

# NACES Maint Review and updates

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***Warfighter Focused &  
Cost Conscious***

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AECS ISSC  
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# Topics to discuss

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- AECS ISSC
  - Who are we?
- Naval Aircrew Common Ejection Seat (NACES):
  - Maintenance concept
  - Manuals related to NACES and purpose
  - Recent and future seat updates
- Recent NACES maintenance issues



# AECS ISSC

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- Aircrew Escape and Crashworthy Systems In Service Support Center:
  - Supports US Navy/Marine fleet aviation on Ejection and Crashworthy Seat Issues:
    - Funded by PMA-202 (Human Systems), PMA-265 (F/A-18) and PMA-273 (T-45)
  - AECS ISSC lead located at FRC East Cherry Point
  - AECS ISSC team members located in seven locations in the continental US
  - Supplemented by 3 CSS support at the moment:
    - 2 Martin Baker Reps funded by production team
    - 1 local rep (non MBA) at Lemoore FRC/I level loft



# AECS ISSC

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- AECS ISSC Sites:
  - NAWCAD Patuxent River (CW Seats, Survival Kits).
  - FRC East Cherry Point (Core Team, Ejection Seats)
  - FRC SW North Island (Ejection Seats)
  - FRC SE Jacksonville (Ejection Seats)
  - NAWCWD China Lake (Parachutes and Torso Harnesses)
  - NAWCAD Lakehurst (Support Equipment)
  - NSWC Indian Head (CADS/PADS)



# Ejection Seat Products



NACES

MK-16



SJU-5/6



GRUEA-7



SJU-4/13/14







# Parachute Recovery Systems





# Crashworthy Seating Systems





# Survival Kits







# AECS ISSC FUNCTIONS



- Fleet support
- Investigation of failed materials (EI's/HMR's and mishaps).
- Design improvements and issue TD's/Bulletins
- Optimize maintenance requirements and manual changes (TMSDR's or TPDR's)
- Supply support recommendations.
- Our job is to **SUPPORT YOU!**



# NACES Maint Concept

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- Ejection Seat:
  - Organizational and Depot Level maintenance
  - Organizational level:
    - Remove and Install
    - Clean
    - Inspect
    - Check and test
    - Minor repair (if required)
- Parachutes and survival kits:
  - Organizational and I Level maintenance



# NACES related pubs and purpose

## Organizational Level:

- F/A-18:
  - A1-F18AC-IETM:
    - Legacy F/A-18A/B/C/D acft maint manual.
  - A1-F18EF-IETM:
    - F/A-18E/F and EA-18G acft maint manual.
  - Both IETMS are used only for on ACFT seat maint.
  - Scheduled maintenance and removal (14/28/84/728 days).
  - Periodic Maint Instruction Cards (PMICs).



# NACES related pubs and purpose

## Organizational Level:

- T-45:
  - A1-T45AB-160-000:
    - Used only for on ACFT seat maint and removal/installation.
    - Checklist
  - A1-T45AB-MRC-SERIES
    - Scheduled maint and removal (Daily/28/140/728 days).
    - Periodic Maint Instruction Cards (PMICs).



# NACES related pubs and purpose (F/A-18)

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- IETMS:
  - Removal of individual seat components:
    - Bucket and related components
    - Survival Kit
    - WB-55s
    - Main Beam
    - Catapult
    - Parachute
    - Drogue Canister (coming soon)
    - PDRM (coming soon)





# NACES related pubs and purpose (F/A-18)

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- A1-120-600 series (Checklist):
  - AC (A/B/C/D), SJU-5/6 and NACES
  - AE (A/B/C/D), NACES
  - EA (E/F and G), NACES
  - Removal/Inst by Disassembly/Assembly
- A1-120-650 series (Checklist):
  - AC (A/B/C/D), SJU-5/6 and NACES
  - AE (A/B/C/D), NACES
  - EA (E/F and G), NACES
  - Removal/Inst as a complete unit



# NACES related pubs and purpose (F/A-18)

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- A1-120-700 series (Checklist):
  - AC (A/B/C/D), SJU-5/6 and NACES
  - AE (A/B/C/D), NACES
  - EA (E/F and G), NACES
  - Removal/Inst of Survival kit and Seat Bucket



# NACES related pubs and purpose (F/A-18)

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- Purpose of Checklist:
  - Use of Checklist is MANDATORY
  - For -700:
    - To be completed by a two member team:
      - Safety Observer/helper
      - Working member (perform procedures)
  - For -600/-650:
    - To be completed by a three member team:
      - Safety Observer/QA/CDQAR (Controlling Guide)
      - Working member (perform procedures)
      - Tool handler/helper



