

1.Scope:**1.1 Contents:**

This specification covers the requirements for product performance, test method and quality assurance provisions of HID SOCKET's contact, housing, sub-assembly made by AMP(Japan),Ltd.

Applicable product description and part numbers are shown in Table 1.

Product Part No.	Description
0-353812-2	HID SOCKET SUB-ASS'Y
0-353813-1	HV. RECEPTACLE CONTACT
0-353814-1	HV. TAB CONTACT
0-353815-1	LV. RECEPTACLE CONTACT
0-353816-1	LV. TAB CONTACT
0-353817-1	DETECTIVE TAB CONTACT
0-353819-1	SHIELD RING
0-353823-2	HSG COVER

Table 1**2.Applicable Document:**

The following documents from a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence.

2.1 AMP Specifications:

- A. 109-5000 : Test Specification, General Requirements for Test Methods
- B. 114-5243-1, 5244-1 : Application Specification
- C. 411-5817-1 : Instruction Sheet

2.2 Commercial Standards and Specifications:

- A. JASO D7101 : Test Methods for Molded Plastic Parts.
- B. JIS C3406 : Low Voltage Cables for Automobiles.
- C. JIS D0203 : Method of Moisture, Rain and Spray Test for Automobile Parts.
- D. JIS D0204 : Method of High and Low Temperature Test for Automobile Parts.
- E. JIS D1601 : Vibration Testing Method for Electronic Components.

3.Requirements:**3.1 Design and Construction:**

Product shall be produced on the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Materials:**A. Contact:**

HV. RECEPTACLE CONTACT	: SUS 304
HV. TAB CONTACT	: PRE-Ni BRASS
LV. RECEPTACLE CONTACT	: PRE-Ni MAX-251C
LV. TAB CONTACT	: PRE-Ni BRASS
DETECTIVE TAB CONTACT	: PRE-Ni BRASS

B. Housing:

HID SOCKET HSG	: Polybutyleneterephthalate(PBT)
HSG COVER	: Polybutyleneterephthalate(PBT)

C. Others:

MOVING PLATE	: MAX-251C
SHIELD RING	: SUS 304
FR SEAL RUBBER	: Si Rubber
RR SEAL RUBBER	: Si Rubber

3.3 Rating:

A. Rated Voltage	: Power Circuit	80 V DC
	: Detective Circuit	13.5V DC
B. Rated Current	: Power Circuit	0.4 A
	: Detective Circuit	10mA
C. Rated Temperature	: -40°C ~ 150°C	

4. Performance Requirements and Test Descriptions:

Satisfy the performance as shown in Table 3, as a result that it was tested based on 4.1 (Test Method) and 4.2 (Test Sequence).

4.1 Test Methods:**4.1.1 Appearance**

Use the visual or touching method.

4.1.2 Dimensions:

Measure on the product drawing.

4.1.3 Insertion Force:

With either end fastened, push the other end in the axial direction at a rate of approx. 100mm/min.

4.1.4 Terminal Solderless Joint Strength:

Fasten the terminal with an approx. 350mm long wire attached without solder. Stretch the wire in the axial direction at a rate of approx. 100mm/min and measure load the instant wire breaks or detaches from the solderless joint.

4.1.5 Material Stiffness of wire crimp of the contact:

Fasten the wire crimp of contact, push the wire in the axial direction at a rate of approx. 100mm/min.

4.1.6 Feature of Spring:

Measure the contact pressure of the contact's spring.

4.1.7 Insertion Force of the detective contact:

Push the detective contact at a rate of approx. 100mm/min to the detective contact's attached point of fastened housing.

4.1.8 Retention Force of the detective contact:

With housing fastened, pull the detective contact in the axial direction at a rate of approx. 100mm/min.

4.1.9 Retention Force between male and female contact:

With either contact fastened, pull the other contact in the axial direction at a rate of approx. 100mm/min.

4.1.10 Mating Force of HSG COVER:

With housing fastened, push HSG COVER in the axial direction at a rate of approx. 100mm/min.

4.1.11 Insertion Force of Bulb:

Fasten bulb or socket, push the other one in the axial direction at a rate of approx. 100mm/min.

4.1.12 Retention Force of Bulb:

Fasten bulb or socket, pull the other one in the axial direction at a rate of approx. 100mm/min.

4.1.13 Insertion and Removal Feel

Check for feel during insertion and removal of terminals and socket.

4.1.14 Retention Force of housing

Engage socket and bulb. With it locked, fasten either end and pull the other end in the axial direction at a rate of approx. 100mm/min.

Measure the destructive strength.

