



**NOTE**

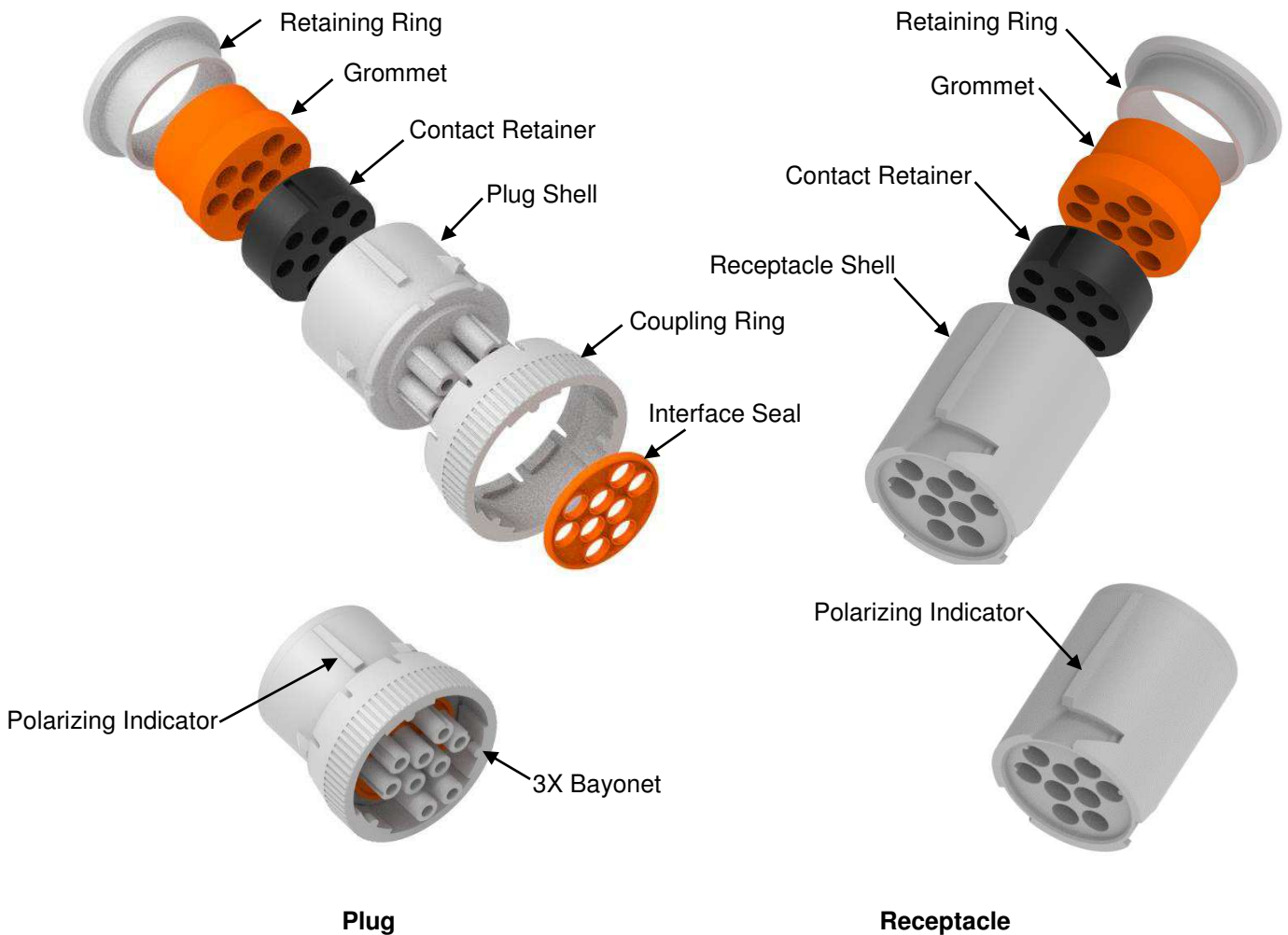
All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of  $\pm 0.005$  [ $\pm 0.13$ ] and angles have a tolerance of  $\pm 2^\circ$ . Figures and illustrations are for identification only and are not drawn to scale.

**1. INTRODUCTION**

This specification covers the requirements for application of TE Connectivity (TE) HD10 series connector system. HD10 features quick connect-disconnect bayonet coupling, single hole bulkhead mounting, silicone seals, and a rear insertion/rear removal contact system.

The HD10 Series is a heavy duty rated, environmentally sealed, thermoplastic, multi-pin connector. The thermoplastic shell is ideal in applications where chemicals can damage a connector housing. With arrangements from 3 to 9 cavities, HD10 connectors accept size 4, 12 and 16 contacts and are available either in-line, flanged or D-hole mounting.

HD10 features quick connect-disconnect bayonet coupling, single hole bulkhead mounting, silicone seals, and a rear insertion/rear removal contact system. Basic terms and features of this product are provide below.



## 1.1 Plug Versions



**With Coupling Ring**  
(HD16-9-16S)



**Without Coupling Ring<sup>(1)</sup>**  
(HD16-6-12S)



**SAE J1939, Type 1**  
(HD16-9-1939S)



**SAE J1939, Type 2**  
(HD16-9-1939S-P080)



**SAE J1939, Type 1<sup>(1)</sup>**  
(HD17-9-1939S)



**SAE J1939, Type 2<sup>(1)</sup>**  
(HD17-9-1939S-P080)



Note

1. Plugs without coupling ring and high durability terminals could be used in a diagnostic tool type application.

## 1.2 Receptacle Versions



**In-line**  
(HD14-9-16P)

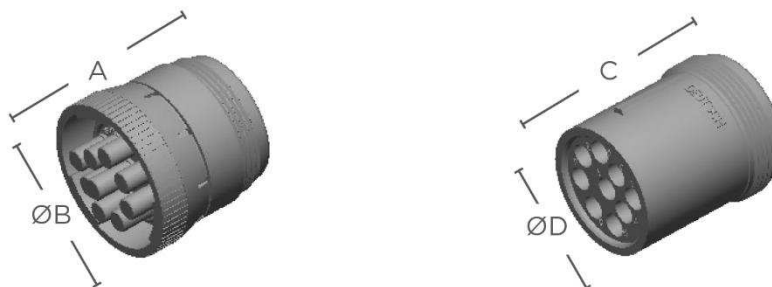


**Flange**  
(HD10-9-16P)



**Header (HD10-9-96P-N005)**

### 1.3 Product Dimensions<sup>(1)</sup>



Cavities	Plug		Receptacle	
	Overall Length A	Overall Height ØB	Overall Length C	Overall Height ØD
3	40.87 [1.609]	27.15 [1.069]	41.63 [1.639]	21.62 [.851]
4	41.63 [1.639]	40.51 [1.595]	41.63 [1.639]	32.54 [1.281]
5	40.87 [1.609]	30.94 [1.218]	41.63 [1.639]	25.43 [1.001]
6	41.12 [1.619]	36.91 [1.453]	41.63 [1.639]	28.98 [1.141]
9	40.87 [1.609]	40.47 [1.593]	41.63 [1.639]	32.54 [1.281]



Note:

1. Dimensions are for reference only. See product drawing.

## 2. REFERENCE MATERIAL

### 2.1 Revision Summary

See Section 8

### 2.2 Customer Assistance

See Section 3.3A for Part Numbering System

Product Code J804 is representative of DEUTSCH HD10 series connector system. Use these number will identify the product line and help you obtain product and tooling information when visiting [www.te.com](http://www.te.com) or calling the number at the bottom of page 1.

## 2.3 Drawings

Customer drawings for product part numbers are available from [www.te.com](http://www.te.com). Information contained in the customer drawing takes priority. Where X is seal type.

