

# OCS (Oval Contact System) Connectors

## OVERVIEW

The OCS (Oval Contact System) is the newest 38999 Interconnect Product offering that provides many advantages for high speed data transmission.

### OCS MECHANICAL/PHYSICAL PROPERTIES

- Mating Cycles 500 (min.)
- Operating temperature -65C to 175C
- Contact materials and platings consistent w/AS39029
- IR 500 VDC
- DWV 500 VAC rms

Max Current Rating:

- 1.5 amps inner contacts
- 3.0 amps outer contacts

### OCS SIGNAL INTEGRITY PERFORMANCE

- Data rate:** 10Gbps per pair  
**Insertion loss:** <0.3 dB up to 5 GHz  
**Return loss:** >20 dB up to 5 GHz  
**NEXT and FEXT:** >40 dB up to 5 GHz  
**Differential to common mode conversion:** >50 dB up to 5 GHz



Plug



Receptacle



Four of Amphenol's OCS Contacts fit into the 38999 Connector shell size 13

### FEATURES AND BENEFITS

- A wide variety of insert arrangements available
- Patterns range from (1) to (21), 100 Ohm differential pairs capable of delivering data transfer speeds of 10Gbps per pair
- MIL-DTL-38999 shell styles available from size 9 to 25
- Front-release, rear-removable contact system for easy repair
- Meets environmental requirements of MIL-DTL-38999
- Uses off-the-shelf Mil Spec backshells
- PCB Tails contacts available, sockets only, epoxy backfilled.

### APPLICATIONS

High Speed Applications-for use with, but not limited to, the following electrical protocols\*:

- 10G Base T
- HDMI
- Fibre Channel (AI)
- 40G Base-T
- SATA 2.0
- SATA 3.0 (limited to 3 meters max)
- Serial RapidIO
- PCI Express 3.0

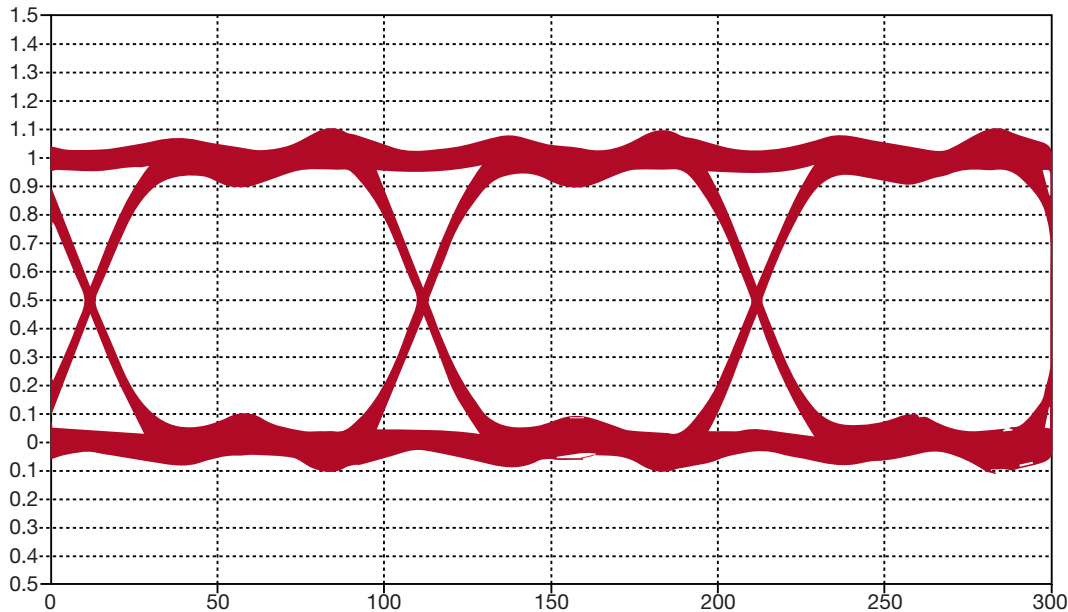
\* Cable selection may limit data rate of protocols.



