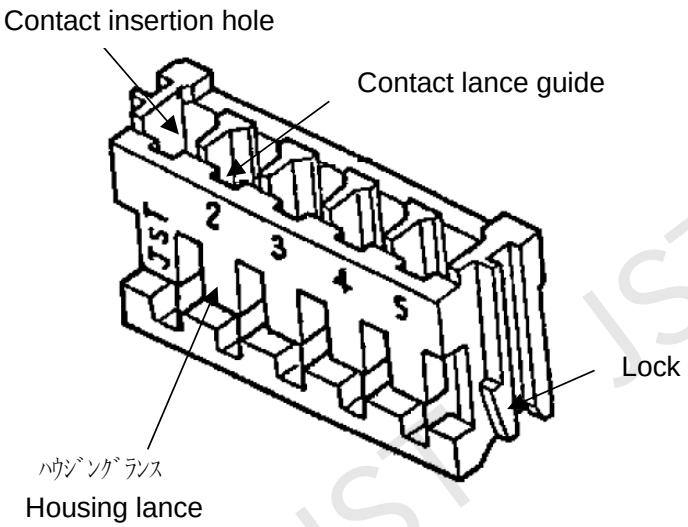
Contact



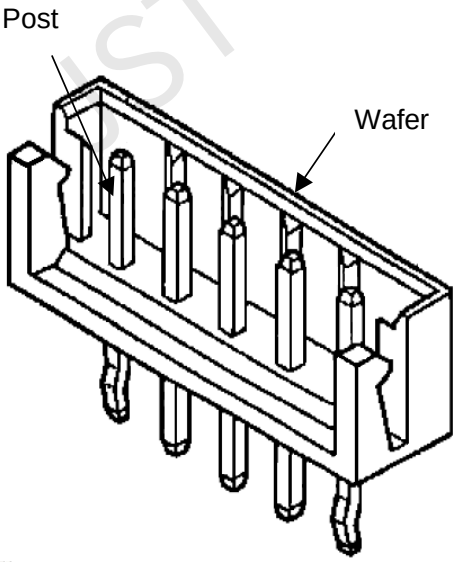
Functions of each part

(1) It holds wire insulation.
(2) Wire conductors are crimped.
(3) It interlocks the contact with the housing.
(4) Contacting part with the header.

Housing



Header (Top entry type)



2. Model Number

Product name			Model No.
Contact	Standard product		SEH-001T-P0.6
	Low insertion force product		SEH-001T-P0.6L
			SEH-002T-P0.6L
Housing			EHR-∗
Header	Top entry type		B∗B-EH (LF)(SN)
			B∗B-EH-A (LF)(SN)
	Side entry type		S∗B-EH (LF)(SN)
	Radial taping	TS type	B∗B-EH-TS (LF)(SN)
		TV4 type	B∗B-EH-TV4 (LF)(SN)
Header (Glass-filled PA)	Top entry type		B∗B-EH-F1 (LF)(SN)
	Radial taping	TV4 type	B2B-EH-F-TV4 (LF)(SN) B∗B-EH-F1-TV4 (LF)(SN)

Note$_1$: 2-digit figures in "∗" denote the circuit number.
Note$_2$: The identification marking "(LF)(SN)" stands for lead-free product.
"(LF)(SN)" shall be displayed on product label.

CAUTION

- The crimp height of the low insertion force product differs from that of the standard one. The following label is put on the product reel and the carton box of the low insertion force type, pay careful attention to the crimp height.
  Refer to item 6-2 "Crimp height" for each contact.

注意 !
標準品とはクリンプハイトが異なります
CAUTION **!**
Crimp height differs from standard one

Note$_3$: The letter of "注意 !", "CAUTION !" and the frame are colored in red.

3. Applicable Wire

(1) SEH-001T-P0.6 (Standard product)

UL1007 (stranded wires) and annealed copper stranded wires with tin plating which is equivalent to UL1007 can be used.

