



Title of Document:	HANDLING MANUAL	Issue No. CHM-1-2772	Rev. 1
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Title subject:	RULH Female Terminal	Revision date: February 20, 2024	

This handling manual describes operation points of crimping and handling of the RULH female terminal. Be sure to read this manual thoroughly before conducting crimping operation and then keep this manual at the place where those who adjust the tool and conduct crimping operation can pick it up soon when required.

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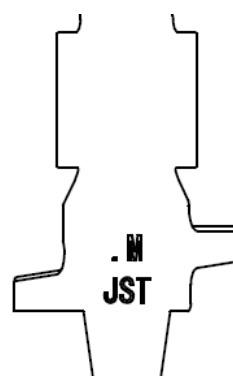
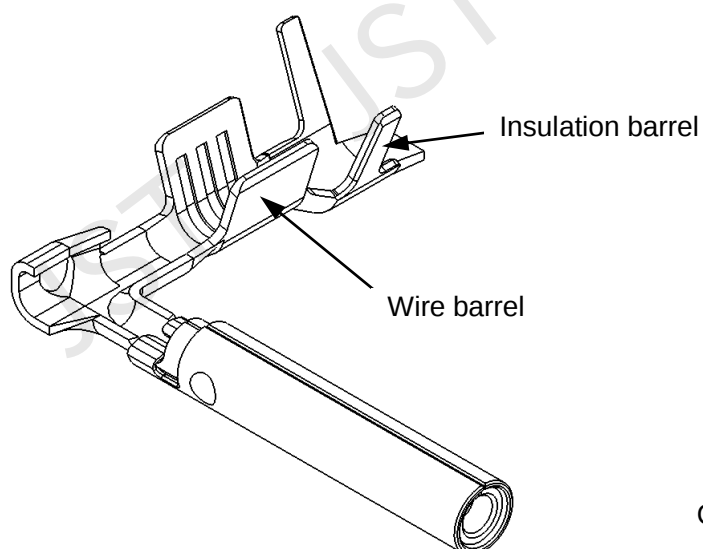
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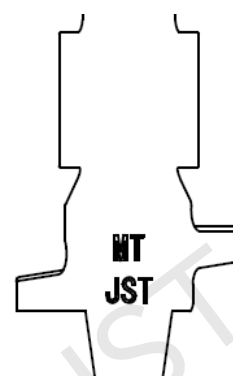
1. Part Name and Model Number

Part name	Model Number	Surface finish
RULH female Terminal	SRULH-A021GF-0.5	Selective Au
	SRULH-A021T-0.5	Sn

1-1 Components



Gold (021GF) marking



Tin (021T) marking

1-2 Storage

In order to keep the terminal clean and safe, they are wound on the reel with paper covering. As the female terminal reel is packed into the exclusive carton box for safety during the transportation and the storage, do not take it out from the box until crimping operation starts and store it in a clean room with normal temperature (5 - 35 °C) and normal humidity (60% max).

2. Applicable Wire

Wire name	Wire size	Insulation outer diameter
MOCAR 150C - Type A (LEONI)	0.35 mm ²	Max 1.5 mm
FLR9Y-A		

Note: As a rule, other than the above wires can't be used. When using other wires, contact JST.

3. Crimping Tool

Tool & Part name	Model No.
Semi-auto crimping press	AP-K2N
Applicator set (Applicator + dies)	APLMK SRULH-A021-05
Applicator	MKS-L
Dies	MK / SRULH-A021-05

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

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4. Check Points of Crimping Operation and Harness Assembly

The operations of crimping and assembly affect the reliability of the connector.

It is recommended that crimping and assembly operations and the finished products be controlled concentrating upon the following check points:

Process	Check point	Description
Crimping	Appearance	① Check that the model Nos. of the female terminal and the applicator are adequate for wires to be used. ② Check that the wires are crimped at the normal position. ③ Check that the crimped configuration is normal and excessive burr does not appear. ④ Check that uncrimped wires are not left behind. ⑤ Check that the female terminal is not bent, deflected or deformed. ⑥ Check that the female terminal is free from dirt, scratches, stains or discoloration.
	Tensile strength	① Check that the crimp height and the tensile strength are adequate.

