DEUTSCH

Industrial Products Division

DRC SERIES

Technical Manual

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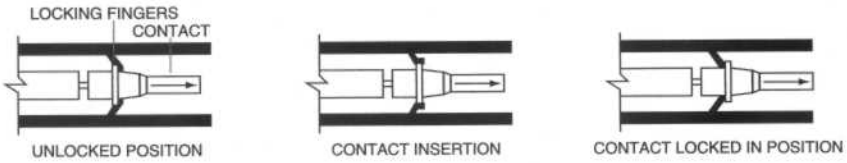
DEUTSCH CONNECTORS A Step Ahead

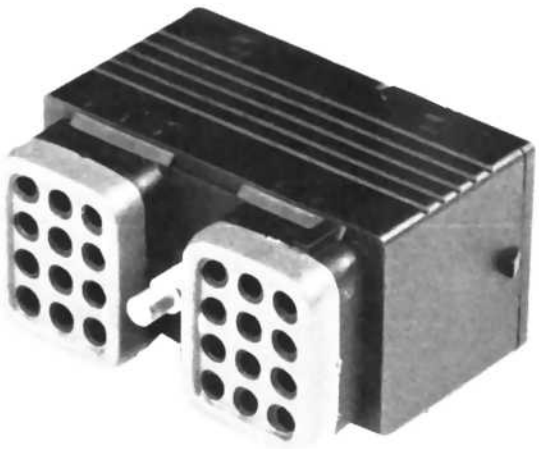
Information contained herein is for reference only.
Consult factor for new envelope drawings, updated specifications, and additions to product lines.

