Title of Document: **HANDLING MANUAL**	Issue No. CHM-1-2143	Rev. 2
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This handling manual describes operation points of crimping, assembling and mounting on PC board for further reliability and performance of connector's features.

C O N T E N T S

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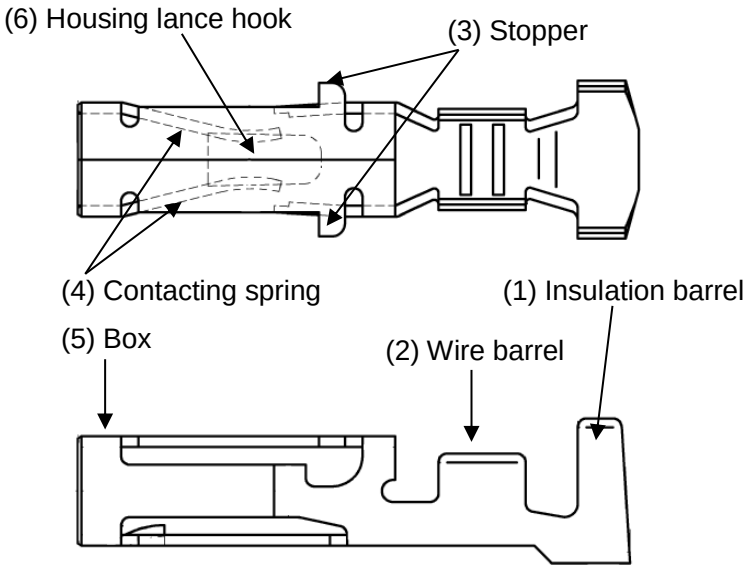
1. Parts Identification

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

Contact: SDY-01T-P1.6ASV

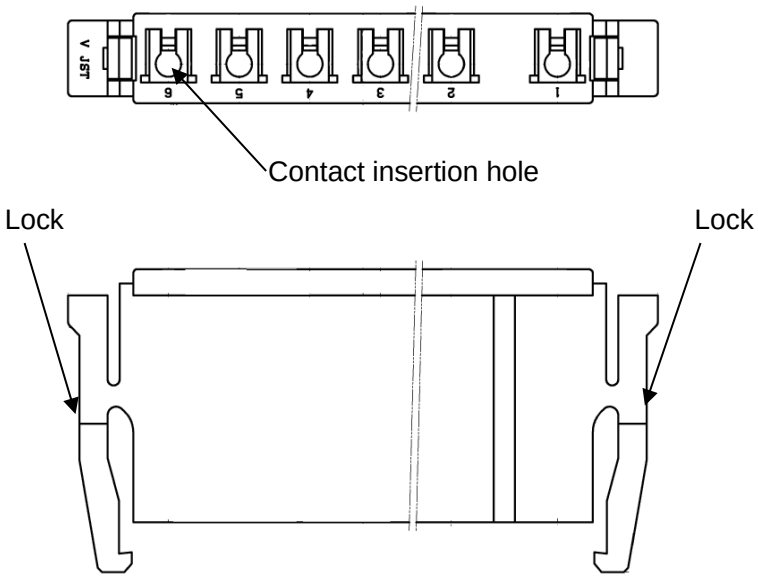


Function of each part

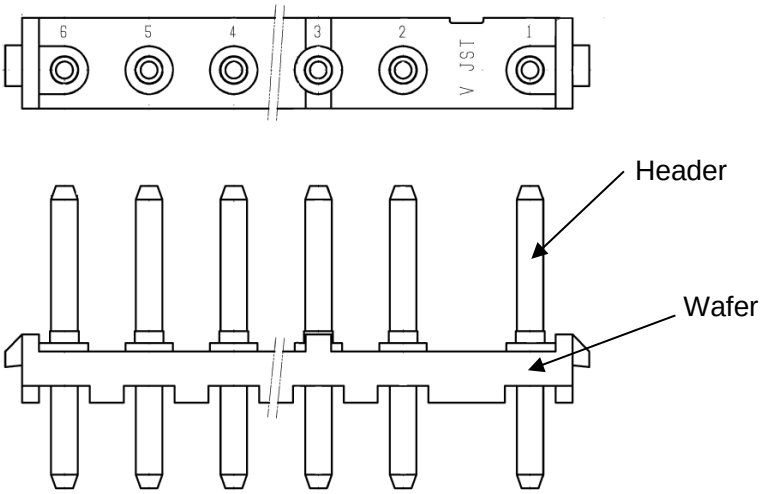
(1) It holds wire insulation.
(2) It crimps wire conductors.
(3) It prevents mis-insertion.
(4) Spring of contacting part.
(5) It protects the contacting spring and the contacting part.
(6) It receives the housing lance.