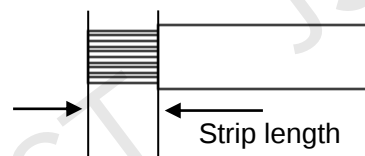
We recommend using a microscope or loupe at the appearance inspection.

5. Crimping Operation

5-1 Stripping a wire

When a wire is stripped, do not damage or cut off the wire conductors.

As the wire strip length differs depending on the wire type and the crimping method, decide the best wire strip length considering the processing condition



Reference value of wire strip length: 2.3mm

5-2 Crimp height

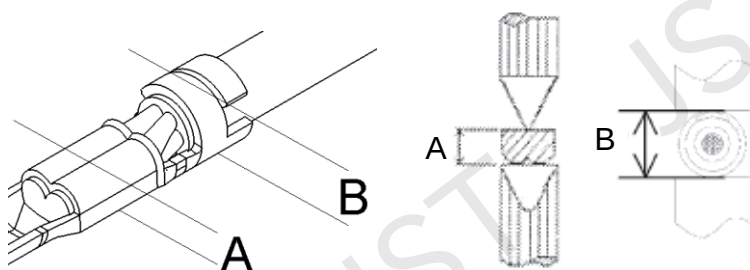
According to wires to be used, adjust the dial at the conductor part and the insulation part of the applicator to the proper crimp height.

Applicable wire					Crimping section of wire conductors (mm)	Crimping section of insulation (mm)
Wire name	Strand		Conductor	Standard (Construction)		
	Quantity	Diameter	Size			
	-	mm	mm ²			
MOCAR 150C – Type A	7	0.26	0.35	ISO6722-1 Type-A	0.69 ± 0.03	1.4 ± 0.05
FLR9Y-A						

Reference

-	12	0.19	0.3	-	(0.66 ± 0.03)	Please contact JST
-	12	0.21	0.35	ISO6722-1 Type-B	(0.69 ± 0.03)	
-	19	0.16	0.35	ISO6722-1 Type-C	(0.69 ± 0.03)	

5-2-1 Measurement of crimp height



- A: The crimp height at the wire barrel should be set to the specified dimensions. Measure the crimp height at the center of the barrel using a micrometer.
- 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. The crimp height at the insulation barrel part shall be measured with a blade micrometer or a digital caliper.

5-2-2 When to measure crimp height

- When the operation starts and finishes.
- When the contact reel is exchanged.
- When the applicator is adjusted. (After trouble-shooting, etc.)
- When the crimping dies are exchanged.

5-2-3 Crimp condition of wire insulation barrel

5.2-3-1 Section View

○ Good



× Excessive crimping



(Pressed excessively)
Barrel bites wire too much
and may damage wire
conductors.

× Insufficient crimping

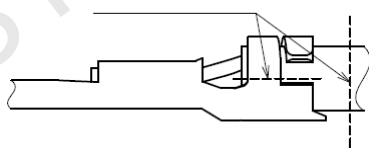


(Pressed weak)
When tension is applied to
wire, wire insulation easily
comes off terminal

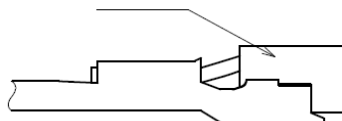
5-2-3-2 Check the damage of wire conductors by insulation crimp

Check that wire conductors are not damaged, since cutting wire insulation barrel and removing wire insulation.

