

No. YGT18-0060

HV 4.8 Connector 2P
(Inline Type)
Product standard

YAZAKI (CHINA)
INVESTMENT
CORPORATION

Prepared August 12. 2019

1.SCOPE

This standard specifies the test methods and performance requirements of
HV 4.8 CONNECTOR 2P (Inline Type) for automotive High voltage cable.

2. PART NUMBER AND APPLICABLE WIRE SIZE

2-1. ASSEMBLY PART NUMBER

Classification	Assembly Part Number	Component Part Number
Male	7385-1226-51etc	See components list

2-2. MATING PART NUMBER

Classification	Assembly Part Number	Component Part Number
Female	7385-1223-51etc	See components list

3. STRUCTURE AND MATERIALS

As specified in each part drawing.

4. HANDLING PRECAUTION

Refer to handling manual of this connector (YPES-15-1891 etc.).

5. SPECIFICATION

②	Rated voltage	High	800V DC
		Low	8~16V DC
	Rated current	High	25~45A (3~5SQ)
		Low	1A
Temperature for usage			-40°C ~ 125°C
Humidity			95% Max.
③	IP performance		IP6K9K, IPXXB, IPXXD

6. PERFORMANCE SPECIFICATION

SAE J1742 released December 2005

USCAR-2 (Class 3) Rev. 4 Dated May 2004, SDS Version 13.0

6-1. Connector-Mechanical Testing

Sec. 5.8.5

No.	Test Name	Acceptance Criteria	Method/ Source
1	Terminal to Connector Engage Force	Maximum engage force: 30N (without shield terminal) Maximum engage force: 30N (0.64mm Terminal) Short terminal engage force: 30N (0.64mm Terminal)	USCAR Sec. 5.4.1
2	Terminal to Connector Disengage Force	<u>4.8mm System Terminal</u> Primary Lock:MIN 80N Primary+Secondary Lock: MIN 110N <u>0.64mm Terminal</u> Primary Lock:MIN 30N USCAR Sec. 5.4.1 Primary+Secondary Lock: MIN 60N	USCAR Sec. 5.4.1
3	Connector to Connector Audible Click	Minimum sound level required: 7dB unconditioned parts 5dB conditioned parts	USCAR Sec 5.4.7
4	Connector Drop Test	Visual Inspection per USCAR Sec 5.1.8	USCAR Sec 5.4.8
5	Miscellaneous Component (TPA/CPA) Engage/Disengage Force	Pre-set to Full Install(Front holder): After terminal insert <u>4.8mm System Terminal:60N Max</u> <u>0.64mm Terminal: 60N Max</u> CPA 60N Min Unmated(Pre-set to lock) 10N Min~30N Max.(Lock to Pre-set) 30N Min complete removal from Pre-stage 22N Max with connectors mated	USCAR Sec. 5.4.5
6	Connector to Connector Engage Force	Connector mating force shall not exceed 75N.	USCAR Sec. 5.4.2
7	Connector to Connector Disengage Force	a) Locking device strength >110N b) Disengage force <75N with lock disabled. c) The force to completely disengage the primary connector lock must be >6N and ≤ 51N	USCAR Sec. 5.4.2

