

**BY ORDER OF THE COMMANDER  
482D FIGHTER WING**

**482D FIGHTER WING INSTRUCTION  
21-101**



**31 OCTOBER 2012**

**Maintenance**

**FOREIGN OBJECT DAMAGE (FOD) AND  
DROPPED OBJECT PROGRAM (DOP)**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction incorporates local changes to procedures from 482d Fighter Wing Instruction (482 FWI) 21-101, *Aircraft and Equipment Maintenance Management* directs action and prescribes foreign object damage and dropped object procedures for all 482 FW personnel. It establishes more restrictive responsibilities, standardize procedures and locations for the 482d Maintenance Group (482 MXG). Commanders and supervisors are responsible for ensuring personnel comply with the provisions of this instruction. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using Air Force Form 847 (AF Form 847), *Recommendation for Change of Publication*; route AF Form 847 from the field through the appropriate functional's chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records* and disposed of in accordance with (IAW) the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/rims.cfm>.

**SUMMARY OF CHANGES**

**Since there have been several interim changes incorporated into this publication, please review entire publication.**

**1. General.**

1.1. The 482 FW Commander (CC) shall appoint the 482 FW Vice Commander (482 FW/CV) as the Foreign Object Damage (FOD) and Dropped Object Program (DOP) Manager IAW AFI 21-101.

**2. Terms Explained:** For terms see [Attachment 1](#).

### 3. FOD Program Meeting Committee.

3.1. Shall be comprised of representatives or their delegates prescribed in 482 FWI 21-101, Chapter 14 and the 125th Fighter Wing Detachment 1 (125 FW Det 1), Florida Air National Guard.

### 4. General Procedures and Safety Requirements.

4.1. The 482 FW/CV shall ensure:

4.1.1. FOD/DOP Program Monitor briefs the committee on items of interest to include Airfield FOD concerns, FOD BOSS/sweeper status, airfield projects that may produce Foreign Object (FO), aircraft/equipment FOD and lost tool incidents and dropped objects.

4.1.2. FOD/DOP Program Monitor conducts a thorough investigation to ascertain the root cause for any FOD mishap and to determine if any underlying problems exist. The results of this investigation shall be reported to the 482 FW/CV.

4.2. Unit commanders shall appoint FOD/DOP Committee members. Members shall represent their commander's FOD issues at the committee meetings and bring back and disseminate to the organization any FOD/DOP information.

4.3. All organizations shall ensure.

4.3.1. Assigned individuals qualified to operate vehicles on the flight line are familiar with Air Force Occupational Safety Health Standard (AFOSH STD 91-100), *Aircraft Flight Line Operations and Ground Operations and Activities*.

4.3.1.1. Vehicle operators adhere to the "circle of safety" prescribed by the 482d Fighter Wing Safety (482 FW/SE) office. The "circle of safety" is the aircraft Fuel Servicing Safety Zone during aircraft refueling consisting of an area within 50 feet of a pressurized fuel carrying servicing component, i.e., servicing hose, fuel nozzle, Single-Point Receptacle (SPR), hydrant hose cart, ramp hydrant connection point, etc., and 25 feet around aircraft fuel vent outlets. Personnel must also, remain twenty-five feet from the aircraft intake (outside the pac man area) and will not walk, drive vehicles, or tow aircraft within 200 feet of the rear of an aircraft with engines running.

4.3.2. A complete FO tire check must be accomplished prior to entry onto flight line. Any vehicle leaving the paved surface while on the flight line must re-accomplish the FO check upon re-entry onto the paved surface. Vehicle shall stop at the Entry Control Point (ECP) to the flight line, remove FOD from tires, roll forward to inspect portion of tire not visible during initial tire inspection, place FO in vehicle FO container, and proceed. If the driver's seat is vacated, turn off the ignition and set the brakes. Place the gear lever in reverse gear for standard transmissions. Use park if the vehicle has an automatic transmission.

