

Jet Fuel Starter Arm



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PROJECT SUMMARY:

The Jet Fuel Starter provides the power to start the engine of the F-16 fighter jet. The Jet Fuel Starter is a manually pressurized tank that requires a pump handle to be inserted to operate. The original handle design requires that it be carried by crew on the ground and leaves the pilot at a loss should they need to stop at a civilian airfield. Our team worked with the U.S. Air Force to create a new handle that could be stowed easily on the aircraft and would withstand repeated use, corrosion, and be manufactured with the taxpayer in mind. Using advanced 3D modelling, 3D printing, and stress analysis, the redesign balances strength and weight to ensure reliability in all potential field conditions.

DESIGN GOAL:

The goal of this project was to create a new Jet Fuel Starter pump handle that would solve a long-standing logistical challenge wherein the current handle must be carried by ground crews, limiting the flexibility of flight operations that left pilots without a backup option should they land away from an airbase. Our redesign aimed to produce a handle that could be stored directly on the F-16, deploy quickly in the field, and withstand years of operational use. The team applied structural analysis, 3D modeling and printing, and prototype testing to refine geometry, reduce weight, and simplify assembly. The final design prioritizes safety, ergonomics, and cost efficiency while still delivering a reliable and easy to use tool for Air Force operations.



The team's prototype in its deployed state.

DESIGN CONSTRAINTS:

- **Lightweight** – Total assembly less than 12 pounds
- **Compact** – Must break down to 2inx5inx4in to fit on aircraft
- **Compatibility** – Fits the existing Jet Fuel Start Interface
- **Durability** – Withstands torque and cyclic loading during usage in the field
- **Corrosion Resistance** – Built from materials that will not be damaged in extreme environments



The team's prototype in its undeployed state.