Wire size: AWG #30 ~ AWG #22 (0.05 mm^2 ~ 0.30 mm^2)
Wire insulation outer diameter: ϕ1.0 mm ~ϕ1.9 mm

(2) SEH-001T-P0.6L (Low insertion force product)

UL1007 (stranded wires) and annealed copper stranded wires with tin plating which is equivalent to UL1007 can be used.

Wire size: AWG #26 ~ AWG #22 (0.13 mm^2 ~ 0.33 mm^2)
Wire insulation outer diameter: ϕ0.9 mm ~ ϕ1.9 mm

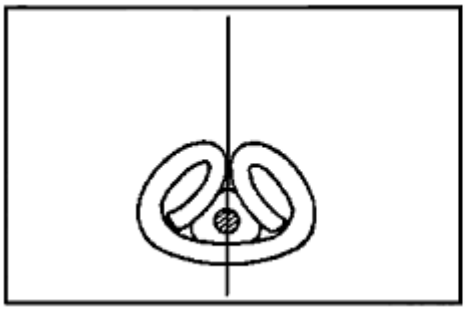
(3) SEH-002T-P0.6L (Low insertion force product)

UL1007 (stranded wires) and annealed copper stranded wires with tin plating which is equivalent to UL1007 can be used.

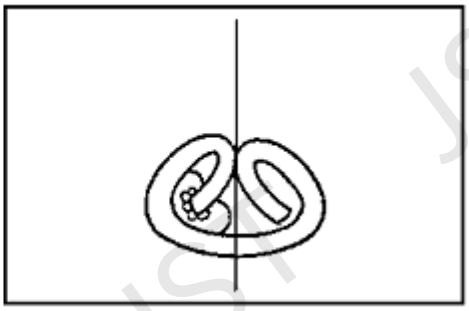
Wire size: AWG #30 ~ AWG #26 (0.05 mm^2 ~ 0.13 mm^2)
Wire insulation outer diameter: ϕ0.9 mm ~ ϕ1.3 mm

CAUTION

- The crimping condition of the wire insulation barrel of this EH connector is different from that of other EH connectors. Pay attention to the following points.



Good



Misaligned wire
(defective crimping)
Wire barrel bites a wire due to wire misalignment inside wire insulation barrel.

(4) Note

Special wires such as solid ones, tin-coated ones, shielded ones and other than the above wires cannot be used in principle. When using special wires, contact JST.
Regarding shielded wires, refer to item 6-3 “Handling method of special wires.”

4. Applicable Tool

Part name	Model No.		
	SEH-001T-P0.6	SEH-001T-P0.6L	SEH-002T-P0.6L
Semi-automatic press	AP-K2( )		
Crimping applicator	MKS-L•MKS-LS	MKS-L•MKS-LS	MKS-L•MKS-LS
Die	MK/SEH-001-06	MK/SEH-001-06L	MK/SEH-002-06L
Applicator and die set	APLMK SEH001-06	APLMK SEH001-06L	APLMK SEH002-06L

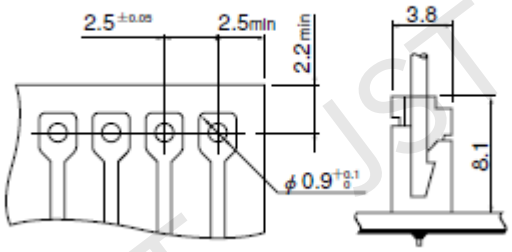
Note$_4$: When crimping operation is conducted by using other than the applicator and the die set shown above, JST cannot guarantee the connector performance.

5. Applicable PC Board

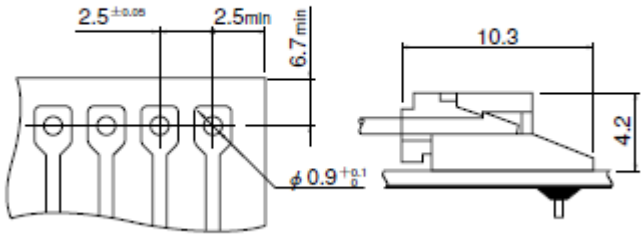
5-1 Applicable PC board thickness: 0.8 mm ~ 1.6 mm

