

# **PDSD DM431 – German 40mm HV**

**based on US M549**

**JUNGHANS Feinwerktechnik**

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by

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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 PD **SD** fuze
- Newest German Army mass production contract from September 2002 for Afghanistan mission  
(further contractors: Norway, Greece, France, Italy)

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## Background of PDSD DM431



**German MULTI-National procurement for Reconnaissance Vehicle FENNEK**

**with Heckler & Koch AGL**

**or SACO MK19 mod 3**

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## Background from PDSD DM431

### DM111 HE-PFF

High Explosive Pre-Formed Fragments



### DM112 HEDP

High Explosive Dual Purpose



in a mixed belt

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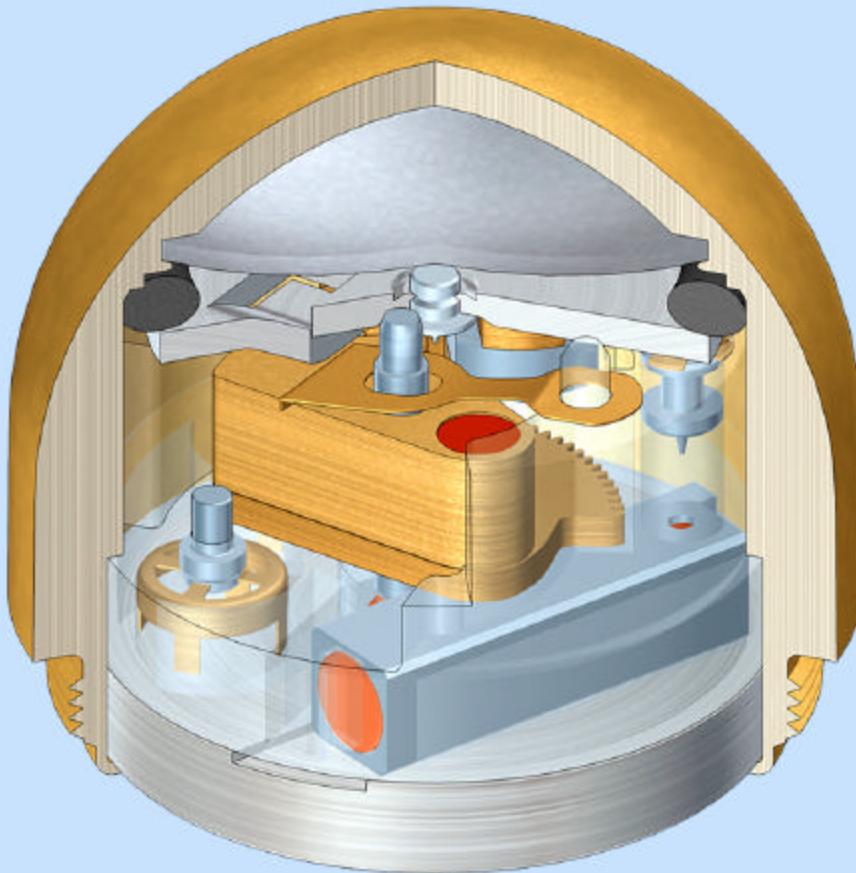
## 2. Goal of the Development of the PDSD DM431

