PDSD DM431 – German 40mm HV
based on US M549

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1. Background of PDSD DM431

- Existing 40mm HV PD fuzes with high dud risk
- German Army request for an SD fuze with 40mm HV
- JUNGHANS decision to modify an existing fuze design
- Selection of US M549 design as basis
- MoU with Kaman-Dayron for the supply of M549 fuze components
- **Modification** of the M549 PD fuze into DM431 PDSD fuze
- Newest German Army mass production contract from September 2002 for Afghanistan mission
  (further contractors: Norway, Greece, France, Italy)
Background of PDSD DM431

German MULTI-National procurement for Reconnaissance Vehicle FENNEK

with Heckler & Koch AGL

or SACO MK19 mod 3
PDSD DM431 – German 40mm HV SDF

Background from PDSD DM431

DM111 HE-PFF
High Explosive Pre-Formed Fragments

DM112 HEDP
High Explosive Dual Purpose

in a mixed belt
2. Goal of the Development of the PDSD DM431

- To leave the basic system functions (arming & PD) unchanged
- Improve the overall reliability of existing M549 by using its existing high potential (use JUNGHANS background as a clock maker)
- Avoid duds by integrating a pyrotechnical SD function!
3. Fuze Description

- Ammunition for example:
  - 40 x 53 HE-PFF
  - 40 x 53 HEDP

- Outer dimensions and interface to ammunition unchanged

- Fuze type: PDS D

- Muzzle safety distance: 18 m

- Arming set back: 22,500g

- Arming Rotation: 6,000 rpm

- SD time (pyro): > 14 sec. over the full temperature range (-46°C to +63°C)
3. Fuze Description (safe position)

- Firing pin
- Percussion pin
- Escapement
- Safety spring
- Booster DM1515
- Stab detonator DM1518
- Rotor
- Delay detonator DM1519
- Set-back device
PDSD DM431 – German 40mm HV SDF

• From M549 to PDSD DM431 – Mechanical Changes

• Change of the lubrication for the verge assembly
• Improvement of the start of the rotor movement
• Incorporation of a second safety pin and a set-back spring
• Redesign of the anti-creep spring for rotor locking in armed position
• Redesign of the verge weight
• Integration of the SD-mechanism
5. From M549 to PDSD DM431 – Integration of SD-mechanism

- Housing
- Percussion pin
- Delay detonator DM1519
6. Fuze Function (animation)
Video of Junghans DM431 with Diehl ammunition
8. Conclusions

- Proven basic design
- Fits to standard M430A1 or M430A1E1 HEDP round as well as to Diehl round DM111 and DM112
- Highest Safety Standard by using redundant safety devices
- Highest Reliability Standard (>98%)
- Highest Quality Standard based on results of Type Classification by German Army for the PDSD DM431 („DM-Number“)
- Running serial production for: Germany, Norway, Italy, Greece, ...
- Most modern fuze by using SD-function according to Ottawa treaty
Questions?

Grenade launcher M79 (US)  Grenade launcher M203 (US)  Grenade launcher HK 69 A1 (GE)