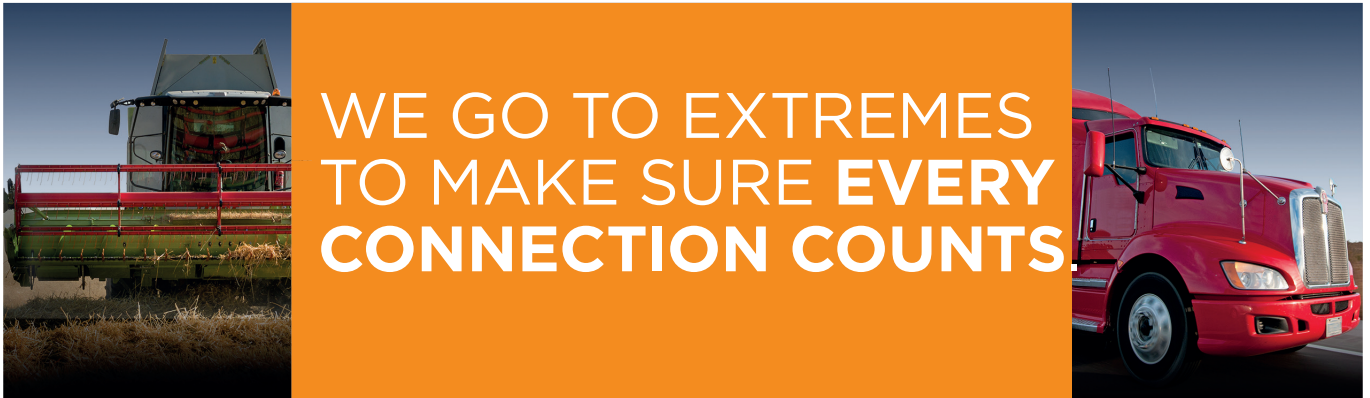




AMPSEAL 16 CONNECTOR SERIES

Terminals and Connectors



WE GO TO EXTREMES TO MAKE SURE EVERY CONNECTION COUNTS


TE Connectivity (TE) Industrial & Commercial Transportation is a reliable provider of solutions for even the harshest environment. With a focus on employee expertise and durable products, we deliver the solutions and support our customers can count on.


<p>2,000+ Employees</p>	<p>10,000+ Customers</p>	<p>20,000+ Different Parts</p>


Years ago, tractors, construction equipment, trucks, and boats had simple electrical systems that might have included electrical starting and a basic lighting package. Today, ECUs, joysticks, fuel-efficient engines, LED lights, and CAN systems are standard equipment. The need to protect sensitive electrical systems from vibration, moisture, dust, dirt, salt, and airborne particles has never been greater. TE Industrial & Commercial Transportation is a leader in supporting today's increasingly complex and sophisticated equipment and applications.


Our comprehensive line of products includes an unparalleled portfolio of rugged sensors, terminals, connectors, relays, and hybrid electric mobility solutions. These solutions are designed to withstand the harshest environmental conditions and to help vehicles operate safer, cleaner, and smarter.


Our solutions adapt to virtually any **harsh environment application**, including:


- 

Motors and Gearboxes
- 

ABS/EBS Brake Units
- 

Telematics Units
- 

Sensors
- 

Wire-To-Wire Coupling at the Chassis
- 

Infotainment Applications

MARKETS WE SERVE



ON-HIGHWAY



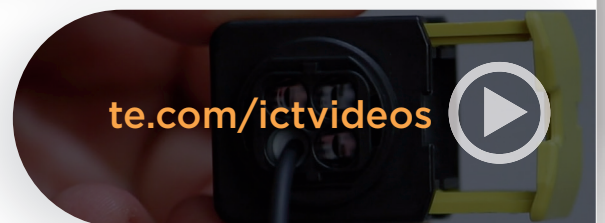
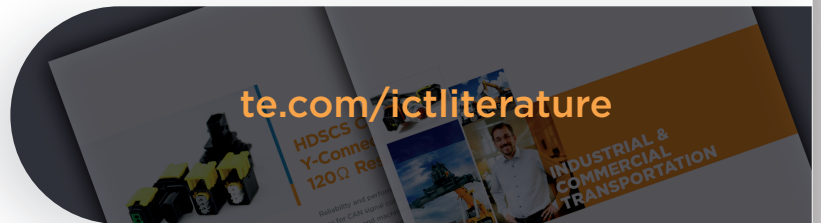
OFF-HIGHWAY