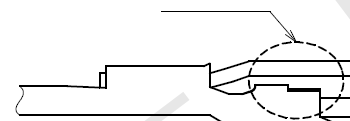
a. Cut the insulation barrel and wire



b. Remove the wire insulation



c. Check the damage of conductor



5-3 Tensile strength at the crimped part

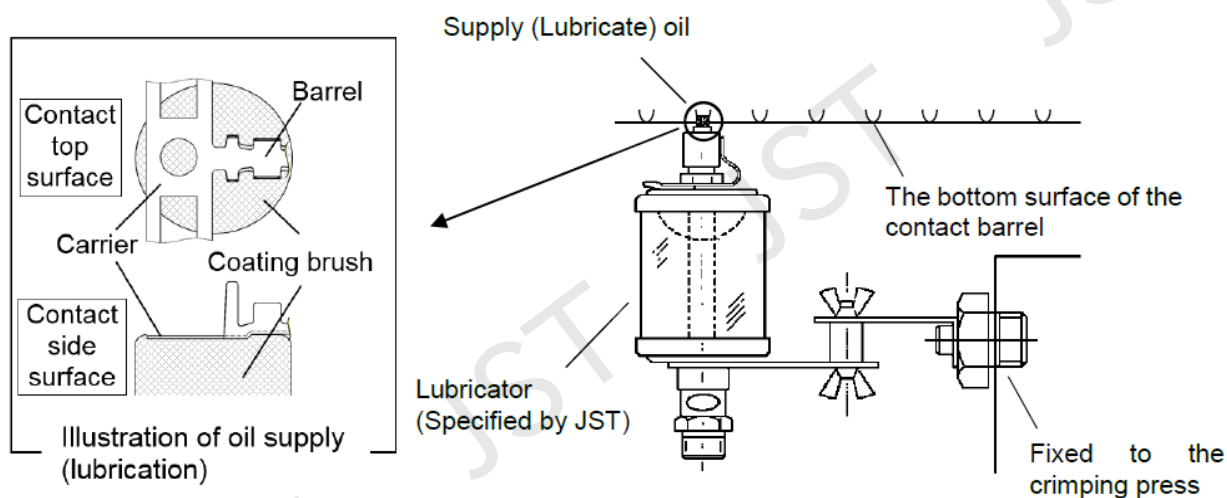
After adjusting the crimp height, check the tensile strength using the trial samples. In case the tensile strength greatly differs from the normal tensile strength (actual value), check if there is a defect. The tensile strength may be different even in the same wire size due to the difference in wire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

Applicable wire		Tensile strength at crimped part	Actual value (Ref.)
Wire Name	Wire size		
MOCAR 150C – Type A	0.35 mm ²	50N min	55.1 ~ 83.9N
FLR9Y-A	0.35 mm ²		52.2 ~ 76.2N

5-4 Applying oil to Terminal Carrier

Please crimping the JST specified lubricating oil as follows. (Oil: Nihon Kohsakyu Co., Ltd.-made blanking oil, G6316) in lubricating oil, use a JST-specified lubricator and coat oil throughout the barrel bottom surface and the carrier of the contact. At this time, be careful not to loose the coating brush of the lubricator which coats oil, because coating becomes insufficient.

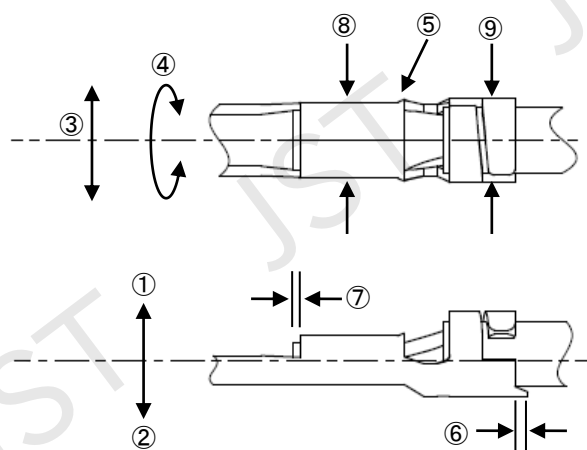
Moreover, in case that an interval is made due to pause until crimping after oil lubrication, lubricate oil before crimping.



5-5 Crimping appearance

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

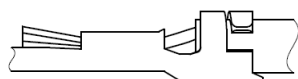
Part name of crimped terminal



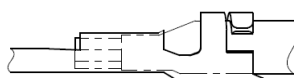
	Item	Control value
①	Bending up	3° max.
②	Bending down	3° max.
③	Twisting	±3° max.
④	Rolling	±6° max.
⑤	Bell-mouth	Approx. 0.1 – 0.5mm
⑥	Cut off length	0.2 mm max.
⑦	Protruded wire brush length	0.3 mm max.
⑧	Crimp width at conductor part	Approx. 1.1 mm
⑨	Crimp width at insulation part	1.35 mm max.

There shall be no front bell-mouth.

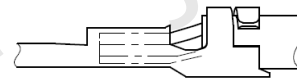
5-5-1 Examples of defective crimping



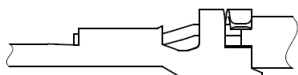
Wire conductor protruding length is long.



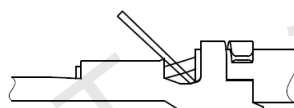
Wire Barrel bites wire insulation.



Wire conductor protruding length is short.



