



**FLIGHT HERITAGE**

# **SPACE MECHANISMS**

**Release Mechanisms · Blind Mate (ASF) Connectors · Lanyard-Release Connectors**

**AUGUST 2017**



Commander Ed White on the first American spacewalk, 1965

# SPACE PROVEN Interconnect Technologies

We like to begin every discussion of Glenair’s proven-performance space-grade products with the golden umbilical life support cable used by Commander Ed White in the first American space walk in 1965. This was a complex cable assembly with an exacting set of performance requirements. Even though this application is now over 50 years old, it still reflects Glenair’s design and fabrication expertise and that we have been a go-to supplier for the space industry for over 5 decades.

Today we continue to manufacture a broad range of high-performance cables and components for space—from our innovative line of non-pyrotechnic HDRMs to high-reliability assisted separation force connectors. Glenair’s proven space flight heritage includes interconnect and electromechanical technology on dozens of robotic spacecraft, including orbiters, landers, and rovers.

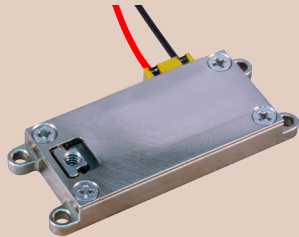
Many customers of discrete HDRM technology look to Glenair for the turnkey supply of interconnect wire and cabling. Non-pyrotechnic separation nuts utilize EMI shielded harness assemblies to supply primary and redundant initiation energy to the split spool actuator, and to transmit telemetry data from release sensors. Glenair operates the largest and best equipped wire harness assembly shop in the mission-critical interconnect industry and has supplied countless turnkey space-grade cable assemblies of this type.



## PROVEN PERFORMANCE IN SPACE

- The “Golden Umbilical” life-support cable
- JPL Mars probes (orbiters, landers, and the Curiosity rover)
- AIRS satellite
- Gravity Probe mission
- Titan II launch vehicles
- EADS Astrium
- ESA Ariane 5
- Countless others

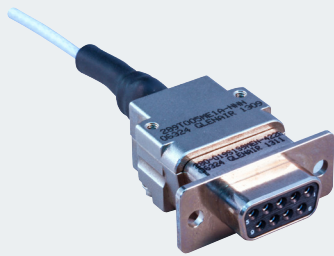




**Pyrotechnic-Free Hold-Down and Release and Pin Pusher/Puller Space Mechanisms**

Non-explosive light, medium, and heavy-duty HDRMs, pin pullers and pin pushers for spacecraft satellite hold down and release. Special-purpose ultra-lightweight small form-factor split-spool release mechanisms for CubeSat and NanoSat deployment as well as antenna, solar array, reflector, boom, and mast release.

A



**Series 28 HiPer-D Advanced Performance M24308 intermateable D-sub**

Small form factor CubeSat applications typically use dispenser canisters for deployment. D-sub miniature cable assemblies are used for activation of the dispenser hold-down release mechanism, interconnection of the door status sensor, and in some cases direct signal interconnection to the satellite. Series 28 HiPer-D machined shells deliver improved shock and vibration performance, advanced electromagnetic compatibility and are rated to 200° C.

B



**Blind-Mate, Float Mount, and Assisted Release (ASF) Connectors**

Space-grade circular blind-mate connectors IAW MIL-DTL-38999 for use in interconnection and separation of instrumentation panels, satellites, scientific research payloads, and other release applications.

C



**Lanyard-Release Quick-Disconnect Connectors  
IAW AS81703 Series 3**

For mission-critical interconnection and release of launch and payload systems that depend on reliable, jam-free mating and disengagement.

D



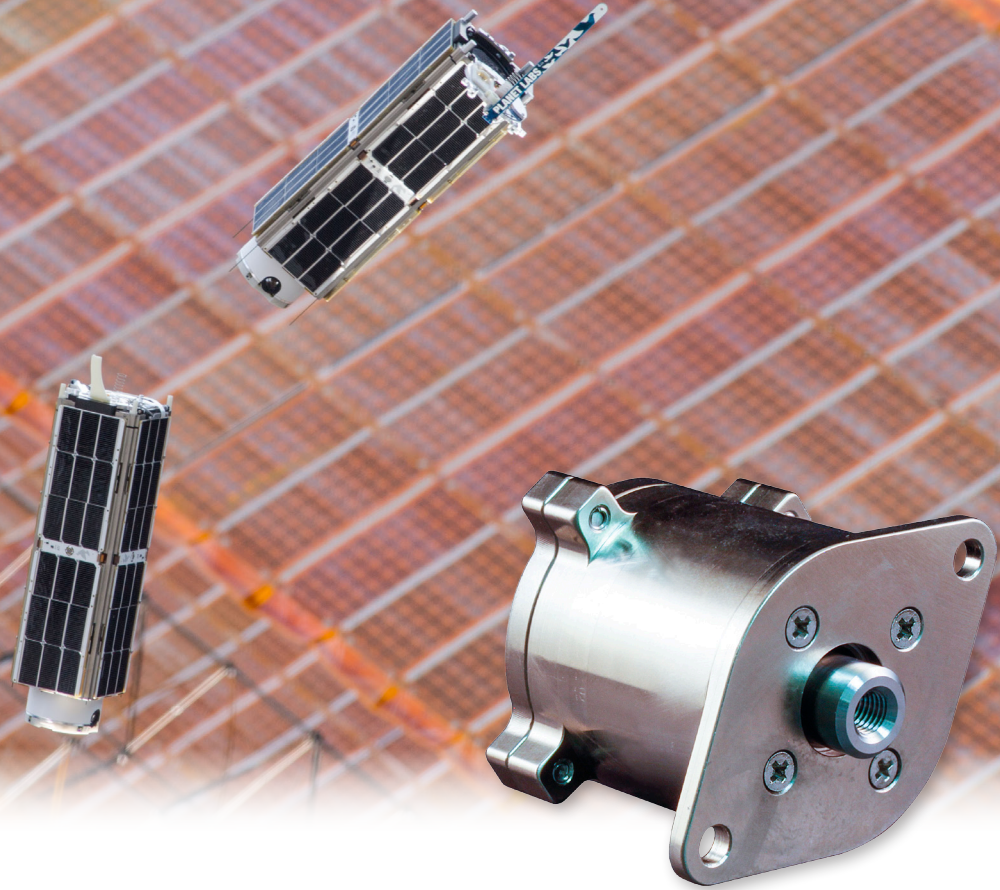
**Space-Grade Clean Room Manufacturing, Test, and Certification / Screening Capabilities**

Complete in-house capabilities including clean room manufacturing, NASA/ESA screening and outgassing, qualification testing and readiness programs.

E



NASA NanoRack CubeSats deployed from the International Space Station. The ISS solar array panels provide the backdrop.

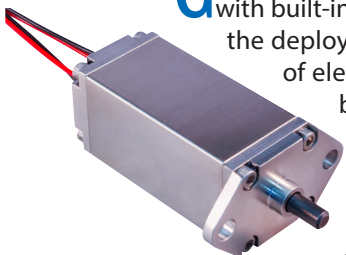


**SERIES 06**

# Pyrotechnic-Free Space Mechanisms

High-reliability, non-explosive (split-spool) separation nuts and electromechanical release mechanisms for dependable stowage and release of deployable space systems

**G**lenair space mechanisms are optimized for foolproof release reliability with built-in mechanical and electrical redundancy. The planned release of the deployable satellite/payload is activated by a pre-determined value of electrical current to a fuse-wire system which causes the wire to break under tension and allows a pre-loaded mechanical bolt to actuate. Glenair's line of low-shock, redundant and non-redundant space mechanisms includes both HDRM devices as well as a family of pin pushers and pin pullers. Customer-defined housing and mounting configurations are available. Consult factory for specific device TR level and qualification test reports.

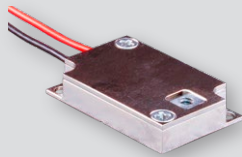


Glenair pyrotechnic-free release mechanisms offer quick release time, low shock, relatively low power input, and virtually no temperature sensitivity. Glenair family of Space Mechanisms include separation nuts, HDRMs, pin pushers, and pin pullers which deliver a higher preload carrying capacity in comparison to similar devices.

- **Pyrotechnic-free alternative for single-event release of deployable space systems**
- **User-serviceable and refurbishable units**
- **Standard catalog as well as custom designs**
- **Not susceptible to transient and noise (EMI/EMP/ESD/RFI) inputs**
- **Extended temperature ranges: -150°C to +150°C**

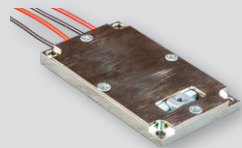


**HDRM Technology Overview**  
Page A-2



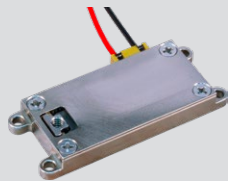
**061-002**  
Light-Duty HDRM  
Non-redundant circuit,  
5 or 20 lb release preload

Page A-3



**061-003**  
Light-Duty HDRM  
Redundant circuit,  
30 lb release preload

Page A-4



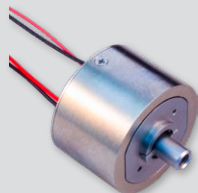
**061-014**  
Light-Duty HDRM  
Non-redundant circuit,  
75 lb release preload,  
side load bearing

Page A-5



**061-007**  
Medium-Duty HDRM  
Redundant circuit,  
300 lb release

Page A-6



**061-006**  
Medium-Duty HDRM  
Redundant circuit,  
1000 lb release preload

Page A-7



**061-005**  
Medium-Duty HDRM  
Redundant circuit,  
2500 lb release preload

Page A-8



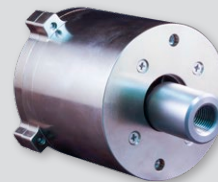
**062-002**  
Heavy-Duty HDRM  
Redundant circuit,  
5000 lb release preload

Page A-10



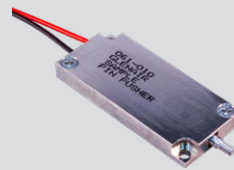
**063-001**  
Heavy-Duty HDRM  
Redundant circuit,  
8750 lb release preload

Page A-12



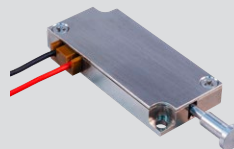
**064-001**  
Heavy-Duty HDRM  
Non-redundant circuit,  
20,000 lb release preload

Page A-13



**061-010**  
Light-Duty Pin Pusher  
Non-redundant circuit  
6 lb push force

Page A-14



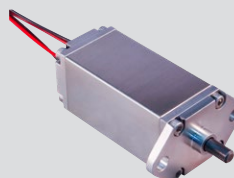
**061-009**  
Light-Duty Pin Puller  
Non-redundant circuit  
18 lb pull force

Page A-15



**061-011**  
Light-Duty Pin Puller  
Non-redundant circuit  
18 lb pull force

Page A-16



**061-013**  
Medium-Duty Pin Puller  
Redundant circuit  
50 lb pull force

Page A-18

A



A

Glenair non-pyrotechnic space mechanism technology is based on a fusible wire-actuated separation nut design. Increasingly popular for its reliability and non-pyrotechnic action, fusible wire-actuated nut technology has the added benefit of being partially reusable and refurbishable post-deployment. Glenair HDRMs, pin pullers and pushers are immune to all forms of EMI or ESD, and capable of easily sustaining launch loads as well as defined preloads—with release deployment times comparable to conventional explosive actuators, but with low-shock and low power input.

A broad range of hold down release mechanism technologies have been historically used to hold secure and subsequently deploy satellites and other appendages (solar arrays, antenna reflectors, radiators, instruments, doors, sensors, booms, and so on) in space. Most of these technologies relied on non-reusable (explosive/pyrotechnic) designs that suffered from a broad range of deficiencies, including susceptibility to electromagnetic interference, problematic synchronization of release with mission requirements, high-shock release action, and significantly, the inability to reuse or refurbish the device during test. Historically, actuators and release devices of this type have included explosive release nuts, bolt cutters, separation nuts, and wire and pyro cable cutters

Glenair has taken a different path in the development of non-explosive HDRMs and other space mechanisms with a consumable initiator which, post-actuation, allows the device to be refurbished and reset on-site, or at the factory. Glenair fusible wire-actuated nut technology solves all of the problems associated with conventional explosive hold down and release devices.

Glenair family of pin pushers and pin pullers are low-shock mechanisms comprised of a spring-loaded pin held in place using the same fusible wire-actuated technology found in our hold down release mechanisms. Once actuated the restraining fuse wire breaks under tension causing the pin to retract under the force of the drive spring. The effects from the release of any potential energy in the loaded spring during actuation are countered by a measured delivery system to limit the effects of shock.

All three key components of Glenair space mechanisms (preloading assembly, release actuator, and load-carrying structure) may be packaged according to specific customer requirements including connectorization in place of wire leads. Packaging options include cylindrical or rectangular housings, lightweight materials, unique shapes and profiles, non-standard mounting dimensions and more. Consult the factory for complete information and TR Level qualification test reports.

### SCALABLE DESIGNS: FROM CUBESATS TO 20,000 POUND PAYLOADS

- Fuse-wire based technology
- Redundant or non-redundant actuation circuit
- Space-rated and screened materials
- Electrical initiation up to 5 amps

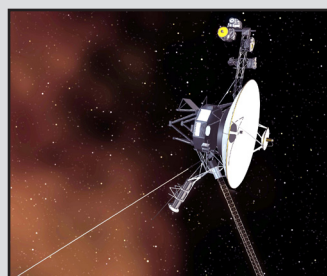


Build-to-spec solutions also available, including connectorized HDRMs, band porch shield termination feed-thrus and power draw resistors. Connectorized Solution above shown with Series 806 Mighty Mouse

### DEPLOYMENT APPLICATIONS



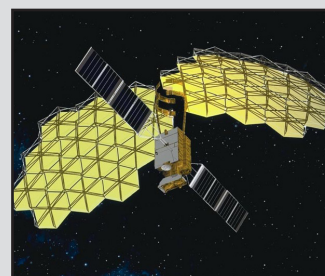
Solar Arrays



Booms and Masts



Antennas



Reflectors

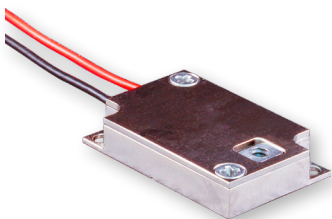
061-002

# Light-duty hold-down release mechanism

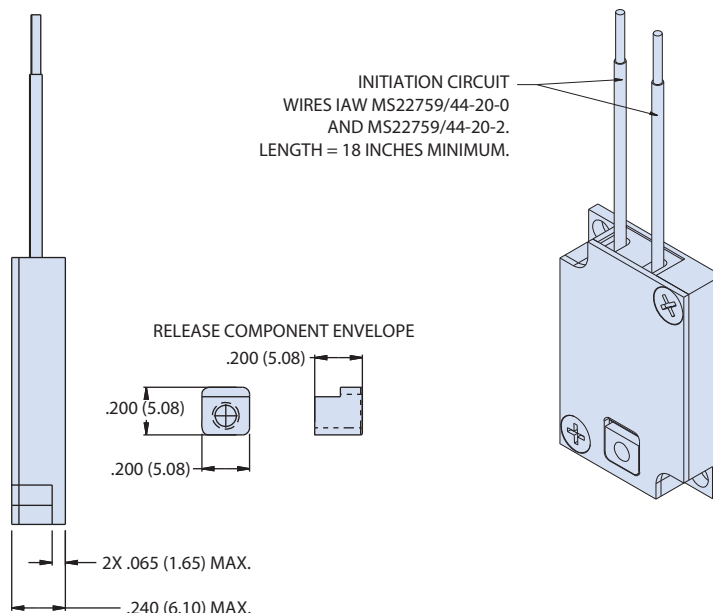
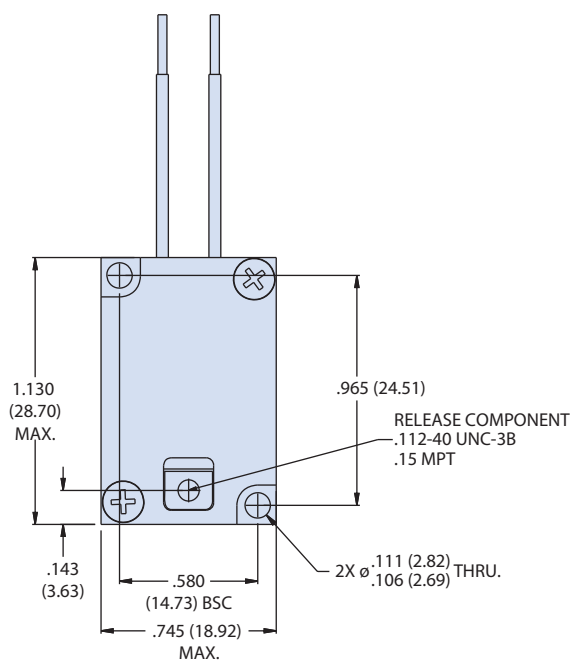
5 lb. (Delrin) or 20 lb. (Stainless Steel) release preload  
Non-redundant circuit



## NON-REDUNDANT CIRCUIT HOLD DOWN RELEASE MECHANISM, LIGHT DUTY



How To Order			
Sample Part No.	061	-002	-S
Basic Part No.	Light/Medium Duty HDRM		
Dash No.	Non-Redundant Circuit		
Release Component Material	S - Stainless Steel	D - Delrin	



### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting.
- Release preload:  
Stainless steel release component: max. limit 20 lbs (89 N)  
Delrin release component: max. limit 5 lbs (22 N)
- Full qualification pending
- Reference Glenair P/N 060-102 for refurbishment initiator
- Metric threads available, consult factory for options

Physical characteristics	
Mass	9 grams nominal weight
Release component thread	0.112-40 UNC-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Consult factory for connectorization options
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	



061-002

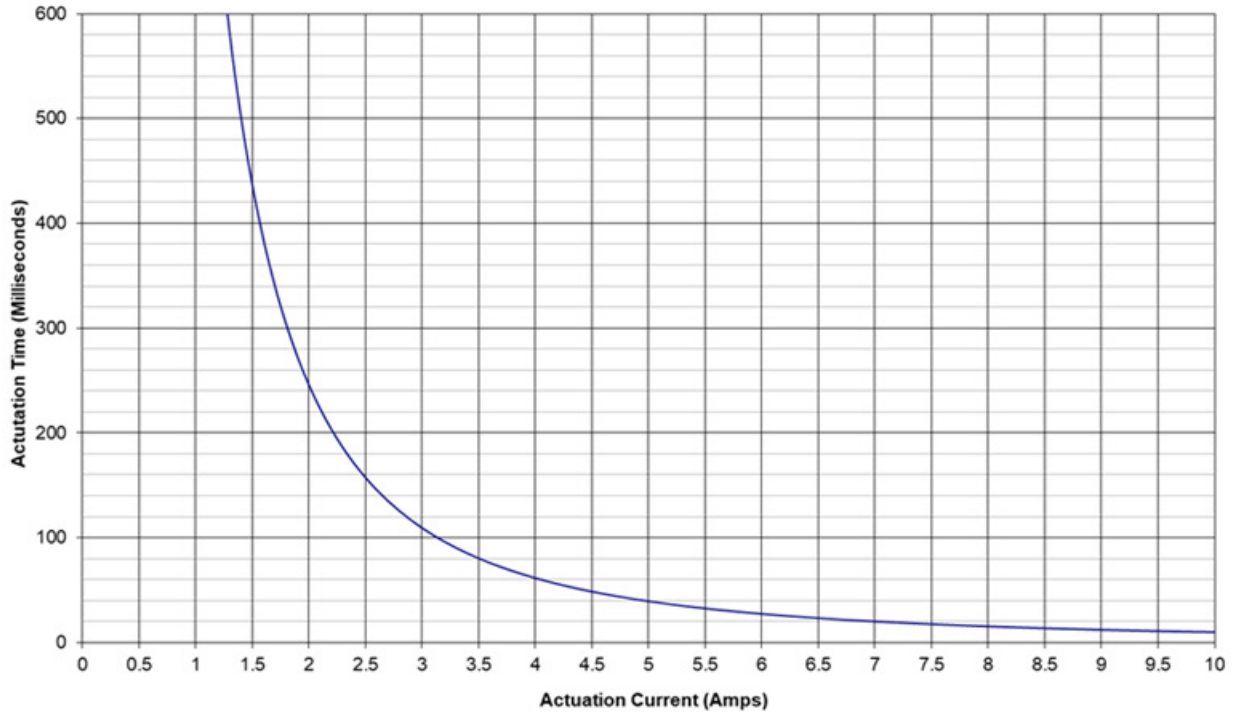
# Light-duty hold-down release mechanism



5 lb. (Delrin) or 20 lb. (Stainless Steel) release preload  
Non-redundant circuit

A

Actuation Curve for Nano Mechanisms  
(ambient conditions)





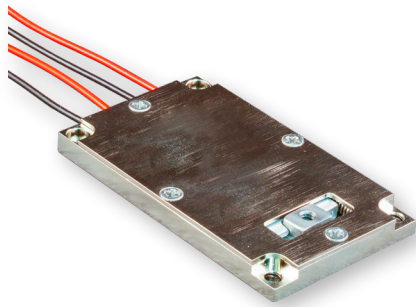
061-003

# Light-duty hold-down release mechanisms

30 lb. (Stainless Steel) release preload  
Electrically Redundant

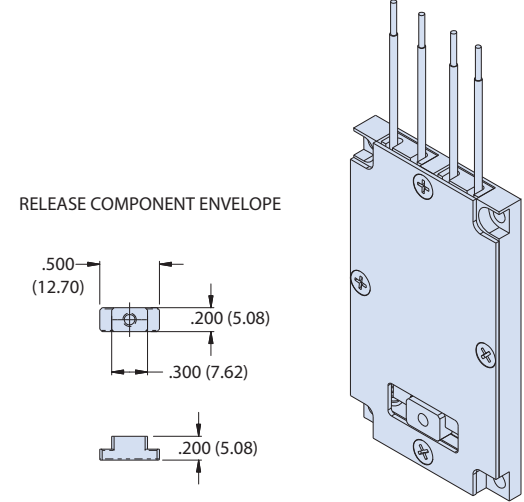
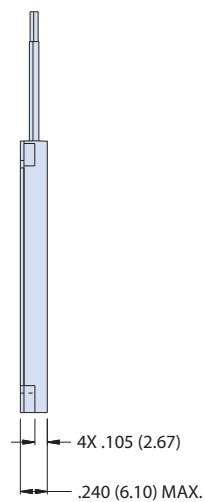
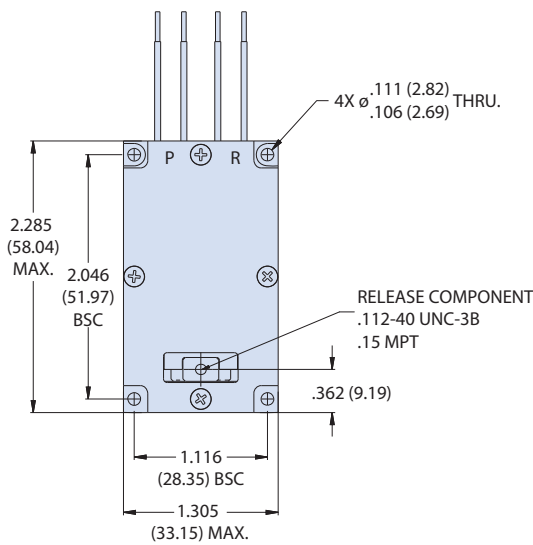


## ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, LIGHT DUTY



How To Order		
Sample Part No.	061	-003
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	

A



### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
- Release preload 30 lbs. (133 N)
- Full qualification pending
- Reference Glenair P/N 060-103 for refurbishment initiator
- Metric threads available, consult factory for options

Physical characteristics	
Mass	27.8 grams nominal weight
Release component thread	0.112-40 UNC-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Consult factory for connectorization options
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

061-003

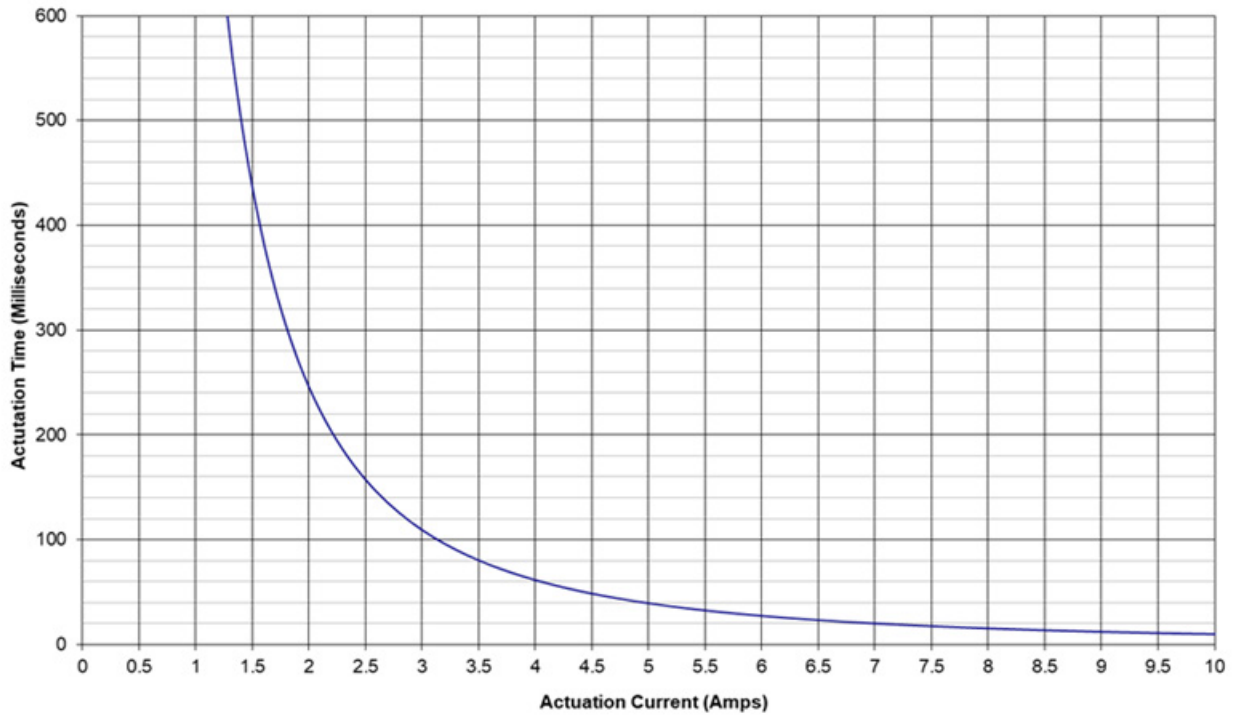
# Light-duty hold-down release mechanisms



30 lb. (Stainless Steel) release preload  
Electrically Redundant

A

Actuation Curve for Nano Mechanisms  
(ambient conditions)



061-014

# Light-duty hold-down release mechanism

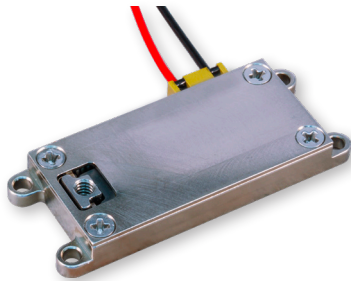
75 lb. release preload

Non-redundant circuit • side load

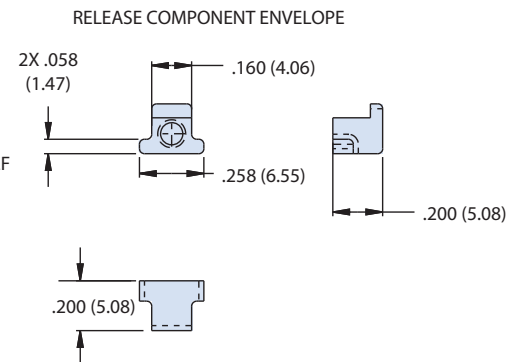
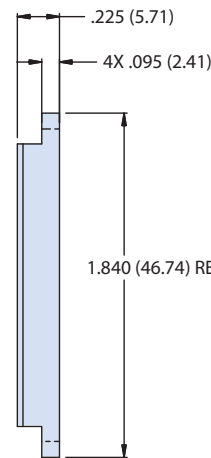
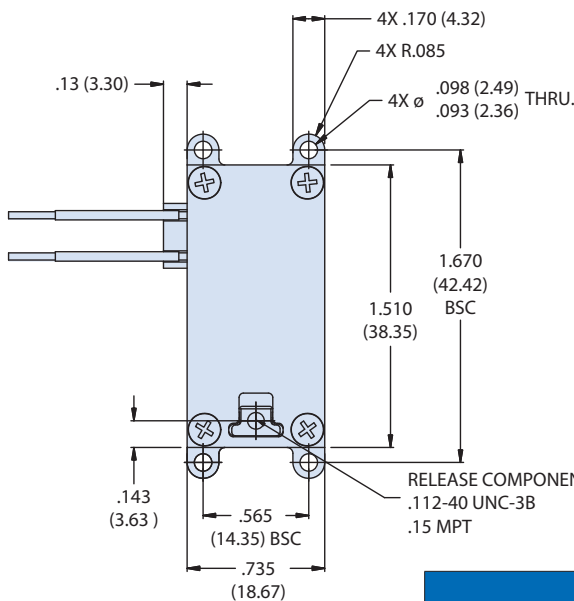
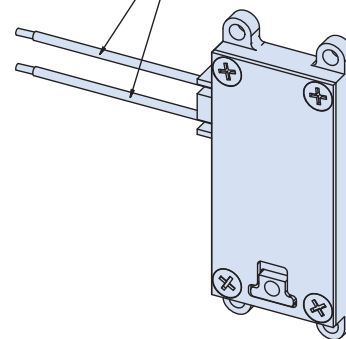


## NON-REDUNDANT CIRCUIT HOLD DOWN RELEASE MECHANISM, LIGHT DUTY

How To Order		
Sample Part No.	061	-014
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Side Load, Non-Redundant Circuit	



INITIATION CIRCUIT WIRES IAW MS22759/44-20-0 AND MS22759/44-20-2. LENGTH = 18 INCHES MIN.



### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
- Release preload: 75 lbs. (334N)
- Full qualification complete, consult factory for test report.
- Reference Glenair P/N 060-114 for refurbishment initiator
- Metric threads available, consult factory for options

Physical characteristics	
Mass	20.6 grams approximate weight
Release component thread	0.115-40 UNC-3B*
Material list	IAW MSFC-STD-3029
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Consult factory for connectorization options
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

061-014

# Light-duty hold-down release mechanism

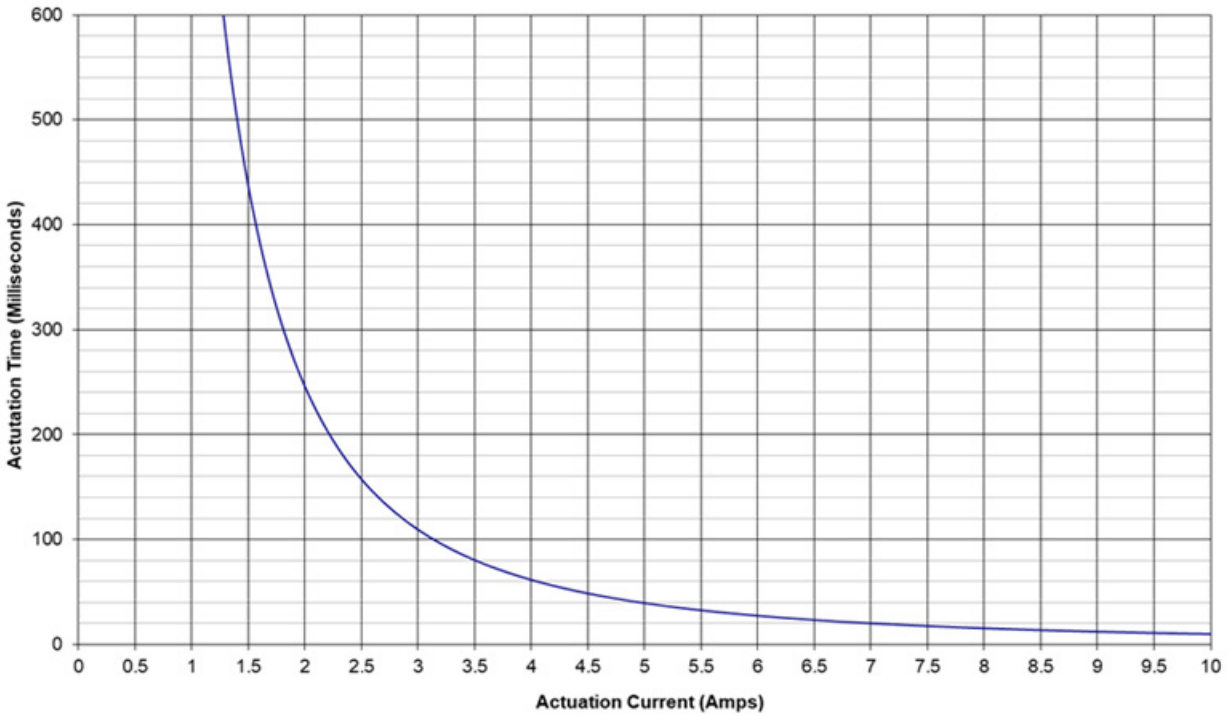
75 lb. release preload

Non-redundant circuit • side load



A

Actuation Curve for Nano Mechanisms  
(ambient conditions)



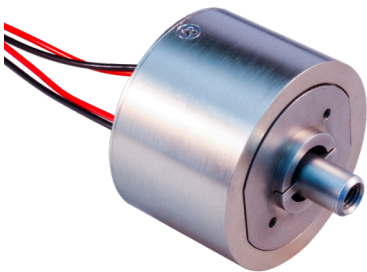
061-005

# Medium-duty hold-down release mechanism

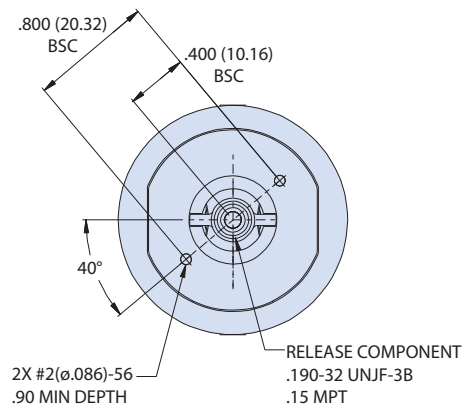
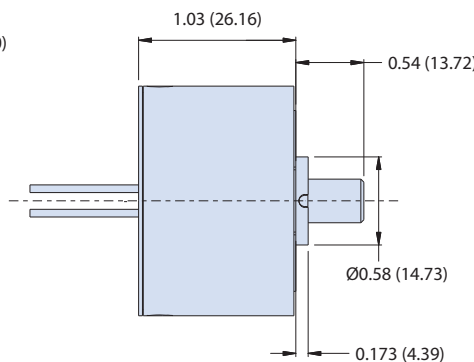
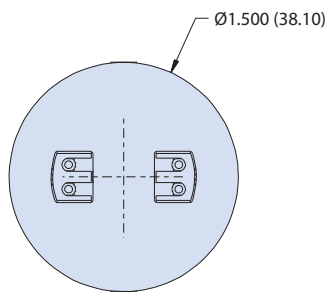
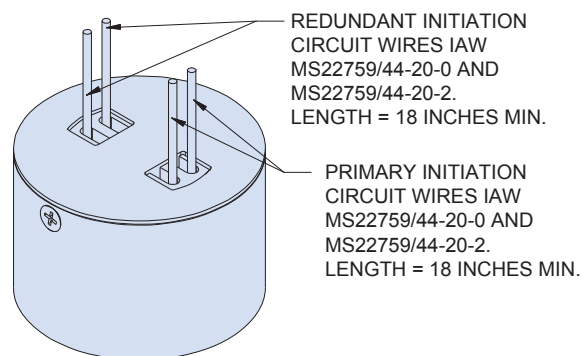
2500 lb. release preload  
Electrically redundant



## ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, MEDIUM DUTY



How To Order		
Sample Part No.	061	-005
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	



### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
- Release preload 2500 lbs. (11.1 kN)
- Reference Glenair P/N 060-105 for refurbishment initiator
- Nominal actuation current 3.5 Amps
- Metric threads available, consult factory for options

Physical characteristics	
Mass	84.9 grams nominal weight
Release component thread	0.190-32 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999994
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

A

061-005

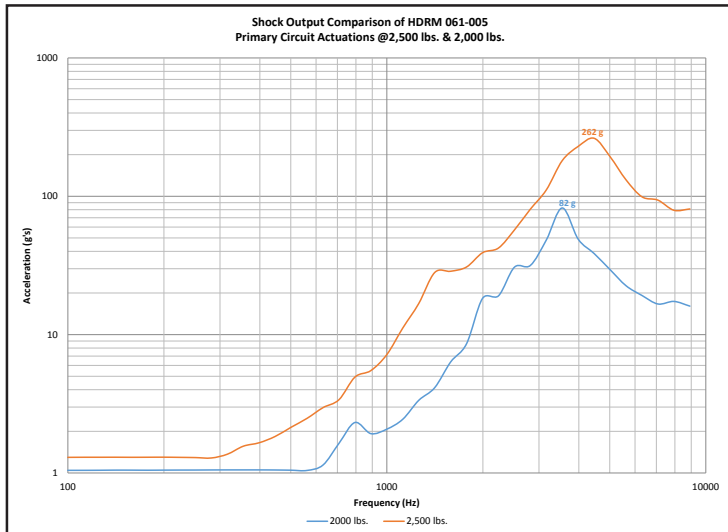
# Medium-duty hold-down release mechanism