**RECREATIONAL
TRANSPORTATION**

ONLINE RESOURCES

To learn more about TE Connectivity Industrial & Commercial Transportation, its products, and their corresponding documents and videos, please check out the following pages on TE.com:



PRODUCT INFORMATION CENTER (PIC)

You can rely on TE Connectivity's PIC team to provide support for answers to your general information or technical questions in an efficient and effective manner.

Connect with our PIC staff at:

te.com/support





AMPSEAL 16 CONNECTOR SERIES

The AMPSEAL 16 connector system is targeted for off-road, heavy duty industrial, recreational and agricultural applications. This wire-to-wire and wire-to-device connector line was designed to meet the rigorous demands of an industry that requires the highest standards in performance.

AMPSEAL 16 receptacle and pin housings offer a one-piece approach and come fully assembled.



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AMPSEAL 16 CONNECTOR SERIES

BENEFITS

- Optimize applied costs with the Heavy Duty Stamped & Formed (HDSF) size 16 contacts rated up to 13 amps each.
- Protect from dust, water, and overspray with up to IP67 rugged sealing capabilities.
- Connect easily with the plug and cap housings one-piece approach that come fully assembled with Terminal Position Assurance (TPA) and Connector Position Assurance (CPA).
- Quickly verify contact alignment and retention with the Primary Latch Reinforcement (PLR), using a reliable assembly process.
- Enhance design flexibility with optional backshell and mounting clip accessory items.

KEY INDUSTRIES

AMPSEAL 16 products can be utilized in the truck, bus, construction, agriculture, and special vehicles industries.



Truck



Bus



Construction



Agriculture



Special

APPLICATIONS

AMPSEAL 16 products can be utilized in the following applications:



Motors and Gearboxes



ABS/EBS Brake Units



Hydraulic Pumps



Fuel Level Sensors



Wire-To-Wire Coupling At The Chassis



Actuators



Switches

PRODUCT DOCUMENTATION

Additional documentation is available for assistance with AMPSEAL 16 products.

The following TE Connectivity document numbers may be helpful:

[108-2184 \(Product Specification\)](#) [114-13045 \(Application Specification, Contacts\)](#)
[114-13065 \(Application Specification\)](#) [408-8623 \(Instruction Sheet\)](#)
[501-708 \(Qualification Test Report\)](#)



PERFORMANCE SPECIFICATIONS

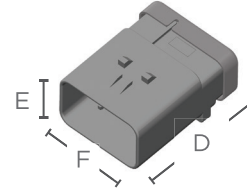
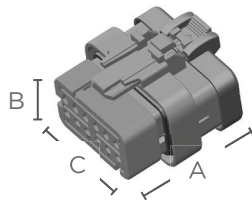
Current	Up to 13 amps
Temperature	Operating at temperatures -40°C to +125°C
Durability	See note. 50 cycles.
Insulation Resistance	20 megohms minimum. SAE J2030 6.3. Insulation resistance at 1000 volts DC adjacent terminals measured after 60 seconds or until stabilization occurs.
Immersion	IP67 rating
Random Vibration	No discontinuities. See note. EIA-364-28 Subject mated specimens to 21 G's rms between 25 to 2000 Hz. Twenty hours in each of three mutually perpendicular planes.
Voltage	250 volts DC

Note: Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in Product Qualification and Requalification Test Sequence in Figure 3 of TE product document 108-2184.