6-2. Connector-Environmental Testing-Vibration/Mechanical Shock
Sec. 5.4.6

No.	Test Name	Acceptance Criteria	Method/ Source
<i>INITIAL TEST</i>			
8	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
9	Dry Circuit for 0.64 Term	Initial: 25mohm max Uturn Initial: 20mohm max NOT Uturn	USCAR Sec 5.3.1
10	Voltage Drop for 4.8 Term	Initial @ 15A saturated, 50mV max	USCAR Sec 5.3.2
11	Temp Rise for 4.8mm System Terminal	Initial @ 27A saturated, 45 degree C max Initial @ 35A saturated, 65 degree C max	
12	Shield Area Resistance	Initial: 100mohm max	
13	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8 System terminals 100Mohm@500VDC for 0.64 terminals	USCAR Sec. 5.5.1
14	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1
<i>DURING TEST</i>			
15	Vibration/Mechanical Shock	Conditioning Step Only	USCAR Sec. 5.4.6
16	Cut Off (Instant Discontinuity)	Max 7.0 ohm for Max 1micro sec	USCAR Sec 5.1.9
<i>POST ENDURANCE TEST</i>			
17	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
18	Dry Circuit for 0.64 Term	Post Endurance: 25mohm max Uturn Post Endurance: 20mohm max NOT Uturn	USCAR Sec 5.3.1
19	Voltage Drop for 4.8 Term	Post endurance @ 15A saturated, 50mV max	USCAR Sec 5.3.2
20	Temp Rise for 4.8mm System Terminal	Post endurance @ 27A saturated, 45 degree C max Post endurance @ 35A saturated, 65 degree C max	
21	Shield Performance (EMC)	150kHz~108MHz ≥20dB	
22	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8 System terminals 100Mohm@500VDC for 0.64 terminals	USCAR Sec. 5.5.1
23	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1

6-3. Connector-Environmental Testing - Thermal Shock
Sec. 5.6.1

No.	Test Name	Acceptance Criteria	Method/ Source
<i>INITIAL TEST</i>			
24	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
25	Dry Circuit for 0.64 Term	Initial: 25mohm max Uturn Initial: 20mohm max NOT Uturn	USCAR Sec 5.3.1
26	Voltage Drop for 4.8 Term	Initial @ 15A saturated, 50mV max	USCAR Sec 5.3.2
27	Temp Rise for 4.8mm System Terminal	Initial @ 27A saturated, 45 degree C max Initial @ 35A saturated, 65 degree C max	
28	Shield Area Resistance	Initial: 100mohm max	
29	Pressure Leak	Connector must withstand 48kPa	USCAR Sec. 5.6.6
30	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8 System terminals 100Mohm@500VDC for 0.64 terminals	USCAR Sec. 5.5.1
31	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1
<i>DURING TEST</i>			
32	Thermal Shock Cycle	Conditioning Step Only	USCAR Sec. 5.6.1
<i>POST ENDURANCE TEST</i>			
33	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
34	Dry Circuit for 0.64 Term	Post Endurance: 25mohm max Uturn Post Endurance: 20mohm max NOT Uturn	USCAR Sec 5.3.1
35	Voltage Drop for 4.8 Term	Post endurance @ 15A saturated, 50mV max	USCAR Sec 5.3.2
36	Temp Rise for 4.8mm System Terminal	Post endurance @ 27A saturated, 45 degree C max Post endurance @ 35A saturated, 65 degree C max	
37	Shield Performance(EMC)	150kHz~108MHz ≥20dB	
38	Pressure Leak	Connector must withstand 28kPa	USCAR Sec. 5.6.6
39	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8 System terminals 100Mohm@500VDC for 0.64 terminals	USCAR Sec. 5.5.1
40	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1

6-4. Connector-Environmental Testing - Temperature/Humidity Cycling
Sec. 5.6.1

No.	Test Name	Acceptance Criteria	Method/ Source
<i>INITIAL TEST</i>			
41	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
42	Dry Circuit for 0.64 Term	Initial: 25mohm max Uturn Initial: 20mohm max NOT Uturn	USCAR Sec 5.3.1
43	Voltage Drop for 4.8 Term	Initial @ 15A saturated, 50mV max	USCAR Sec 5.3.2
44	Shield Area Resistance	Initial: 100mohm max	
45	Pressure Leak	Connector must withstand 48kPa	USCAR Sec. 5.6.6
46	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8 System terminals 100Mohm@500VDC for 0.64 terminals	USCAR Sec. 5.5.1
47	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1
<i>DURING TEST</i>			
48	Temp/Humidity Cycle	Conditioning Step Only	USCAR Sec. 5.6.1
<i>POST ENDURANCE TEST</i>			
49	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
50	Dry Circuit for 0.64 Term	Post Endurance: 20mohm max	USCAR Sec 5.3.1
51	Voltage Drop for 4.8 Term	Post endurance @ 15A saturated, 50mV max	USCAR Sec 5.3.2
52	Shield Performance(EMC)	150kHz~108MHz ≥20dB	
53	Pressure Leak	Connector must withstand 28kPa	USCAR Sec. 5.6.6
54	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
55	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1