4.3.2.1. Emergency vehicles responding to an emergency are exempt from FOD check at the ECP.

4.3.2.2. Refuel trucks are exempt from the requirement to turn off the vehicle ignition at the flight line ECP.

- 4.3.2.3. Locally manufactured or purchased FO removal tools are authorized. If used, they shall be etched with the vehicle identification number and secured to the vehicle key(s).
- 4.3.3. All vehicles normally driven on the flight line are equipped with secured and lidded FO containers. Containers shall be marked with the word "FOD" in contrasting letters no smaller than two inches. All FOD containers, regardless of location, shall be emptied when full or daily.
- 4.3.4. Fire extinguishers carried on or mounted to vehicles have safety chains or cables attached to the extinguishers safety pins to prevent FOD.
- 4.3.5. Personal items such as electronic devices, (cell phones/PDA's etc.), wigs, hair fasteners (except rubber bands), and all jewelry, are not authorized on the flight line or in any aircraft maintenance work area.
- 4.3.5.1. Personal tools are prohibited on the flight line and in all maintenance areas (i.e. mini-mag flashlights, Leatherman's, Buck knives, etc.).
- 4.3.6. Exceptions to **paragraph 4.3.5.** (Electronic devices): Only official government issued electronic devices/cell phones may be carried and used on the flight line/maintenance areas. Devices must not be carried/used in fuel servicing safety zones and be at least 50 feet away from aircraft when being used.
- 4.3.6.1. Jewelry is not authorized on the flightline or industrial areas. EXCEPTION: Watches are authorized to be worn on the flight line and maintenance areas. However, watches shall be removed and stored prior to performing any maintenance. Watches shall not be stored on belt loops, line badge lanyards or hanging from pockets. In addition, they shall be accounted for when leaving the flight line/maintenance area.
- 4.3.6.2. Personnel are authorized to bring plastic drink containers to the flight line/hangar bays. Metal/Glass drink containers are prohibited. In addition, when not in use, or when aircraft engines are operating, the drink containers must be secured. Drink containers are prohibited in the vicinity of any maintenance activity that involves the use of POL or chemical products.
- 4.3.7. Clothing requirements.
- 4.3.7.1. Metal insignia shall not be worn on the flight line.
- 4.3.7.2. Ear protectors, communication headsets and eyewear are the only headgear authorized for wear while working on or within danger zones of aircraft with operating engines. While working in maintenance areas, lanyards may be worn with approved eyewear. However, lanyards shall not be worn outside of the maintenance area.
- 4.3.7.2.1. Double hearing protection shall be worn within 50 feet of operating jet engines and -60 power units.
- 4.3.7.3. Approved hats/caps, (i.e. Boonie caps) are allowed on the flight line to mitigate exposure to the sun and heat. However, they are removed and appropriately stored/secured within 25 feet of an operating aircraft engine.

4.3.7.3.1. Wear of the seasonal watch cap is authorized. Wear of the seasonal watch cap shall comply with AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*. Watch cap shall be removed when within 25 feet of any operating aircraft engine.

4.3.7.4. Restricted area and identification badges/passes with imbedded clips are authorized so long as the badge and clip are both secured with a subdued nylon/cotton cord. When worn around the neck, cords shall have a break-away feature.

4.3.7.4.1. Badges with imbedded metal clips must not be used with the plastic armband. If an armband is used it shall be worn on the upper part of the arm between the shoulder and the elbow.

4.3.7.4.2. The plastic armband shall be worn with the Ground Crew Ensemble instead of the nylon/cotton cord.

4.3.7.4.3. Badges shall be removed when performing intake and exhaust inspections and stowed within 25 feet of an operating jet engine.

4.3.7.5. Personnel shall wear a reflective belt during hours of darkness/reduced visibility while working on the flight line and transiting within the 482d Maintenance Group (482 MXG) maintenance area.

4.3.7.6. "Camelbacks" (personal hydration packs) are authorized for use on the flightline, however they are not authorized inside the intake or exhaust. The "Camelbacks" are authorized during launch and recovery, if serviceable and worn properly. "Camelbacks" shall be secured when not in use.

4.3.7.7. Personal backpacks/bags are permitted on the flightline. Backpacks shall comply with AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*. Backpack/bags shall be secured when not in use.

#### 4.4. Aircraft/Equipment FOD prevention practices and guidelines.

4.4.1. If it is suspected that a tool or object may be aboard an aircraft already in operation, the Expediter shall notify 482d Maintenance Group/Maintenance Operations Center (482 MXG/MOC) immediately. If the aircraft is already in flight, 482 MXG/MOC shall then notify the 482 MXG/CC, 482d Maintenance Group Quality Assurance office (482 MXG/MXQ) office and 482d Aircraft Maintenance Squadron Commander (482 AMXS/CC) or senior Air Reserve Technician (ART) officer for a coordinated decision to recall the aircraft if necessary. If the aircraft has not taken off, 482 MXG/MOC shall notify 93d Fighter Squadron/Operations (93 FS/DO), and the 93 FS/DO shall notify the pilot and advise him to stand-by until the determination is made to recall the aircraft.

4.4.2. When any item is lost or there is suspected FO on an aircraft, ensure that 482 MXG/MOC and 482 MXG/MXQ are notified.

