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Development of a LW30mm M230 Percussion Prime Chain Gun[®]

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Approved for Public Release, 22 CFR 125.4(b)(13) Applicable



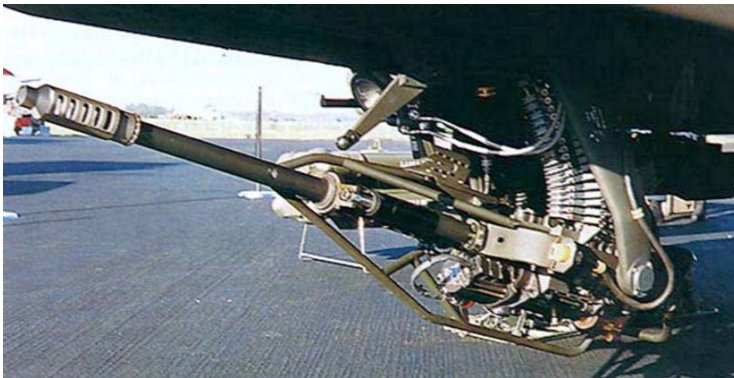
- The standard LW30mm M230 Chain Gun® has been widely used with AH-64 Apaches and MH-60DAP Blackhawks since the early 1980's



- The M230 Percussion Prime (PP) variant was developed in the late 1980's by Hughes/McDonnell Douglas to qualify percussion-primed LW30 ammo for the AH-64
 - Two prototype ammunition variants: XM949 (HEDP) and XM950 (TP)
 - Utilized design concepts from 25mm M242 Bushmaster® Automatic Cannon on Bradley IFV
 - U.S. Army test fired over 4,000 rounds without incident (summer 1988)
 - Additional 2,500 rounds fired at hot and cold temperatures without incident (1988)

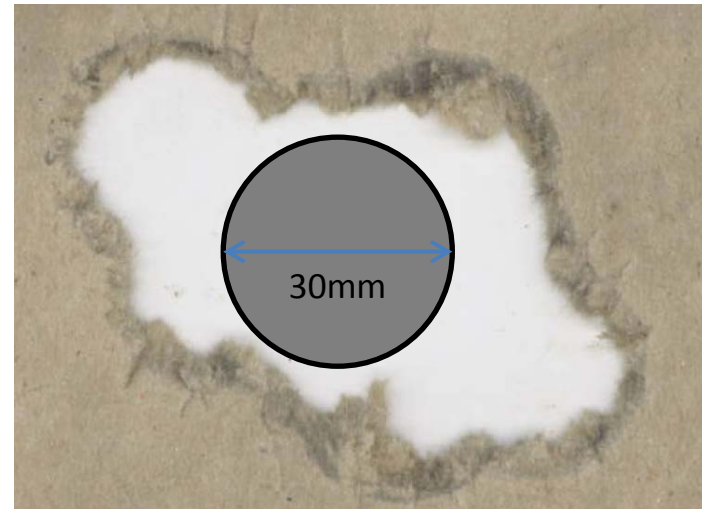
- **Hazards of Electromagnetic Radiation to Ordnance (HERO)**
 - OP 3565 Defines precautions and procedures in RF environments
 - LW30mm ammo suite for the M230 cannon uses PA520 low-voltage electric primers
 - M788 and related cartridges were rated SUSCEPTABLE in U.S. Navy tests (1983)
 - Susceptibility applies to shipboard operations within HAZ/RAD environment
 - Risk is mitigated during storage and transport by standard packing configuration
- **Percussion-primed ammunition eliminates HERO concerns for operation near radar for shipboard applications**
 - XM949 and XM950 use M36A2 percussion primers
 - No electro-mechanical components within the percussion cartridges

- **NAVAIR PMS-242 and PMS-299 Congressional Plus-up (2010) (N00178-06-D-1006)**
 - Updated drawing package
 - Added visual/manual safety features
 - Procured hardware for qualification tests
 - » Two prototype cannons
 - » Ammunition handling system
 - » System controls