Product Drawing	Description
<a href="#">HD10-3-96P</a>	REC, 3P, GRY, N, THRD, FLANGE, 16
<a href="#">HD10-3-96P-B009</a>	REC, 3P, GRY, N, NO KEY, FLANGE, 16
<a href="#">HD10-3-96PE</a>	REC, 3P, GRY, E, THRD, FLANGE, 16
<a href="#">HD10-4-4P</a>	REC, 4P, GRY, N, THRD, FLANGE, 4/16
<a href="#">HD10-4-4P-C024</a>	REC, 4P, GRY, N, BCD, BLK, THRD, FLANGE, 4/16
<a href="#">HD10-5-16P</a>	REC, 5P, GRY, N, FLANGE, 16
<a href="#">HD10-5-16P-B009</a>	REC, 5P, GRY, N, NO KEY, FLANGE, 16
<a href="#">HD10-6-12P</a>	REC, 6P, GRY, N, THRD, FLANGE, 16
<a href="#">HD10-6-12P-E004</a>	REC, 6P, BLK, N, THRD, FLANGE, 12
<a href="#">HD10-6-96P</a>	REC, 6P, GRY, N, THRD, FLANGE, 16
<a href="#">HD10-6-96P-N005</a>	HDR, 6P, BLK, N, ST, SN/NI, 16
<a href="#">HD10-9-16P</a>	REC, 9P, GRY, N, FLANGE, 16
<a href="#">HD10-9-16P-B009</a>	REC, 9P, GRY, N, NO KEY, FLANGE, 16
<a href="#">HD10-9-1939P</a>	REC, 9P, BLK, N, FLANGE, 1939, TYPE 1
<a href="#">HD10-9-1939PE</a>	REC, 9P, BLK, E, FLANGE, 1939, TYPE 1
<a href="#">HD10-9-1939PX-B022</a>	REC, 9P, BLK, N/E, PANEL, 1939, TYPE 1
<a href="#">HD10-9-1939PX-BP03</a>	REC, 9P, GRN, N/E, PANEL, 1939, TYPE 2
<a href="#">HD10-9-1939PX-P080</a>	REC, 9P, GRN, N/E, FLANGE, 1939, TYPE 2
<a href="#">HD10-9-96P</a>	REC, 9P, GRY, N, FLANGE, 16
<a href="#">HD10-9-96P-BN05</a>	HDR, 9P, BLK, N, ST, SN/NI, 16
<a href="#">HD10-9-96PE</a>	REC, 9P, GRY, E, FLANGE, 16
<a href="#">HD10-9-96P-N005</a>	HDR, 9P, BLK, N, ST, SN/NI, 16
<a href="#">HD10-9-96PX-B009</a>	REC, 9P, GRY, N/E, NO KEY, FLANGE, 16
<a href="#">HD10-9-96PX-B025</a>	REC, 9P, BLK, N/E, PANEL, 16
<a href="#">HD10-9-96PX-BE09</a>	REC, 9P, GRY, N/E, PANEL, 16
<a href="#">HD14-3-16PX</a>	REC, 3P, GRY, N/E, 16
<a href="#">HD14-3-96P</a>	REC, 3P, GRY, N, THRD, 16
<a href="#">HD14-3-96PE</a>	REC, 3P, GRY, E, THRD, 16
<a href="#">HD14-5-16P</a>	REC, 5P, GRY, N, 16
<a href="#">HD14-6-12P</a>	REC, 6P, GRY, N, 12
<a href="#">HD14-6-12P-B030</a>	REC, 6P, GRY, N, THRD, 12
<a href="#">HD14-6-96P</a>	REC, 6P, GRY, N, THRD, 16
<a href="#">HD14-9-16P</a>	REC, 9P, GRY, N, 16
<a href="#">HD14-9-1939P</a>	REC, 9P, BLK, N, THRD, 1939, TYPE 1
<a href="#">HD14-9-1939PE</a>	REC, 9P, BLK, E, THRD, 1939, TYPE 1
<a href="#">HD14-9-1939PX-P080</a>	REC, 9P, GRN, N/E, THRD, 1939, TYPE 2
<a href="#">HD14-9-96P</a>	REC, 9P, GRY, N, THRD, 16
<a href="#">HD14-9-96P-C016</a>	REC, 9P, GRY, N, HJ BLOCKED, THRD, 16
<a href="#">HD14-9-96PE</a>	REC, 9P, GRY, E, THRD, 16

Product Drawing	Description
<a href="#">HD16-3-16SX</a>	PLG, 3P, GRY, N/E, 16
<a href="#">HD16-3-96S</a>	PLG, 3P, GRY, N, THRD, 16
<a href="#">HD16-3-96SE</a>	PLG, 3P, GRY, E, THRD, 16
<a href="#">HD16-4-4S</a>	PLG, 4P, GRY, N, THRD, 4/16
<a href="#">HD16-4-4S-C024</a>	PLG, 4P, GRY, N, BCD BLK, THRD, 4/16
<a href="#">HD16-5-16S</a>	PLG, 5P, GRY, N, 16
<a href="#">HD16-6-12S</a>	PLG, 6P, GRY, N, 12
<a href="#">HD16-6-12S-B010</a>	PLG, 6P, GRY, N, DATALINK, 12
<a href="#">HD16-6-12S-B029</a>	PLG, 6P, GRY, N, CSA, 12
<a href="#">HD16-6-96S</a>	PLG, 6P, GRY, N, 16
<a href="#">HD16-9-16S</a>	PLG, 9P, GRY, N, 16
<a href="#">HD16-9-1939S</a>	PLG, 9P, BLK, N, 1939, TYPE 1
<a href="#">HD16-9-1939SE</a>	PLG, 9P, BLK, E, 1939, TYPE 1
<a href="#">HD16-9-1939SX-P080</a>	PLG, 9P, GRN, N/E, 1939, TYPE 2
<a href="#">HD16-9-96S</a>	PLG, 9P, GRY, N, THRD, 16
<a href="#">HD16-9-96S-C016</a>	PLG, 9P, GRY, HJ BLK, THRD, 16
<a href="#">HD16-9-96SE</a>	PLG, 9P, GRY, E, THRD, 16
<a href="#">HD17-9-1939S</a>	PLG, 9P, BLK, N, THREAD, 1939, TYPE 1
<a href="#">HD17-9-1939SE</a>	PLG, 9P, BLK, E, THREAD, 1939, TYPE 1
<a href="#">HD17-9-1939SX-P080</a>	PLG, 9P, GRN, N/E, THREAD, 1939, TYPE 2

## 2.4 Specifications

108-151000	DEUTSCH S&F Contact Product Specification
108-151004	DEUTSCH Solid Contact Product Specification
108-151016	DEUTSCH HD10 Series Product Specification
114-151000	DEUTSCH Size 16 S&F Pin and Socket Application Specification
114-151001	DEUTSCH Size 16 S&F Pin and Socket Application Specification
114-151002	DEUTSCH Size 12 S&F Pin and Socket Application Specification
114-151004	DEUTSCH Size 4-20 Solid Pin and Socket Application Specification
114-151006	DEUTSCH Size 12 S&F Pin and Socket Application Specification

## 2.5 Instructional Material

Instruction sheets (408-series) provide product assembly instructions or tooling setup, and operation procedures and customer manuals (409-series) provide machine setup and operating procedures. Instructional material that pertain to this product are:

408-151007	DEUTSCH Extraction Tools for Rear-Release Connectors
408-151066	DEUTSCH Sealing Plugs and Locking Keying Pins
408-151078	DEUTSCH Extended PCB Pins
408-151083	DEUTSCH Size 4 Crimp Sleeve Reducer

## 3. REQUIREMENTS

### 3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

### 3.2. Storage

#### A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the product material.

#### A. Shelf Life

The product should remain in the shipping containers until ready for use to prevent deformation to components. The product should be used on a first in, first out basis to avoid storage deterioration could adversely affect performance.

#### B. Chemical Exposure

Do not store product near any chemical listed below as they may cause stress corrosion cracking in the material.

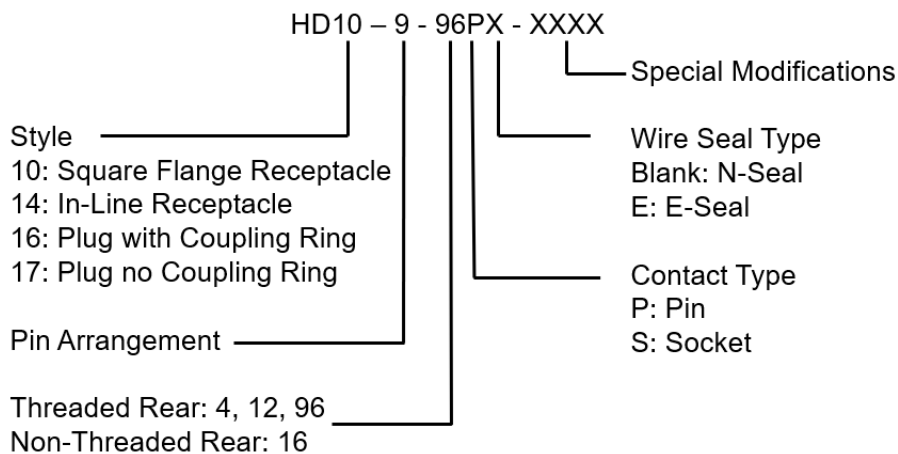
Alkalis	Amines	Carbonates	Nitrites	Sulfur Nitrites	Tartrates
Acids	Ammonia	Citrates	Phosphates	Sulfur Compounds	

**NOTE**

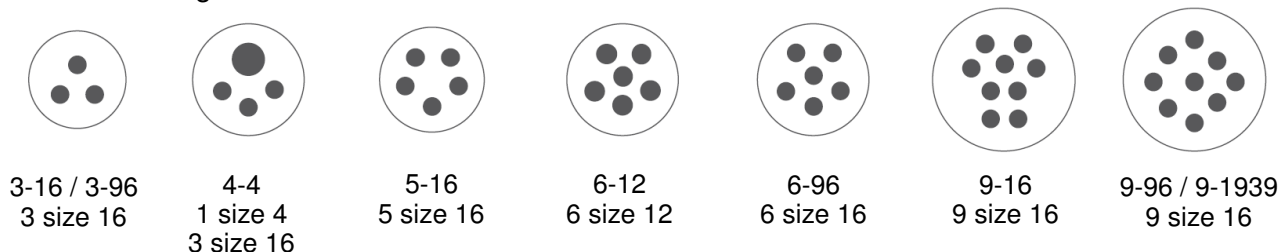
*Resistance depend on chemical concentration, temperature, and exposure medium.*