MATERIAL SPECIFICATIONS

Wire Seal	Silicone rubber
Plug Peripheral Seal	Silicone rubber
Housing	15% Glass filled thermoplastic
CPA	15% Glass filled thermoplastic
PLR	15% Glass filled thermoplastic

AMPSEAL 16 DIMENSIONS



AMPSEAL 16 Receptacle Housing

AMPSEAL 16 Cap

Cavity	Overall Length A	Overall Height B	Overall Width C	Overall Length D	Overall Height E	Overall Width F
2	1.45 (36.75)	.93 (23.5)	.80 (20.33)	1.87 (47.55)	.75 (18.93)	.77 (19.60)
3	1.45 (36.80)	.93 (23.5)	.98 (24.83)	1.87 (47.55)	.75 (19.15)	.95 (24.10)
4	1.44 (36.70)	1.06 (26.8)	1.00 (25.33)	1.87 (47.55)	.88 (22.45)	.97 (24.60)
6	1.44 (36.60)	1.22 (31.0)	1.00 (25.33)	1.87 (47.55)	1.05 (26.65)	.97 (24.60)
8	1.45 (36.80)	1.24 (31.5)	1.15 (29.33)	1.87 (47.55)	1.05 (26.65)	1.13 (28.60)
12	1.45 (36.80)	1.24 (31.5)	1.51 (38.33)	1.87 (47.55)	1.05 (26.65)	1.48 (37.60)

Dimensions are for reference only.

AMPSEAL 16 CONFIGURATIONS



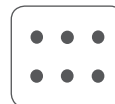
2 Positions
2 size 16



3 Positions
3 size 16



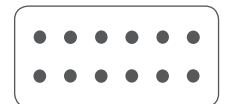
4 Positions
4 size 16



6 Positions
6 size 16



8 Positions
8 size 16



12 Positions
12 size 16

AMPSEAL 16 WIRE SEALING RANGE

The wire sealing range is the recommended outside diameter of the wire insulation required to maintain an environmental seal in the rear connector cavities.

Contact Size	Standard Seal	Reduced Diameter Seal
HDSF 16 14-20 AWG (2.0- 0.5mm ²)	.086-.144 (2.18-3.67)	.051-.100 (1.30-2.54)

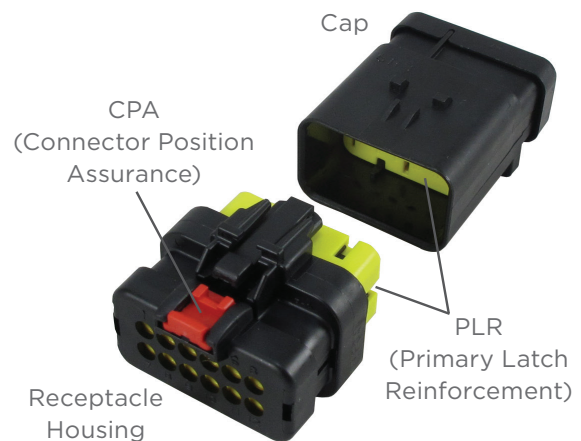
AMPSEAL 16 ORDERING INFORMATION

Position	PLR Color	Keying	Receptacle Housing Standard Dia. Seal	Cap Standard Dia. Seal	Receptacle Housing Reduced Dia. Seal	Cap Reduced Dia. Seal
2	Red	Key A	776427-1	776428-1	776522-1	776534-1
	Gray	Key B	776427-2	776428-2	776522-2	776534-2
	Yellow	Key C	776427-3	776428-3	776522-3	776534-3
	Green	Key D	776427-4	776428-4	776522-4	776534-4
3	Red	Key A	776429-1	776430-1	776523-1	776535-1
	Gray	Key B	776429-2	776430-2	776523-2	776535-2
	Yellow	Key C	776429-3	776430-3	776523-3	776535-3
	Green	Key D	776429-4	776430-4	776523-4	776535-4
4	Red	Key A	776487-1	776488-1	776524-1	776536-1
	Gray	Key B	776487-2	776488-2	776524-2	776536-2
	Yellow	Key C	776487-3	776488-3	776524-3	776536-3
	Green	Key D	776487-4	776488-4	776524-4	776536-4
6	Red	Key A	776433-1	776434-1	776531-1	776537-1
	Gray	Key B	776433-2	776434-2	776531-2	776537-2
	Yellow	Key C	776433-3	776434-3	776531-3	776537-3
8	Red	Key A	776494-1	776495-1	776532-1	776538-1
	Gray	Key B	776494-2	776495-2	776532-2	776538-2
	Yellow	Key C	776494-3	776495-3	776532-3	776538-3
	Green	Key D	776494-4	776495-4	776532-4	776538-4
12	Red	Key A	776437-1	776438-1	776533-1	776539-1
	Gray	Key B	776437-2	776438-2	776533-2	776539-2
	Yellow	Key C	776437-3	776438-3	776533-3	776539-3
	Green	Key D	776437-4	776438-4	776533-4	776539-4

