

//UNCLASSIFIED//  
081339Z Jan 16  
FROM CDR JMC ROCK ISL IL//AMSJM-QAS//  
740 (A)

SUBJECT: AMMUNITION INFORMATION NOTICE (AIN) 024-16, ADVISORY/RESTRICTION REGARDING HARDENED DOWNBORE CANNON RESIDUE WHEN FIRING 155MM HOWITZERS WITH CHARGE, PROPELLING, 155MM: M203A1 (DODAC 1320-D532) AND M232A1 (DODAC 1320-DA13)

1. AIN 023-16 WAS TRANSMITTED ON 211848Z Dec 15
2. THIS IS THE INITIAL ISSUE OF THIS AIN.
3. DODIC: D532, DA13
4. REFERENCES:
  - A. ARMY TM 9-1000-202-14; TECHNICAL MANUAL, EVALUATION OF CANNON TUBES; 01 FEBRUARY 1999, W/CHANGES DATED 28 JANUARY 2011.
  - B. AIN 059-15 ADVISORY / RESTRICTION WHEN FIRING M777-SERIES TOWED HOWITZER WITH CHARGE, PROPELLING, 155MM: M232A1 (DODAC 1320-DA13), DATED 27 JULY 2015.
5. REQUEST THAT THIS INFORMATION BE DISSEMINATED TO ALL ORGANIZATIONS/ACTIVITIES THAT STORE AND MAINTAIN CONVENTIONAL AMMUNITION.
6. REQUEST DISSEMINATION OF THIS AIN TO ALL 155MM ARTILLERY USING UNITS, RANGE SAFETY OFFICERS, AMMUNITION SURVEILLANCE (QASAS) AND AMMUNITION SUPPLY POINT (ASP) PERSONNEL.
7. CAUTION USERS OF THE FOLLOWING ADVISORY/RESTRICTION REGARDING HARDENED DOWNBORE CANNON RESIDUE WHEN FIRING 155MM HOWITZERS WITH M203A1 (DODAC 1320-D532) AND M232A1 (DODAC 1320-DA13)

PROPELLING CHARGES:

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**          *** CAUTION ***          **  
** FAILURE TO TAKE THE USER ACTIONS OUTLINED BELOW **  
**   COULD RESULT IN CANNON BORE CONDITIONS           **  
** THAT PREVENTS PROPER PERIODIC BORESCOPE INSPECTION **  
**   AND CAN CREATE CONDITIONS                       **  
**   THAT RENDERS THE CANNON UNSERVICEABLE           **  
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A. SUMMARY OF PROBLEM: DURING TESTING PRIMARILY AT PROVING GROUNDS SINCE LATE-2008 IT WAS OBSERVED THAT HARDENED DOWNBORE RESIDUE WAS ADHERING AND BUILDING-UP ONTO 155MM CANNON BORE SURFACES (LANDS AND GROOVES) AFTER FIRING SEVERAL CONSECUTIVE

ROUNDS, APPROXIMATELY THIRTY ROUNDS OR MORE, WITH BOTH M203A1 AT CHARGE-8S (NSN 1320-01-202-8938) AND M232A1 AT CHARGE-5H (NSN 1320-01-526-6523). THIS RESIDUE IS A COMBINATION OF INGREDIENTS COMMON TO THE PROJECTILES AND BOTH OF THESE PROPELLING CHARGES.

(1) ADDITIONAL FIRINGS OF CONSECUTIVE ROUNDS AT THESE TOP CHARGES (M203A1-8S AND M232A1-5H) CAN CAUSE OTHER ISSUES SUCH AS INABILITY TO PROPERLY SEAT PROJECTILE OR EROSION OF LANDS AT MUZZLE-END OF CANNON. MANAGEMENT OF THESE ISSUES WILL BE ADDRESSED WITHIN A SEPARATE MESSAGE TO THE FIELD.

(2) THIS HARDENED DOWNBORE RESIDUE PREVENTS PROPER PERIODIC BORESCOPE INSPECTION IN ACCORDANCE WITH REFERENCE 4.A DUE TO INABILITY TO INSPECT THE BORE SURFACES BENEATH THE RESIDUE.

(3) THIS HARDENED DOWNBORE RESIDUE CANNOT BE REMOVED BY NORMAL CLEANING METHODS. THE ONLY PROVEN METHOD TO REMOVE THIS RESIDUE IS FIRING ROUNDS AT LOWER CHARGES. THIS INCLUDES FIRING THE FOLLOWING PROPELLING CHARGES: M3-SERIES (CHARGES 3G, 4G AND 5G), M4-SERIES (CHARGES 3W, 4W, 5W, 6W AND 7W), M231 (CHARGES 1L AND 2L) AND M232-SERIES (CHARGE 3H).