### 3.3 Characteristics

#### A. Part Numbering System



#### B. Pin Arrangements



#### C. Material





- Plug Shell: PA66 15GF (gray, black, green)
- Receptacle Shell: PA66 15GF (gray, black, green)
- Header Shell: PPS 40GF (black)
- Retainer Ring: PA66 15GF (gray, black, green)
- Contact Retainer: PEI (black)
- Coupling Ring: PA66 10GF (gray, black)
- Grommet: VMQ (Red-Orange)
- Interface Seal: VMQ (Red-Orange)
- Pin Contact: Copper Alloy
- Pin Plating: Mating and PCB Side (Sn/Ni)

#### D. Sealing Range

Contact Size	N-Seal	E-Seal
16 14-20 AWG [2.0-0.5mm <sup>2</sup> ]	2.54-3.81 [.100-.150]	1.35-3.05 [.053-.120]
12 10-14 AWG [6.0-2.0mm <sup>2</sup> ]	3.40-4.32 [.134-.170]	-
4 6 AWG [16.0-13.0mm <sup>2</sup> ]	7.11-7.42 [.280-.292]	-


## E. Sealing Plugs

Open cavities provide pathways for contaminants to enter the connectors. To maintain seal integrity, any unused cavity must be filled with the appropriate size sealing plug. See [408-151066](#) for instructions.

Part Number	Contact Size	Material	Color	Description	Sealing Plug
<a href="#">114019</a>	4	VMQ	Red-Orange		
<a href="#">114017</a>	12, 16	PBT	White		
<a href="#">0413-217-1605</a>	16	PBT	White	Locking	
<a href="#">0413-003-1605</a>	16	PBT	Blue		

## F. Keying Pins

Keying pins are solid plastic rods used to help prevent mis-mating of like connectors in close proximity. Keying pins are inserted into the retention fingers of an empty socket cavity. Once installed, the keying pin blocks a mating contact pin from being inserted. The contact pin will be blocked before the coupling device mates the connectors, helping to prevent the mis-mating of like connectors. Proper usage requires that the corresponding mating pin be omitted, and a sealing plug inserted in the rear cavity of the mating connector. Individual applications will vary, and testing should be done to determine the best pattern arrangement to help prevent improper connector mating. See [408-151066](#) for instructions.

Part Number	Contact Size	Material	Color	Description	Sealing Plug
<a href="#">0413-215-1605</a>	16	PBT	White	Keying	
<a href="#">0413-214-1205</a>	12	PBT	Yellow		



Note:

Multiple keying pins may be required to help prevent unintentional forced mating.

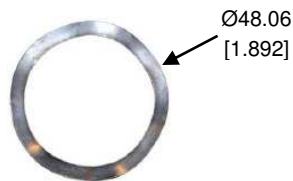
## G. Modifications

Mod	Description
B009	Receptacle with raised key removed from front of flange, no rear threads
B010	Plug with coupling ring added
B022	Receptacle with D-hole panel mount, rear threads, J1939, black
B025	Receptacle with D-hole panel mount, no rear threads, black
B029	Complies with UL183
B030	Rear threads 1.3125-18 UNEF-2A
BE09	Receptacle with D-hole panel mount, no rear threads, gray
BP03	Receptacle with D-hole panel mount, rear threads, J1939 Type 2, green
C016	Cavities H, J blocked
C024	Cavities B, C, D blocked
E004	Black
N005	Receptacle header
P080	SAE J1939 Type 2, green

## H. Mounting Hardware

DEUTSCH lockwashers and panel nuts are available to aid in mounting the HD10 Series connectors. The lockwashers are used to add tension between the threads and the nut to provide a secure mount. The lockwasher and the panel nut should be used together.

## LOCKWASHER

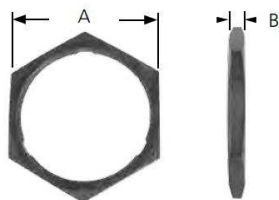


2414-002-1886

Material: Spring Steel, Tin plate

Operating temperature is -55°C to +125°C [-67° to +257°F]

## PANEL NUT



Part Number	A	B
2411-002-1805	1.685 [42.80]	.250 [6.35]

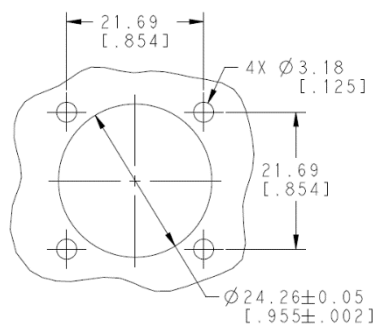
Material: PEI

Operating temperature is -55°C to +125°C [-67° to +257°F]

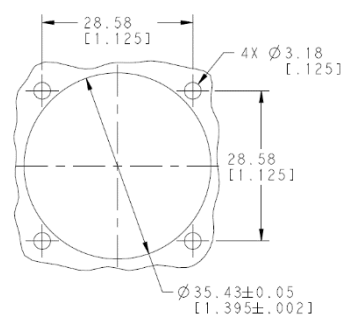


## I. Panel Mounting Layouts

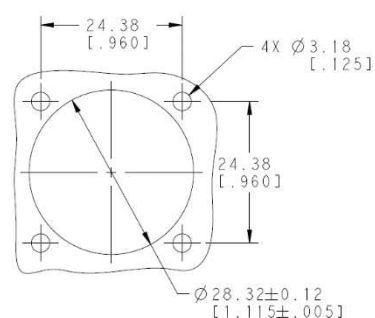
The flanged receptacle may use a panel cutout that allows the flange to be mounted on the inside of the panel.



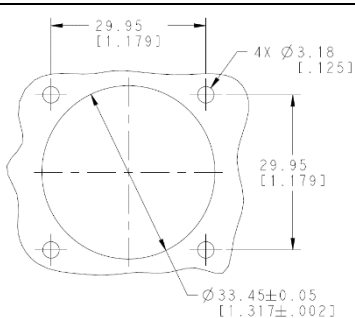
HD10-3



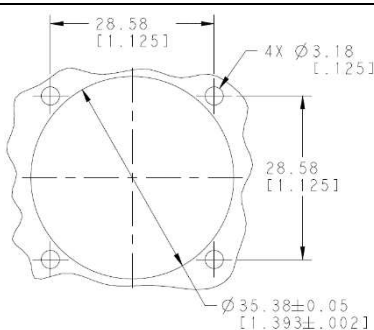
HD10-4



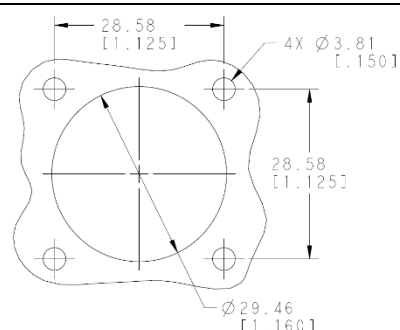
HD10-5



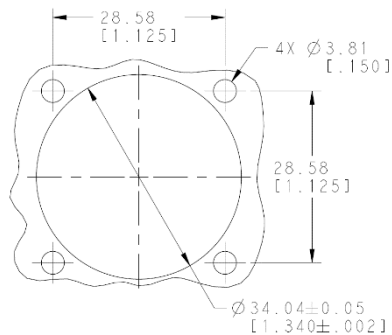
HD10-6



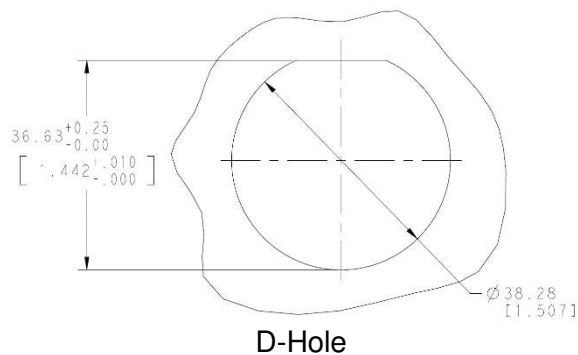
HD10-9



HD10-6-96P-N005



HD10-9-96P-N005



D-Hole



Note:

- 1) Tolerance:  $\pm 0.12$  [0.005]
- 2) Surface:  $0.8 Ra$  [32 RMS] or better and  $\square 0.13$  [0.005]

## D HOLE PUNCH

The D hole punch is a hand tool used to cut a D shaped hole. The D shaped hole allows the connector to be securely mounted and prevents the connector from spinning.

Part Number	
18-D-PUNCH	

## J. Accessories

Several accessory items can be used to complement the connectors such as PVC boots, plastic backshells, neoprene closed cell gaskets, and plastic protective caps. Accessories are designed to complete the application and meet a wide array of design requirements such as solutions for mounting, providing additional protection, and offering increased aesthetics.

### BOOTS

Slip-on boots are not only aesthetically appealing, but also provide increased protection from dirt, paint overspray, and pressure washing.



