F–16 FUEL ACCESS DOOR COVERS

COMPONENT PURPOSE/REQMNTS:

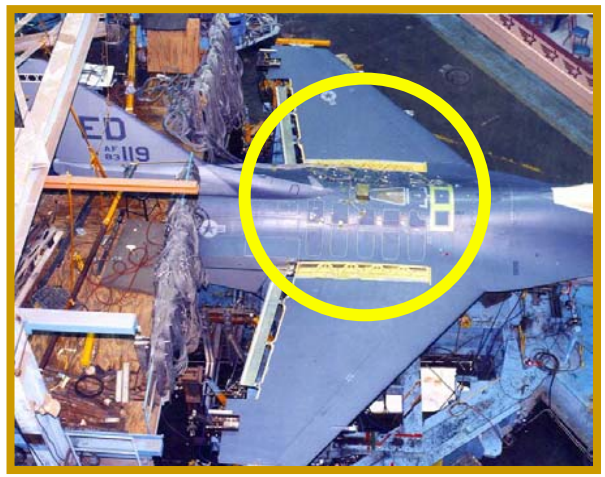
- provide aerodynamic cover to fuel doors in initial design
- later modified to carry skin loads

COMPONENT CONFIGURATION:

- wrought sheet between 2.0–2.5 mm thick, with bolt hole attachments

PROBLEM:

- high-*g* maneuvers induce loading in fuselage skin
- unloaded door holes in original design led to fuselage cracking near the vertical tail root
- bolts were modified to allow doors to carry loads, motivating redesign of door covers



PREFERRED SOLUTION:

- high strength and stiffness, high bearing strength, good high cycle fatigue resistance, and compatibility with jet fuel equivalent to Al

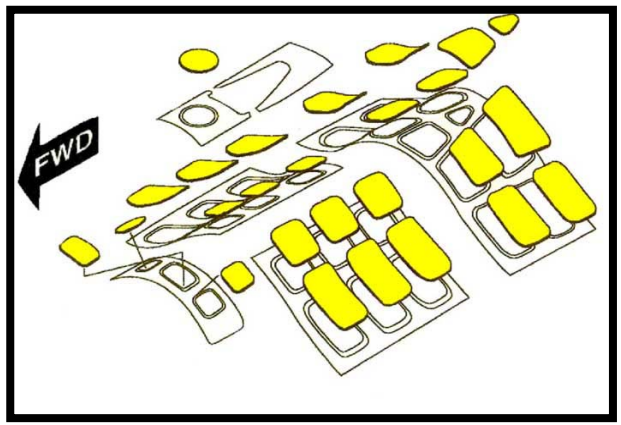
CANDIDATES:

- double thickness of 2024–T4 Al doors
- DRA doors

F–16 FUEL ACCESS DOOR COVERS

TEAM AND APPROACH:

- Lockheed Martin, USAF Ogden Air Logistics Center, DWA Al Composites, USAF Materials Manufacturing Directorate and AF Title III Program Office
- collaborative design trade studies and M&P studies
- MIL-HDBK 5 data generation



MATERIAL AND PROCESS:

- *Al 6092/SiC/17.5p* DRA sheet was selected for study
- P/M billets (ϕ = 51cm) extruded and rolled to final thickness of 2.0 mm or 2.5 mm
- high speed routing, hole pre-punching, drilling performed at fabricator
- roll formed to final contour and heat treated
- cleaned and painted

RESULTS/PAYOFF:

- DRA has jet fuel compatibility equivalent to Al
- DRA provides significant improvement in strength, stiffness and bearing strength relative to 2024 Al
- actively being retrofitted in the Falcon-Up! program
- peak stresses reduced by 38%, mean stresses reduced by 10%, eliminating fuselage cracking
- fuselage durability projected to exceed ~8000 hours