



Title of Document:	HANDLING MANUAL	Issue No. CHM-1-2051	Rev. 5
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This handling manual describes points to check for smooth crimping operation of the NH connector contact.

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1. Part Name and Model Number

Part name		Model No.
Contact		SHF-001T-0.8BS SHF-002T-0.8BS
Housing		H()P-SHF-AA
Header	Top entry type	B()P-SHF-1AA (LF)(SN)
	Side entry type	BS()P-SHF-1AA (LF)(SN)
	Bottom entry type	BE()P-SHF-1AA (LF)(SN)

Note₁: Figures in () denote the circuit number.

Note₂: Identification marking "(LF)(SN)" stands for lead-free product.
 "(LF)(SN)" shall be displayed on product label.

2. Storage

2-1 Storing the connectors

Recommended storage condition: Temperature: 5 – 35 °C, Relative humidity 60 % or less
 (Under packaging like the state of JST shipment)

Keep off direct sunlight, places exposing to such corrosive gas as industrial gas (generate from a stove and whatnot) and ammonia gas (generate from a toilet and whatnot) and dusty place.
 Also, keep the storage room from condensation.

Note that the resin molding part may break due to transportation and handling, such as processing and mating, under dry or low temperature condition.
 After unpacking, return the products in the original package to store.

2-2 Storing the crimped contacts

Not leaving the crimped contact to stand in a place exposed to high humidity and direct sunshine, and not placing them directly on the ground. Keep them in a clean storage room.

3. Applicable Wire

3-1 Applicable wire per barrel size

Wire size and wire insulation outer diameter for SHF-001T-0.8BS and SHF-002T-0.8BS are as below.

- Applicable wire···UL1007 (stranded wire) and its equivalent stranded wires

Contact	Applicable wire size	Wire insulation O.D.
SHF-001T-0.8BS	AWG #28 ~ #22	φ 1.2 ~ φ 1.7 mm
SHF-002T-0.8BS	AWG #30 ~ #28	φ 0.9 ~ φ 1.2 mm

3-2 Precautions

- ① Do not crimp two wires together.
- ② Special wires such as solid wire, tin-coated wire, shielded wire, etc. other than above wires cannot be used in principle.
 When using such special wires, contact JST.

4. Crimping Tool

Tool name		Model No.
Crimping machine		AP-K2(N)
Applicator		MKS-L
Dies	001 type	MK/SHF-001-08S
	002 type	MK/SHF-002-08S
Applicator with die	001 type	APLMK SHF001-08S
	002 type	APLMK SHF002-08S

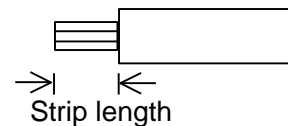
Note₃: When crimping operation is conducted by using other than above applicator and die set, JST cannot guarantee the connector performance.

5. Crimping Operation

5-1 Wire strip

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

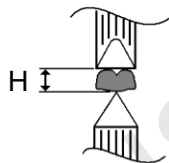
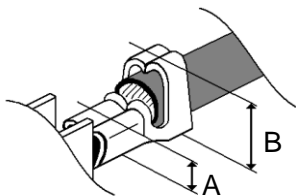
Reference value of wire strip length: 2.5 ~ 3.0 mm



5-2 Crimping

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

5-2-1 Measurement of crimp height

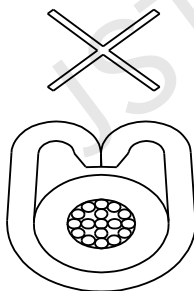


A: The crimp height at the wire barrel should be set to the pre-determined dimensions.

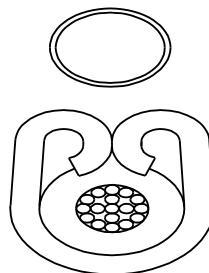
B: Adjust the crimp height at the wire insulation barrel to the extent that the wire insulation is slightly pressed, and set it so that crimping is not excessive.

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

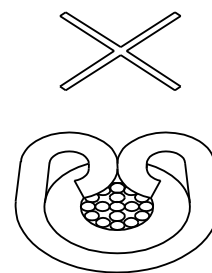
5-2-2 Crimping condition at wire insulation barrel