Receptacle housing and cap PLR colors are mechanically keyed to mate only with identical colors.

Part Number Suffix:

- 1 = A key (red PLR)
- 2 = B key (gray PLR)
- 3 = C key (yellow PLR)
- 4 = D key (green PLR)



AMPSEAL 16 ACCESSORIES

Backshells and mounting clips are accessory items available for use with AMPSEAL 16 connectors. These accessories cover design requirements by assisting with mounting, providing additional protection, and offering increased aesthetics.

BACKSHELLS - NEXT GENERATION



The new and improved AMPSEAL 16 backshells provide strain relief, environmental protection, and deliver enhanced aesthetics for TE's rugged AMPSEAL 16 connectors. They are constructed of robust thermoplastic and install easily by snapping onto the connectors.

The new backshells are available in 180° and 90° versions for all AMPSEAL 16 plug and cap arrangements (2, 3, 4, 6, 8, and 12). The two-piece 180° version channels the wires directly out of the back of the connector, offering a high level of protection and providing strain relief. The four-piece 90° version features an innovative elbow that allows for 360° rotation, enabling the wires to be routed in various angles.

The backshells are available with either a smooth wire exit or a corrugated tubing style exit. The smooth wire exit style has slots for a tie wrap, which hold the wires in place and provide strain relief. The corrugated tubing style exit backshells allow a wide range of conduit sizes to nest within the rear of the backshell.

AMPSEAL 16 ACCESSORIES

BACKSHELLS - NEXT GENERATION

Number of Positions	Conduit Size	Plug Part Numbers		Cap Part Numbers	
		Straight Backshell Part Number	90° Adapter Part Number	Straight Backshell Part Number	90° Adapter Part Number
2	Smooth	2292797-1	2292849-1	2292860-1	2292849-1
	NC12/NW10	2292797-2	2292849-2	2292860-2	2292849-2
	NC08/NW7.5	2292797-3	2292849-3	2292860-3	2292849-3
3	Smooth	2292798-1	2292849-1	2292861-1	2292849-1
	NC12/NW10	2292798-2	2292849-2	2292861-2	2292849-2
	NC08/NW7.5	2292798-3	2292849-3	2292861-3	2292849-3
4	Smooth	2292799-1	2292850-1	2292862-1	2292850-1
	NC16/NW13	2292799-2	2292850-2	2292862-2	2292850-2
	NC12/NW10	2292799-3	2292850-3	2292862-3	2292850-3
6	Smooth	2292800-1	2292850-1	2292863-1	2292850-1
	NC16/NW13	2292800-2	2292850-2	2292863-2	2292850-2
	NC12/NW10	2292800-3	2292850-3	2292863-3	2292850-3
8	Smooth	2292801-1	2292851-1	2292864-1	2292851-1
	NC20/NW17	2292801-2	2292851-2	2292864-2	2292851-2
	NC16/NW13	2292801-3	2292851-3	2292864-3	2292851-3
12	Smooth	2292802-1	2292851-1	2292865-1	2292851-1
	NC16/NW13	2292802-2	2292851-2	2292865-2	2292851-2
	NC12/NW10	2292802-3	2292851-3	2292865-3	2292851-3

MOUNTING CLIPS



Part Number	Description
1924487-1	Mounting clip without anti-rotational feature
1924487-2	Mounting clip with anti-rotational feature

AMPSEAL 16 HYBRID LEVER

The AMPSEAL 16 hybrid lever is a sealed connector system that features a lever slide mechanism for mating and a slide in mounting clip. The mix of 24 size 16 and 4 size 12 terminals creates design flexibility for use in various vehicle applications.