Contact Retention System

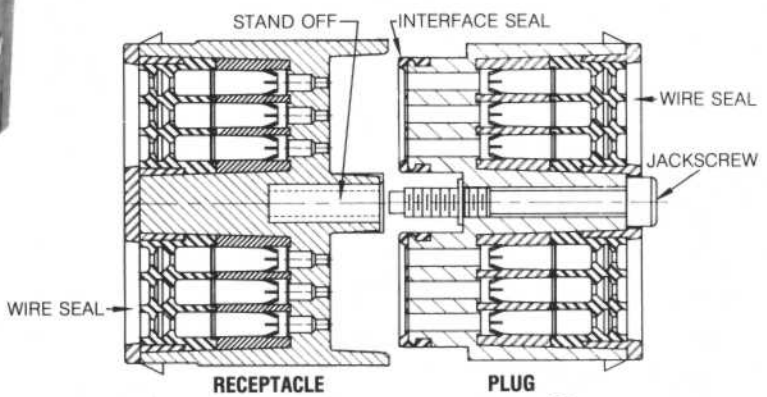


CONTACT INSERTION PROCEDURE

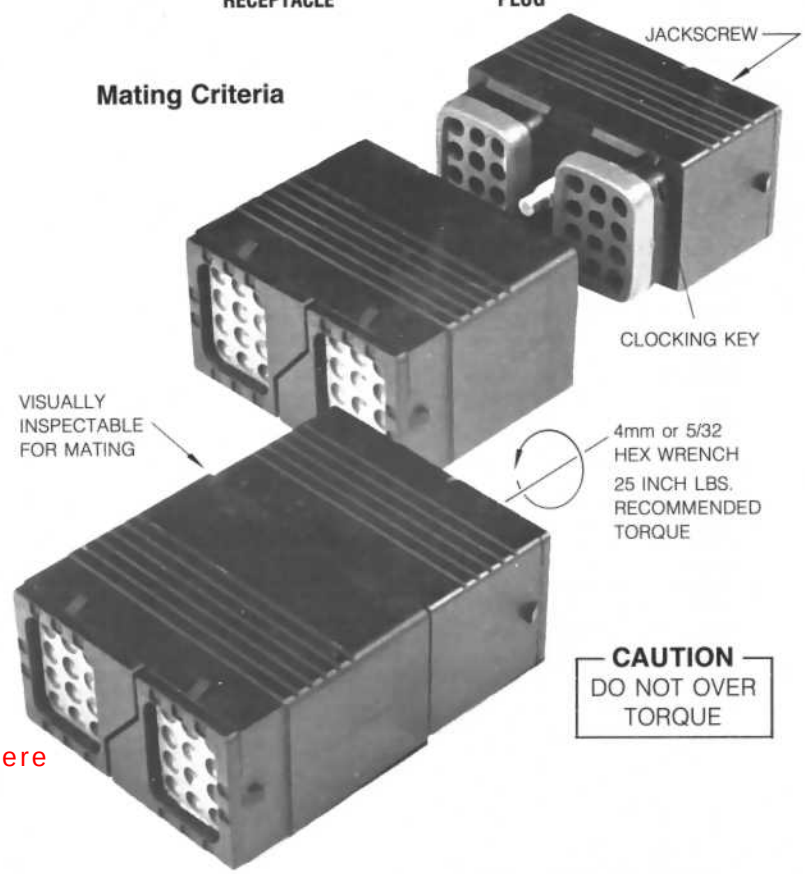
CONTACT REMOVAL PROCEDURE



Connector Sealing Elements



Mating Criteria



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ELECTRICAL INTERCONNECTIONS FOR HEAVY DUTY EQUIPMENT

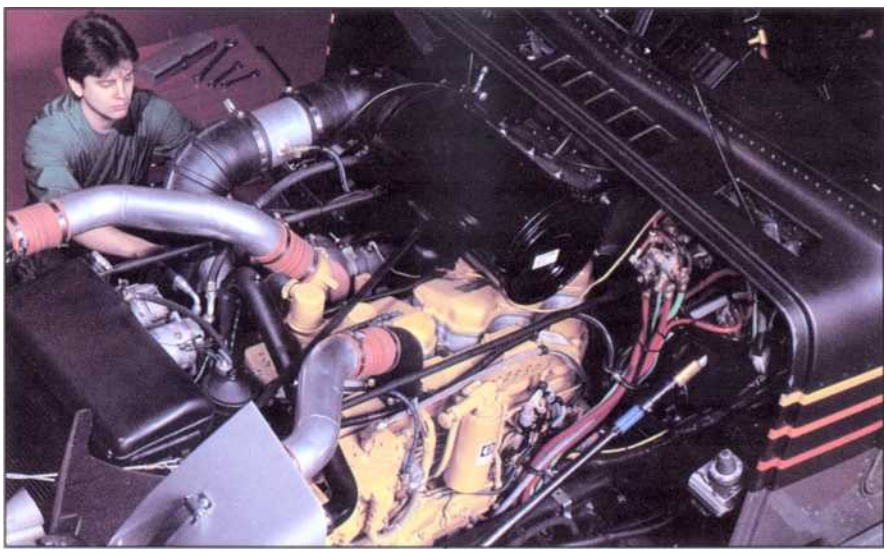
The heavy duty connector industry is into the most dynamic and challenging time in its history. Computerized sensors, monitoring devices and expanding electronics in trucks, buses, off-road equipment and farm machinery are changing design objectives. These objectives must not only address the electrical requirements, but give heavy consideration to the future maintenance and service of these new high technology systems.

Increasingly intricate electronic systems will continue to drive the demand for heavy duty interconnections well into the next century. Most notable are: engine, controls, transmission controls, electronic panels, ABS, traction controls, navigation and electrical load management. Designers of these new systems must address difficult criteria for connector selection, these include:

- Higher Density - Greater Number of Terminals
- Data Transmission Added to Power Distribution
- Non-Cab Mounted Electronics
- Significance of Total Installed Cost

Taking advantage of the many years Deutsch continues to be a major supplier of electrical interconnections for the heavy duty equipment industry. Working with design, manufacturing and test personnel at the leading O.E.M.s in the truck, bus and off-highway industry, we have defined the Deutsch rectangular connector series.

The DRC Series is designed with a higher number of terminal counts. Insert arrangements of 24, 40, 50 and 70 contacts are tooled and available. The use of size 16 & 20 crimp type contacts common to the other Deutsch product lines simplifies the design effort required to accomplish electrical and mechanical criteria.



By utilizing a rectangular shape, the DRC is best suited to be compatible with externally or internally mounted electronic modules. P.C.B. applications are addressed with the DRC Series receptacles being supplied with contact terminations designed for flex-tape or direct board mountings.

The Deutsch DRC Series is completely environmentally sealed, using silicone seals and wire grommets that withstand engine and transmission temperatures. The rugged thermoplastic housings are designed to meet field abuse for the life of the equipment.