(4) PROVING GROUNDS HAVE INSTITUTED A FIRING MATRIX THAT INCLUDES FIRING LOWER CHARGES AFTER A SEQUENCE OF TOP CHARGES (M203A1-8S AND M232A1-5H) IN A RATIO OF ONE-FOR-EVERY-TWO TO ONE-FOR-EVERY-THREE TOP CHARGES IN ORDER TO MINIMIZE RESIDUE BUILD-UP. ADDITIONAL FIRINGS OF LOWER CHARGES ARE REQUIRED TO REMOVE ENOUGH RESIDUE TO ALLOW PROPER BORESCOPE INSPECTION OF THE BORE SURFACE.

(5) NOTE THAT ADVISORY/RESTRICTION WHEN FIRING M777-SERIES LIGHTWEIGHT TOWED HOWITZER WITH M232A1 CHARGE-5H REMAINS IN EFFECT UNTIL APPLICATION OF BOTH THE M776 BREECH MODIFICATION KIT AND THE ELECTRONIC THERMAL WARNING DEVICE KIT IN ACCORDANCE WITH REFERENCE 4.B.

(6) NOTE THAT THE BASE MODEL M203 (NSN 1320-01-033-9394) AND M232 (NSN 1320-01-457-4063) PROPELLING CHARGES DO NOT CAUSE RESIDUE BUILD-UP.

B. PARTS, ASSEMBLY OR COMPONENTS AFFECTED:

(1) M199 CANNON USED ON M198 TOWED HOWITZER

(2) M284-SERIES CANNON USED ON M109A5, M109A6 AND M109A7 SELF-PROPELLED HOWITZER

(3) M776-SERIES CANNON USED ON M777-SERIES LIGHTWEIGHT TOWED HOWITZER

C. USER ACTIONS: CREW PERSONNEL ARE RESTRICTED FROM FIRING M203A1 CHARGE-8S AND M232A1 CHARGE-5H DURING TRAINING, UNLESS THE HOWITZER INCLUDES FULL-BORE CHROME-PLATED CANNON IDENTIFIED IN PARAGRAPH 7.D(2) BELOW, OTHERWISE FIRE M232 CHARGE-5H AS AUTHORIZED SUBSTITUTE. UNITS MUST SPECIFY THE PROPER NSN 1320-01-457-4063 TO ENSURE RECEIPT OF THE M232. FOR MISSIONS OTHER THAN TRAINING WHERE FIRING M203A1 CHARGE-8S AND M232A1 CHARGE-5H IS AUTHORIZED THE FOLLOWING GUIDANCE IS PROVIDED:

(1) UNITS ARE ADVISED OF THE IMPORTANCE TO PERFORM PROPER MAINTENANCE AND CLEANING OF CANNON TUBES. FOR CANNONS THAT EXHIBIT RUST AND/OR PITTING ON THE BORE SURFACE, IT HAS BEEN OBSERVED THIS CONDITION WILL ACCELERATE THE ADHERENCE AND BUILD-UP OF HARDENED RESIDUE.

(2) UNITS ARE ADVISED WHERE PRACTICAL TO LIMIT THE QUANTITY OF CONSECUTIVE TOP CHARGES TO BE FIRED AT M203A1-8S AND M232A1-5H.

(3) UNITS ARE ADVISED WHERE PRACTICAL TO FIRE TEN (10) TO FIFTEEN (15) LOWER CHARGES AFTER EACH GROUP OF CONSECUTIVE TOP CHARGES FIRED AT M203A1-8S AND M232A1-5H. ANY COMBINATION OF LOWER CHARGES IDENTIFIED IN PARAGRAPH 7.A(3) MAY BE FIRED IN ORDER TO PROVIDE FLEXIBILITY TO RANGE SAFETY OFFICERS.

(4) WHEN PERFORMING BORESCOPE INSPECTION, SEE ATTACHMENT AIN 024-16A FOR CLASSIFICATION OF RESIDUE AS CLEAN, MILD OR SEVERE ALONG WITH PICTORIAL EXAMPLES. IF RESIDUE IS MILD OR SEVERE THAT PREVENTS PROPER INSPECTION OF BORE SURFACE THEN UNITS ARE ADVISED WHERE PRACTICAL TO FIRE TEN (10) TO FIFTEEN (15) LOWER CHARGES IDENTIFIED IN PARAGRAPH 7.A(3). IF RESIDUE STILL REMAINS THEN ADDITIONAL LOWER CHARGES MUST BE FIRED UNTIL SUFFICIENT RESIDUE IS REMOVED TO ALLOW PROPER INSPECTION.