- 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 !**

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### 3. Fuze Description



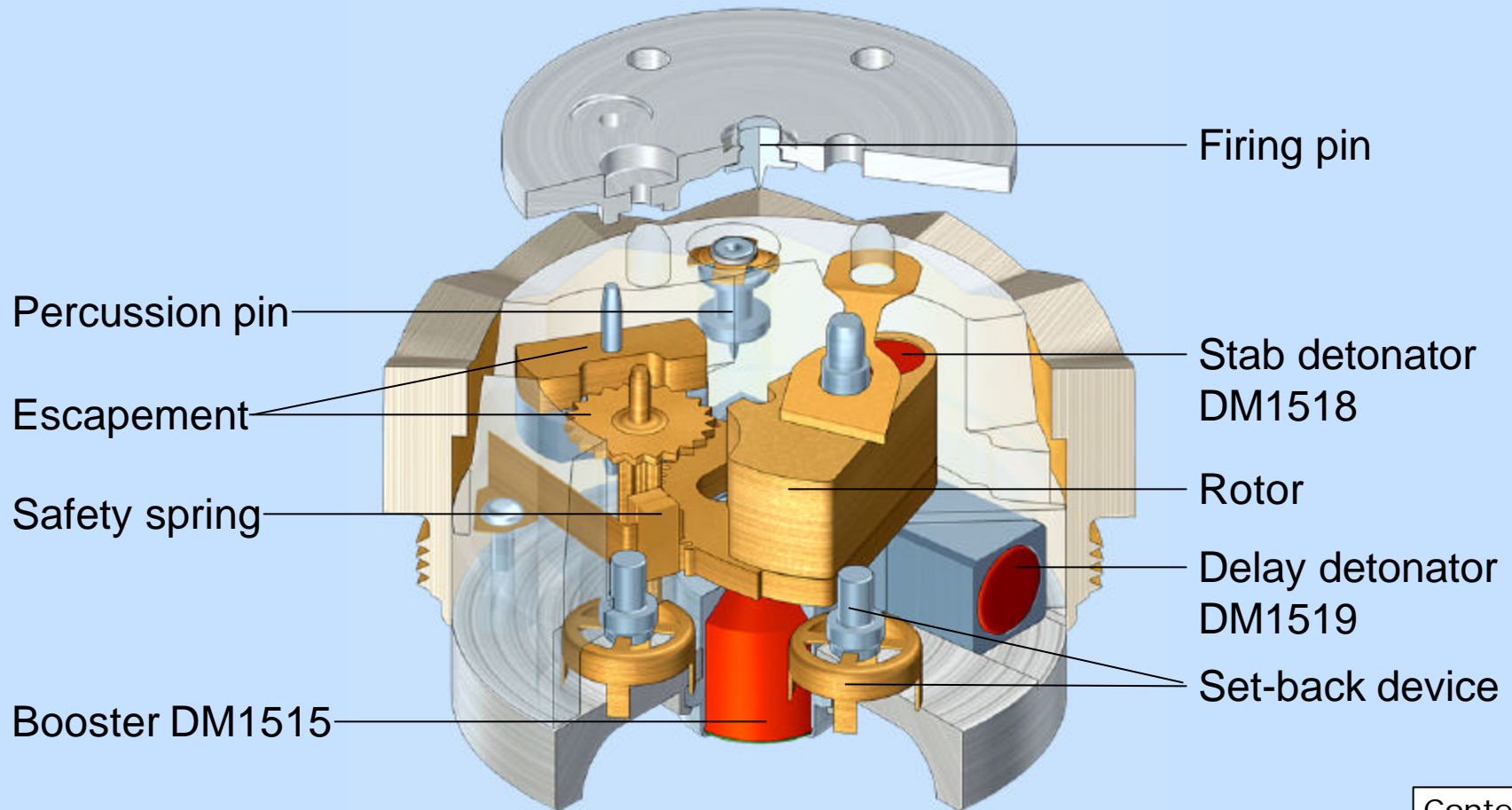
- Ammunition for example:
  - 40 x 53 HE-PFF
  - 40 x 53 HEDP
- Outer dimensions and interface to ammunition unchanged
- Fuze type: PD**SD**
- Muzzle safety distance: 18 m
- Arming set back: 22,500g
- Arming Rotation: 6,000 rpm
- **SD time (pyro): > 14 sec. over the full temperature range (-46°C to +63°C)**

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### 3. Fuze Description (safe position)



