



Concorde Battery Corporation

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TECHNICAL BULLETIN

Subject: Connector Maintenance

July 18, 2011

Number: 11

The majority of RG Series aircraft batteries manufactured by Concorde Battery Corporation incorporate an MS3509 Style 1 receptacle for making electrical connection to the aircraft. This connector was originally developed for military aircraft but has become the de facto standard for commercial aircraft as well. Specifications for MS3509 connectors are given in MIL-PRF-18148D and MIL-PRF-18148/3.

See Figure 1 for a schematic drawing of the MS3509 Style 1 receptacle. It features silver plated copper contacts and a center socket for mechanical engagement. This connector is rated for starting all types of reciprocating and turbine engines used for aircraft applications. The voltage drop at 1500A is less than 90 millivolts and it is rated for 1500 mating cycles. Mating connectors are shown in Figure 2 (2-Wire Style) and Figure 3 (4-Wire Style).

The MS3509 receptacle is very robust and normally lasts the life of the battery with little deterioration in performance. In some aircraft applications, where the receptacle experiences a large number of mating cycles, the contact pins and/or engagement socket may become worn to the point where electrical performance is adversely affected. To assure sustained performance in high mating cycle applications, the connector system should be maintained as described below.

Cleaning/Lubrication

Clean and lubricate the following surfaces every 500 mating cycles:

- Receptacle Contact Pins
- Receptacle Engagement Socket and Retaining Pins
- Mating Plug Contact Sockets
- Mating Plug Worm Screw

To clean, wipe surfaces with a soft, clean, lint-free cloth or Q-tip. If corrosion is present, neutralize with a 5% solution of sodium bicarbonate in water, rinse with water, then wipe dry. To lubricate, apply a thin layer of light lubricating oil using a Q-tip. The following lubricating oils are recommended:

- NATO Type O-190 per MIL-PRF-32033(2). Trade names include Aero Shell Fluid 18, Arpolube 800, and Royco 308A.
- NATO Type O-156 per MIL-PRF-23699F. Trade names include Aero Shell Turbine Oil 500, Mobil Jet Oil II and Royco 500.

Do not use silicone-based oils for connector lubrication.



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Contact Wear Check

Check the contact sockets of the mating plug for excessive wear every 500 mating cycles. As the sockets wear, the compression force against the receptacle pins decreases, causing higher electrical resistance. This check can be done with a Go/No Go gauge available from Rebling Plastics (Gauge 29). This gauge has a 0.370-inch diameter pin on one end and a 0.385-inch diameter pin on the other end. Only the 0.370-inch diameter pins should be used. Insert the 0.370-inch diameter pin into each socket. Each socket should exert enough pressure on the pin to hold it in place when the gauge is pointed toward the ground. If the gauge slips out, the sockets are too loose and the mating plug should be replaced.

Other Checks

Replace mating plug if any of the following are detected:

- Excessive pitting or corrosion that cannot be removed from contacts,
- Burned contacts due to arcing, or
- Cracked housing.

NOTE: If any of the above conditions are detected on the battery receptacle, the battery should be replaced (receptacle is not field replaceable).

Connector Alignment

Make sure the mating plug stays horizontally aligned with the battery receptacle during each mating cycle. Misalignment of the plug can result in excessive shear forces that gradually wear down the retaining pins inside the engagement socket.