Part Number	Description
<a href="#">HD10-3BT</a>	Boot, 3p, Gray
<a href="#">HD10-5BT</a>	Boot, 5p, Gray
<a href="#">HD10-5BT-BK</a>	Boot, 5p, Black
<a href="#">HD10-6BT</a>	Boot, 6p, Gray
<a href="#">HD10-6BT-BK</a>	Boot, 6p, Black
<a href="#">HD10-9BT</a>	Boot, 9p, Gray
<a href="#">HD10-9BT-BK</a>	Boot, 9p, Black

Material: PVC

Operating temperature is -29°C to +100°C [-20° to +212°F]

### PROTECTIVE DUST CAPS

Protective dust caps provide an environmental seal and are used to protect the connector interface when the connector is not mated. Optional rubber and steel lanyards are available.



Part Number Plug	Description
<a href="#">HDC14-3</a>	Dust Cap, 3p, Gry
<a href="#">HDC14-6</a>	Dust Cap, 6p, Gry
<a href="#">HDC14-9</a>	Dust Cap, 9p, Gry

Part Number Receptacle	Description
<a href="#">HDC16-3</a>	Dust Cap, 3p, Gry
<a href="#">HDC16-5</a>	Dust Cap, 5p, Gry
<a href="#">HDC16-6</a>	Dust Cap, 6p, Gry
<a href="#">HDC16-6-E004</a>	Dust Cap, 6p, Blk
<a href="#">HDC16-9</a>	Dust Cap, 9p, Gry
<a href="#">HDC16-9-E004</a>	Dust Cap, 9p, Blk
<a href="#">YHDC16-9-OB000000</a>	Dust Cap, 9p, Gry
<a href="#">YHDC16-9-OB0-E0040</a>	Dust Cap, 9p, Blk
<a href="#">2301692-1</a>	Dust Cap, 9p, Grn

Material: PA66 10GF

Operating temperature is -55°C to +125°C [-67° to +257°F]



Nitrile (NBR)



Steel (STL)



Nitrile (NBR)





Steel (STL)

Part Number Plug	Description
<a href="#">HDC14-3-JDL</a>	Dust Cap, 3p, NBR Lanyard, Gry
<a href="#">HDC14-6-JDL</a>	Dust Cap, 6p, NBR Lanyard, Gry
<a href="#">HDC14-6-LA</a>	Dust Cap, 6p, STL Lanyard, Gry
<a href="#">HDC14-9-JDL</a>	Dust Cap, 9p, NBR Lanyard, Gry

Part Number Receptacle	Description
<a href="#">HDC16-3-JDL</a>	Dust Cap, 3p, NBR Lanyard, Gry
<a href="#">HDC16-3-LA</a>	Dust Cap, 3p, STL Lanyard, Gry
<a href="#">HDC16-5-LA</a>	Dust Cap, 5p, STL Lanyard, Gry
<a href="#">HDC16-6-JDL</a>	Dust Cap, 6p, NBR Lanyard, Gry
<a href="#">HDC16-6-LA</a>	Dust Cap, 6p, STL Lanyard, Gry
<a href="#">HDC16-9-JDL</a>	Dust Cap, 9p, NBR Lanyard, Gry
<a href="#">HDC9-JDL082397</a>	Dust Cap, 9p, NBR Lanyard, Blk
<a href="#">HDC16-9-L47N</a>	Dust Cap, 9p, STL Lanyard, Gry
<a href="#">HDC16-9-E004-L47N</a>	Dust Cap, 9p, STL Lanyard, Blk
<a href="#">429596-ZZ</a>	Dust Cap, 9p, PA Lanyard, Gry

## LANYARDS

Part Number Lanyard	Description	Cross Section Diameter	Lanyard
<a href="#">JDL082397</a>	Lanyard, Nitrile, 3M Heat Shrink 134.87 [5.31] long	1.78 [.070]	
L47N-600-1	Lanyard, Steel w/ Clear Nylon 152.40 [6.00] long	1.19 [.047]	

Dimensions are for reference only

## BACKSHELLS

Designed to screw onto plugs and receptacles with rear threads. The rigid, durable backshells offer a high level of protection, provide strain relief, and improve aesthetics.



Connector Part Number	Cable Diameter	Backshell	Compression Nut
HD1*-3-96**	4.75-7.62 [.187-.300]	M902-2131	M902-2041
	7.62-10.92 [.300-.430]	M902-2132	M902-2042
HD1*-6-12** HD1*-6-96**	4.75-7.62 [.187-.300]	M902-2161	M902-2041
	7.62-10.92 [.300-.430]	M902-2162	M902-2042
	10.92-14.48 [.430-.570]	M902-2163	M902-2053
	14.48-18.03 [.570-.710]	M902-2164	M902-2054
HD1*-4-4** HD1*-9-96** HD1*-9-1939**	4.75-7.62 [.187-.300]	M902-2191	M902-2041
	7.62-10.92 [.300-.430]	M902-2192	M902-2042
	10.92-14.48 [.430-.570]	M902-2193	M902-2053
	14.48-18.03 [.570-.710]	M902-2194	M902-2054

1\* = 10, 14, 16, 17

\*\* = P, PE or S, SE

Material: PC/PBT

Operating temperature is -40°C to +134°C [-40° to +273°F]

## STRAIN RELIEF

Designed to screw onto plugs and receptacles with rear threads. The rigid, durable strain reliefs offer a high level of protection, provide a tie wrap holder to reduce strain from the wires and improve aesthetics.





Part Number	Description
<a href="#">HD18-003</a>	Strain Relief, 3p, Gry
<a href="#">HD18-006</a>	Strain Relief, 6p, Gry
<a href="#">HD18-009</a>	Strain Relief, 4/9p, Gry

Material: PA66 10GF

Operating temperature is -55°C to +125°C [-67° to +257°F]

## GASKETS

Moisture, dirt, salt, sand, and road debris can all work their way into electrical panels through unsealed mounting flanges. These rugged high quality gaskets form a tight seal between the panel face and connector flange to help keep out destructive elements. The gasket thickness is 3.18 [.125].

Part Number	Used On	Gasket
<a href="#">HD10-3-GKT</a>	HD10-3-XXXX	
<a href="#">HD10-5-GKT</a>	HD10-5-XXXX	
<a href="#">HD10-6-GKT</a>	HD10-6-XXXX	
<a href="#">HD10-9-GKT</a>	HD10-9-XXXX	
<a href="#">16-04978</a>	HD10-9 B022 HD10-9 B025 HD10-9 BE09 HD10-9 BP03	



Material: Closed Cell Sponge

Operating temperature is -57°C to +107°C [-70° to +225°F]

## CRIMP SLEEVE REDUCER

A crimp sleeve reducer allows DEUTSCH size 4 solid contacts to accept 8-10 AWG wire. When populating a connector using a contact with a reducer sleeve, be sure the insert seal penetrates the rear grommet. The use of the crimp sleeve reducer requires no extra crimp tools and provides an easy transition and increased flexibility. Used on pin arrangements with size 4 contact cavity. See [408-151083](#) for instructions.



Part Number	Description	Material	Image
<a href="#">0410-241-0406</a>	Insert Seal	VMQ Red-Orange	
<a href="#">0421-203-04141</a>	Crimp Sleeve Reducer	Copper Alloy Nickel	

## EXTENDED PCB PINS

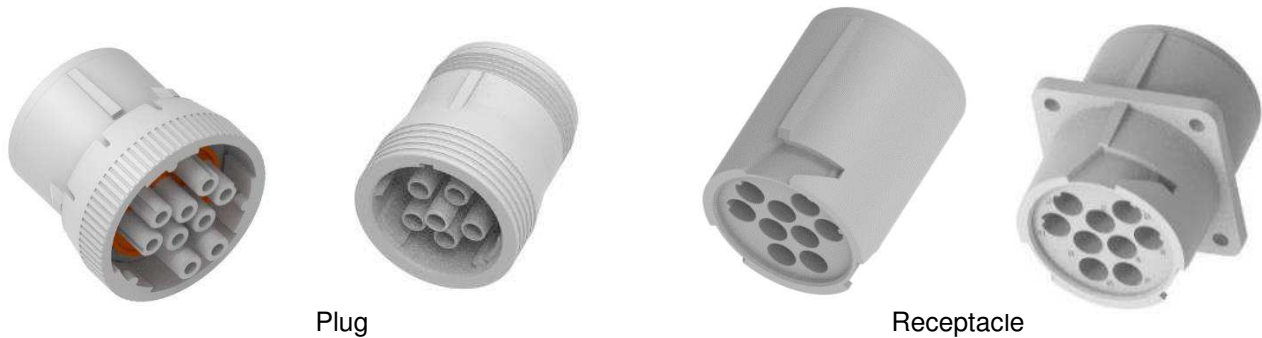
Straight reduced diameter extended pins are available for installation in the HD Series connectors. The use of removable contacts provides design flexibility and a low cost alternative to meet application needs. These solid copper alloy pins may be specified in various plating's. See [408-151078](#) for instructions.