Socket housing: DVR-∗∗V-S

Note$_1$: Two-digit figures in ∗∗ denote the circuit number.



Header (Top entry type)



2. Product Name and Model Number

Product name		Model No.
Contact		SDY-01T-P1.6ASV
Socket Housing		DVR-∗∗V-S
Header	Top entry type	B∗∗B-DVS-L (LF)
	Side entry type	S∗∗B-DVS-L (LF)

Note$_2$: Two-digit figures in ∗∗ denote the circuit number.
Note$_3$: (LF) as identification part number indicating lead-free shall be displayed on a label.

3. Storage

3.1.Connector storage

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), dusty place and 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.

3.2. Storage of 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,

4. Applicable Wire

	SDY-01T-P1.6ASV
Wire size	AWG #24 ~ AWG #20
Conductor cross sectional area	0.22 mm^2 ~ 0.5 mm^2
Wire insulation outer dia.	ϕ1.5 ~ ϕ2.7 mm
Conductor spec.	Annealed copper stranded wire with tin plating

Note$_4$: When using annealed copper stranded wires without plating, check the conformance with connector before using it.

Note$_5$: Special wires such as solid ones and tin-coated ones other than the above wires cannot be used in principle.

5. Crimping Tool

Part name	Model No.
Semi-automatic press	AP-K2*
Crimping applicator	MKS-L
Die	MK/SDY-01-16AS
Applicator and die set	APLMK SDY-01-16AS

Note$_6$: When crimping operation is conducted by using other than the above applicator and die set, JST cannot guarantee the performance of the connector.

6. Applicable PC Board

6.1. Applicable PC board thickness

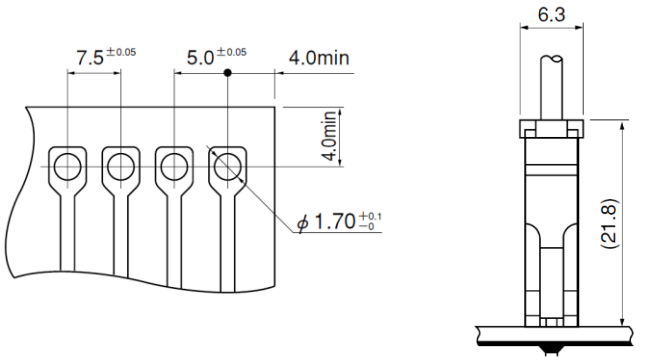
1.6 mm

6.2. PC board layout and assembly layout

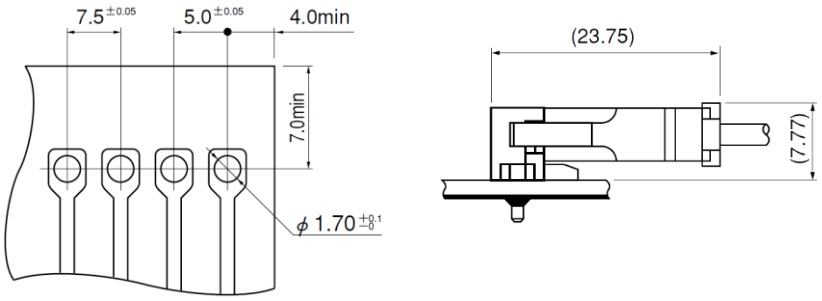
Refer to the following figure for PC board layout. Tolerances for PC board are non-cumulative ±0.05 mm for all centers.

Note: The dimensions above should serve as a guideline for drilling. Hole diameters differ according to piercing method and PC board material.

Top entry type



Side entry type

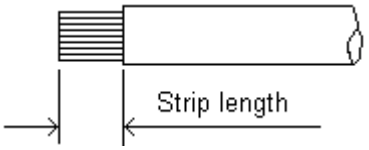


7. Crimping Operation

Before crimping operation, be sure to check the combination of the contact, wires to be used and the crimping die are correct.

