

Mission Success
Ensign-Bickford Aerospace & Defense Company (EBAD) is dedicated to supporting our customers in the aerospace and defense industry through on-time delivery of innovative products that exceed expectations and assure mission success.

Frangible Joint Assembly (FJA)

A Frangible Joint Assembly is a unique explosive device that provides instantaneous separation of flight vehicle structures while maintaining complete confinement of explosive debris.

The key components of a Frangible Joint include Mild Detonating Fuse (MDF), an explosive confinement tube, a separable structural element, and associated initiation manifolds and attachment hardware.

Principle of Operation

Upon detonation of the explosive MDF by an EBAD electric detonator or FCDCA, shock is transmitted to an aluminum structural member that subsequently fractures along a stress riser. Complete confinement of the explosive by-products is maintained by the confinement tube and manifold assembly, and no secondary fracturing of the structural member occurs.

The FJA arrives fully assembled for customers to install this hardware at the vehicle assembly facility. This can save critical processing time on the pad and simplifies supply chain management as the assembly can be integrated at the factory at the same time as other components.



Hollow Form Extrusion FJA with Clevis type attachment

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Frangible Joint Assembly (FJA)

Construction

The Frangible Joint consists of a separable structural member that encloses an expanding tube assembly. Within the expanding tube assembly, an MDF is installed in a rubber bladder that in turn is inserted into a seamless stainless steel tube. The rubber bladder serves as a holder/locating device for the MDF and provides system shock management. The MDF energetic charge is sized specifically to the structural member to be fractured at a predefined notch. EBAD has experience designing, developing, and manufacturing various structural member configurations to meet customer specific needs and requirements.

Applications

- Payload fairing (shroud) separation
- Payload separation
- Stage separation
- Initiated by FCDCA or standard electric detonators

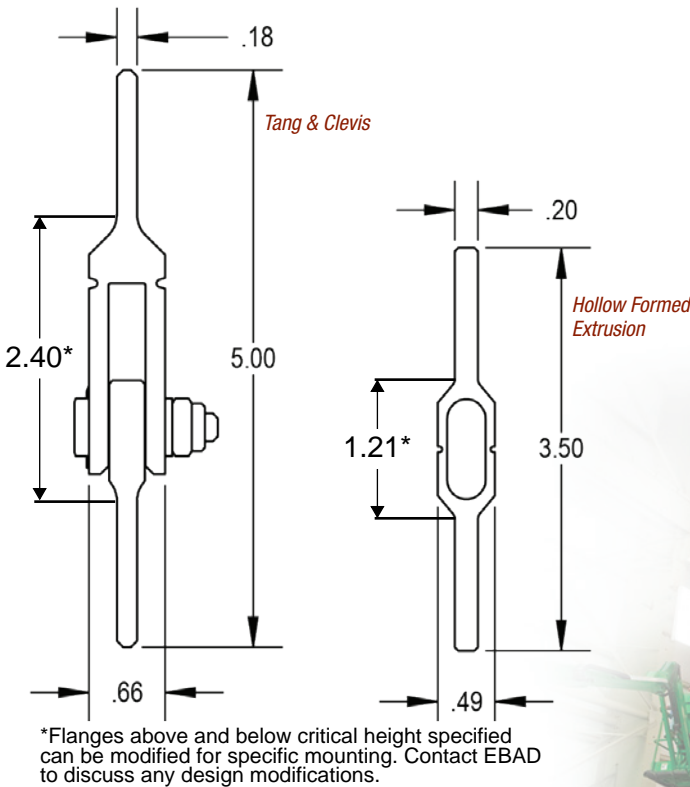
Key Features

- Fully contained explosive byproducts
- Near zero debris
- Variety of attachment options
- Fast operation
- Delivered ready to install
- Field servicable

Frangible Joint Assembly (FJA)

Parameter	Capability
Pyrotechnic Shock	32,000 g peak
Random Vibration	54.2 g RMS, 180 sec/axis
High/Low Temp Function	Hollow Form Extrusion: -20°F/160°F Tang & Clevis: -71°F/225°F
High Temp Storage	60 days at 160°F, 40-60%RH
Thermal Cycling	-71°F to 165°F, (8 cycles)
Load Capability	Hollow Form Extrusion: 3,600 lb/in Tang & Clevis: >10,000 lb/in

Frangible Joint Assembly (FJA) Mechanical Interface Drawing



An example of a typical assembly: (2) 18 ft diameter Frangible Joint separation rings



Hollow form extrusion Frangible Joint Assembly

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