(5) UNITS ARE REQUESTED TO INCLUDE THE RESULTS OF BORESCOPE INSPECTIONS REGARDING RESIDUE CLASSIFICATION WITHIN REMARKS SECTION OF "WEAPON RECORD DATA" DA FORM 2408-4. UNITS ARE ALSO REQUESTED TO IDENTIFY WHEN M203A1 OR M232A1 PROPELLING CHARGES ARE FIRED WITHIN THE REMARKS SECTION.

(6) PLACE A COPY OF THIS NOTICE WITHIN THE HOWITZER TM UNTIL THIS AIN IS RESCINDED OR SUPERSEDED, OR UNTIL THE REFERENCE TM IS UPDATED WITH THIS INFORMATION.

#### D. PROGRAM SPONSOR ACTIONS:

(1) IN THE NEAR-TERM, THE INVESTIGATION TEAM IS CONTINUING TO IDENTIFY ALTERNATIVES THAT HAVE MINIMAL IMPACT ON ARTILLERY USERS TO PREVENT THE ADHERENCE AND BUILD-UP OF HARDENED RESIDUE.

(2) IN THE LONG-TERM, THE CANNON DEVELOPER AT BENÉT LABORATORIES HAS DESIGNED AND QUALIFIED FULL-BORE CHROME-PLATED M284A2 AND M776 CANNONS THAT PREVENT ADHERENCE OF RESIDUE AND ALSO EXTENDS TUBE WEAR LIFE. FULL-BORE CHROME-PLATED CANNONS ARE IDENTIFIED BY THE ADDITION OF "C" FOR THE M776 OR "CB" FOR THE M284A2 AT THE END OF THE TUBE SERIAL NUMBER. THIS ADVISORY/RESTRICTION DOES NOT APPLY TO FULL-BORE CHROME-PLATED CANNONS.

(3) ALSO IN THE LONG-TERM, THE PROJECT MANAGER FOR COMBAT AMMUNITION SYSTEMS (PM-CAS) HAS INITIATED A PROGRAM TO TEST AND QUALIFY, IF SUCCESSFUL, A "CLEANER" MACS VARIANT THAT PREVENTS ADHERENCE AND BUILD-UP OF HARDENED RESIDUE.

E. SUPPLY STATUS: THE ONLY ASPECT OF THE SUPPLY SYSTEM THAT WILL BE AFFECTED IS REGARDING FIELDING OF FULL-BORE CHROME-PLATED CANNONS (SEE PARAGRAPH 7.D(2)).

(1) THE PRODUCT MANAGER FOR SELF-PROPELLED HOWITZER SYSTEMS (PM-SPHS) PLANS TO FIELD M284A2 FULL-BORE CHROME-PLATED CANNONS TO THE SELF-PROPELLED HOWITZER FLEET STARTING OCTOBER 2015.

(2) THE PROGRAM MANAGER FOR TOWED ARTILLERY SYSTEMS (PM-TAS) FIELDED EIGHT M776 FULL-BORE CHROME-PLATED CANNONS (TWO FOR ARMY AND SIX FOR USMC) IN AUGUST 2015 FOR AN EIGHTEEN-MONTH FIELD DATA COLLECTION PROGRAM. FULL RATE PRODUCTION AND SUSTAINMENT DECISION REVIEW WILL OCCUR IN 2017.

8. THE POC FOR CONTENT IS RICHARD CIRINCIONE, SFAE-AMO-CAS, DSN 880-7091, E-MAIL RICHARD.CIRINCIONE.CIV@MAIL.MIL. POC FOR CANNON INSPECTIONS IS JEANNE BROOKS, RDAR-WSB-PC, DSN 374-5823, E-MAIL JEANNE.C.BROOKS.CIV@MAIL.MIL. POC FOR DISTRIBUTION IS JAMES BREWER, AMSJM-QAS, DSN 793-7552 OR COMMERCIAL (309) 782-7552, EMAIL: JAMES.M.BREWER10.CIV@MAIL.MIL.

9. THIS AIN WILL EXPIRES 31 JULY 17 UNLESS OTHERWISE RESCINDED OR SUPERSEDED.

//SIGNED//

JEAN-MICHEL W. SERRA  
CHIEF, AMMUNITION SURVEILLANCE DIVISION