Title of Document:	HANDLING MANUAL	Issue No. CHM-1-083	Rev. 3
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This handling manual describes points to check for smooth crimping operation of the contacts of the BH and BHM connectors.

C O N T E N T S

1. Part Name and Model Number

Part name	Model No.
Contact	SBH-001T-P0.5
Housing	BHR-∗VS-1
Contact (wire-to-wire type)	SBHM-001T-P0.5
Housing (wire-to-wire type)	BHMR-∗V

Note$_1$: 2-digit figure in "∗∗" denote the circuit number.

2. Applicable Wire

The wire size, the wire insulation outer diameter and the specification for SBH-001T-P0.5 and SBHM-001T-P0.5 are as below.

	SBH-001T-P0.5, SBHM-001T-P0.5
Wire size	AWG #28 ~ AWG #22
Insulation outer dia. (mm)	ϕ1.6 ~ ϕ2.4
Conductor	Annealed copper stranded tin-plated wire

Note$_2$: Special wires such as solid wires, tin-coated wires and shielded wires other than above wires cannot be used in principle.

3. Crimping Tool

Part name	Model No.
Semi-automatic press	AP-K2( )
Crimping applicator	MKS-L
Die set	SBH/M-001-05

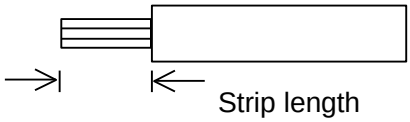
Note$_3$: When crimping operation is conducted by using other than the above applicator and die set, JST cannot guarantee the connector performance.

4. Crimping Operation

4-1 Wire strip length

Referring to the reference wire strip length stated below, strip wires.
As the wire strip length differs depending on wire type and crimping method, decide the best wire strip length considering the processing condition. When the wire is stripped, do not damage or cut off the wire conductors.

Reference value of wire strip length: 2.5 mm

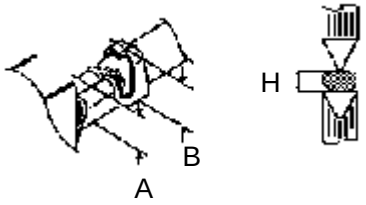


4-2 Crimping

Measure and inspect the below points to make sure of correct crimping according to circumstances at beginning, middle and end of crimping operation.

4-2-1 Crimp height

According to wires to be used, adjust the dials (the conductor part and the insulation part) of the applicator to a proper 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 micrometer.

Table of crimp height

SBH-001T-P0.5/SBHM-001T-P0.5

Wire size	Crimp height at conductor part (mm)
AWG #28	0.60 - 0.65
AWG #26	0.60 - 0.70
AWG #24	0.65 - 0.75
AWG #22	0.70 - 0.80

Note$_4$: Contact JST for the crimp height at the insulation part when using other than the wires shown on the tables.

Reference value of crimp height at the insulation part

【UL3133 AWG#28 - #22】

Wire size	Insulation O. D. (mm)	Crimp height at insulation part (mm)
AWG #28	1.9	2.35 ± 0.05
AWG #26	2.1	2.40 ± 0.05
AWG #24	2.2	2.40 ± 0.05
AWG #22	2.4	2.45 ± 0.05

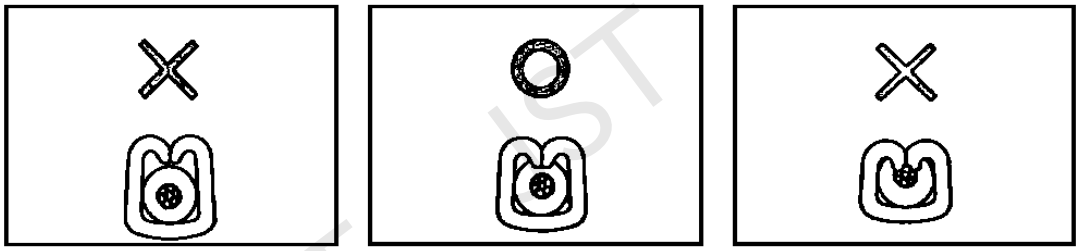
【UL3239 AWG#24 - #22】

Wire size	Insulation O. D. (mm)	Crimp height at insulation part (mm)
AWG #24	1.6	2.30 ± 0.05
AWG #22	1.8	2.45 ± 0.05

【UL3239 AWG#24 - #22】

Wire size	Insulation O. D. (mm)	Crimp height at insulation part (mm)
AWG #24	2.2	2.45 ± 0.05
AWG #22	2.4	2.45 ± 0.05