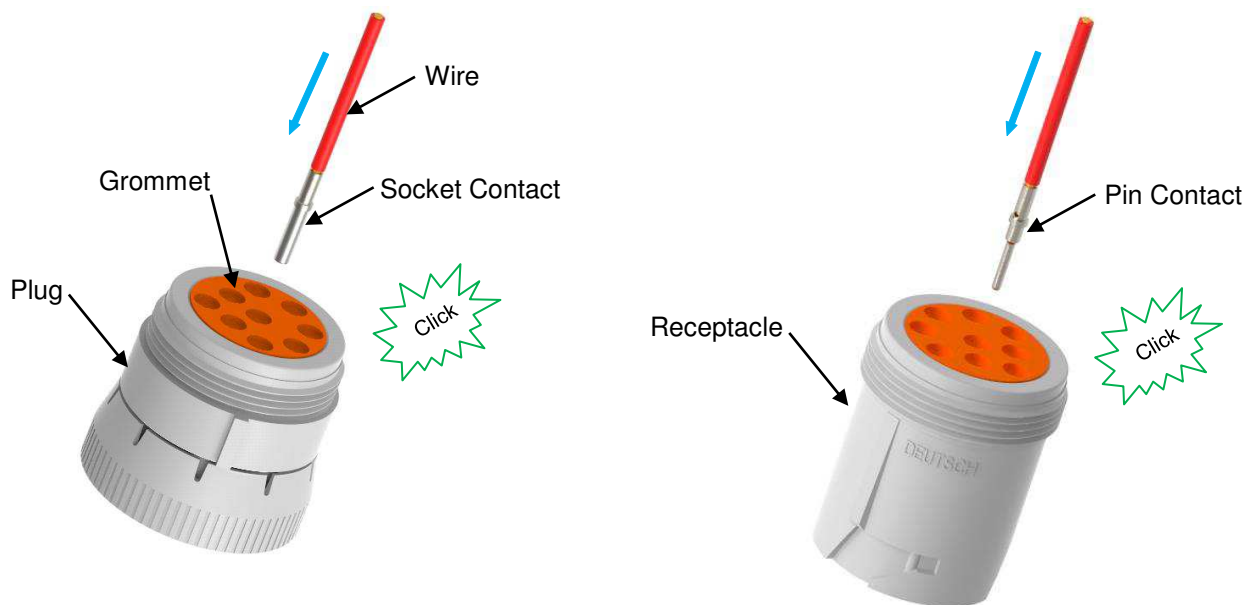
### 3.4 Contact Insertion

- The crimped contacts must meet these specification:
  - [114-151000](#) DEUTSCH Size 16 S&F Pin and Socket Application Specification
  - [114-151001](#) DEUTSCH Size 16 S&F Pin and Socket Application Specification
  - [114-151002](#) DEUTSCH Size 12 S&F Pin and Socket Application Specification
  - [114-151004](#) DEUTSCH Size 4-20 Solid Pin and Socket Application Specification
  - [114-151006](#) DEUTSCH Size 12 S&F Pin and Socket Application Specification

2. Ensure the correct connector configuration is being used before inserting contacts. Pins used in Receptacle; Sockets used in Plug.



3. Push contacts straight into the grommet until a positive stop is felt. The contact will lock into place. A slight tug on wire will confirm that it is properly locked in place.



**i** Note


- Wire insulation outside diameter must meet connector wire sealing range per section 3.3.D.
- Insertion tool, [M15570-16](#) (size 16) may be needed for 20 AWG [0.50mm<sup>2</sup>] wire.


### 3.5 Contact Insertion Tool

Insertion tools are used to help insert small gage wired contacts into connectors that utilize a round shoulder contact retention system. Insertion tools are compact, easy-to-use and made with durable plastic to insert wired contacts without damage to wire, insulation, rear grommet seal or connector housing.

#### 1. USING THE TOOL

1. Insert the wired contact into the colored end wire entry slot and gently pull back until the contact locking shoulder is against tool.
2. Push the tool/wired contact assembly into the connector rear until the contact is felt snap into position within the retainer.
3. While holding the wire forward, gently pull remove tool out.
4. A slight tug on wire will confirm the contact is properly locked in place.

Contact Size	Part Number	Mil-Spec	Color Insertion	Insertion Tool
16	M15570-16	M81969/14-03	Blue	

**CAUTION**  Do not twist or insert the insertion tool at an angle; otherwise, damage to the cavity retention finger(s) will result.

### 3.6 Contact Removal

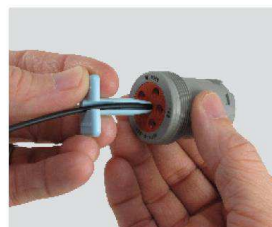
DEUTSCH removal tools are designed to simplify contact removal and field service repair in connectors that utilize a round shoulder contact retention system. Removal tools are compact, easy-to-use, and manufactured of heavy duty plastic to remove contacts without damage to the wire, insulation, connector seals, or connector body.

Each extraction tool is designed to extract individual DEUTSCH solid and stamped and formed (S&F) pin and socket contacts from rear-release connectors. See [408-151007](#) for instructions.

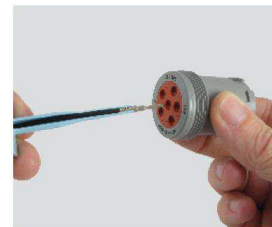
#### 1. USING THE TOOL


1. From the rear of the connector, align the tool tip with the contact cavity of the contact to be removed. Place the wire of the contact over the tool wire entry slot and apply light pressure on the wire until it enters the wire entry slot. See Detail A.
2. Slide the tool along the wire and into the contact cavity until the tool tip engages the contact and resistance is felt. See Detail A.
3. Gently pull the tool with the wire until the contact is removed. See Detail B.

**Detail A**









**Detail B**



**CAUTION**  Do not twist or insert the extraction tool at an angle; otherwise, damage to the cavity retention finger(s) will result.

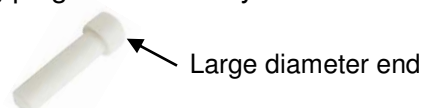
## EXTRACTION TOOLS

Part Number	Contact Size	Wire Gauge Range	Extraction Tool
114009	Size 4	6 AWG	
114010	Size 12	12 AWG	
0411-337-1205	Size 12	12 AWG (E-Seal)	
0411-291-1405	Size 16	14-16 AWG	
0411-310-1605	Size 16	16-20 AWG	
0411-336-1605	Size 16	16-20 AWG (E-Seal)	

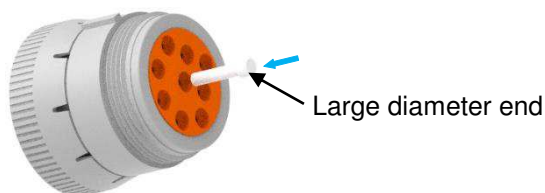
### 3.7 Sealing Plug, Locking Sealing Plug and Keying Pin Installation

#### SEALING PLUG (408-151066)

1. Holding the sealing plug with large diameter end away from the connector, gently apply downward pressure to force the sealing plug into the cavity.



2. With perpendicular motion, apply downward pressure to the large diameter end of the sealing plug.



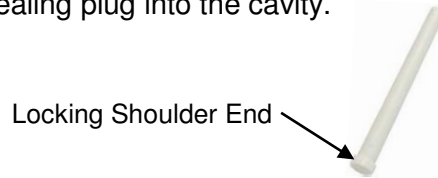
3. Apply pressure until sealing plug is forced to stop by contact with rear grommet. Visually inspect the sealing plug to confirm it is flush with cavity opening.



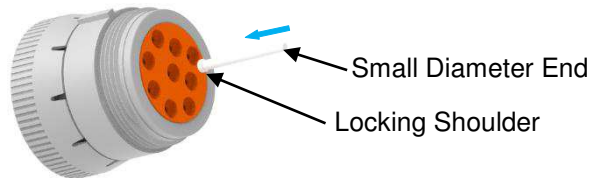


### LOCKING SEALING PLUG (408-151066)

1. Holding the sealing plug with locking shoulder end towards the connector, gently apply downward pressure to force the sealing plug into the cavity.



2. With perpendicular motion, apply downward pressure to the small diameter end of the sealing plug.

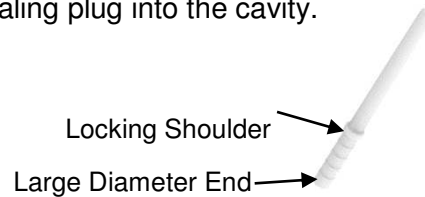


3. Apply pressure until sealing plug locks into place. A slight tug on the sealing plug will confirm it is locked into place.

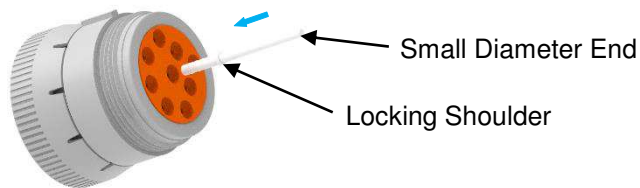


### KEYING PIN (408-151066)

1. Holding the keying pin with large diameter end towards the connector, gently apply downward pressure to force the sealing plug into the cavity.