5-2 PC board layout and assembly layout

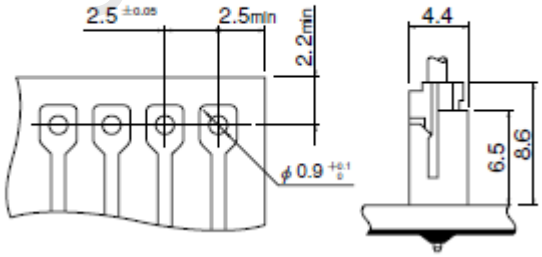
Top entry type



Side entry type



Radial taping



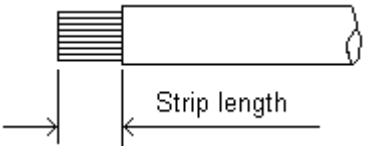
Note$_5$: Tolerances for PC board are non-cumulative±0.05 mm for all centers.
The PC board hole diameter above is reference for drill hole.
The applicable hole diameter differs depending on piercing method and PC board material.
Adjustment is necessary for your usage condition.

6. Crimping Operation

6-1 Wire strip

When a wire is stripped, do not damage or cut off the wire conductors. As the wire strip length differs depending on type of wire and crimping method, decide the best wire strip length considering the processing condition.

Reference value of wire strip length: 1.9 mm - 2.5 mm



Note$_6$: Do not leave such a stripped wire for a long time in order to prevent the oxidation of the conductor's surface, since such oxidation may lead to the fluctuation of the contact resistance.

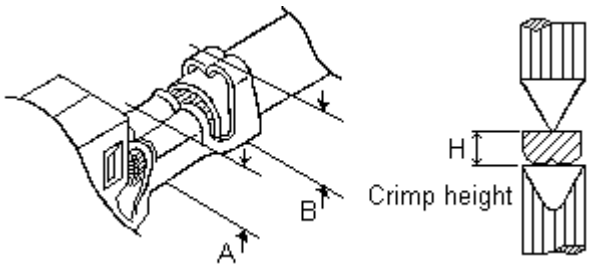
6-2 Crimping

Check the below points for correct crimping at beginning, middle and end of crimping condition.

6-2-1 Crimp height

According to wires to be used, adjust the dials of the applicator at the wire conductor part and the wire insulation part to a proper crimp height.

Measurement of crimp height

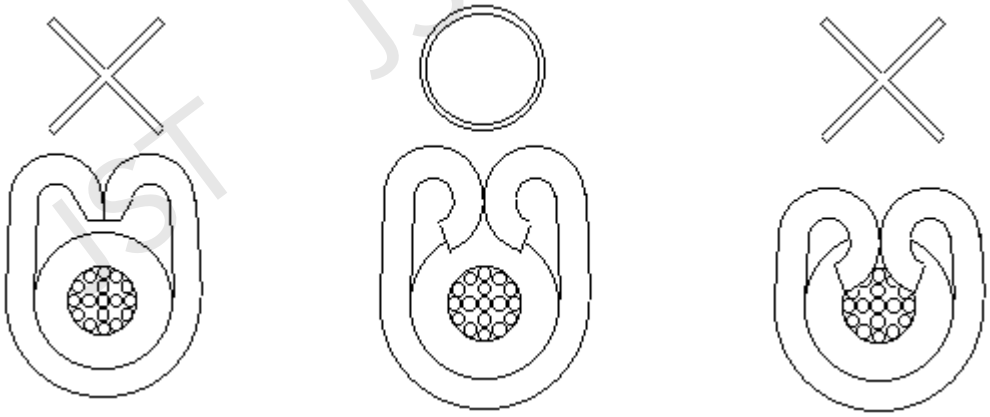


A: The crimp height at the wire barrel should be set to the pre-determined dimensions.

B: Adjust and set the crimp height at the insulation barrel as per finished outer diameter and wire type so that the wire insulation does not come off the contact easily and it is not crimped excessively.

H: Measure the crimp height at the center of the barrel using a specified micrometer.