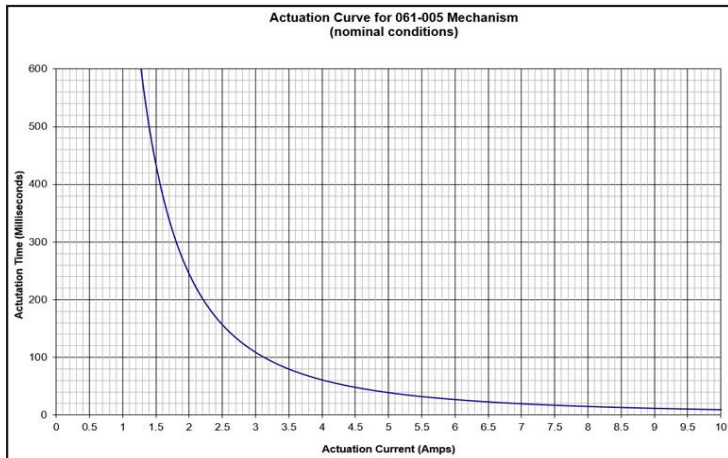
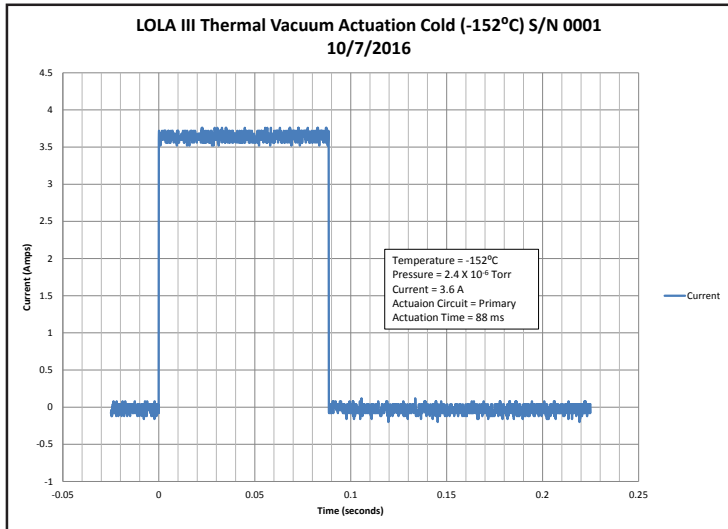
2500 lb. release preload

## Summary of qualification test data

A



Tested Capability for 061-005	
Nominal Release Preload	2,250 pounds
Proof Preload	2,500 pounds
Ultimate Load	3,250 pounds
Electrical Resistance	1.5 ohms max
Sine Vibration 3 orthogonal axes	25 G's
Random Vibration 3 orthogonal axes	50.9 G <sub>rms</sub>
Actuation Time	Under 100 ms @3.5 Amps
Shock Input	2,849 G's
Source Shock	Under 300 G's @2,500 pounds
Life Test	10 refurbishments during qualification and an expected continued usage
Temperature	-150°C to +150°C released in a vacuum (1x10 <sup>-6</sup> Torr)
Extended Preload	<4.0% loss



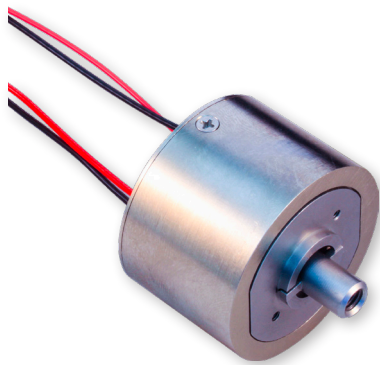
061-006

# Medium-duty hold-down release mechanism

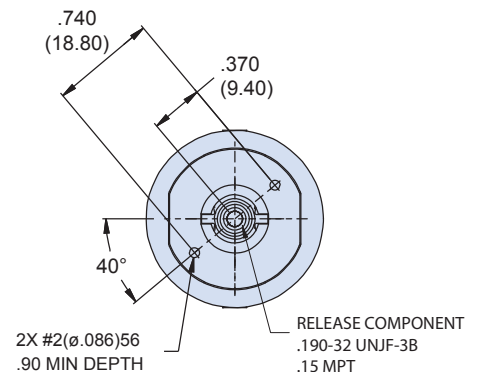
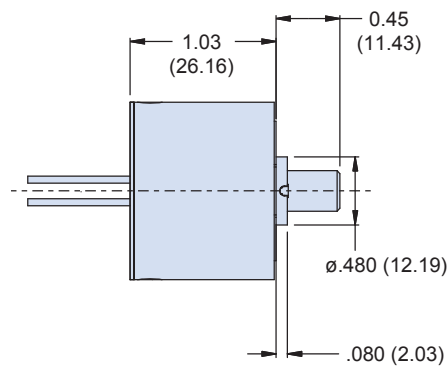
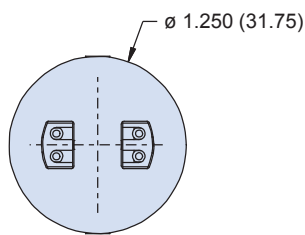
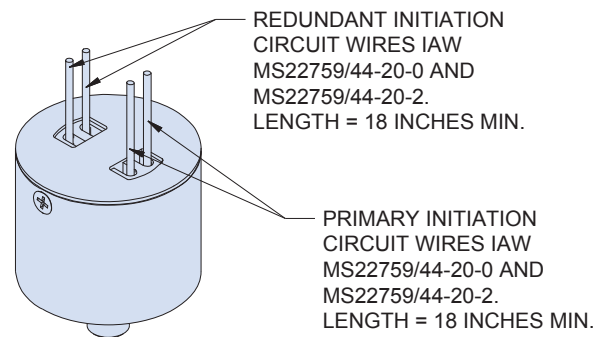
1000 lb. release preload  
Electrically redundant



## ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, MEDIUM DUTY



How To Order		
Sample Part No.	061	-006
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	



### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
- Release preload 1000 lbs. (4.5 kN) on similar model, contact factory
- Qualification complete
- Reference Glenair P/N 060-106 for refurbishment initiator
- Metric threads available, consult factory for options

Physical characteristics	
Mass	65.3 grams approximate weight
Release component thread	0.190-32 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999994 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

A

061-006

# Medium-duty hold-down release mechanism

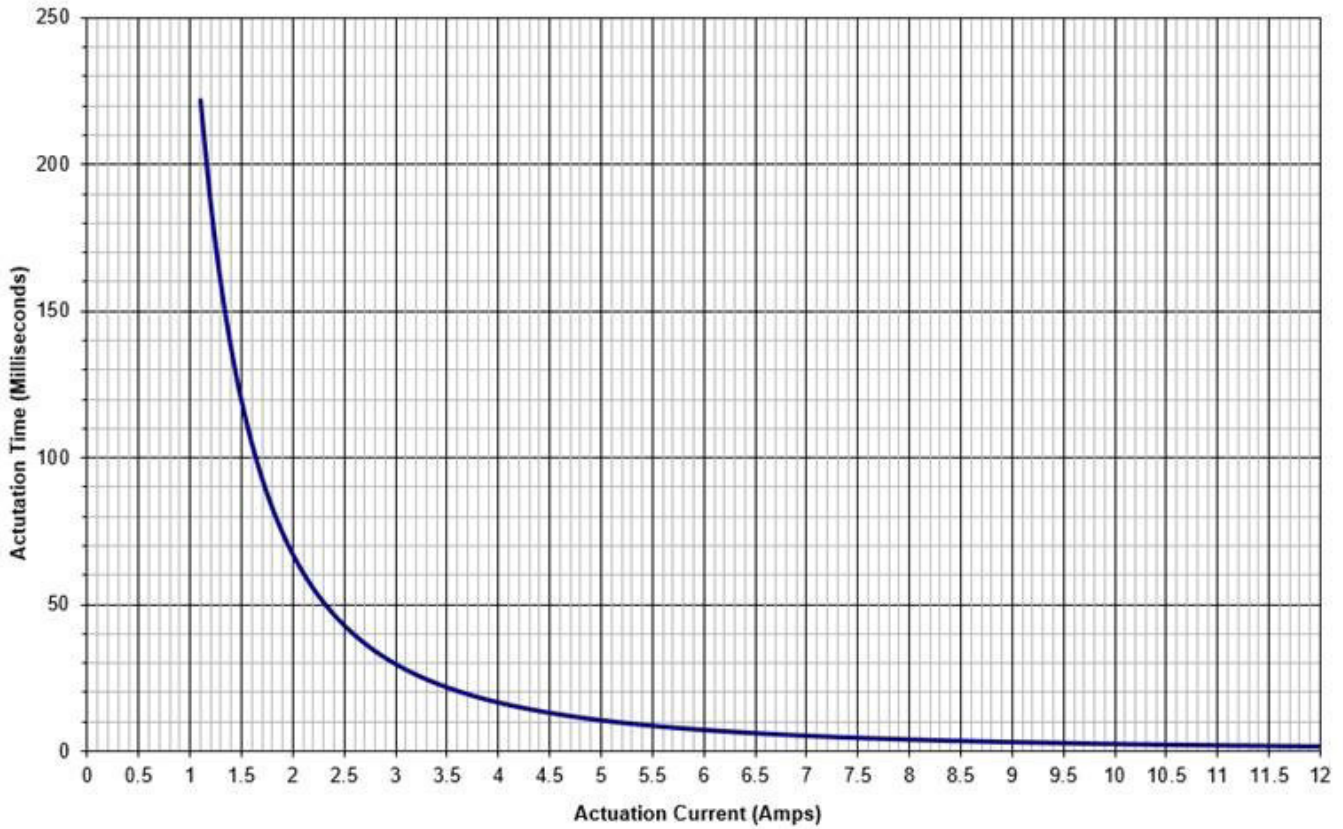


1000 lb. release preload

Actuation curve

A

Actuation Curve for 061-006 Mechanism  
(nominal conditions)





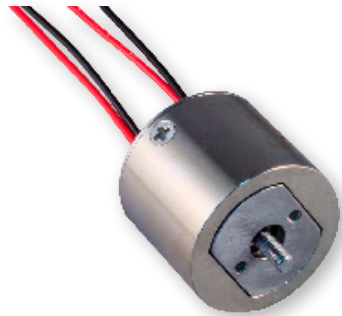
061-007

# Medium-duty hold-down release mechanism

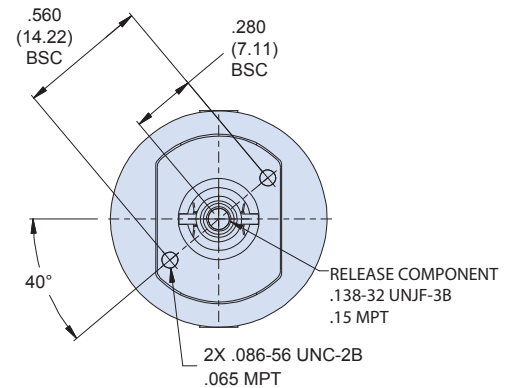
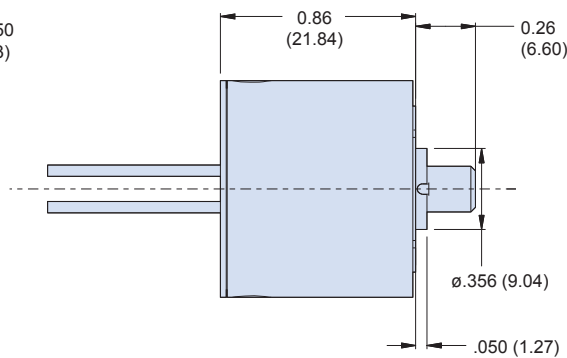
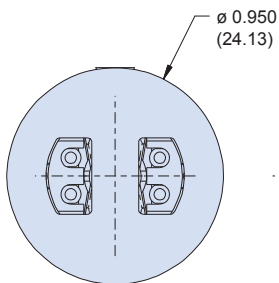
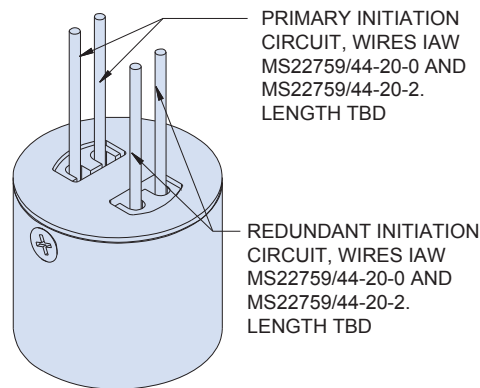
300 lb. release preload  
Electrically redundant



## ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, MEDIUM DUTY



How To Order		
Sample Part No.	061	-007
Basic Part No.	Light/Medium Duty HDRM	
Dash No.	Redundant Circuit	



Physical characteristics	
Mass	38.6 grams approximate weight
Release component thread	0.138-32 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999994 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
- Release preload 300 lbs. (1.33 kN)
- Full qualification pending
- Reference Glenair P/N 060-107 for refurbishment initiator
- Metric threads available, consult factory for options

A

061-007

# Medium-duty hold-down release mechanism

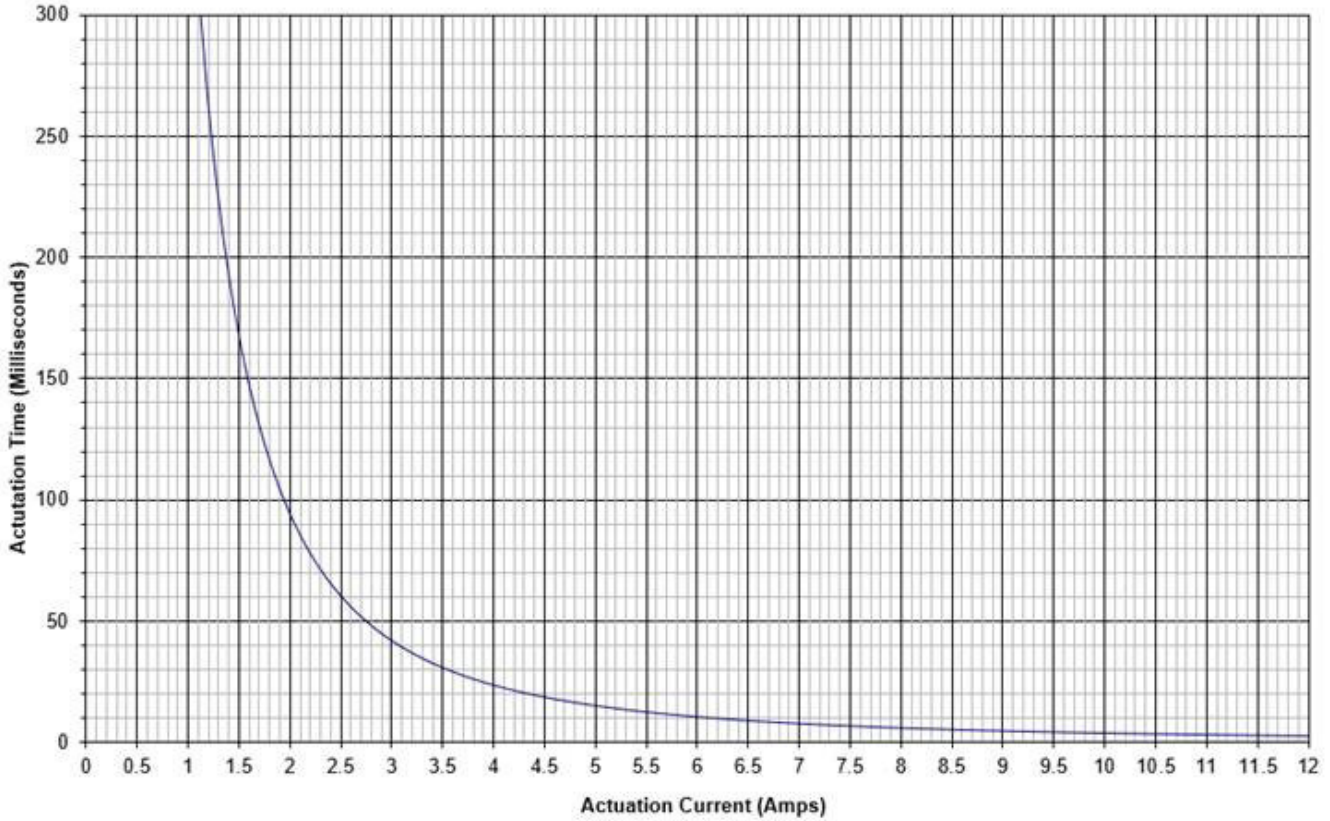


300 lb. release preload

Actuation curve

A

Actuation Curve for 061-007 Mechanism  
(nominal conditions)



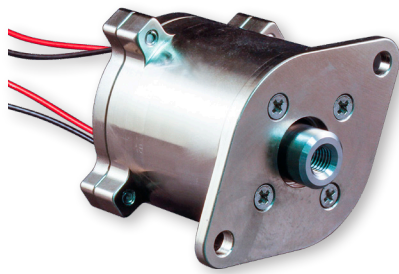
062-002

# Heavy-duty hold-down release mechanism

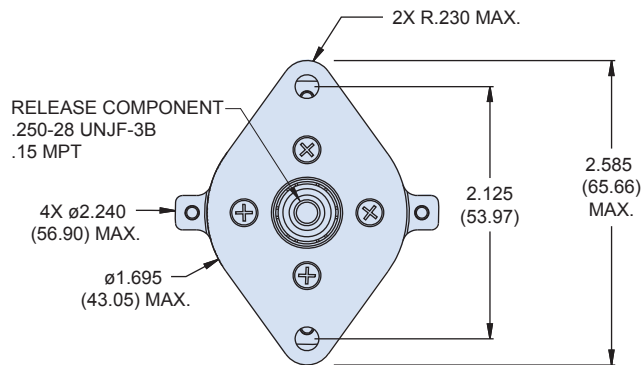
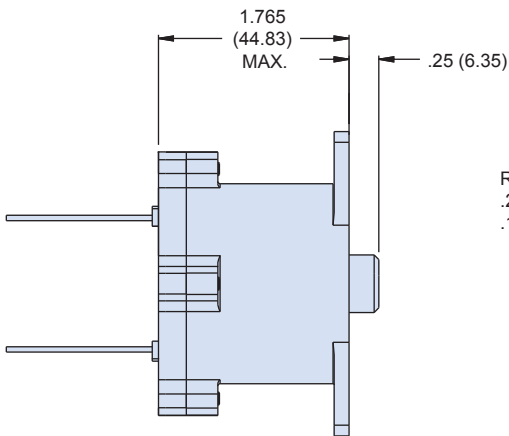
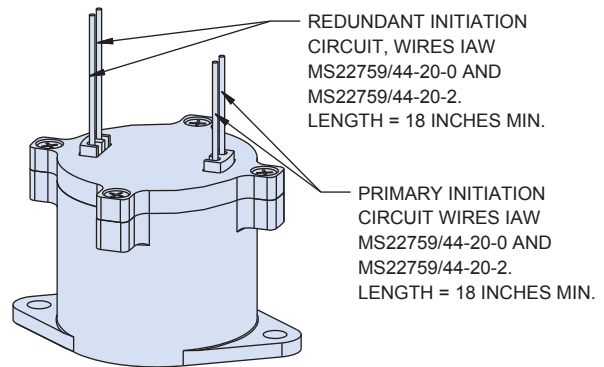
5000 lb. release preload  
Electrically redundant



## ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, HEAVY DUTY



How To Order		
Sample Part No.	062	-002
Basic Part No.	Heavy Duty HDRM	
Dash No.	Redundant Circuit	



Available 069-201 mechanical release for use in place of refurbishment initiator. Consult factory for application notes.

Physical characteristics	
Mass	241 grams nominal weight with 18 inch lead wire included
Release component thread	0.250-28 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999995
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Complete test report available upon request	

A

# Heavy-duty hold-down release mechanism

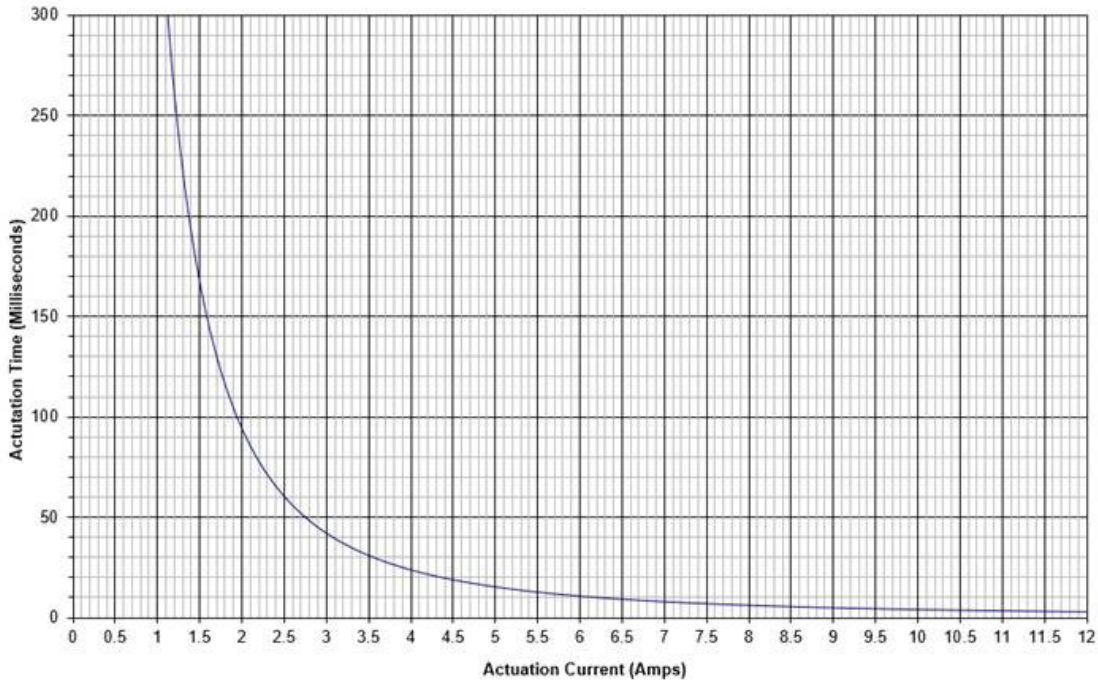


5000 lb. release preload

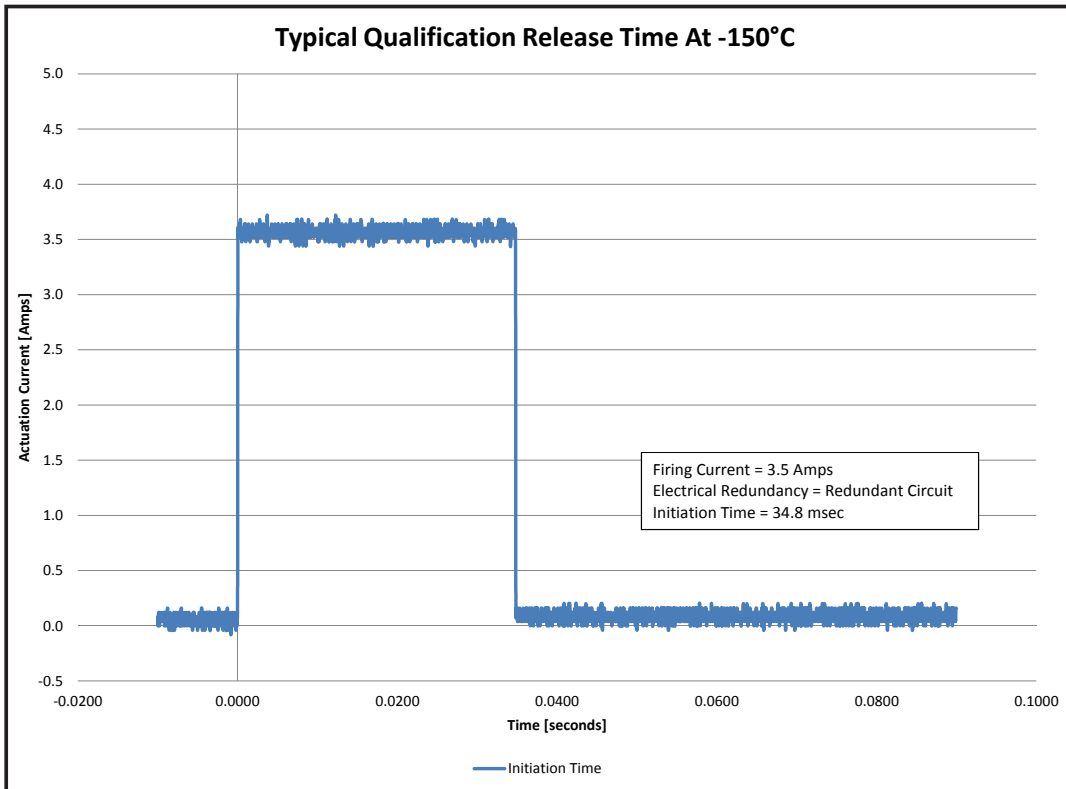
Electrically redundant

A

Actuation Curve for Heavy Duty Mechanism



Typical Qualification Release Time At -150°C



063-001

# Heavy-duty hold-down release mechanisms

8750 lb. release preload  
Electrically redundant

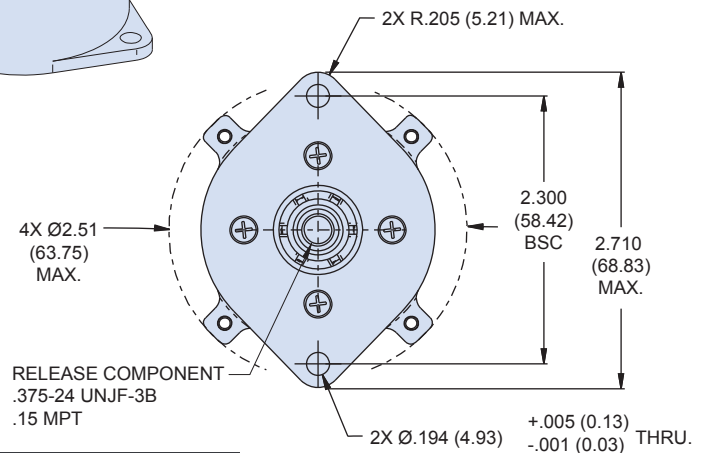
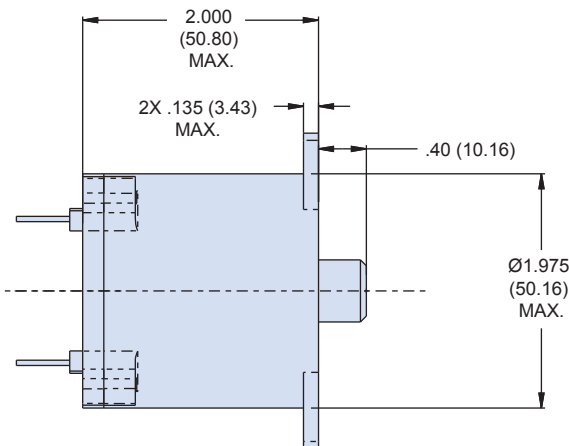
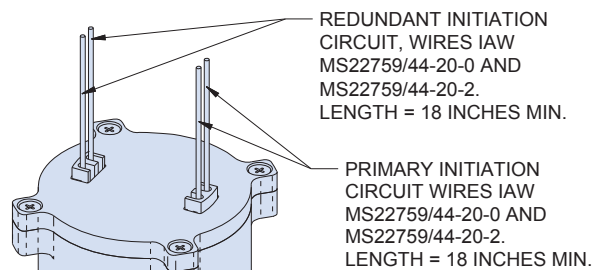


## ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, HEAVY DUTY

A



How To Order		
Sample Part No.	063	-001
Basic Part No.	Heavy Duty HDRM	
Dash No.	Redundant Circuit	



Physical characteristics	
Mass	335 grams approximate weight
Bolt	0.375-24 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999995 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements

\*Size callout based on the bolt size to be used. Metric thread also available.  
Consult factory for qualification test report.

### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
- Release preload: 8,750 lbs. (38.9 kN)  
Proof load: 12500 lbs. (55.6 kN)  
Ultimate preload: 16500 lbs. (73.4 kN) min.
- Full qualification pending
- Reference Glenair P/N 060-301 for refurbishment initiator
- Metric threads available, consult factory for options

063-001

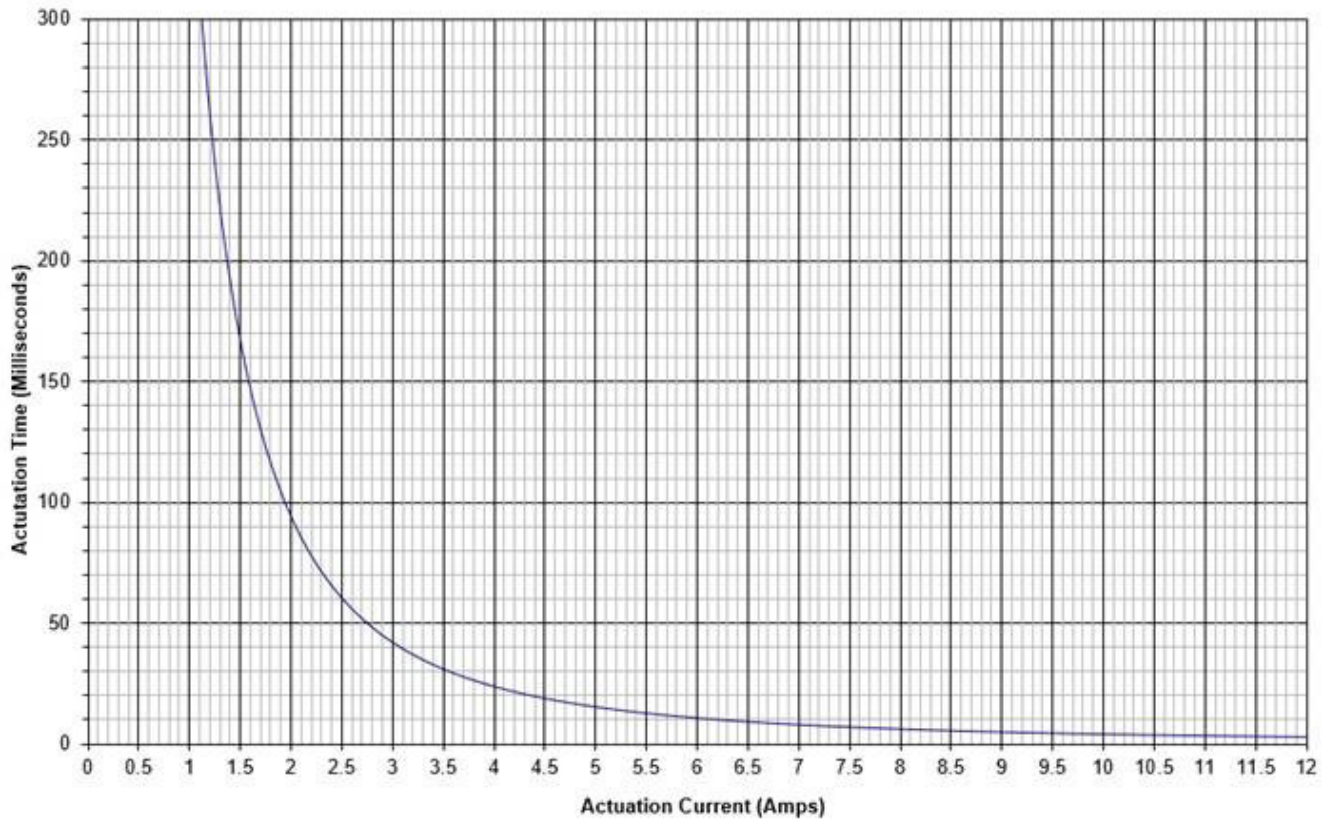
# Heavy-duty hold-down release mechanisms

8750 lb. release preload

Electrically redundant



Actuation Curve for Heavy Duty Mechanism



A

064-001

# Heavy-duty hold-down release mechanisms

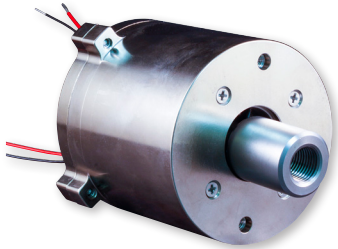
20,000 lb. release preload

Electrically redundant

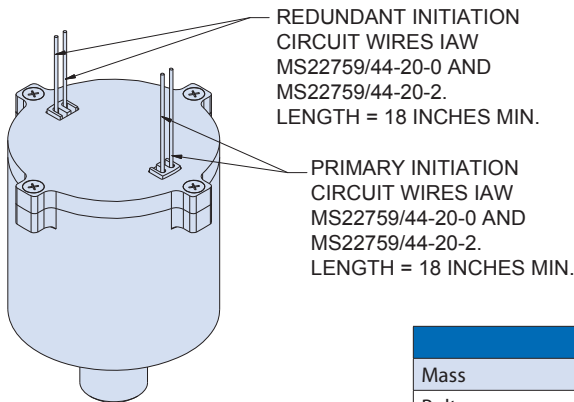
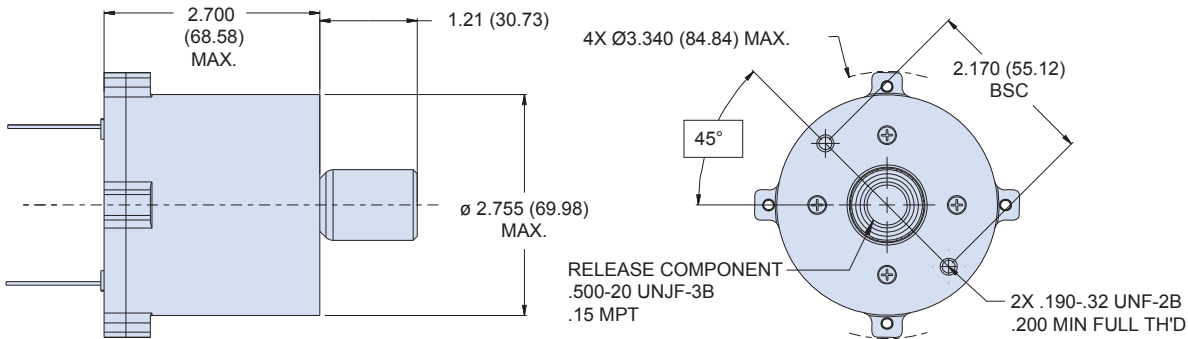


A

## ELECTRICALLY REDUNDANT HOLD DOWN RELEASE MECHANISM, HEAVY DUTY



How To Order		
Sample Part No.	064	-001
Basic Part No.	Heavy Duty HDRM	
Dash No.	Redundant Circuit	



Available 069-401 mechanical release for use in place of refurbishment initiator. Consult factory for application notes.

### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting. Primary initiation circuit identified with "P" and redundant with "R".
- Release preload 20,000 lbs. (88.9 kN)
- Full qualification pending
- Reference Glenair P/N 060-401 for refurbishment initiator
- Metric threads available, consult factory for options

Physical characteristics	
Mass	870.4 grams nominal weight
Bolt	.500-20 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999995 (based off scaled design)
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for complete test report	

064-001

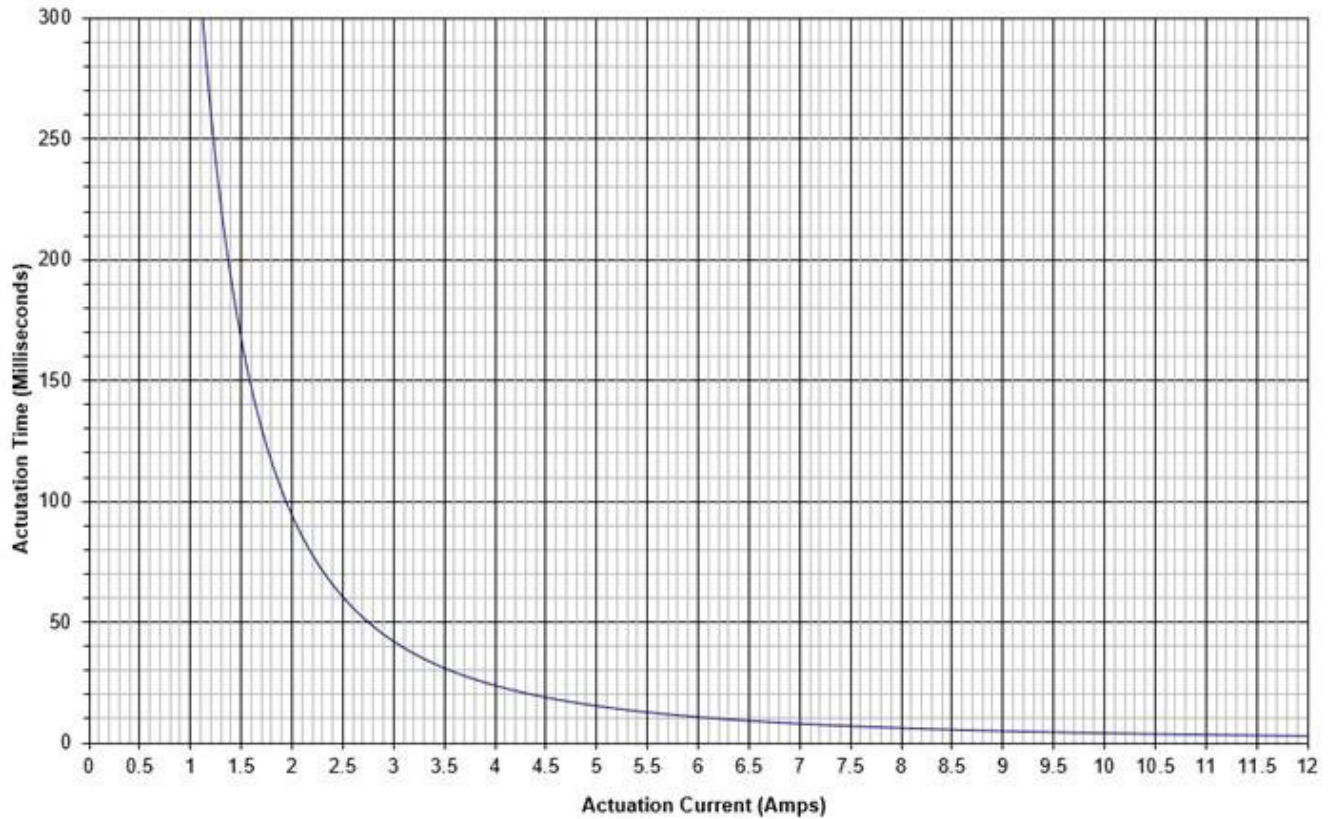
# Heavy-duty hold-down release mechanisms

20,000 lb. release preload

Electrically redundant



Actuation Curve for Heavy Duty Mechanism



A



061-010

# Light-duty pin pushers and pullers

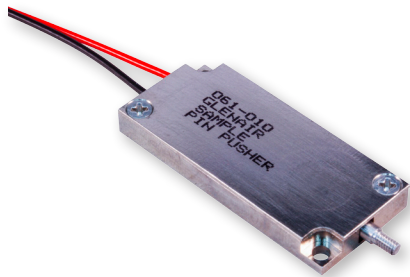
6 lb. push force

Non-redundant circuit

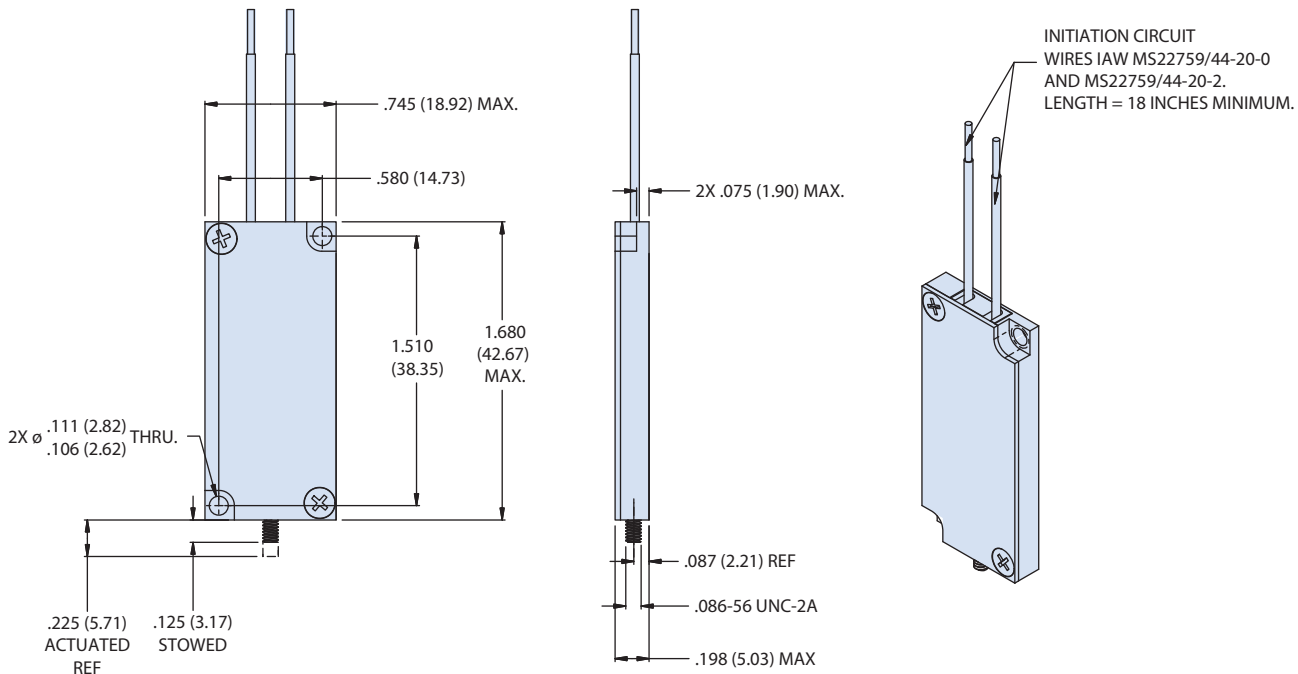


A

## NON-REDUNDANT CIRCUIT PIN PUSHER MECHANISM, LIGHT DUTY



How To Order		
Sample Part No.	061	-010
Basic Part No.	Light-Duty Pin Pusher	
Dash No.	Non-Redundant Circuit	



### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting.
- Push load: 6 lbs. (26.7 N)
- Full qualification pending
- Reference Glenair P/N 060-711 for refurbishment initiator
- Metric threads available, consult factory for options

Physical characteristics	
Mass	15.2 grams approximate weight
Material list	IAW MSFC-STD-3029
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

061-009

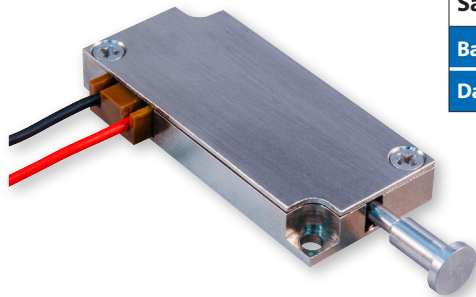
# Light-duty pin pushers and pullers

18 lb. pull force

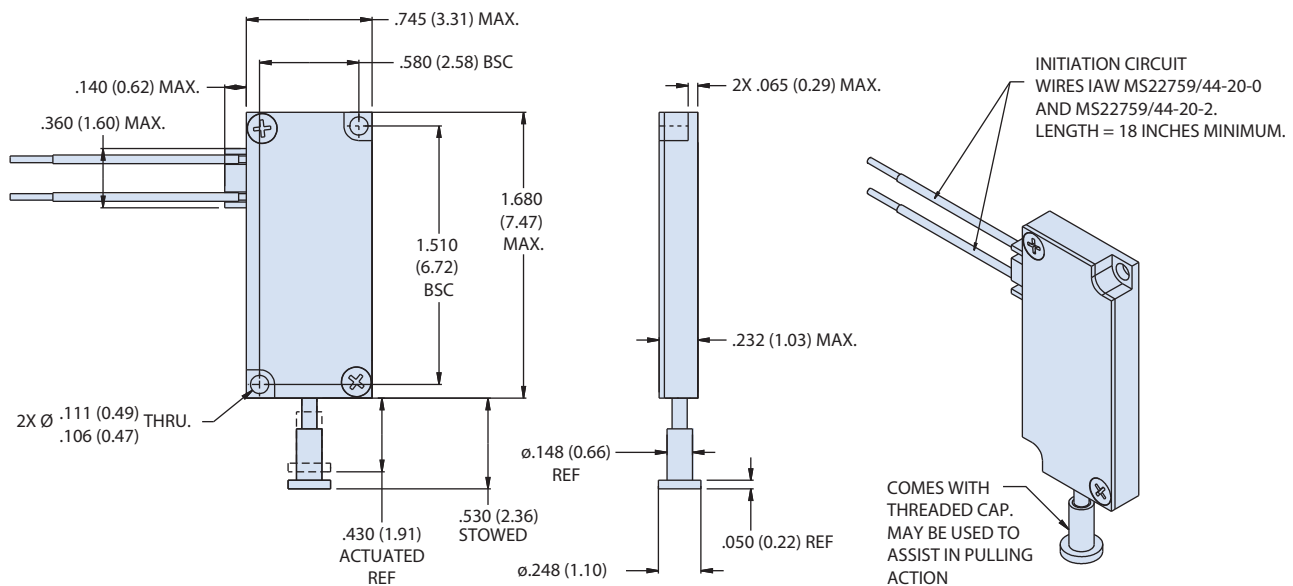
Non-redundant circuit



## NON-REDUNDANT CIRCUIT PIN PULLER MECHANISM, LIGHT DUTY



How To Order		
Sample Part No.	061	-009
Basic Part No.	Light-Duty Pin Puller	
Dash No.	Non-Redundant Circuit	



### NOTES

- Unit is identified with Glenair name, CAGE code, part number, and date code, space permitting.
- Release preload 18 lbs. (80 N)
- Full qualification pending
- Reference Glenair P/N 060-109 for refurbishment initiator
- Metric threads available, consult factory for options

Physical characteristics	
Mass	16.2 grams nominal weight
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384
Device features	
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for complete test report	

A

061-013

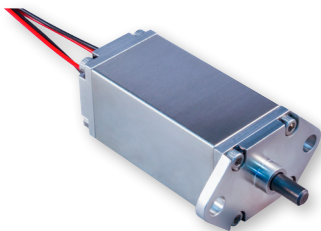
# Medium-duty pin pushers and pullers

50 lb. pull force

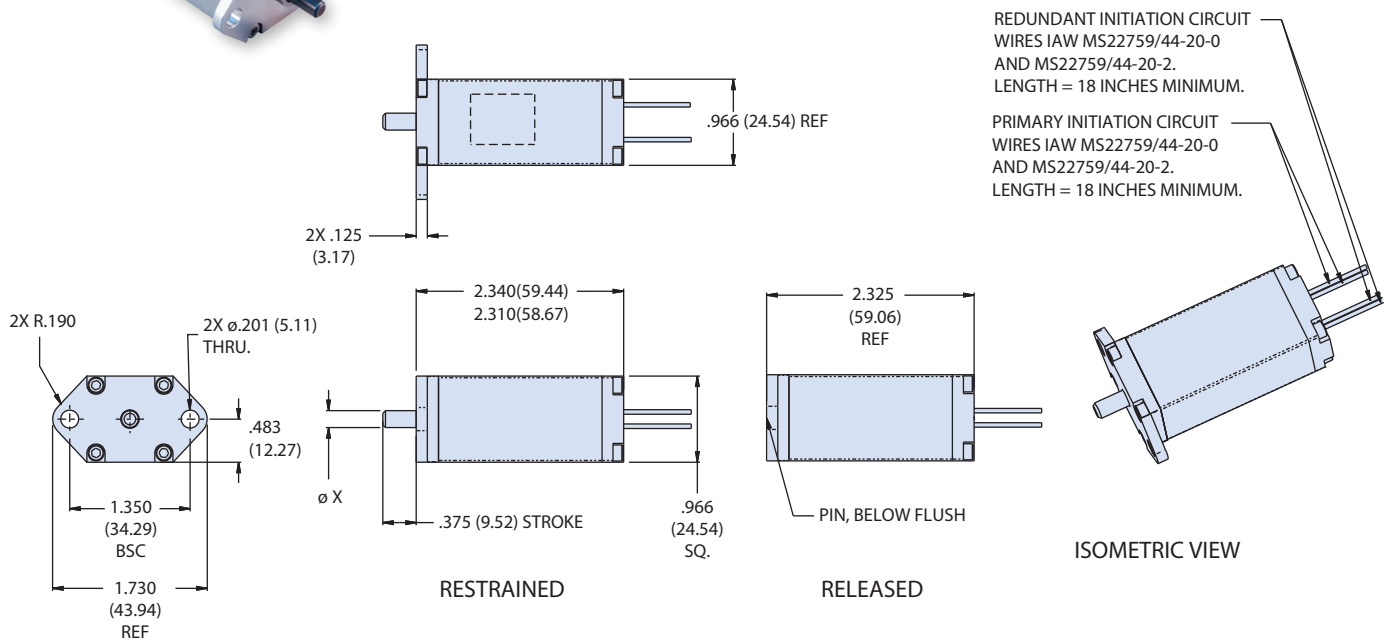
Electrically redundant



## ELECTRICALLY REDUNDANT PIN PULLER MECHANISM, MEDIUM DUTY



How To Order		
Sample Part No.	061-013	-190
Basic Part No.	Medium-Duty Pin Puller	
Pin Diameter/Side Load:	Per Table I	



### NOTES

- Primary initiation circuit identified with "P" and redundant with "R".
- Pull force: 50 lbs. (222 N)
- Baseline pin puller qualification test parameters:
  - Survive static load: 330 Lbs
  - Hold and release: 4 Lbs
  - Random vibration 28.2 GRMS
  - Shock input: 2849 Gs
  - Thermal vacuum:
    - 3 cycles -65°C to +70°C,
    - 1.5 x 10<sup>-6</sup> Torr, actuations at each extreme
  - Thermal vacuum no fire current: .250A, 5 minutes
  - Life cycle: 5 releases (one unit)
- Reference Glenair P/N 060-113 for refurbishment initiator
- Threads are available on the pin if needed. Metric threads also available
- Consult factory for additional options

Physical characteristics	
Mass	145.8 grams approximate weight
Material list	IAW MSFC-STD-3029
Device features	
Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
*Size callout based on the bolt size to be used. Metric thread also available. Consult factory for qualification test report.	

Part Number Definition		
Dash Number	"X" (Pin Ø)	Maximum Static Side Load (LBS)
-190	.190	330
-375	.375	1200



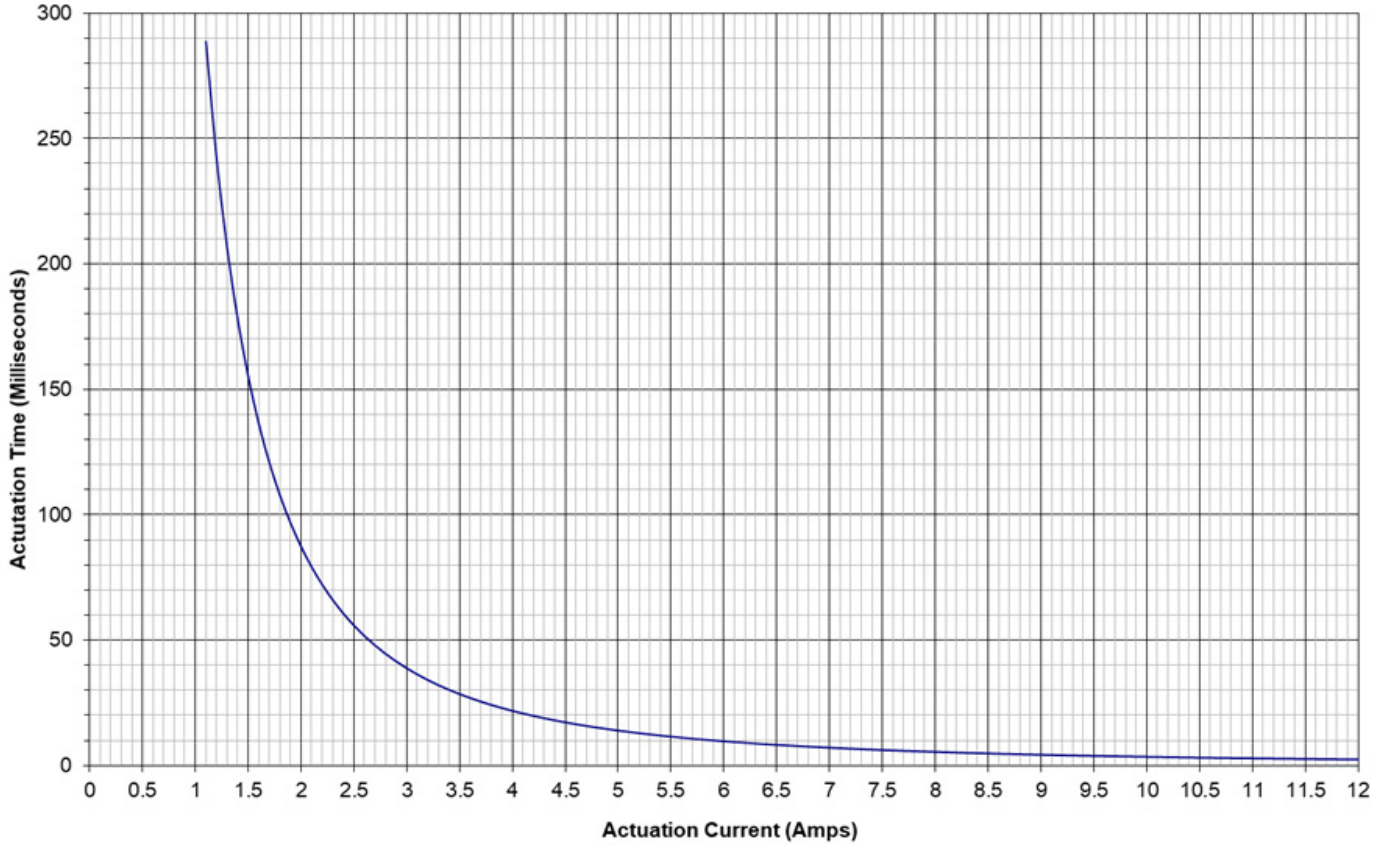
061-013

# Medium-duty pin pushers and pullers

50 lb. pull force,  
electrically redundant



Actuation Curve for Pin Puller Mechanism



A



JAXA Kounotori H2 Transfer Vehicle and the Canadarm on the ISS

B

## ADVANCED-PERFORMANCE

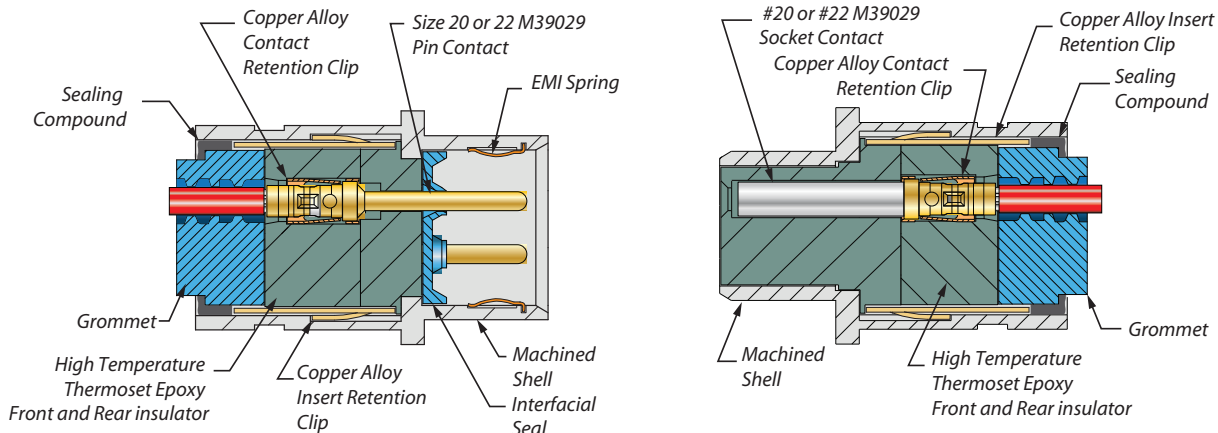
# HiPer-D Connectors

### Space-grade M24308 intermateable

The HiPer-D connector is a M24308-type D-Subminiature connector with superior design features. Unlike standard M24308 connectors with stamped steel shells, the HiPer-D connector features such as a one-piece machined shell, 200°C continuous operating temperature rating and enhanced, mated shell EMI/RFI protection via an integrated ground spring. Aerospace grade fluorosilicone grommets and face seals (JAXA / NASA outgassing available) provide environmental protection. The HiPer-D is intermateable, intermountable and interchangeable with standard M24308 D-Sub connectors.

- Advanced temperature, vibration and EMC/ electrical performance
- 11 standard and 20 combo insert arrangements
- High temperature epoxy insulators
- Watertight sealing
- Rugged machined one-piece shell

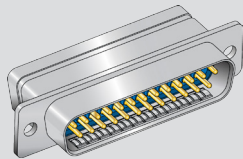
### STANDARD AND HIGH DENSITY HIPER-D® - CUTAWAY



# SERIES 28

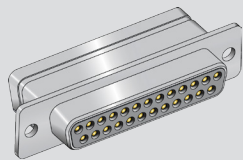
## HiPer-D Space Grade Connectors

### Product Selection Guide



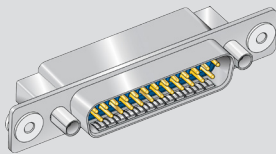
**280-018 In-line or Panel Mount  
Crimp Terminated, Pin Connector for Attaching Wires**

Pages B-2



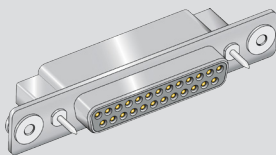
**280-019 In-line or Panel Mount  
Crimp Terminated, Socket Connector for Attaching Wires**

Pages B-4



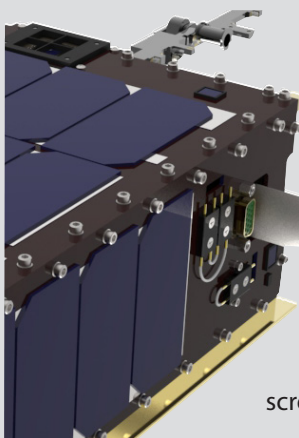
**280-030 Float Mount  
Crimp Terminated, Pin Connector for Attaching Wires**

Page B-6



**280-031 Float Mount  
Crimp Terminated, Socket Connector for Attaching Wires**

Page B-8



Glenair HiPer-D M24308 D-sub connectors are ideally suited for CubeSat or NanoSat canister dispenser applications where rack and panel or connectorized wire assemblies are used to communicate with HDRMs, pin pullers, pin pushers, door status sensors, as well as system communications and testing prior to deployment of satellite equipment. Standardized usage of M24308 connectors on hardware interfaces simplifies interconnection and communication. Glenair HiPer-D space grade M24308 D-sub connectors eliminate potential interconnect electrical problems on mission critical systems. Connectors are supplied with NASA/ESA/JAXA outgassing and screening in accordance with NASA EEE-INST-0002.

### OTHER M24308 HIPER-D SOLUTIONS ALSO AVAILABLE - SEE OUR HIPER-D CATALOG

**Sealed Panel Mount  
Technology**



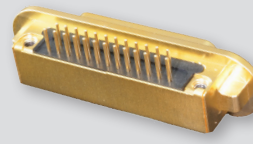
**Combo HiPer-D Contact  
Arrangements**



**Ground Fingers for  
Improved EMC**



**Advanced Board  
Mount Features**



**Modern EMI backshells**





## STANDARD AND HIGH DENSITY CONTACT ARRANGEMENTS *(face view of pin connector)*

### Standard Density

### High Density



Arrangement  
Shell Size  
Contacts

**1S9**  
1  
9 #20

**1H15**  
1  
15 #22



Arrangement  
Shell Size  
Contacts

**2s15**  
2  
15 #20

**2H26**  
2  
26 #22



Arrangement  
Shell Size  
Contacts

**3S25**  
3  
25 #20

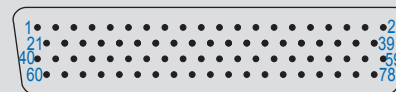
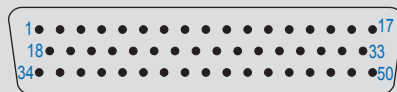
**3H44**  
3  
44 #22



Arrangement  
Shell Size  
Contacts

**4S37**  
4  
37 #20

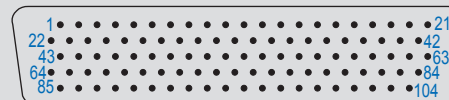
**4H62**  
4  
62 #22



Arrangement  
Shell Size  
Contacts

**5S50**  
5  
50 #20

**5H78**  
5  
78 #22



Arrangement  
Shell Size  
Contacts

**6H104**  
6  
104 #22

B

SERIES 28  
**HiPer-D Space Grade Connectors**  
 Reference and Technical Data



Description	Requirement			Procedure
Voltage Rating (DWV)	1000 VAC Sea Level			EIA-364-20
Operating Temperature	-65° C. to +200° C.			
Insulation Resistance	5000 megohms minimum			EIA-364-21
Current Rating	Size #20 7.5A, #22 5A			
Contact Resistance	<b>Wire Size</b>	<b>Test Current</b>	<b>Millivolt Drop</b>	EIA-364-06
	20	7.5	55	
	22	5	73	
	24	3	45	
Low Level Contact Resistance	<b>Wire Size</b>	<b>Max Milliohms</b>		EIA-364-23
	20	9		
	22	15		
	24	20		
Shell-to-Shell Resistance	2.5 milliohm max (ground spring required)			EIA-364-83
Shielding Effectiveness	<b>Freq. GHz</b>	<b>Min Attenuation (dB)</b>		EIA-364-66 Electroless nickel plated shells with ground spring installed
	0.1	100		
	0.4	90		
	0.8	85		
	1.0	80		
	3.0	55		
	6.0	40		
10.0	30			
Water Immersion, mated	1 hour immersion at a depth of 1 meter			MIL-STD-810F Method 512.4
Ingress Protection Rating	IP67, mated connectors			IEC-60529
Vibration, Sine	20 g's			EIA-364-28
Vibration, Random	43 g's			EIA-364-28
Mechanical Shock	300 g's			EIA-364-27
Thermal Shock	-65° C. to +200° C.			EIA-364-32
Humidity	10 cycles, 10 days, 25°C to 65°C			EIA-364-31
Altitude Immersion	75,000 feet			EIA-364-03
Fluid Immersion	No damage from solvents, oils, and fuels			EIA-364-10
Magnetic Permeability	2 μ maximum			EIA-364-54
Mechanical Durability	500 Mating Cycles			EIA-364-09

B

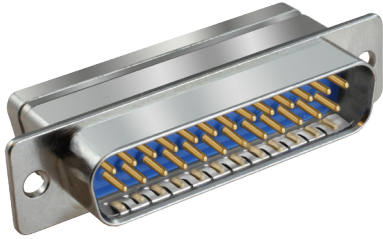
Description	Material	Finish
<b>Contacts</b>	Copper Alloy	Gold (50 microin.) over nickel
<b>Socket Contact Hood (Size 20, 22)</b>	Stainless steel	Passivated
<b>Shell</b>	Aluminum Alloy or stainless steel	See ordering information
<b>Insulators</b>	Thermoset epoxy resin per ASTM D-5948	None
<b>Interfacial Seal</b>	Fluorosilicone	None
<b>Grommet</b>	Fluorosilicone	None
<b>EMI Spring</b>	Copper alloy	Electroless nickel
<b>Contact retention clips</b>	Copper alloy	None
<b>Insert retention clip</b>	Copper alloy	None
<b>Sealant</b>	RTV silicone	None
<b>Hardware</b>	Stainless steel (300 series)	Passivated
<b>O-ring</b>	Fluorosilicone	None



SERIES 28

# HiPer-D Space Grade Connectors

280-018P inline cable or panel mount pin connector, crimp termination

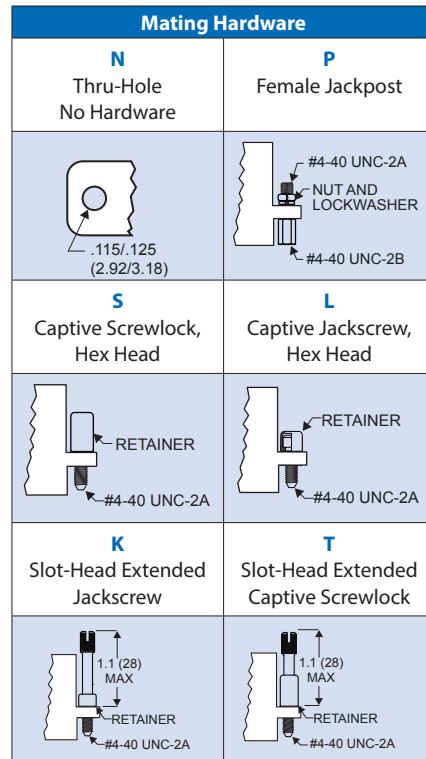


HiPer-D pin connectors for cable or panel mount feature crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell, waterproof sealing and optional ground springs for improved resistance to electromagnetic interference. Gold-plated size #20 contacts conform to M39029/64-369 and accept #20 to #24 AWG wire. Gold-plated size #22 contacts conform to M39029/58-360 and accept #22 to #28 AWG wire. Contacts are packaged with connector. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Fluorosilicone face seal and rear grommet meet IP67 immersion requirement. 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

B

How To Order								
Sample Part Number	280-018P				3S25	ME	G	P
Basic Part Number	280-018P							
Shell Size-Contact Arrangement	See Shell Size - Contact Arrangements Table							
Shell Finish	ME = Electroless Nickel (RoHS) Z2 = Gold (RoHS) Z1 = Passivated Stainless Steel (RoHS)							
Ground Spring	G = Supplied with EMI Ground Spring		N = No Ground Spring					
Mating Hardware	N = No Hardware (Through-Hole) L = Jackscrew, Hex Head, Low Profile S = Screwlock, Male, Hex Head, Low Profile		P = #4-40 Female Jackpost K = Jackscrew, Slot Head, Extended Length T = Screwlock, Male, Slot Head, Extended Length					

Shell Size - Contact Arrangements		
Shell Size-Contact Arr.	Contact Size and Qty	
	#20	#22
<b>Standard Density</b>		
1S9	9	
2S15	15	
3S25	25	
4S37	37	
5S50	50	
<b>High Density</b>		
1H15		15
2H26		26
3H44		44
4H62		62
5H78		78
6H104		104



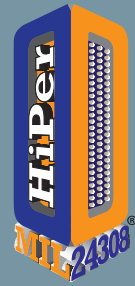
Materials and Finishes	
Shell	Aluminum alloy
Contacts	Copper alloy, 50 microin. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet and Seal	Fluorosilicone rubber
EMI Spring	Copper alloy, nickel plated
Hardware	300 series stainless steel

Specifications	
Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

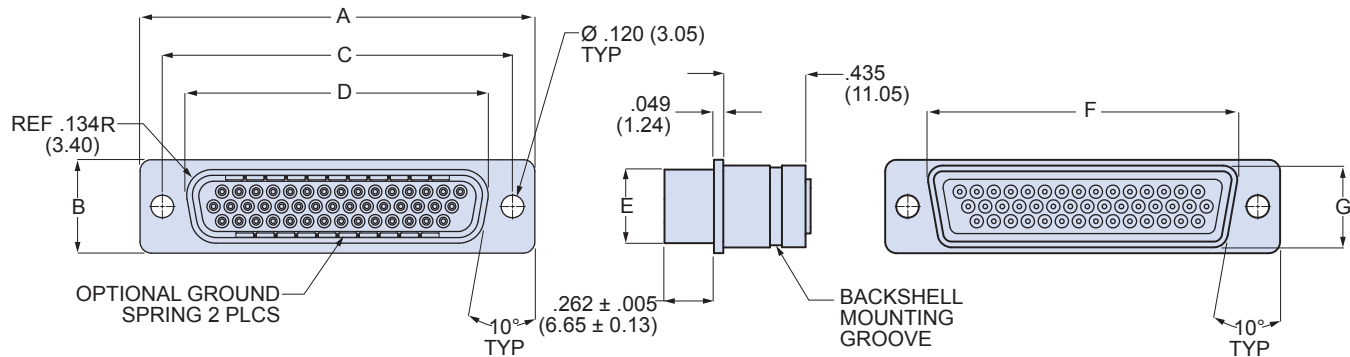
SERIES 28

# HiPer-D Space Grade Connectors

280-018P inline cable or panel mount pin connector, crimp termination



## 280-018P DIMENSIONS



Dimensions														
Shell Size	A		B		C Basic		D		E		F Max.		G Max.	
	in	mm	in	mm	in.	mm	in	mm	in	mm	in.	mm	in.	mm
1	1.213	30.81	.494	12.55	.984	24.99	.726	18.44	.389	9.88	.769	19.53	.432	10.97
2	1.541	39.14	.494	12.55	1.312	33.32	1.054	26.77	.389	9.88	1.093	27.76	.432	10.97
3	2.088	53.04	.494	12.55	1.852	47.04	1.594	40.49	.389	9.88	1.635	41.53	.432	10.97
4	2.729	69.32	.494	12.55	2.500	63.50	2.242	56.95	.389	9.88	2.282	57.96	.432	10.97
5	2.635	66.93	.605	15.37	2.406	61.11	2.139	54.33	.501	12.73	2.188	55.58	.544	13.82
6	2.729	69.32	.668	16.97	2.500	63.50	2.272	57.71	.563	14.30	2.312	58.72	.606	15.39

## NOTES

- HiPer-D connectors are available with a wide variety of materials and finishes. See [About Series 28 HiPer-D® Shell Plating Options](#) for additional choices. Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
- For panel cutout dimensions, refer to [Panel Cutouts and Printed Circuit Board Footprints](#).
- Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to [HiPer-D® Contacts and Crimp Tools](#) for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
- HiPer-D connectors meet the requirements of MIL-DTL-24308 and are intermateable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
- Additional electrical, mechanical and environmental specifications are listed in [HiPer-D® Product Specification](#).

SERIES 28

# HiPer-D Space Grade Connectors

280-019S inline cable or panel mount socket connector, crimp termination



HiPer-D socket connectors for in-line cable or panel mount feature crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell and waterproof sealing. Gold-plated size #20 contacts conform to M39029/63-368 and accept #20 to #24 AWG wire. Gold-plated size #22 contacts conform to M39029/57-354 and accept #22 to #28 AWG wire. Contacts are packaged with connector. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Fluorosilicone rear grommet meets IP67 immersion requirement. Shell has backshell attachment groove. 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

B

How To Order				
Sample Part Number	280-019S	4H62	ME	L
Basic Part Number	280-019S			
Shell Size-Contact Arrangement	See Shell Size - Contact Arrangements Table			
Shell Finish	ME = Electroless Nickel (RoHS) Z2 = Gold (RoHS) Z1 = Passivated Stainless Steel (RoHS)			
Mating Hardware	N = No Hardware (Through-Hole)      P = #4-40 Female Jackpost L = Jackscrew, Hex Head, Low Profile      K = Jackscrew, Slot Head, Extended Length S = Screwlock, Male, Hex Head, Low Profile      T = Screwlock, Male, Slot Head, Extended Length			

Shell Size - Contact Arrangements		
Shell Size-Contact Arr.	Contact Size and Qty	
	#20	#22
<b>Standard Density</b>		
1S9	9	
2S15	15	
3S25	25	
4S37	37	
5S50	50	
<b>High Density</b>		
1H15		15
2H26		26
3H44		44
4H62		62
5H78		78
6H104		104

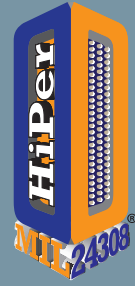
Mating Hardware	
<b>N</b> Thru-Hole No Hardware 	<b>P</b> Female Jackpost 
<b>S</b> Captive Screwlock, Hex Head 	<b>L</b> Captive Jackscrew, Hex Head 
<b>K</b> Slot-Head Extended Jackscrew 	<b>T</b> Slot-Head Extended Captive Screwlock 

Materials and Finishes	
Shell	Aluminum alloy
Contacts	Copper alloy, 50 micron. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet	Fluorosilicone rubber
Hardware	300 series stainless steel

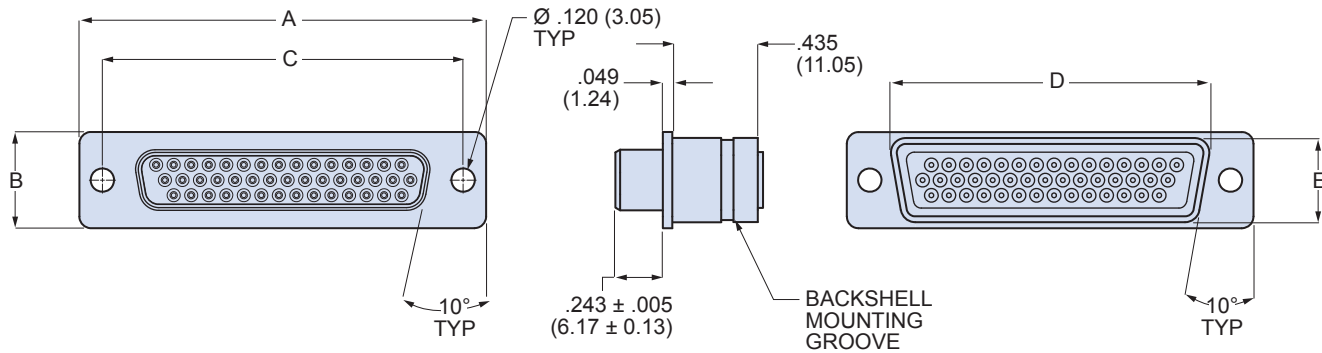
Specifications	
Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

# SERIES 28 HiPer-D Space Grade Connectors

280-019S inline cable or panel mount socket connector, crimp termination



## 280-019S DIMENSIONS



Dimensions										
Shell Size	A		B		C Basic		D		E	
	in ± .015	mm ± 0.38	in ± .015	mm ± 0.38	in. ± .005	mm ± 0.13	in ± .005	mm ± 0.13	in ± .005	mm ± 0.13
1	1.213	30.81	.494	12.55	.984	24.99	.769	19.53	.432	10.97
2	1.541	39.14	.494	12.55	1.312	33.32	1.093	27.76	.432	10.97
3	2.088	53.04	.494	12.55	1.852	47.04	1.635	41.53	.432	10.97
4	2.729	69.32	.494	12.55	2.500	63.50	2.282	57.96	.432	10.97
5	2.635	66.93	.605	15.37	2.406	61.11	2.188	55.58	.544	13.82
6	2.729	69.32	.668	16.97	2.500	63.50	2.312	58.72	.606	15.39

## NOTES

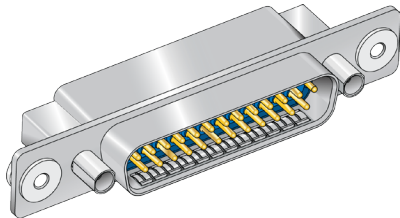
- HiPer-D connectors are available with a wide variety of materials and finishes. See [About Series 28 HiPer-D® Shell Plating Options](#) for additional choices. Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
- For panel cutout dimensions, refer to [Panel Cutouts and Printed Circuit Board Footprints](#).
- Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to [HiPer-D® Contacts and Crimp Tools](#) for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
- HiPer-D connectors meet the requirements of MIL-DTL-24308 and are intermateable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
- Additional electrical, mechanical and environmental specifications are listed in [HiPer-D® Product Specification](#).