# NACES related pubs and purpose

- Purpose of Checklist (cont):
  - BE PHYSICALLY THERE!
  - All personnel must be qualified/certified
  - Ensures the accomplishment of tasks in the correct sequence
  - Purpose is to eliminate the possibility of error or omission
  - NO INTERRUPTIONS (UNLESS IN AN EMERGENCY)
  - No partial work/checklist allowed



# NACES related pubs and purpose

- For on acft individual removal/installation of component or seat maint:
  - Use IETMS (F/A-18) or A1-T45AB-160-000 (T-45)
- NAVAIR 13-600-15-6-3:
  - NACES MRC deck (updated annually)
  - Provides the task/maint to perform the 728 day seat inspection
  - Detail instructions will refer to NAVAIR 13-1-36 (shop Maint)





# NACES related pubs and purpose

- NAVAIR 13-1-36:
  - NACES Seat Shop Maintenance and IPB
  - Updated annually
  - Detailed org level maint instructions for the seat removed from the acft
  - Not for seat maint on the acft -> Use IETMS.



# NACES related pubs and purpose

- NAVAIR 13-1-37 NACES Dearm/Arm Checklist:
  - Updated annually
  - To be completed by a three member team:
    - Safety Observer/QA/CDQAR (Controlling Guide)
    - Working member (perform procedures)
    - Tool handler/helper



# NACES Maint Concept

- Ejection Seat:
  - Depot Level maint:
  - NAVAIR 13-1-44:
    - Components Sent to Depot/FRC
      - BRU (16 yrs)
      - Harness Reel (20 yrs)
      - Multi-Purpose Initiator (IMP, 14 yrs)
      - Catapult, Bucket & Main Beam send for cause (corrosion, damage, etc.), BCM



# Recent NACES Mods

- Lanyard Retention Collar (ACC-756):
  - Replaces metallic tape.
  - Strict compliance with assembly instructions.





# Recent NACES Mods

## Lanyard Retention Collar (ACC-756):



Picture 2. Lanyard Tie and Emergency/O2 Lanyard



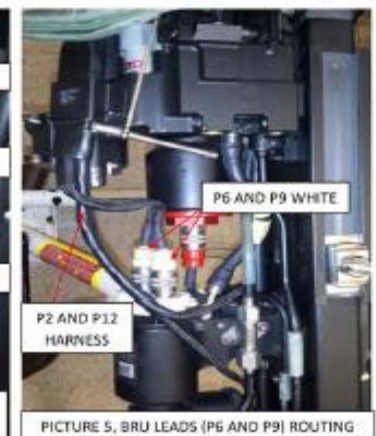
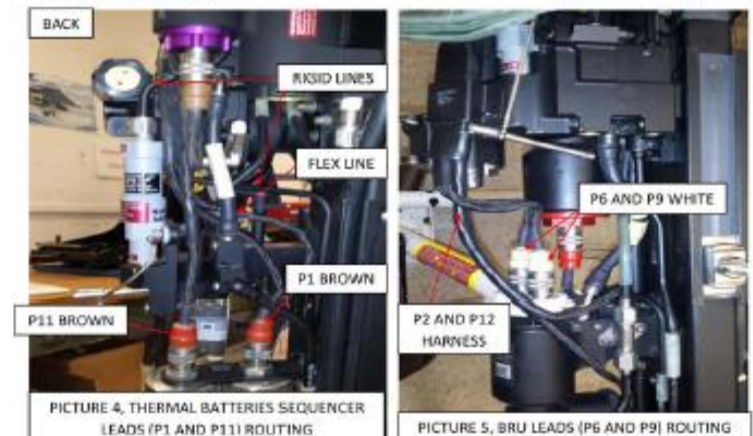
Picture 3. Lanyard Retention Collar Assembly





# Recent NACES Updates

- Enhanced Sequencer routing Procedures:





# Recent Updates

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- Time and Altitude Test Set (TATS):





# Future Seat Updates

- New ejection Handle (Late 2016):



Current Handle



Current Handle (repaired)