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



Good



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

5-2-3 Check of crimping condition at insulation barrel

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

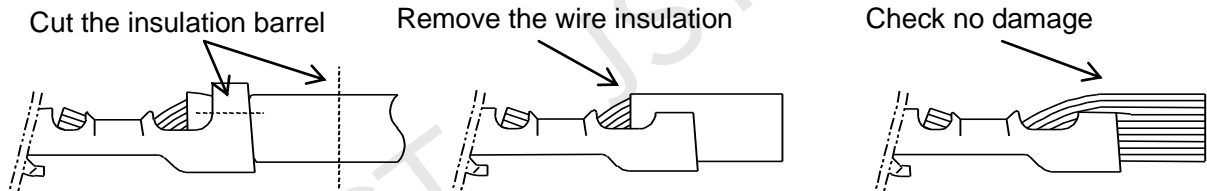


Table of crimp height

• SHF-001T-0.8BS

Unit: N

Wire (UL1007)		Crimp height (mm)	
Wire size	Insulation O.D. (mm)	Conductor part	Insulation part (Ref. value)
AWG #28	(1.2)	0.65 ~ 0.70 (Target: 0.67 mm)	1.6
AWG #26	(1.3)	0.70 ±0.05	1.7
AWG #24	(1.5)	0.75 ±0.05	1.7
AWG #22	(1.7)	0.80 ±0.05	1.8

• SHF-002T-0.8BS

Unit: N

Wire (UL1007)		Crimp height (mm)	
Wire size	Insulation O.D. (mm)	Conductor part	Insulation part (Ref. value)
AWG #30	(0.9)	0.53 ~ 0.58	1.2
AWG #28	(1.2)	0.55 ~ 0.60	1.3

5-3 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 the wire size is same.

Table of tensile strength at crimped part (Reference value)

- SHF-001T-0.8BS

Wire size	Requirement	Actual value (N)
AWG #28	9.8N min.	19 ~ 25
AWG #26	14.7N min.	32 ~ 37
AWG #24	19.6N min.	66 ~ 76
AWG #22	34.3N min.	78 ~ 86

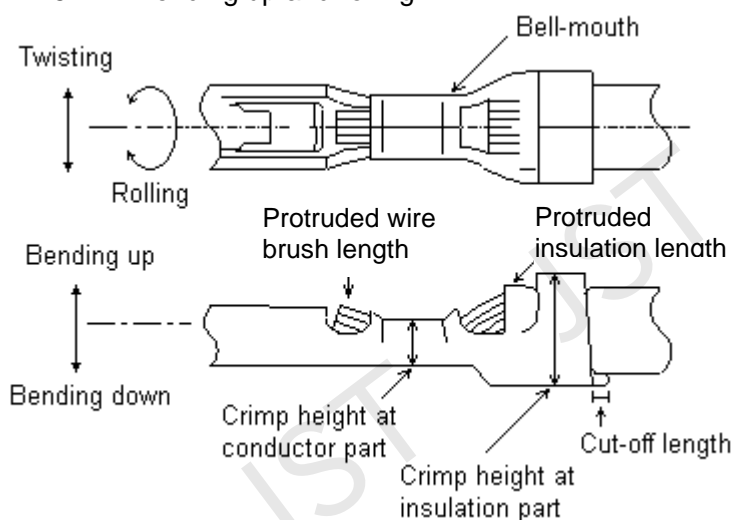
- SHF-002T-0.8BS

Wire size	Requirement	Actual value (N)
AWG #30	7.8N min.	22 ~ 25
AWG #28	9.8N min.	24 ~ 29

5-4 Crimping appearance

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

5-4-1 Bending up and rolling



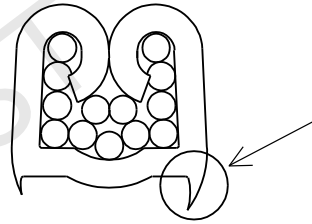
Item	Reference value
Bending up	3° max.
Bending down	3° max.
Twisting	4° max.
Rolling	5° max.
Bell-mouth	0.1 ~ 0.4 mm
Cut-off length	0 ~ 0.3 mm
Protruded wire brush length	0.3 ~ 0.7 mm
Crimp width at conductor part	approx. 1.5 mm

(Others)

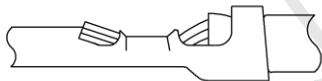
No deformation on the mating part and the lance part

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

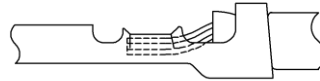
5-4-2 There must not be large burr or one-sided burr.