SERIES 28

# HiPer-D Space Grade Connectors



280-030P float mount pin connector for blind mating with float bushings or guide pins, crimp termination



280-030P HiPer-D pin connectors feature stainless steel float bushings for blind mating. Attach to panel with #4-40 screws (not supplied with connector). Crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell, rubber seals and optional ground springs for improved resistance to electromagnetic interference. Threaded holes on the rear of the connector allow direct attachment of HiPer-D EMI backshells. Contacts are packaged with connector. Terminate contacts with crimp tools purchased separately. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Fluorosilicone face seal and rear grommet meet IP67 immersion requirement (mated). 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

### How To Order

<b>Sample Part Number</b>	<b>280-030P</b>	<b>6H104</b>	<b>MT</b>	<b>N</b>	<b>N</b>
<b>Basic Part Number</b>	<b>280-030P</b>				
<b>Shell Size-Contact Arrangement</b>	See Shell Size - Contact Arrangements Table				
<b>Shell Finish</b>	<b>ME</b> = Electroless Nickel (RoHS) <b>Z2</b> = Gold (RoHS) <b>Z1</b> = Passivated Stainless Steel (RoHS)				
<b>Ground Spring</b>	<b>G</b> = Supplied with EMI Ground Spring	<b>N</b> = No Ground Spring			
<b>Mating Hardware</b>	<b>N</b> = No Hardware (supplied with #8-32 tapped hole) <b>B</b> = Female Guide Bushings	<b>G</b> = Male Guide Pins			

### Shell Size - Contact Arrangements

Shell Size-Contact Arr.	Contact Size and Qty	
	#20	#22
<b>Standard Density</b>		
<b>1S9</b>	9	
<b>2S15</b>	15	
<b>3S25</b>	25	
<b>4S37</b>	37	
<b>5S50</b>	50	
<b>High Density</b>		
<b>1H15</b>		15
<b>2H26</b>		26
<b>3H44</b>		44
<b>4H62</b>		62
<b>5H78</b>		78
<b>6H104</b>		104

### Mating Hardware

**N**  
No Hardware  
#8-32 tapped hole

**B**  
Female Guide Bushings

**G**  
Male Guide Pins

### Materials and Finishes

Shell	Aluminum alloy
Contacts	Copper alloy, 50 microin. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet, Seal, O-ring	Fluorosilicone rubber
Hardware	300 series stainless steel

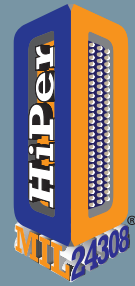
### Specifications

Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

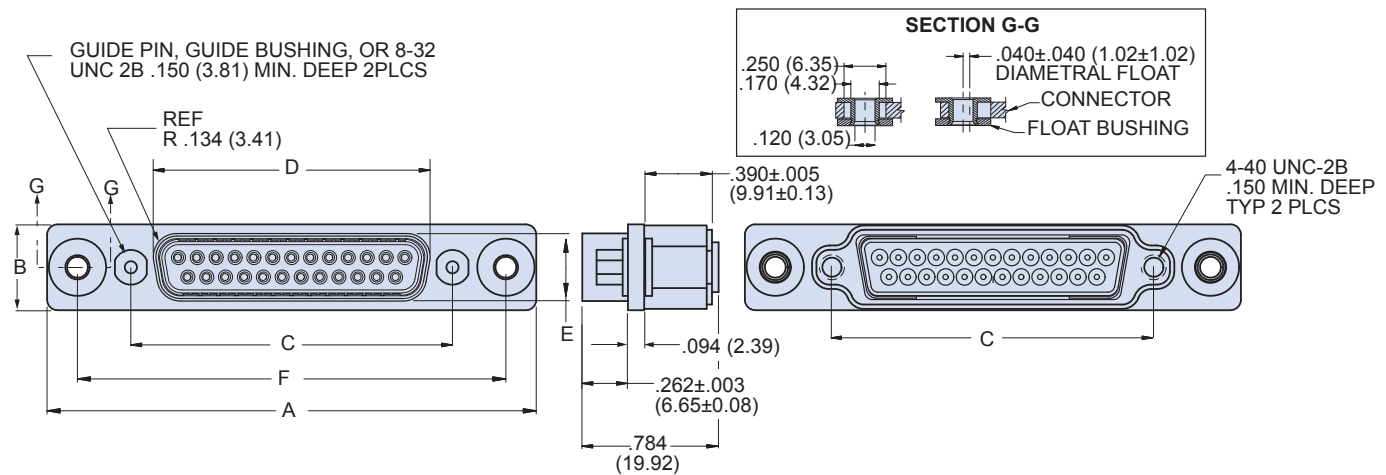
B

# SERIES 28 HiPer-D Space Grade Connectors

280-030P float mount pin connector for blind mating with float bushings or guide pins, crimp termination



## 280-030P DIMENSIONS



Dimensions												
Shell Size	A		B		C Basic		D		E		F Basic	
	in ± .015	mm ± 0.38	in ± .015	mm ± 0.38	in.	mm	in ± .005	mm ± 0.13	in ± .005	mm ± 0.13	in	mm
1	1.986	50.44	.494	12.55	.984	24.99	.726	18.44	.389	9.88	1.636	41.55
2	2.314	58.78	.494	12.55	1.312	33.32	1.054	26.77	.389	9.88	1.964	49.89
3	2.854	72.49	.494	12.55	1.852	47.04	1.594	40.49	.389	9.88	2.504	63.60
4	3.502	88.95	.494	12.55	2.500	63.50	2.242	56.95	.389	9.88	3.152	80.06
5	3.408	86.56	.600	15.24	2.406	61.11	2.139	54.33	.501	12.73	3.058	77.67
6	3.502	88.95	.662	16.81	2.500	63.50	2.272	57.71	.563	14.30	3.152	80.06

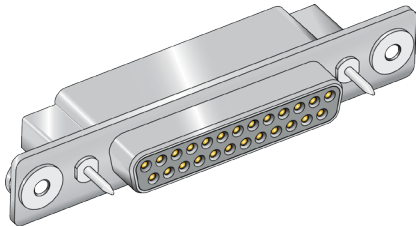
## NOTES

- HiPer-D connectors are available with a wide variety of materials and finishes. See [About Series 28 HiPer-D® Shell Plating Options](#) for additional choices. Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
- For panel cutout dimensions, refer to [Panel Cutouts and Printed Circuit Board Footprints](#).
- Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to [HiPer-D® Contacts and Crimp Tools](#) for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
- HiPer-D connectors meet the requirements of MIL-DTL-24308 and are interchangeable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
- Additional electrical, mechanical and environmental specifications are listed in [HiPer-D® Product Specification](#).

# HiPer-D Space Grade Connectors



280-031S float mount socket connectors for blind mating with float mount bushings or guide pins, crimp termination

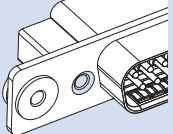
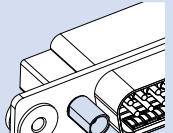
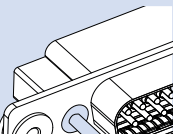


280-031S HiPer-D socket connectors feature stainless steel floating bushings for blind mate applications. Attach to panel with #4-40 screws (not supplied with connector). Crimp, rear-releaseable size #20 or #22 contacts. Intermateable with standard M24308-type D-Subminiature connectors, the HiPer-D features a rugged machined aluminum shell and rubber grommet. Threaded holes on the rear of the connector allow attachment of HiPer-D EMI backshells. Contacts are packaged with connector. Terminate contacts with crimp tools purchased separately. Glass-reinforced thermoset epoxy insulators, copper alloy retention clips. Connector meets IP67 immersion requirement. 1000 VAC, 5 Amps (#22) or 7.5 Amps (#20).

B

How To Order				
Sample Part Number	280-031S	2H26	Z2	G
Basic Part Number	280-031S			
Shell Size-Contact Arrangement	See Shell Size - Contact Arrangements Table			
Shell Finish	ME = Electroless Nickel (RoHS) Z2 = Gold (RoHS) Z1 = Passivated Stainless Steel (RoHS)			
Mating Hardware	N = No Hardware (supplied with #8-32 tapped holes) G = Male Guide Pins B = Female Guide Bushings			

Shell Size - Contact Arrangements		
Shell Size-Contact Arr.	Contact Size and Qty	
	#20	#22
<b>Standard Density</b>		
1S9	9	
2S15	15	
3S25	25	
4S37	37	
5S50	50	
<b>High Density</b>		
1H15		15
2H26		26
3H44		44
4H62		62
5H78		78
6H104		104

Mating Hardware
<b>N</b> No Hardware #8-32 tapped hole 
<b>B</b> Female Guide Bushings 
<b>G</b> Male Guide Pins 

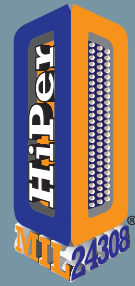
Materials and Finishes	
Shell	Aluminum alloy
Contacts	Copper alloy, 50 micron. gold plated
Insulators	Thermoset epoxy
Retention Clips	Copper alloy
Grommet	Fluorosilicone rubber
Hardware	300 series stainless steel

Specifications	
Current Rating	#22 5 AMPS, #20 7.5 AMPS
Test Voltage	1000 VAC RMS
Insulation Resistance	5000 megohms minimum
Operating Temperature	-65° C. to +200° C.
Ingress Protection	IP 67
Shock	300 g.
Vibration, Random	43.92 g.

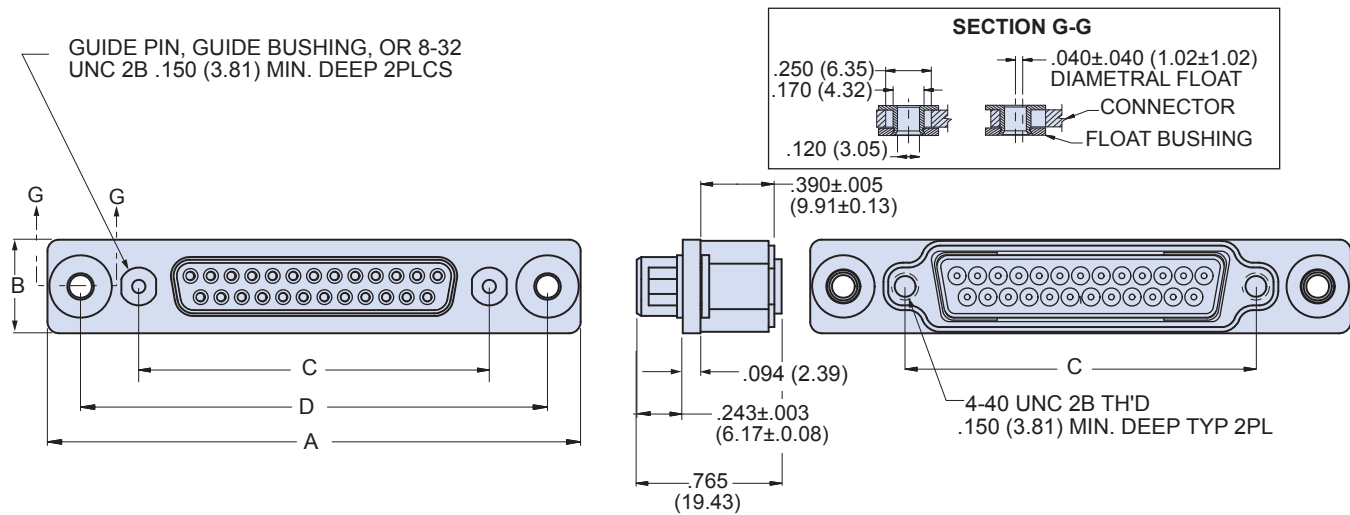
SERIES 28

# HiPer-D Space Grade Connectors

280-031S float mount socket connectors for blind mating with float mount bushings or guide pins, crimp termination



## 280-031S DIMENSIONS



Dimensions								
Shell Size	A		B		C Basic		D Basic	
	in ± .015	mm ± 0.38	in ± .015	mm ± 0.38	in.	mm	in	mm
1	1.986	50.44	.494	12.55	.984	24.99	1.636	41.55
2	2.314	58.78	.494	12.55	1.312	33.32	1.964	49.89
3	2.854	72.49	.494	12.55	1.852	47.04	2.504	63.60
4	3.502	88.95	.494	12.55	2.500	63.50	3.152	80.06
5	3.408	86.56	.600	15.24	2.406	61.11	3.058	77.67
6	3.502	88.95	.662	16.81	2.500	63.50	3.152	80.06

## NOTES

- HiPer-D connectors are available with a wide variety of materials and finishes. See [About Series 28 HiPer-D® Shell Plating Options](#) for additional choices. Glenair offers the industry's widest selection of plating and material choices with no setup charge, no minimum order quantity and no schedule impact.
- For panel cutout dimensions, refer to [Panel Cutouts and Printed Circuit Board Footprints](#).
- Connectors are supplied with crimp contacts per M39029. Contacts are not installed. Refer to [HiPer-D® Contacts and Crimp Tools](#) for contact part numbers, specifications, crimp tool information, and insertion/extraction tools.
- HiPer-D connectors meet the requirements of MIL-DTL-24308 and are intermateable with standard M24308-type D-Subminiature connectors with corresponding contact arrangements and type.
- Additional electrical, mechanical and environmental specifications are listed in [HiPer-D® Product Specification](#).





# Space-Grade Circular Blind-Mate Connectors



**Application:** Glenair Series 253 blind-mate connectors are designed to meet applicable environmental, electrical and mechanical performance characteristics of D38999 Series III. The technology is well suited for use in commercial rack-and-panel instrumentation applications, as well as a blind-mate solution for satellite deployment, scientific research and development payloads, interstage, UAV, and munitions release and more.

- Blind-mate, fixed and float-mount interconnects for non-ITAR commercial as well as military/defense applications
- Adjustable separation force (AKA assisted-release, zero extraction force) solutions
- Misalignment accommodation and special auxiliary sealing for trouble-free blind mating in environmental applications
- Available in most symmetrical MIL-STD-1560 insert arrangements with contacts sizes from #23 to #8
- Selected materials offer low outgassing properties and high resistance to both corrosion and stress corrosion cracking
- NASA outgassing bake-out process available
- Designed to withstand the rigors of launch and flight—including shock, vibration, thermal vacuum, acceleration, and temperature extremes
- Standard accessory threads and teeth per MIL-DTL-38999 accommodate a wide range of backshell accessories
- Crimp-removable contacts standard. Consult factory for PC tails, dual-flange standoffs, custom blind-mate configurations, and hermetically sealed options

Current Rating	
Size Contact	Amps
23	5
22D	5
20	7.5
16	13
12	23

Altitude (Feet)	Unmated Test Voltages, AC RMS, 60 Hz			
	Service Rating M	Service Rating N	Service Rating I	Service Rating II
Sea Level	1300	1000	1800	2300
50,000	550	400	600	800
70,000	350	260	400	500
100,000	200	260	200	200

# Space-grade, blind-mate connectors

## Float-mount and adjustable separation force connectors

### MIL-DTL-38999 Series III type, environmental, crimp contact

#### CRITICAL MECHANICAL FEATURES OF BLIND-MATE AND ADJUSTABLE SEPARATION FORCE (ZEF) CONNECTORS



**Roll-off nose:** allows for the smooth disconnection of blind mate plugs and receptacles. Without this feature, connectors can catch or hang during mate and demate.



**Float mounting:** allows for a modicum of coplanar movement of the receptacle during rack-and-panel and other blind mate applications, preventing both contact and shell damage.



**Misalignment accommodation:** Additional radial, axial, and angular misalignment during mating is accounted for in the receptacle design with integral wave springs.



**Sealing:** Misalignment accommodation makes environmental sealing difficult in blind-mate connectors. The problem is solved with auxiliary external seals.



**EMI shielding:** Glenair incorporates ground springs in receptacle connectors as well as grounding fingers in special coupling nut-equipped plugs (253-018-G6 feed-thru shown) to optimize 360° shell-to-shell continuity.



**Assisted separation force:** Glenair supplies two styles of spring-loaded blind-mate connectors. **Adjustable kick-off styles** feature spring-loaded posts on the plug and an adjustment ring on the receptacle used to calibrate separation force. A second style uses wave springs on the shell body.



Available non-ITAR environmental blind-mate and adjustable separation force solutions		
Basic Part No.	Description	Mates With
<a href="#">253-014</a>	Fixed jam-nut mount plug with roll-on/roll-off nose and Accessory threads	<a href="#">253-015</a>
<a href="#">253-015</a>	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	<a href="#">253-014</a>
<a href="#">253-016</a>	Fixed wall mount plug with spring assist (zero separation force)	<a href="#">253-017</a>
<a href="#">253-017</a>	Floating wall mount receptacle with adjustable separation force and misalignment accommodation	<a href="#">253-016</a>
<a href="#">253-018-07</a>	Blind-mate feed-thru, jam-nut mount plug with B-side D38999 type receptacle mating interface and assisted kick-off (spring force)	<a href="#">253-019</a>
<a href="#">253-018-G6</a>	Blind-mate in-line feed-thru with B-side D38999 type plug mating interface and assisted kick-off (spring force)	<a href="#">253-019</a>
<a href="#">253-019</a>	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	<a href="#">253-018</a>
<a href="#">253-031</a>	Blind-mate jam-nut mount plug with kick-off spring and accessory threads	<a href="#">253-032</a>
<a href="#">253-032</a>	Floating jam-nut mount receptacle with misalignment accommodation	<a href="#">253-031</a>
<a href="#">253-033</a>	Float mount feed-thru, jam nut mount receptacle to 38999 type Series III plug mating interface	<a href="#">253-019</a>
<a href="#">253-025</a>	Locking circuit and test mate connector	<a href="#">253-016</a>

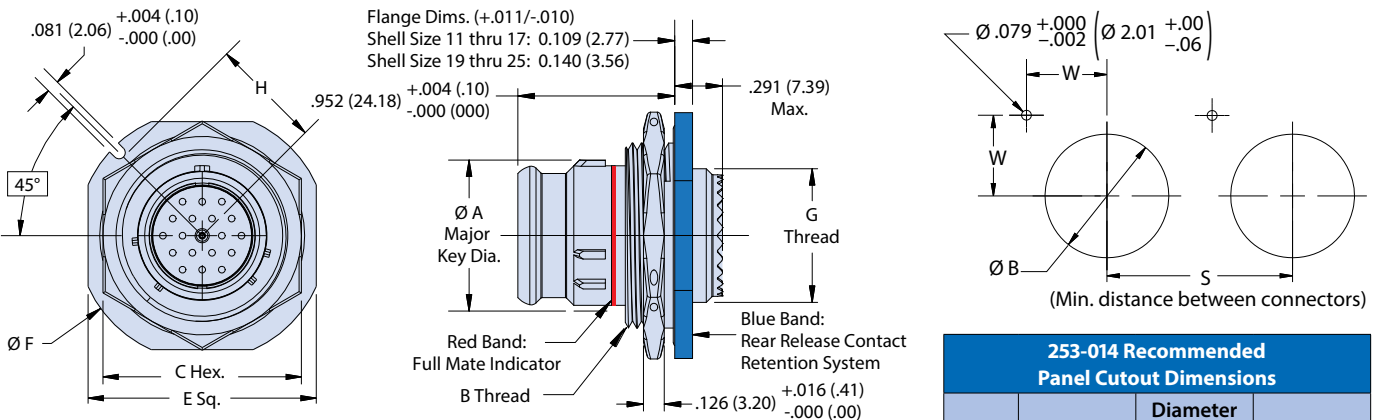
# Space-grade, blind-mate connectors Plug and receptacle pair, jam-nut mount with misalignment accommodation and optional sealing



Part Number Development														
Sample Part Number	253-014						-07	ME	25-35	P	N	NS	H	
Series / Basic Part No.	253 = Blind-mate -014 = Plug (fixed mount) -015 = Receptacle (float mount)													
Connector Style	07 = Jam nut mount; contact factory for wall mount receptacles													
Material/Finish	ME = Aluminum, electroless nickel ZL = CRES, electrodeposited nickel MT = Aluminum, nickel PTFE Z1 = CRES, passivated													
Shell Size - Insert Arrangement*	Per MIL-STD-1560; symmetrical layouts only, consult factory for complete details													
Contact Type	P = Pin, crimp removable S = Socket, crimp removable A = Pin insert, less contacts B = Socket insert, less contacts													
Alternate Polarization	A, B, C, D, E, N = Normal (Polarization for intermateability with 253-014 is per MIL-DTL-38999 Series I)													
Non Sealing	NS = Non-Sealing (omit for external elastomer seal version, applies to 253-015 only)													
Jam-Nut Type	H = Hex S = Spanner with wire holes (applies to 015 only)													

\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

## 253-014 FIXED JAM-NUT MOUNT PLUG WITH ROLL-ON/ROLL-OFF NOSE AND ACCESSORY THREADS



Shell Size	A Max Dia.	Thread B Class 2A	C Max	E (±.016)	F Max Dia.	G Thread Class 2A	H (+.0/- .008)
11	.673 (17.09)	.8125-20 UNEF	1.016 (25.81)	1.250 (31.75)	1.386 (35.20)	.5625-24	.604 (15.34)
13	.798 (20.27)	1.0000-20 UNEF	1.181 (30.00)	1.375 (34.92)	1.511 (38.38)	.6875-24	.666 (16.92)
15	.923 (23.44)	1.1250-18 UNEF	1.300 (33.02)	1.500 (38.10)	1.636 (41.55)	.8125-20	.729 (18.52)
17	1.048 (26.62)	1.2500-18 UNEF	1.457 (37.01)	1.625 (41.28)	1.761 (44.73)	.9375-20	.791 (20.09)
19	1.173 (29.79)	1.3750-18 UNEF	1.575 (40.00)	1.812 (46.02)	1.949 (49.50)	1.0625-18	.893 (22.68)
21	1.298 (32.97)	1.5000-18 UNEF	1.693 (43.00)	1.938 (49.23)	2.073 (52.65)	1.1875-18	.955 (24.26)
23	1.423 (36.14)	1.6250-18 UNEF	1.880 (47.75)	2.062 (52.37)	2.200 (55.88)	1.3125-18	1.017 (25.83)
25	1.548 (39.32)	1.7500-18 UNS	2.016 (51.21)	2.187 (55.55)	2.323 (59.00)	1.4375-18	1.096 (27.84)

Shell Size	W	Diameter B ±.004	S
11	.460 (11.68)	0.821 (20.85)	1.282 (32.56)
13	.504 (12.80)	1.007 (25.58)	1.417 (35.99)
15	.549 (13.94)	1.134 (28.80)	1.559 (39.60)
17	.593 (15.06)	1.259 (31.98)	1.705 (43.31)
19	.665 (16.89)	1.384 (35.15)	1.850 (46.99)
21	.709 (18.01)	1.507 (38.28)	1.992 (50.60)
23	.753 (19.13)	1.634 (41.50)	2.134 (54.20)
25	.797 (20.24)	1.759 (44.68)	2.350 (59.69)

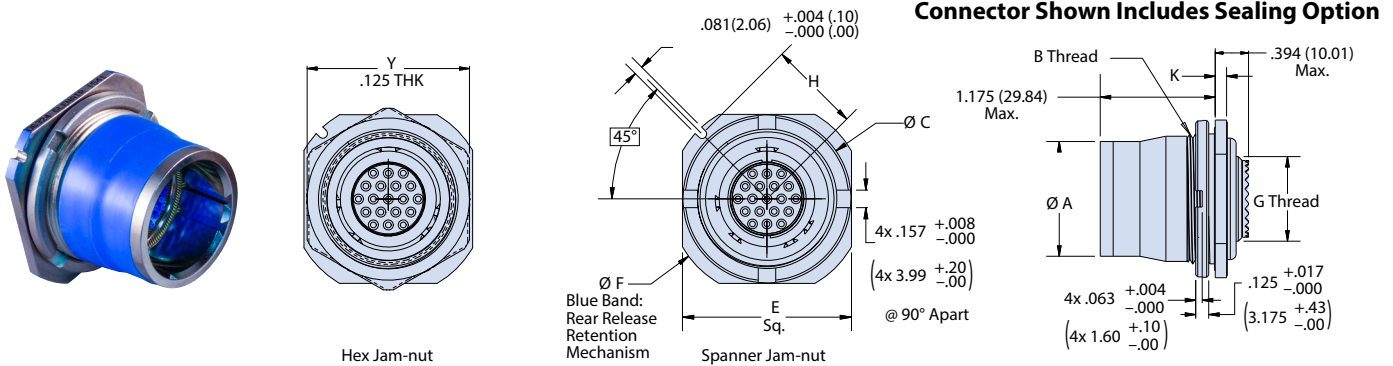
### NOTES:

- Glenair 253-014 is designed to mate with 253-015 with same insert arrangement.
  - Stainless steel locating pin to be shipped with connector
  - Misalignment capabilities are possible with 253-014, when mated to 253-015.
  - Contact manufacturer for outgassing options.
  - Material/finish
- Shell, jam-nut: see P/N development, finish
  - Insulator: high grade rigid dielectric/N.A.
  - Seals: fluorosilicone blend/N.A.
  - contacts: copper alloy/gold plated

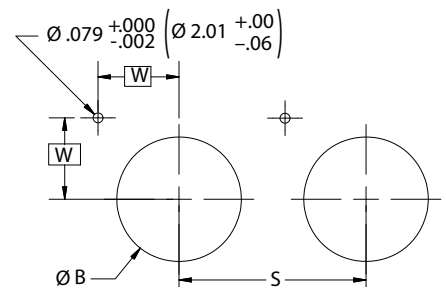
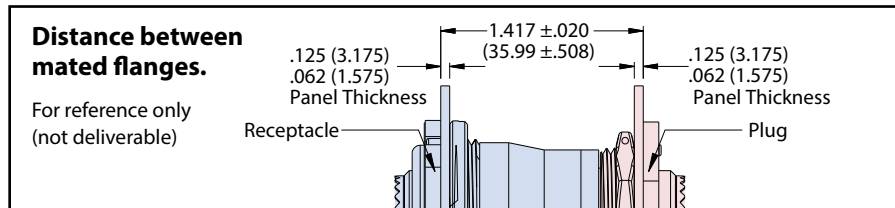
# Space-grade blind-mate connectors

## Plug and receptacle pair, jam-nut mount with misalignment accommodation and optional sealing

### 253-015 FLOATING JAM-NUT MOUNT RECEPTACLE WITH MISALIGNMENT ACCOMMODATION AND OPTIONAL SEALING

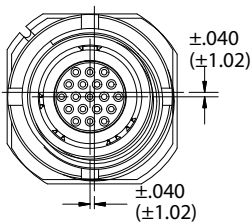


253-015 Dimensions									
Shell Size	A Max Dia.	Thread B Class 2A	C Max.	Y Hex	E ±.016(.41)	F Max Dia.	G Thd Class 2A	K +.011/.010 (+.28/.25)	H +0/- .008 (+0/- .20)
11	.853 (21.67)	1.0000-20 UNEF	1.264 (32.11)	1.181 (30.00)	1.266 (32.16)	1.500 (38.10)	.5625-24	.109 (2.77)	.666 (16.92)
13	.978 (24.84)	1.1250-18 UNEF	1.388 (35.26)	1.300 (33.02)	1.391 (35.33)	1.641 (41.68)	.6875-24	.109 (2.77)	.729 (18.52)
15	1.103 (28.02)	1.2500-18 UNEF	1.512 (38.40)	1.457 (37.01)	1.516 (38.51)	1.750 (44.45)	.8125-20	.109 (2.77)	.791 (20.09)
17	1.228 (31.19)	1.3750-18 UNEF	1.638 (41.61)	1.575 (40.00)	1.641 (41.68)	1.938 (49.23)	.9375-20	.109 (2.77)	.893 (22.68)
19	1.353 (34.37)	1.5000-18 UNEF	1.823 (46.30)	1.693 (43.00)	1.828 (46.43)	2.062 (52.37)	1.0625-18	.140 (3.56)	.955 (24.26)
21	1.478 (37.54)	1.6250-18 UNEF	1.953 (49.61)	1.880 (47.75)	1.954 (49.63)	2.188 (55.58)	1.1875-18	.140 (3.56)	1.017 (25.83)
23	1.603 (40.72)	1.7500-18 UNS	2.075 (52.71)	2.010 (51.05)	2.078 (52.78)	2.312 (58.72)	1.3125-18	.140 (3.56)	1.080 (27.43)
25	1.728 (43.89)	1.8750-16 UNS	2.122 (53.90)	2.125 (53.97)	2.128 (54.05)	2.327 (59.11)	1.4375-18	.140 (3.56)	1.086 (27.58)

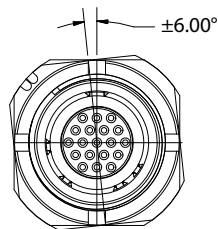


### 253-015 Misalignment Capabilities

Axial Misalignment

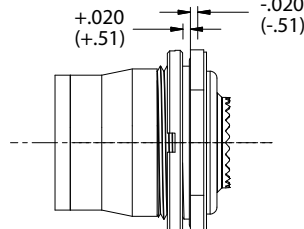


Angular Misalignment



Reference Only (Not Deliverable)

Longitudinal Misalignment



253-015 Recommended Panel Cutout Dimensions			
Shell Size	W	B Dia. ±.004 (.10)	S
11	.504 (12.80)	1.007 (25.58)	1.282 (32.56)
13	.549 (13.94)	1.134 (28.80)	1.417 (35.99)
15	.593 (15.06)	1.259 (31.98)	1.559 (39.60)
17	.665 (16.89)	1.384 (35.15)	1.705 (43.31)
19	.709 (18.01)	1.507 (38.28)	1.850 (46.99)
21	.753 (19.13)	1.634 (41.50)	1.992 (50.60)
23	.797 (20.24)	1.759 (44.68)	2.134 (54.20)
25	.842 (21.39)	1.884 (47.85)	2.262 (57.45)

# Space-grade, blind mate connectors

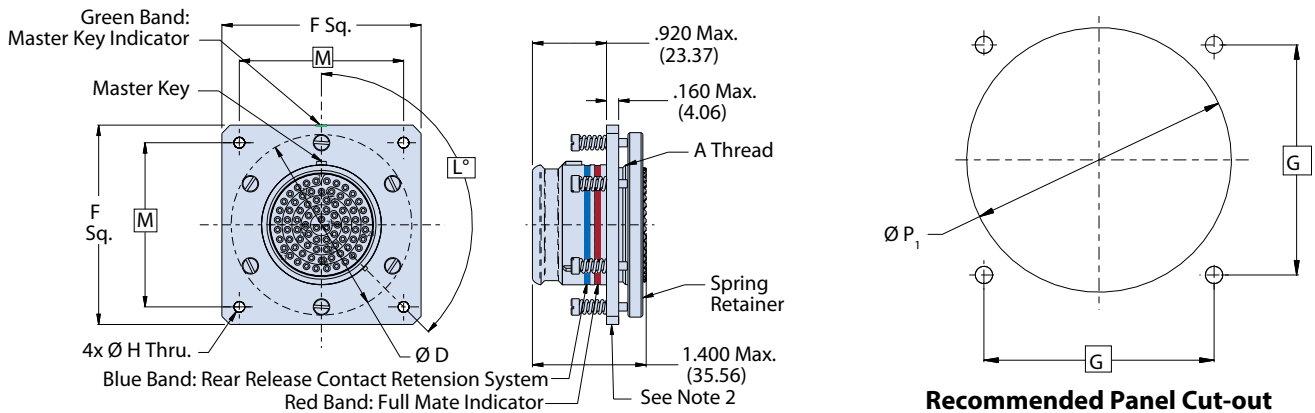
## Wall mount assisted separation force (ZEF)

### plug and receptacle pair with misalignment accommodation

Part Number Development	
<b>Sample Part Number</b>	<b>253-016</b> 00 ME 21-35 S N MS A
<b>Series / Basic Part No.</b>	253 = Blind-mate connector with adjustable assisted separation force -016 = Plug (fixed mount) -017 = Receptacle (float mount)
<b>Connector Style</b>	00 = Wall mount
<b>Material/Finish</b>	ME = Aluminum, electroless nickel ZL = CRES, electrodeposited nickel MT = Aluminum, nickel PTFE Z1 = CRES, passivated
<b>Shell Size-Insert Arrangement</b>	Per MIL-STD-1560
<b>Contact Type</b>	P = Pin, crimp removable S = Socket, crimp removable
<b>Alternate Polarization</b>	A = 40°, B = 65°, C = 80°, D = 210°, E = 250°, F = 280°, G = 310°, H = 330°, N = 135° (Normal) Per L°
<b>Contact Type</b>	MS = Military specification
<b>Adjustment Ring Material</b>	(253-017 receptacle only) A = Aluminum C = Corrosion-resistant steel

\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

### 253-016 FIXED WALL MOUNT PLUG WITH SPRING ASSIST (ZERO SEPARATION FORCE)



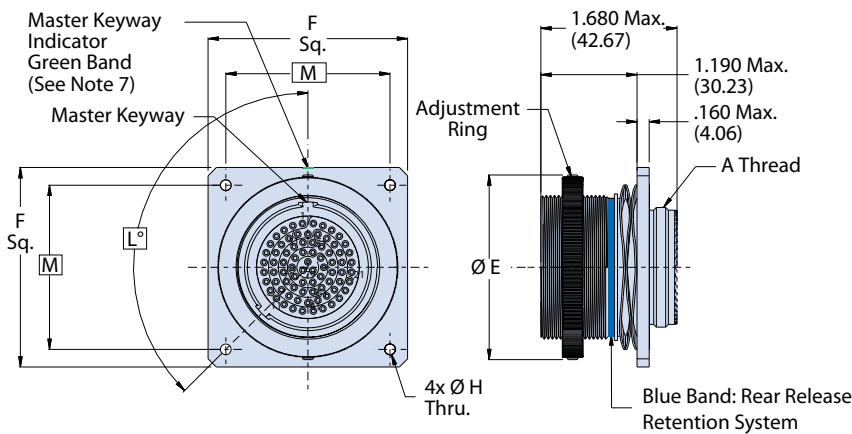
Dimensions for 253-016 and 253-017									
Shell Size	F Flange ±.010 (±.25)	M Square	Ø H ±.005 (±.13)	Ø D Max.	Ø E Max.	A Thread	Ø P <sub>1</sub> ±.005 (±.13)	Ø P <sub>2</sub> ±.005 (±.13)	G Square
9	1.430(36.32)	1.000(25.40)	.128(3.25)	1.250(31.75)	1.300 (33.02)	M12 X 1.0-6g-0.100R	1.300(33.02)	1.330 (33.78)	1.150 (29.21)
11	1.555(39.50)	1.200(30.48)	.128(3.25)	1.375(34.93)	1.425 (36.20)	M15 X 1.0-6g-0.100R	1.425(36.20)	1.455 (36.96)	1.200 (30.48)
13	1.680(42.67)	1.250(31.75)	.128(3.25)	1.500(38.10)	1.550 (39.37)	M18 X 1.0-6g-0.100R	1.550(39.37)	1.580 (40.13)	1.250 (31.75)
15	1.805(45.85)	1.375(34.93)	.128(3.25)	1.625(41.28)	1.675 (42.55)	M22 X 1.0-6g-0.100R	1.675(42.55)	1.705 (43.31)	1.375 (34.92)
17	1.930(49.02)	1.500(38.10)	.128(3.25)	1.750(44.45)	1.800 (45.72)	M25 X 1.0-6g-0.100R	1.800(45.72)	1.830 (46.48)	1.500 (38.10)
19	2.055(52.20)	1.625(41.28)	.128(3.25)	1.875(47.63)	1.925 (48.90)	M28 X 1.0-6g-0.100R	1.925(48.90)	1.955 (49.66)	1.625 (41.28)
21	2.180(55.37)	1.750(44.45)	.128(3.25)	2.000(50.80)	2.050 (52.07)	M31 X 1.0-6g-0.100R	2.050(52.07)	2.080 (52.83)	1.750 (44.45)
23	2.305(58.55)	1.875(47.63)	.154(3.91)	2.125(53.98)	2.175 (55.25)	M34 X 1.0-6g-0.100R	2.175(55.25)	2.205 (56.01)	1.875 (47.63)
25	2.430(61.72)	2.000(50.80)	.150(3.81)	2.250(57.15)	2.300 (58.42)	M37 X 1.0-6g-0.100R	2.300(58.42)	2.330 (59.18)	2.000 (50.80)

# Space-grade, blind-mate connectors

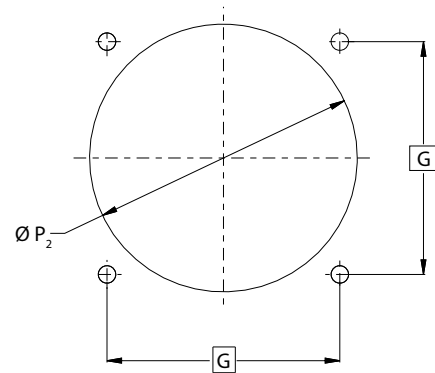
## Wall mount assisted separation force (ZEF)

### plug and receptacle pair with misalignment accommodation

#### 253-017 FLOATING WALL MOUNT RECEPTACLE WITH ADJUSTABLE SEPARATION FORCE AND MISALIGNMENT ACCOMMODATION



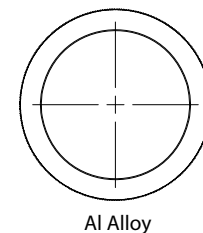
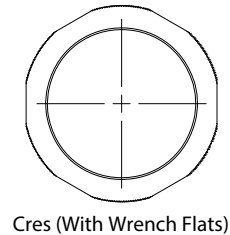
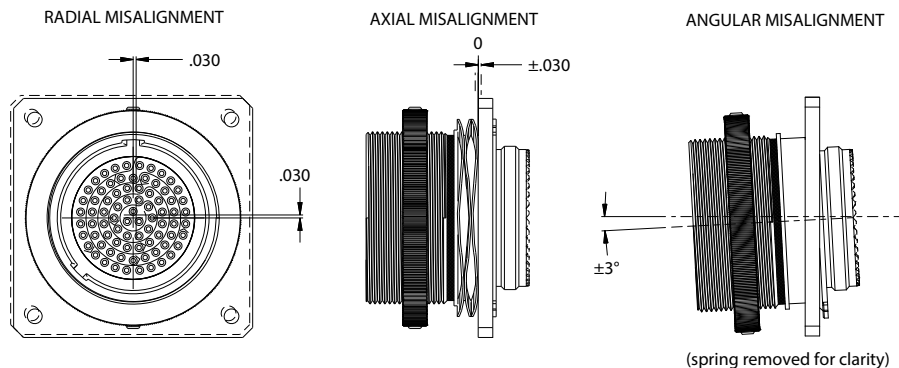
#### Recommended Panel Cut Out



#### 253-017 Misalignment Capabilities

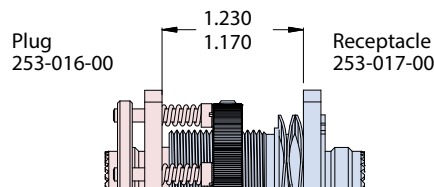
#### Adjustment Ring Geometry and Material Options

Contact manufacturer for other options



#### Distance between mated flanges.

For reference only (not deliverable)



#### NOTES:

- 253-017 mates with 253-016 fixed series.
- Distance between mated mounting flanges: 1.170/1.230. Consult manufacturer other distance between mounting flanges is required
- Separation force is adjustable  $\pm 5$  lbs when mated with 253-016 and 253-017 pairs have adjustable separation force of  $\pm 5$  lbs
- See Space-Grade guidelines material, in this section, for outgassing/screening options available
- Spares: pin or socket contacts IAW AS39029 or per Glenair part number if controlled force contacts
- Contact factory for PC tail versions
- Material/finish
  - Shell (016 and 017), ring (017), retainer ring (016): see P/N development, finish
  - Wave spring(017), springs and spring retainer (016): CRES/passivated
  - Insulators: high grade rigid dielectric/N.A.
  - Seals: fluorosilicone blend/N.A.