The tool-less mounting design, environmental protection, and temporary panel retention latches (which temporarily hold the connector in place for one person mounting through the panel) all reduce application cost and assembly time.

APPLICABLE PRODUCT DOCUMENTATION

Additional documentation is available for assistance with the AMPSEAL 16 hybrid lever product. The following TE Connectivity document numbers may be helpful:

108-32036 (Product Specification)
 114-32117 (Application Specification)

501-32026 (Qualification Test Report)

DIMENSIONS



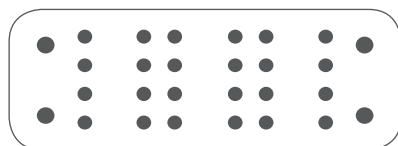
AMPSEAL 16 Hybrid Lever Receptacle Housing

AMPSEAL 16 Hybrid Lever Cap

Cavity	Overall Length A	Overall Height B	Overall Width C	Overall Length D	Overall Height E	Overall Width F
28	2.08 (52.95)	1.82 (46.25)	4.59 (116.5)	2.86 (72.75)	1.91 (48.45)	4.38 (111.25)

Dimensions are for reference only.

CONFIGURATION



28 Positions

24 size 16, 4 size 12

ORDERING INFORMATION

Position	Keying	Plug Housing	Cap Housing
28	Key A	2138839-1	2138846-1
	Key B	2138839-2	2138846-2

AMPSEAL 16 HYBRID LEVER

ACCESSORIES

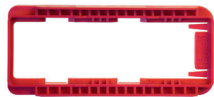
Wire covers and mounting clips are accessory items available for use with AMPSEAL 16 hybrid lever connectors. These accessories cover design requirements by assisting with mounting and providing wire strain relief.

WIRE COVER



Part Number	Description
2138853-1	Wire cover for 28 position AMPSEAL 16 hybrid lever

MOUNTING CLIPS

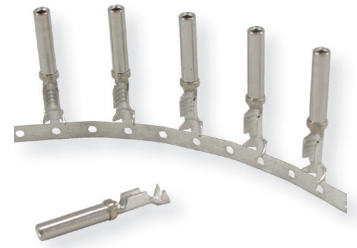


Part Number	Description
2138852-1	Mounting clip, 5 mm panel
2138852-2	Mounting clip, 4 mm panel
2138852-3	Mounting clip, 3 mm panel



AMPSEAL 16 CONTACTS

AMPSEAL 16 and AMPSEAL 16 hybrid lever connectors commonly use the HDSF size 16 contact system. The contacts are round, stamped & formed contacts with dual beam sockets.



HDSF 16 CONTACT PERFORMANCE SPECIFICATIONS

Durability

SAE J2030 6.11. 50 cycles. See note.

Current Rating

Up to 13 amps, consult TE product document 108-2184.

Contact Retention

IEC 512-8, Test 51a. Apply axial load of 111 N to contacts at a maximum rate of 10 N per second (or 50mm per minute) and hold for 10 seconds. Contacts shall not dislodge.

Crimp Tensile Strength

USCAR 21 @ 50mm/min

Wire Gauge

Tensile Strength

18 AWG

90 N Min

16 AWG

120 N Min

14 AWG

180 N Min

Voltage Drop

Contact Size	Test Current Amps	Voltage Drop (millivolts max)
18	8	100
16	10	100
14	13	100

Note: Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence in Figure 3 of TE product document 108-2184. USCAR is a trademark.

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.