Wire insulation protruding length is short.



Wire conductors come off.

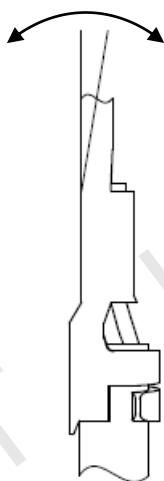
No Opening is made.
(Wire conductors must not be visible.)



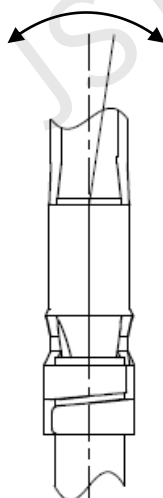
No large burr is made

Bending up, bending down, twisting and rolling

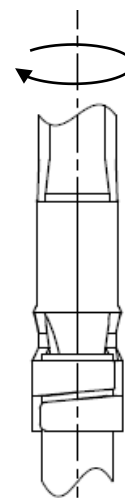
Bending up (down)



Twisting



Rolling



Notes that bending up, bending down, twisting and rolling of contact may cause deterioration of operability of inserting contact into housing, deterioration of contact retention force, and defective mating.

5-5-2 Abrasion of crimping die

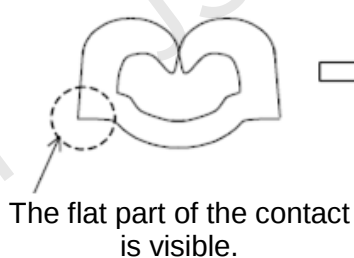
Regarding a crack caused by the abrasion of the crimping dies, check the appearance of the contact crimping part and replace the die with a new one occasionally in order to prevent electrical discontinuity.

- Replacement timing of crimping die
 - When the number of proper crimping exceeds 300,000 crimping
 - When the crimped contact surface of the female terminal becomes rough. (The gloss of the contact surface disappears.)
 - When the seam of the crimped part opens. (See figure below.)

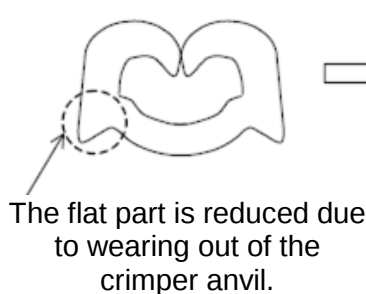
Note: In the case that crimping continues beyond the reference timing, a crack may appear on the contact as shown below.

- Mechanism of occurrence of crack (Cross section at wire conductor part)

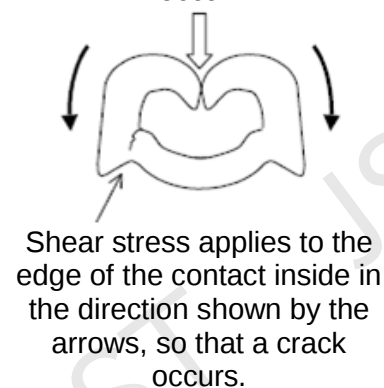
Initial condition of die



Worn-out die



Opening of seam may occur.



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5-6 Precautions for crimping operation

1. Conduct crimping operation properly and inspect the crimping appearance of the crimped product with a microscope or loupe.
2. Do not crimp with no contact and twice, because they may cause outstanding burrs at the crimped part and may lead to the 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 appropriate crimping.
4. Abrasion of the crimping die and insufficient adjustment of the applicator may cause the poor crimping appearance. Do not fail to conduct daily inspection.

5-7 Precautions for the storage and the handling 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 4 points for the storage and the handling:

1. The number of the crimped contacts for one bundle should be 100 pcs. Max. Protect the female terminals by wrapping with thick paper to prevent the deformation of the contact surface and adhesion of foreign substances. Keep them in an adequate box.
2. Do not place the terminals in humid area, under direct sunshine and directly on the floor. Store them in a clean room with ordinary temperature (5 to 35 °C) and humidity (60% max.).
3. Do not stack too much quantity of the crimped female terminals nor place anything on them, since the weights of themselves may cause the deformation of the terminals and troubles such as defective contacting.
4. When the crimped female terminal is taken out from the bundle, do not pull the wire as much as possible but hold around the crimping area of the female terminal. The female terminal is right angle-shaped so it is easy to get caught on something.