The DRC contact systems decrease installation costs and increase reliability.

- Crimp type solid copper alloy contacts eliminate the need to solder.
- Wire seals are designed in the connector housing - no need to attach the seals to the wire.
- The DRC dielectric contact retention system is an integral part of the connector insert, thus allowing quick and easy assembly, while providing a positive lock for reliability.
- As in all Deutsch products, a common contact design is specified. This commonality reduces inventory costs and eliminates the chance of error in the harness system, as the termination process is common, allowing assembly operators repeat performance regardless of wire size. This ensures the repeatability of crimping, inserting and inspection.

Rugged thermoplastic shells. Designed for ***heavy duty service.***

Environmentally sealed against moisture and contaminants. Silicone wire grommets are an integral part of the connector, reducing total installed costs.

-55° to +125° continuous operation at rated current for engine service.

Available in ***high density pin counts*** of 24, 40 and 70, meeting most electronic design demands.

Crimp-type, nickel plated, solid copper alloy contacts increase ***durability*** and reduce ***installation costs*** by eliminating soldering after crimping.

Positive locking contact retention system by use of dielectric "fingers" designed in the connector inserts, thus, eliminating the need for a second lock.

Quick, fool-proof assembly, decreasing time on the assembly line and increasing profits. The ease of contact insertion and removal reduces field-service down time.

Deutsch's common contact system ***slashes inventory costs,*** and ***reduces the chance of errors*** caused by hundreds of different types of terminations within one harness assembly.

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PART NUMBERING SYSTEM

DRC 14 - 40 P A X - XXX

- **DRC** — Designates Deutsch Rectangular Connector Bulk Packaged Without Contacts or Accessories
- **14** — Type
  1 = Accepts Size 16 Terminals
  2 = Accepts Size 20 Terminals
- **40** — Style
  0 = Molded in contacts
  2= Receptacle-Flange Mount
  3 = 90° Receptacle PC Termination*
  4 = Receptacle-Inline
  5 = 45° Receptacle PC Termination*
  6 = Plug
  8 = Keyed Plug 40 pin size 16 only
- **P** — Contact Style
  P = Pin (Male) type
  S = Socket (Female) type
- **A** — Shell size and insert layout (See facing page for available arrangements)
- **X** — Keying Position A,B,C,D
  50 Pin Size 20 only
  01-09 Consult Factory For Availability
- **XXX** — Special Modifications
- Wire Seals †
  Blank = Standard Seal
  T = Thin Wall Seal (Size 16 only)
  E = Extra Thin Wall Seal (Size 16 only)

MATERIAL SPECIFICATIONS

Plug

Shell:	Thermoplastic
Insert:	Retainer-Thermoplastic Grommet-Silicone Rubber
Jackscrew:	Stainless Steel

Receptacle

Shell:	Thermoplastic
Insert:	Retainer-Thermoplastic Grommet-Silicone Rubber
Standoff:	Stainless Steel

Contacts

Pin:	Copper Alloy
Socket:	Copper Alloy
Finish:	Nickel Plated

Sealing Plugs

Thermoplastic: Size 16, Size 20

GENERAL SPECIFICATIONS

Dielectric Withstanding Voltage (Test Voltage):
Sea Level - 1500 VAC (rms)

Current Rating (Maximum):
No. 16 13 amps
No. 20 7.5 amps

Silicone Insert:
Front and rear silicone inserts are devoid of all organic matter.

ARC Resistance:
All dielectric materials withstand a minimum of 130 seconds per ASTM D-495.

Physical Shock:
No unlocking, unmating, or other unsatisfactory results during or after 50 g's in each of three usually perpendicular planes. No electrical discontinuities longer than 1 microsecond. MIL-STD 202. Method 213, Condition "C".

Dielectric Strength:
350 volts per mil. minimum.

Submersion:
Properly wired and mated connection will withstand immersion under three feet of water without loss of electronic qualities or leakage.

Vibration:
Maintains continuity and exhibits no mechanical or physical damage after vibration levels of 20 g's at 10 -2000 Hz.

Temperature:
Operative at temperatures from -55° to +125°C at rated current.