Color	Part Number	Contact Size	Wire Gauge Range	Description
Yellow	776363-1	Size 16	16-20 AWG	PBT, used with AMPSEAL 16 (standard diameter cavities)
White	776364-1	Size 20	16-20 AWG	PBT, used with AMPSEAL 16 (reduced diameter cavities)

AMPSEAL 16 CONTACTS

HDSF 16 STAMPED & FORMED CONTACTS FOR AMPSEAL 16 CONNECTORS

Size	Pin Part Numbers				Wire Size AWG (mm ²)	Insulation Diameter (mm)	Wire Insulation Support	Finish
	Strip Form	Pakcage Quantity	Loose Piece	Pakcage Quantity				
HDSF 16	1924463-1	4000	1924579-1	1000	18-20 (0.8-0.5)	.107-.05 (2.72-1.27)	yes	Gold
	1924463-3	4000	1924579-3	1000				Nickel
	776349-1	4000	-	-	18-20 (0.8-0.5)	.131-.089 (3.33-2.26)	yes	Gold
	776349-3	4000	-	-				Nickel
	638078-1	4000	776300-1	1000	14-18 (2.0-0.8)	.131-.089 (3.33-2.26)	yes	Gold
	638078-3	4000	776300-2	1000				Nickel
	638112-1	4000	776298-1	1000	14-18 (2.0-0.8)	.155-.077 (3.94-1.96)	no	Gold
	638112-3	4000	776298-2	1000				Nickel
	2098250-1	4000	-	-	18 (1.5-0.8)	.118-.065 (3.00-1.65)	yes	Gold
	2098250-3	4000	-	-				Nickel
	2098252-1	4000	-	-	14 (2.0-1.5)	.128-.083 (3.25-2.10)	yes	Gold
	2098252-3	4000	-	-				Nickel

Size	Receptacle Part Numbers				Wire Size AWG (mm ²)	Insulation Diameter (mm)	Wire Insulation Support	Finish
	Strip Form	Pakcage Quantity	Loose Piece	Pakcage Quantity				
HDSF 16	1924464-1	4000	1924580-1	1000	18-20 (0.8-0.5)	.107-.05 (2.72-1.27)	yes	Gold
	1924464-2	4000	1924580-2	1000				Nickel
	776493-1	4000	-	-	18-20 (0.8-0.5)	.131-.089 (3.33-2.26)	yes	Gold
	776493-2	4000	-	-				Nickel
	776492-1	4000	776299-1	1000	14-18 (2.0-0.8)	.131-.089 (3.33-2.26)	yes	Gold
	776492-2	4000	776299-2	1000				Nickel
	776491-1	4000	776297-1	1000	14-18 (2.0-0.8)	.155-.077 (3.94-1.96)	no	Gold
	776491-2	4000	776297-2	1000				Nickel
	2098251-1	4000	-	-	18 (1.5-0.8)	.118-.065 (3.00-1.65)	yes	Gold
	2098251-2	4000	-	-				Nickel
	2098253-1	4000	-	-	14 (2.0-1.5)	.128-.083 (3.25-2.10)	yes	Gold
	2098253-2	4000	-	-				Nickel

AMPSEAL 16 TOOLING

Tools are specific to the contact style. To create a proper crimp and achieve the highest performance specifications, contacts must be crimped with the recommended tooling.

HAND TOOLS FOR HDSF 16 CONTACTS



PRO-CRIMPER III CERTI-CRIMP II

Pin Strip Form	Pin Loose Piece	Socket Strip Form	Socket Loose Piece	Tool P/N	Description
1924463-1 1924463-3	1924579-1 1924579-3	1924464-1 1924464-2	1924580-1 1924580-2	2119118-1	PRO-CRIMPER III hand tool and die set assembly
638078-1 638078-3 776349-1 776349-3	776300-1 776300-2	776492-1 776492-2 776493-1 776493-2	776299-1 776299-2	91337-1	PRO-CRIMPER III hand tool and die set assembly
638112-1 638112-3	776298-1 776298-2	776491-1 776491-2	776297-1 776297-2	2217753-1	CERTI-CRIMP II straight action hand tool

Note: Base PRO-CRIMPER III tool part number with -2 suffix is the part number for the die set, which can be ordered separately