6-5. Connector-Environmental Testing - High Temperature Exposure

Sec. 5.6.1

No.	Test Name	Acceptance Criteria	Method/ Source
<i>INITIAL TEST</i>			
56	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
57	Dry Circuit for 0.64 Term	Initial: 25mohm max Uturn Initial: 20mohm max NOT Uturn	USCAR Sec 5.3.1
58	Voltage Drop for 4.8 Term	Initial @ 15A saturated, 50mV max	USCAR Sec 5.3.2
59	Temp Rise for 4.8mm System Terminal	Initial @ 27A saturated, 45 degree C max Initial @ 35A saturated, 65 degree C max	
60	Shield Area Resistance	Initial: 100mohm max	
61	Pressure Leak	Connector must withstand 48kPa	USCAR Sec. 5.6.6
62	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8 System terminals 100Mohm@500VDC for 0.64 terminals	USCAR Sec. 5.5.1
63	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1
<i>DURING TEST</i>			
64	High Temperature Exposure	Conditioning Step Only	USCAR Sec. 5.6.1
<i>POST ENDURANCE TEST</i>			
65	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
66	Dry Circuit for 0.64 Term	Post Endurance: 25mohm max Uturn Post Endurance: 20mohm max NOT Uturn	USCAR Sec 5.3.1
67	Voltage Drop for 4.8 Term	Post endurance @ 15A saturated, 50mV max	USCAR Sec 5.3.2
68	Temp Rise for 4.8mm System Terminal	Post endurance @ 27A saturated, 45 degree C max Post endurance @ 35A saturated, 65 degree C max	
69	Shield Performance(EMC)	150kHz~108MHz ≥20dB	
70	Pressure Leak	Connector must withstand 28kPa	USCAR Sec. 5.6.6
71	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
72	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1

6-6. Connector-Environmental Testing - Fluid Resistance
Sec. 5.6.4

No.	Test Name	Acceptance Criteria	Method/ Source
<i>INITIAL TEST</i>			
73	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
74	Pressure Leak	Connector must withstand 48kPa	USCAR Sec. 5.6.6
75	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
76	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	USCAR Sec. 5.5.2
<i>DURING TEST</i>			
77	Fluid Resistance	Conditioning Step Only	USCAR Sec. 5.6.4
<i>POST ENDURANCE TEST</i>			
78	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
79	Pressure Leak	Connector must withstand 28kPa	USCAR Sec. 5.6.6
80	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
81	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	SAE J1742 4.12.1

6-7. Pressure Leak
Sec 5.6.6

No.	Test Name	Acceptance Criteria	Method/ Source
82	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
83	Pressure Leak	Connector must withstand 48kPa (7psi) before heat soak. After 70 hour heat soak at max ambient, 28kPa (4psi) for a minimum of 15 seconds.	USCAR Sec. 5.6.6
84	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
85	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8

6-8. Connector-Environmental Testing -Salt Fog
Sec. 5.6.7

No.	Test Name	Acceptance Criteria	Method/ Source
<i>INITIAL TEST</i>			
86	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
87	Shield Area Resistance	Initial: 100mohm max	USCAR Sec. 5.3.1
88	Pressure Leak	Connector must withstand 48kPa	USCAR Sec. 5.6.6
89	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
<i>DURING TEST</i>			
90	Salt Fog	Conditioning Step Only	USCAR Sec. 5.6.7
<i>POST ENDURANCE TEST</i>			
91	Shield Performance (EMC)	150kHz~108MHz >=20dB	
92	Pressure Leak	Connector must withstand 28kPa	USCAR Sec. 5.6.6
93	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1