Crimping condition at wire insulation barrel



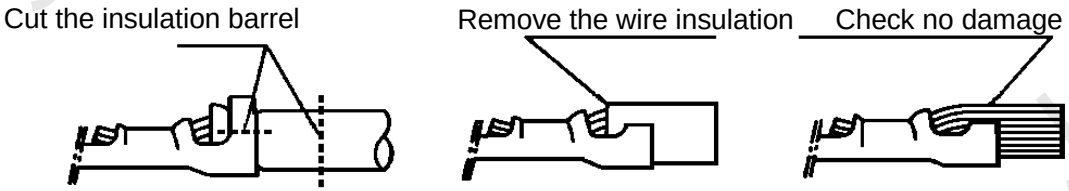
Insufficient crimping
(pressed weak)
When tension is applied to a wire, the wire insulation easily comes off the contact.

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 the wire insulation barrel, remove the wire insulation and check if the wire conductors are not damaged as below.



4-2-2 Tensile strength at crimped part

After adjusting the crimp height, check the tensile strength using the test samples, and then, start continuous crimping operation. In case the tensile strength greatly differs from the normal tensile strength (actual value), check if there is a defect. The actual value may be different depending on the difference in wire strength even if wire size is same.

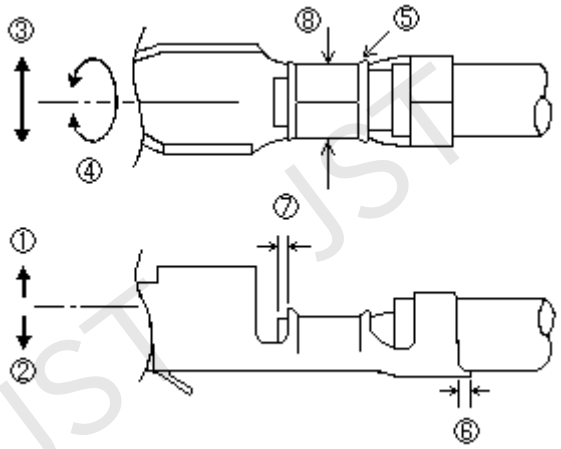
Table of tensile strength at crimped part

Wire size	Requirement (N)
AWG #28	13 min.
AWG #26	15 min.
AWG #24	20 min.
AWG #22	25 min.

4-2-3 Crimping appearance

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

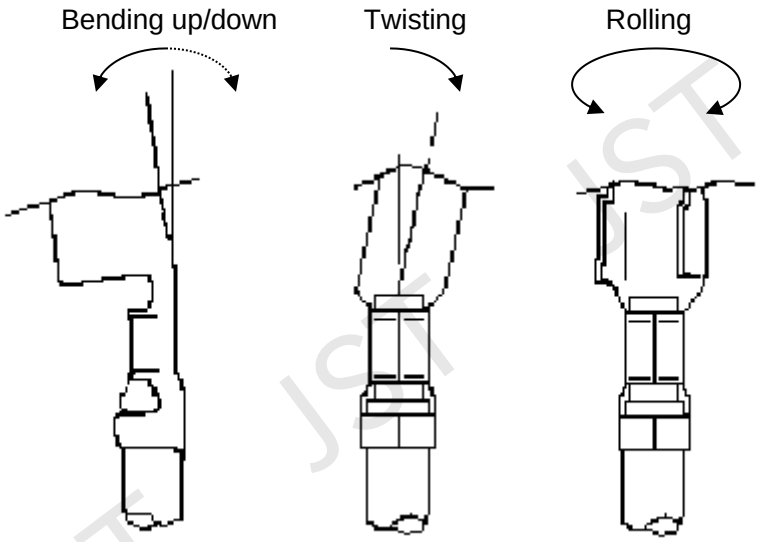
Part name of crimped contact



	item	Reference value
①	Bending up	approx. 3° max.
②	Bending down	approx. 3° max.
③	Twisting	approx. 3° max.
④	Rolling	approx. 5° max.
⑤	Bell-mouth	approx. 0.1 ~ 0.3 mm
⑥	Cut-off length	approx. 0 ~ 0.3 mm
⑦	Wire conductor protruding length	approx. 0.3 ~ 0.6 mm
⑧	Crimp width at conductor part	approx. 1.4 mm

Remarks: As far as the crimped contact can be inserted into the housing, bending up of the contact may be allowed.