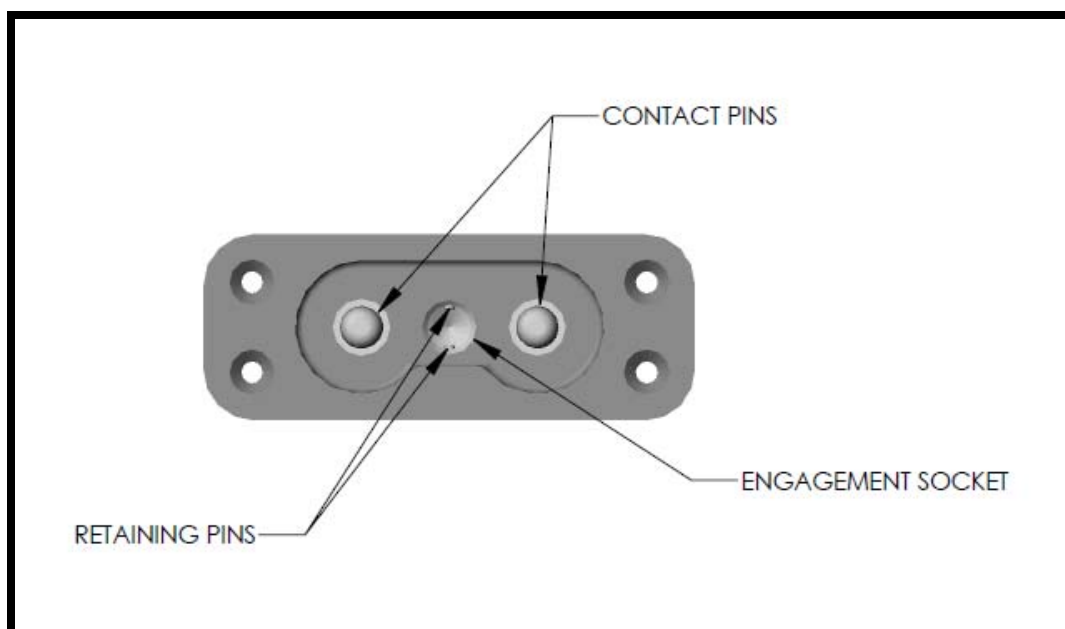


Figure 1 – MS3509 Style 1 Battery Receptacle

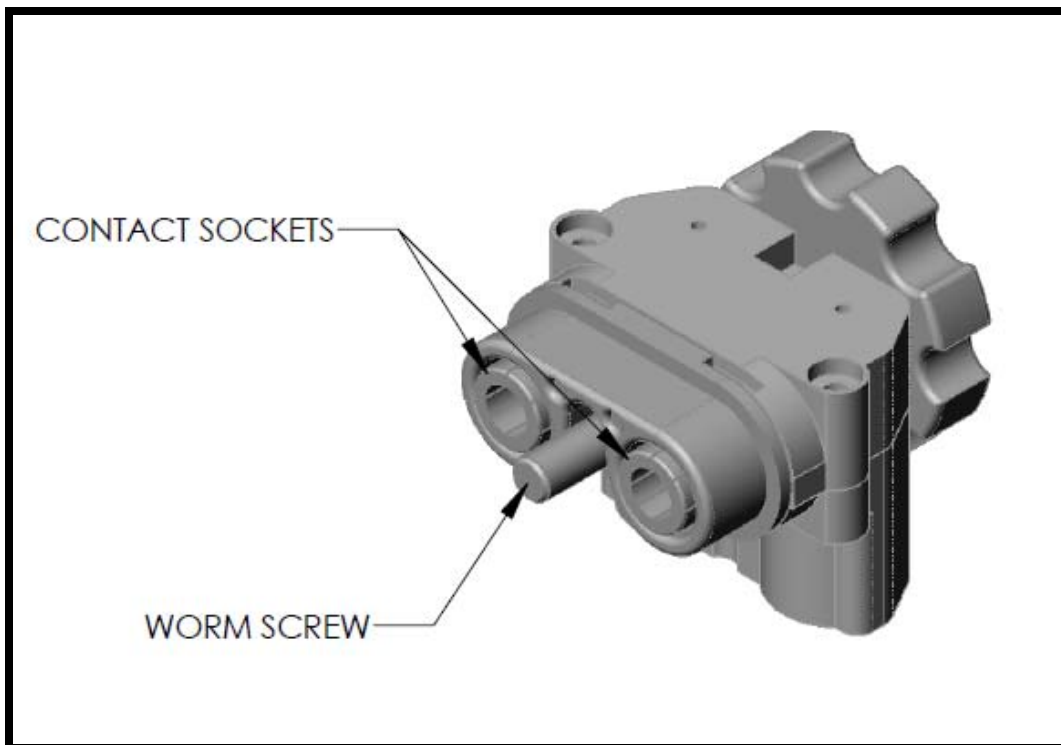


Figure 2 – MS3509 Mating Plug (2-Wire Style)

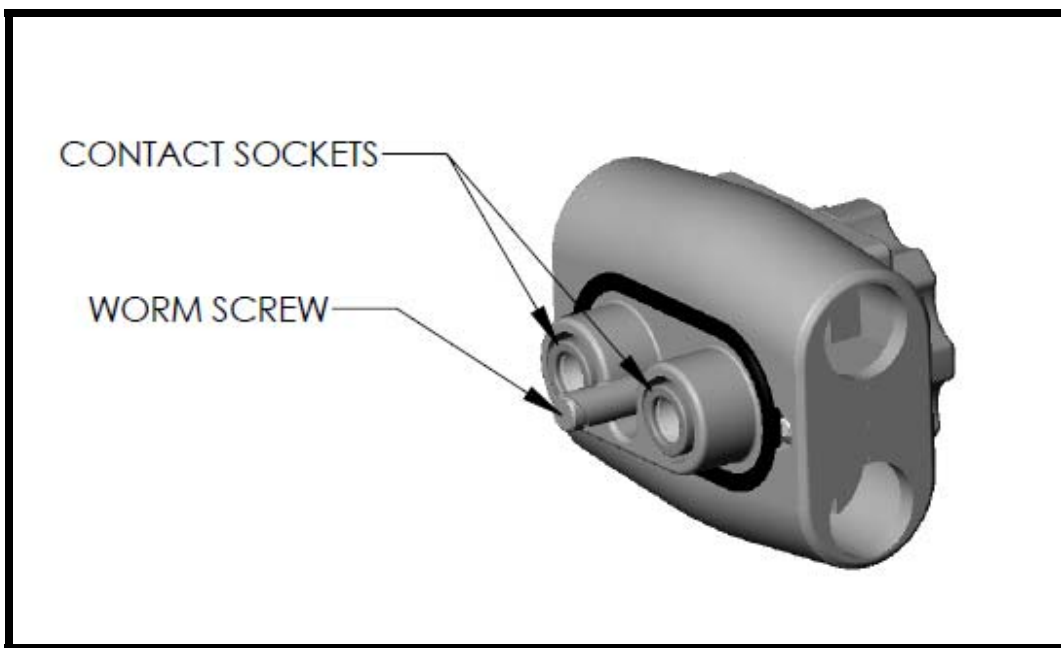


Figure 3 – MS3509 Mating Plug (4-Wire Style)