7.1. Wire strip

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



Reference value of wire strip length: 3.0 mm

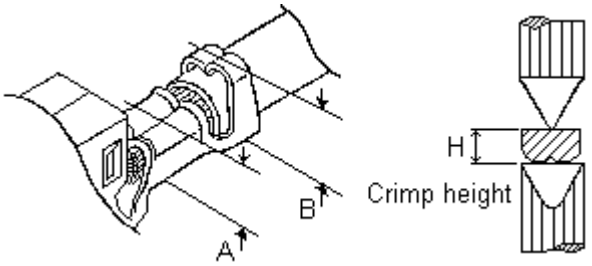
Note$_7$: Do not leave such a stripped wire for a long time in order to prevent the oxidation of the conductor's surface, since such oxidation may lead to the fluctuation of the contact resistance.

7.2. Crimping

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

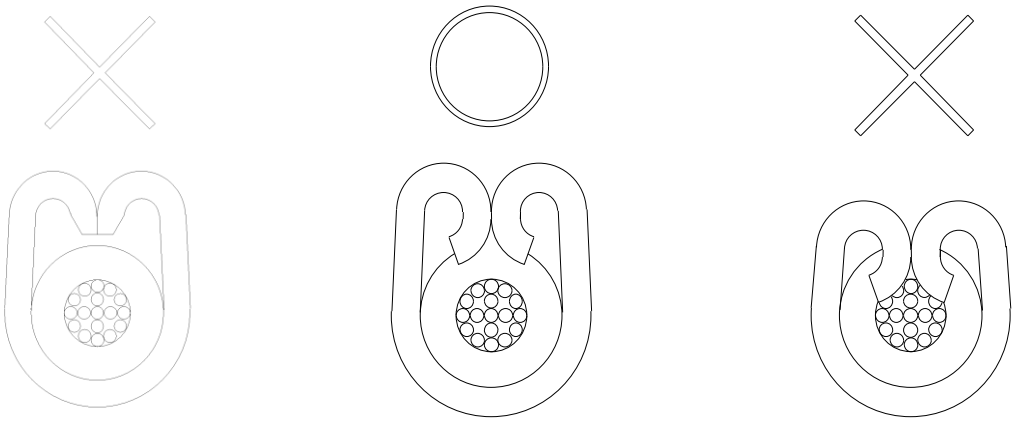
5-2-1 Measurement of crimp height

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 wire iInsulation barrel as per finished outer diameter and wire type so that the wire insulation does not come off of the contact easily and 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 is applied
to a wire, the wire insulation
easily comes off the contact

Good

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

Check of the crimping condition at the wire insulation barrel

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

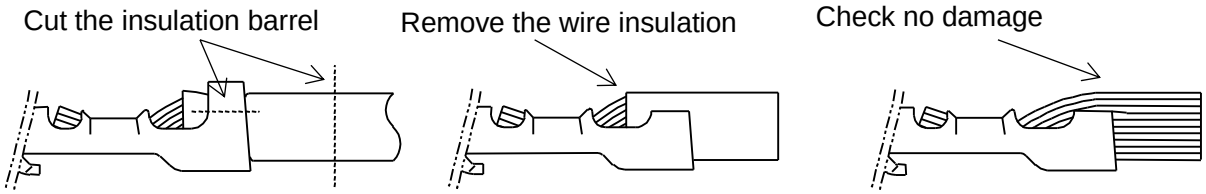


Table of crimp height

Wire size	Crimp height (mm)	
	Conductor part	Insulation part (Ref. value)
UL1007 AWG #24	0.85 ± 0.05	2.0
UL1032 AWG #22	0.90 ± 0.05	2.3
UL1007 AWG #22	0.95 ± 0.05	2.1

7.2.1. 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 values), check if there is a defect. The tensile strength may be different even in the same wire size due to the difference in the strength of wire itself.

