

Test Case 2a: Wing/Body Cruise

- **Verification of steady CFD analysis**

- **CRM Wing/Body**

- Reynolds number: 5M (LoQ)
- Dynamic Pressure: $Q_\infty = 1384$ psf
- Mach number: 0.85 (M_{cruise})
- Angle of Attack = 2.50 deg
- Temperature: 120.0 F (579.67 R / 322.04 K)

Grid: Level 1-6

<u>Comparison Data</u>
NTF197: r44,r51,r53
NTF197: r92,r97,r99 (WBTO)
NTF215: r43,r103
NTF229: r296,r300,r302
ETW ESWIRP: r164,r182,r153
Ames216: r35,r126,r130,r133

- **Committee-supplied**

- NASA CRM geometry including deformed wing matching condition
 - Optional: Trip location – Wing: 10% chord upper/lower surface
- Grid Family: https://dpw.larc.nasa.gov/DPW8/Scatter/Test_Case_2
 - L1:Tiny/L2:Coarse/L3:Medium/L4:Fine/L5:eXtra-fine/L6:Ultra-fine

- **Reference Units**

Sref (semi-span grid)	Cref	Semispan	Moment Center
297360.0 sq.in	275.8 in	1156.75 in	(1325.90, 0.00, 177.95)

- **Comparison metrics**

- Forces / Moments
- Sectional C_p distribution
- Residuals (Flow & Structural Solver)

Test Case 2b: Wing/Body Polar

- CFD/FEM start from unloaded (wind-off) geometry/grid

- CRM Wing/Body

- Reynolds number: 5M (LoQ)
- Dynamic Pressure: $Q_\infty = 1384$ psf
- Mach number: 0.85 (M_{cruise})
- Angles of attack: -1.50, 2.50, 3.00, 3.50, 4.00, 4.50
- Temperature: 120.0 F (579.67 R / 322.04 K)

Grid: Level 3

<u>Comparison Data</u>
NTF197: r44,r51,r53
NTF197: r92,r97,r99 (WBTO)
NTF215: r43,r103
NTF229: r296,r300,r302
ETW ESWIRP: r164,r182,r153
Ames216: r35,r126,r130,r133

- Committee-supplied

- NASA CRM geometry in jig/unloaded condition
 - Optional: Trip location – Wing: 10% chord upper/lower surface
- Grid Family: https://dpw.larc.nasa.gov/DPW8/Scatter/Test_Case_2
 - L1:Tiny/L2:Coarse/L3:Medium/L4:Fine/L5:eXtra-fine/L6:Ultra-fine

- Reference Units

Sref (semi-span grid)	Cref	Semispan	Moment Center
297360.0 sq.in	275.8 in	1156.75 in	(1325.90, 0.00, 177.95)

- Comparison metrics

- Forces / Moments
- Sectional C_p distribution
- Residuals (Flow & Structural Solver)