2. With perpendicular motion, apply downward pressure to the small diameter end of the sealing plug.



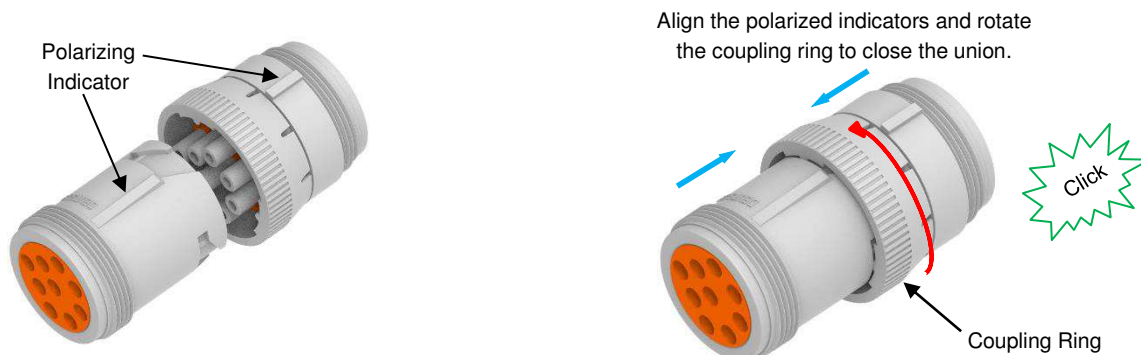
3. Apply pressure until keying pin locks into place. A slight tug on the sealing plug will confirm it is locked into place.



### 3.8. Connector Mating

#### COUPLING RING TYPE

To mate the plug and receptacle, align the plug and receptacle Polarizing Indicators as shown. Once aligned, push together until they stop, and the Coupling Ring can be aligned and rotated. Rotate the Coupling Ring until it comes to a hard stop. This will indicate that the connector is fully mated.



#### WITHOUT COUPLING RING TYPE

To mate the plug and receptacle, align the plug and receptacle Polarizing Indicators as shown. Once aligned, push together until there is a hard stop. This will indicate that the connector is fully mated.



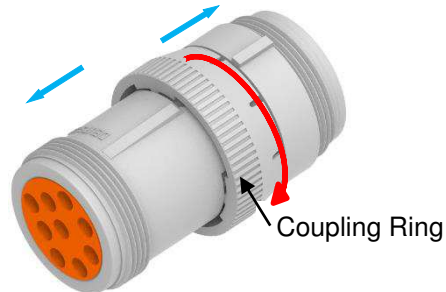
#### Note

1. It is not recommended to use dielectric grease on either plug or receptacle. The HD10 connectors are guaranteed to seal and perform per [108-151016](#) product performance without the application of grease or other foreign substance.
2. Plugs without coupling ring and high durability terminals could be used in a diagnostic tool type application.

### 3.9. Connector Unmating

#### COUPLING RING TYPE

To uncouple the plug and receptacle, rotate the Coupling Ring counterclockwise. This will unlock the lock and allow them to separate. Pull connectors apart.



#### WITHOUT COUPLING RING TYPE

To uncouple the plug and receptacle, pull the plug to separate from the receptacle.



### 3.10. Backshell, Strain Relief, Boot, Gasket, Protective Dust Cap Installation and Removal

See section J for part numbers.

#### BACKSHELL AND COMPRESSION NUT

1. Installation of backshell and compression nut starts with the insertion of wires in the connector, once inserted the wires are passed through the backshell.
2. Screw the backshell on the back of the connector. The connector has threads which the backshell is threaded on. Hand tight backshell. Do not overtighten.

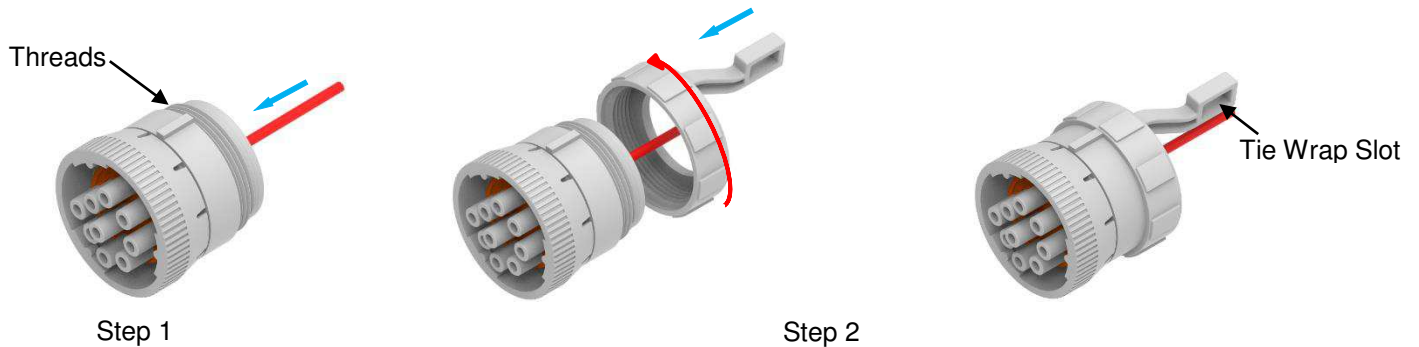
3. Pass the wires through the compression nut and this will be screwed on the backshell in this way the wires will be secured. Hand tight compression nut. Do not overtighten.



4. Remove in reverse steps.

### STRAIN RELIEF

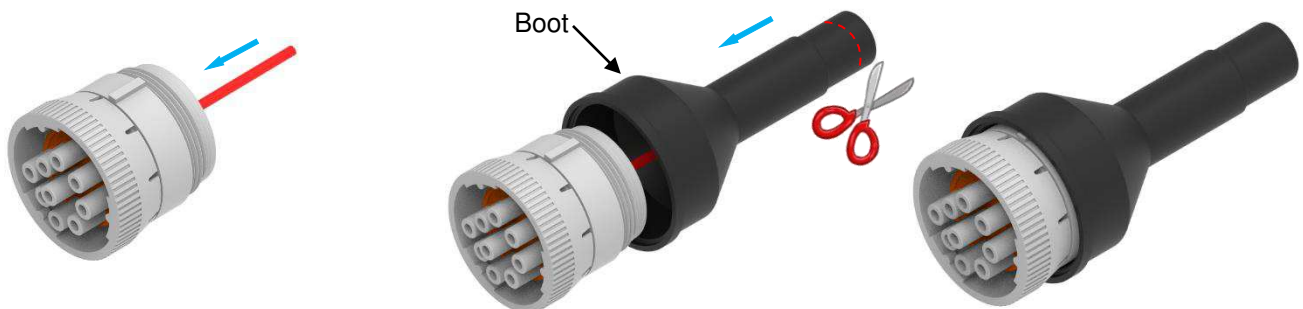
1. Installation of strain relief nut starts with the insertion of wires in the connector, once inserted the wires are passed through the strain relief.
2. Screw the strain relief on the back of the connector and hand tight. The connector has threads which the backshell is threaded on. Hand tight strain relief. Do not overtighten.



3. Remove in reverse steps.

### BOOT

First insert the wires into the connector. Next, cut off the end of the boot as needed then pass through the wires through the boot. Slide the boot onto the connector. If needed, attach a tie wrap on the end of the connector and boot. Trim tie wrap as needed.



## GASKET

Install the gasket onto the connector in front of the flange. Next install into panel mounting hole. See section 3.11 for panel installation.



## PROTECTIVE DUST CAP

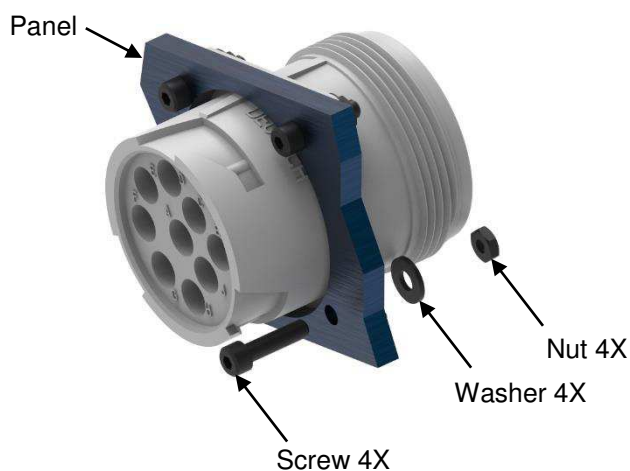
To mate the protective cap to the receptacle, align the bayonets on the receptacle to the openings on the cap. Turn clockwise until a snap is felt. Remove in reverse steps.



## 3.11. Panel Installation

### FLANGED RECEPTACLE

The receptacles may be mounted to a panel as shown. If a gasket is used, ensure the gasket is installed onto the housing before inserting mating side through the panel cutout. Mounting hardware (i.e. screws, washer, nuts) are customer supplied. Recommended screw size is M3 [4-40]. Screw length and torque depend on application. Maximum panel thickness is 6.35 [.250].