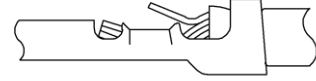
5-4-3 Examples of defective crimping



Long protruded wire conductor



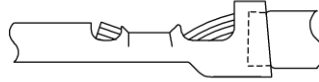
Short protruded wire brush



Stray wire conductors



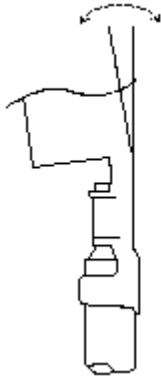
Bitten wire insulation
with wire barrel



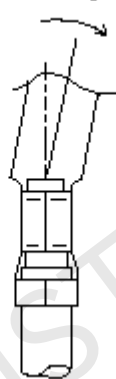
Poorly crimped wire insulation

5-4-4 Bending up, bending down, twisting and rolling

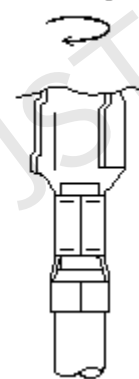
Bending up (bending down)



Twisting



Rolling



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5-5 Precautions for crimping operation

- ① Conduct the crimping operation properly and inspect the crimping appearance of the crimped product with loupe.
Note₄: If conductors are not crimped at the center in the barrel, the contact may twist slightly, but it does not affect the performance.
- ② Do not crimp with no terminals and twice, because they may cause an outstanding burr at the crimped part and may lead to abrasion of the crimping die quickly.
- ③ As cutting residues (powder), etc. adhered to the crimping die part affects the life of the dies, clean the crimping part occasionally and conduct the appropriate crimping.
- ④ When chips or excessive roughness are observed on the crimping die, replace it without delay.
- ⑤ 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 the crimping operation is conducted with the wire-holding spring damaged or extracted, the wire conductors may come off or the wire barrel may bite the wire insulation.

5-6 Control of crimping operation

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

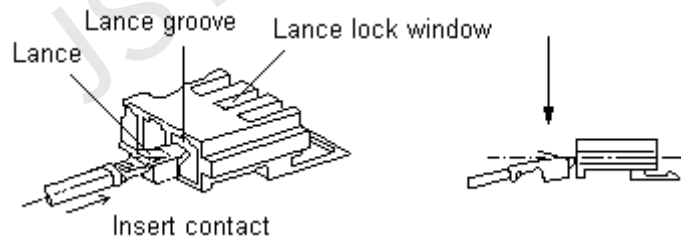
- ① Model No. or control No. of semi-automatic press and applicator
- ② Contact lot No.
- ③ The number of crimping and cumulative total
- ④ Crimp height
- ⑤ Wire retention force
- ⑥ Crimping appearance and record of adjustment and replacement of crimping die

6. 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 the harness assembly as well as the said crimping operation.

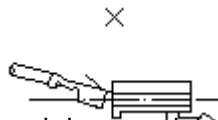
6-1 Inserting the contact into the housing

- ① Hold the housing with the lance lock window facing up, and align the lance groove of the housing with the contact lance, and then, gently insert the contact parallel to the insertion axis. (The contact will lean as shown below, leading to the insertion into the housing.)

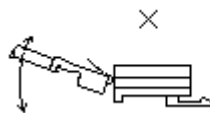


Precautions when inserting

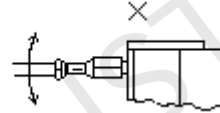
Do not tilt contact to the direction that the contact lance is pressed as shown in figure below, because the lance height becomes low and locking between the contact and the housing becomes unstable.



Besides, do not pry the contact up and down or right and left in inserting, because the contact lance and the mating part may be deformed.

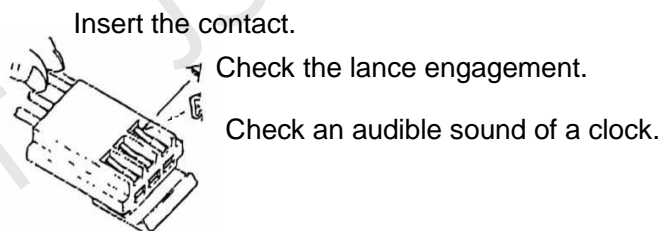


Do not pry the contact up and down.



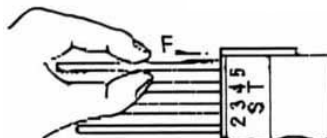
Do not pry the contact right and left.

- ② Insert the contact into the housing without stopping to the innermost. When the contact is fully inserted into the housing, you can hear the audible sound of a click and there is a sense of fit. The locking condition can also be checked through the lance lock window.