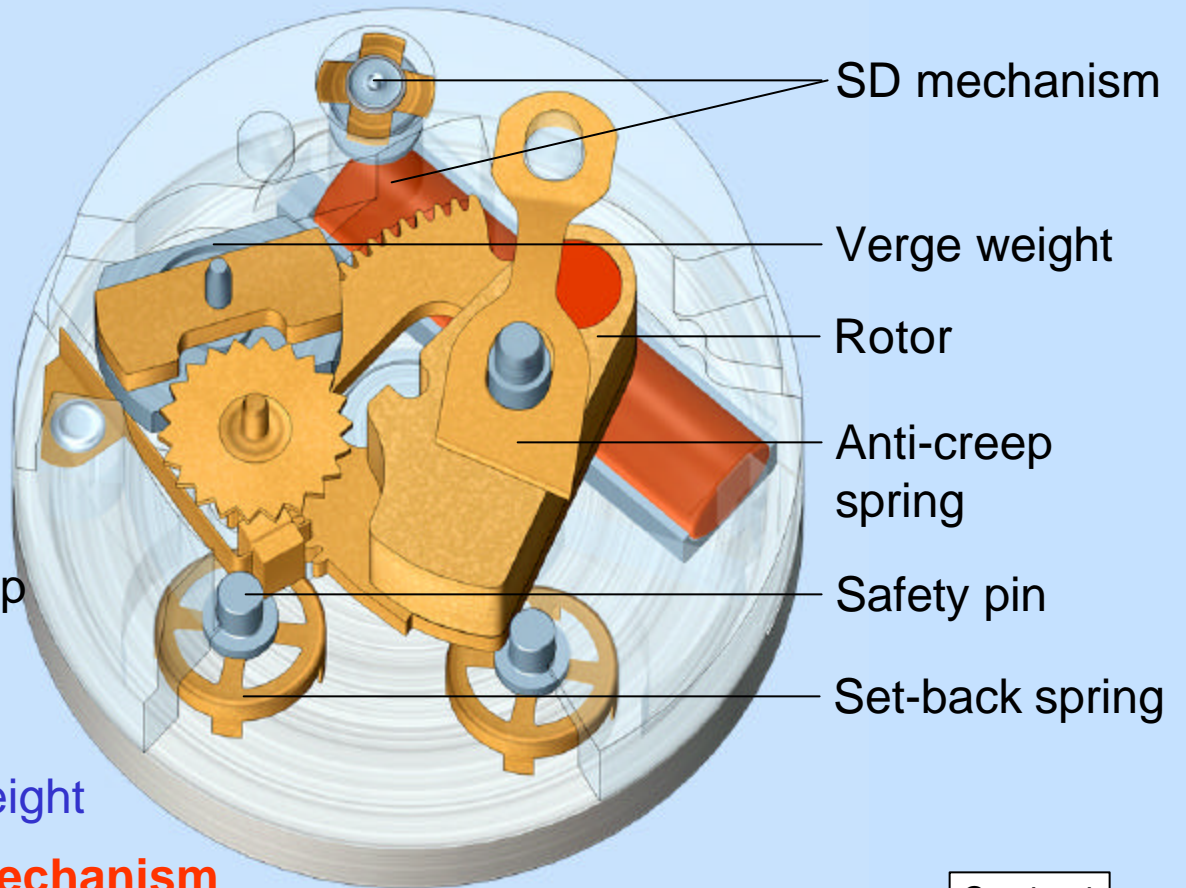
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- **From M549 to PDSD DM431 – Mechanical Changes**

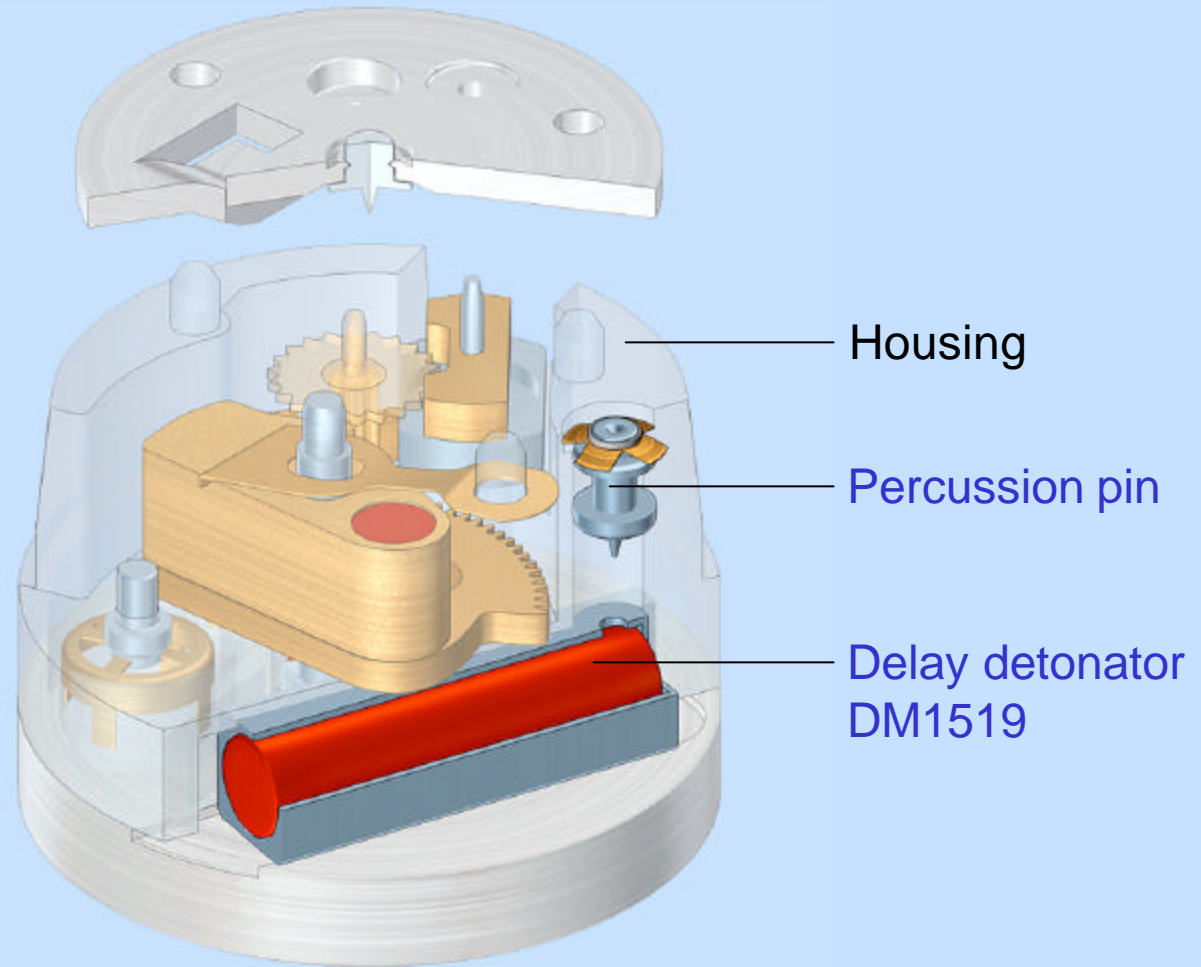
- Change of the lubrication for the verge assembly
- Improvement of the start of the rotor movement
- Incorporation of a second safety pin and a set-back spring
- Redesign of the anti-creep spring for rotor locking in armed position
- Redesign of the verge weight
- **Integration of the SD-mechanism**



