JOINT SERVICES WIRING ACTION GROUP

Summer 2021 Edition **JSWAG Newsletter** *Vol. 12 Issue 1*

http://www.navair.navy.mil/jswag

Announcements

The 2021 Fall JSWAG/JAvFOWG Technical Interchange Meeting will take place virtually and in-person in Lexington Park, MD. Please contact the appropriate committee chair for an invitation if interested in attending.

Resources

- MIL-HDBK-522C Guidelines for Inspection of Aircraft Electrical Wiring Interconnect Systems https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=277535
- MIL-HDBK-525 Electrical Wiring Interconnect System (EWIS) Integrity Program https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=279725
- Need help locating information on connectors, contacts or accessories? If so, email us at jswag@navy.mil

Newsletter Contact

JSWAG Coordinator

jswag@navy.mil

Connector Mated/Locked Awareness

Recent data analysis for maintenance malfunction codes and applicable maintenance action forms (MAF) have shown a significant number of improper/damaged/loose connector (including keyway) entries (W17).

From October 2015 through December 2020, W17 MALCODE was entered as follows:

AH-1Z	4,727		F/A-18F	949		MH-53E	312
UH-1Y	5,201		MH-60S	1,686		KC-130J	1,468
V-22	5,669		MH-60R	1,214		CH-53E	2,651
E-2D	190		F/A-18E	1,193			

Review of the MAFs showed a significant proportion of corrective actions was only to reseat the connectors. Based on past maintainer experience, it appears this trend is increasing. It is important that connector inspection is performed per guidance available to ensure connectors are properly mated and locked. Careful inspection could reveal the cause of an unlocked connector, especially if the system malfunction or connector maintenance action has been repeated.

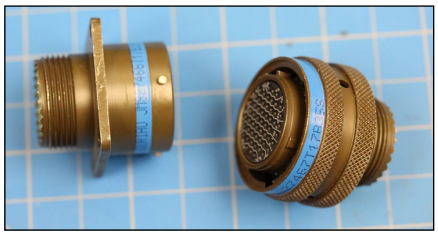
Locking mechanisms come in many coupling designs: bayonet, fine and coarse thread screw, push-pull, breakaway, push and press to release, locked by screw and push-push locked. Military applications should not be using all of these designs.

Connector “lock/mated” indicators are features installed on some connectors that allow for a visual indication of a fully locked or mated connector. These indicators vary depending on the series connector and/or manufacturer. Refer to Installation and Repair Practices Technical Manual 505-1, WP 020 000 paragraphs 61-66 and MIL-HDBK-522C Guideline 5 for detailed inspection criteria and lock/mated features for connector styles.

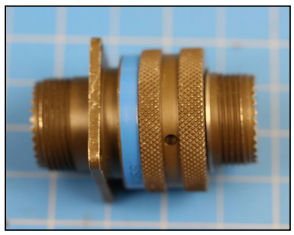
Loose connectors can result in moisture intrusion and/or partially or non-mated contacts. Hazards associated with these conditions include: contact fretting, arcing and shorting between contacts, corrosion, and loss of or system degradation.

Preventative Maintenance: Refer to installation procedures for ALL electrical connectors to ensure they are properly installed and verified (for those with lock/mated indicators). Always perform applicable verification procedures (e.g. continuity checks, operational checks) upon installation of EVERY connector.

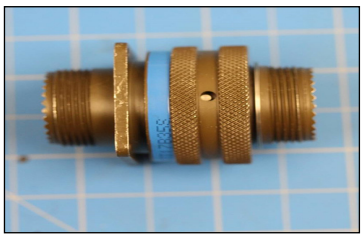
Please note the latest revision of MIL-HDBK-522 Rev C was just published in May 2021 and can be downloaded from the Assist website (https://quicksearch.dla.mil/qsSearch.aspx).



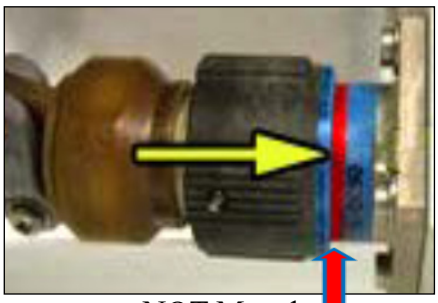
Uncoupled



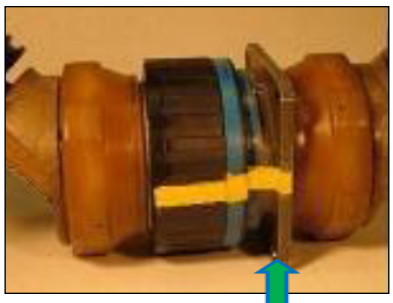
Coupled; Not locked
Note- The silver post is not seen.



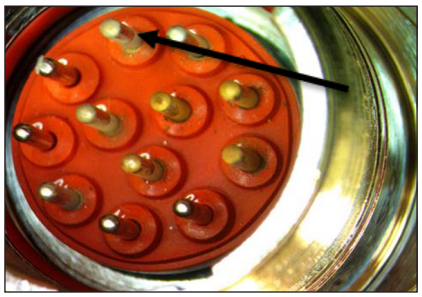
Locked
Note- The silver post is visible and a "click" is felt.



NOT Mated



Mated



Pin contact fretting

Many times reseating a connector may only be a temporary solution. This can be due to poor contact between pin and socket. Contact fretting, loss of material due to micro-motion between pin and socket, erodes plating material and can cause poor conduction. When the connector is reseated, a new conduction point is created, solving the problem temporarily. A thorough visual inspection should be performed before any component replacement. Splayed sockets, fretting, or corrosion of contact plating are good wear indicators particularly in high vibration applications. Evidence or accumulation of gold flakes in bottom of connector plug/receptacle require cleaning and reinspecting. Replace worn components with serviceable ones and re-test. If discrepancies are discovered, or intermittent faults warrant disassembly of affected wire harness or connector, then disassemble one connector at a time. Remove any cable clamps, back-shells and shielding necessary to reveal all connections. See NAVAIR 01-1A-505-2 or -3 for specific connector assembly/disassembly and repair techniques. The photo above shows an example of contact fretting. Contact your Cognizant Engineering Authority for further assistance, if there are questions.

References: NA 01-1A-505-1 WP 004 01 (section 23), NAVAIR 01-1A-505-2, NAVAIR 01-1A-505-3

Find the Answer

Current Question:
What is the technical manual order of precedence for EWIS maintenance?
Resource:
NA 01-1A-505-1 WP 002 00
Answer will be provided in next Newsletter publication

Previous Question:
What are the 4 authorized repairs for insulation damage to single conductor wire without conductor damage?
Answer:
1. Wrap-around side entry wire insulation repair (C-Wrap) see WP 014 02 para 4 and 8
2. Heat shrink see WP 014 02 para 3 and 4
3. Environmental splice see WP 014 00 para 4
4. Wire segment replacement see WP 004 00 and 011 00
Source: NAVAIR 01-1A-505-1