Crimping condition at wire insulation barrel



Insufficient crimping (pressed weak)
When tension applies to to the wire, the wire insulation easily comes off of the contact.

Good

Excessive crimping (pressed excessively)
The barrel bites the wire too much and may damage the wire conductors.

Check of crimping condition at wire insulation barrel

Cut only wire insulation barrel, remove wire insulation and check if wire conductors are not damaged.

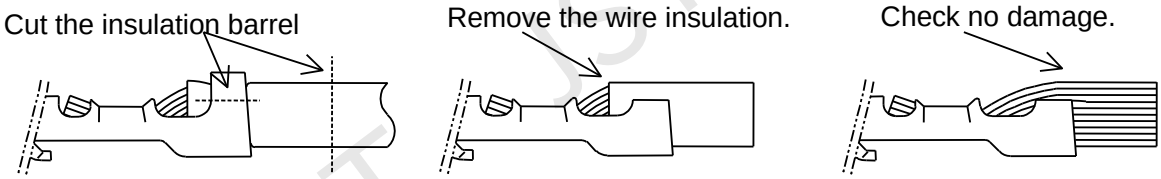


Table of crimp height

- SEH-001T-P0.6 (Standard type)

Wire (UL1007)		Crimp height (mm)	
Wire size	Insulation O. D. (mm)	Conductor part	Insulation part (Ref. value)
AWG #30	1.1	0.57 ~ 0.62 (Target: 0.59)	1.4
AWG #28	1.2	0.60 ~ 0.65 (Target: 0.62)	1.5
AWG #26	1.3	0.65 ± 0.05	1.6
AWG #24	1.5	0.70 ± 0.05	1.7
AWG #22	1.6	0.75 ± 0.05	1.8

- SEH-001T-P0.6L (Low insertion force type)

Wire (UL1007)		Crimp height (mm)	
Wire size	Insulation O. D. (mm)	Conductor part	Insulation part (Ref. value)
AWG #26	1.3	0.57 ~ 0.62 (Target: 0.59)	1.6
AWG #24	1.5	0.62 ~ 0.67 (Target: 0.64)	1.7
AWG #22	1.6	0.67 ~ 0.72 (Target: 0.69)	1.8

- SEH-002T-P0.6L (Low insertion force type)

Wire (UL1007)		Crimp height (mm)	
Wire size	Insulation O. D. (mm)	Conductor part	Insulation part (Ref. value)
AWG #30	1.1	0.52 ~ 0.57 (Target: 0.54)	1.4
AWG #28	1.2	0.55 ~ 0.60 (Target: 0.57)	1.5
AWG #26	1.3	0.57 ~ 0.62 (Target: 0.59)	1.6

6-2-2 Tensile strength at crimped part

After adjusting the crimp height, check the tensile strength using test samples.
In case the tensile strength greatly differs from the normal tensile strength (actual value), check if there is a defect. The tensile strength may be different even in the same wire size due to the difference in strength of wire itself.

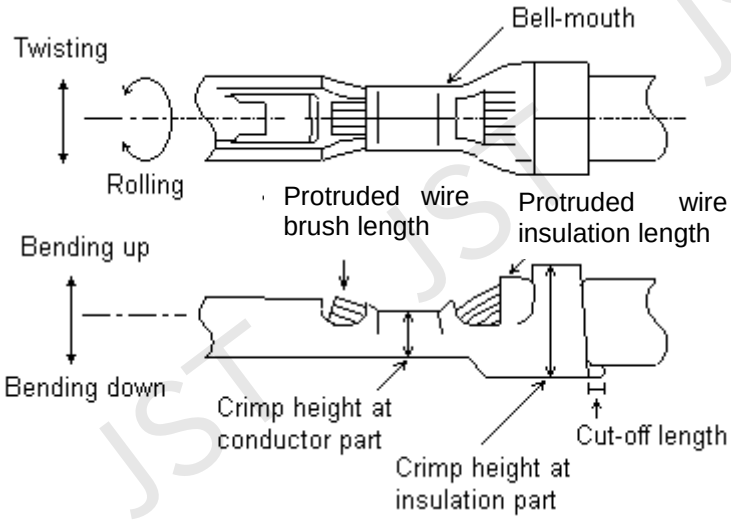
Table of tensile strength at crimped part