# OCS (Oval Contact System) Connectors

Contact Eye Pattern at 10 Gbps

## EYE DIAGRAM (REAL PART)



Individually Shielded Twinax cable is recommended for use with the OCS connectors. Other type of wires can be used, but will not be compatible with the rear accessory supplied with the connectors. Below is a list of recommended cables. Additional cables can be used if they meet specifications.

The provided grommet assembly will accommodate cable diameters ranging from Ø.124 to Ø.175. Larger diameters may work based on cable construction.

Impedance (Ohms)	Conductor (AWG)	Pairs	Cable Part Number
100	24	1	Tensolite 24463/9P025X-2(LD)
			Thermax MX100-24
			PIC E10224
			Gore GSC-05-82559-00 (space rated)
			GSC-05-84308-00
	Gore DXN2602		
	24	4	Gore RCN 9034-24 (CAT6A Ethernet)*
26	4	Gore RCN 9034-26 (CAT6A Ethernet)*	
	1	Spectra Strip 160-2699-952	

\*Optimized for 13-53 insert pattern.

OCS cable assemblies available, please consult Amphenol Aerospace for details.

# OCS (Oval Contact System) Connectors

How to Order

1.	2.	3.	4.	5.	6.
Connector Type and Shell Style	Service Class	Shell Size – Insert Arrangement	Contact Type	Alternate Keying Position	Suffix Code
<b>TVP00</b>	<b>RZW</b>	<b>13-53</b>	<b>P</b>	<b>B</b>	<b>(595)</b>

1. CONNECTOR TYPE	
<b>TVP00</b>	Wall Mount Back panel mounted receptacle with metal shells
<b>CTVP00</b>	Wall Mount Back panel mounted receptacle with composite shells
<b>TV06</b>	Straight Plug
<b>CTV06</b>	Straight Plug composite shells
<b>TV07</b>	Jam Nut
<b>CTV07</b>	Jam Nut composite shells

2. SERVICE CLASS		
(Z) Threaded Backshell Style	(W) Integral Backshell Style*	Description
<b>RZF</b>	<b>RWF</b>	Electroless nickel plated
<b>RGZF</b>	<b>RGWF</b>	Electroless nickel plated ground plane
<b>RZW</b>	<b>RWW</b>	Olive drab cadmium plate
<b>RGZW</b>	<b>RGWW</b>	Olive drab cadmium plated ground plane
<b>RZB</b>	<b>RWB</b>	NiAlBronze
<b>RGZB</b>	<b>RGWB</b>	NiAlBronze ground plane
<b>RZK</b>	<b>RWK</b>	Corrosion resistance stainless steel
<b>RGZK</b>	<b>RGWK</b>	Stainless steel ground plane
<b>ZDT</b>	<b>WDT</b>	Durmalon plated, Nickel-PTFE alternative to cadmium
<b>GZDT</b>	<b>GWDT</b>	Groundplane Durmalon
<b>ZDZ</b>	<b>WDZ</b>	Black Zinc

\* Integral Backshell - an integral backshell style eliminates the need for costly backshell accessories, and allows the user to attach the shield of their cable directly to the backshell. The integral shell style also provides superior EMI shielding and ease for overmold applications.

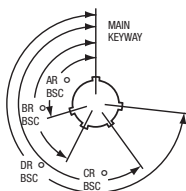


For unused OCS connector cavities:

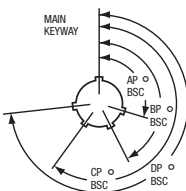
- Leave the contact insert cavity empty in the connector.
- Size 12 MS27488-12-2 (orange color) sealing plug can be installed into the grommet of the backshell large end first.



RECEPTACLE (front face shown)



PLUG (front face shown)



### 3. Select a Shell Size and Insert Arrangement

Shell Size and Insert Arrangement are together. First number represents Shell Size, second number is the Insert Arrangement. See page 7 for Insert Arrangements.