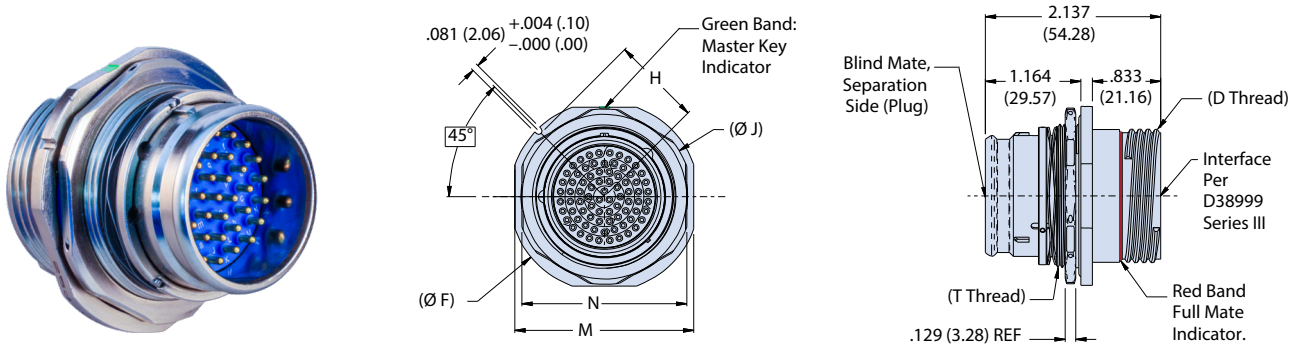
# Space-grade, blind-mate connectors

## Bulkhead feed-thrus with assisted kick-off and standard triple-start plug and receptacle mating interfaces

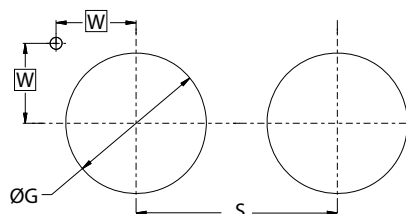
Part Number Development									
Sample Part Number	253-018				-07	ME	25-35	PP	N
Series / Basic Part No.	253-018 = Blind-mate feed-thru								
Connector Style	-07 = Jam-nut mount, feed-thru plug (fixed) with rear D38999 type receptacle interface -G6 = In-line plug with rear D38999 type plug interface and EMI spring								
Material/Finish	ME = Aluminum, electroless nickel    ZL = CRES, electrodeposited nickel MT = Aluminum, nickel PTFE        Z1 = CRES, passivated								
Shell Size-Insert Arrangement*	Per MIL-STD-1560								
Contact Type	PP = Pin on both sides            BSDP = Blind-mate side socket - D38999 side pin SS = Socket on both sides        BPDS = Blind-mate side pin - D38999 side socket								
Alternate Polarization*	A = 40°, B = 65°, C = 80°, D = 210°, E = 250°, F = 280°, G = 310°, H = 330°, N = 135° (Normal) Per L°. G6 only Refers to blind mate side. Plug/Receptacle side per MIL-DTL-38999								

\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

### 253-018-07 BLIND-MATE FEED-THRU, JAM-NUT MOUNT PLUG WITH B-SIDE D38999 TYPE RECEPTACLE MATING INTERFACE AND ASSISTED KICK-OFF (SPRING FORCE)



Dimensions							
Shell Size	F Flange	H (End of Slot) [+0/-0.008 (-.20)]	Ø J, Jam Nut	N, Jam Nut Flat	M, Flange Flats ±.010 (±.25)	T Thread Class 2A	D Thread 0.1P-0.3L-TS-2
13	1.515 (38.48)	.666 (16.92)	1.375 (34.93)	1.175 (29.85)	1.430 (36.32)	1.000-20 UNEF	0.875 (22.23)
15	1.636 (41.55)	.729 (18.52)	1.500 (38.10)	1.300 (33.02)	1.500 (38.10)	1.125-18 UNEF	1.000 (25.40)
21	2.065 (52.45)	.955 (24.26)	1.875 (47.63)	1.688 (42.88)	1.930 (49.02)	1.500-18 UNEF	1.375 (34.92)
23	2.200 (55.88)	1.017 (25.83)	2.063 (52.40)	1.875 (47.63)	2.060 (52.32)	1.625-18 UNEF	1.500 (38.10)
25	2.316 (58.83)	1.096 (27.84)	2.141 (54.38)	2.010 (51.05)	2.180 (55.37)	1.750-18 UNS	1.625 (41.28)



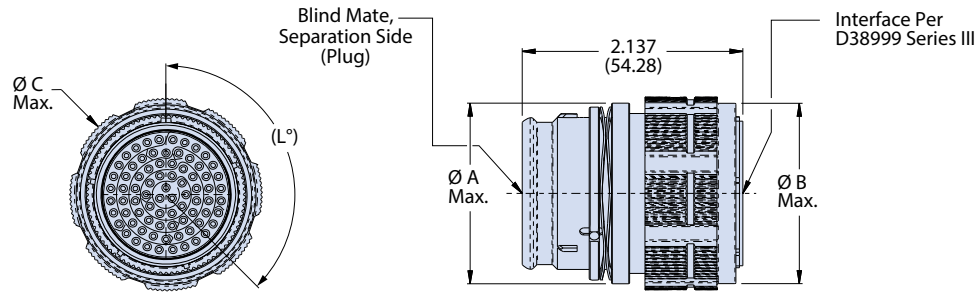
Panel Cut-Out			
Shell Size	Ø G, Thru Hole ±.004	W (Basic)	S
13	1.009 (25.63)	.504 (12.80)	1.460 (37.08)
15	1.134 (28.80)	.549 (13.94)	1.545 (39.24)
21	1.509 (38.33)	.709 (18.01)	1.995 (50.67)
23	1.634 (41.50)	.753 (19.13)	2.120 (53.85)
25	1.759 (44.68)	.809 (20.55)	2.315 (58.80)

# Space-grade, blind mate connectors

## Feed-thru plug, jam-nut mount or in-line

### IAW MIL-DTL-38999 Series III

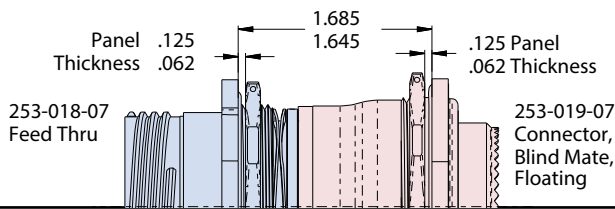
#### 253-018-G6 BLIND-MATE IN-LINE PLUG WITH B-SIDE D38999 TYPE PLUG MATING INTERFACE AND ASSISTED KICK-OFF (SPRING FORCE)



Dimensions for 253-018-G6 Plug			
Shell Size	Ø A Max	Ø B Max.	Ø C Max
13	1.020 (25.91)	1.025 (26.03)	1.175 (29.85)
15	1.145 (29.08)	1.155 (29.34)	1.295 (32.89)
21	1.520 (38.61)	1.525 (38.73)	1.660 (42.16)
23	1.645 (41.78)	1.645 (41.78)	1.765 (44.83)
25	1.770 (44.96)	1.770 (44.96)	1.890 (48.01)

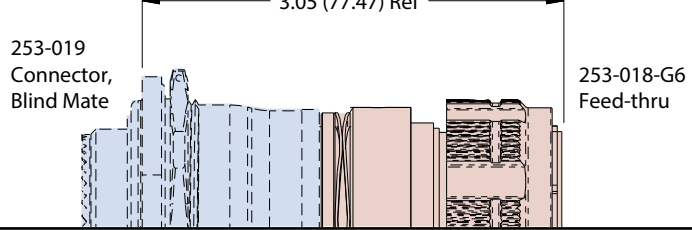
#### Distance between mated flanges.

For reference only (not deliverable)



#### Distance between mated connectors.

For reference only (not deliverable)



#### NOTES:

- Mates with 253-019 and D38999 series III connectors with same insert arrangement and polarization
- Distance between mated mounting flanges: 1.685/1.645. Consult manufacturer if other distance between mated mounting flanges is required
- Misalignment capabilities are possible with mated pair reference Glenair connector 253-019.
- See Space-Grade guidelines material, in this section, for outgassing/screening options available
- Stainless steel locating pin (Ø.079) shipped with each -07 jam-nut receptacle connector
- For feed-thru connector configurations that are either pin/pin or socket/socket, the position identification/ marking on the D38999 side of the connector will be as shown in MIL-STD-1560. The blind mate separation side will be the reverse identification marking
- Blind mate side mates with 253-019 with reverse silkscreen marking for contact type PP (pin on both sides) or SS (socket on both sides)
- Kick-off spring is not intended to offset all of the contact retention force for each insert arrangement
- Material/finish
  - Shell, jam-nut coupling nut: see part number development, finish
  - Spring: CRES/passivated
  - Insulators: high grade rigid dielectric/N.A.
  - O-ring: fluorosilicone blend
  - Contacts: copper alloy/gold plated



# Space-grade, blind mate connectors

## Floating jam-nut mount receptacle

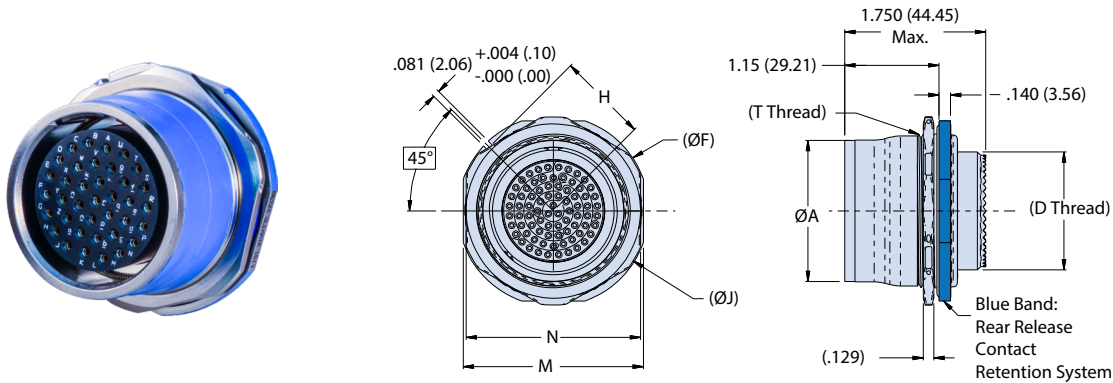
### for use with 253-018 bulkhead feed-thru



Part Number Development									
Sample Part Number	253-019				-07	ME	25-35	S	N
Series / Basic Part No.	253-019 = Blind-mate receptacle for use with 253-018 bulkhead feed-thru								
Connector Mounting	07 = Jam-nut mount (float mount), receptacle 007 = Jam-nut mount (float mount), receptacle; reverse silkscreen marking								
Material/Finish	ME = Aluminum, electroless nickel    ZL = CRES, electrodeposited nickel MT = Aluminum, nickel PTFE        Z1 = CRES, passivated								
Shell Size-Insert Arrangement*	Per MIL-STD-1560; symmetrical layouts only, consult factory for complete details								
Contact Type	S = Socket, crimp removable    P = Pin, crimp removable								
Alternate Polarization*	A = 40°, B = 65°, C = 80°, D = 210°, E = 250°, F = 280°, G = 310°, H = 330°, N = 135° (Normal) Per L°. G6 only Refers to blind mate side. Plug/Receptacle side per MIL-DTL-38999								

\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

### 253-019 FLOATING JAM-NUT MOUNT RECEPTACLE WITH MISALIGNMENT ACCOMMODATION AND OPTIONAL SEALING: MATES WITH 253-018 BULKHEAD FEED-THRU



Dimensions for 253-019-07 Jam Nut Receptacle								
Shell Size	F Flange	H (End of Slot) 0.0/-0.008(0.0/-0.20)	Ø J Jam Nut	N, Jam Nut Flat ±.010 (±.25)	M, Flange Flats ±.010 (±.25)	T Thread Class 2A	D Thread Class 2A	Ø A ±.010 (±.25)
13	1.640 (41.66)	0.729 (18.52)	1.500 (38.10)	1.300 (33.02)	1.390 (35.31)	1.125-18 UNEF	.6875-24	.970 (24.64)
15	1.750 (44.45)	0.791 (20.09)	1.625 (41.28)	1.450 (36.83)	1.515 (38.48)	1.250-18 UNEF	.8125-20	1.105 (28.07)
21	2.180 (55.37)	1.017 (25.83)	2.063 (52.40)	1.875 (47.63)	1.955 (49.66)	1.625-18 UNEF	1.1875-18	1.475 (37.47)
23	2.315 (58.80)	1.076 (27.33)	2.141 (54.38)	2.010 (51.05)	2.080 (52.83)	1.750-18 UNS	1.3125-18	1.595 (40.51)
25	2.330 (59.18)	1.100 (27.94)	2.300 (58.42)	2.125 (53.98)	2.195 (55.75)	1.875-16 UN	1.4375-18	1.720 (43.69)

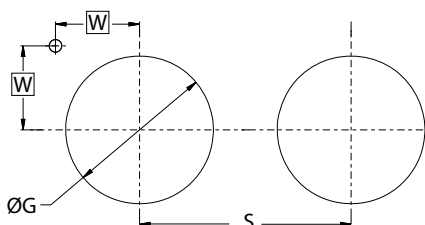


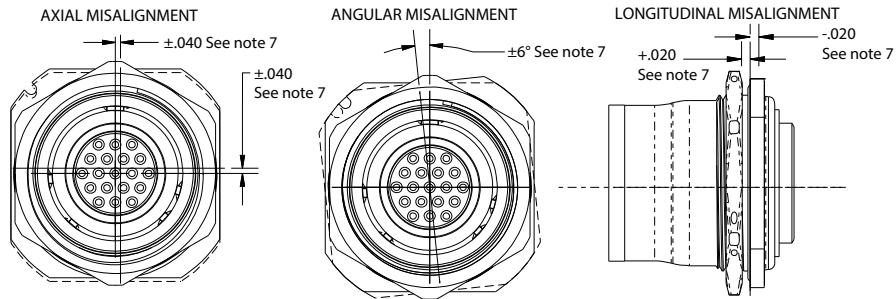
Table IV 253-019-07 Panel Cut-Out		
Shell Size	Ø G, Thru-Hole ±.004	W (Basic)
13	1.134 (28.80)	.549 (13.94)
15	1.259 (31.98)	.593 (15.06)
21	1.634 (41.50)	.753 (19.13)
23	1.759 (44.68)	.797 (20.24)
25	1.884 (47.85)	.810 (20.57)

# Space-grade, blind mate connectors

## Floating jam-nut mount receptacle

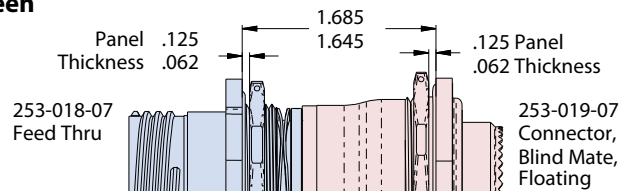
### for use with 253-018 bulkhead feed-thru

#### 253-019 Misalignment Capabilities



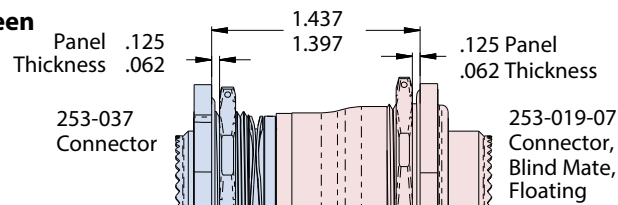
#### Distance between mated flanges.

For reference only  
(not deliverable)



#### Distance between mated flanges.

For reference only  
(not deliverable)



#### NOTES:

- Connector mates with Glenair 253-018 and 253-037 fixed series connectors having same insert arrangement and polarization.
- Distance between mated mounting flanges as shown. Consult manufacturer if other distance between mated mounting flanges is required.
- Misalignment capability as shown.
- See Space-Grade guidelines material, in this section, for outgassing/screening options available
- Stainless steel locating pin ( $\varnothing .079$ ) shipped with each connector
- Contact factory for PC tail versions.
- Dimensions and features are intended for customer use only.
- Dimensions are reference only and not measured during final inspection at factory.
- Connector style 007, jam nut mount with reverse silkscreen marking is used when mating to 253-018 feed-thru connector that is contact type PP (pin on both sides) or SS (socket on both sides).
- Material/finish
  - Shell, jam-nut: see part number development, finish
  - Spring: CRES/passivated
  - Insulators: high grade rigid dielectric/N.A.
  - Seals: fluorosilicone blend, silicone
  - Contacts: copper alloy/gold plated

# Space-grade, blind mate connectors

## Plug, jam-nut mount

### with assisted kick-off (spring force)

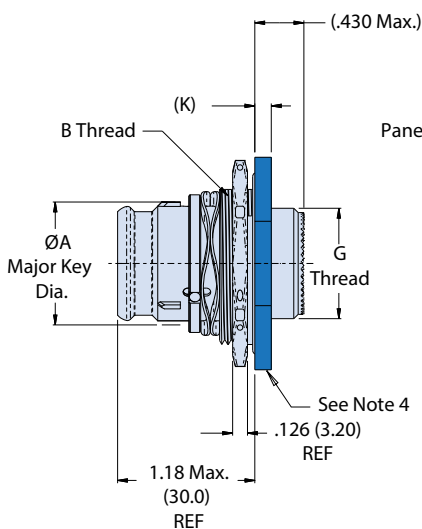
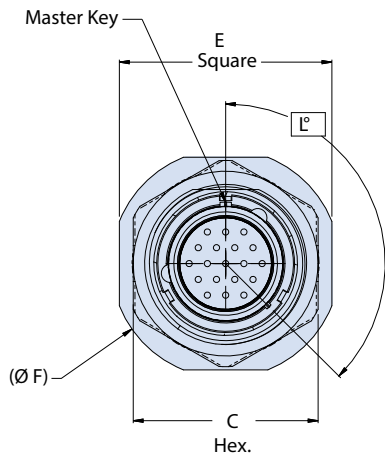


Part Number Development						
Sample Part Number	253-031	-07	ME	25-35	P	N
Series / Basic Part No.	253-031 Blind-mate plug with non-adjustable assisted separation					
Connector Mounting	-07 = Fixed jam-nut mount plug					
Material/Finish	ME = Aluminum, electroless nickel    ZL = CRES, electrodeposited nickel MT = Aluminum, nickel PTFE        Z1 = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560					
Contact Type	P = Pin, crimp removable    A = Pin insert less contacts S = Socket, crimp removable    B = Socket insert less contacts					
Alternate Polarization*	A = 40°, B = 65°, C = 80°, D = 210°, E = 250°, F = 280°, G = 310°, H = 330°, N = 135° (Normal) Per L° BSC. Refers to blind mate side.					

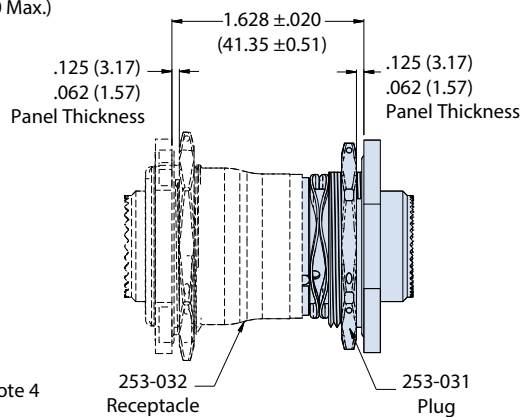
\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

### 253-031 BLIND-MATE JAM-NUT MOUNT PLUG WITH KICK-OFF SPRING AND ACCESSORY THREADS

07 - Receptacle, Jam Nut Mount



Mated Jam Mount Connectors



\*Dimensions shown are for reference only and not intended to be verified during final inspection

**NOTES:**

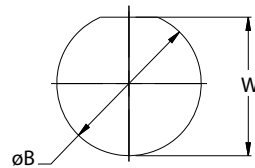
- Connector mates with Glenair 253-032 series connector, having the same insert arrangement and polarization.
- Insert arrangement is in accordance with MIL-STD-1560 arrangements only. Contact manufacturer for availability.
- See Space-Grade guidelines material, in this section, for outgassing/screening options available
- Blue color band indicates rear release contact retention mechanism.
- Kick-off spring is not intended to offset all of the contact retention force for each insert arrangement
- Material/ finish:
  - Shell, jam-nut: see part number development table, finish
  - Insulators: high grade rigid dielectric / N.A.
  - Contacts: copper alloy/gold plated
  - O-ring: fluorosilicone blend / N.A.

# Space-grade, blind mate connectors

## Plug, jam-nut mount

### with assisted kick-off (spring force)

Dimensions							
Shell Size	ØA Max	Thd B Class 2A	C Max	E ±.016(0.4)	ØF Max	G Thd Class 2A	K .011/-0.010 (.28/.25)
11	.673 (17.09)	1.0000-20 UNEF	1.181 (30.00)	1.375 (34.92)	1.511 (38.38)	.5625-24	.109 (2.77)
13	.798 (20.27)	1.1250-18 UNEF	1.300 (33.02)	1.500 (38.10)	1.636 (41.55)	.6875-24	.109 (2.77)
15	.923 (23.44)	1.2500-18 UNEF	1.457 (37.01)	1.625 (41.28)	1.761 (44.73)	.8125-20	.109 (2.77)
17	1.048 (26.62)	1.3750-18 UNEF	1.575 (40.00)	1.812 (46.02)	1.949 (49.50)	.9375-20	.140 (3.56)
19	1.173 (29.79)	1.5000-18 UNEF	1.693 (43.00)	1.938 (49.23)	2.073 (52.65)	1.0625-18	.140 (3.56)
21	1.298 (32.97)	1.6250-18 UNEF	1.811 (46.00)	2.062 (52.37)	2.200 (55.88)	1.1875-18	.140 (3.56)
23	1.423 (36.14)	1.7500-18 UNS	2.016 (51.21)	2.187 (55.55)	2.323 (59.00)	1.3125-18	.140 (3.56)
25	1.548 (39.32)	1.8750-16 UNS	2.125 (53.97)	2.312 (58.72)	2.448 (62.18)	1.4375-18	.140 (3.56)



Recommended Panel Cutout		
Shell Size	Ø B .010/-0.000 (0.25/.00)	W +.000/-0.010 (.00/-.25)
11	1.010	0.955
13	1.135	1.085
15	1.260	1.210
17	1.385	1.335
19	1.510	1.460
21	1.635	1.585
23	1.760	1.710
25	1.885	1.835

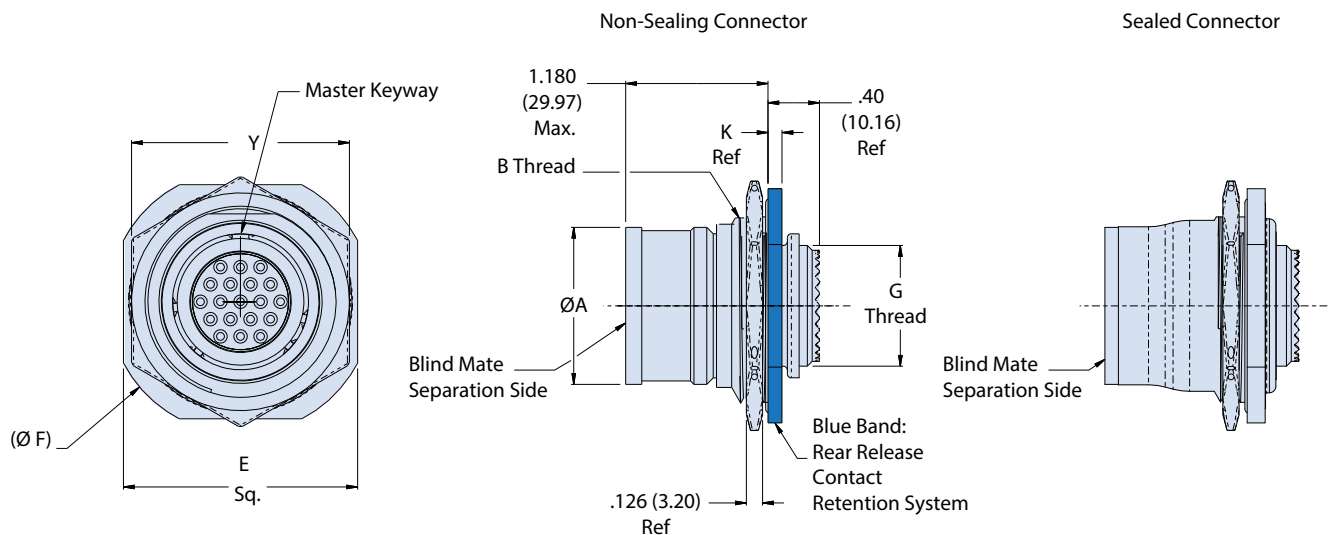
# Blind-mate floating jam-nut mount receptacle

with misalignment accommodation; for use with 253-031 plug

Part Number Development						
Sample Part Number	253-032	-07	ME	25-35	S	N NS
Series / Basic Part No.	253-032 = Blind-mate receptacle for use with 253-031 plug					
Connector Mounting	-07 = Floating jam nut mount receptacle					
Material/Finish	ME = Aluminum, electroless nickel    ZL = CRES, electrodeposited nickel MT = Aluminum, nickel PTFE        Z1 = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560; Symmetrical layouts only, consult factory for complete details.					
Contact Type	P = Pin, crimp removable            A = Pin insert less contacts S = Socket, crimp removable        B = Socket insert less contacts					
Alternate Polarization*	A = 40°, B = 65°, C = 80°, D = 210°, E = 250°, F = 280°, G = 310°, H = 330°, N = 135° (Normal) Per L° BSC. Refers to blind mate side.					
Non Sealing	NS = Non-Sealing (omit for external elastomer seal version)					

\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

## 253-032 FLOATING JAM-NUT MOUNT RECEPTACLE WITH MISALIGNMENT ACCOMMODATION; MATES WITH 253-031 ONLY



**NOTES:**

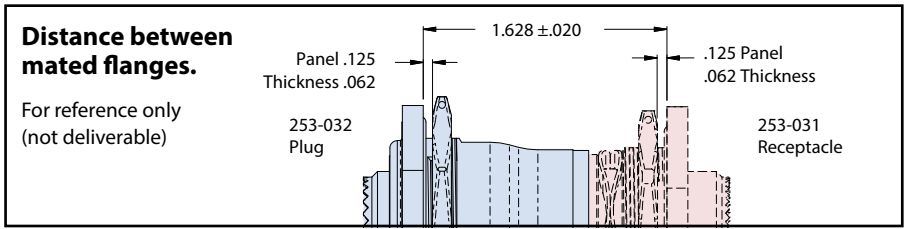
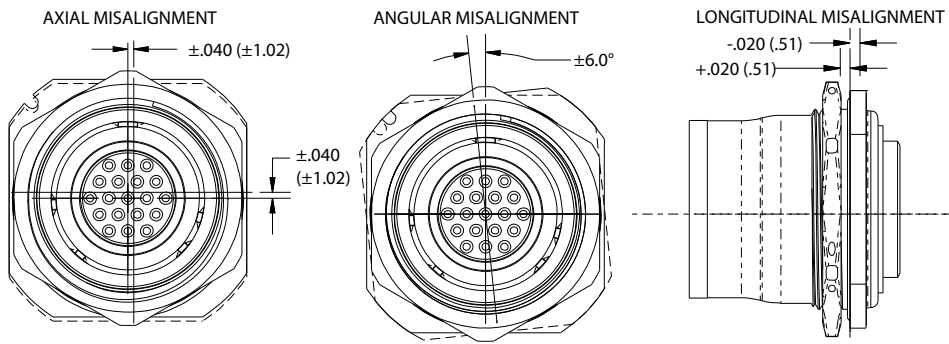
- Connector mates with Glenair 253-031 series connector, having the same insert arrangement and polarization.
- Insert arrangement is in accordance with MIL-STD-1560 arrangements only. Contact manufacturer for availability.
- Misalignment capabilities are possible when mated with Glenair connector 253-031
- See Space-Grade guidelines material, in this section, for outgassing/screening options available
- Material/ finish:
  - Shell, flange, jam-nut: see part number development, finish
  - Wave spring: CRES 17-7PH/passivate
  - Insulators: high grade rigid dielectric/N.A.
  - Contacts: copper alloy/gold plated
  - O-ring: fluorosilicone blend/N.A.

# Space-grade, blind mate connectors

## Floating jam-nut mount receptacle

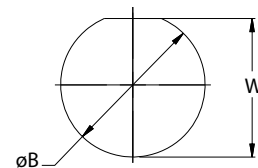
with misalignment accommodation; for use with 253-031 plug

### Misalignment Capabilities



Dimensions							
Shell Size	ØA Max	B Thd, Class 2A	Y Hex	E ±.016 (0.41)	Ø F Max	Thd G, Class 2A	K .011/-.010 (0.28/ 0.25)
11	.853 (21.67)	1.1250-18 UNEF	1.300 (33.02)	1.391 (35.33)	1.641 (41.68)	.5625-24	.109 (2.77)
13	.978 (24.84)	1.2500-18 UNEF	1.457 (37.01)	1.516 (38.51)	1.750 (44.45)	.6875-24	.109 (2.77)
15	1.103 (28.02)	1.3750-18 UNEF	1.575 (40.00)	1.641 (41.68)	1.938 (49.23)	.8125-20	.109 (2.77)
17	1.228 (31.19)	1.5000-18 UNEF	1.693 (43.00)	1.828 (46.43)	2.062 (52.37)	.9375-20	.140 (3.56)
19	1.353 (34.37)	1.6250-18 UNEF	1.811 (46.00)	1.954 (49.63)	2.188 (55.58)	1.0625-18	.140 (3.56)
21	1.478 (37.54)	1.7500-18 UNS	2.010 (51.05)	2.078 (52.78)	2.312 (58.72)	1.1875-18	.140 (3.56)
23	1.603 (40.72)	1.8750-16 UNS	2.209 (56.11)	2.128 (54.05)	2.327 (59.11)	1.3125-18	.140 (3.56)
25	1.728 (43.89)	2.0000-16 UN	2.334 (59.28)	2.253 (57.23)	2.452 (62.28)	1.4375-18	.140 (3.56)

Recommended Panel Cutout		
Shell Size	Ø B .010/-.000 (0.25/.00)	W +.000/-.010 (.00/-.25)
11	1.135 (28.83)	1.085 (27.56)
13	1.260 (32.00)	1.210 (30.73)
15	1.385 (35.18)	1.335 (33.91)
17	1.510 (38.35)	1.460 (37.08)
19	1.635 (41.53)	1.585 (40.26)
21	1.760 (44.70)	1.710 (43.43)
23	1.885 (47.88)	1.835 (46.61)
25	2.010 (51.05)	1.960 (49.78)



# Space-grade, blind-mate connectors

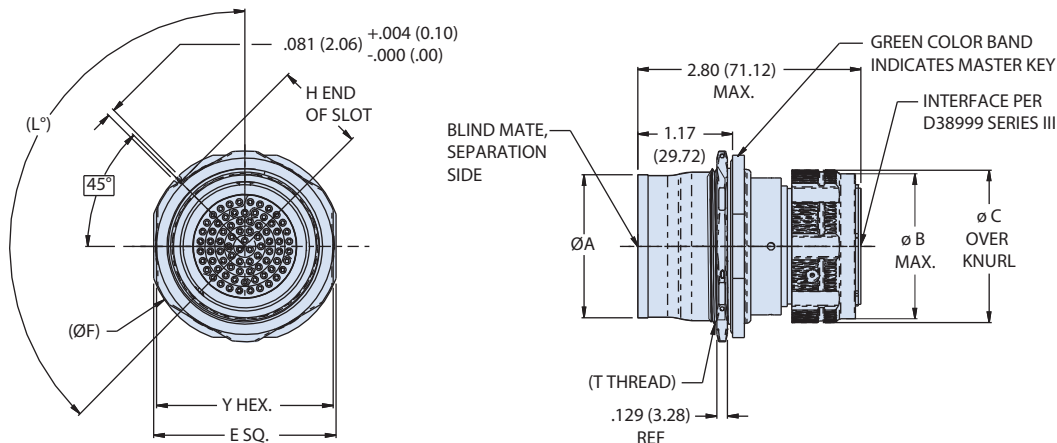
## Feed-thru receptacle, with D38999 type plug

### IAW MIL-DTL-38999 Series III

Part Number Development					
Sample Part Number	253-033	-07	ME	25-35	PP N
Series / Basic Part No.	253-033 = Floating jam-nut mount, feed-thru receptacle with rear D38999 Series III plug interface. Receptacle interface also available, contact factory				
Connector Style	-07 = Jam-nut mount, float mount				
Material/Finish	ME = Aluminum, electroless nickel    ZL = CRES, electrodeposited nickel MT = Aluminum, nickel PTFE        Z1 = CRES, passivated				
Shell Size-Insert Arrangement*	Per MIL-STD-1560; symmetrical layouts only, consult factory for complete details				
Contact Type	PP = Pin on both sides        BSDP = Blind-mate side socket - D38999 side pin SS = Socket on both sides    BPDS = Blind-mate side pin - D38999 side socket				
Alternate Polarization*	A = 40°, B = 65°, C = 80°, D = 210°, E = 250°, F = 280°, G = 310°, H = 330°, N = 135° (Normal) Per L°. Refers to blind mate side. Plug side per MIL-DTL-38999. See alternate polarizations table				

\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

### 253-033 FLOAT MOUNT FEED-THRU, JAM NUT MOUNT RECEPTACLE TO 38999 TYPE SERIES III PLUG MATING INTERFACE



Alternate Polarizations	
ID	L°
N	135°
A	40°
B	65°
C	80°
D	210°
E	250°

Dimensions for 253-033								
Shell Size	Ø A Max	T Thread Class 2A	Y Hex Flats	E flange ±.016	ØF Flange	H End of Slot +0/-0.008	ØB Max	ØC Max
13	.978	1.1250-18 UNEF	1.300 (33.02)	1.391 (35.33)	1.6441 (41.76)	.729 (18.52)	1.050 (26.67)	1.200 (30.48)
15	1.103	1.2500-18 UNEF	1.457 (37.01)	1.516 (38.51)	1.750 (44.45)	.791 (20.09)	1.180 (29.97)	1.320 (33.53)
23	1.603	1.7500-18 UNEF	2.010 (51.05)	2.078 (52.78)	2.312 (58.72)	1.072 (27.23)	1.670 (42.42)	1.790 (45.47)
25	1.728	1.8750-18 UNEF	2.125 (53.97)	2.200 (55.88)	2.327 (59.11)	1.096 (27.84)	1.800 (45.72)	1.920 (48.77)

**NOTES:**

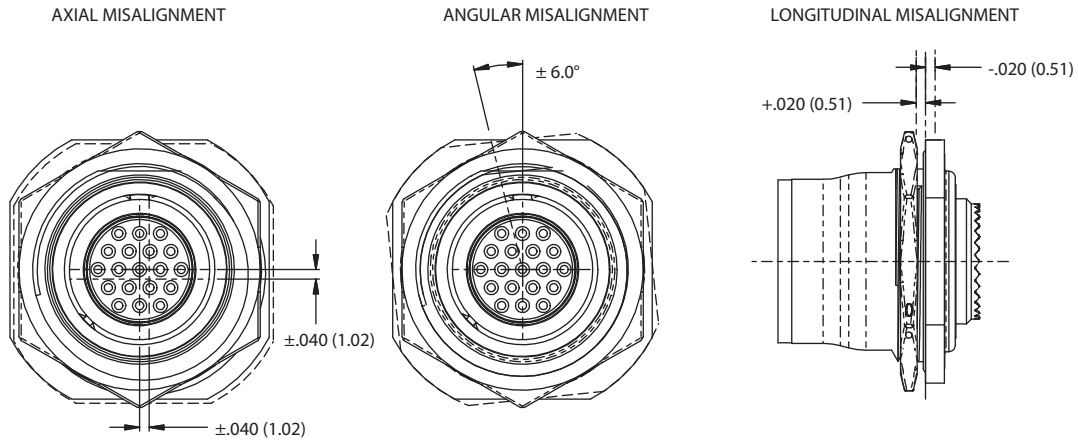
- Distance between mated mounting flanges: 1.808 Consult manufacturer other distance between mounting flanges is required
- See Space-Grade guidelines material, in this section, for outgassing/screening options available
- Stainless steel locating pin (Ø.079) shipped with each connector
- Misalignment capabilities are possible with mated pair reference Glenair connector 253-019

# Space-grade, blind-mate connectors

## Feed-thru receptacle, with D38999 type plug

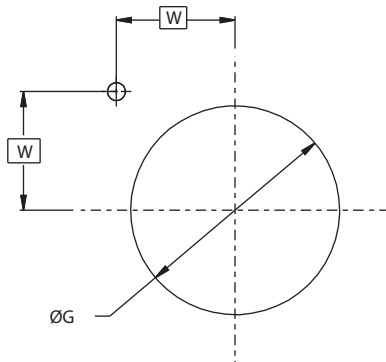
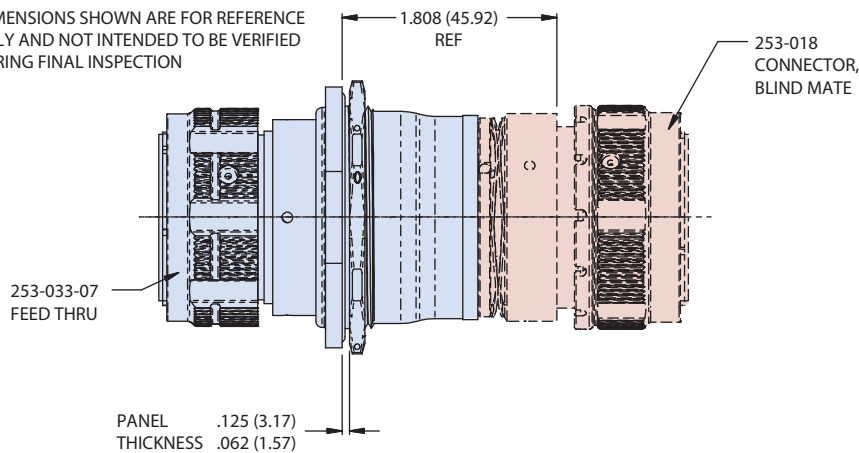
### IAW MIL-DTL-38999 Series III

#### MISALIGNMENT CAPABILITIES (see note 4)



#### Distance Between Mated Flanges

\*DIMENSIONS SHOWN ARE FOR REFERENCE ONLY AND NOT INTENDED TO BE VERIFIED DURING FINAL INSPECTION



Recommended Panel Cut-out		
Shell Size	$\text{ØG}$ , Thru Hole $\pm 0004$ (0.10)	W Basic
13	1.134 (28.80)	.549 (13.94)
15	1.259 (31.98)	.593 (15.06)
23	1.759 (44.68)	.797 (20.24)
25	1.884 (47.85)	.809 (20.55)



# Space-grade, blind mate connectors

## Locking circuit and test mate connector

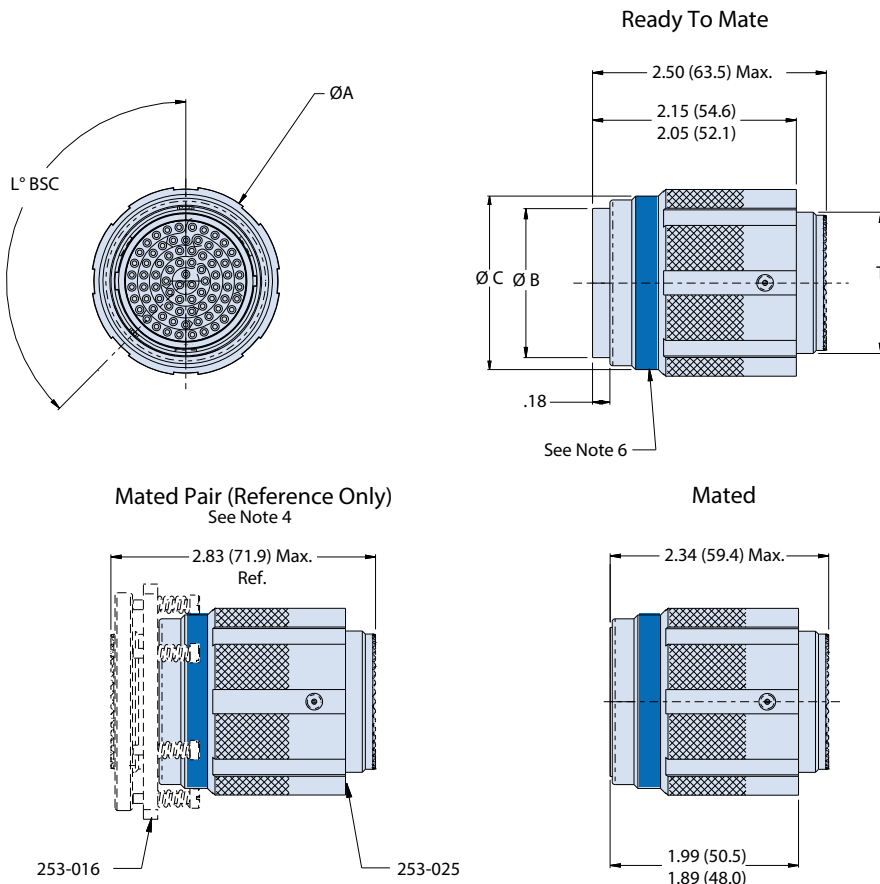
### IAW MIL-DTL-38999 Series III



Part Number Development									
Sample Part Number	253-025				-G6	ME	23-43	P	N
Series / Basic Part No.	253-025 = Locking circuit and test mate connector								
Connector Mounting	-G6 = In-line								
Material/Finish	ME = Aluminum, electroless nickel MT = Aluminum, nickel PTFE			ZL = CRES, electrodeposited nickel Z1 = CRES, passivated					
Shell Size-Insert Arrangement*	Per MIL-STD-1560								
Contact Type	P = Pin, crimp removable S = Socket, crimp removable		A = Pin insert less contacts B = Socket insert less contacts						
Alternate Polarization*	A = 40°, B = 65°, C = 80°, D = 210°, E = 250°, F = 280°, G = 310°, H = 330°, N = 135° (Normal) Per L° Basic. Refers to blind mate side. Plug side per MIL-DTL-38999. See alternate polarizations table								

\*Refer to section A for complete details. Refer to Space-Grade Guidelines material (IAW NASA EEE INST-002) for outgassing and screening modification codes, on pages 60 and 61. Modification codes may be added directly to the end of any valid part number

### 253-025 LOCKING CIRCUIT AND TEST MATE CONNECTOR, MATES WITH 253-016 PLUG



Dimensions				
Shell Size	Ø A Max	Ø B	Ø C	T Thd 1.0-6g -0.100R
17	1.55 (39.37)	1.10 (27.94)	1.29 (32.77)	M25
25	2.05 (52.07)	1.54 (39.12)	1.79 (45.47)	M37

**NOTES:**

- Material/ finish:
  - Shell, coupling ring, segments - see part number development, finish
  - Insulators - high grade rigid dielectric / N.A.
  - Contacts - copper alloy / gold plated
- Connector mates with Glenair 253-016 series connector, having the same insert arrangement and polarization.
- Insert arrangement is in accordance with MIL-STD-1560 arrangements only. Contact manufacturer for availability.
- Connector mated with Glenair 253-016 is shown for reference only.
- See Space-Grade guidelines material, in this section, for outgassing and screening options available
- Blue color band indicates rear release contact retention system



## JAM-FREE LAUNCHING

# AS81703 Series 3 Type Lanyard Connectors

Ideal for high shock / high vibration environments including military space and defense applications such as missile and space payload deployment, the AS81703 provides jam-free, push-on, pull-off operation. Glenair's AS81703 Series 3 type connector series is intermateable and intermountable with currently available AS81703 mil-spec and commercial connectors, and offers several enhancements to the standard design: an integrated band porch for shield termination, 360° saw teeth for rear-end accessory clocking, and a red full-mate indicator stripe.

