Improved Battery/Power Connectors for Aircraft and Other High Current Applications
MS3509 Receptacle: Old vs. New
Molding Material Improvements

• Higher Heat Tolerance (HDT over 500ºF)
• Robust and Chemical Resistant
• Better Design for Manufacturing- no sink marks
MS3509 Receptacle: Old vs. New
Mounting Holes

• Eliminated plated steel mounting ferrules
  – Reduced cost (4 less inserts)
  – Removed 4 rust sources
Improved Locking Pin Engagement

• Reduced tolerance on pin chamfer
• Reduced tolerance on hole diameter (Φ)
• Reduced distance between pins (L)
• Increased engagement with mating worm screw
Lower Resistance Terminal Adapter Assembly

• Improved consistency and quality
• Two less components in assembly
• Less mistakes in customer assembly
• Eliminated stainless steel and hollow post from circuit
• Uses same low-resistance design as 7007 Quick Disconnect (MS25182-2)
• Copper terminal adapter better than ledloy
Lower Resistance Terminal Adapter Assembly

- Stainless steel pin
- Solid copper pin
- Hollow post
Test Program

• Prototype samples and standard Receptacles were mated to P/N 7007 & tested @ 1500A
  – 3 type 3509-28 receptacles
  – Prototype with steel terminal blocks
  – Prototype with copper terminal blocks

• Terminal blocks shunted with copper block of same C.S

• Volt drop measured at cable connections in mating connector P/N 7007
Receptacle Test set up

- Copper shunting bar bolted in place across adaptor blocks
Volt Drop @ 1500A
P/N 7007 & 3509-28: Prototype, Standard

| Cu | 3509#1 | 3509#2 | 3509#3 | Steel |

Distribution Statement A: Approved for Public Release; Unlimited Distribution
Add-on Connectors for Rebling Plastics MS25182-2

• Normal configuration- only one side used.
5002 “Add-on Receptacle”

- Design fits either unused side of MS25182-2
- Uses same low-resistance socket/pin design as in MS25182-2 & MS3509
P/N 5002 Open for Connection

- Integral dust cover with gasket keeps sockets clean and snaps open/closed
5003 Quick Disconnect

• Correct polarity guaranteed for either side
• Pivoting handle fits tight spaces
Rebling add-on connections

• Low resistance for high current applications
• Easily retrofit to either side of MS25182-2 connector
• Polarized
• Add-on Receptacle meets qualification requirements of MS25182-2 (MIL-P-18148C)
• Battery always connected
Rebling add-on connections

• Qualified to requirements of MS25182-2
• Installs in Rebling P/N 7007, 4-Wire Connector, Type MS25182-2 Connector
• Makes Available side a Low Resistance Power Receptacle: Micro-ohm resistance
• Allows connecting external power directly to aircraft battery without breaking battery-to-aircraft connection.
Support-Side Add-on Connector

- Installs on support Cable
- Has Comparable high current capability
- Shell Material: High-Temperature Nylon to Endure Mechanical Shocks that can occur during handling
MS25182-2 Four-Wire Connector

• Shell
  – High Temperature Plastic
  – Shell adequately protects contact sockets so that plastic caps are not needed on sockets
MS25182-2 Four-Wire Connector

• Contacts
  – Low resistance copper alloy
  – Maximum surface contact with mating pins
  – Floating for precise alignment with mating pins
  – Capable of continuous high current.
P/N 7007, 4-Wire Max Current

- Current
- Plug +
- Plug -
- Cable
- Block

**Graph:**
- **Y-axis:** Current, Degrees F
- **X-axis:** Elapsed Time

Legend:
- Red: Current
- Green: Plug +
- Blue: Plug -
- Black: Cable
- Purple: Block
Power Supply Used for Test
Power Supply, Shunt and Connector
Test Receptacle
Dual Cable Installation
Questions?

Nate Bower (215) 343-2400 ext. 203
Rebling Plastics
natebower@reblingplastics.com
www.reblingplastics.com

Barry Newman (812) 854-4087
Naval Surface Warfare Center
Crane Division
baird.newman@navy.mil