Wire size	Requirement (N) min.	Actual value (Ref. value) (N)
AWG #30	4.9	9.8 – 14.7
AWG #28	9.8	19.6 – 29.7
AWG #26	19.6	29.7 – 39.2
AWG #24	29.4	49.0 – 58.8
AWG #22	49.0	63.7 – 78.4

6-2-3 Crimping appearance

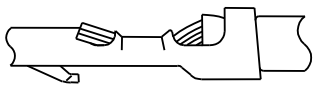
Check the crimping appearance visually for correct crimping with equipment such as a loupe.

Part name of crimped contact

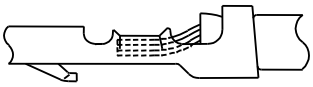


Item	Reference value
Bending up	approx. 6° max.
Bending down	approx. 6° max.
Twisting	approx. 5° max.
Rolling	approx. 7° max.
Bell-mouth (wire side)	approx. 0.1 ~ 0.3 mm
Cut-off length	approx. 0 ~ 0.5 mm
Protruded wire brush length	approx. 0.3 ~ 0.6 mm
Standard crimping width at wire barrel	(1.4 mm)

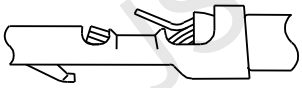
Examples of defective crimping



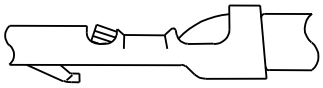
Long protruded wire brush



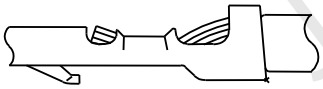
Short protruded wire brush



Stray wire conductor

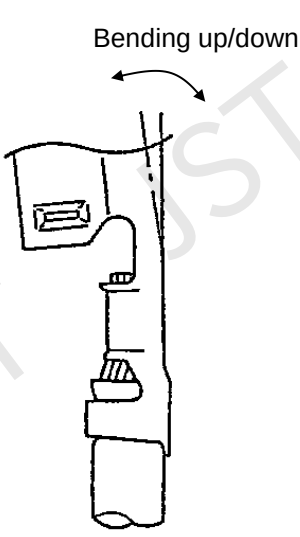


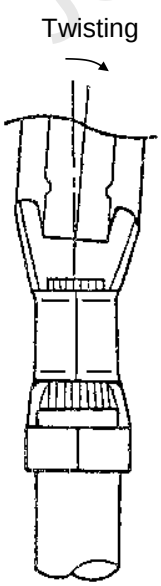
Bitten wire insulation with wire barrel

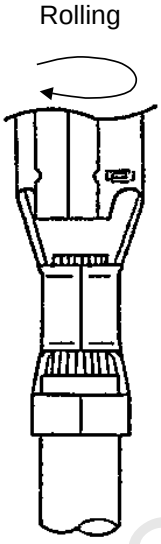


Short protrusion of wire insulation

Bending up, bending down, twisting and rolling

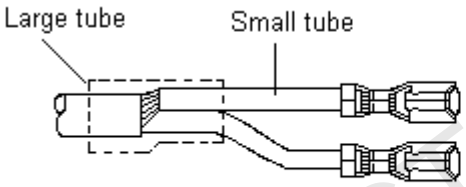




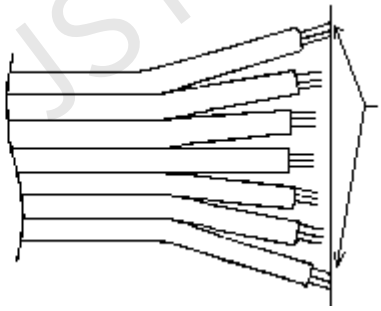


6-3 Handling method of special wires

Split length of core wire and braided shielding wires



Split length of flat-ribbon cable

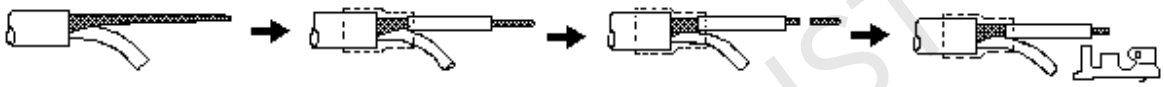


The outer wires should be longer than the inner side's ones.