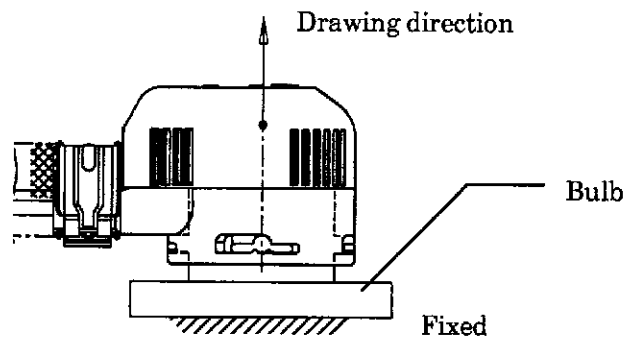


Fig. 1

4.1.15 Operating Force of bulb lock

Fasten either end of wire wound on a bulb more than 90 degrees. Engage socket and bulb, pull the wire in the axial direction at a rate of approx. 100mm/min.

Measure the operating torque.

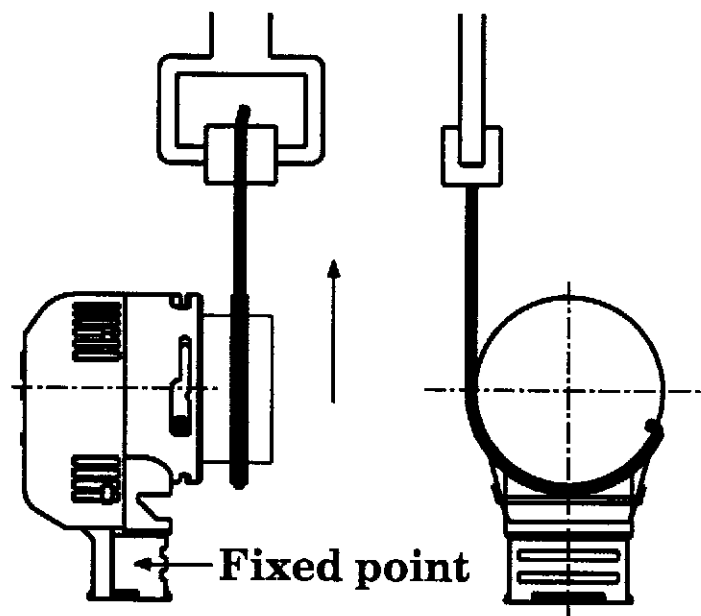


Fig.2

4.1.16 Incomplete Fitting Detection

Engage socket and bulb. Measure the relation between locking position and detective timing.

4.1.17 Confirm whether wire is pinched

Bury the sample in resin. Observe harness and housing on the cross section.

4.1.18 Voltage Drop:

Apply $400 \pm 10\text{mA(DC)}$ to the power and detective circuit. When the temperature at the contact has stabilized, measure the voltage drop at the each circuit.

4.1.19 Insulation Resistance:

Engage socket and bulb which the circuit was opened.

Measure the insulation resistance between HV contact and LV contact, HV contact and shield's earth, HV contact and detective circuit, using a 500V DC insulation resistance meter as shown in Fig. 3.

The diagram shows a cross-section of an HID socket assembly. A bulb is inserted into the socket, with a note indicating: "Break glass and cut lead wire, and bury with silicone." The bulb is connected to an HV HARNESS. The socket is connected to an LV HARNESS and a DETECTIVE HARNESS. Three voltage measurement points are indicated: V₁ is between the LV HARNESS and DETECTIVE HARNESS; V₂ is between the HV HARNESS and DETECTIVE HARNESS; and V₃ is between the HV HARNESS and the SHIELD CASE. The SHIELD CASE is shown as a protective outer shell.

Fig.3

5 of 13

Rev B

4.1.20 Withstand Voltage

Engage socket and bulb which the circuit was opened.

Raise voltage at a rate of approx. 1kV/sec. till 35kV, and keep 35kV during 5sec. between HV contact and LV contact, HV contact and shield's earth, HV contact and detective circuit.

Watch the electric discharge position, and record voltage.

4.1.21 Heat Run

With socket and headlamp assembled, Attach thermocouple at ①② as shown in Fig.4. Turn on the lamp at 85 ± 5 degree. When the temperature has stabilized, measure the temperature at the each position.