New Handle

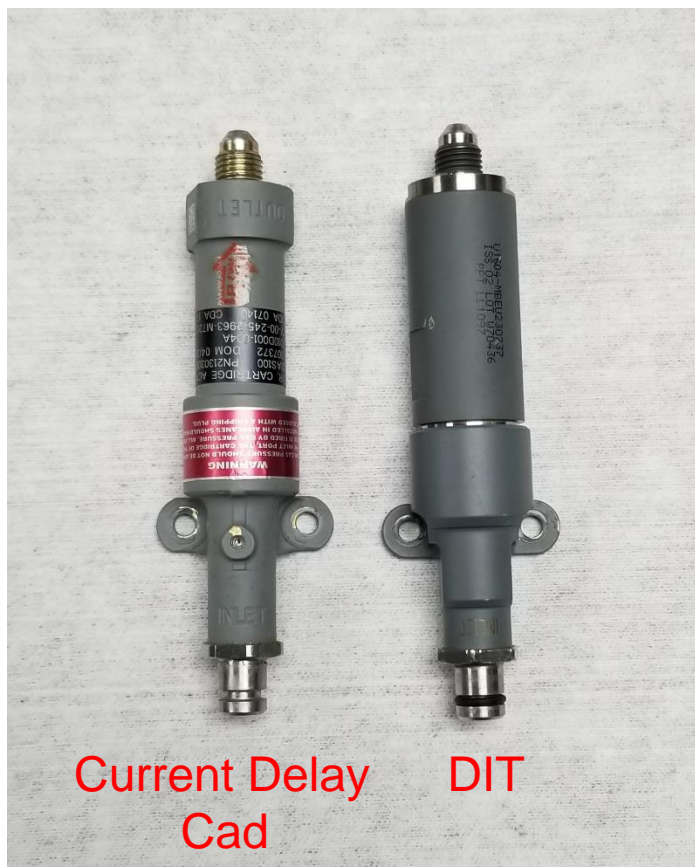
- New handle did not meet environmental/operational Acft conditions.





# Future Seat Updates

- Digital Inline Timer (DIT) (WB54/55/56/M720):
  - Effort to increase reliability and increase service life over current timers





# Future Seat Updates

- Digital Inline Timer (DIT) (WB54/55/56/M720):
  - Minor installation/routing changes needed for T-45/FA-18 FWD seat



Chafing problem



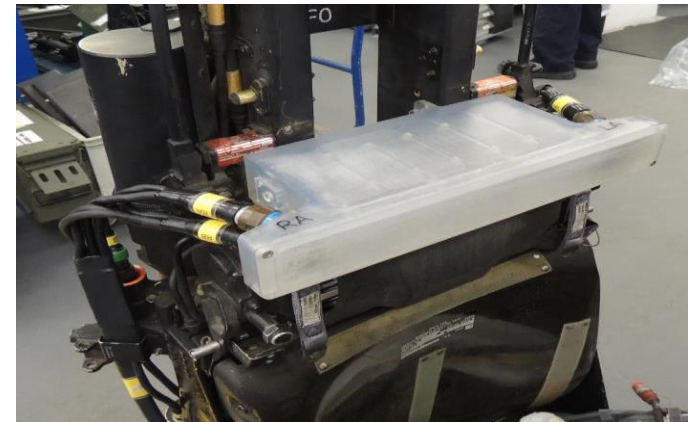
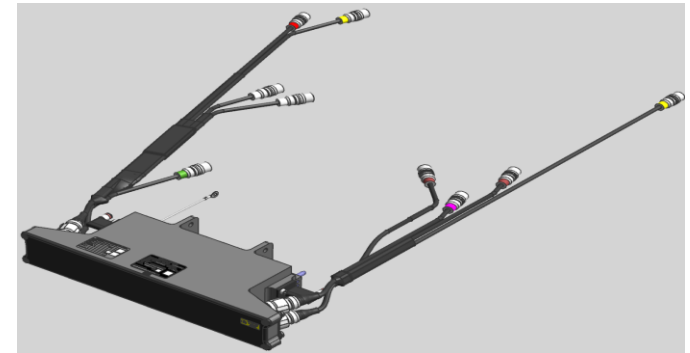
Tie strap to avoid chafing





# Future Seat Updates

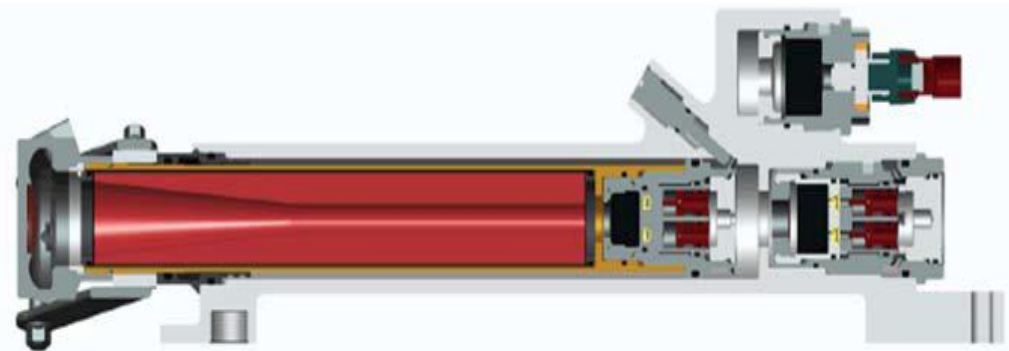
- Ejection Seat Sequencer:
  - Enhanced software
  - Detachable leads
  - New test set