The processing shown above is necessary for special wires when the contact is inserted into the housing to ensure good insertion and to prevent the deformation and wire cutting in inserting the contact.
After inserting the contact into the housing, adjust the split length of the braided shielding wire and flat-ribbon cable so that a tension does not apply to the smaller size wire for braided shielding wire, and so that a tension does not apply to the both sides only for flat-ribbon cable.

Crimping of braided shielding wire

After stripping and slightly twisting the braided shielding wires, trim the tip with a nipper to align and crimp the contact. If the tip is not aligned, the contact may not be crimped properly.
When the conductor cross-sectional area of a braided shielded wire is over that of the applicable wire range, adjust the cross- sectional area to meet the one specified by the applicable crimp height, do the crimping operation.
The insulation outer diameter of the tube should conform to the one applicable to the contact.



6-4 Precautions for the handling of the crimped contact

As the crimped contact before inserting into the housing is exposed, it is easy to be deformed by an external force. Pay careful attention to the following 5 points for the storage and the handling:

① The number of the crimped contacts for one bundle should be 300 pcs. max. Protect the contacts by wrapping with paper to prevent from the deformation and the adhesion of foreign substances, and keep them in an adequate box.

② Do not place the contacts in humid area, under direct sunshine and directly on the floor. Store them in a clean room with ordinary temperature and humidity.

③ Do not stack too much quantity of the crimped contacts nor place anything on them, because the weight of themselves may cause the deformation of the contact and troubles such as defective contacting.

④ Do not stain the contact with household goods such as oils, detergent, seasoning, fruit juice and insecticide. If stained, never use the stained contact.

⑤ Do not use improperly crimped or deformed contact.

7. Harness Assembly Operation

Harness assembly operation is a very important process to decide the connector performance and the harness quality. Careful operation is required for harness assembly as well as the said crimping operation.

7-1 Precautions before inserting the crimped contact into the housing

Before inserting the contact into the housing, check the below points.

① Do not place other things on or near working table and do not conduct any other works on the same working table to prevent from operation mistake.

② Do not stain the contact with household goods such as oils, detergent, seasoning and fruit juice. If stained, never use the stained contact.

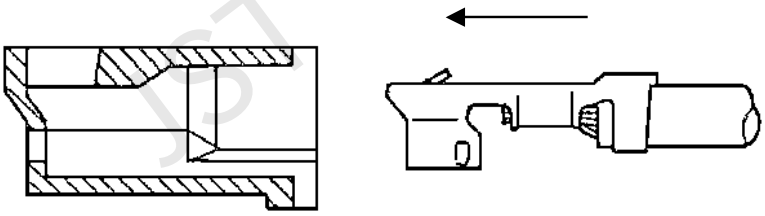
③ Do not use the contact that is improperly crimped and deformed (such as at the lance and the mating part).

7-2 Inserting the crimped contact into the housing

① Do not apply any pulling force to the crimped part.

② Do not use something like a pin, because the tip of the pin accidentally reaches the contact mating part, which may cause poor contact or the contact deformation.

③ Hold the contact with the lance part up, and insert the contact into the housing parallel to the insertion axis so that the contact lance turns to the lance guide of the housing.



- Precautions for inserting contact

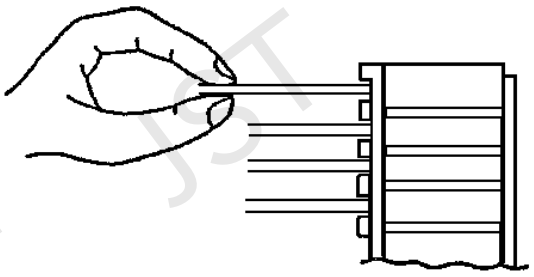
  Do not tilt the contact to the direction that the contact lance is pushed or insert the contact prying up and down or right and left, because such handling may deform the contact lance and the mating part.