The AS81703 Series 3 type connector is ideally suited for droppable stores, umbilical connect, air launch to orbit, and other extreme vibration and shock environments where rugged and reliable lanyard-release and push-pull mating is a must. Nineteen contact arrangements are available, including hybrid signal/power layouts, and a full complement of backshells and connector accessories is offered—with Glenair's high availability and quick delivery.



- Intermateable and intermountable with available AS81703 connectors
- Signal, power, and high-speed shielded contact arrangements
- Reliable fail-safe axial-pull lanyard equipped coupling
- Instant disconnect for critical quick-release systems
- Available integrated band porch for easy shield termination
- 360° saw teeth for accessory clocking
- Red full-mate indicator stripe
- Blind mate and rack-and-panel versions available
- Available backshells and accessories IAW AS81703
- Polarization keying for mis-mate prevention

LANYARD-RELEASE  
**AS81703 Series 3 Type Connectors**

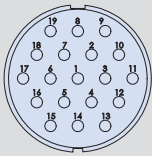


Table of contents / selection guide



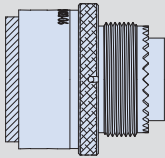
**Connector specifications, How-to-order,  
 General information and Test report summary**

pages D-2-3



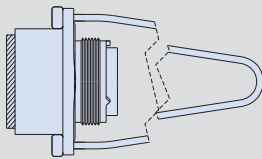
**Contact arrangements**

pages D-4-5



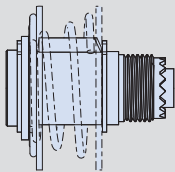
**253-020-06  
 Straight plug**

page D-6



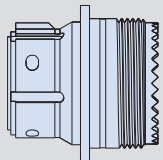
**253-020-08  
 Lanyard-release plug**

page D-7



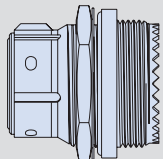
**253-020-09  
 Rack-and-panel plug**

page D-8



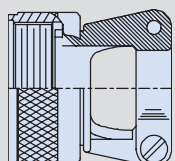
**253-020-00  
 Wall-mount receptacle**

page D-9



**253-020-07  
 Jam-nut receptacle**

page D-10



**Backshells and accessories**

page D-11



# SERIES 253-020

## AS81703 Series 3 Type Connectors

### How to order



How To Order									
Sample Part Number	253-020			-	06	ME	19-7	P	N
Basic Part Number	AS81703 Series 3 type connector								
Rear Option	- = Accessory threads B = Band porch (consult factory)								
Connector Style (and AS cross-ref)	<b>00</b> = Sq. flange mount receptacle AS34241 type (MS3424) <b>06</b> = Straight plug AS34671 type (MS3467) <b>07</b> = Jam nut mount receptacle AS34641 type (MS3464) <b>08</b> = Lanyard release plug MS3468 type (no SAE equivalent) <b>09</b> = Rack & panel plug AS34461 type (MS3446)								
Material / Finish	See Table I								
Shell Size / Insert Arrangement	See Table II, diagrams on pgs. 4-5								
Contact Styles	<b>P</b> = Pin insert <b>A</b> = Pin insert less contacts (not available for -09 Plug) <b>S</b> = Socket insert <b>B</b> = Socket insert less contacts (not available for -09 Plug)								
Insert Clocking Positions	<b>N, W, X, Y, B, C</b> (See Table III)								
Lanyard Ring Mod. Code (-08 Receptacle Only)	<b>Omit</b> = Standard Lanyard Ring <b>812</b> = Lanyard Ring Rotated 90° from Master Keyway								

Code	Mil Class	Material	Finish
C	-	Aluminum Alloy	Black Anodize
ME	E		Electroless Nickel
NF	L		O.D. Cadmium over Electroless Nickel
MT	-		Nickel-PTFE
ZR	-		Zinc-Nickel/Black (Tri-Valent CR)

Insert Rotation and Insert Clocking Rotation	
	<p>AS81703 Series 3 type connectors feature locksmith key/keyways. Plug connector keyways and receptacle connector keys are fixed for all sizes and contact arrangements.</p> <p>Alternate Insert Clocking is specified in the part number. Pin inserts are rotated clockwise, Socket inserts rotated counter-clockwise relative to the master key/keyway, to the positions indicated in the table below.</p>

Contact Arrangement	Contact Size & Quantity		
	#20	#16	#12
3-50	3		
7-50	7		
12-6	6		
12-50	12		
19-4			12
19-7			7
19-12		12	
19-50	19		
27-2		14	
27-3	14	2	
27-5		19	
27-8		6	4
27-11	12		
27-50	27		
37-2		24	
37-3			12
37-50	37		
61-42	29	4	8
61-50	61		

Contact Arrangement	Alternate Insert Clocking Positions					
	N	W	X	Y	B	C
3-50	0°			75°		
7-50	0°				150°	
12-6	0°	25°	45°	80°	150°	220°
12-50	0°	15°	50°	75°	150°	225°
19-4	0°			22° 30'	135°	247° 30'
19-7	0°			75°	150°	225°
19-12	0°	25°	50°	75°	150°	225°
19-50	0°			75°	150°	225°
27-2	0°	25°	50°	75°	150°	225°
27-3	0°	25°	50°	75°	150°	225°
27-5	0°			75°	150°	225°
27-8	0°	25°	50°	75°	150°	225°
27-11	0°	25°	50°	75°	150°	225°
27-50	0°	25°	50°	75°	150°	225°
37-2	0°	25°	145°	227° 30'		
37-3	0°	20°	70°			
37-50	0°	25°	50°	75°	150°	225°
61-42	0°		67° 30'			
61-50	0°			75°	150°	225°

D



Validation Test Summary. Tested IAW AS81703							
Test	Requirement						Result
Magnetic Permeability	Relative Magnetic Permeability: $\leq 2.0 \text{ Mu}$						Pass
Maintenance Aging and Contact Forces	Insertion Force: $\leq 15 \text{ lbs.}$ Removal Force: $\leq 10 \text{ lbs.}$						Pass
Gage Location and Retention	Axial Displacement of the Test Gages: $\leq 0.012$						Pass
Operating Forces	Shell Size	Max Engagement force (lb)	Measured Engagement force (lb)	Min Disengagement force (lb)	Max Disengagement force (lb)	Measured Disengagement force (lb)	Pass
	12	34	15.2	2	34	3.80	
			16.8			4.05	
	19	38	16.2	3	38	6.75	
			15.8			8.06	
	37	44	19.7	6	44	7.56	
20.1			7.72				
Insulation Resistance, Room Temperature	Insulation resistance shall be $>10,000$ megohms						Pass
Dielectric Withstanding Voltage	No evidence of breakdown or flashover. Leakage Current $\leq 5 \text{ mA}$						Pass
	Condition	Service Rating I	Service Rating II				
	Sea Level	600 V AC	1000 V AC				
	70,000 ft.	300 V AC	450 V AC				
Thermal Shock	Low Temperature: $-55^\circ \pm 3^\circ\text{C}$ • High Temperature: Class L $175^\circ \pm 3^\circ\text{C}$ ; Class E, $200^\circ \pm 3^\circ\text{C}$ . 5 cycles, 2 hour minimum soak. No damage detrimental to the connector						Pass
Insert Retention	Inserts shall not be dislocated from the specified insert position as shown on the applicable MS drawing when an effective pressure differential of $75 \text{ lbs.f/in}^2$ is applied						Pass
Vibration	10 to 2,000 Hz and return to 10 Hz in 20 minutes. 12 cycles in 4 hours for X,Y, and Z Axes. Total 12 hrs. Amplitude of 0.06" double amplitude or 20g, whichever is less. Support wires 8" both ends. Electrical load 100 mA max, open circuit $<5\text{V}$ . Maximum initial R not to exceed 3 Ohms on individual loops. All samples measured no discontinuity on any axis.						Pass
Shock	15g peak value, half-sine pulse, 11ms duration. One shock each direction on 3 major axes. Mated connectors shall not be damaged and there shall be no loosening of parts. All samples measured no discontinuity on any axis.						Pass
Insulation Resistance, Elevated Temperature	After an exposure for 1000 hours at $200^\circ\text{C}$ , the insulation resistance shall be greater than 500 megohms, unmated condition						Pass
Moisture Resistance	10 cycles, low temperature subcycle 5 cycles. Initial and final mated insulation resistance measured $>100\text{Mohms}$ for all samples at $25^\circ$ , 500V, 12s.						Pass
Insulation Resistance	Unmated, 500V, 120x, 10,000 megohms						Pass
Contact Resistance	#24 AWG wires crimped to size 20 contacts. Test current 3A, maximum mV drop 45 mV						Pass
Contact Retention	Axial load: 15 lb. Duration: 5 sec min. Rate: approx. 1lb/sec. Initial load of 2 lb before measuring contact displacement. Force applied in the direction tending to dislodge the contacts toward the rear of the connector. Displacement shall not exceed 0.012"						Pass
Magnetic Permeability	Relative magnetic permeability of connector assemblies $< 2.0 \text{ Mu}$						Pass
Durability	500 mating cycles with no mechanical or electrical defects detrimental to operation						Pass
Salt Spray	Unmated, 48 hours, 20% salt concentration. No exposure of basic metal due to corrosion which will affect performance.						Pass
Fluid Immersion, Lubricating Oil	Unmated connectors immersed in MIL-PRF-7808 oil, 20 hours.						Pass

Contact Glenair for complete validation test reports: GT-15-93 (AS81703, series 3, class E) and GT-15-94 (AS81703, series 3, class L).

### MATERIALS/FINISHES

Shells, Jam Nuts, Lockwashers - Aluminum alloy

Insulators - High-grade rigid dielectric

O-Rings, Grommets, Peripheral Seals - Fluorosilicone or equivalent



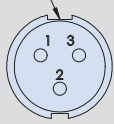
SERIES 253-020

# AS81703 Series 3 Type Connectors

Contact arrangements (pin face shown)

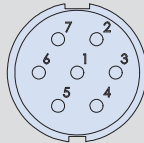


MASTER KEY



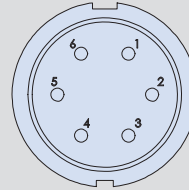
**3-50**

3X SIZE 20 CONTACT



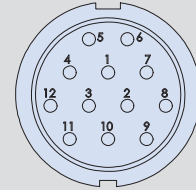
**7-50**

7X SIZE 20 CONTACT



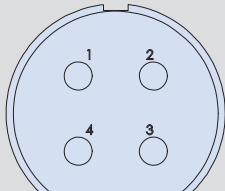
**12-6**

6X SIZE 20 CONTACT



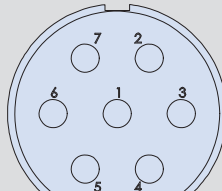
**12-50**

12X SIZE 20 CONTACT



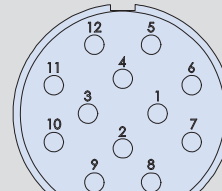
**19-4**

4X SIZE 12 CONTACT



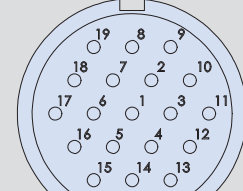
**19-7**

7X SIZE 12 CONTACT



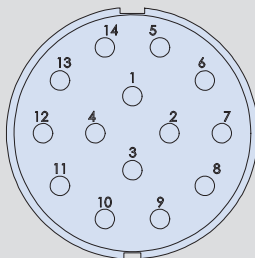
**19-12**

12 SIZE 16 CONTACT



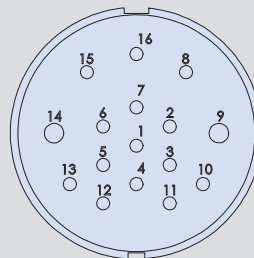
**19-50**

19X SIZE 20 CONTACT



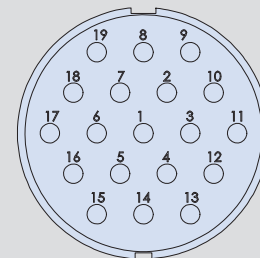
**27-2**

14X SIZE 16 CONTACT



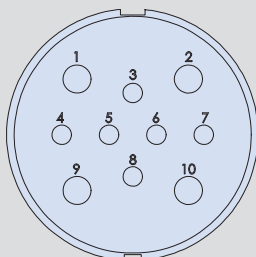
**27-3**

2X SIZE 16 CONTACT  
14X SIZE 20 CONTACT



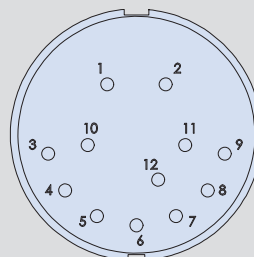
**27-5**

19X SIZE 16 CONTACT



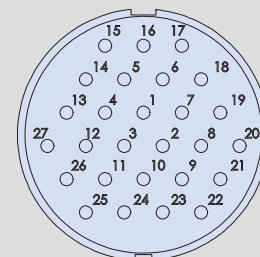
**27-8**

6X SIZE 16 CONTACT  
4X SIZE 12 CONTACT



**27-11**

12X SIZE 20 CONTACT



**27-50**

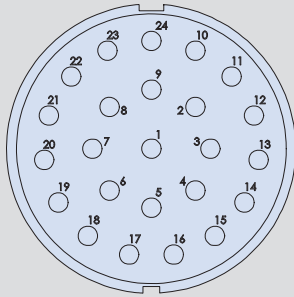
27X SIZE 20 CONTACT

D

SERIES 253-020

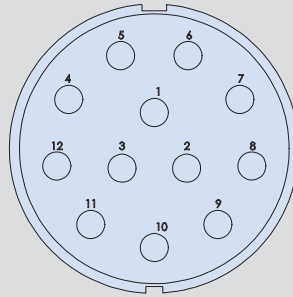
# AS81703 Series 3 Type Connectors

Contact arrangements (pin face shown)



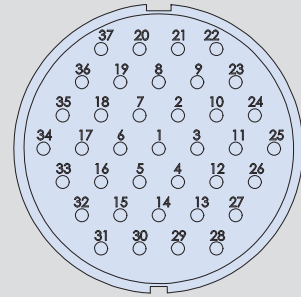
**37-2**

24X SIZE 16 CONTACT



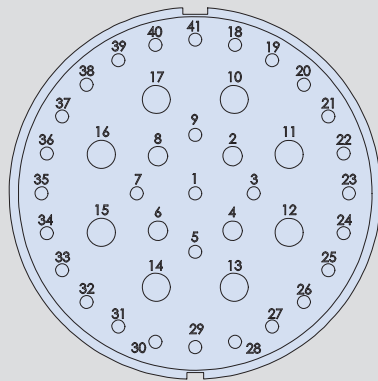
**37-3**

12X SIZE 12 CONTACT



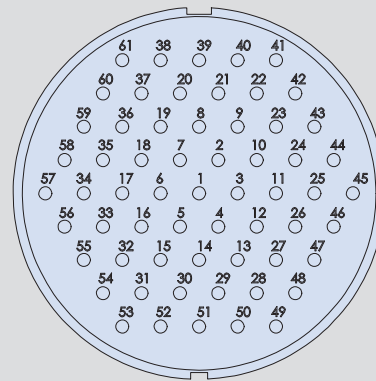
**37-50**

37X SIZE 20 CONTACT



**61-42**

4X SIZE 16 CONTACT  
29X SIZE 20 CONTACT  
8X SIZE 12 CONTACTS



**61-50**

61X SIZE 20 CONTACT

D

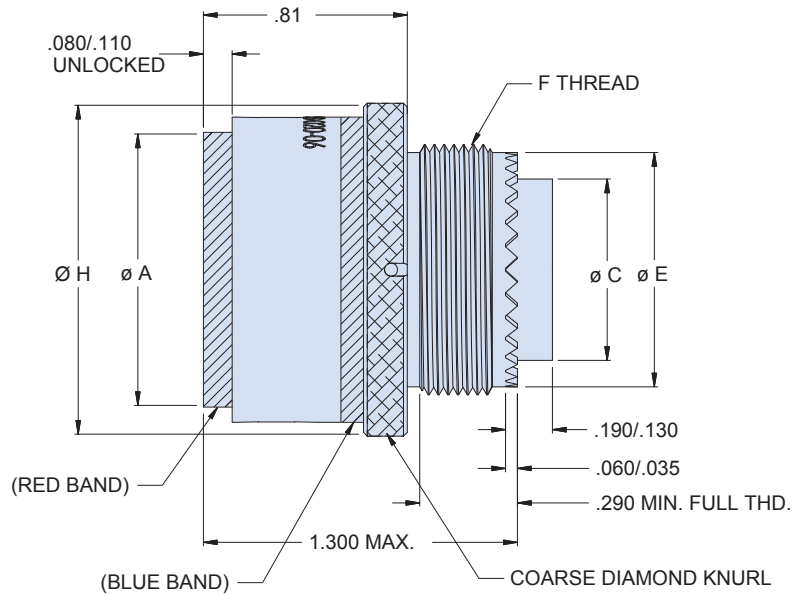
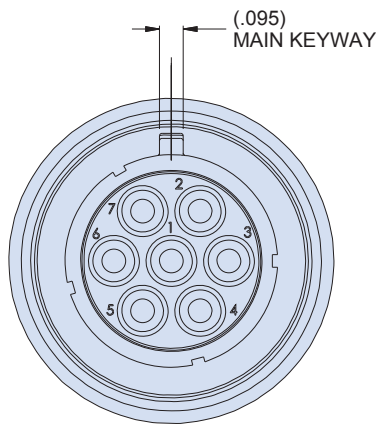
# AS81703 SERIES 3 TYPE CONNECTORS

## Plug

253-020-06



How To Order							
Sample Part Number	253-020	-	06	ME	19-7	P	N
Basic Part Number	AS81703 Series 3 type connector						
Rear Option	- = Accessory threads B = Band porch (consult factory)						
Connector Style	06 = Straight plug AS34671 type (MS3467)						
Material / Finish	C = Al Alloy/Black Anodize ME = Al Alloy/Electroless Nickel NF = Al Alloy/Cad O.D. Over Electroless Nickel MT = Al Alloy/Nickel-PTFE ZR = Al Alloy/Zinc-Nickel Black						
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4-5						
Contact Styles	P = Pin insert A = Pin insert less contacts S = Socket insert B = Socket insert less contacts						
Insert Clocking Positions	N, W, X, Y, B, C (See Table III pg. 2)						



-06 Plug Dimensions									
Shell Size	Ø A		Ø C Max.		Ø E Max.		F Thd.	H	
	In. ± .02	mm ± .5	In.	mm	In.	mm		In. ± .025	mm ± .6
3	.657	16.7	.351	8.9	.509	12.9	9/16-24 UNEF-2A	.925	23.5
7	.795	20.2	.531	13.5	.687	17.4	3/4-20 UNEF-2A	1.062	27.0
12	.945	24.0	.665	16.9	.812	20.6	7/8-20 UNEF-2A	1.172	29.8
19	1.090	27.7	.790	20.1	.937	23.8	1-20 UNEF-2A	1.328	33.7
27	1.230	31.2	.869	22.1	.992	25.2	1 1/16-18 UNEF-2A	1.475	37.5
37	1.350	34.3	.994	25.2	1.117	28.4	1 3/16-18 UNEF-2A	1.610	40.9
61	1.620	41.1	1.280	32.5	1.427	36.2	1 1/2-18 UNEF-2A	1.890	48.0



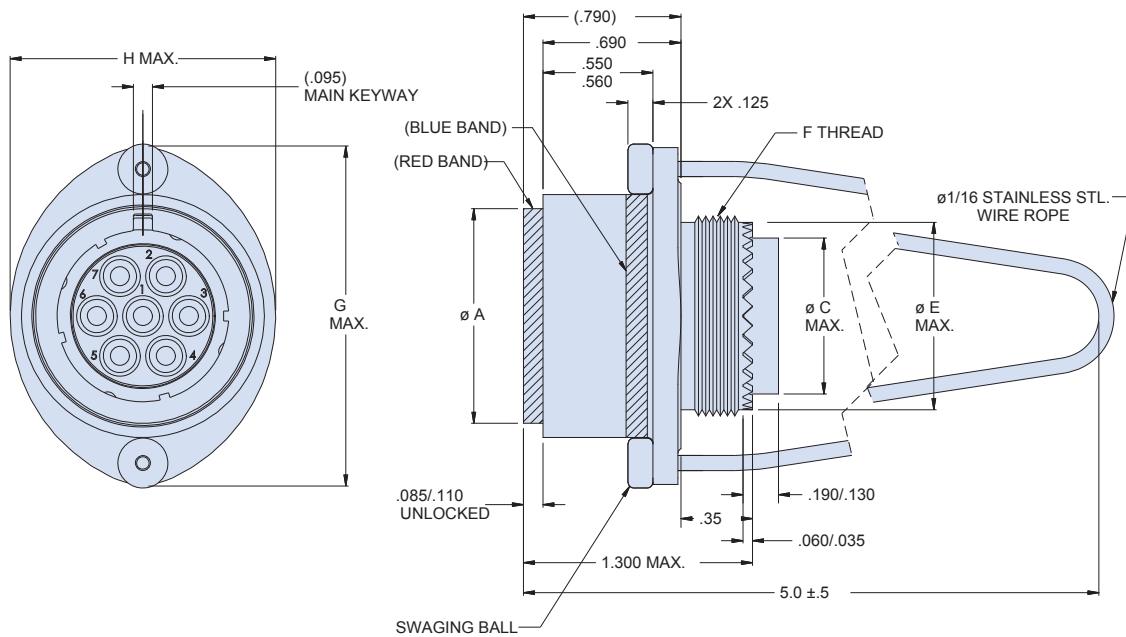
# AS81703 SERIES 3 TYPE CONNECTORS

## Lanyard-release plug

### 253-020-08



How To Order									
Sample Part Number	253-020			-	08	ME	19-7	P	N
Basic Part Number	AS81703 Series 3 type connector								
Rear Option	- = Accessory threads B = Band porch (consult factory)								
Connector Style	08 = Lanyard release plug MS3468 type (no SAE equivalent)								
Material / Finish	C = Al Alloy/Black Anodize ME = Al Alloy/Electroless Nickel MT = Al Alloy/Nickel-PTFE NF = Al Alloy/Cad O.D. Over Electroless Nickel ZR = Al Alloy/Zinc-Nickel Black								
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4-5								
Contact Styles	P = Pin insert S = Socket insert A = Pin insert less contacts B = Socket insert less contacts								
Insert Clocking Positions	N, W, X, Y, B, C (See Table III pg. 2)								
Lanyard Ring Mod. Code	Omit = Standard Lanyard Ring 812 = Lanyard Ring Rotated 90° from Master Keyway								



-08 Lanyard-Release Plug Dimensions											
Shell Size	Ø A		Ø C Max.		Ø E Max.		F Thd.	G Max.		H Max.	
	In.	mm	In.	mm	In.	mm		In.	mm	In.	mm
3	.657 .648	16.7 16.5	.351	8.9	.509	12.9	1/16-24 UNEF-2A	1.261	32.0	.925	23.5
7	.793 .782	20.1 19.9	.531	13.5	.687	17.4	3/4-20 UNEF-2A	1.411	35.8	1.062	27.0
12	.942 .932	23.9 23.7	.665	16.9	.812	20.6	7/8-20 UNEF-2A	1.531	38.9	1.172	29.8
19	1.073 1.063	27.3 27.0	.790	20.1	.937	23.8	1-20 UNEF-2A	1.681	42.7	1.328	33.7
27	1.226 1.216	31.1 30.9	.869	22.1	.992	25.2	1 1/16-18 UNEF-2A	1.826	46.4	1.475	37.5
37	1.348 1.338	34.2 34.0	.994	25.2	1.117	28.4	1 3/16-18 UNEF-2A	1.915	48.6	1.610	40.9
61	1.614 1.604	41.0 40.7	1.280	32.5	1.427	36.2	1 1/2-18 UNEF-2A	2.235	56.8	1.890	48.0

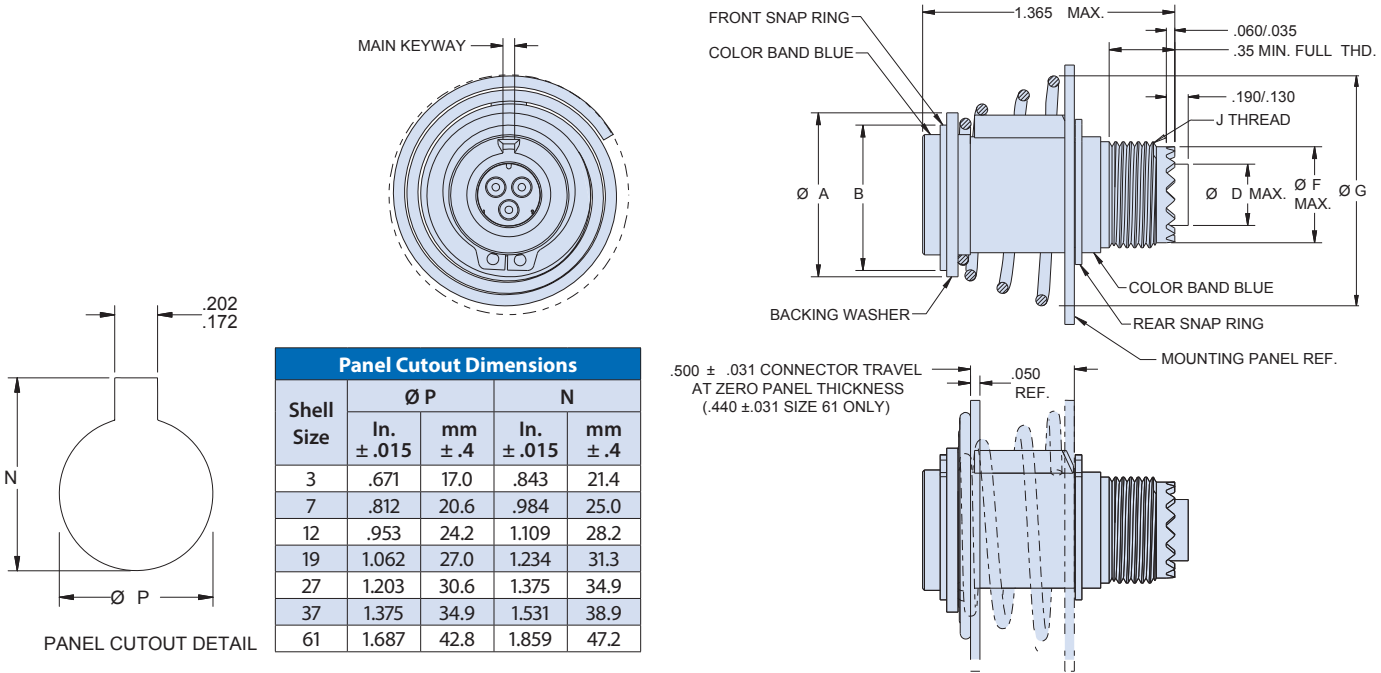
# AS81703 SERIES 3 TYPE CONNECTORS

## Rack-and-panel plug

### 253-020-09



How To Order									
Sample Part Number	253-020			-	09	ME	19-7	P	N
Basic Part Number	AS81703 Series 3 type connector								
Rear Option	-- = Accessory threads B = Band porch (consult factory)								
Connector Style	09 = Rack & panel plug AS34461 type (MS3446)								
Material / Finish	C = Al Alloy/Black Anodize ME = Al Alloy/Electroless Nickel MT = Al Alloy/Nickel-PTFE NF = Al Alloy/Cad O.D. Over Electroless Nickel ZR = Al Alloy/Zinc-Nickel Black								
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4-5								
Contact Styles	P = Pin insert S = Socket insert A = Pin insert less contacts B = Socket insert less contacts								
Insert Clocking Positions	N, W, X, Y, B, C (See Table III pg. 2)								



D

-09 Rack-and-Panel Plug Dimensions												
Shell Size	Ø A		Ø B Max.		Ø D Max.		Ø F Max.		Ø G Max.		J Thd.	Spring force when mated (lbs.-In.)
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm		
3	.891 .869	22.6 22.1	.800	20.3	.351	8.9	.509	12.9	1.225	31.1	5/16-24 UNEF-2A	16 - 20
7	1.172 1.150	29.8 29.2	.990	25.1	.531	13.5	.687	17.4	1.356	34.4	3/4-20 UNEF-2A	16 - 20
12	1.263 1.241	32.1 31.5	1.190	30.2	.665	16.9	.812	20.6	1.575	40.0	7/8-20 UNEF-2A	30 - 35
19	1.391 1.369	35.3 34.8	1.320	33.5	.790	20.1	.937	23.8	1.715	43.6	1-20 UNEF-2A	40 - 50
27	1.529 1.507	38.8 38.3	1.475	37.5	.869	22.1	.992	25.2	1.860	47.2	1 1/16-18 UNEF-2A	43 - 50
37	1.816 1.794	46.1 45.6	1.655	42.0	.994	25.2	1.117	28.4	2.120	53.8	1 3/16-18 UNEF-2A	45 - 53
61	2.150 2.118	54.6 53.8	2.025	51.4	1.280	32.5	1.427	36.2	2.850	72.4	1 1/2-18 UNEF-2A	75 - 80

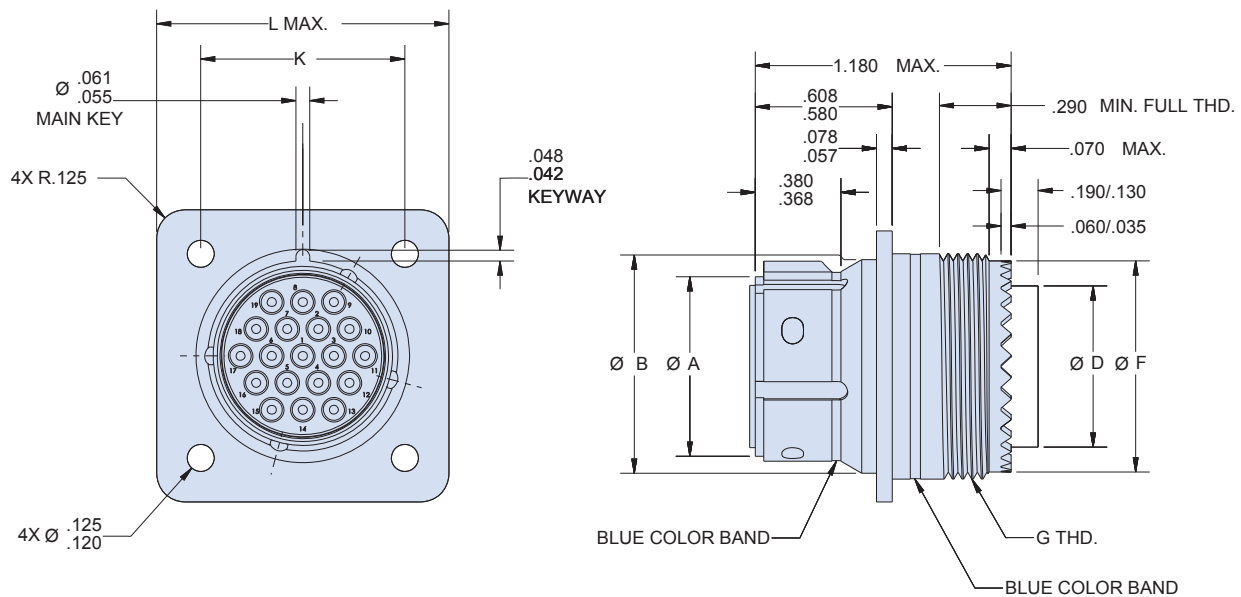
# AS81703 SERIES 3 TYPE CONNECTORS

## Wall-mount receptacle

### 253-020-00



How To Order							
<b>Sample Part Number</b>	<b>253-020</b>						
<b>Basic Part Number</b>	AS81703 Series 3 type connector						
<b>Rear Option</b>	- = Accessory threads    B = Band porch (consult factory)						
<b>Connector Style</b>	00 = Sq. flange mount receptacle    AS34241 type (MS3424)						
<b>Material / Finish</b>	C = Al Alloy/Black Anodize    ME = Al Alloy/Electroless Nickel NF = Al Alloy/Cad O.D. Over Electroless Nickel    MT = Al Alloy/Nickel-PTFE ZR = Al Alloy/Zinc-Nickel Black						
<b>Shell Size / Insert Arrangement</b>	See Table II pg. 2, diagrams on pgs. 4-5						
<b>Contact Styles</b>	P = Pin insert    A = Pin insert less contacts S = Socket insert    B = Socket insert less contacts						
<b>Insert Clocking Positions</b>	N, W, X, Y, B, C (See Table III pg. 2)						