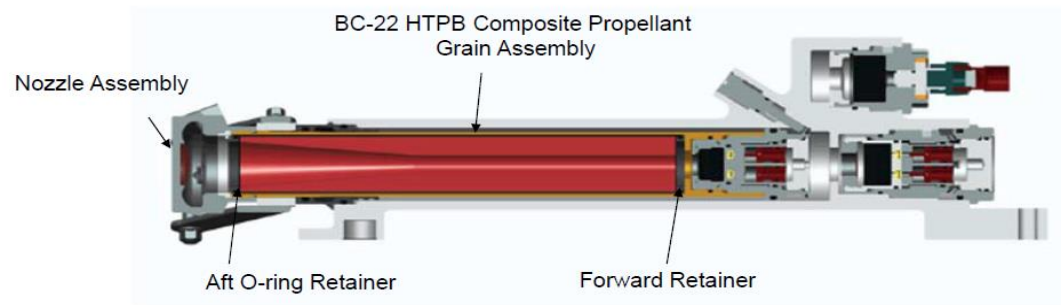


# Future Seat Updates

- MK-122 (PDRM) Improvement
  - Increase Service Life



Mk 122 Mod 0



Mk 122 Mod 1



# Future Seat Updates

- Detachable Risers and UWARS:
  - Includes new packing press
  - Reduce maint (packing and 28 day insp)



SEAWARS UWARS JWARS



# Maintenance Issues

- Main Beam Dowel Pin Damage:
  - Pin damaged during Main Beam/Seat installation.
  - Total of 9 main beams damaged in the last 3 years.
  - Damaged caused by non-compliance with seat installation checklist.

**A1-F18EA-120-600**

**004 00**

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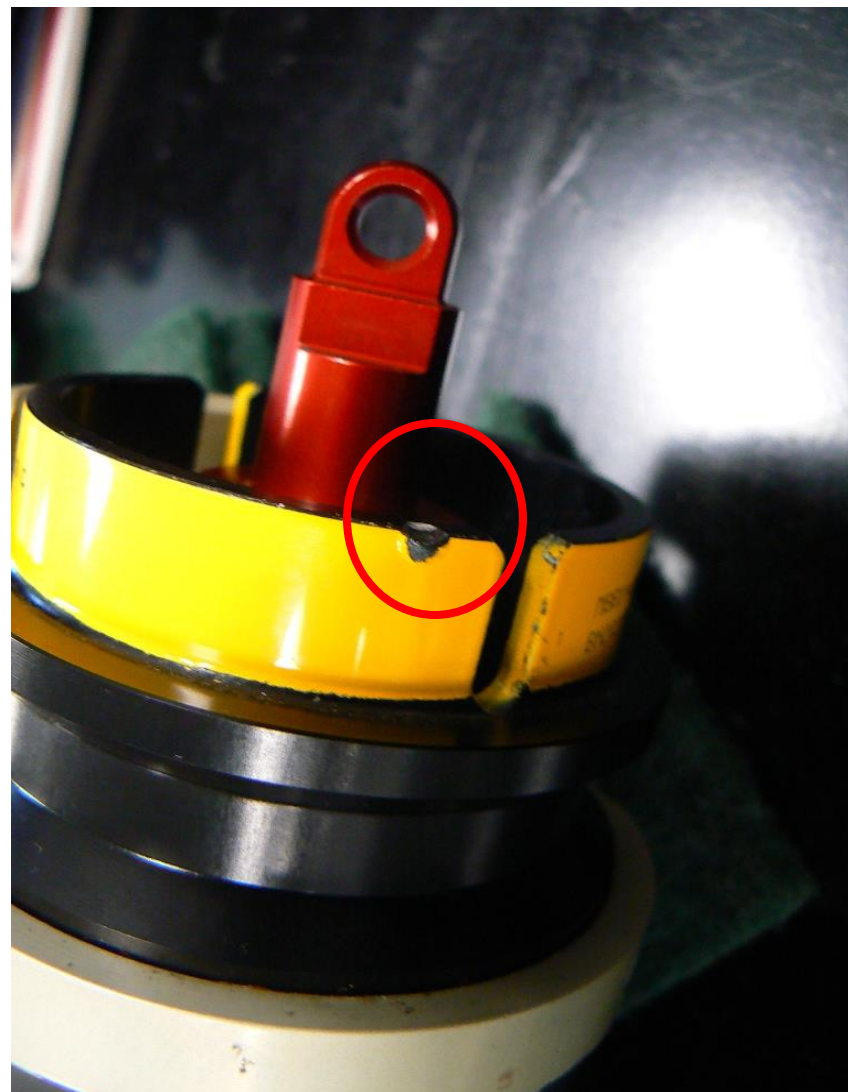
**CAUTION**