④ Insert the contact into the housing without stopping to the innermost.
When the contact is fully inserted into the housing, the housing lance clicks and there is feeling of response.

7-3 Check after inserting the crimped contact into the housing

Check secure locking per each insertion by pulling a wire softly with force of approx. 3N.

Note$_7$: When the wire is pulled with too much force, the contact lance may be deformed and the contact may come off of the housing.



7-4 How to extract the crimped contact from the housing in case of mis-insertion

When the contact is inserted into an improper circuit hole, conduct the following points:

① Do not reuse the housing that the contact was extracted once but use a new one.
(The method to extract the contact from the housing is as below.)

② When the contact that is inserted into an improper circuit is extracted from the housing and the housing is reused.

- Only a specified person conducts the operation.
- The housing reuse should be once.
- The housing lance should be pushed down to the original position.

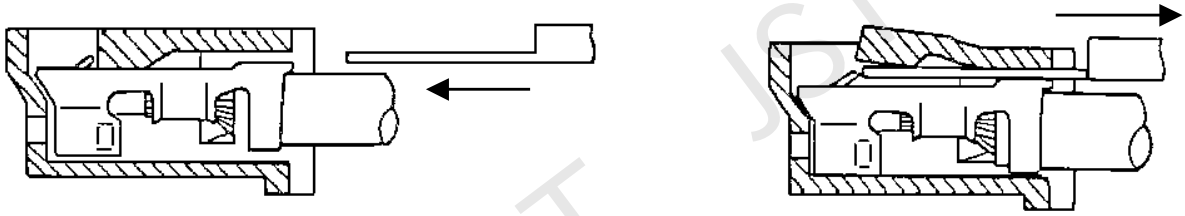
How to extract the crimped contact from the housing

① Prepare the contact extraction tool, EJ-PH.

② Insert the EJ-PH from the contact inserting direction in parallel with the housing into between the contact lance and the housing.

③ Insert the extraction tool to the innermost, and hold the contact lance.

④ Pull a wire softly with force of approx. 10N while holding the contact lance with the tool, and extract the contact from the housing.
When the contact cannot be extracted even by pulling a wire softly, do not pull it out by force and try again back to step ①.

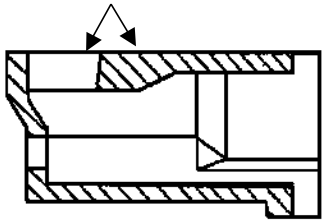


Note$_8$: Do not extract the contact using the tools other than the specified ones by JST.
The extraction by using a non-specified one may deform the mating part.

Precautions for the reuse of the housing

After extracting the contact, push the housing lance with your finger and check if the housing lance surface is even or lower than other surfaces.

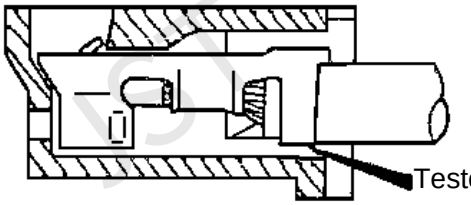
Even surface



8. Inspection of Finished Product (Continuity Check)

8-1 Simple wiring inspection using a tester

① Do not insert a tester stick into the mating part.
② Inadequate diameter of a tester stick and prying a tester stick may deform the mating part.
③ Contact a tester stick with the wire insulation side inserting it from the connector contact entrance of the housing, and conduct the inspection.



8-2 Wiring inspection using an inspection jig

Note the following points.
① Use the header applicable to the connector for inspection.
Do not remove the housing wall of the header. If removed, the contact may be pried easily during inspection and insufficient contacting may be caused.
② Use the header free from deformation, damage and stains. If found, replace it with a new one. Periodical replacement of the header should be conducted as well.
③ Carefully mate and unmate the connector, holding the housing without prying.
When an inspection board is used, design it considering that mating and unmating works are not difficult.