4. CONTACT TYPE	
<b>P</b>	Pin contacts 21-033585-001
<b>S</b>	Socket contacts 21-033586-001

Inner contacts accept 28, 26, and 24 awg cable.

### 5. Select an Alternate Keying Position

Alternate Positions below "N" not required for normal position

#### Tri-Start Alternate Positions:

A plug with a given rotation letter will mate with a receptacle with the same rotation letter.

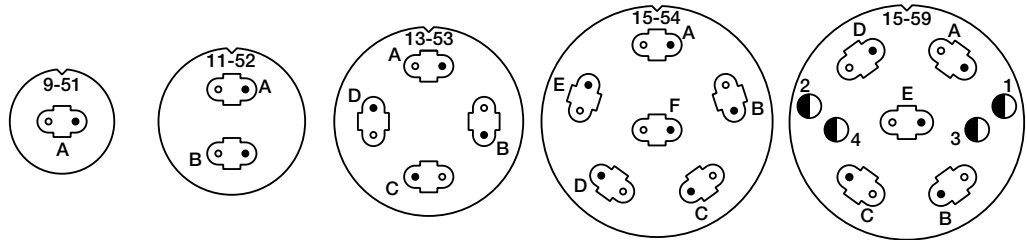
SHELL SIZE	KEY & KEYWAY ARRANGEMENT IDENTIFICATION LETTER	AR° OR AP° BSC	BR° OR BP° BSC	CR° OR CP° BSC	DR° OR DP° BSC
9	<b>N*</b>	105	140	215	265
	<b>A</b>	102	132	248	320
	<b>B</b>	80	118	230	312
	<b>C</b>	35	140	205	275
	<b>D</b>	64	155	234	304
11, 13, and 15	<b>N*</b>	91	131	197	240
	<b>A</b>	95	141	208	236
	<b>B</b>	113	156	182	292
	<b>C</b>	90	145	195	252
	<b>D</b>	53	156	220	255
17 and 19	<b>D</b>	119	146	176	298
	<b>E</b>	51	141	184	242
	<b>N*</b>	80	142	196	293
	<b>A</b>	135	170	200	310
	<b>B</b>	49	169	200	244
21, 23, and 25	<b>C</b>	66	140	200	257
	<b>D</b>	62	145	180	280
	<b>E</b>	79	153	197	272
	<b>N*</b>	80	142	196	293
	<b>A</b>	135	170	200	310
	<b>B</b>	49	169	200	244
	<b>C</b>	66	140	200	257
	<b>D</b>	62	145	180	280
	<b>E</b>	79	153	197	272

6. SUFFIX CODE	
<b>595</b>	Space Grade
<b>591</b>	Space Grade with critical dimensions verified at 100%

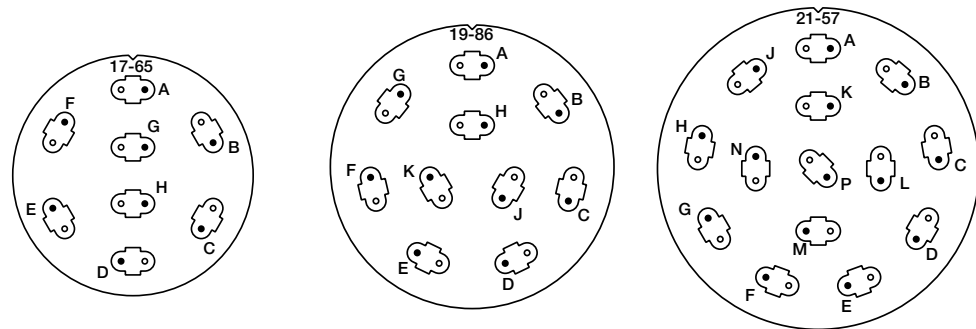
Order information for Removal Tool OCS Contact  
**10-6460C1-001**