Contact Retention:
Contacts withstand a minimum load of 25 lbs. for size 16, 20 lbs. for size 20.

Thermal Shock:
No cracking, chipping or leaking after 5 test cycles from -55° to +125°C.

Insulation Resistance:
1000 megonms minimum at 25°C.

Durability:
No electrical or mechanical defects after 100 cycles of engagement and disengagement.

Wire Sealing Range:

WIRE SEALING RANGE

SEAL TYPE	CONTACT SIZE	INCH	MM
STD	16	.100 - .134	2.54 - 3.40
REDUCED "T"	16	.088 - .134	2.24 - 3.40
REDUCED "E"	16	.053 - .120	1.35 - 3.05
STD	20	.040 - .095	1.02 - 2.41

Contact Millivolt Drop:

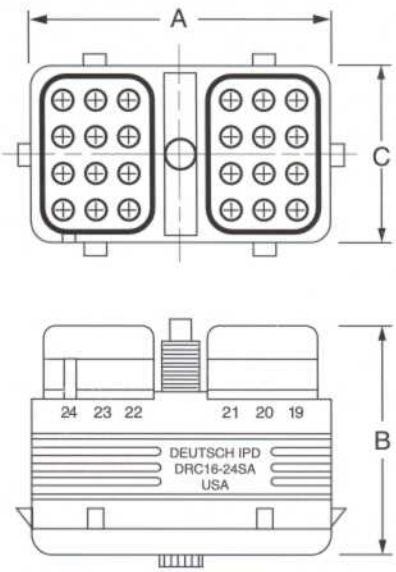
CONTACT MILLIVOLT DROP

SOLID	WIRE GAUGE	TEXT AMPS	MILLIVOLT DROP*
16	16	13 Amps	60
20	20	7.5 Amps	60
STAMPED & FORMED			
16	16	13 Amps	100
20	20	7.5 Amps	100

For more information consult factory or see IPD Brochure: Environmentally Sealed Connectors For Electronic Modules.

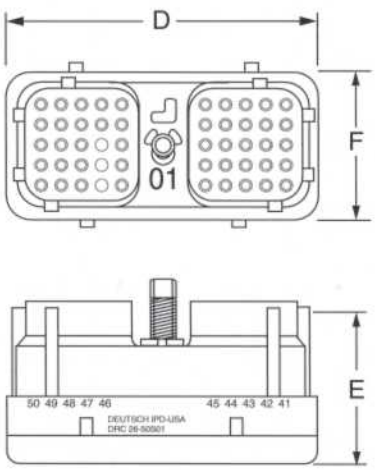
† Consult factory for availability.

PLUG DRC 16



SHELL SIZE	A	B	C
24	2.100	1.597	1.148
40	2.868	1.592	1.202
70	4.094	1.620	1.421

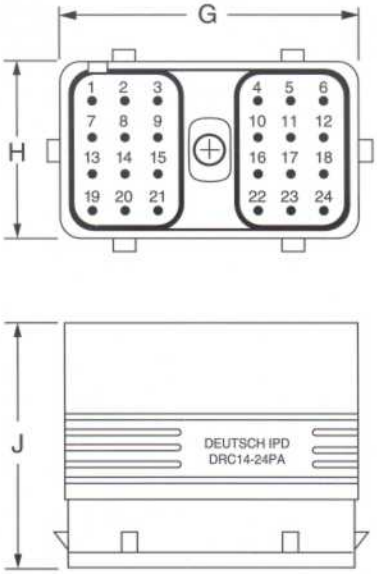
DRC 26



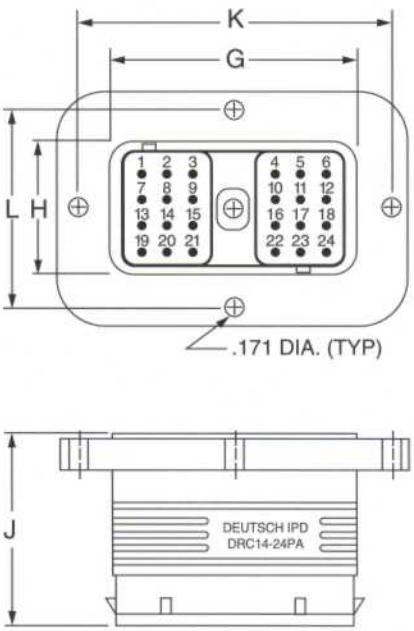
SHELL SIZE	D	E	F
24	2.004	1.435	1.100
40	2.70	1.285	1.100
50	2.70	1.435	1.274