Bending up, bending down, twisting and rolling



4-3 Precautions for crimping operation

① Do crimping operation properly and inspect the crimping appearance of the crimped product with loupe, etc.
Note$_5$: If the conductors are not crimped at the center in barrel, the contact may twist slightly but it does not affect the performance.
② Do not crimp with no contacts and twice, because they may cause an outstanding burr at the crimped part and may lead to the abrasion of the crimping die quickly.
③ As cutting residues (powder) adhered to the crimping die part affects the life of the dies, clean the crimping part occasionally and do crimping properly.
④ The crimping dies are consumables. When chips or excessive roughness are observed on the crimping die, replace it without delay.
⑤ As the abrasion of the crimping die and insufficient adjustment of the applicator may cause defective crimping appearance, do not fail to conduct daily inspection.
⑥ When crimping operation is conducted with the wire-holding spring damaged or extracted, wire conductors may come off or wire barrel may bite the wire insulation.

4-4 Control of crimping operation

To conduct secure crimping operation, record the following items for semi-automatic press and crimping applicator.

① Model No. or control No. of semi-automatic press and applicator
② Contact lot No.
③ The number of crimping and cumulative total
④ Crimp height
⑤ Wire retention force
⑥ Crimping appearance and record of adjustment and replacement of crimping die

4-5 Precautions for the storage and the handling of the crimped contact

As the crimped contact before inserting into the housing is subject to deformation, etc. by external forces, pay careful attention to the following 3 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 and other defects.

5. Harness Assembly Operation

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's mating part, which may result in defective contacting or contact deformation.

③ Check secure locking per each insertion by pulling the wire softly with force of approx. 9.8N.
(When the wire is pulled with too much force, the contact lance may be deformed and the contact may come off of the housing.)

6. How to Extract the Crimped Contact from the Housing in Case of Mis-Insertion

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

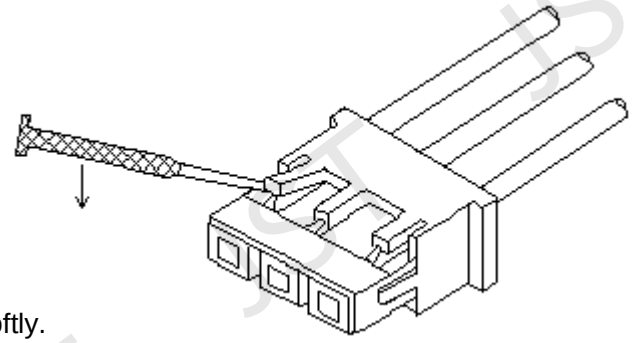
① Do not reuse the used housing and contact but use the new ones.
(The way of extracting the contact from the housing is as below.)

② When an improperly inserted contact is extracted from the housing and reused.

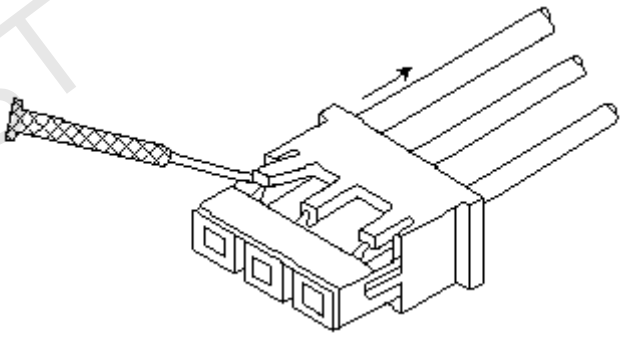
a) Only a specified person conducts the operation.
b) In case such contact and housing are reused in some reasons, the reuse should be once. From twice, use the new contact and housing.
c) After modification completes, be sure to check the inserted contact in the housing (item 5 ③). When the contact comes off the housing, use the new housing.

<u>How to extract the contact from the housing</u>

(1) Raise the housing lance (0.5 mm max.) with a flat-head tool like a flathead screwdriver, and disengage the housing lance.



(2) Pull out a wire softly.



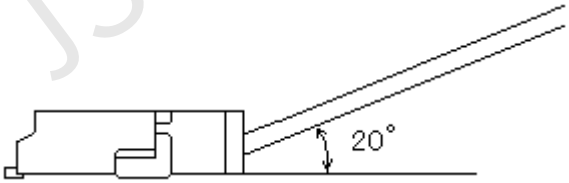
(3) Put back the raised housing lance to its original position.

7. Mating and Unmating Connector

① Mating the connector
Hold the socket housing firmly and insert it straightly into the header until clicking.

② Unmating the connector
Hold the inserted wire firmly and unmate the connector along the mating axis.

③ As prying withdrawal may deform the header post and damage the connector, do not conduct prying withdrawal. When the withdrawal operation on the mating axis is difficult, do the operation within 20 degrees against the mating axis.



④ Wire handling
When handling the wires, do not apply other than an external load of wire bucking level by keeping an enough wire length and fixing wires.