EXTRACTION TOOL FOR HDSF 16 CONTACTS



Part Number	Description
776106-1	Contact extraction tool for HDSF 16 contacts

AMPSEAL 16 TOOLING

AUTOMATED TOOLING FOR HDSF 16 CONTACT



OCEAN end
feed applicator



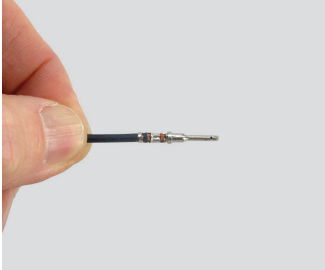
OCEAN side
feed applicator

Pin Strip Form	Socket Strip Form	Applicator P/N	Description
1924463-1 1924463-3	1924464-1 1924464-2	2151962-1	OCEAN end feed applicator with mechanical feed
		2151962-2	OCEAN end feed applicator with pneumatic feed
638078-1 638078-3 776349-1 776349-3	776492-1 776492-2 776493-1 776493-2	2151731-1	OCEAN end feed applicator with mechanical feed
		2151731-2	OCEAN end feed applicator with pneumatic feed
638112-1 638112-3	776491-1 776491-2	2151239-1	OCEAN end feed applicator with mechanical feed
		2151239-2	OCEAN end feed applicator with pneumatic feed
2098250-1 2098250-3	2098251-1 2098251-2	2151617-1	OCEAN end feed applicator with mechanical feed
		2151617-2	OCEAN end feed applicator with pneumatic feed
2098252-1 2098252-3	2098253-1 2098253-2	1530207-1	OCEAN side feed applicator that crops the terminal strip, for use in lead-maker
		1530207-2	OCEAN side feed applicator that crops the terminal strip, for use in bench press
		1530207-6	OCEAN side feed applicator that does not crop the terminal strip, for use in lead-maker

Note: Applicators with additional feed styles are available, contact your representative

AMPSEAL 16 HOW-TO INSTRUCTIONS

CONTACT INSERTION



Step 1:
Grasp crimped contact approximately one inch behind the contact barrel.



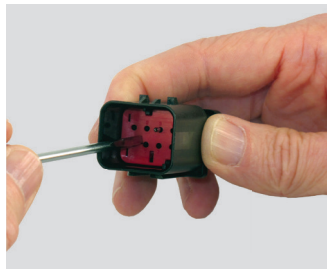
Step 2:
Verify the PLR is in the pre-staged position, unlocked.



Step 3:
Align the contact with the desired circuit cavity at the rear of the housing assembly.



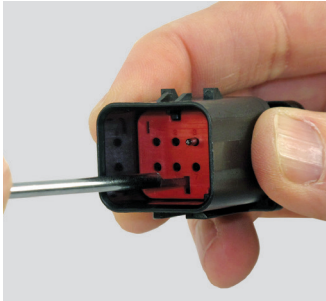
Step 4:
Push the contact straight into the connector cavity until the contact retention finger returns to its normal position behind the retention shoulder on the contact. A slight tug will verify the contact is locked in place.



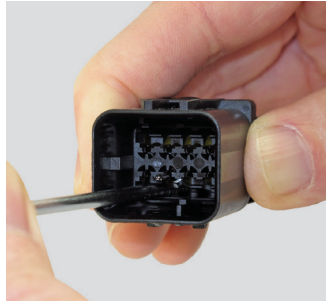
Step 5:
When all of the required contacts have been inserted, push the PLR into the fully locked position.

AMPSEAL 16 HOW-TO INSTRUCTIONS

CONTACT REMOVAL



Step 1:
Insert the removal tool into the PLR extraction slot and pull until the PLR is completely removed from the housing.



Step 2:
Insert the tool into the contact cavity and deflect the contact retention finger.



Step 3:
Gently pull the wire until the contact is free from the housing.

TE Connectivity Ltd. is a \$14 billion global technology and manufacturing leader creating a safer, sustainable, productive, and connected future. For more than 75 years, our connectivity and sensor solutions, proven in the harshest environments, have enabled advancements in transportation, industrial applications, medical technology, energy, data communications, and the home. With 80,000 employees, including more than 8,000 engineers, working alongside customers in approximately 140 countries, TE ensures that **EVERY CONNECTION COUNTS.**



te.com/ict

LET'S CONNECT

We make it easy to connect with our experts and are ready to provide all the support you need. For additional information or product assistance, please contact your field representative or our customer service department. Additional information is also available on the website te.com/ict.

TECHNICAL SUPPORT

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