Function tested prototype cannons - Jan 2012

- **Functional Description – LW30mm M230 Percussion Prime Chain Gun®**
 - Externally powered, electric drive (3 phase, 115 VAC)
 - Processes percussion prime ammo 30mm x 113mm (XM950, XM949)
 - Positive timing with open bolt function and rotating breech bolt
- **Performance (M230 typical)**
 - 625 25 rds per minute
 - 3,000 lbs peak recoil
 - 132 lbs with barrel
 - 1.1 in. max recoil travel
 - Dispersion: 80% within 3 mrad diameter
 - 2,000m effective range
 - 20,000+ MRBF reliability (projected)



Impact of 20 rd burst at 20m range during functional testing of prototypes procured under N00178-06-D-1006.

- 1. Capability to fire percussion-primed ammunition**
 - 23 new components
 - New firing pin forced changes to breech bolt and bolt carrier
 - New contact box forced changes to contact box assembly and forward track
- 2. Capability to be manually locked in “SAFE” with visual indication***
 - 10 new components
 - Manual lever access forced changes to receiver
- 3. Minimize cannon function and performance impact**
 - Firing rate, recoil, overall weight and envelope unchanged
- 4. Minimize integration and logistics impact**
 - 90% of drawing package is unchanged
 - No change to gun control or power interface
 - Integration interfaces unchanged except for manual safety lever
 - Essential maintenance schedule and method is unchanged
 - Standard M230 cannons can be converted to PP variant and back

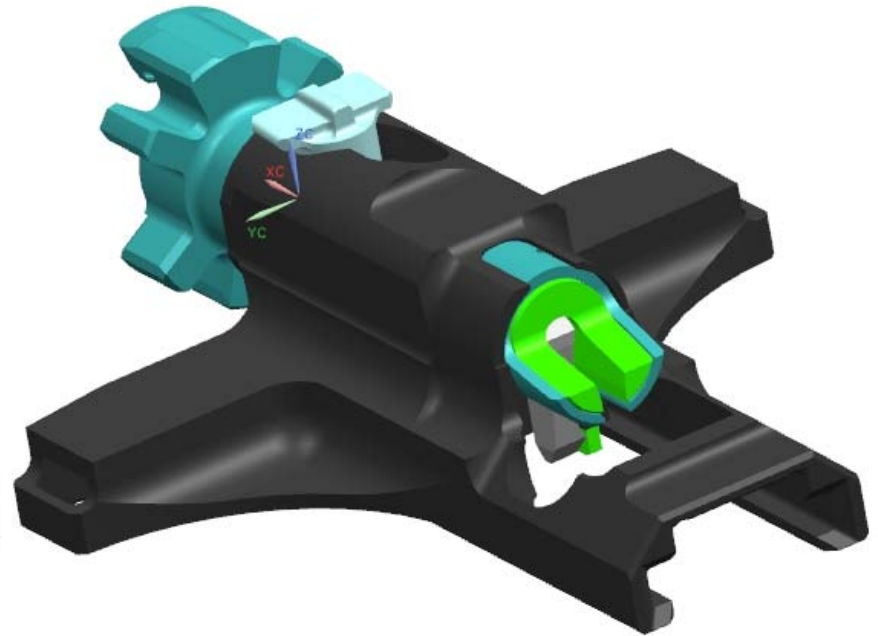
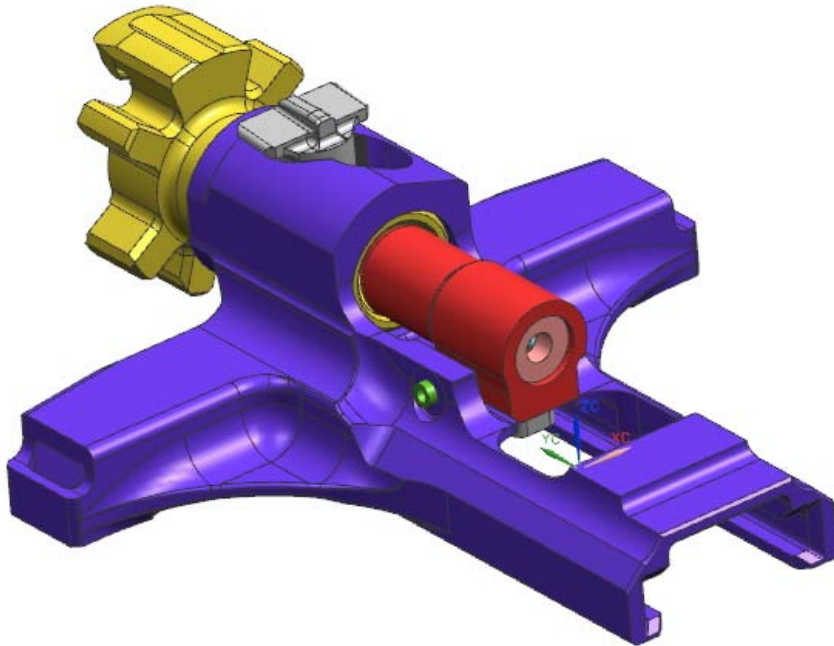
*Requirement directed and funded under N00178-06-D-1006

