

Boeing Demonstrates Next Generation Bomb Rack

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The Boeing Company has successfully developed and demonstrated a pneumatic bomb rack that provides a more affordable and effective alternative to current pyrotechnic bomb racks.

"Our pneumatic rack offers twice the life span of current bomb racks at one-third the life cycle cost," said Ted Jakubowski, weapon carriage systems team leader in the Boeing Phantom Works. "It's also adaptable to all combat aircraft - including Joint Strike Fighter - and can eject more types of weapons more reliably over a wider range of flight conditions."

Like current bomb racks, the pneumatic rack uses gas-driven pistons to eject munitions quickly away from the turbulent air flow of an aircraft. But unlike current racks, the new rack uses pure, dry air as its energy source rather than extremely hot, erosive gases produced by explosive cartridges.

By replacing pyrotechnic components with a pure, dry air generator, Boeing has developed a simpler, cleaner, lighter bomb rack that provides higher performance and hundreds of more firings between maintenance checks.

"Our new rack has one-third the parts and is two-thirds the weight of current racks," Jakubowski said. "In addition, its ejection velocities are 20 percent higher with one-tenth the performance variation - which improves weapons separation and accuracy - and its components don't get fouled or eroded by hot gases."

Historically, the operation of pyrotechnic bomb racks has dictated cleaning after every firing day, complete rebuilding after 500 firings and disposal after 1,000 firings. This maintenance process also involves hundreds of spare parts, special tools, and pyrotechnic handling and disposal procedures.

Because no operational maintenance is required on the pneumatic rack until well beyond 1,000 firings, and because few spares and no special tools or procedures are required, millions of dollars in life cycle costs will be saved for each aircraft equipped with the rack.

According to Jakubowski, customers will acquire additional mission flexibility as well. "Besides bombs, our rack is also designed to directly carry the AIM-120 missile without any adapters," he said. "No other bomb rack has that capability."

In a demonstration in early June for potential government and industry customers, the Boeing pneumatic rack successfully ejected an AIM-120 along with a variety of air-to-ground munitions. "The rack worked perfectly every time," Jakubowski said.

Phantom Works - the advanced R&D division of Boeing - began developing its pneumatic bomb rack in 1992 and successfully flight tested a prototype on an F/A-18 in 1996. It is currently planning to develop pneumatic bomb racks to demonstrate on the F-15E.

The pneumatic rack also can be easily adapted to the AV-8B, F-22, F-117, F-16, B-1B and B-2. Boeing also plans to use this more affordable and effective bomb rack technology on the Joint Strike Fighter.

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