6-9. Connector-Environmental Testing -High Pressure Spray
Sec 5.8.1

No.	Test Name	Acceptance Criteria	Method/ Source
<i>INITIAL TEST</i>			
94	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
95	Pressure Leak	Connector must withstand 48kPa	USCAR Sec. 5.6.6
96	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
97	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	USCAR Sec. 5.5.2
<i>DURING TEST</i>			
98	High Pressure Spray	Conditioning Step Only	USCAR Sec. 5.8.1
<i>POST ENDURANCE TEST</i>			
99	Visual Inspection	No visible degradation, swelling, cracking, or loss of mechanical function evident when examined with the aid of a 10X magnifying glass.	USCAR Sec 5.1.8
100	Pressure Leak	Connector must withstand 28kPa	USCAR Sec. 5.6.6
101	Insulation Resistance	Resistance between every combination of two adjacent terminals in the CUT must exceed 100Mohm@1000VDC for 4.8mm System Terminals 100Mohm@500VDC for 0.64mm Terminals	USCAR Sec. 5.5.1
102	Dielectric Withstand Voltage	No dielectric breakdown or flashover 4.8mm System Terminal: 2.2kVAC 0.64mm Terminal: 1.0kVAC	USCAR Sec. 5.5.2

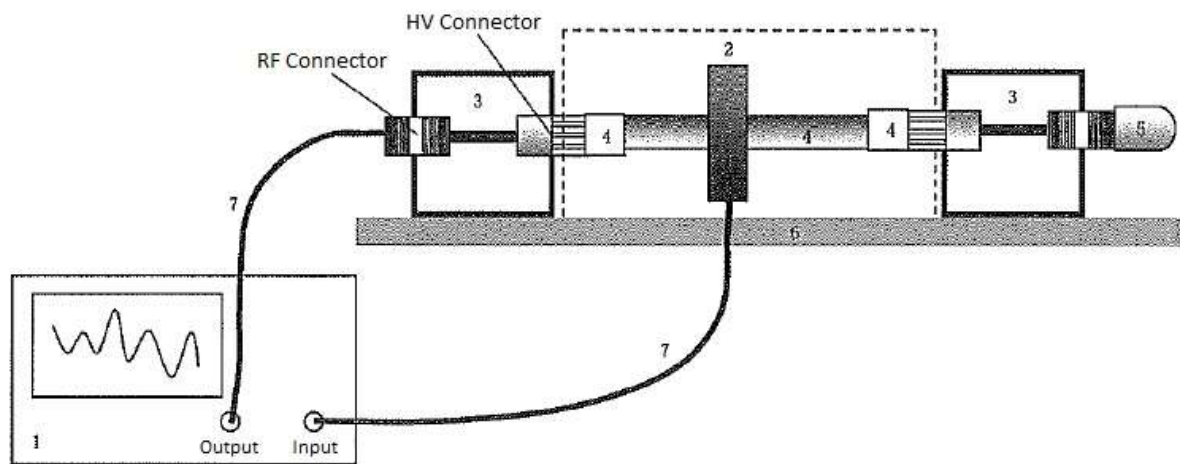
6-10. Measurement method for Noise shield

Measurement method: Using an absorption clamp method, measure the current leaking from the Connector.

Move the absorption clamp over the wire and record the peak value for each frequency band.

Take measurement for both shield and normal wire (same size and insulation material as the shield wire).

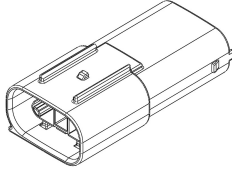
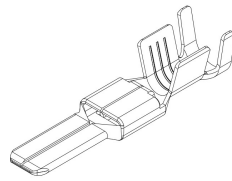
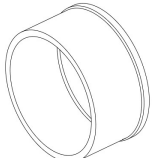
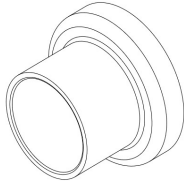
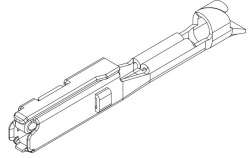
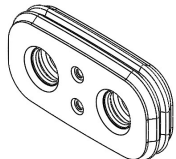
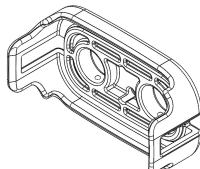
The difference in the value to be the shield effect (See Figure below).