Side-by-Side, Bolt Carrier Assembly



M230

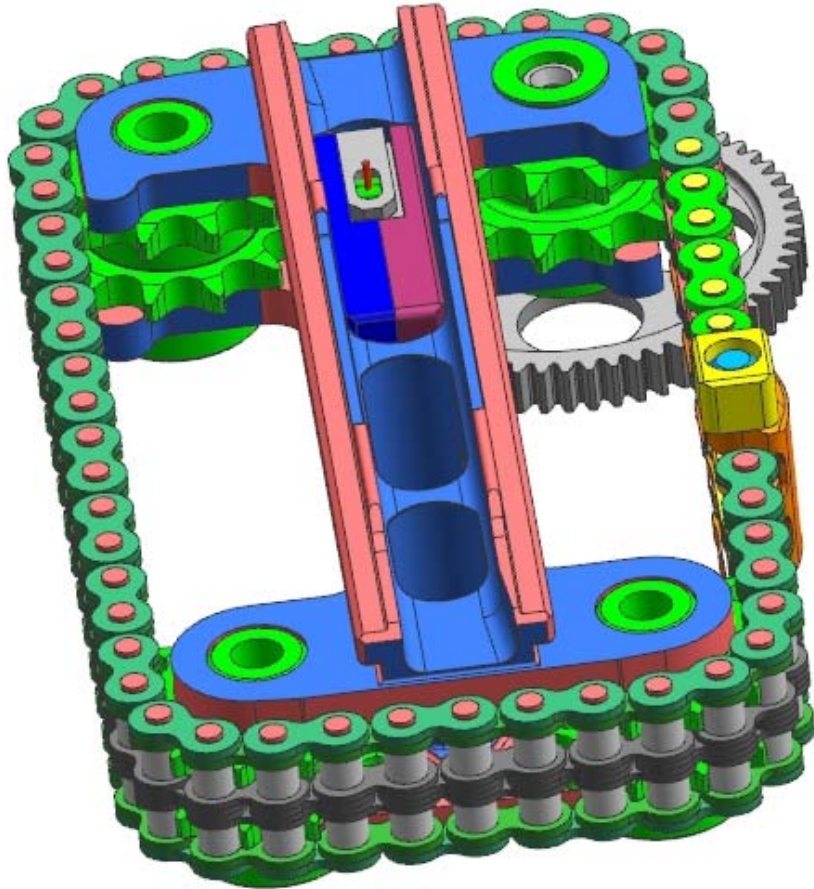
M230 Percussion Prime



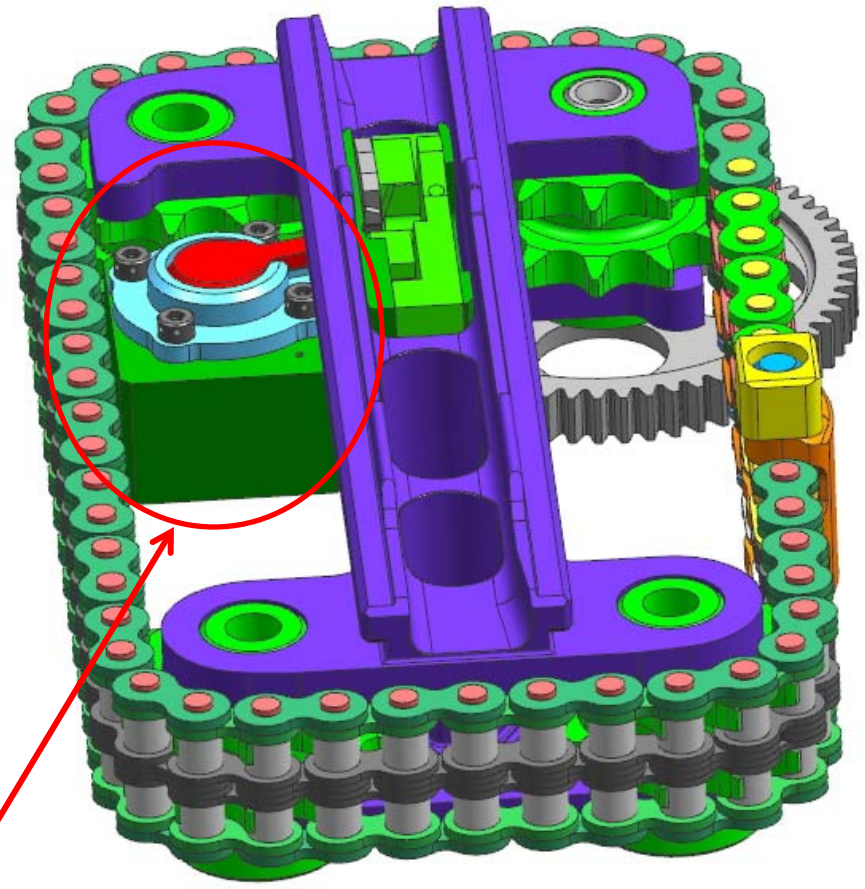
Side-by-Side, Forward Track Assembly*



M230



M230 Percussion Prime

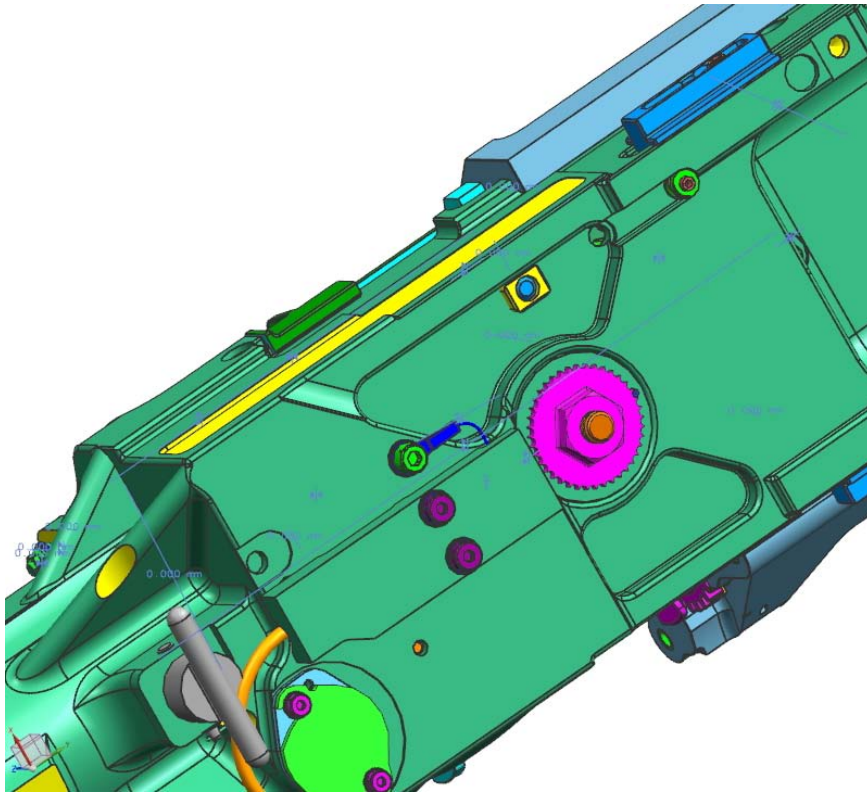


*Visible manual safety requirement directed and funded under N00178-06-D-1006