4.4.2.1. If any item is lost on an aircraft and not found within two hours of notification or end of shift if less than two hours, an AFRC Form 174, *Lost Tool/Object Report*, shall be initiated.

4.4.3. The individual who lost or discovered the missing object shall perform a preliminary search and annotate the findings on AFRC Form 174. A thorough search shall be directed to include the use of bores cope and NDI, if necessary.

4.4.3.1. The section chief is responsible for filing the AFRC Form 174 in the aircraft's AFTO Form 781, *Aerospace Flight Report and Maintenance Document* binder.

4.4.4. If the object is not found, notify 482 MXG/MXQ. 482 MXG/MXQ shall notify the Impoundment Authority for possible aircraft/equipment impoundment.

#### 4.5. Aircraft Cockpit procedures and FO searches.

4.5.1. All personnel entering aircraft cockpits shall ensure equipment, consumables, tools and personal belongings are properly secured and accounted for to prevent FOD.

4.5.2. In the event cockpit FO is suspected, perform preliminary search.

4.5.2.1. If the FO is not found, notify egress shop for assistance.

4.5.2.2. Egress personnel shall perform a preliminary inspection. If unable to find FO, notify QA. QA shall notify Impoundment Authority for possible aircraft/equipment impoundment.

#### 4.6. Tool/Equipment and hardware control.

4.6.1. Extreme caution shall be exercised using toolboxes, test equipment, etc. when working around aircraft and aircraft maintenance areas (i.e. aircraft hangars). A FO check shall be accomplished and all tools/equipment/consumables shall be accounted for upon completion of the assigned task.

4.6.2. All maintenance personnel shall secure panel hardware removed from the aircraft in screw bags and attach the screw bag to the panel. Screw bags shall be marked with the aircraft tail number and the panel number. Use of masking tape to hold fasteners in place on a panel after panel removal is permissible.

4.6.3. All other removed hardware shall be secured in a suitable container or zip lock bag. Regardless of the storage method, it shall be marked at minimum with the aircraft or equipment identification (ID) and noun that the hardware is attached to.

4.6.4. When cannon plugs or other connectors are disconnected, both the cannon plug and receptacle shall be covered with a suitable protective device IAW applicable technical data. **Note:** Aluminum foil or other metal covers not specifically designed for electrical connectors shall not be used.

4.6.5. FOD containers shall be used to control work residue during maintenance.

4.6.5.1. All Consolidated Tool Kit (CTKs) dispatched to the flightline shall have FOD container assigned to the CTK.

4.6.5.2. Used safety wire, cotter pins or hardware shall be disposed of in work center scrap metal bins. Ensure precious metal is separated accordingly.

4.6.6. Aircraft dash 21 equipment shall be marked with the aircraft serial number and shall be installed at all times on aircraft. The covers shall only be removed when

required for maintenance or when an aircraft is declared crew ready. The pilot, Angle Of Attack (AOA) and air data probe covers shall be installed upon aircraft recovery after flight.

4.6.6.1. Ensure only parts or hardware required to complete a specific task are taken to the flight-line and accounted for at the completion of the task.

4.6.6.2. "JOBBOX" storage bins shall not be used for FO storage. They shall also be inspected IAW the manufacturers instruction label located on the "JOBBOX". Inspections shall be documented on AF Form 2411, *Inspection Document*.

#### 4.7. FOD procedures for engine intake/exhaust maintenance and engine operation.

4.7.1. All intake/exhaust inspections shall be documented in the Air Force Technical Order (AFTO) Form 781A, *Maintenance Discrepancy and Work Document*, as a Red X and shall be signed off by an individual certified on the Special Certification Roster.

4.7.2. In all cases, prior to engine start, a CTK inventory shall be accomplished and all equipment, tools, forms, rags, etc. in the vicinity of the aircraft shall be accounted for and secured.

4.7.2.1. The following procedures are to be used when performing any maintenance in the aircraft intake or exhaust:

4.7.2.2. Prior to entering the aircraft intake/exhaust and again upon completion of maintenance, the individual shall inventory all tools and test equipment taken into the intake/exhaust.

4.7.2.3. If any maintenance is performed in the intake/exhaust after they are inspected, another intake or exhaust inspection shall be accomplished.

#### 4.8. FOD Walk.

4.8.1. FOD walks shall be accomplished prior to the start of the daily flying period by all available aircraft/equipment maintenance personnel. All aircraft operating areas up to the adjacent taxiways areas are to be inspected and made free of FO.