# OCS (Oval Contact System) Connectors

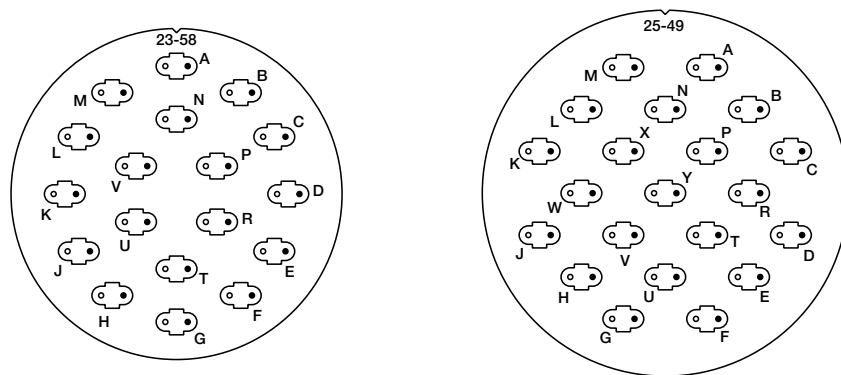
Insert Arrangements - Front face of pins illustrated



Insert Arrangement	9-51	11-52	13-53*	15-54	15-59*
Number of Contacts	1	2	4	6	5 OCS, 4 22D



Insert Arrangement	17-65	19-86*	21-57*
Number of Contacts	8	10	14



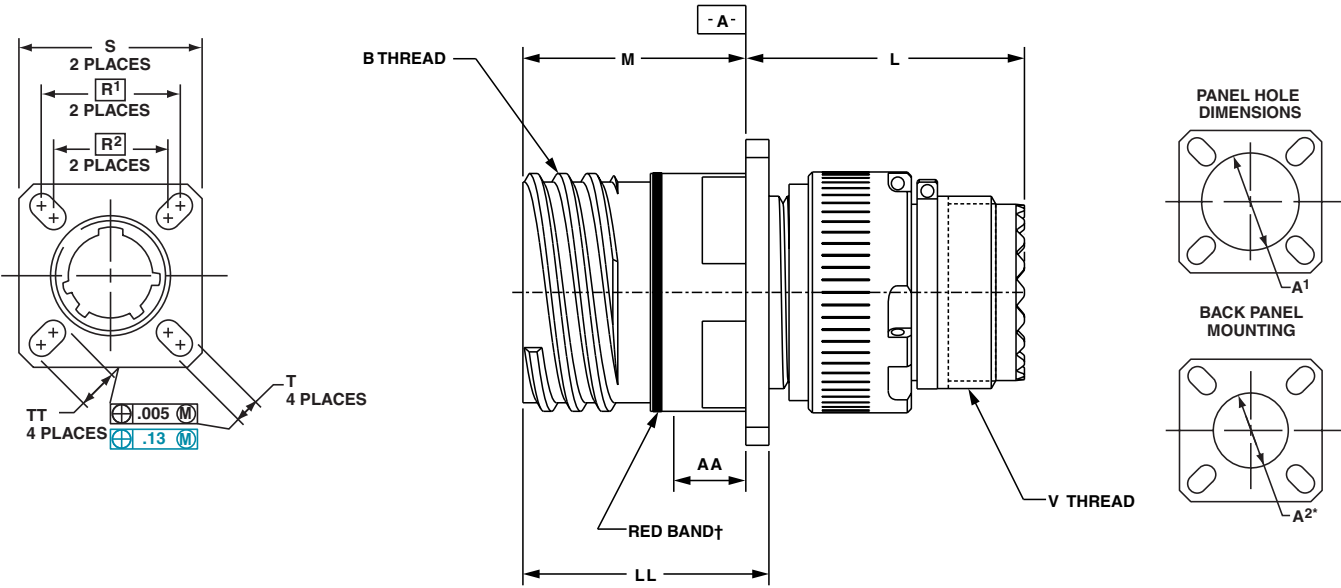
Insert Arrangement	23-58*	25-49*
Number of Contacts	18	21