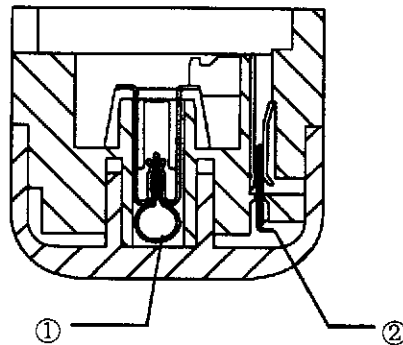


Fig. 4

4.1.22 Instant Cutoff:

Engage socket and shorting bulb. Apply 400 ± 10 mA to power circuit and 10 ± 0.5 mA to detective circuit, check if instant cutoff occurs.

4.1.23 Resistance Change Monitor:

Engage socket and shorting bulb. Apply 400 ± 10 mA(DC), monitor a change in the resistance.

4.1.24 Resistance to "Kojiri":

Insert a socket to bulb in up and down, right and left direction by finger. Insertion time is 10 times.

4.1.25 Thermal Shock Test:

Place a socket in a thermostatic chamber. Repeat the thermal cycle for 1000 times as shown in Fig. 5. Then, take the socket out and let stand at room temperature for 2 hours or more. Monitor a change in the resistance during the test.

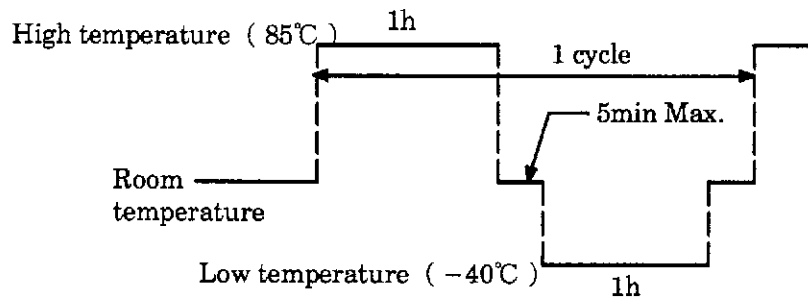


Fig. 5

4.1.26 Thermal Humidity cycle

Place a socket in a thermostatic chamber. Repeat the thermal humidity cycle for 10 times as shown in Fig.6 10. Then, take the socket out and let stand at room temperature for 2 hours or more. Apply 10mA, monitor a change in the resistance during the test.