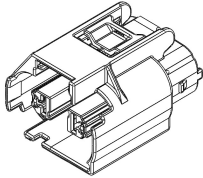
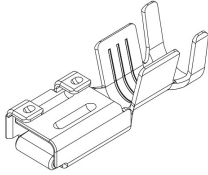
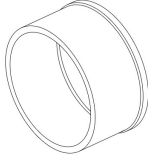
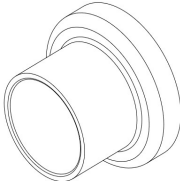
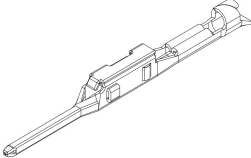
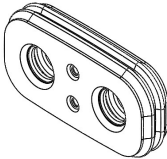
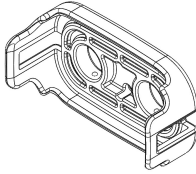
Details:

- 1—RF Signal Sources and Receiver;
- 2—Current Probe;
- 3—Shield Tool (Consist of RF Shield Box, RF Connector and Wiring Conductor, ect.);
- 4—Measured High Voltage Connecting System;
- 5—50 Ω Terminal Resistance;
- 6—Ground Plane;
- 7—RF Coaxial Cable.

COMPONENTS LIST (INLINE)

No.	YAZAKI PART No.	PART NAME	ILLUSTRATION	MATERIAL/ SPEC.
1	$\triangle 1$ 7285-1214-51 7285-1213-51 7285-1401-51 72A0-0096-51 $\triangle 3$ etc.	HV 4.8 CONNECTOR 2P INLINE SUB ASSEMBLY MALE TYPE C- 1		
2	7185-0905-02	HV 4.8 CONNECTOR 2P TERMINAL MALE		COPPER ALLOY (TIN PLATING)
3	$\triangle 3$ 7185-0807 7185-9852 7185-0806 7185-9377 7185-9376 etc.	HV 4.8 CONNECTOR 2P SHIELD PIPE		BRASS
4	$\triangle 3$ 7185-0903-03 7185-0805-03 7185-4209-02 71A4-0003-02	HV 4.8 CONNECTOR 2P SHIELD TERMINAL		STEEL/BRASS (Zn/Sn PLATING)
5	7116-4416-02	RH TYPE TERMINAL FEMALES		BRASS (TIN PLATING)
6	$\triangle 3$ 7172-5730-80 7172-5731-30 7172-6249-10 etc.	HV 4.8 CONNECTOR 2P RUBBER		SILCOM/ DARK BROWN BLACK etc.
7	$\triangle 3$ 7185-0799 7185-0800-60 7185-0801-51 7185-9847-80 etc.	HV 4.8 CONNECTOR 2P REAR HOLDER TYPE B		PBT-G / GREEN NATURAL ORANGE etc.

COMPONENTS LIST (INLINE)

No.	YAZAKI PART No.	PART NAME	ILLUSTRATION	MATERIAL/ SPEC.
1	¹ 7285-1207-51 7285-1208-51 7285-1209-51 etc. ³	HV 4.8 CONNECTOR 2P SUB ASSEMBLY FEMALE TYPE F		
2	7185-0906-02	HV 4.8 CONNECTOR 2P TERMINAL FEMALE		COPPER ALLOY (TIN PLATING)
3	³ 7185-0807 7185-9852 7185-0806 7185-9377 7185-9376 etc.	HV 4.8 CONNECTOR 2P SHIELD PIPE		BRASS
4	³ 7185-0903-03 7185-0805-03 7185-4209-02 71A4-0003-02	HV 4.8 CONNECTOR 2P SHIELD TERMINAL		STEEL/BRASS (Zn/Sn PLATING)
5	7114-4416-02	RH TYPE TERMINAL MALES		BRASS (TIN PLATING)
6	³ 7172-5730-80 7172-5731-30 7172-6249-10 etc.	HV 4.8 CONNECTOR 2P RUBBER		SILCOM/ DARK BROWN BLACK etc.
7	³ 7185-0799 7185-0800-60 7185-0801-51 7185-9847-80 etc.	HV 4.8 CONNECTOR 2P REAR HOLDER TYPE B		PBT-G / GREEN NATURAL ORANGE etc.

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