\* Indicates Insert currently tooled

• Designates pin 1 location within the OCS contact assembly

# OCS (Oval Contact System) Connectors

TVP00 - Crimp, Metal & CTVP00 - Crimp, Composite Wall Mounting

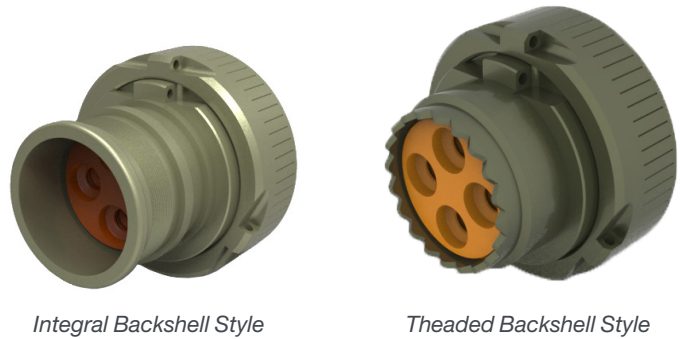


Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	L Max. (TV)	L' Max. (CTV)	M +.000 - .005 (TV)	M' +.000 - .005 (CTV)	R <sup>1</sup>	R <sup>2</sup>	S Max.	T ±.008	A <sup>1</sup> Back Panel Mount	A <sup>2</sup> Front Panel Mount	AA Max. Panel Thickness	LL +.006 - .000 (TV)	LL ±.005 (CTV)	TT ±.008	V Thread Metric
9	.6250	1.039	1.086	.820	.773	.719	.594	.948	.128	.655	.845	.234	.905	.908	.216	M12X1-6g
11	.7500	1.039	1.086	.820	.773	.812	.719	1.043	.128	.796	.963	.234	.905	.908	.194	M15X1-6g
13	.8750	1.039	1.086	.820	.773	.906	.812	1.137	.128	.922	1.081	.234	.905	.908	.194	M18X1-6g
15	1.0000	1.039	1.086	.820	.773	.969	.906	1.232	.128	1.047	1.239	.234	.905	.908	.173	M22X1-6g
17	1.1875	1.039	1.086	.820	.773	1.062	.969	1.323	.128	1.219	1.357	.234	.905	.908	.194	M25X1-6g
19	1.2500	1.039	1.086	.820	.773	1.156	1.062	1.449	.128	1.297	1.475	.234	.905	.908	.194	M28X1-6g
21	1.3750	1.069	1.118	.790	.741	1.250	1.156	1.575	.128	1.442	1.593	.204	.905	.904	.194	M31X1-6g
23	1.5000	1.069	1.118	.790	.741	1.375	1.250	1.701	.154	1.547	1.711	.204	.905	.904	.242	M34X1-6g
25	1.6250	1.069	1.118	.790	.741	1.500	1.375	1.823	.154	1.672	1.829	.204	.905	.904	.242	M37X1-6g

† Red band indicates fully mated \* A2 dimensions are larger than standard D38999 dimensions to accommodate backshell. All dimensions for reference only.