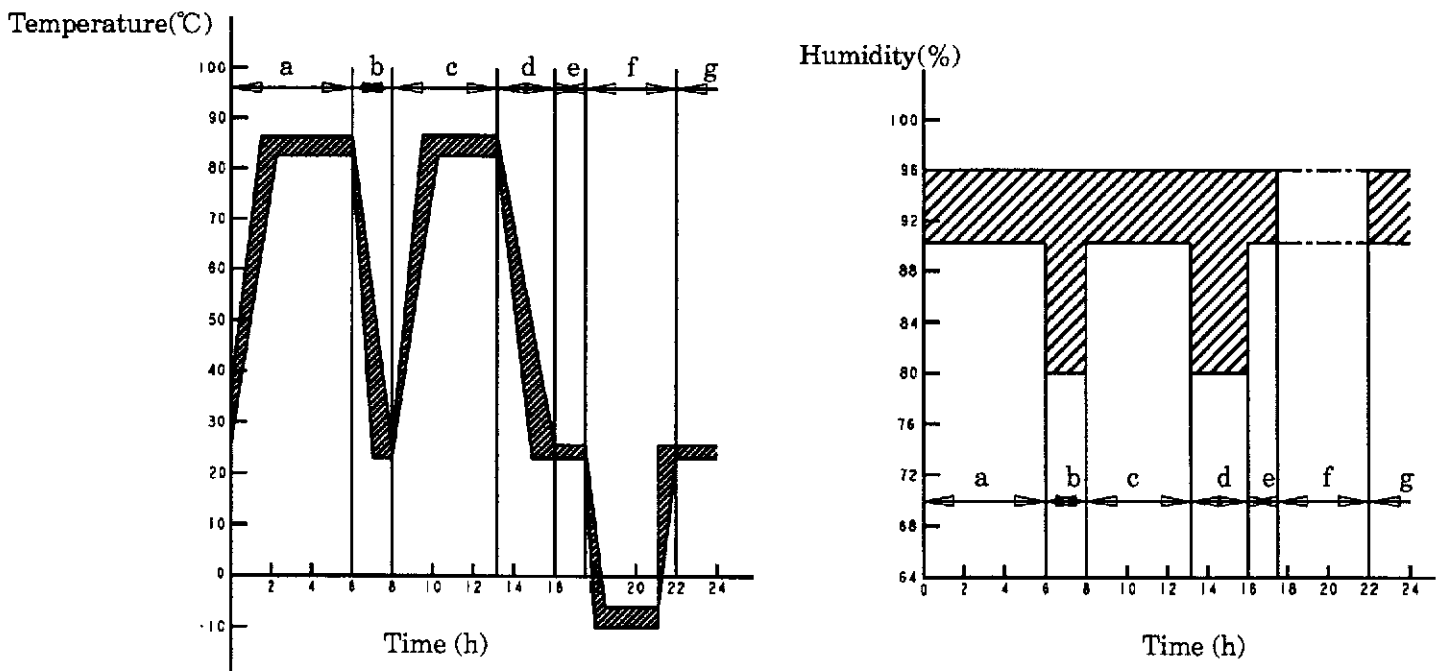


Fig. 6

4.1.27 High Temperature Storage Test

Place sockets in a thermostatic chamber at $150 \pm 5^\circ\text{C}$ for 120h. Take them out and let stand at room.

4.1.28 Vibration Test

Install sockets on a vibrating table as shown in Fig. 7. Apply power and check whether instant cutoff occurs. The direction of vibration shall be back and force, left and right, and up and down. The vibration time is 10 minutes each direction, total 30 minutes.

Other vibrating condition shall be as shown in Table 2. During the test, all the electrodes should be connected in series to make a single path for the current.

Acceleration (m/s^2) (G)	Vibrating time (min)	Vibrating frequency (Hz)	Short-circuit current (mA)
39.2 {4.0} (20~50Hz)	10	20~500	400 \pm 10
14.7 {1.5} (50~500Hz)			

Table 2

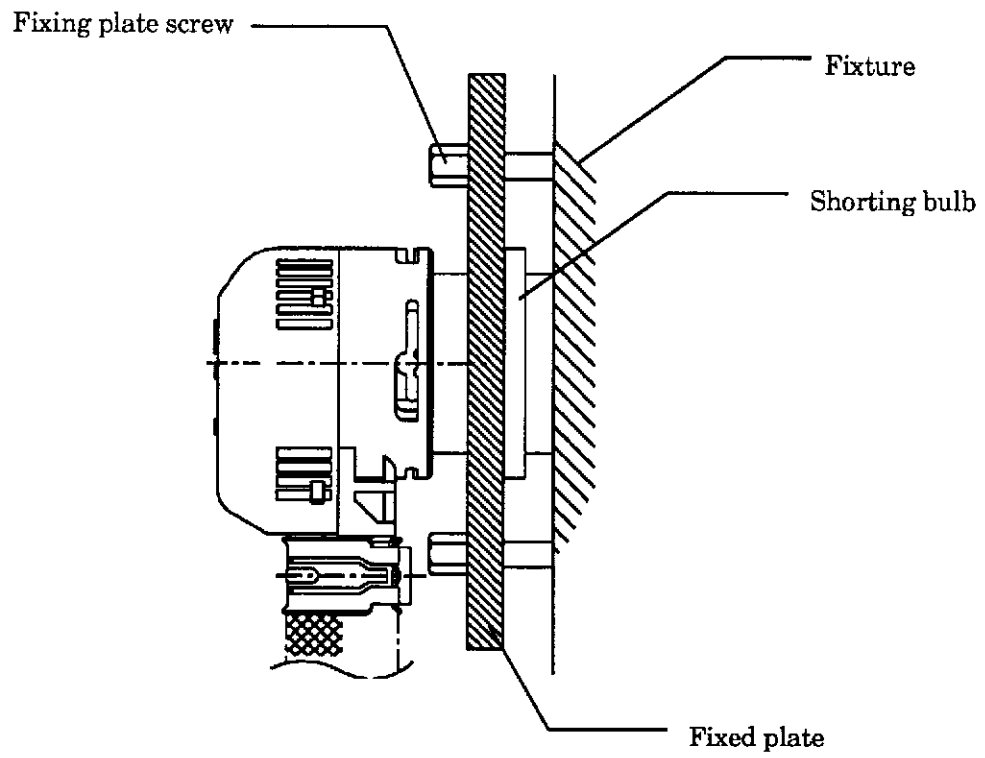


Fig. 7

4.1.29 Compound Environment Resistance

Install sockets on a vibrating table as shown in Fig. 7. Apply 400 ± 10 mA DC: first apply for 45 minutes; then interrupt for 15 minutes; repeat this for 300 cycles. There should be no draft during the test. The ambient temperature should be $85 \pm 5^\circ\text{C}$. The directions of vibration shall be back and forth, left and right, up and down. Measure them after 300 cycles. During test, measure temperature of contacts and check whether instant cutoff occurs.

All the electrodes should be connected in series to make a single path for the current.