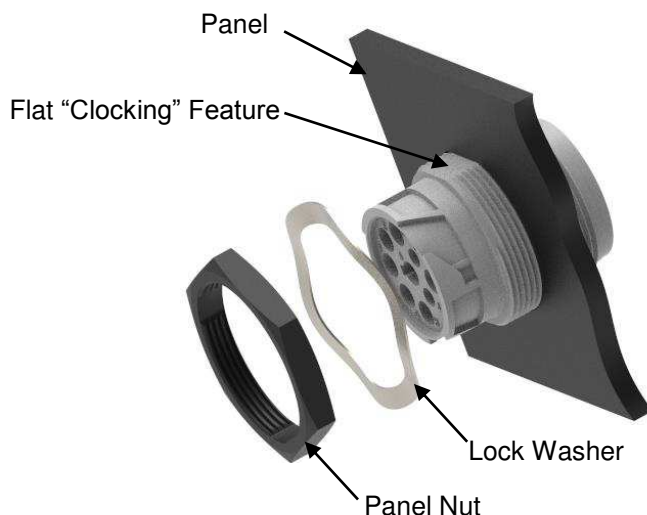
### CAUTION

Do not over torque mounting hardware. Mounting torque must not damage receptacle mounting flange.

## D-SHAPE RECEPTACLE

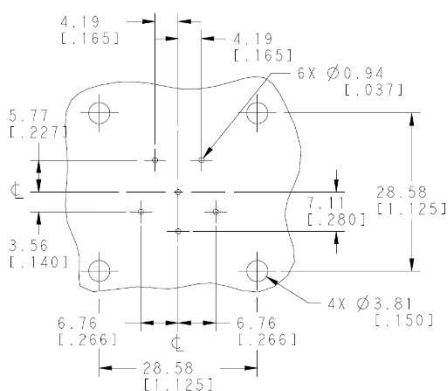
The D-shape receptacles may be mounted to a panel as shown. A clocking feature on the housing may be used to orient the connector on the panel, but the panel cutout must contain the proper tab in order to properly utilize this feature. If a gasket is used, ensure the gasket is installed onto the housing before inserting mating side through the panel cutout. Maximum panel thickness is 4.78 [.188].

- Panel Nut Mounting Torque: 5.1-6.1 Nm [45-55 in-lbf]
- Panel Nut Socket: 1-11/16 inch
- Tool Speed: 5 RPM

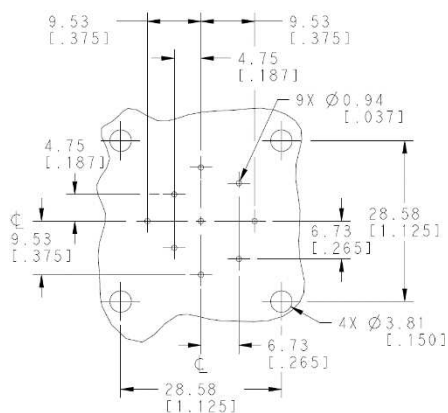


### 3.12. Header Installation

#### PRINTED CIRCUIT BOARD (PCB) LAYOUT



HD10-6-96P-N005



HD10-9-96P-N005



Note:

1. Tolerance:  $\pm .05$  [.002].
2. Customer to determine finished hole diameter based on soldering process, through hole plating, etc.

## PANEL CUTOUT

See Section 3.3 I

## SOLDERING GUIDELINES

The header is designed to be compatible with standard soldering process (i.e. hand soldering, wave soldering, reflow soldering) which uses tin solder. The header material is capable to withstand 260°C [500°F] for 5 seconds. There must be no interruptions of the conveyor carrying the PCB through the solder bath.



### CAUTION

*Care must be taken not to leave the header exposed directly to the soldering flow during an interruption. Any header exposed to the solder flow longer than the normal soldering cycle must be rejected and replaced*

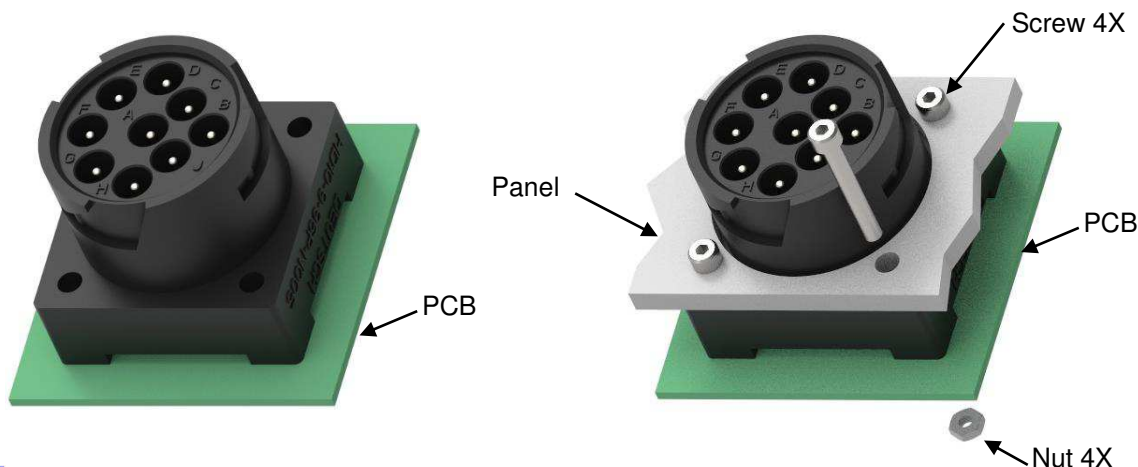
Manual [402-40](#) is available to be used as a guide to soldering. This manual provides information on various flux types and characteristics with the commercial designation and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

After soldering, removal of fluxes, residues and activators is necessary. Cleaners must be free of dissolved flux and other contaminants. We recommend cleaning the PCB on its edge. If using an aqueous cleaner, we recommend standard equipment such as a soak-tank or an automatic in-line machine.

When drying cleaned assemblies and printed circuit boards, make certain that temperature limitations are not exceeded: -40° to 70°C [-40° to 158°F]. Excessive temperatures may cause housing degradation.

## PRINTED CIRCUIT BOARD (PCB) AND PANEL MOUNT

1. Solder the header to the PCB.
2. Mount header through the panel as shown. Mounting hardware (i.e. screws, washer, nuts) are customer supplied. Recommended screw size is M3 [4-40]. Screw length and torque depend on application. Maximum panel thickness is 6.35 [.250].



### Note

- 1) Mounting torque must not damage connector or PCB.

### 3.13. Replacement and Repair

Damaged or defective connectors must not be used. These connectors cannot be repaired.

### 4. QUALIFICATION

Refer to product specification [108-151016](#) for qualification and approved agency.

### 5. TOOLING

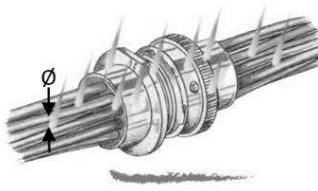
Refer to the following application specifications for reference on all pins and sockets contact termination tooling

- [114-151000](#) DEUTSCH Size 16 S&F Pin and Socket Application Specification
- [114-151001](#) DEUTSCH Size 16 S&F Pin and Socket Application Specification
- [114-151002](#) DEUTSCH Size 12 S&F Pin and Socket Application Specification
- [114-151004](#) DEUTSCH Size 4-20 Solid Pin and Socket Application Specification
- [114-151006](#) DEUTSCH Size 12 S&F Pin and Socket Application Specification

### 6. HELPFUL HINTS

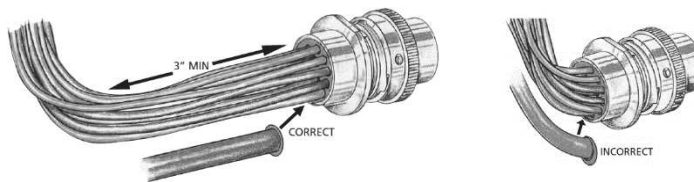
**Helpful hint**

Proper wire outside diameters help provide water tight seals.



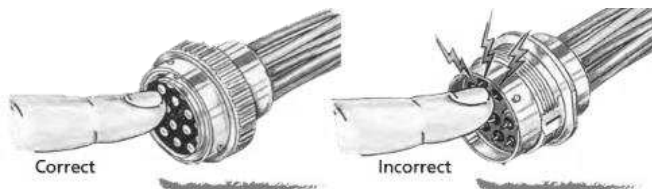
**Helpful hint**

Proper wire routing assures. Water tight seal performance



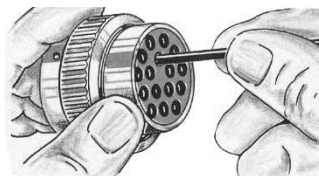
**Helpful hint**

Making the socket contact side the "hot side" can reduce the danger of electric shock.



