Title of Document: HANDLING MANUAL	Issue No. CHM-1-125	Rev. 3
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This handling manual describes points to check for smooth crimping operation of BHS conntact.

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1. Part Name and Model Number

Part name	Model No.
Socket Contact	SBHS-002T-P0.5A
Socket Housing	BHSR-02VS-1 (N)
Contact (Wire-to-wire type)	SBHSM-002T-P0.5
Housing (Wire-to-wire type)	BHSMR-02VS
Header	SM02B-BHSS-1 (LF)(SN)

Note$_1$: The above-mentioned contact, “SBHS-002T-P0.5A” cannot be inserted into the housing whose model number is “BHSR-02VS-1”.

2. Applicable Wire

	SBHS-002T-P0.5A	SBHSM-002T-P0.5
Wire size	AWG #28 ~ #24	AWG #28 ~ #24
Wire insulation O. D.	ϕ0.9 mm ~ ϕ1.7 mm	ϕ0.9 mm ~ ϕ1.8 mm
Conductor spec.	Tin-plated annealed copper stranded wire	Tin-plated annealed copper stranded wire

Note$_2$: Special wires such as solid wire, tin-coated wire, shielded wire, FFC, etc. other than above wires cannot be used in principle.
When using such wires, contact JST.

3. Crimping Tools

Product name		Model No.
Semi-automatic press		AP−K2N
Crimping applicator		MKS−L
SBHS−002T−P0.5A	Die set	MK／SBHS002−05
	Applicator and die set	APLMK SBHS002−05
SBHSM−002T−P0.5 (Wire-to-wire type))	Die set	MK／ SBHSM002−05
	Applicator and die set	APLMK SBHSM002−05

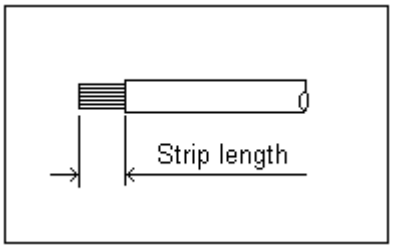
Note$_3$: When crimping operation is conducted by using other than the above applicator and die set, JST cannot guarantee the performance of the connector.

4. Crimping Operation

4-1 Wire strip

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

Reference value of wire strip length: 2.2 mm



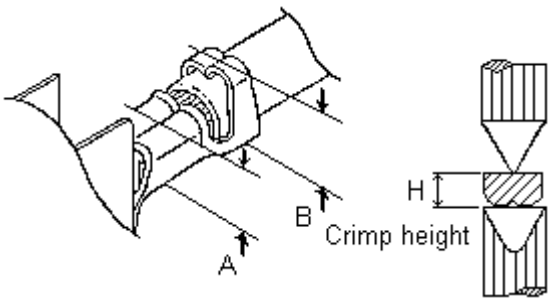
4-2 Crimping

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

4-2-1 Crimp height

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

Measurement of crimp height



A: Crimp height at wire barrel should be set to pre-determined dimensions.

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

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

Table of crimp height

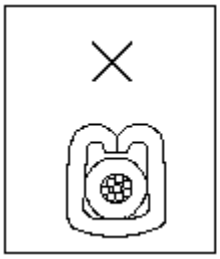
Wire size	SBHS-002T-P0.5A SBHSM-002T-P0.5
	Crimp height at wire conductor (mm)
AWG #28	0.57 ~ 0.62
AWG #26	0.60 ~ 0.65
AWG #24	0.65 ~ 0.70

Table of crimp height at wire insulation part

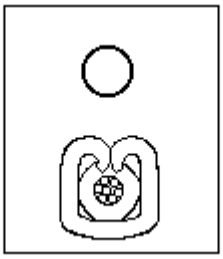
Wire size	Wire insulation O. D.	SBHS-002T-P0.5A	SBHSM-002T-P0.5
		Crimp height at wire insulation part (Reference value) (mm)	
AWG #28	0.93	1.40	1.50
AWG #26	1.45	1.60	1.70
AWG #24	1.60	1.90	1.90

Note$_4$: The following UL wires are used.
AWG #28……UL3443
AWG #26……UL10267
AWG #24……UL3239

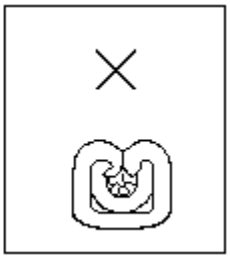
Crimping condition at wire insulation barrel part



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



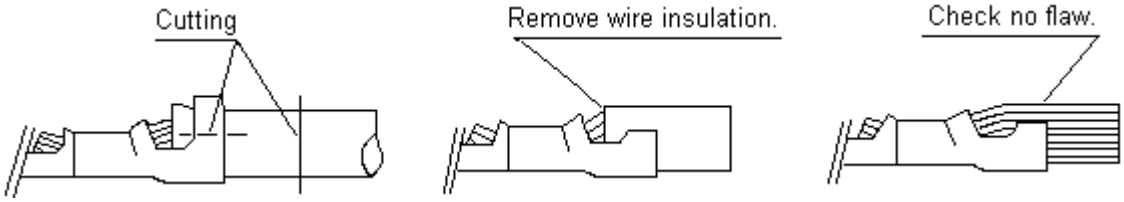
Good



Excessive crimping (pressed excessively)
Barrel bites wire and may damage 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.