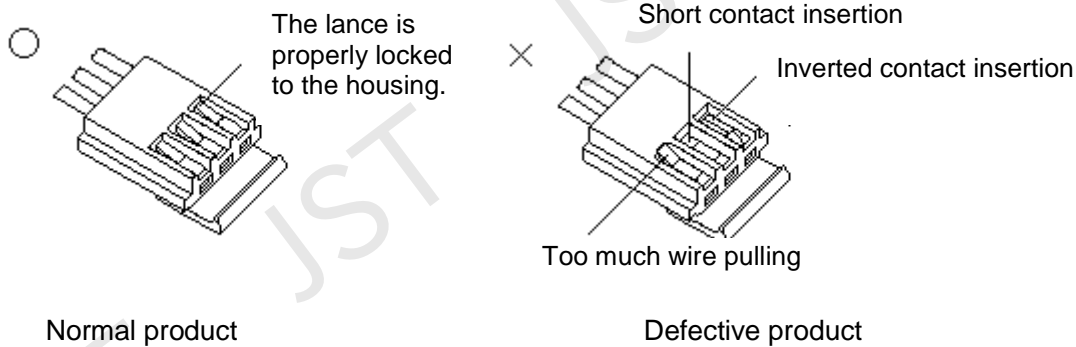
- ③ Check secure locking per each insertion by pulling a wire softly in order to check that the contact does not come off the housing. Besides, check whether there is the backlash in the direction of the insertion axis
 Note₅: When the wire is pulled with too much force, the lance may be deformed and the contact may come off the housing.

Pull a wire softly.



6-2 Doublecheck of the contact insertion into the housing

After inserting all contacts into the housing, check visually again that all contacts are properly inserted into the housing and securely locked.



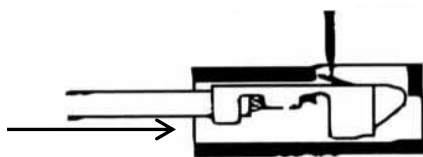
7. How to Extract Crimped Contact from Housing in Case of Mis-insertion

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

- ① Do not reuse the miss-inserted contact and the used housing but use the new ones. (The method of extracting the contact from the housing is as below.)
- ② When the miss-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, the reuse should be once. From twice, use the new contact and housing.
 - c) Be sure to raise the contact lance to its original position.

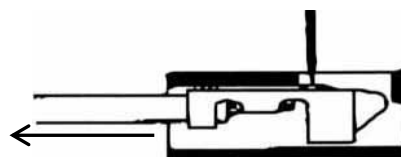
How to extract the crimped contact from the housing

- ① Push the lance with a needle-like tool.



Push a wire forward.

- ② Pull a wire while pushing the lance softly, and the contact comes off.

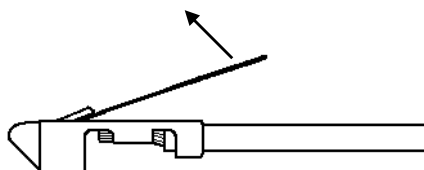


Pull a wire.

Note that pulling a wire without pushing the lance may damage the housing lance hooking part.

How to raise the lance

Insert something like a knife with a flat head in the lance to raise.



Note that a needle enters into a space that made under the lance by raising the lance with a needle-like tool, which may deform the curl.

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8. Handling Precautions

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

- ① Keep the contact away from a place exposed to high humidity and direct sunshine and do not leave it directly on the floor. Store it in a clean room with room temperature and dedicated to the storage.
- ② As "THIS WAY UP", which shows the arrow directing to the ceiling, is printed to the product label attached surface of the package of the contact reel, be sure to lay the contact reel during the storage and the transportation according to the printed instruction.
- ③ When the contact reels are left stand after taking out of the product box, deformation, discoloration or adhesion of foreign matters may appear. Be sure to store them in boxes.
- ④ Fasten the tip of the remaining chain contact in the reel with wire, string, and the like to the reel so as not to unravel, and store the reel in the package.
- ⑤ Bundle the crimped contacts and protect them by wrapping them in paper, and the like to prevent them from scratches, deformation, or adhesion of dust. The quantity per wire bundle depends on the wire type. We recommend bundling up to 300 pieces for AWG #24 or smaller wires and up to 200 pieces for AWG #22 or larger wires and using slippery papers such as an advertising paper rather than a newspaper.
- ⑥ Do not stack too much quantity of the crimped contacts nor place anything on them, because weight of themselves may deform the contact.
- ⑦ When the crimped contact is taken out of the bundle, do not pull a wire but hold a wire near the crimped section taken it out.
- ⑧ Impact on the housing under low temperature and dryness sometimes breaks the lock part. Be especially careful of assembling and handling the connector at the beginning especially in winter.
- ⑨ Be sure to check the following points before inserting the crimped contact into the housing.
 - Do not place other things on or near working table and do not conduct any other work on same working table to prevent from operation mistake.
 - Do not stain contact with household goods such as oils, detergent, seasoning, and fruit juice. If stained, never use stained contact.
 - Do not use the miss-inserted crimped contact and the deformed contact such as the lance and the mating part.
- ⑩ Note the following points when wiring inspection is conducted.
 - Do not insert foreign matters such as a tester stick into the mating part.
 - Do not conduct prying insertion or withdrawal operation.