9. Header

① Floating from PC board
The header of the EH connector has a retention mechanism not to separate from the PC board in inserting.
However, when the header floats due to such an external factor as force and vibration, press the header softly so that the bottom of the header fits on the PC board surface, and then, solder the connector.

② Flux
Use rosin type flux.
As inorganic flux may corrode the header housing, do not use it.

③ Dip soldering
Do soldering at the temperature range of 230°C ~ 260°C within 5 seconds.

④ Soldering by hand and soldering repair
When the connector is soldered with a soldering iron or soldering repair is conducted for bridge, note the following points, because the header housing may deteriorate due to heating.

Soldering iron:	Use a soldering iron with small heat capacity (40W max.).
Soldering time:	Do soldering quickly within 3 seconds.
Soldering method:	Do not apply an external force by such an operation as holding the header post with the tip of the soldering iron during soldering.

⑤ Cleaning operation
In normal flux cleaning, the cleaning solvent does not affect the header of the EH connector.
However, when polluted cleaning solvent by flux is left in the header, poor contact and other defects may be caused.

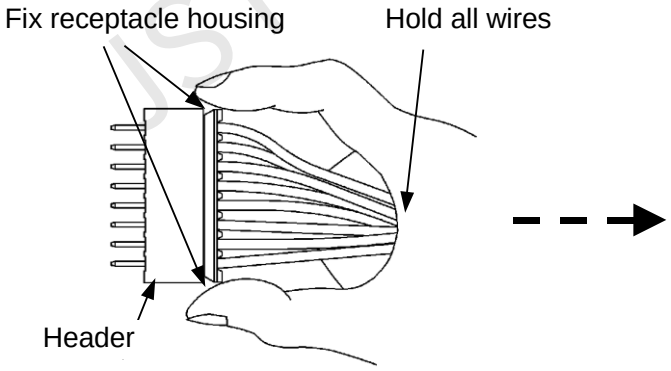
10. Mating and Unmating Connector

① Mating the connector

Hold the receptacle housing securely and insert it into the header in a straight against to the header post.

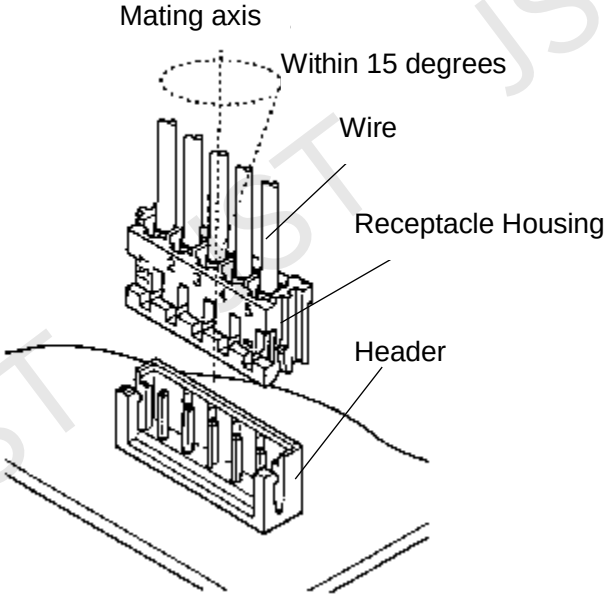
② Unmating the connector

Hold all wires securely and stabilize the receptacle housing by fingers not to pry, and then, withdraw it on the mating axis.



③ Prying

As prying withdrawal may deform the header post and damage the receptacle housing, do not conduct prying withdrawal. When withdrawal operation on mating axis is difficult, conduct prying withdrawal within 15 degrees against the mating axis.



11. Storage and Usage

Polyamide resin which is used for EH connector housing has a characteristic of large elongation, while under the condition of dryness and low temperature, the elongation lowers outstandingly and it becomes vulnerable to shock. Handle and operate the connector with care because the housing or the lock may break during the transportation and the mating under the condition of dryness and low temperature.