4-2-2 Tensile strength at crimped part

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

Table of tensile strength at crimped part Unit: N

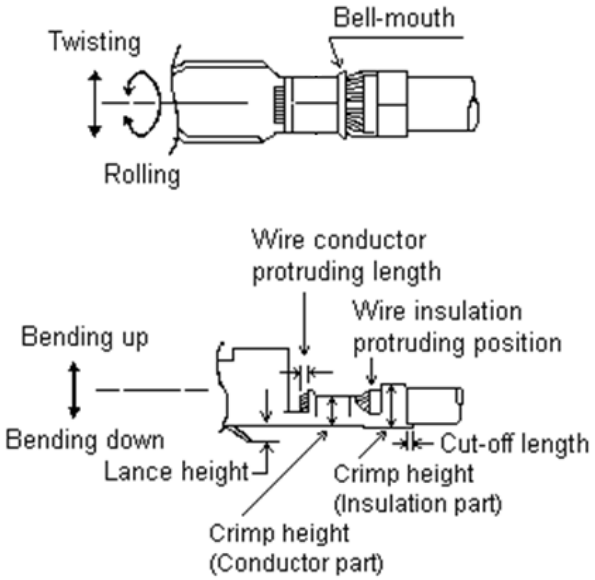
Wire size	Requirement (Reference value)	Actual value SBHS-002T-P0.5A	Actual value SBHSM-002T-P0.5 (Wire-to-wire type)
AWG #28	13 min.	20 ~ 31	16 ~ 22
AWG #26	15 min.	35 ~ 50	30 ~34
AWG #24	20 min.	56∽66	55 ~ 65

Note$_5$: The following UL wires are used.
AWG #28……UL3443
AWG #26……UL10267
AWG #24……UL3239

4-2-3 Crimping appearance

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

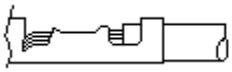
Part name of crimped contact



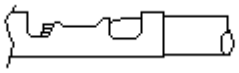
	Item	Reference value
①	Bending up	approx. 3° max.
②	Bending down	approx. 3° max.
③	Twisting	approx. 3° max.
④	Rolling	approx. 5° max.
⑤	Bell-mouth	approx. 0.1 ~ 0.3 mm
⑥	Cut-off length	approx. 0 ~ 0.3 mm
⑦	Wire conductor protruding length	approx. 0.3 ~ 0.7 mm

Note$_6$: As far as crimped contact can be inserted into housing, bending up of contact may be allowed.

Examples of defective crimping

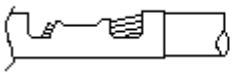


Wire conductor protruding length is long.

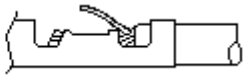


Wire barrel bites wire insulation.

Wire conductor protruding length is short.

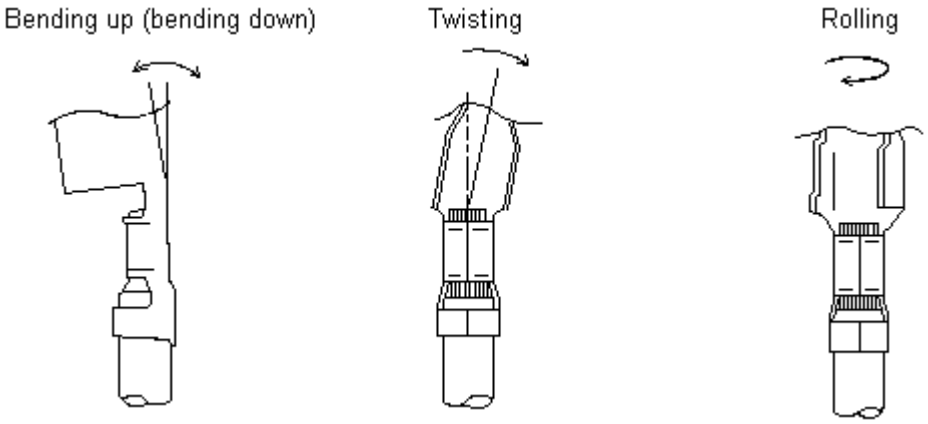


Wire insulation is not crimped sufficiently.



Wire conductors come off.

Bending up, bending down, twisting and rolling



4-3 Precautions for crimping operation

① Conduct crimping operation properly and inspect crimping appearance of crimped product with loupe.
Note: If conductors are not crimped at the center in barrel, contact may twist slightly but it does not affect the performance.

② Do not conduct empty crimping and crimping twice, because they may cause outstanding burr at crimped part and may lead to abrasion of crimping die quickly.

③ As cutting residue (powder), etc. adhered to crimping die part affects life of dies, clean crimping part occasionally and conduct appropriate crimping.