4.1.30 Low-Temperature Storage Test

Place sockets in a thermostatic chamber at $-40 \pm 5^\circ\text{C}$ for 120h. Take them out and let stand at room temperature.

4.1.31 Humidity Resistance Test

Suspend sockets in a thermo-hygrostatic chamber at $85 \pm 5^\circ\text{C}$ and 90 to 95% RH so that no water drop falls on sockets. During the test, apply 400 ± 10 mA across poles of sockets.

4.1.32 Sulfur Dioxide Resistance

Place sockets in an atmosphere of 25 ± 5 ppm sulfur dioxide (SO_2) at 75% RH or higher and room temperature for 96h.

4.1.33 Ozone Test

Place unmated sockets in an ozone weather-meter (ozone concentration: 50 ± 5 ppm, chamber temperature: $40 \pm 5^\circ\text{C}$) for 24h.

4.2 Test Sequence

Measurements shall follow 4.2.1 and 4.2.2.

4.2.1 Characteristics tests

Measure them according to 4.1.1~4.1.21 for Characteristics tests.

As a general rule, the sample for measurement should not share among each tests.

4.2.2 Durability tests

Measurements shall follow Table 3.

TestNo. Item	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	
4.1.1 Appearance	1, 5	1, 6	1, 6	1, 3	1, 5	1, 6	1, 5	1, 5	1, 5	1, 5	1, 5
4.1.6 Feature of Spring				4							
4.1.13 Insertion & Removal Feel	10	11	11		9	11		10	10	9	
4.1.14 Retention Force of Bulb	11	12	12		10	12		11	11		
4.1.15 Operating Force of Bulb Lock	9	10	10		8	10		9	9		
4.1.18 Voltage Drop	2, 6	2, 7	2, 7		2, 6	2, 7	2, 6	2, 6	2, 6	2, 6	2, 6
4.1.19 Insulation Resistance	3, 7	3, 8	3, 8		3, 7	3, 8	3, 7	3, 7	3, 7	3, 7	3, 7
4.1.20 Withstand Voltage	8	9	9			9	8	8	8	8	8
4.1.21 Heat Run							4				
4.1.22 Instant Cutoff						5	4, 9				
4.1.23 Resistance Change Monitor		5	5				4				
4.1.24 Resistance to "Kojiri"	4										
4.1.25 Thermal Shock		5									
4.1.26 Thermal Humidity cycle			5								
4.1.27 High-temperature Storage		4	4	2	4	4					
4.1.28 Vibration						5	9				
4.1.29 Compound Environment							4				
4.1.30 Low-temperature Storage								4			
4.1.31 Humidity Resistance									4		
4.1.32 Sulfur Dioxide Resistance										4	
4.1.33 Ozone Test											4

Table 3

4.3 Criteria for Test results

The result should satisfy the criteria as shown in Table 4.

	Item	Criteria
1	Appearance	Shall be free from harmful fissure, rust, looseness, flaw, deformation and discoloration.
2	Dimension	Initial: Follow the drawing After durability test: Transformational amount: 10% Max.
3	Insertion and Removal Feel	Shall be free from harmful resistance.
4	Insertion Force	Bulb: 58.8N Max. Contact: 30.4N Max.
5	Retention Force	58.8N Max.
6	Terminal solderless joint strength	68.6N Min.
7	Material Stiffness of wire crimp of the contact	14.7N Min.
8	Feature of Spring	Initial and After durability test: 7N Min.
9	Insertion Force of the detective contact	19.8N Max.
10	retention Force of the detective contact	8N Min.
11	Mating Force of HSG COVER	98N Max.
12	Operating Force of bulb lock	4.02N Max.
13	Incomplete Fitting Detection	Rotative angle of operation should be $7 \pm 5^\circ$ Max.
14	Retantion Force of Shield Sleeve	98N Min.
15	Condition of Shield Sleeve	Contacting area should be sufficient.
16	Confirm whether wire is pinched	Wire should not be pinched.
17	Voltage Drop	Power-circuit : Initial 120mV Max.(300mΩ Max.) After durability test 200mV Max.(500mΩ Max.) Detective-circuit : Initial 3mV Max.(7.5mΩ Max.) After durability test 10mV Max.(25mΩ Max.)
18	Insulation Resistance	100MΩ Min.
19	Withstand Voltage	Without the electric discharge at 35kV during 5 sec.

20	Heat Run	Contact of bulb: 170°C Max. Contact of Harness: 110°C Max.
21	Instant Cutoff	Instant cutoff shall not occur.
22	Resistance change monitor	200mΩ Max.

Table 4