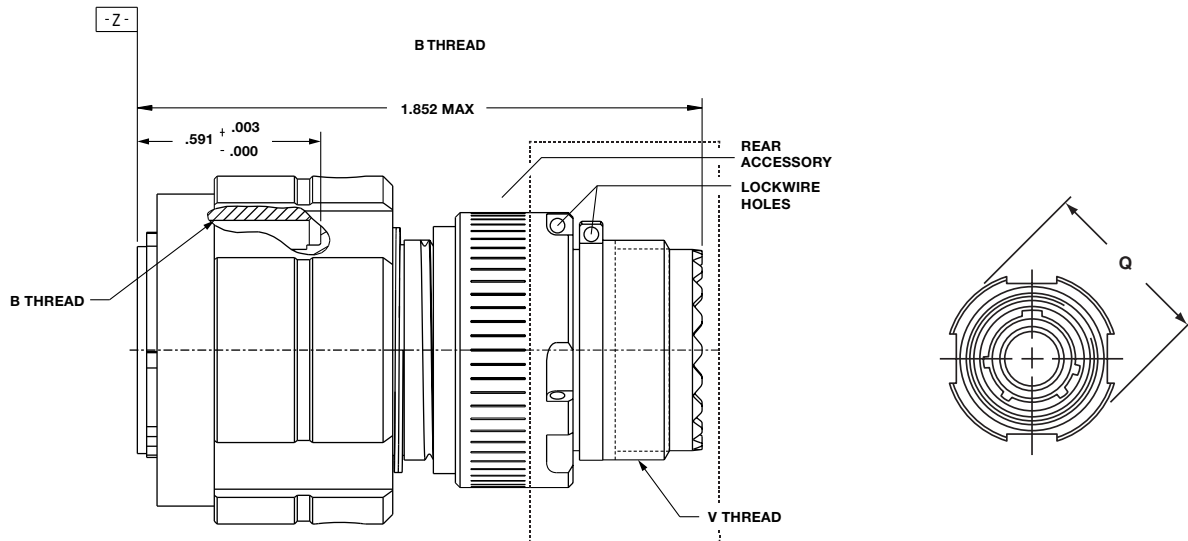
The rear accessory shown above is provided kitted with each connector and is for environmental sealing. The grommet included is insert arrangement specific, shown at right is the 13-53 pattern.

The provided grommet assembly will accommodate cable diameters ranging from Ø.124 to Ø.175. Larger diameters may work based on cable construction.



# OCS (Oval Contact System) Connectors

TV06 - Crimp, Metal & CTV06R - Crimp, Composite Straight Plug

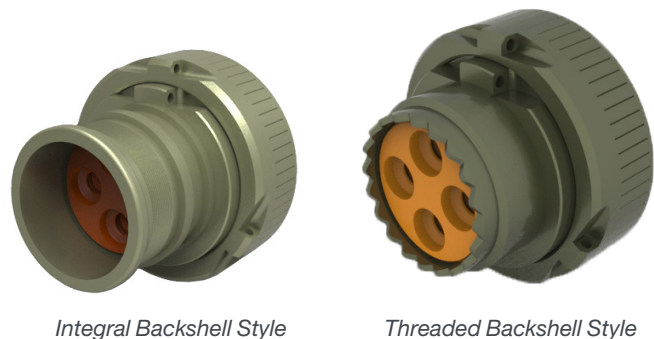


Shell Size	B Thread 0.1P-0.3L-TS-2B (Plated)	Q Dia. Max.	V Thread Metric
9	.6250	.858	M12X1-6g
11	.7500	.984	M15X1-6g
13	.8750	1.157	M18X1-6g
15	1.0000	1.280	M22X1-6g
17	1.1875	1.406	M25X1-6g
19	1.2500	1.516	M28X1-6g
21	1.3750	1.642	M31X1-6g
23	1.5000	1.768	M34X1-6g
25	1.6250	1.890	M37X1-6g

All dimensions for reference only.