④ Crimping die is a consumable.When chips or excessive roughness are observed on crimping die, replace it without delay.

⑤ As abrasion of crimping die and insufficient adjustment of applicator may cause defective crimping appearance, do not fail to conduct daily inspection.

⑥ When crimping operation is conducted with wire hold spring damaged or extracted, they may cause that wire conductors come off or wire barrel bites 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 storage and handling of crimped contact

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

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

② Do not place 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 crimped contacts nor place anything on them, because weight of themselves may cause deformation of 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. Harness Assembly Operation

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

5-1 Precautions before inserting crimped contact into housing

Before inserting the crimped contact into the housing, note the following points:

① Do not apply any pulling force to crimped part.

② Do not use pin, etc., because the tip of pin accidentally reach contact mating part and it may cause defective contacting or deformation of contact.

③ Check secure locking of contact into housing per each insertion, and check whether there is the backlash in the direction of insertion axis.
Note$_7$: When wire is pulled with too much force, lance may be deformed and contact may come off housing.

④ 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.

⑤ Do not use the improperly crimped contact or the deformed contact such as the lance and mating the part.

5-2 How to Extract Crimped Contact from Housing in Case of Mis-insertion

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

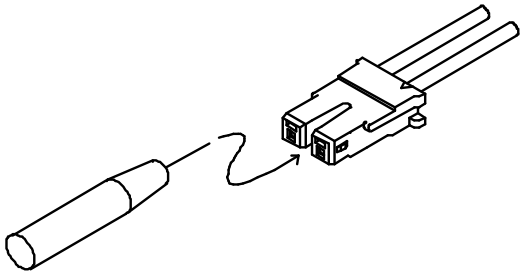
① Do not recycle once used housing and contact in principle but use a new one.

② When improperly inserted contact is extracted from housing and recycled.
(Method of extracting contact from housing is as below.)

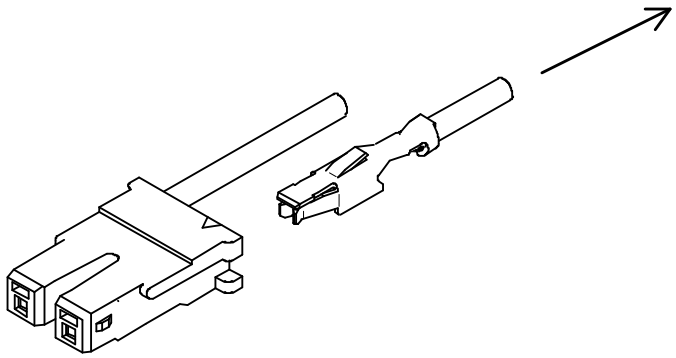
a) Only specified person conducts the operation.
b) In case such contact and housing are recycled, the recycle should be once.
c) After modification completes, be sure to check secure locking stated in item 5-③.
When contact comes off housing, use a new housing.

Method of extracting contact from housing
(Conduct same extracting method for wire-to-wire type of BHS connector in principle.)

① Insert a sharp-pointed tool as shown in the figure into housing lance release entrance and unhook housing lance.

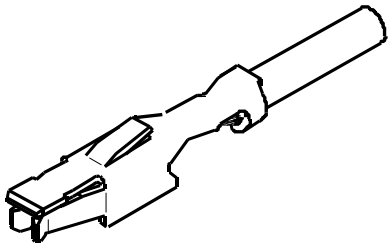


② Pull out wire.



③ Put back housing lance to its original position.

Note: When lance is raised, contact retention force against housing may drop extremely due to metal fatigue at lance part.



6. Mating and Unmating of Connector

6-1 Mating connector

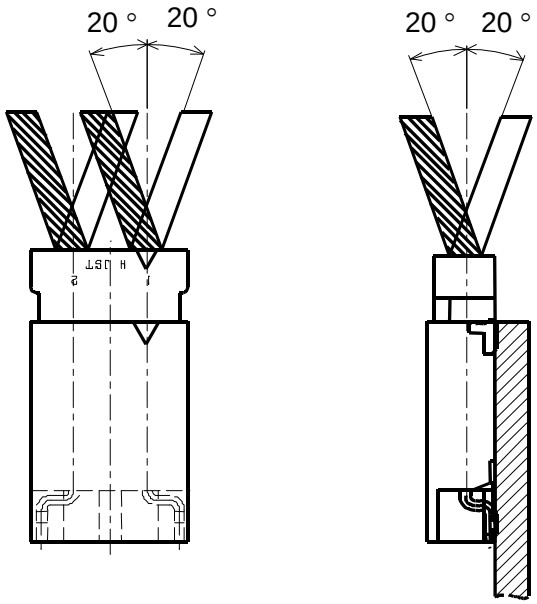
Hold receptacle housing securely and insert it into header straight against to header post until click sounds.

6-2 Unmating connector

Hold receptacle housing securely and withdraw it on the mating axis.

6-3 Prying

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



6-4 Routing of wire

Route wire so as not to apply external force to connector except force to such an extent that wire slightly buckles, considering an enough length to route and fixing of wire.