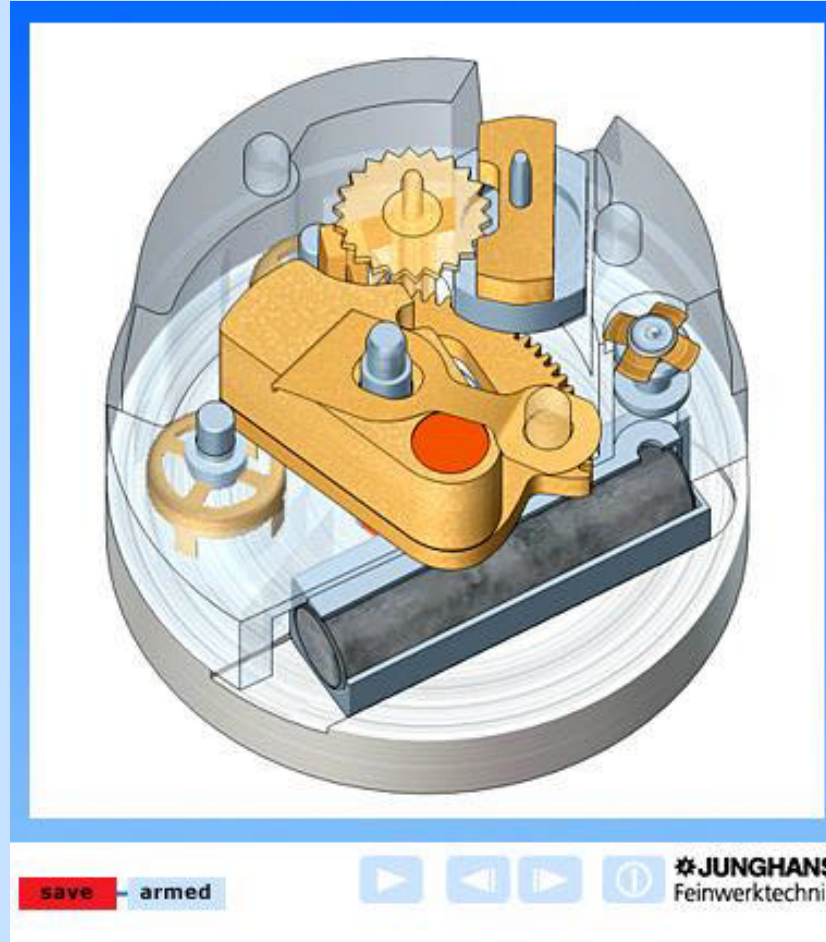
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5. From M549 to **PDSD DM431 – Integration of SD-mechanism**



## 6. Fuze Function (animation)



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## Video of Junghans DM431 with Diehl ammunition



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## 8. Conclusions

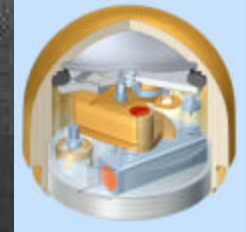
- Proven basic design
- Fits to standard M430A1 or M430A1E1 HEDP round as well as to Diehl round DM111 and DM112
- Highest Safety Standard by using redundant safety devices
- Highest Reliability Standard (>98%)
- Highest Quality Standard based on results of Type Classification by German Army for the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

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# Questions ?



Grenade launcher M79 (US)



Grenade launcher M203 (US)



Grenade launcher HK 69 A1 (GE).....