Table of tensile strength at crimped part

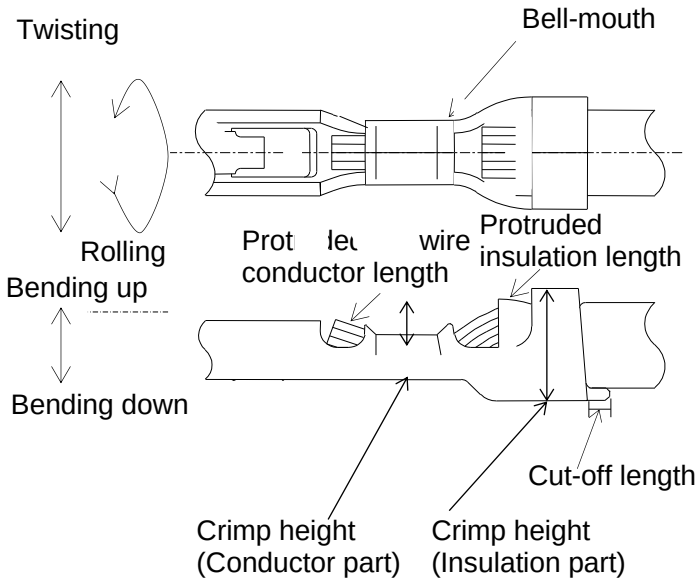
Unit: N

Wire	Specified value	Actual value (Ref. value)
UL1007 AWG #24	30.0 min.	48.0 ~ 61.7
UL1032 AWG #22	60.0 min.	79.5 ~ 95.1
UL1007 AWG #22	80.0 min.	101.4 ~ 123.2

7.2.2. Crimping appearance

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

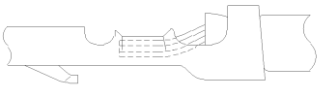
Part name of crimped contact



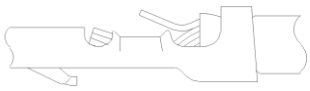
Item	Reference value
Bending up	about 3° max.
Bending down	about 3° max.
Twisting	about 3° max.
Rolling	about 5° max.
Bell-mouth	about 0.1 ~ 0.4 mm
Cut-off length	about 0 ~ 0.4 mm
Protruded wire conductor length	about 0.3 ~ 0.6 mm
Crimp width at wire conductor part	about 1.4 mm

Examples of defective crimping

Protruded wire conductors is long.

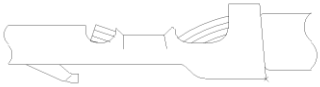


Protruded wire conductors is short.



Wire conductors come off.

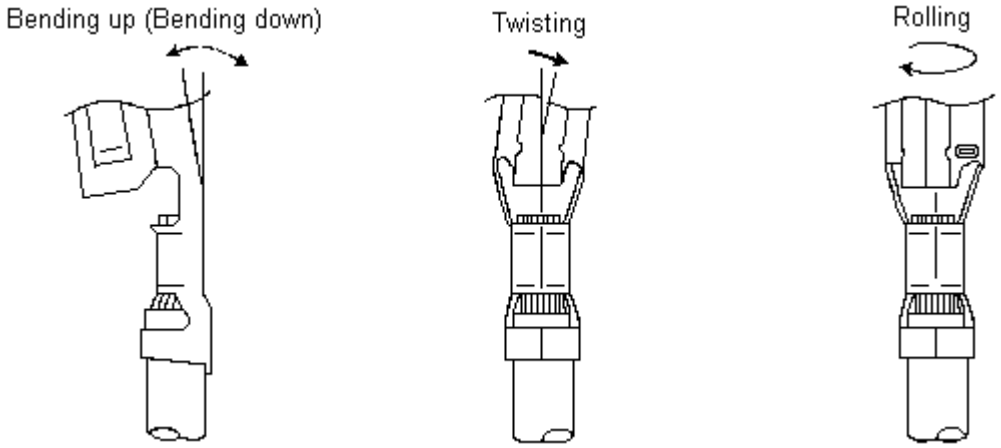
Wire barrel bites wire insulation.



Wire insulation is not crimped Insufficiently.

Bending up, bending down, twisting and rolling

Note that bending up, bending down, twisting and rolling of the contact may cause the deterioration of the insertion operation into the housing and poor mating.



7.3. Precautions for crimping operation

① Conduct the crimping operation properly and inspect the crimping appearance of the crimped product with loupe.

② Do not crimp with no terminal 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), etc. adhered to the crimping die part affects the life of the dies, clean the crimping part occasionally and conduct the appropriate crimping.

④ 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.

⑤ 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.