RECEPTACLE DRC 14

Inline Receptacle



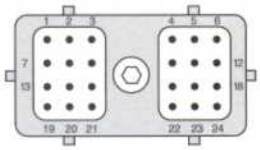
Flange Mounting Receptacle



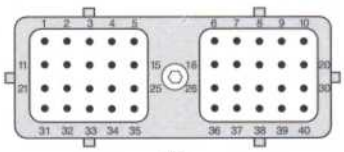
SHELL SIZE	G	H	J	K	L
24	2.154	1.202	1.742	2.724	1.772
40	2.908	1.202	1.699	3.530	1.772
70	4.094	1.421	1.757	4.664	1.991

INSERT ARRANGEMENTS

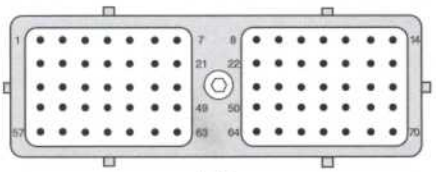
SIZE 16 ARRANGEMENTS



24
24 SIZE 16

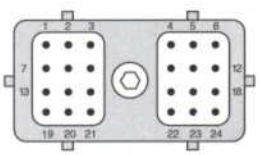


40
40 SIZE 16

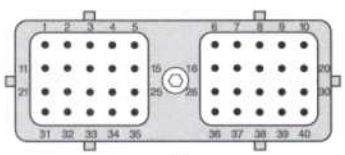


70
70 SIZE 16

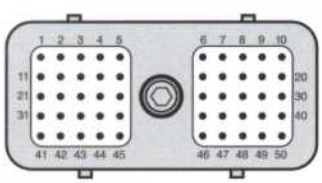
SIZE 20 ARRANGEMENTS



24
24 SIZE 20



40
40 SIZE 20



50
50 SIZE 20

ALL INSERT ARRANGEMENTS
SHOW REAR GROMMET (SOCKET INSERT)

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ASSEMBLY INSTRUCTIONS

The purpose of this section is to assist you in assembling the Deutsch DRC Series electrical connectors. This section describes the correct procedure to use when crimping, inserting and removing contacts.

To determine the correct insert arrangement, check the part number stamped on the connector. A typical part number would appear as DRC 16-24SA. The number 24 indicates the insert arrangement (24 contacts). The designation "P" indicates pin contacts. An "S" designation indicates socket contacts.

Since contacts are inserted and extracted from the REAR or wire side of the connector, the views shown are of the REAR GROMMET.

Size 16 Terminals for 16 and 18 AWG Wire

Contact Crimping

1. Strip 1/4" (6.3 mm) insulation from wire.

2. Raise selector knob and rotate until arrow is aligned with wire size to be crimped.

3. Loosen lock nut, turn adjusting screw in until it stops.

4. Insert contact with wire barrel up. Turn adjusting screw counter-clockwise until contact is flush with indentor cover. Tighten lock nut.

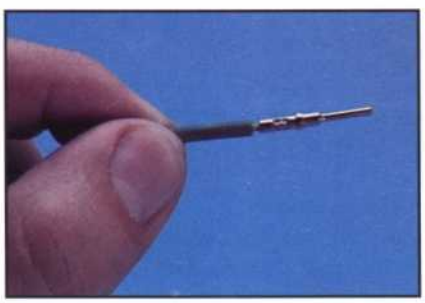
5. Insert wire into contact. Contact must be centered between indicators. Close handles until crimp cycle is completed.

6. Release handles and remove crimped contact.

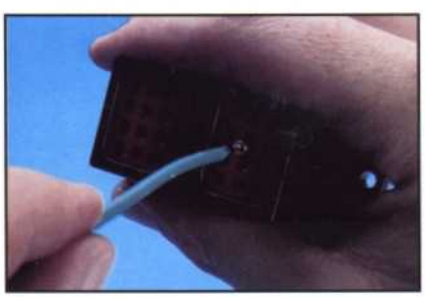
7. Inspect terminal to insure that all strands are in crimp barrel.