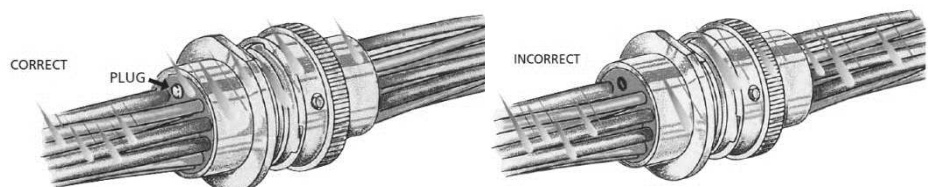
**Helpful hint**

Pulling lightly on the wire after it is snapped in place will assure the contact is locked.



**Helpful hint**

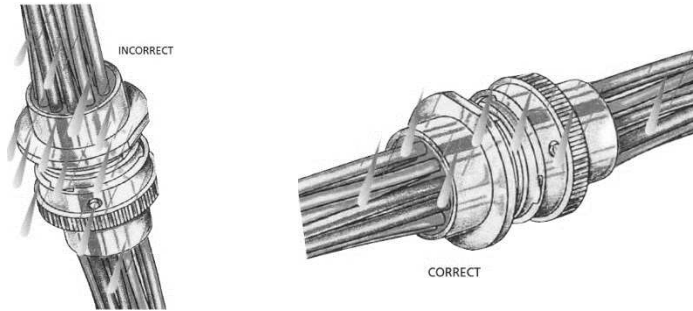
Sealing plugs are used to seal the connector when all the cavities are not used by wires.





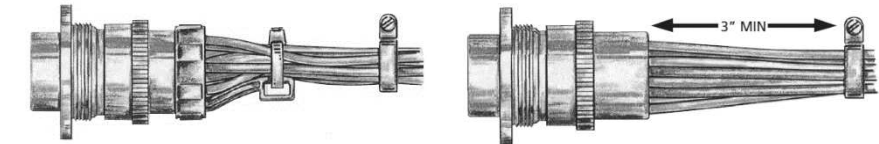
**Helpful hint**

Mounting connectors horizontally allows proper water drainage.



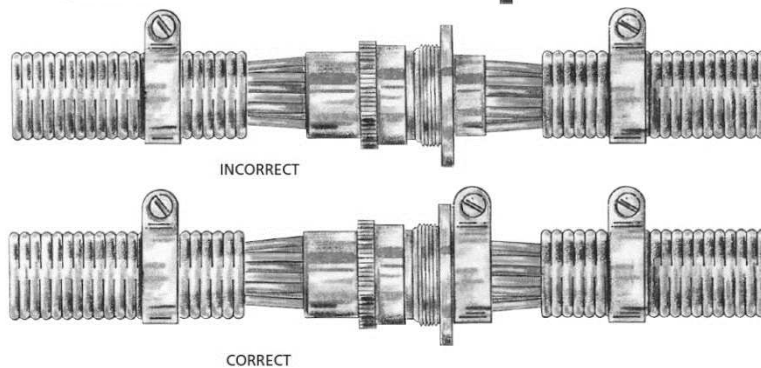
**Helpful hint**

Planned wire routing and clamp points can reduce harness cost by eliminating strain reliefs.



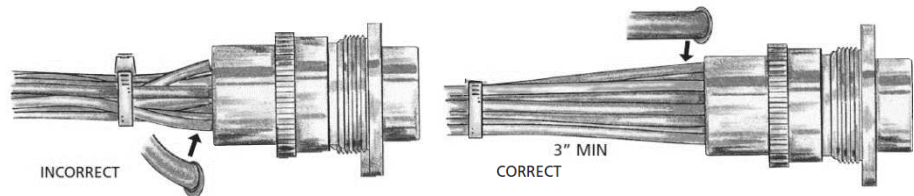
**Helpful hint**

Attaching the connector to a structure eliminates straining the electrical system in service.



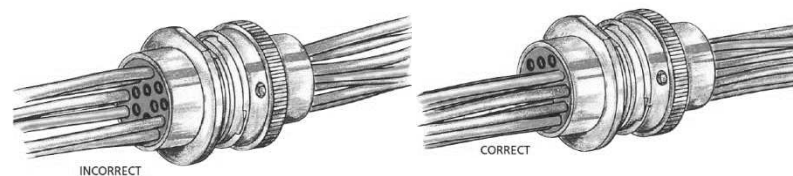
**Helpful hint**

Tie wraps and tape away from the rear of the connector will allow the wire to be sealed properly.



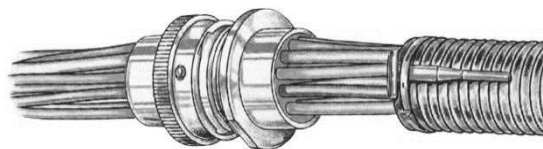
**Helpful hint**

Harness design should permit filling the connector cavities from the center out in order to provide support for the center of the harness and to allow easier connector assembly.



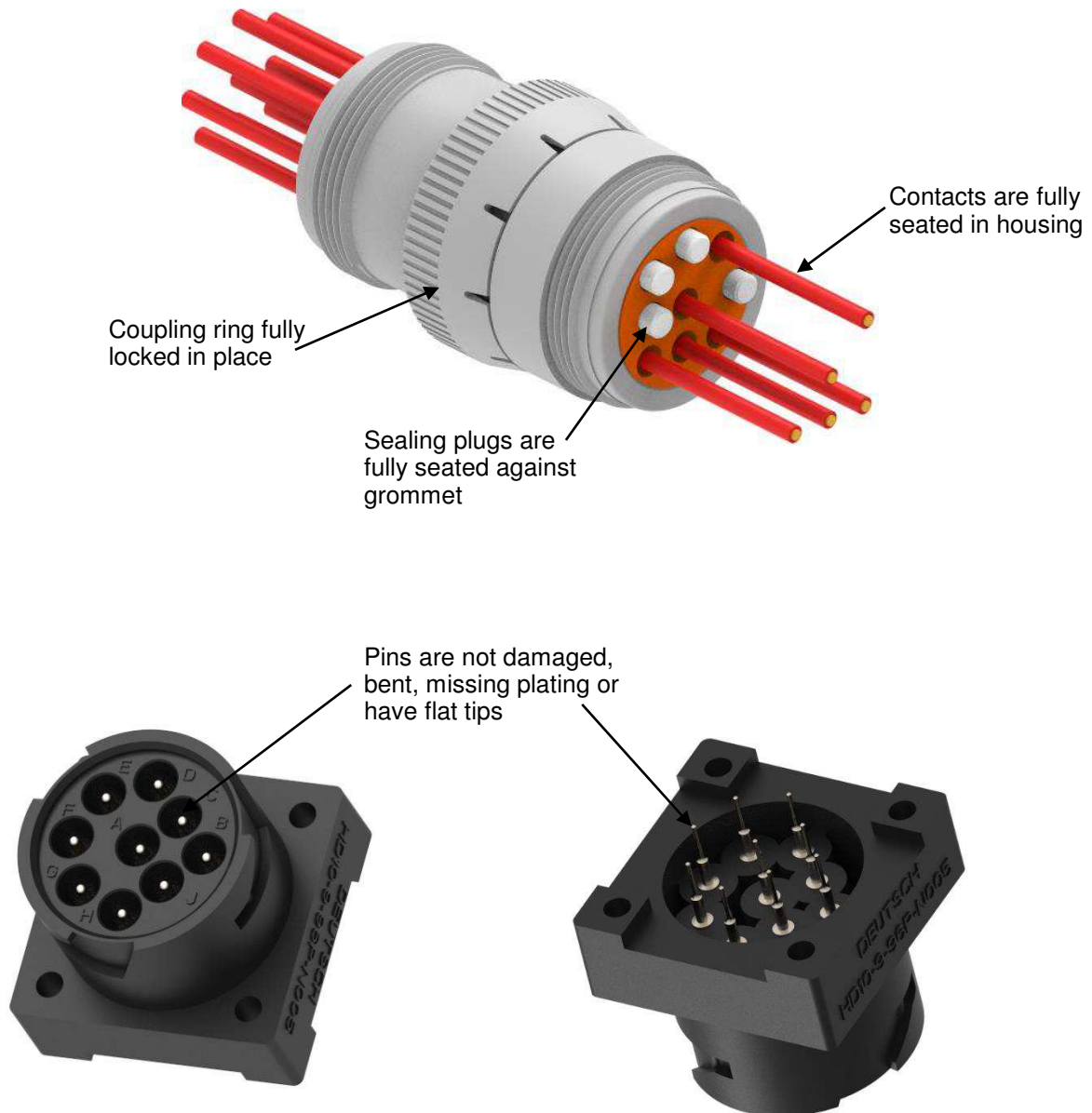
**Helpful hint**

A contact removal tool taped or tie wrapped to the harness will make it easily available should repairs be needed.



## 7. VISUAL AID

Below shows a typical application of the HD10 Series Connector. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the proceeding pages of this specification and in the instruction material shipped with the product or tooling.



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**8. REVISION HISTORY**

<b>Rev Ltr</b>	<b>Brief Description of Change</b>	<b>Date</b>	<b>Dwn</b>	<b>Apvd</b>
A	Initial Release	22-Sep-20	DM	IG