To prevent damage to main beam assembly, dowel pin and catapult breech, make sure dowel pin on upper cross beam of main beam assembly is aligned with catapult V-groove before installation.





# Maintenance Issues

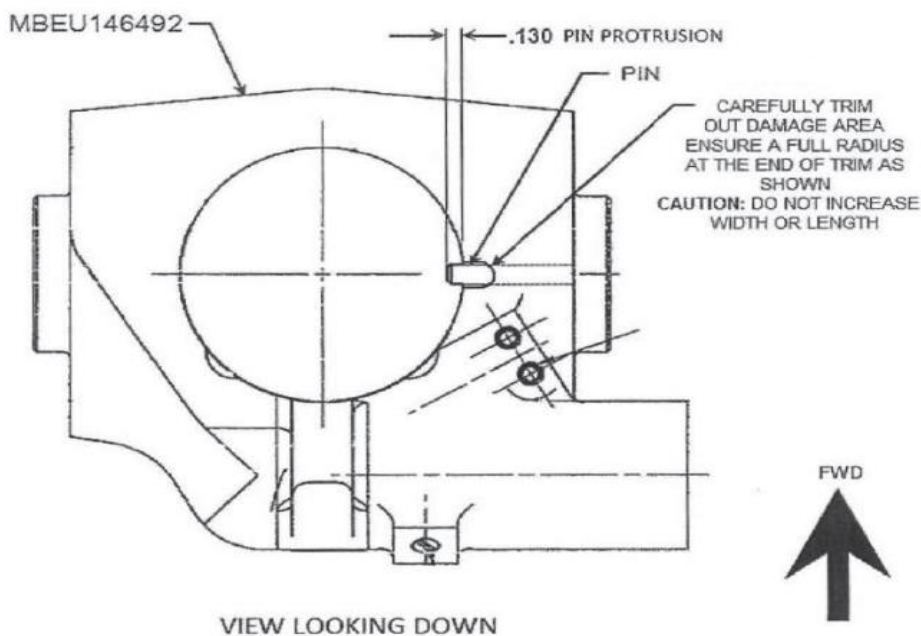




# Maintenance Issues

- Main Beam Dowel Pin Damage:
  - Depot repair in place.