NOTE: Tool must be readjusted for each type/size of contact.

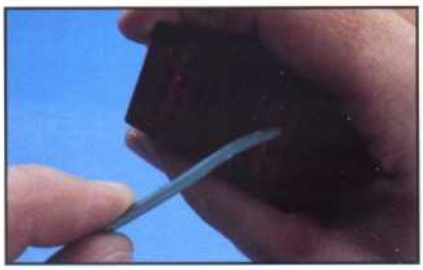
Contact Insertion



1. Grasp contact approximately 1.00" (25.4 mm) behind the contact crimp barrel.



2. Hold connector with rear grommet facing you.



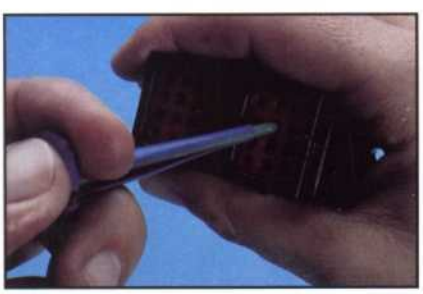
3. Push contact straight into connector grommet until a positive stop is felt. A slight tug will confirm that it is properly locked in place.

Contact Removal

1. With rear insert toward you, snap appropriate size extractor tool over the wire of contact to be removed.

2. Slide tool along wire into the insert cavity until it engages contact and resistance is felt.

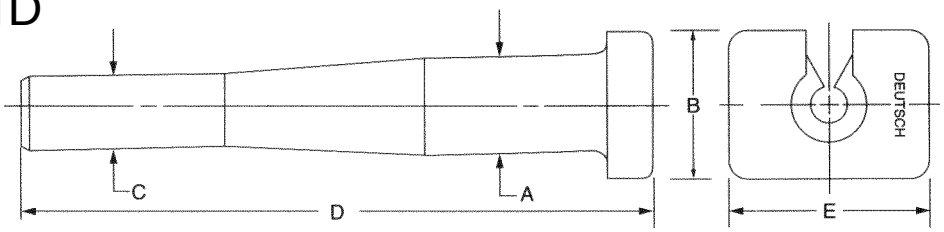
NOTE: Do not twist or insert tool at an angle.



3. Pull contact-wire assembly out of connector.

CONTACTS AND APPLICATION DATA

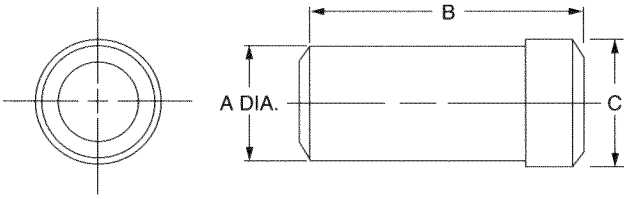
Removal Tool



SIZE 16 CONFIGURATION

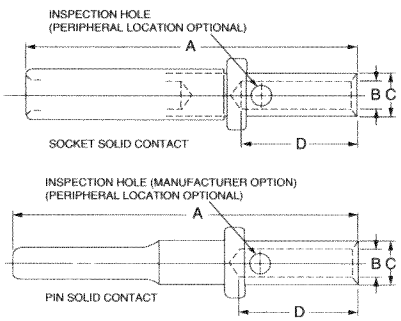
PART NUMBER	SIZE	A ±.015	B ±.031	C REF	D MAX	E ±.031
0411-204-1605	16	.286	.500	.160	2.300	1.000
0411-240-2005	20	.252	.500	.121	2.230	1.000