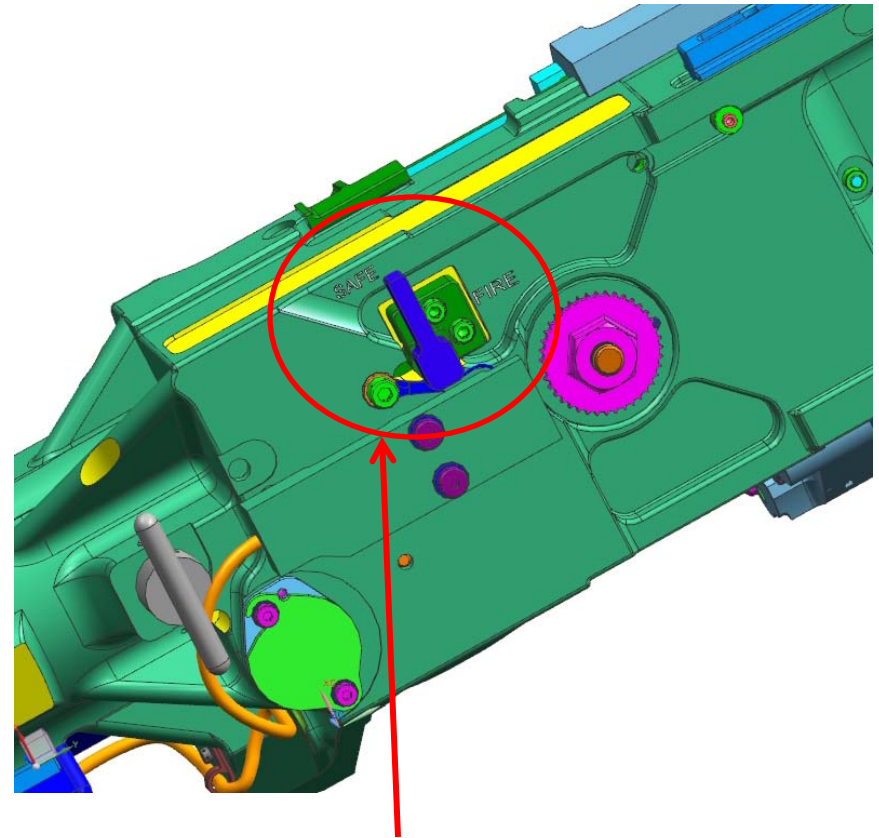
Side-by-Side Manual Safety*



M230



M230 Percussion Prime



*Visible manual safety requirement directed and funded under N00178-06-D-1006

Functional Checkout – Live Fire



- **Primary Armament**

- Rotorcraft in Shipboard Missions (Fixed forward or turreted)
- Deck mount operations for smaller patrol ships
- Remote weapon station mounted on turreted ground vehicle



US Navy Photo By Photographer's Mate Third Class (Naval Aircrewman)
Rebecca J. Moat, 5 Apr 2006

- **Secondary Armament**

- Deck mount for larger patrol ships, coastal protection vessels

- **Other**

- Any vehicle or aircraft that will be based or operated from a naval vessel with HAZ/RAD exposure