## Main Beam Repair



## Main Beam Repair

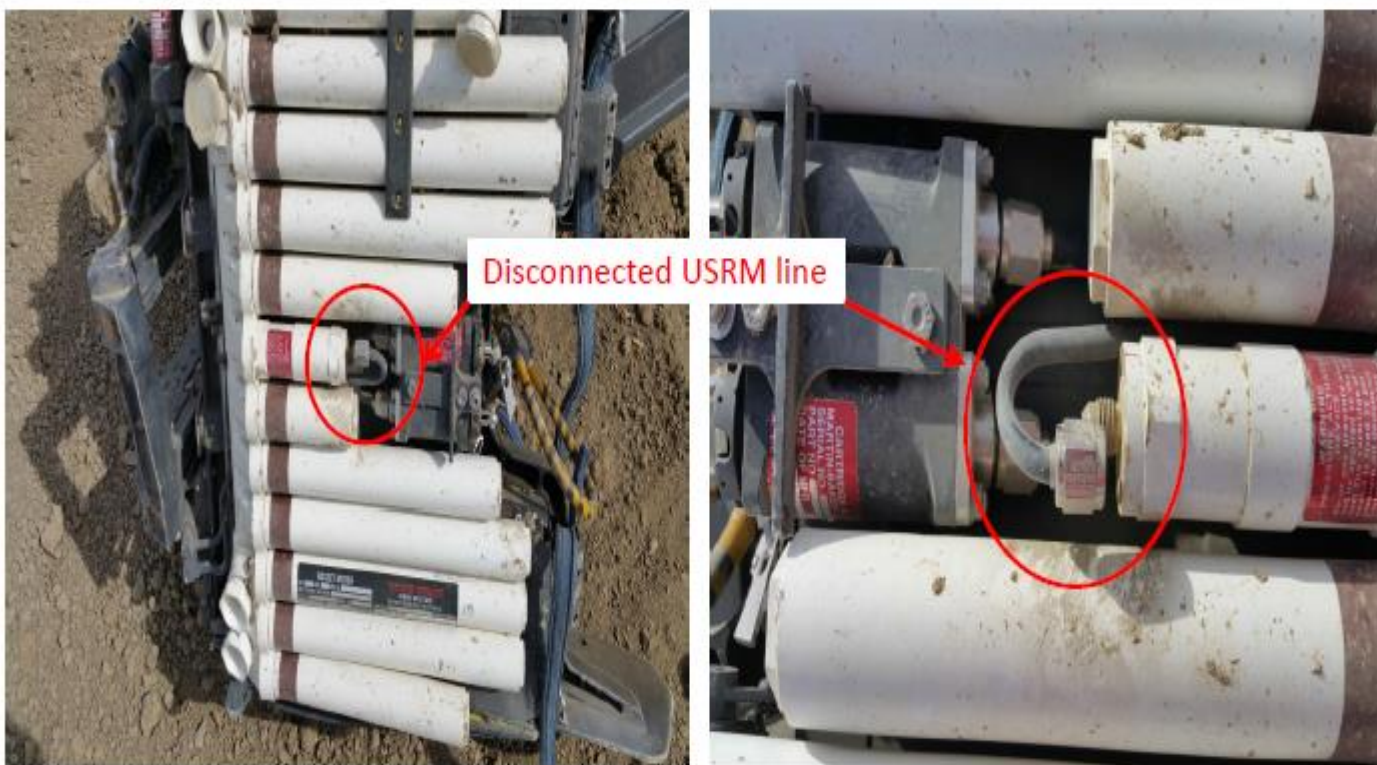






# Maintenance Issues

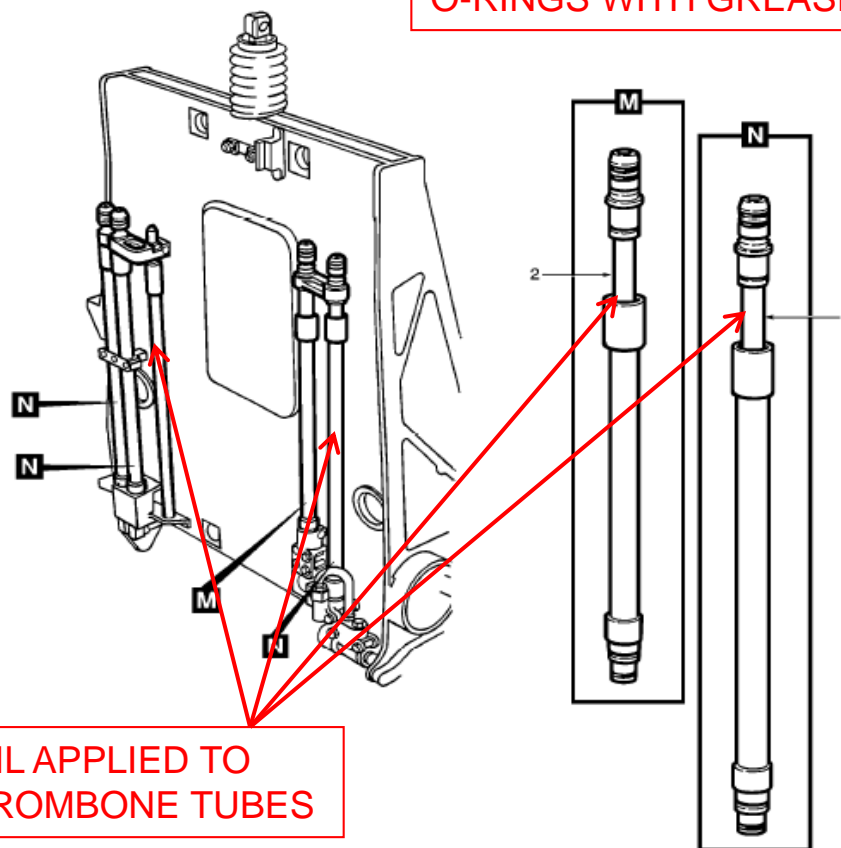
- USRM Pipe discrepancy:





# Maintenance Issues

## NACES Seat Bucket Trombone Tubes Oil Intrusion



MIMS REQUIRE LUBRICATE  
O-RINGS WITH GREASE

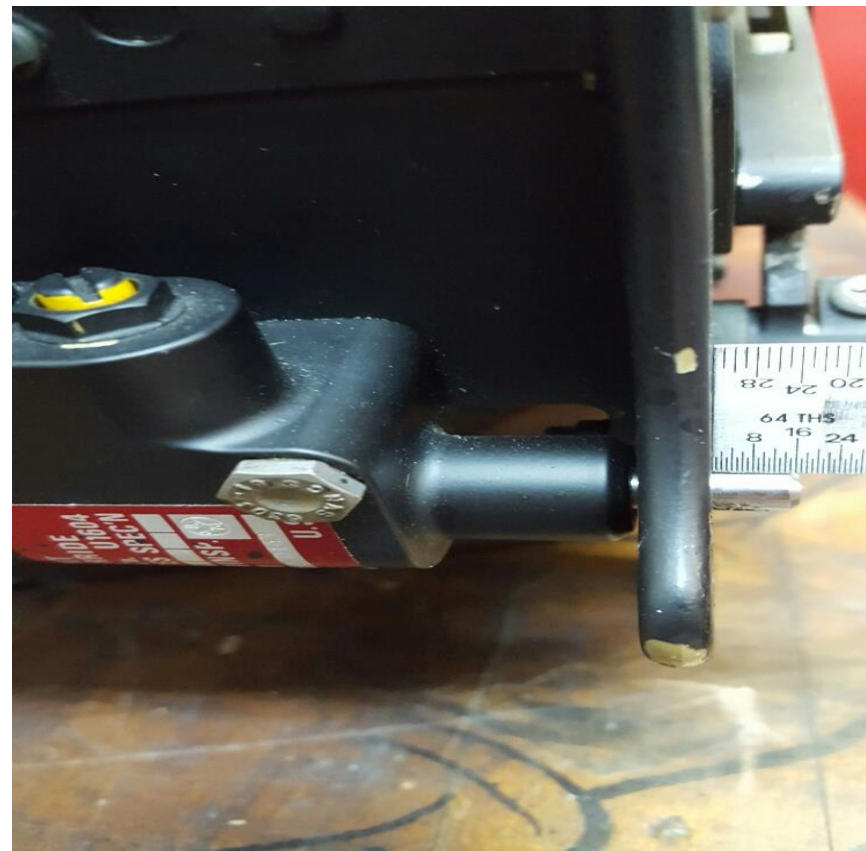
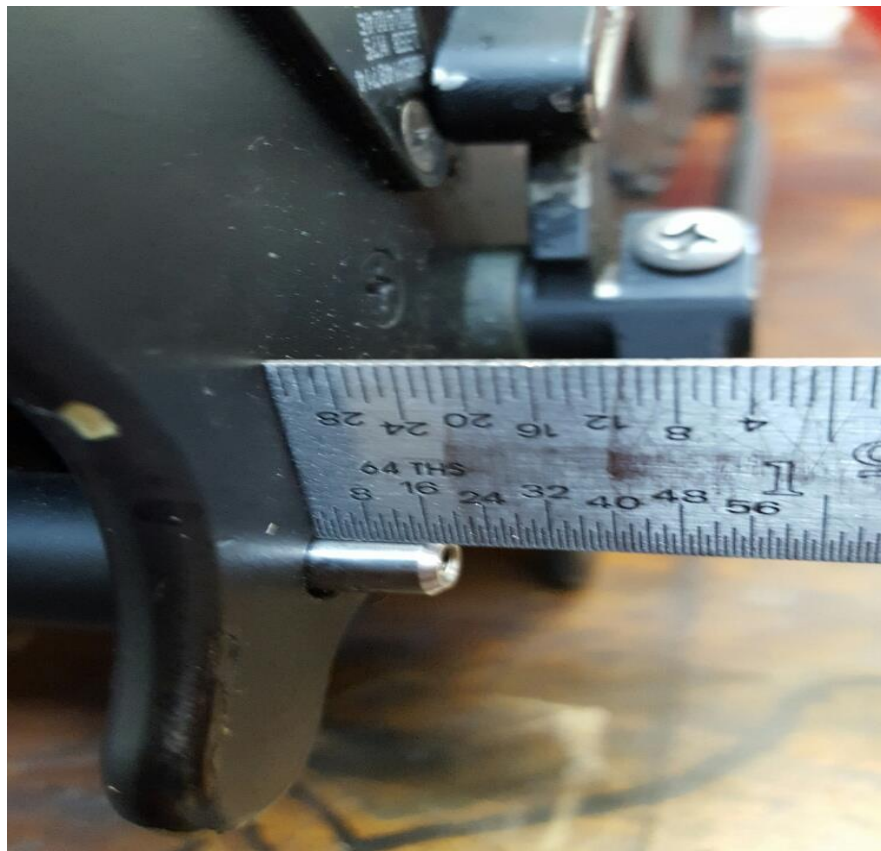
OIL APPLIED TO  
TROMBONE TUBES