Sealing Plug

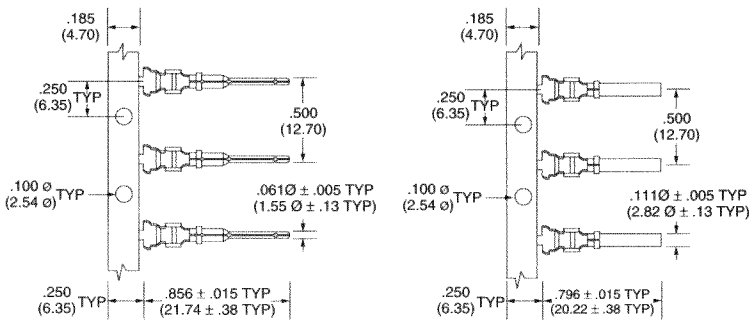


PART NUMBER	CONT. SIZE	A DIA±.010	B DIM±.030	C DIAM±.015
114017	16	.121	.575	.171
0413-204-2005	20	.062	.575	.085

Solid Contacts



Stamped and Formed Contacts



SOLID

CONTACT PART NUMBER	SIZE & TYPE	A ±.020	B MIN	C MAX	D MIN	WIRE GUAGE RANGE	RECOMMENDED STRIP LENGTH	SUGGESTED CRIMP TOOL
0460-202-16141	16 PIN	.821	.062	.106	.250	16-18 AWG (1.0-0.8mm)	.250 - .312 (0.635 - 0.792mm)	HDT - 48-00 HAND HDP 400 PROD.
0462-201-16141	16 SOCKET	.759	.062	.106	.250	16-18 AWG (1.0-0.8mm)	.250 - .312 (0.635 - 0.792mm)	
0460-202-20141	20 PIN	.711	.050	.076	.172	20-24 AWG (0.5-0.2mm)	.218 - .156 (5.54 - 3.96mm)	HDT - 48-00 HAND HDP 400 - PROD.
0462-201-20141	20 SOCKET	.647	.050	.076	.172	20-24 AWG (0.5-0.2mm)	.218 - .156 (5.54 - 3.96mm)	

STAMPED AND FORMED		± .015						
1060-16-0122	16 PIN	.856				16 - 18 AWG (1.0-0.8 mm)	.150 - .200 (3.81 - 5.08mm)	DTT - 16-00 HAND DCT 16-02-00 PROD.
1062-16-0122	16 SOCKET	.790				16 - 18 AWG (1.0-0.8 mm)	.150 - .200 (3.81 - 5.08mm)	
1060-20-0122	20 PIN	.855				16 - 20 AWG (1.0-0.5 mm)	.150 - .200 (3.81 - 5.08mm)	DTT - 20-00 HAND DCT 20-02-00 PROD.
1062-20-0122	20 SOCKET	.792				16 - 20 AWG (1.0-0.5 mm)	.150 - .200 (3.81 - 5.08mm)	

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DEUTSCH CONNECTOR FAMILY
A COMMON SYSTEM OF CONTACTS KNOWN WORLDWIDE

DEUTSCH COMMON CONTACT SYSTEM
Fundamental to the Deutsch connector series is the principle that all wires are terminated by a single contact system. The only variation in contacts is that dictated by wire gauge. The word "common" describes the Deutsch contact system well. Deutsch contacts, whether solid or stamped and formed, can be assembled into the entire Deutsch connector family. Let's look at the common system of contacts, tooling, processes, and terminations in detail:

COMMON CONTACTS
The basic system uses five contact sizes: 4, 8, 12, 16, & 20. These are the only contacts that an O.E.M. or their supplier need stock no matter what connector is being terminated. Two styles of Deutsch contacts are available - solid crimp types, manufactured by a cold heading process of solid copper alloys. Stamped and formed contacts are manufactured with a series of progressive dies. Both contacts are interchangeable within the connector and are selected based upon the user's application. Stocking costs, engineering costs, and termination costs are all slashed, because the number of evaluations, test procedures, test reports, process standards, drawing notes, etc., are reduced, if not eliminated.

COMMON TOOLING
Two hand crimp tools are used to crimp the five different sizes of contacts to the wire end. For semi-automation to full automation, one universal crimp tool will crimp the volume required for wire termination.

COMMON PROCESSING
Using Deutsch contacts means that the way an O.E.M. supplier attaches a wire to its terminus never varies. This procedural standard allows electrical workers to become highly proficient in terminating Deutsch connectors.

COMMON TERMINATIONS
The selection of Deutsch connectors means that all contact terminations will be the same, thus reducing the chance of errors in the harness system. Performance, reliability, and maintainability are critical to any electrical system. The use of a common contact system eliminates many of the failures reported in harnesses where hundreds of different types of terminations are used. The end result of selecting Deutsch is increased profits and long term performance.

For Regional Information Contact ...
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