4.8.1.1. Special attention will be given to cleaning of cracks and expansion seams in hard surfaced areas where engines will be operated.

4.8.2. 482 MXG personnel shall report to the aircraft parking ramp with appropriate hearing protection.

4.8.3. Jewelry, (except watches), unapproved electronic devices, food, and drinks shall not be brought to FOD walk.

4.8.4. Personnel shall line up as directed by maintenance supervision.

4.8.5. FO found on the ramp shall be turned in to 482 MXG/MXQ.

4.8.6. The supervisor in charge of the daily FOD walk or 482 MXG/MXQ shall call in completion to 482 MXG/MOC. 482 MXG/MXQ shall be responsible for follow-up actions.

4.8.7. Work center personnel shall accomplish a FOD walk around the exterior of their facilities, weekly.

4.8.8. The FOD Monitor, or representative, shall perform a spot FOD check in a selected area, weekly. This inspection shall be documented in the Quality Assurance Tracking and Trend Analysis (QANTTAS) database.

4.8.8.1. Common use areas such as the End of Runway (EOR), Live Ordnance Load Area (LOLA), Hot Pit area, Aircraft Wash Rack, Trim Pad and the Hydrazine Pad shall be policed prior to use by the using organization.

## **5. FOD/Dropped Object Reporting.**

5.1.1. 482 MXG/MOC shall be notified immediately of FOD or suspected FOD including bird strikes and Dropped Objects. MOC shall initiate applicable checklists and notify appropriate agencies. Additional FOD/Dropped Object reporting requirements shall be accomplished IAW AFI 21-101, AFRC SUP I.

5.1.2. The FOD/DOP Manager or a designated alternate shall investigate all FOD/Dropped Object incidents for root cause. Aircraft/equipment shall be impounded, if deemed necessary. The results of a FOD investigation shall be presented to the 482 FW/CV.

5.1.3. FOD/DOP incidents shall be loaded in the QANTTAS database, and included in 482 MXG/MXQ quarterly summary.

## **6. Training.**

6.1. All newly assigned 482 FW personnel shall receive FOD Awareness and Responsibilities training during Newcomers orientation conducted at the 482d Force Support Squadron Newcomers Flight (482 FSS/FSM).

6.1.1. 482 MXG/MXQ shall maintain the Newcomers attendance roster in the 482 MXG/MXQ FOD folder on the P drive.

6.1.2. FOD awareness training consists of watching the "ACC FOD for Non-Flight line Personnel" video. The video is available on the Homestead Air Reserve Base (HARB) IPTV link.

6.1.3. Unit training monitors are responsible for tracking and documenting the training.

6.1.4. All 482 MXG personnel shall receive initial FOD Prevention training prior to being allowed to work on the flight line or in the maintenance areas. The training consists of watching the "Air Combat Command (ACC) FOD for Flight line Maintenance Personnel" video on the HARB IPTV link. The training shall be tracked in Integrated Maintenance Data System (IMDS). The 482 FW/CV can direct more frequent training, if required.

6.1.5. All 482 MXG FOD walk personnel shall receive FOD, Flight line Safety and Non-Ion Radiation training prior to participating in the flight line FOD walk. This training is available on P/MXG/AMXS/MXAAW/Public/Block Training file. This Computer Based Training (CBT) shall be tracked in IMDS. In rare circumstances, designated representatives appointed by the 482 MXG/CC can waive this requirement due to mission requirements.

6.1.6. All 482 MXG personnel involved in on-equipment maintenance shall receive Dropped Object Program training. The training consists of watching the Dropped Object

training video located on the HARB IPTV link. The training shall be documented in IMDS.

## **7. Awards Programs.**

7.1. 482 MXG/MXQ is the OPR for the FOD Awards Program.

7.1.1. The intent of this program is to increase FOD, Dropped Object and Lost Tool awareness and reward outstanding contributions by 482 FW personnel for their efforts. The 482 FW/CC, 482 FW/CV, 482 OG/CC, 482 MXG/CC or their designated representative shall present the awards.

7.1.2. Personnel may be submitted by their supervisor for their FOD prevention efforts via the FOD Award nomination package. A certificate of recognition signed by the 482 FW/CV shall be presented for this achievement.

7.1.3. Personnel may also be recognized for their efforts through military or civilian award programs, (Time off Award, Notable Achievement, etc).

## **8. Bird Strikes.**

8.1. 482 AMXS and 482d Maintenance Squadron (482 MXS) maintenance personnel shall consult Technical Order (TO) 1-1-691 *Cleaning And Corrosion Prevention And Control, Aerospace And Non-Aerospace Equipment* for bird strike clean up procedures and AFMAN 91-223 for bird strike reporting procedures.