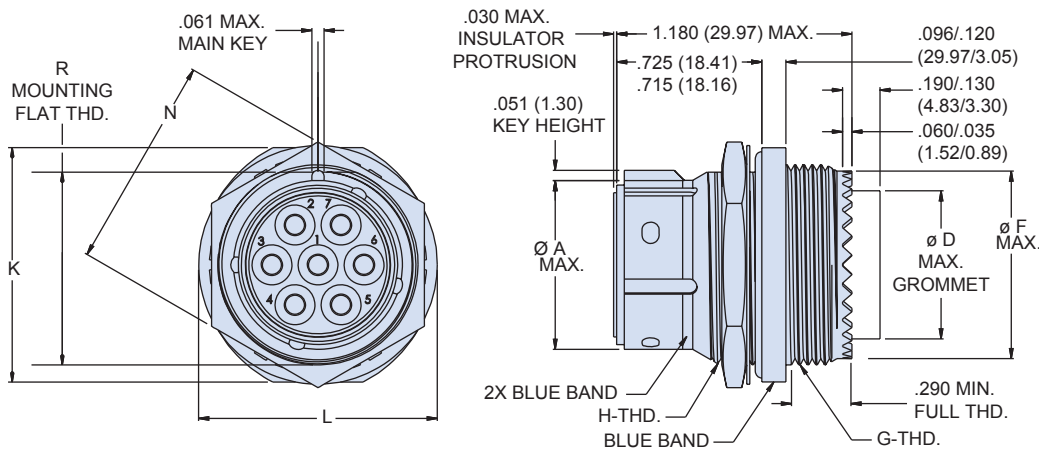


-00 Wall Mount Receptacle Dimensions													
Shell Size	Ø A		Ø B		Ø D Max.		Ø F Max.		G Thd.	K		L Max.	
	In.	mm	In. ±.003	mm ±.1	In.	mm	In.	mm		In.	mm	In.	mm
3	.441 .431	11.2 10.9	.573	14.6	.351	8.9	.509	12.9	9/16-24 UNEF-2A	.625	15.9	.896	22.8
7	.576 .566	14.6 14.4	.686	17.4	.531	13.5	.687	17.4	3/4-20 UNEF-2A	.719	18.3	1.021	25.9
12	.710 .700	18.0 17.8	.823	20.9	.665	16.9	.812	20.6	7/8-20 UNEF-2A	.812	20.6	1.114	28.3
19	.849 .839	21.6 21.3	.948	24.1	.790	20.1	.937	23.8	1-20 UNEF-2A	.906	23.0	1.208	30.7
27	1.004 .994	25.5 25.2	1.132	28.8	.869	22.1	.992	25.2	1 1/16-18 UNEF-2A	.968	24.6	1.302	33.1
37	1.126 1.116	28.6 28.3	1.261	32.0	.994	25.2	1.117	28.4	1 3/16-18 UNEF-2A	1.187	30.1	1.458	37.0
61	1.414 1.404	35.9 35.7	1.573	40.0	1.280	32.5	1.427	36.2	1 1/2-18 UNEF-2A	1.438	36.5	1.797	45.6

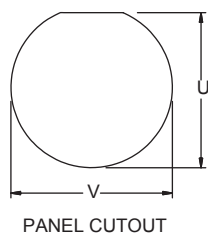




How To Order						
Sample Part Number	253-020	-	09	ME	19-7	P N
Basic Part Number	AS81703 Series 3 type connector					
Rear Option	-- = Accessory threads B = Band porch (consult factory)					
Connector Style	07 = Jam nut receptacle AS34461 type (MS3446)					
Material / Finish	C = Al Alloy/Black Anodize ME = Al Alloy/Electroless Nickel MT = Al Alloy/Nickel-PTFE NF = Al Alloy/Cad O.D. Over Electroless Nickel ZR = Al Alloy/Zinc-Nickel Black					
Shell Size / Insert Arrangement	See Table II pg. 2, diagrams on pgs. 4-5					
Contact Styles	P = Pin insert S = Socket insert A = Pin insert less contacts B = Socket insert less contacts					
Insert Clocking Positions	N, W, X, Y, B, C (See Table III pg. 2)					



-07 Jam Nut Receptacle Dimensions									
Shell Size	Ø A	Ø D Max.	Ø F Max.	G Thd.	H Thd.	K	L	R	N Mounting Nut
3	.441 (11.20)	.351 (8.92)	.509 (12.93)	5/16-24 UNEF-2A	5/16-24 UNEF-2A	.765 (19.43)	.765 (19.43)	.523 (13.28)	.625 (15.88)
	.431 (10.95)								
7	.576 (14.63)	.531 (13.49)	.687 (17.45)	3/4-20 UNEF-2A	1 1/16-24 UNEF-2A	.890 (22.61)	.890 (22.61)	.655 (16.64)	.812 (20.62)
	.566 (14.38)								
12	.710 (18.03)	.665 (16.89)	.812 (20.62)	7/8-20 UNEF-2A	1 3/16-20 UNEF-2A	1.077 (27.36)	1.077 (27.36)	.778 (19.76)	.937 (23.80)
	.700 (17.78)								
19	.849 (21.56)	.790 (20.07)	.937 (23.80)	1-20 UNEF-2A	1-20 UNEF-2A	1.171 (29.74)	1.202 (30.53)	.963 (24.46)	1.062 (26.97)
	.839 (21.31)								
27	1.004 (25.50)	.869 (22.07)	.992 (25.20)	1 1/16-18 UNEF-2A	1 1/8-18 UNEF-2A	1.327 (33.71)	1.327 (33.71)	1.089 (27.66)	1.250 (31.75)
	.994 (25.25)								
37	1.126 (28.60)	.994 (25.25)	1.117 (28.37)	1 3/16-18 UNEF-2A	1 1/4-18 UNEF-2A	1.450 (36.83)	1.515 (38.48)	1.214 (30.84)	1.375 (34.92)
	1.116 (28.35)								
61	1.414 (35.92)	1.280 (32.51)	1.427 (36.25)	1 1/2-18 UNEF-2A	1 1/2-18 UNEF-2A	1.864 (47.35)	1.890 (48.01)	1.463 (37.16)	1.688 ±.015
	1.404 (35.66)								



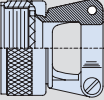
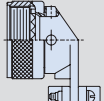
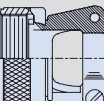
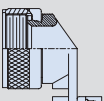
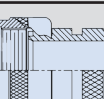
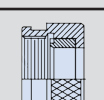
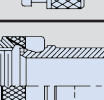

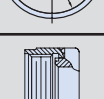
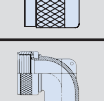
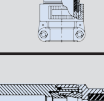

Panel Cutout					
Shell Size	U	V	Shell Size	U	V
3	.538 (13.67)	.577 (14.66)	19	.973 (24.71)	1.013 (25.73)
	.534 (13.56)	.567 (14.40)		.969 (24.61)	1.003 (25.48)
7	.665 (16.89)	.701 (17.81)	27	1.099 (27.91)	1.138 (28.91)
	.661 (16.79)	.961 (24.41)		1.095 (27.81)	1.128 (28.65)
12	.788 (20.02)	.826 (20.98)	37	1.224 (31.09)	1.263 (32.08)
	.784 (19.91)	.816 (20.73)		1.220 (30.99)	1.253 (31.83)
61	1.471 (37.36)	1.514 (38.46)	61	1.471 (37.36)	1.514 (38.46)
	1.467 (37.26)	1.504 (38.20)		1.467 (37.26)	1.504 (38.20)

# AS81703 SERIES 3 TYPE CONNECTORS

## Backshells and Accessories



### Selection guide

	<b>Straight strain relief</b> <b>AS85049/118</b>	page D-12
	<b>90° strain relief</b> <b>AS85049/120</b>	page D-13
	<b>Straight strain relief</b> <b>AS85049/52</b>	page D-14
	<b>90° strain relief</b> <b>AS85049/51</b>	page D-15
	<b>Straight shrink boot adapter</b> <b>AS85049/60-1</b>	page D-16
	<b>Straight shrink boot adapter</b> <b>AS85049/60-2G</b>	page D-17
	<b>Straight crimp ring backshell and crimp ring</b> <b>AS85049/26-1 and MS3419</b>	page D-18
	<b>Backshell Crimp Ring</b> <b>AS85049/26-2</b>	page D-19
	<b>E-Nut (Self-Locking and Non-Self-Locking)</b> <b>AS85049/31, MS3416 and MIL-DTL-85723/15N</b>	page D-20
	<b>90° Environmental Backshell</b> <b>AS85049/9 and MS3188B</b>	page D-21
	<b>Straight EMI/RFI Environmental Backshell</b> <b>AS85049/10 and MS3437A</b>	page D-22
	<b>Straight Environmental Backshell</b> <b>AS85049/11 and MS3437B</b>	page D-23



# BACKSHELLS AND ACCESSORIES FOR AS81703 SERIES 3 TYPE CONNECTORS

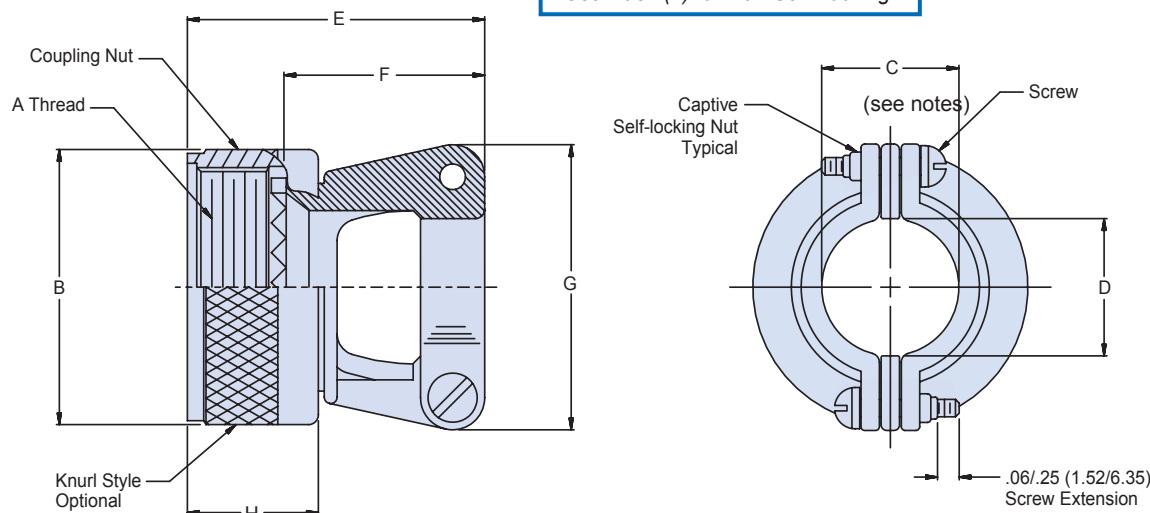
## Straight Strain Relief



### AS85049/118

<b>Product Series and Basic Part Number</b>	<b>Dash No.</b> <i>Table I</i>	<b>Finish</b> <i>Table II</i>
<b>M85049/118</b>	<b>S</b> <b>08</b>	<b>W</b>

**S** = Detented Self-Locking  
**N** = Non-Detented Self-Locking  
 Use Dash (-) for Non-Self-Locking



Dash No.	Screw Size	Shell Size	A Thread Class 2B	B Dia Max	C Dim ± .031 (0.8)	D Min	E Max Length	F Dim	G Dim Max	H Dim Max
03	4-40	3	9/16-24 UNEF	.95 (24.1)	.219 (5.6)	.22 (5.6)	1.14 (29.0)	.77 (19.6) .51 (13.0)	.88 (22.4)	.710 (18.00)
12	4-40	7	3/4-20 UNEF	1.14 (29.0)	.344 (8.7)	.35 (8.9)	1.38 (35.1)	1.01 (25.7) .76 (19.3)	1.12 (28.4)	.710 (18.00)
14	4-40	12	7/8-20 UNEF	1.26 (32.0)	.460 (11.7)	.47 (11.9)	1.38 (35.1)	1.01 (25.7) .76 (19.3)	1.19 (30.3)	.710 (18.00)
16	4-40	19	1-20 UNEF	1.39 (35.3)	.545 (13.8)	.55 (14.0)	1.50 (38.1)	1.13 (28.7) .88 (22.4)	1.44 (36.6)	.710 (18.00)
18	6-32	27	1 1/16-18 UNEF	1.51 (38.4)	.615 (15.6)	.62 (15.7)	1.75 (44.5)	1.38 (35.1) 1.13 (28.7)	1.56 (39.6)	.710 (18.00)
20	6-32	37	1 3/16-18 UNEF	1.64 (41.7)	.698 (17.7)	.70 (17.8)	1.88 (47.8)	1.51 (38.4) 1.25 (31.8)	1.69 (42.9)	.710 (18.00)
61	8-32	61	1 1/2-18 UNEF	1.95 (49.5)	.850 (21.6)	.85 (21.6)	2.13 (54.1)	1.76 (44.7) 1.51 (38.5)	1.88 (47.8)	.710 (18.0)

D

Sym.	Material	Finish
A	Aluminum Alloy	Black Anodize
N		Electroless Nickel
W		Cadmium, Olive Drab
X		Nickel Fluorocarbon Polymer
Z		Zinc Nickel

- NOTES**
- Glenair Series 600 Backshell Assembly Tools are recommended for assembly/installation.
  - Cable entry is measured with saddle bars closed and bottomed on clamp ears.
  - Material/Finish:  
 Clamp body, coupling nut, saddles - Al alloy or 300 Series SST/See Table II.  
 Clamp screws and lock nuts - CRES/Passivated, Silver plate optional.  
 Anti-rotation device - Corrosion resistant material

# BACKSHELLS AND ACCESSORIES FOR AS81703 SERIES 3 TYPE CONNECTORS

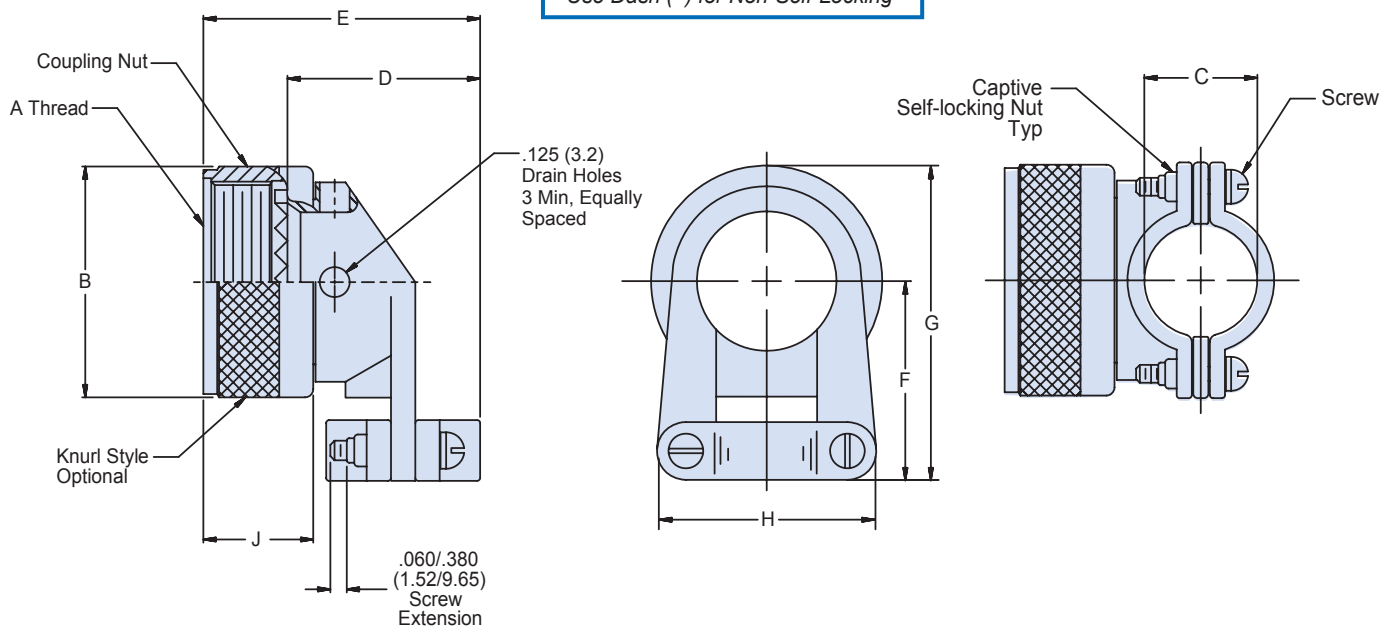
## 90° Strain Relief

### AS85049/120



<b>Product Series and Basic Part Number</b>	<b>Dash No.</b> <i>Table I</i>	<b>Finish</b> <i>Table II</i>
<b>M85049/120</b>	<b>S</b> <b>08</b>	<b>W</b>

**S** = Detented Self-Locking  
**N** = Non-Detented Self-Locking  
 Use Dash (-) for Non-Self-Locking



Dash No.	Screw Size	Shell Size	A Thread Class 2B	B Dia Max	C Dim ± .031 (0.8)	D Max	E Max Length	F Dim Max	G Dim Max	H Dim Max	J Dim Max
03	4-40	3	9/16-24 UNEF	.95 (24.1)	.219 (5.6)	.93 (23.6)	1.29 (32.8)	.84 (21.3)	1.32 (33.5)	.88 (22.4)	.710 (18.0)
12	4-40	7	3/4-20 UNEF	1.14 (29.0)	.344 (8.7)	1.21 (30.7)	1.57 (39.9)	.93 (23.6)	1.50 (38.1)	1.12 (28.4)	.710 (18.0)
14	4-40	12	7/8-20 UNEF	1.26 (32.0)	.460 (11.7)	1.27 (32.3)	1.63 (41.4)	1.00 (25.4)	1.62 (41.4)	1.19 (30.2)	.710 (18.0)
16	4-40	19	1-20 UNEF	1.39 (35.3)	.545 (13.8)	1.42 (36.1)	1.78 (45.2)	1.06 (26.9)	1.75 (44.5)	1.44 (36.6)	.710 (18.0)
18	6-32	27	1 1/16-18 UNEF	1.51 (38.4)	.615 (15.6)	1.53 (38.9)	1.89 (48.0)	1.23 (31.2)	1.99 (50.5)	1.56 (39.6)	.710 (18.0)
20	6-32	37	1 3/16-18 UNEF	1.64 (41.7)	.698 (17.7)	1.65 (41.9)	2.01 (51.1)	1.30 (33.0)	2.07 (52.6)	1.69 (42.9)	.710 (18.0)
61	8-32	61	1 1/2-18 UNEF	1.95 (49.5)	.850 (21.6)	1.90 (48.3)	2.26 (57.4)	1.45 (36.8)	2.43 (61.7)	1.88 (47.8)	.710 (18.0)

Sym.	Material	Finish
A	Aluminum Alloy	Black Anodize
N		Electroless Nickel
W		Cadmium, Olive Drab
X		Nickel Fluorocarbon Polymer
Z		Zinc Nickel

### NOTES

- Glenair Series 600 Backshell Assembly Tools are recommended for assembly and installation.
- Cable entry is measured with saddle bars closed and bottomed on clamp ears.
- Material/Finish:  
 Clamp body, coupling nut, saddles - Al alloy or 300 Series SST/See Table II.  
 Clamp screws and lock nuts - CRES/Passivated, Silver plate optional.  
 Anti-rotation device - Corrosion resistant material

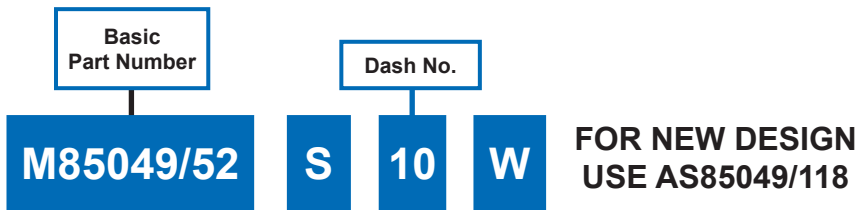


# BACKSHELLS AND ACCESSORIES FOR AS81703 SERIES 3 TYPE CONNECTORS

## Straight Strain Relief



### AS85049/52



**Superseded Part Number**

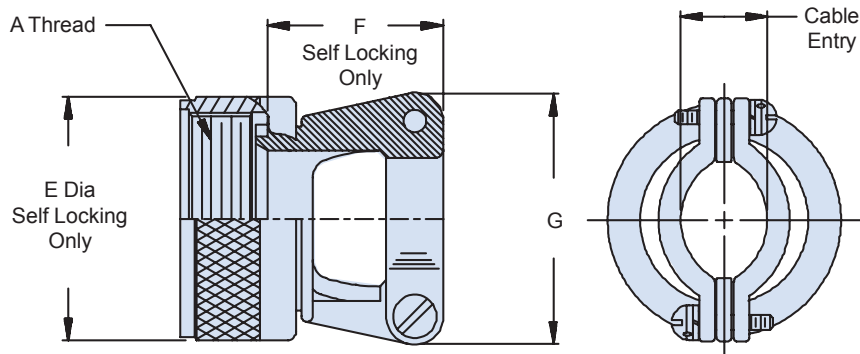
**MS3417-10 A**

Basic Part No. (Non-Self-Locking)      Dash No.

**Metal and Finish Designator**  
 A = Aluminum 1000 Hour Cadmium Olive Drab over Electroless Nickel  
 C = Aluminum, Cadmium Olive Drab  
 G = Aluminum Black Anodize  
 N = Aluminum, Electroless Nickel

**S = Self-Locking**  
**-1 = Non-Self-Locking**  
**N = Non-Detented**

**Material and Finish Designator**  
**A = Aluminum, Black Anodize**  
**N = Aluminum, Electroless Nickel**  
**S = Stainless Steel, Passivate**  
**W = Aluminum, 1000 Hr. Cadmium O.D. over Electroless Nickel**



D

**TABLE I: Shell Size, Cable Entry and Backshell Dimensions**

Dash No.	Shell Size	A Thread Class 2B	Ø E Max Self-Locking		F Max Self-Locking		G Max		Cable Entry			
									Min	Max		
03*	3	.562 - 24 UNEF	-	-	-	-	.782	(19.9)	.125	(3.2)	.204	(5.2)
12	7	.750 - 20 UNEF	1.135	(28.8)	.98	(24.9)	1.003	(24.6)	.291	(7.4)	.416	(10.6)
14	12	.875 - 20 UNEF	1.260	(32.0)	.98	(24.9)	1.061	(25.5)	.351	(8.9)	.476	(12.1)
16	19	1.000 - 20 UNEF	1.385	(35.2)	1.10	(27.9)	1.234	(26.9)	.501	(12.7)	.626	(15.9)
18	27	1.062 - 18 UNEF	1.510	(38.4)	1.35	(34.3)	1.466	(35.4)	.518	(13.2)	.706	(17.9)
20	37	1.188 - 18 UNEF	1.635	(41.5)	1.98	(50.3)	1.572	(37.2)	.581	(14.8)	.831	(21.1)
61*	61	1.500 - 18 UNEF	-	-	-	-	1.775	(45.1)	.706	(17.9)	1.081	(27.5)

\* Not Available in Self Locking

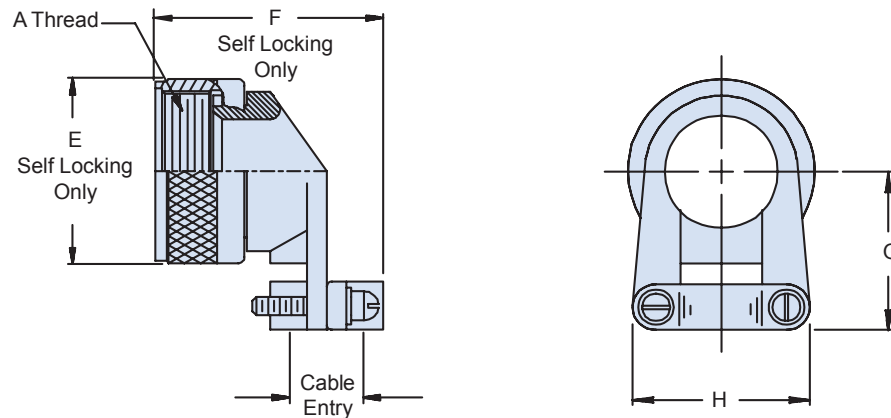
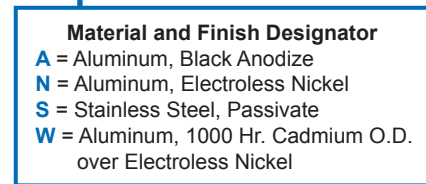
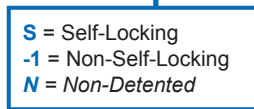
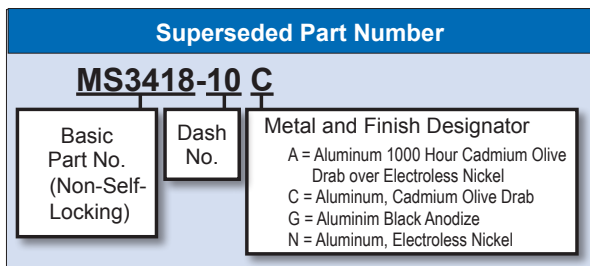
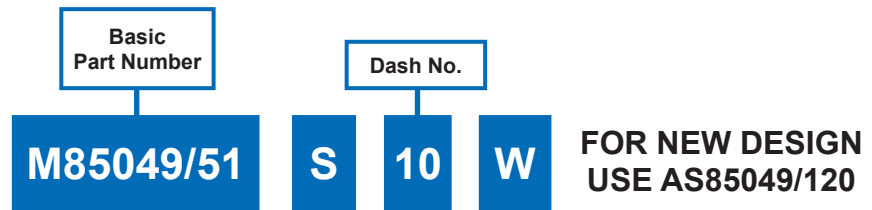
- NOTES**
1. Cable Entry is defined as the accommodation entry for the wire bundle or cable.
  2. Dimensions are not intended for inspection criteria.
  3. For complete dimensions, see the applicable Military Specification.



BACKSHELLS AND ACCESSORIES  
FOR AS81703 SERIES 3 TYPE CONNECTORS

90° Strain Relief

AS85049/51



**TABLE I: Shell Size, Cable Entry and Backshell Dimensions**

Dash No.	Shell Size	A Thread Class 2B	Ø E Max Self-Locking		F Max Self-Locking		G		H Max		Cable Entry			
							±.062	(1.6)			Min	Max		
3*	3	.562 - 24 UNEF	-	-	-	-	.777	(19.7)	.782	(19.9)	.125	(3.2)	.204	(5.2)
12	7	.750 - 20 UNEF	1.135	(28.8)	1.532	(38.9)	.867	(22.0)	.968	(24.6)	.291	(7.4)	.416	(10.6)
14	12	.875 - 20 UNEF	1.260	(32.0)	1.592	(40.4)	.930	(23.6)	1.003	(25.5)	.351	(8.9)	.476	(12.1)
16	19	1.000 - 20 UNEF	1.385	(35.2)	1.741	(44.2)	.994	(25.2)	1.061	(26.9)	.501	(12.7)	.626	(15.9)
18	27	1.062 - 18 UNEF	1.510	(38.4)	1.853	(47.1)	1.171	(29.7)	1.394	(35.4)	.518	(13.2)	.706	(17.9)
20	37	1.188 - 18 UNEF	1.635	(41.5)	1.978	(50.2)	1.234	(31.2)	1.466	(37.2)	.581	(14.8)	.831	(21.1)
61*	61	1.500 - 18 UNEF	-	-	-	-	1.388	(35.3)	1.775	(45.1)	.706	(17.9)	1.081	(27.5)

\* Not Available in Self Locking

**NOTES**

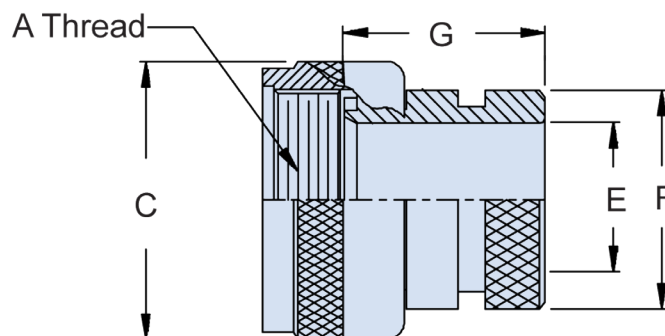
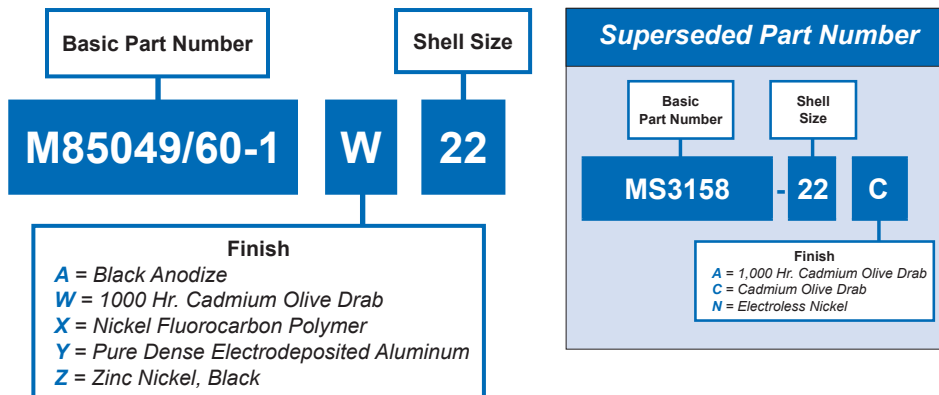
1. Cable Entry is defined as the accommodation entry for the wire bundle or cable.
2. Dimensions are not intended for inspection criteria.
3. For complete dimensions, see the applicable Military Specification.



BACKSHELLS AND ACCESSORIES  
FOR AS81703 SERIES 3 TYPE CONNECTORS  
**Straight Shrink Boot Adapter**



AS85049/60-1



**TABLE I: Shell Size, Thread and Dimensions**

Dash No.	Shell Size	A Thread Class 2B	C Dia Max +.000 (0.0) -.045 (1.14)	E Min Dia	F Dia +.000 (0.0) -.020 (0.5)	G Max
3	3	.562 - 24 UNEF	.670 (17.0)	.250 (6.4)	.533 (13.5)	.832 (21.1)
12	7	.750 - 20 UNEF	.860 (21.8)	.491 (12.5)	.774 (19.7)	.832 (21.1)
14	12	.875 - 20 UNEF	.980 (24.9)	.565 (14.4)	.838 (21.3)	.832 (21.1)
16	19	1.000 - 20 UNEF	1.110 (28.2)	.690 (17.5)	.963 (24.5)	.832 (21.1)
18	27	1.062 - 18 UNEF	1.220 (31.0)	.769 (19.5)	1.042 (26.5)	.832 (21.1)
20	37	1.188 - 18 UNEF	1.350 (34.3)	.894 (22.7)	1.217 (30.9)	.832 (21.1)
61	61	1.500 - 18 UNEF	1.650 (41.9)	1.174 (29.8)	1.529 (38.8)	.832 (21.1)

**NOTE**

1. For complete dimensions see the applicable Military Specification.

BACKSHELLS AND ACCESSORIES  
FOR AS81703 SERIES 3 TYPE CONNECTORS

# Straight Shrink Boot Adapter

AS85049/60-2G

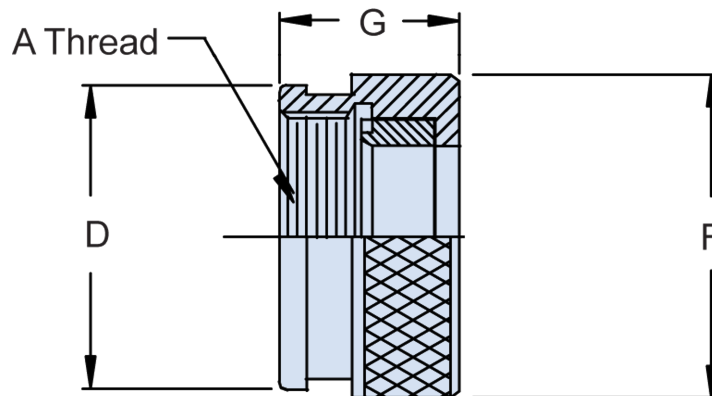
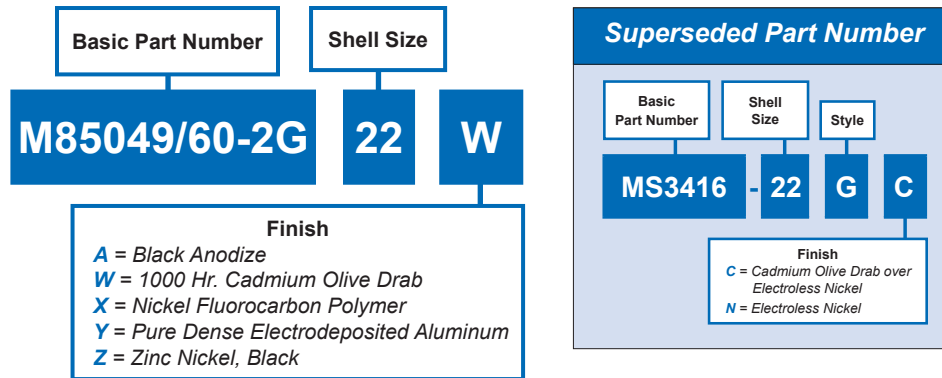


TABLE I: Shell Size, Thread and Dimensions					
Dash No.	Shell Size	A Thread Class 2B	D Dia +.000 (0.0) -.020 (0.5)	F Dia +.000 (0.0) -.045 (1.1)	G Max
3	3	.562 - 24 UNEF	.709 (18.0)	.750 (19.1)	.540 (13.7)
12	7	.750 - 20 UNEF	.898 (22.8)	.938 (23.8)	.540 (13.7)
14	12	.875 - 20 UNEF	1.024 (26.0)	1.063 (27.0)	.540 (13.7)
16	19	1.000 - 20 UNEF	1.152 (29.3)	1.238 (31.4)	.540 (13.7)
18	27	1.062 - 18 UNEF	1.243 (31.6)	1.310 (33.3)	.540 (13.7)
20	37	1.188 - 18 UNEF	1.370 (34.8)	1.436 (36.5)	.540 (13.7)
61	61	1.500 - 18 UNEF	1.653 (42.0)	1.748 (44.4)	.540 (13.7)

**NOTE**

1. For complete dimensions see the applicable Military Specification.



BACKSHELLS AND ACCESSORIES  
FOR AS81703 SERIES 3 TYPE CONNECTORS  
**Straight Crimp Ring Backshell and Crimp Ring**



**AS85049/26-1 and MS3419**

**Basic Part Number**  
*M85049/26-1 = Adapter Only*  
*M85049/26-2 = Crimp Ring Only*  
*M85049/26-3 = Adapter with Crimp Ring*  
 (See Page B-52 for Crimp Ring)

**Shell Size**  
(Table II)

**M85049/26-1 - 12 W**

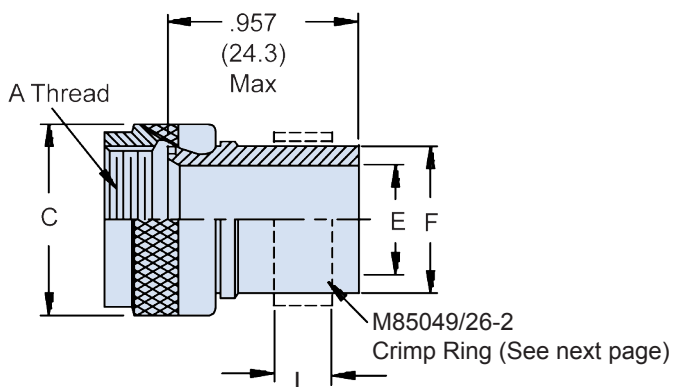
**Finish**  
*N = Electroless Nickel*  
*W = 1,000 Hr. Cadmium Olive Drab over Electroless Nickel*  
*X = Aluminum, Nickel Fluorocarbon Polymer*  
*Z = Aluminum, Zinc-Nickel, Black*

**Superseded Part Number**

**MS3419-21 C**

Basic Part No. | Shell Size

**Finish**  
(Material is Aluminum Only)  
*A = Electroless Nickel*  
*C = 500 Hr. Cadmium Olive Drab over Electroless Nickel*



**TABLE I: Adapter Shell Size, Thread, and Dimensions**

Dash No.	Shell Size	A Thread Class 2B	C Dia Max	E Dia	F Dia
3	3	.562 - 24 UNEF	.670 (17.0)	.250 (6.4)	.337 (8.6)
12	7	.750 - 20 UNEF	.860 (21.8)	.420 (10.7)	.500 (12.7)
14	12	.875 - 20 UNEF	.980 (24.9)	.540 (13.7)	.620 (15.7)
16	19	1.000 - 20 UNEF	1.110 (28.2)	.670 (17.0)	.750 (19.1)
18	27	1.062 - 18 UNEF	1.220 (31.0)	.789 (20.0)	.880 (22.4)
20	37	1.188 - 18 UNEF	1.350 (34.3)	.914 (23.2)	1.000 (25.4)
61	61	1.500 - 18 UNEF	1.650 (41.9)	1.210 (30.7)	1.359 (34.5)

**NOTES**

1. For complete dimensions see the applicable Military Specification.
2. Metric dimensions (mm) are in parentheses.

**D**

# Backshell Crimp Ring

AS85049/26-2

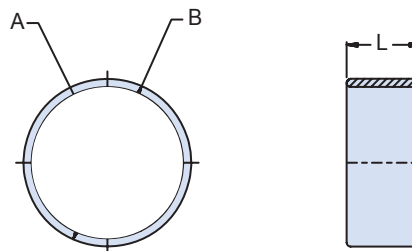
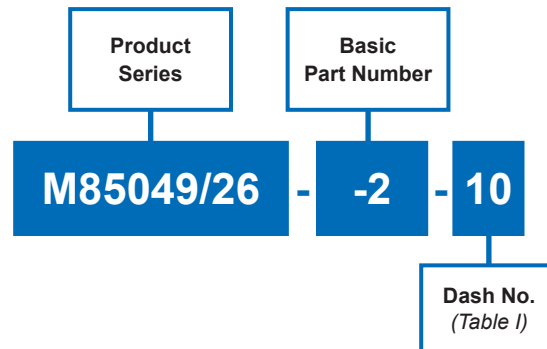


TABLE I: Shell Size, Thread, Cable Entry and Dimensions								
Dash No.	Shell Size	Color Code	A Dia		B Dia		L Dim ± ±.020 (0.5)	Installing Die Cat. No. (See Note 2)
			Min	Max	Min	Max		
8	3	GREEN	.400 (10.2)	.410 (10.4)	.448 (11.4)	.458 (11.6)	.250 (6.4)	GS405
12	7	RED	.585 (14.9)	.595 (15.1)	.660 (16.8)	.680 (17.3)	.440 (11.2)	GS590
14	12	BLUE	.705 (17.9)	.715 (18.2)	.780 (19.8)	.800 (20.3)	.440 (11.2)	GS710
16	19	GREY	.835 (21.2)	.845 (21.5)	.910 (23.1)	.930 (23.6)	.440 (11.2)	GS840
18	27	BROWN	1.005 (25.5)	1.015 (25.8)	1.080 (27.4)	1.100 (27.9)	.440 (11.2)	GS1010
20	37	GREEN	1.125 (28.6)	1.135 (28.8)	1.200 (30.5)	1.220 (31.0)	.440 (11.2)	GS1130
61	61	PURPLE	1.435 (36.4)	1.445 (36.7)	1.510 (38.4)	1.530 (38.9)	.440 (11.2)	GS1440

## NOTES

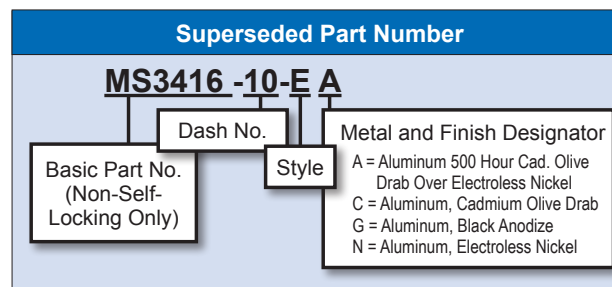
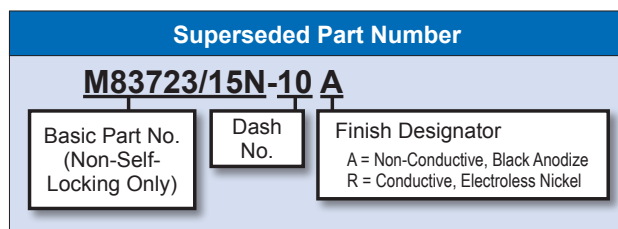
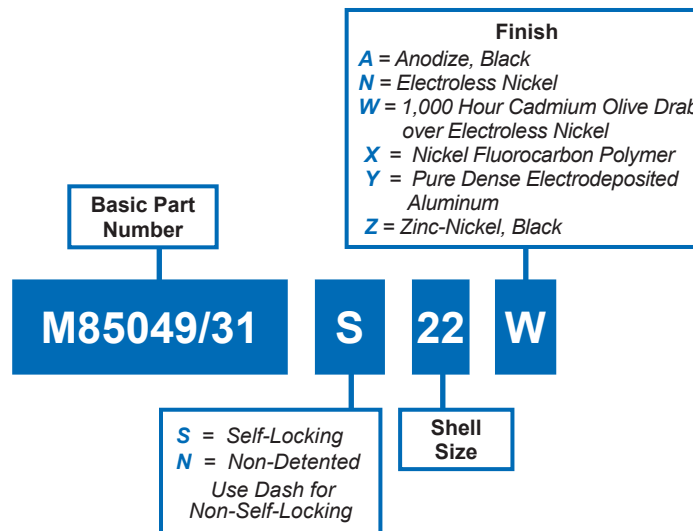
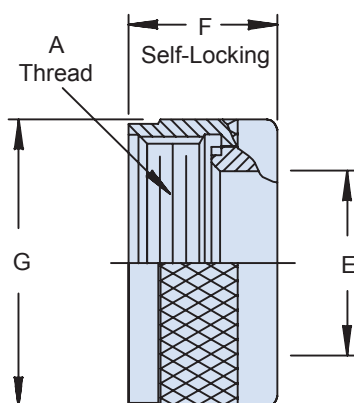
1. Assembly identified with manufacturer's name and part number, space permitting.
2. Crimp tool shall be the Thomas and Betts Installing Head catalog number 13640 or equivalent (see Table I).
3. The installing dies (Thomas and Betts Cat. No.--See Table I) shall be used with the Thomas and Betts Installing head Catalog Number 13640 or an equivalent tool.
4. Material/Finish: Copper/Tin Plate.
5. Metric dimensions (mm) are in parentheses.



