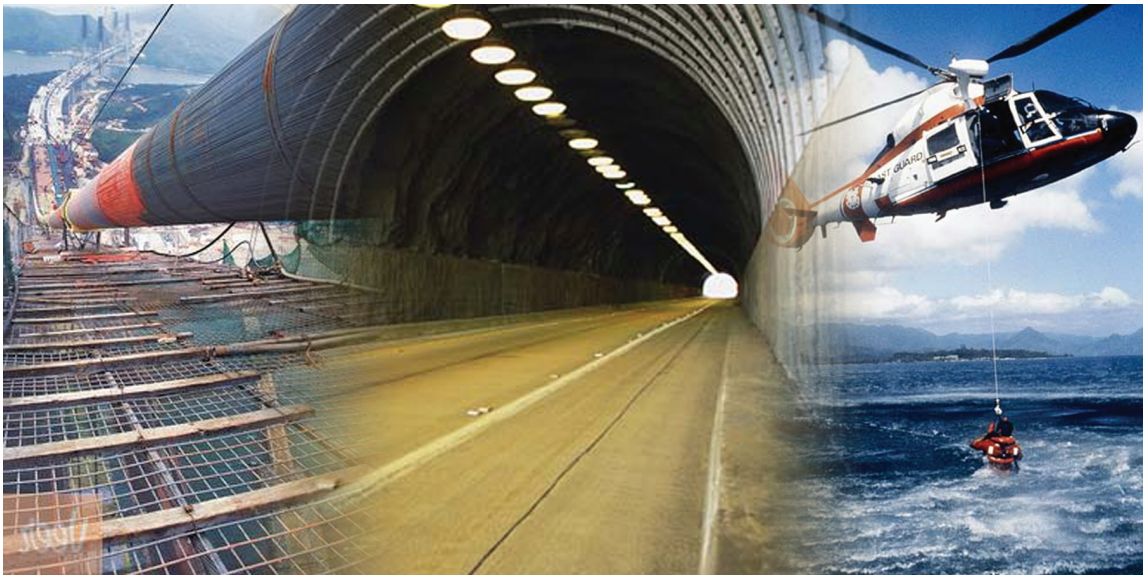
National Aeronautics and Space Administration

Technology *Opportunity*

Space Flight Support Technology

Bolt Retractor System



NASA's Marshall Space Flight Center (MSFC) has developed a bolt retraction system for spacecraft separation systems. This technology offers a low-cost approach to designing bolt retraction systems of varying sizes. It incorporates off-the shelf components, minimizing costs and time involved in the streamlined design process. In addition, this technology allows for fast bolt retraction, low mass, low debris, and minimized bolt spring-back. This technology can be used to create customized bolt retractor systems for a number of applications where rapid, reliable detachment of large components is required.

Benefits

- Streamlined bolt retraction system design
- Rapid bolt retraction (1.25" diameter bolt can travel a distance of 4.2" in 20 ms).
- Low cost
- Low mass
- Low debris
- Minimized bolt spring-back

Commercial Applications

- Launch vehicles
- Aircraft
- Missiles
- Emergency/Rescue Equipment
- Container Opening/Jettisoning
- Construction/Equipment Submersion

For More Information

If you would like more information about this technology or about NASA's technology transfer program, please contact:

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The Technology

Devices that allow the rapid, automated detachment of two objects play a number of roles in space flight. They help the Space Shuttle Orbiter separate from the boosters that lift it into space, move the Shuttle away from the supports on the launch pad, and, in orbit, they help astronauts open various experiment doors and release projects into space.

NASA's Marshall Space Flight Center has developed a technique for designing bolt retractor systems for the separation of two components. This system uses off-the-shelf pyrotechnic release nuts to initiate bolt release and a spring-loaded system for retraction. The use of off-the-shelf components reduces costs and design time while maximizing reliability.

Partnership Opportunities

This patent-pending technology is part of NASA's Technology Transfer Program, which seeks to stimulate commercial use of NASA-developed technology. Companies are invited to explore co-development opportunities for the technology with a view to licensing commercial products. NASA is flexible in its agreements, and opportunities exist for exclusive, nonexclusive, or exclusive field-of-use patent licensing.

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