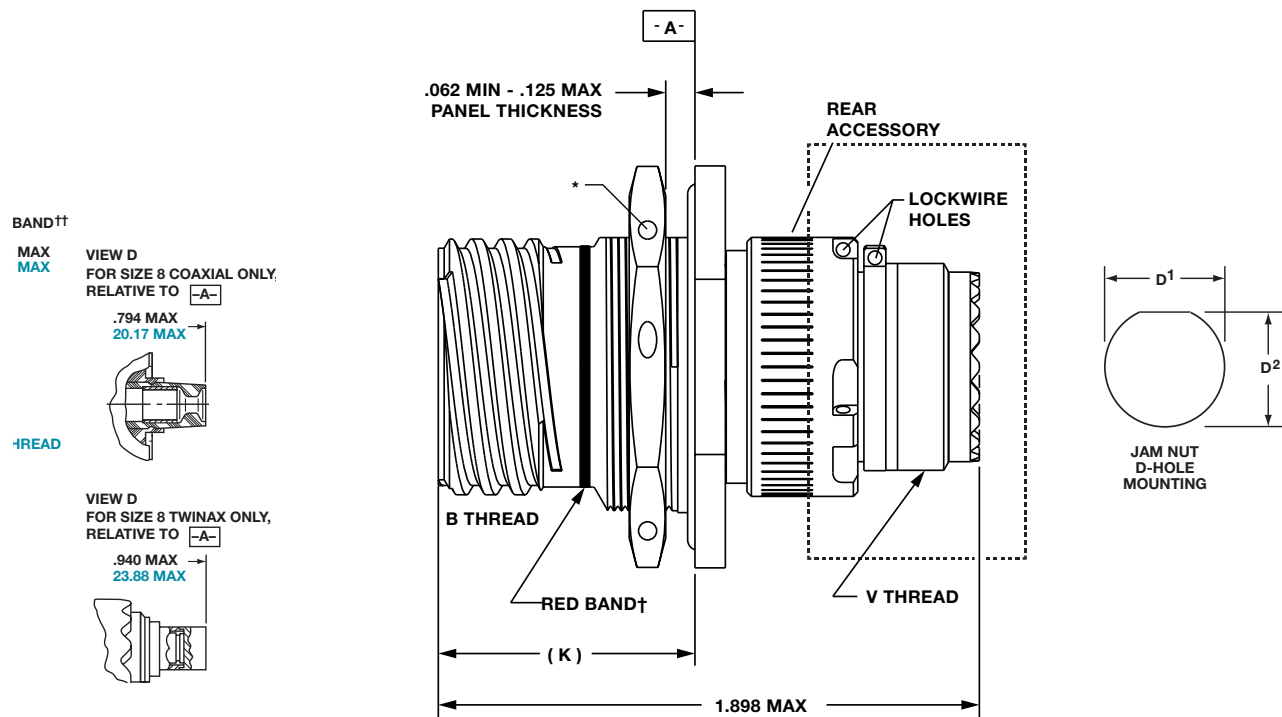
The rear accessory shown above is provided kitted with each connector and is for environmental sealing. The grommet included is insert arrangement specific, shown at right is the 13-53 pattern.

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# OCS (Oval Contact System) Connectors

TV07R - Crimp, Metal & CTV07R - Crimp, Composite Jam Nut Receptacle



All dimensions for reference only.

Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	C Max.	D <sup>1</sup> +.010 - .000	D <sup>2</sup> +.000 - .010	H Hex +.017 - .016	K Ref.	S ±.010	V Thread Metric
9	.6250	1.199	.693	.657	.875	.871	1.062	M12X1-6g
11	.7500	1.386	.825	.770	1.000	.871	1.250	M15X1-6g
13	.8750	1.511	1.010	.955	1.188	.878	1.375	M18X1-6g
15	1.0000	1.636	1.135	1.085	1.312	.878	1.500	M22X1-6g
17	1.1875	1.761	1.260	1.210	1.438	.878	1.625	M25X1-6g
19	1.2500	1.949	1.385	1.335	1.562	.878	1.812	M28X1-6g
21	1.3750	2.073	1.510	1.460	1.688	.878	1.938	M31X1-6g
23	1.5000	2.199	1.635	1.585	1.812	.878	2.062	M34X1-6g
25	1.6250	2.323	1.760	1.710	2.000	.878	2.188	M37X1-6g

† Red band indicates fully mated  
 \* .059 dia min., 3 lockwire holes, Formed lockwire hole design (6 holes) is optional

The rear accessory shown above is provided kitted with each connector and is for environmental sealing. The grommet included is insert arrangement specific, shown at right is the 13-53 pattern.

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Integral Backshell Style



Threaded Backshell Style