BACKSHELLS AND ACCESSORIES  
FOR AS81703 SERIES 3 TYPE CONNECTORS  
**E-Nut (Self-Locking and Non-Self-Locking)**



AS85049/31, MS3416 and MIL-DTL-85723/15N



**TABLE I: Shell Size, Thread and Dimensions**

Shell Size	A Thread Class 2B	Ø E Max		F Max		Ø G Max	
3	.562 - 24 UNEF	.270	(6.9)	--	--	--	--
7	.750 - 20 UNEF	.511	(13.0)	.710	(18.0)	1.135	(28.8)
12	.875 - 20 UNEF	.585	(14.9)	.710	(18.0)	1.260	(32.0)
19	1.000 - 20 UNEF	.710	(18.0)	.710	(18.0)	1.385	(35.2)
27	1.062 - 18 UNEF	.789	(20.0)	.710	(18.0)	1.510	(38.4)
37	1.188 - 18 UNEF	.914	(23.2)	.710	(18.0)	1.635	(41.5)
61	1.500 - 18 UNEF	1.194	(30.3)	--	--	--	--

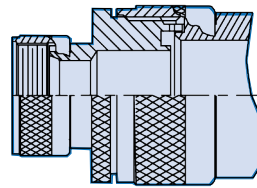
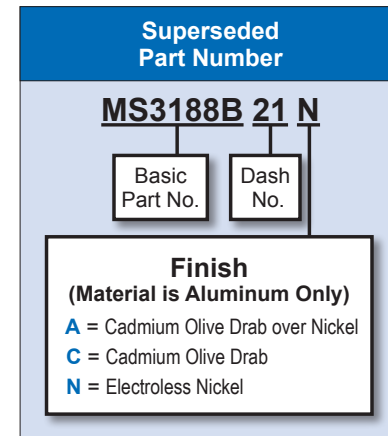
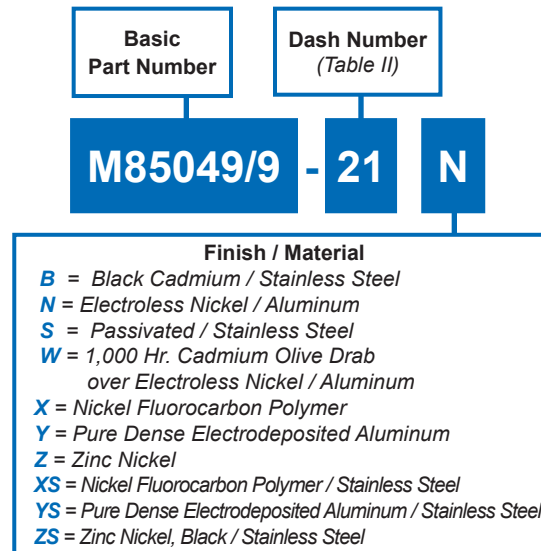
**NOTES**

1. For complete dimensions see the applicable Military Specification.
2. Metric dimensions (mm) are in parentheses.

BACKSHELLS AND ACCESSORIES  
FOR AS81703 SERIES 3 TYPE CONNECTORS

90° Environmental Backshell

AS85049/9 and MS3188B



STYLE 2

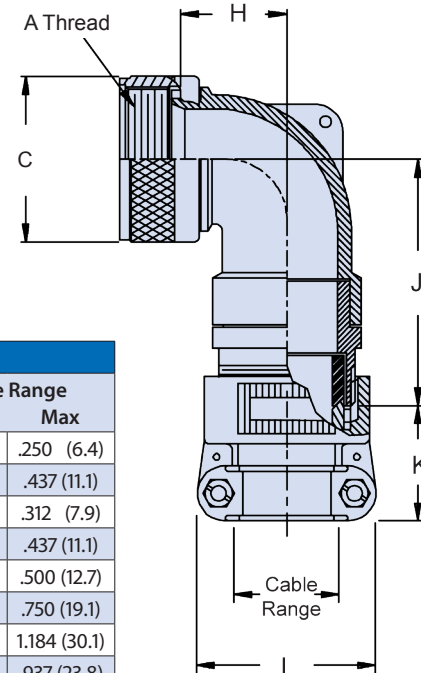


TABLE II: Dash Number and Cable Range									
Dash No.	Shell Size	A Thread Ref	C Dia Max	H Max	J Max	K Ref.	L Max	Cable Range Min	Cable Range Max
1	03	9/16-24 UNEF	.98 (24.9)	.761 (19.3)	1.862 (47.3)	1.027 (26.1)	.957 (24.3)	.125 (3.2)	.250 (6.4)
2	03			1.511 (38.4)	1.382 (35.1)	1.027 (26.1)	1.145 (29.1)	.250 (6.4)	.437 (11.1)
6	12	7/8-20 UNEF	1.28 (32.5)	.766 (19.5)	2.002 (50.9)	1.027 (26.1)	.957 (24.3)	.125 (3.2)	.312 (7.9)
7	12			.766 (19.5)	2.002 (50.9)	1.027 (26.1)	1.145 (29.1)	.250 (6.4)	.437 (11.1)
8	12			.766 (19.5)	1.397 (35.5)	1.027 (26.1)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
38	61	1-1/2-18 UNEF	1.89 (48.0)	1.291 (32.8)	2.442 (62.0)	1.059 (26.9)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
39	61			1.291 (32.8)	2.087 (53.0)	1.375 (34.9)	2.113 (53.7)	.875 (22.2)	1.184 (30.1)
53	61			1.291 (32.8)	2.087 (53.0)	1.156 (29.4)	1.770 (45.0)	.625 (15.9)	.937 (23.8)

NOTES

- For complete dimensions see the applicable Military Specification.
- Metric dimensions (mm) are in parentheses.
- When maximum cable entry is exceeded, Style 2 will be supplied.
- Cable Range is defined as the accommodation range for the wire bundle or cable. Dimensions shown are not intended for inspection criteria.
- Approximate chain lengths: Dash No. 01-12 = 5.0 (127.0); Dash No. 13-29 = 6.0 (152.4).

# BACKSHELLS AND ACCESSORIES FOR AS81703 SERIES 3 TYPE CONNECTORS

## Straight EMI/RFI Environmental Backshell



### AS85049/10 and MS3437A

**Superseded Part Number**

**MS3437A 21 C**

Basic Part No. | Dash No.

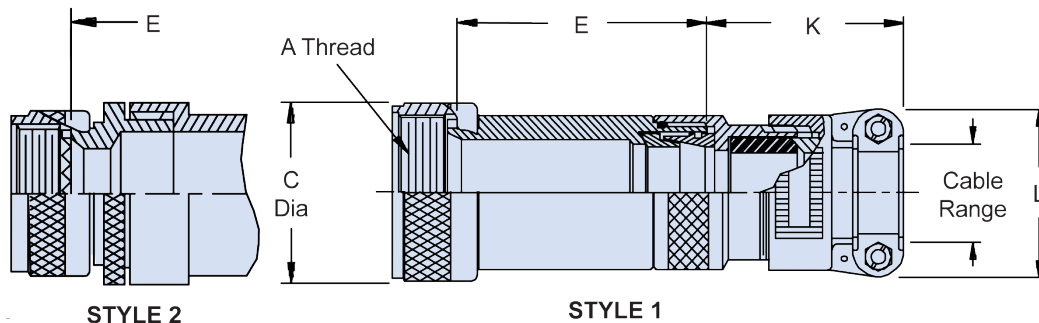
**Finish (Material is Aluminum Only)**

A = Cadmium Olive Drab over Nickel  
C = Cadmium Olive Drab  
N = Electroless Nickel

Basic Part Number: **M85049/10** | Dash Number (Table II): **21** | Finish / Material: **W**

**Finish / Material**

B = Black Cadmium / Stainless Steel  
N = Electroless Nickel / Aluminum  
S = Passivated / Stainless Steel  
W = 1,000 Hr. Cadmium Olive Drab over Electroless Nickel / Aluminum  
X = Aluminum, Nickel Fluorocarbon Polymer  
Z = Aluminum, Zinc-Nickel, Black  
XS = Stainless Steel, Nickel Fluorocarbon Polymer  
ZS = Stainless Steel, Zinc-Nickel, Black



**TABLE I: Shell Size and Dimensions**

Dash No.	Shell Size	A Thread Class 2B	C Dia Max
3	3	.562 - 24 UNEF	.67 (17.0)
12	7	.750 - 20 UNEF	.86 (21.8)
14	12	.875 - 20 UNEF	.98 (24.9)
16	19	1.000 - 20 UNEF	1.11 (28.2)
18	27	1.062 - 18 UNEF	1.22 (31.0)
20	37	1.188 - 18 UNEF	1.34 (34.0)
61	61	1.500 - 18 UNEF	1.65 (41.9)

**TABLE II: Dash No., Style, Shell Size, Dimensions and Cable Range**

Dash No.	Shell Size	Style	E Max	K Ref	L Max	Cable Range	
						Min	Max
01	3	1	2.125 (54.0)	1.544 (39.2)	.957 (24.3)	.125(3.2)	.250(6.4)
02	3	1	3.125 (79.4)	1.544 (39.2)	.957 (24.3)	.125(3.2)	.250(6.4)
03	3	2	2.875 (73.0)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
04	3	2	3.875 (98.4)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
13	12	1	2.125 (54.0)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
14	12	1	3.125 (79.4)	1.544 (39.2)	1.145 (29.1)	.250(6.4)	.437 (11.1)
15	12	2	2.875 (73.0)	1.844 (46.8)	1.332 (33.8)	.350(8.9)	.625 (15.9)
16	12	2	3.875 (98.4)	1.844 (46.8)	1.332 (33.8)	.350(8.9)	.625 (15.9)
103	61	1	3.125 (79.4)	1.916 (48.7)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
104	61	1	4.125 (104.8)	1.916 (48.7)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
105	61	1	3.125 (79.4)	2.000 (50.8)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
106	61	1	4.125 (104.8)	2.000 (50.8)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
107	61	2	3.875 (98.4)	2.230 (56.6)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
108	61	2	4.875 (123.8)	2.230 (56.6)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
109	61	2	3.875 (98.4)	2.024 (51.4)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
110	61	2	4.875 (123.8)	2.024 (51.4)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
111	12	1	2.125 (54.0)	1.844 (46.8)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
114	12	1	2.125 (54.0)	1.544 (39.2)	.957 (24.3)	.125 (3.2)	.312 (7.9)
115	12	1	3.125 (79.4)	1.544 (39.2)	.957 (24.3)	.125 (3.2)	.312 (7.9)
138	12	1	2.125 (54.0)	1.844 (46.8)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
139	12	1	3.125 (79.4)	1.844 (46.8)	1.332 (33.8)	.350 (8.9)	.500 (12.7)

#### NOTES

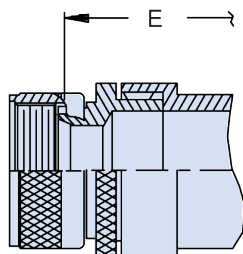
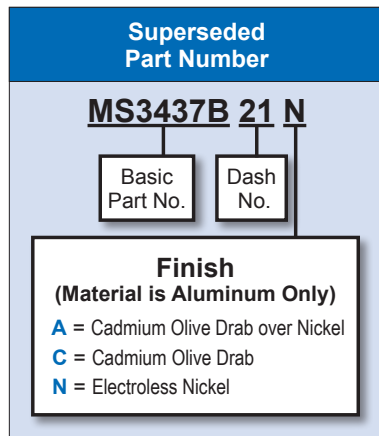
- For complete dimensions see the applicable Military Specification.
- Metric dimensions (mm) are in parentheses.
- Cable Range is defined as the accommodation range for the wire bundle or cable. Dimensions shown are not intended for inspection criteria.



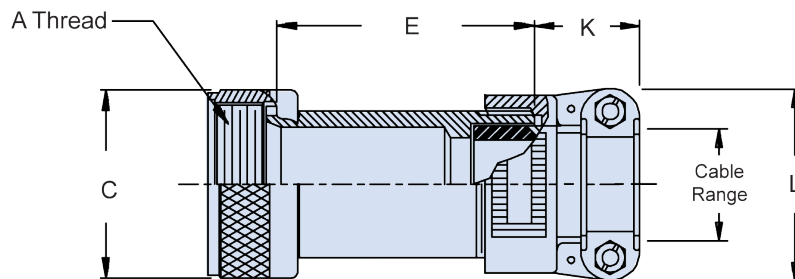
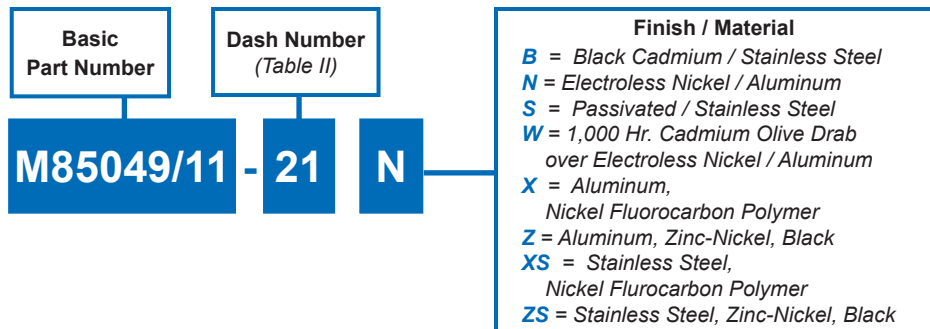
BACKSHELLS AND ACCESSORIES  
FOR AS81703 SERIES 3 TYPE CONNECTORS

Straight Environmental Backshell

AS85049/11 and MS3437B



STYLE 2



STYLE 1

**TABLE I: Shell Size and Dimensions**

Dash No.	Shell Size	A Thread Class 2B	C Dia Max
3	3	.562 - 24 UNEF	.67 (17.0)
12	7	.750 - 20 UNEF	.86 (21.8)
14	12	.875 - 20 UNEF	.98 (24.9)
16	19	1.000 - 20 UNEF	1.11 (28.2)
18	27	1.062 - 18 UNEF	1.22 (31.0)
20	37	1.188 - 18 UNEF	1.34 (34.0)
61	61	1.500 - 18 UNEF	1.65 (41.9)

**NOTES**

- For complete dimensions see the applicable Military Specification.
- Metric dimensions (mm) are in parentheses.
- Cable Range is defined as the accommodation range for the wire bundle or cable. Dimensions shown are not intended for inspection criteria.

**TABLE II: Dash No., Style, Shell Size, Dimensions and Cable Range**

Dash No.	Shell Size	Style	E Max	K Ref	L Max	Cable Range	
						Min	Max
01	3	1	2.125 (54.0)	1.027 (26.1)	.957 (24.3)	.125(3.2)	.250(6.4)
02	3	1	3.125 (79.4)	1.027 (26.1)	.957 (24.3)	.125(3.2)	.250(6.4)
03	3	2	2.875 (73.0)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
04	3	2	3.875 (98.4)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
13	12	1	2.125 (54.0)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
14	12	1	3.125 (79.4)	1.027 (26.1)	1.145 (29.1)	.250(6.4)	.437 (11.1)
15	12	2	2.875 (73.0)	1.027 (26.1)	1.332 (33.8)	.350(8.9)	.625 (15.9)
16	12	2	3.875 (98.4)	1.027 (26.1)	1.332 (33.8)	.350(8.9)	.625 (15.9)
103	61	1	3.125 (79.4)	1.059 (26.9)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
104	61	1	4.125 (104.8)	1.059 (26.1)	1.551 (39.4)	.500 (12.7)	.750 (19.1)
105	61	1	3.125 (79.4)	1.156 (29.4)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
106	61	1	4.125 (104.8)	1.156 (29.4)	1.770 (45.0)	.625 (15.9)	.937 (23.8)
107	61	2	3.875 (98.4)	1.375 (34.9)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
108	61	2	4.875 (123.8)	1.375 (34.9)	2.113 (53.7)	.875 (22.2)	1.250 (31.8)
109	61	2	3.875 (98.4)	1.500 (38.1)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
110	61	2	4.875 (123.8)	1.500 (38.1)	2.363 (60.0)	1.000 (25.4)	1.375 (34.9)
111	12	1	2.125 (54.0)	1.027 (26.1)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
114	12	1	2.125 (54.0)	1.027 (26.1)	.957 (24.3)	.125 (3.2)	.312 (7.9)
115	12	1	3.125 (79.4)	1.027 (26.1)	.957 (24.3)	.125 (3.2)	.312 (7.9)
138	12	1	2.125 (54.0)	1.027 (26.1)	1.332 (33.8)	.350 (8.9)	.500 (12.7)
139	12	1	3.125 (79.4)	1.027 (26.1)	1.332 (33.8)	.350 (8.9)	.500 (12.7)



## Specification information

## Space-grade interconnect manufacturing and test capability

## Outgassing and Inspection Modification Codes

Glenair space mechanisms and related interconnect solutions are ideally designed for deployment of CubeSat and NanoSat equipment. All HDRMs, and connectors feature materials, finishes, and performance specifications that perform to NASA EEE-INST-002

### Outgassing

Space flight equipment requires low-outgassing components in order to prevent degradation to optics and other sensitive instruments. Various Glenair connectors contain nonmetallic materials such as rubber, plastic, adhesives and potting compounds which can give off gasses when subjected to a vacuum or high heat. Unless the connector is specially processed, the TML and CVCM can exceed allowable limits. The space industry has adopted a standardized test procedure, ASTM E595, to evaluate outgassing properties. The MIL-DTL-38999 specification Class G also details specific TVM and CVCM values. In Glenair's 186T process, for example, connectors and connector materials are heated to 175° C at a vacuum of  $5 \times 10^{-6}$  Torr for 48 hours. Items under test are then weighed to calculate the Total Mass Loss (TML), which may not exceed 1.0% of the total initial mass. A collector plate is used to determine the Collected Volatile Condensable Material (CVCM), which may not exceed 0.1% of the total original specimen mass. Glenair is able to offer outgas processing which assures all materials comply with their respective standards.

### Note on Connector Material and Finish Options

Some types of metals are prohibited for space flight. "Pure Tin, Cadmium, Zinc shall not be used as a final finish on EEE part (NASA EEE-INST-002 Instructions for EEE Parts Selection, Screening, Qualification, and Derating). NASA recommends electroless nickel or gold finish on connector shells and gold finish for contacts.

## Specifying Appropriate NASA Screening

**1** Choose a NASA EEE-INST-002 Table 2A screening level. This table contains three screening levels: **Level 1** for missions requiring the highest reliability and lowest level of risk, **Level 2** for low to moderate risk missions, and **Level 3** missions where enhanced screening and inspection is not invoked.

**2** Choose outgassing process and/or NASA inspection requirements. 9 options are available for NASA outgassing, see Table I for details. Cross reference Table II for inspections completed by screening level as required by NASA standards.

**3** Select the modification code from the table and add it to the part number.  
Example: 253-01600ME21-35PNMSA-429.

**Table I: Outgassing per NASA Screening Levels and D38999, Class G**

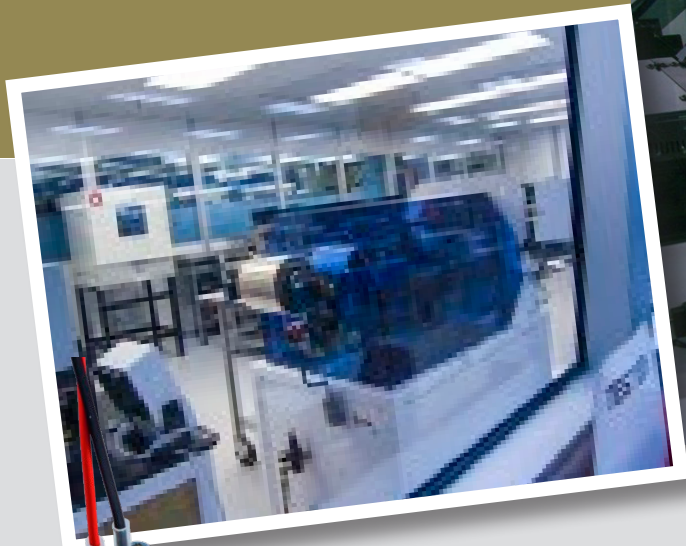
Screening Level	No Outgas Processing	48 Hour Oven Bake 175° C 100%	Thermal Vacuum* Outgassing 24 Hour 125° C 100%	Thermal Vacuum* Outgassing 48 Hour 175° C 100%	Mod Code
No Screening			●		186M (ASTM E595)
				●	186T (Class G)
3			●		429L
	●				429
2			●		429A
		●			429K
1	●				429B
			●		429C
		●			429J

\*Thermal vacuum of  $10^{-6}$  Torr.

**Table II: NASA EEE-INST-02, Table 2A Screening Levels**

Inspection	Level 1	Level 2	Level 3
Visual	100%	100%	100%
Mechanical	2	2	
Dielectric Withstanding Voltage	2	2	
Insulation Resistance	2	2	
Contact Engagement & Separation Force	2		
Hermeticity (Sealed Receptacles Only)	100%	100%	100%
Coupling Force	2		

Note: required inspection quantity shown. Zero acceptance of failures allowed for all quantities inspected. Inspection is not performed/required for MIL-DTL-38999, Class G

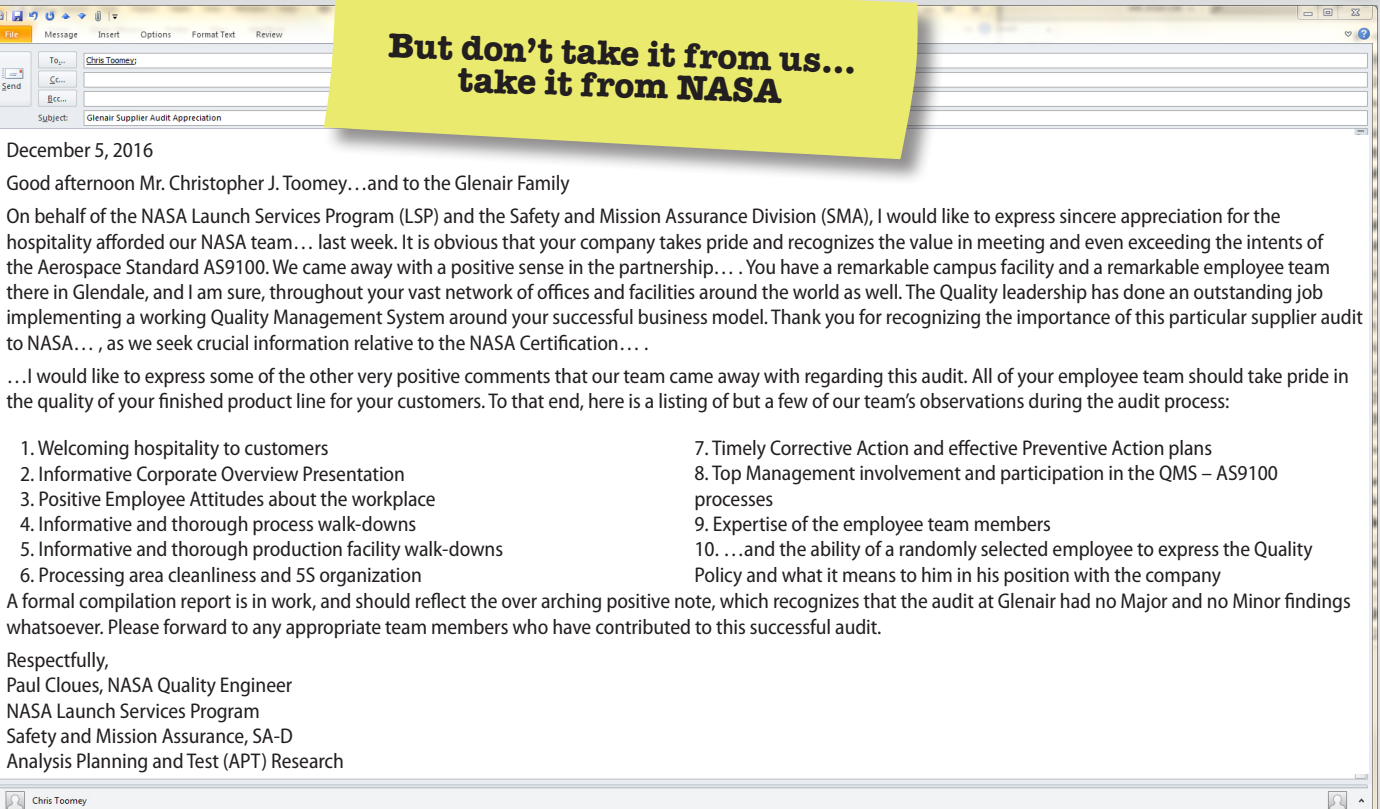


**NASA  
ESA, JAXA  
SCREENED**

SPACE GRADE

Glenair's family of space mechanisms are manufactured in certified cleanrooms. Full qualification test reports are available for every device type. NASA/ESA outgas processing and screening completed on-site. All operations are managed under a single certified quality system with unprecedented levels of performance.

**But don't take it from us...  
take it from NASA**



December 5, 2016

Good afternoon Mr. Christopher J. Toomey...and to the Glenair Family

On behalf of the NASA Launch Services Program (LSP) and the Safety and Mission Assurance Division (SMA), I would like to express sincere appreciation for the hospitality afforded our NASA team... last week. It is obvious that your company takes pride and recognizes the value in meeting and even exceeding the intents of the Aerospace Standard AS9100. We came away with a positive sense in the partnership... You have a remarkable campus facility and a remarkable employee team there in Glendale, and I am sure, throughout your vast network of offices and facilities around the world as well. The Quality leadership has done an outstanding job implementing a working Quality Management System around your successful business model. Thank you for recognizing the importance of this particular supplier audit to NASA... as we seek crucial information relative to the NASA Certification...

...I would like to express some of the other very positive comments that our team came away with regarding this audit. All of your employee team should take pride in the quality of your finished product line for your customers. To that end, here is a listing of but a few of our team's observations during the audit process:

- |  |  |
|--|--|
| 1. Welcoming hospitality to customers                      | 7. Timely Corrective Action and effective Preventive Action plans  |
| 2. Informative Corporate Overview Presentation             | 8. Top Management involvement and participation in the QMS – AS9100 processes  |
| 3. Positive Employee Attitudes about the workplace         | 9. Expertise of the employee team members  |
| 4. Informative and thorough process walk-downs             | 10. ...and the ability of a randomly selected employee to express the Quality Policy and what it means to him in his position with the company |
| 5. Informative and thorough production facility walk-downs |  |
| 6. Processing area cleanliness and 5S organization         |  |

A formal compilation report is in work, and should reflect the over arching positive note, which recognizes that the audit at Glenair had no Major and no Minor findings whatsoever. Please forward to any appropriate team members who have contributed to this successful audit.

Respectfully,  
Paul Cloues, NASA Quality Engineer  
NASA Launch Services Program  
Safety and Mission Assurance, SA-D  
Analysis Planning and Test (APT) Research

PROVEN FLIGHT HERITAGE

# SPACE-GRADE SOLUTIONS

NASA · ESA · JAXA · Commercial



Complex space-grade cable assemblies (shown: Glenair-made "Golden Umbilical")

## TURNKEY, SPACE-GRADE EMI/RFI WIRE HARNESS AND CABLE ASSEMBLIES



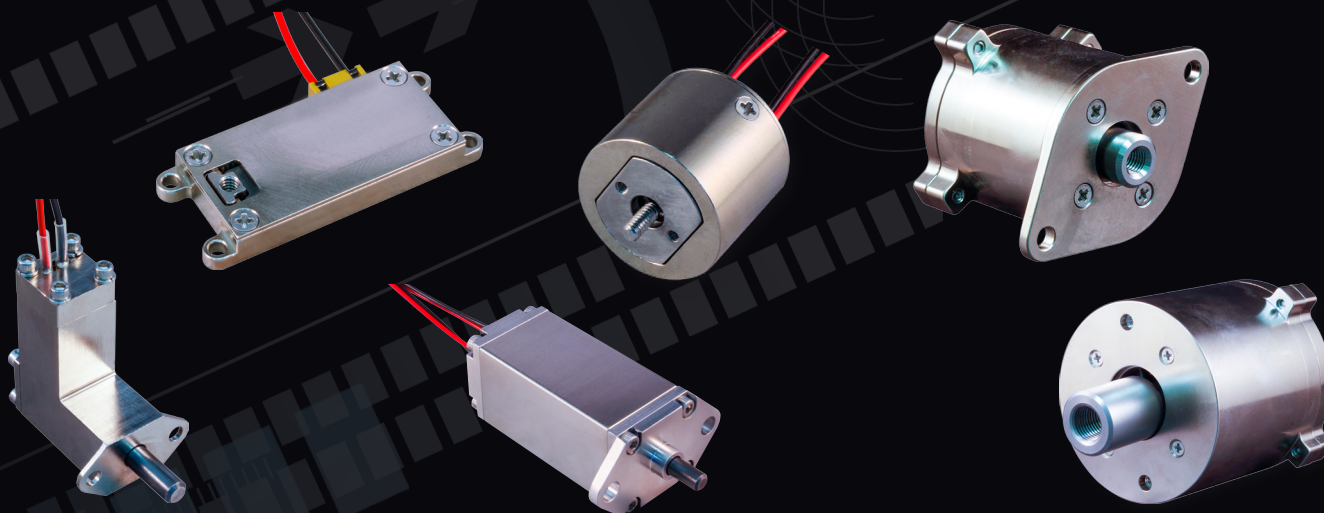
Multibranch Micro-D / Mighty Mouse cable assembly with ArmorLite™ lightweight EMI shield overbraiding



EMI/RFI shielded multibranch Micro-D connector assembly with Glenair Series 23 SuperNine™ panel mount I/O connector

Repairable backshell-equipped cable assembly for a space lab application

## HOLD-DOWN RELEASE MECHANISMS, PIN PULLERS AND PIN PUSHERS



**Light Duty**  
Up to 75 lb release payload

**Medium Duty**  
Up to 1,000 lb release payload

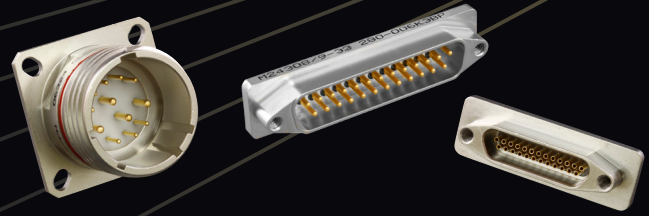
**Heavy Duty**  
Up to 20,000 lb release payload

## SPACEWIRE CERTIFIED CABLES



Laboratory and flight variants

## SPACE-QUALIFIED HERMETIC RECEPTACLES



Glass-to-metal and CODE RED encapsulant hermetic solutions for high-pressure / low-leakage space applications

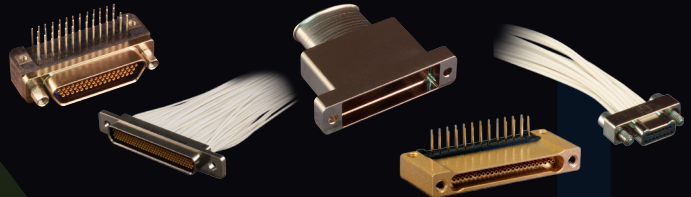
## EMI/RFI FILTER CONNECTORS



MIL-DTL-38999 type, Series 80 Mighty Mouse, and other circulars

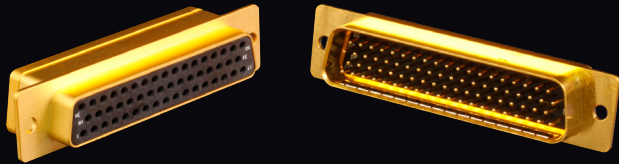
HiPer-D and Micro-Crimp filtered rectangulars

## SPACE-GRADE 83513 MICRO-D AND 32139 NANO



ESA and NASA screened connectors and backshells available as discrete components or wired pigtail assemblies

## SERIES 28 HIPER-D M24308 INTERMATEABLE



Qualified MIL-DTL-24308 Class K Space-Grade Hermetic, environmental, filter, Sav-Con's and cordsets

## LIGHTWEIGHT MIGHTY MOUSE AND SERIES 79



Small, lightweight, high-density ideally suited for space programs

A proven product, ideal for guidepin and rack-and-panel applications

## SAV-CON® CONNECTOR SAVERS



Available for every military and commercial circular and rectangular connector series

## ULTRA-LIGHTWEIGHT CONDUIT AND BRAID



Factory-terminated and user-installable conduit systems

Weight-saving microfilament EMI braided shielding solutions

## ASSISTED-RELEASE, AND LANYARD QUICK-DISCONNECTS



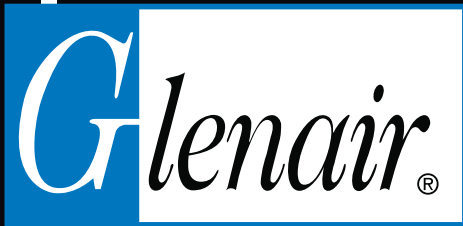
Blind mate D38999 type feedthrough with kick-off assist

Lanyard-release quick-disconnects

## FIBER OPTIC CONNECTORS, CABLES, AND PHOTONIC MEDIA CONVERSION



High-speed, high-bandwidth space-grade solutions



**MISSION-CRITICAL  
INTERCONNECT  
SOLUTIONS**

**Glenair, Inc.**

1211 Air Way • Glendale, California • 91201-2497  
Telephone: 818-247-6000 • Fax: 818-500-9912 • sales@glenair.com  
[www.glenair.com](http://www.glenair.com)

**Glenair Power  
Products Group**

860 N. Main Street Extension  
Wallingford, CT  
06492

Telephone:  
203-741-1115  
Facsimile:  
203-741-0053  
sales@glenair.com

**Glenair UK Ltd**

40 Lower Oakham Way  
Oakham Business Park  
Mansfield, Notts  
NG18 5BY England

Telephone:  
+44-1623-638100  
Facsimile:  
+44-1623-638111  
sales@glenair.co.uk

**Glenair Microway Systems**

7000 North Lawndale Avenue  
Lincolnwood, IL  
60712

Telephone:  
847-679-8833  
Facsimile:  
847-679-8849

**Glenair Nordic AB**

Gustav III : S Boulevard 46  
SE-169 27 Solna  
Sweden

Telephone:  
+46-8-50550000  
sales@glenair.se

**Glenair Electric GmbH**

Schaberweg 28  
61348 Bad Homburg  
Germany

Telephone:  
06172 / 68 16 0  
Facsimile:  
06172 / 68 16 90  
info@glenair.de

**Glenair Iberica**

C/ La Vega, 16  
45612 Velada  
Spain

Telephone:  
+34-925-89-29-88  
Facsimile:  
+34-925-89-29-87  
sales@glenair.es

**Glenair Italia S.p.A.**

Via Del Lavoro, 7  
40057 Quarto Inferiore –  
Granarolo dell'Emilia  
Bologna, Italy

Telephone:  
+39-051-782811  
Facsimile:  
+39-051-782259  
info@glenair.it

**Glenair France SARL**

7, Avenue Parmentier  
Immeuble Central Parc #2  
31200 Toulouse  
France

Telephone:  
+33-5-34-40-97-40  
Facsimile:  
+33-5-61-47-86-10  
sales@glenair.fr

**Glenair Korea**

B-1304 Gunpo IT Valley  
148 Gosan-Ro, Gunpo-Si  
Kyunggi-Do, Korea  
435-733

Telephone:  
+82-31-8068-1090  
Facsimile:  
+82-31-8068-1092  
sales@glenair.kr