8.2. Bird remains shall be forwarded to HARB BASH personnel for processing IAW AFMAN 91-223.

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**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

482 FWI 21-101, *Aircraft and Equipment Maintenance Management*, 14 July 2011

AFI 21-101, *Aircraft and Equipment Maintenance Management*, 13 January 2011, Incorporating Change 1, 16 August 2011

AFI 21-101 AFRC SUP 1, *Aircraft and Equipment Maintenance Management*, 13 Jan 2011

AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, 18 July 2011

AFI 91-204, *Safety Investigations and Reports*, 24 September 2008

AFMAN 91-223, *Avian Safety Investigations and Reports*, 6 July 2004

AFMAN 24-306, *Manual for the Wheeled Vehicle Driver*, 1 July 2009

AFMAN 33-363, *Management of Records*, 1 March 2008

AFOOSH Standard 91-100, *Aircraft, Flightline Ground Operations and Activities*, 1 May 1998

AFOOSH Standard 91-501, *Air Force Consolidated Occupational Safety Standard*, 7 July 2004

TO 1F-16C-2-00GV-00-1, *General Vehicle Organizational Maintenance*, 1 September 2010

TO 1-1-691 *Cleaning and Corrosion Prevention And Control, Aerospace And Non-Aerospace Equipment*, 19 October 2007

<https://www.my.af.mil/gcss-af61a/afirms/afirms/rims.cfm>

***Adopted Forms***

AF Form 673, *Air Force Publication/Form Action Request*

AF Form 847, *Recommendation for Change of Publication*

AF Form 1199B, *U.S. Air Force Restricted Area Badge*

AF Form 2411, *Inspection Document*

AFTO Form 781, *Aerospace Flight Report and Maintenance Document*

AFTO Form 781A, *Maintenance Discrepancy and Work Document*

AFRC Form 174, *Lost Tool/Object Report*

***Abbreviations and Acronyms***

**ACC**—Air Combat Command

**AF**—Air Force

**AFI**—Air Force Instruction

**AFMAN**—Air Force Manual

**AFRC**—Air Force Reserve Command

**AFRIMS**—Air Force Records Information Management System  
**AFTO**—Air Force Technical Order  
**AGE**—Aerospace Ground Equipment  
**AMXS**—Aircraft Maintenance Squadron  
**AOA**—Angle of Attack  
**CC**—Commander  
**CBT**—Computer Based Training  
**CD**—Deputy Commander  
**CTK**—Consolidated Tool Kit  
**DoD**—Department of Defense  
**DOP**—Dropped Object Program  
**e-Publishing**—the e-publishing website ([www.e-publishing.af.mil](http://www.e-publishing.af.mil))  
**ECP**—Entry Control Point  
**EOR**—End of Runway  
**FO**—Foreign Object  
**FOD**—Foreign Object Damage  
**FW**—Fighter Wing  
**FW/CC**—Fighter Wing Commander  
**FW/CV**—Vice Wing Commander  
**FWI**—Fighter Wing Instruction  
**HARB**—Homestead Air Reserve Base  
**IAW**—In Accordance With  
**IMDS**—Integrated Maintenance Data System  
**MOC**—Maintenance Operations Center  
**MOF**—Maintenance Operations Flight  
**MSG**—Maintenance Support Group  
**MXG**—Maintenance Group  
**MXG CC**—Maintenance Group Commander  
**MXG CD**—Maintenance Group Vice Commander  
**MXQ**—Maintenance Group Quality Assurance Office  
**MXS**—Maintenance Squadron  
**NDI**—Non Destructive Inspection

**OG/CC**—Operations Group

**OPR**—Office of Primary Responsibility

**POC**—Point of Contact

**QA**—Quality Assurance

**QANTTAS**—Quality Assurance Trending and Tracking System

**RDS**—Records Disposition Schedule

**SUP**—Supplement

**TO**—Technical Order

**USAF**—United States Air Force

**UTA**—Unit Training Assembly

*Terms*

**Foreign Object**—Any substance or article alien to its surrounding area that could cause damage to aircraft or associated equipment. Major concerns are chunks of asphalt, pieces of reflective paint striping, stones, pieces of concrete, loose pieces of sealant, metal objects, etc.

**Foreign Object Damage**—Any damage to an aircraft or equipment caused by the introduction of FO.

**Dropped Object**—Any item that falls from an aircraft, from engine start to engine shutdown (i.e. panels, static wicks, pins, etc).