# Maintenance Issues

## MOR Cartridge Firing





# Maintenance Issues

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## MOR Cartridge Firing

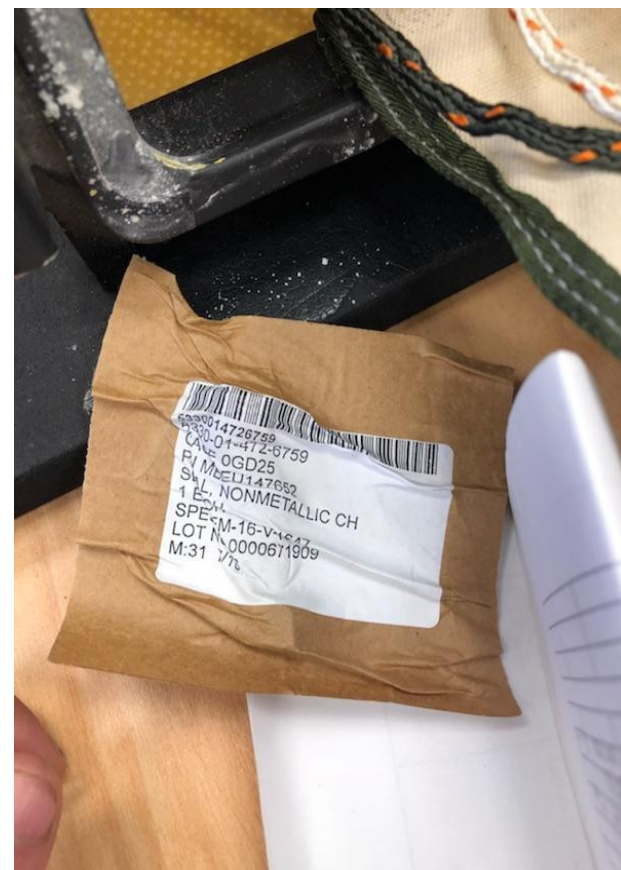






# Maintenance Issues

## Parachute FOD



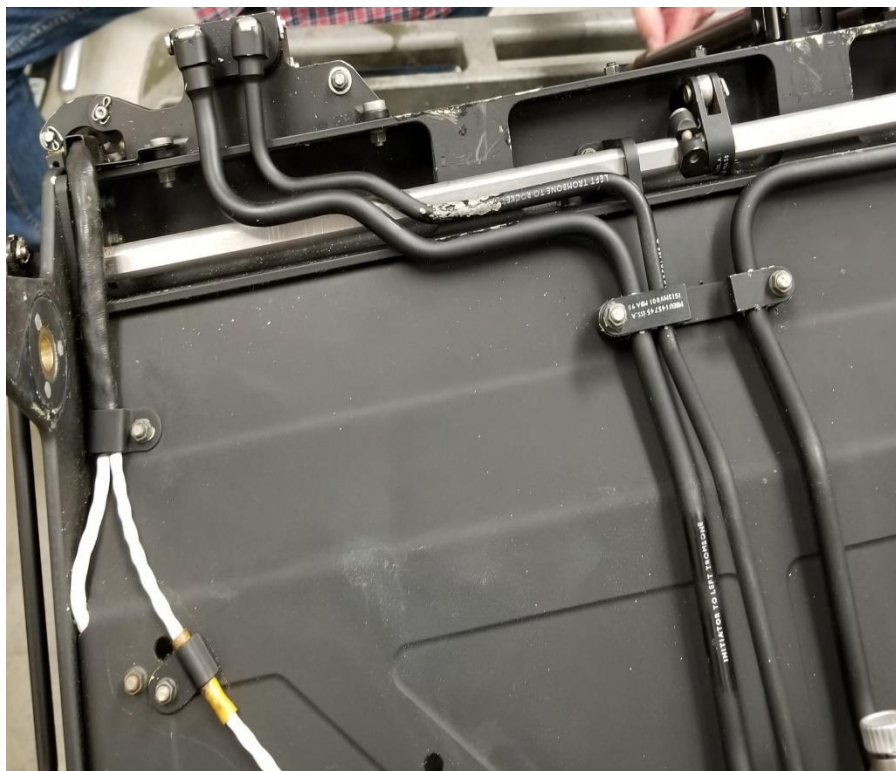






# Maintenance Issues

## USRM pipe damage





# Maintenance Issues

## Corrosion







# Questions?