7.4. Control of crimping operation

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

Contents of record..... ① Model No. or control No. of crimping machine and applicator
② Contact lot No.
③ The number of crimping and cumulative total
④ Crimp height
⑤ Tensile strength at crimped part
⑥ Crimping appearance and record of adjustment and replacement of crimping die

7.5. Storage and handling method 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 5 points for the storage and the handling:

① The number of the crimped contacts for one bundle should be 100 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 use the improperly crimped contact and deformed one.

8. 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.

8.1. Precautions before inserting the crimped contact into the housing

Note the following points before inserting the crimped contact into the housing:

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

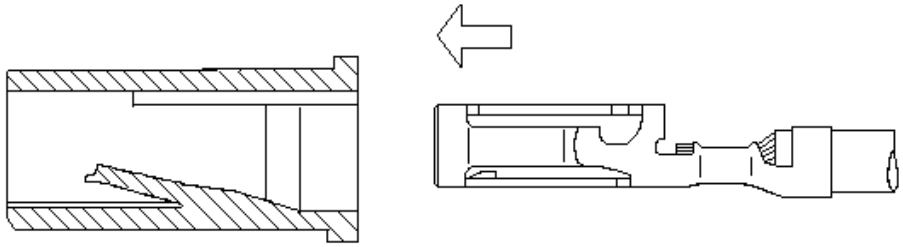
② Do not use improperly crimped contact and deformed one such as the contact lance and the mating part.

8.2. Inserting the crimped contact into the housing

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

② Do not use an insertion jig such as pin when inserting the contact into the housing, because the tip of the pin accidentally reaches the contact mating part, which may result in defective contacting or the deformation of the contact.

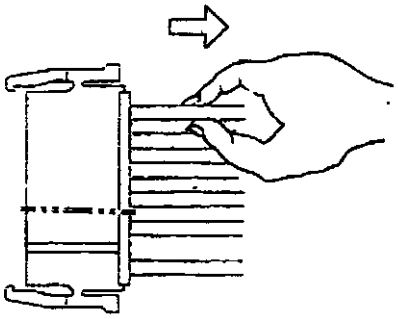
③ Insert the crimped contact into the housing parallel to the insertion axis so as to turn the housing lance hook of the contact to the housing lance.



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

8.3. Check after inserting the crimped contact into the housing

Check secure locking per each insertion by pulling a wire softly. (about 9.8 N)



Note$_8$: When a wire is pulled with too much force, the housing lance may be scraped and the contact may come off of the housing.

8.4. How to extract the crimped contact in case of mis-insertion

When the contact is inserted into an improper circuit hole, pay attention to the following points:

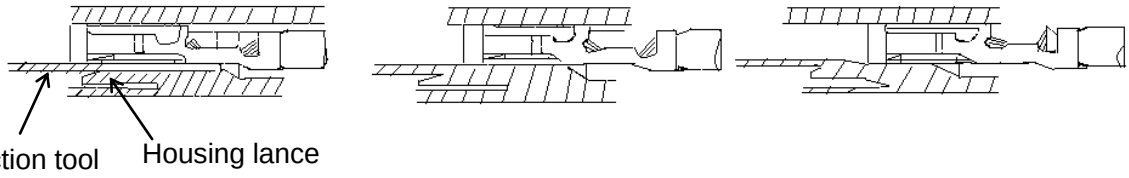
① Do not reuse the housing from which the contact has been extracted but use a new one in principle.
(It is shown below how the contact is extracted from the housing.)

② When reusing the housing from which the contact inserted in an improper circuit has been extracted

(1) Only a specified person conducts the extracting operation.
(2) The housing reuse should be once.

③ As it is very difficult to extract the contact from the housing, avoid the extraction operation as much as possible.

How to extract the crimped contact



① Prepare the contact extraction tool, SLJ-1.4.

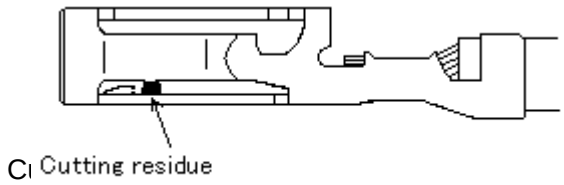
② Insert SLJ-1.4 between the tongue part at the tip of the housing lance and the contact parallel to the housing from the mating direction.

③ Press the housing lance with the tip of SLJ-1.4, and extract the crimped contact from the housing by pulling the wire.
When the wire cannot be extracted even by pulling them softly, do not pull them out forcibly because the lance is damaged, but try again back to step ①.

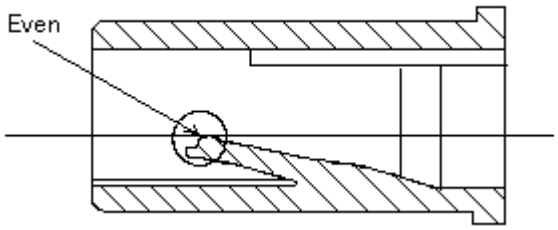
Note$_9$: Do not use the tool other than the specified one by JST in the extraction operation.
When the tools other than specified one are used, the mating part may be deformed.

Checkpoints when reusing housing

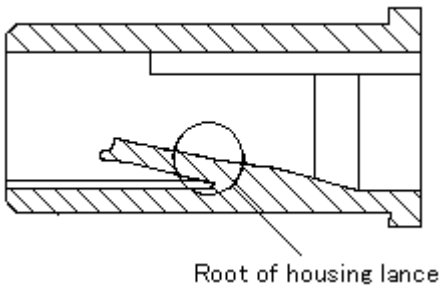
① When cutting resin debris adhered to the housing lance hook of the contact, replace the housing with a new one and the debris adhered to the contact should be removed without fail.



② Check that the housing lance returns to the original state.
(Check that the surface of the housing lance is level with that of others.)



③ Check the roots of the housing lance with a loupe or stereomicroscope.
When abnormalities, such as cracks and flaws are found, replace the housing with a new one.



④ After the modification completes, be sure to check the inserting contact into the housing (item: 6-3). When the contact comes off of the housing, replace the housing with a new one.

9. Inspection of Finished Product (Continuity Check)

9.1. Wiring inspection using an inspection jig.

Note the following points:

(1) Use the header applicable to the connector for inspection.
Handle it with care because it may insert into the lance hole of the housing.

(2) Use header free from deformation, damage and dust. When they are found, replace the header with a new one. Periodical replacement of the header should be conducted as well.

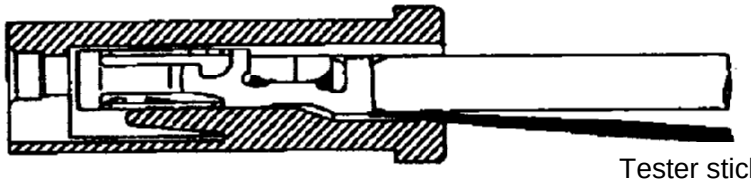
(3) Holding the housing, do the insertion and extraction operation of the connector with care not to pry.
When inspection board is used, design it so that the mating and unmating works are not difficult.

9.2. Simple wiring inspection using a tester

(1) Do not insert a tester stick from the mating part.

(2) Depending on the diameter of the tester stick and the prying insertion, the mating part may be deformed.

(3) Contact a tester stick with the insulation barrel side from the connector contact entrance of the housing in the inspection.



Tester stick

10. Header

① Floating from PC board

When connector is floated by external force, vibration, etc., press connector softly so that the bottom of connector fits on the surface of PC board, and then, solder it.

② Flux

Use rosin type flux.
As inorganic flux may corrode the wafer, do not use it.

③ Dip soldering

Conduct soldering operation in a temperature range of 245°C ~ 260°C and within 3 - 5 seconds.

④ Soldering by hand and soldering modification

When soldering by using soldering iron or soldering repair for bridge, etc. are conducted, note the following points, because deterioration of resin is considered due to heating.

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

⑤ Cleaning operation

On processing normal flux cleaning, header of DV connector is not deteriorated by cleaning solvent. However, when polluted cleaning solvent by flux is left in header, residual cleaner may cause defective contacting and other troubles.

11. Handling Precautions

① Do not contaminate the contact with household goods such as oils, detergent, seasoning, fruit juice and insecticide. If contaminated, do not use.

② Do the mating and unmating operation of the harness connector with the counterpart mounted on PC boards on the mating axis with holding the housing,
In case that it is difficult to hold the housing from the connecting and soldering conditions of the connector, Hold all wires at once while supporting the housing by your finger to apply even load to wires.
(Mating and unmating operation with a load applied to some wires may cause breakage on the connector.)