

Five stringer crown panel NASA Langley Research Center 11/3/1992 Image # EL–1996–00088 David M. McGowan

Selected Publications:

D.M. McGowan, R.D. Young, G.D. Swancon, and W.A. Waters, 5th NASA/DoD Adv. Compos. Tec. Con., Seattle, Wash., Paper No. A94-33140 (1994).

McGowan, D. M.; and Ambur, D. R.: Compression Response of a Sandwich Fuselage Keel Panel With and Without Damage. Presented at the Sixth NASA/DoD/ARPA Advanced Composites Technology Conference, Anaheim, CA, August 7-11, 1995.

David M. McGowan and Damodar R. Ambur (Langley Research Center, Hampton, Virginia), "Damage-Tolerance Characteristics of Composite Fuselage Sandwich Structures With Thick Facesheets", NASA Technical Memorandum 110303, February 1997

ABSTRACT: Damage tolerance characteristics and results from experimental and analytical studies of a composite fuselage keel sandwich structure subjected to low-speed impact damage and discrete-source damage are presented. The test specimens are constructed from graphite-epoxy skins bonded to a honeycomb core, and they are representative of a highly loaded fuselage keel structure. Results of compression-after-impact (CAI) and notch-length sensitivity studies of 5-in.-wide by 10-in-long specimens are presented. A correlation between low-speed-impact dent depth, the associated damage area, and residual strength for different impact-energy levels is described; and a comparison of the strength for undamaged and damaged specimens with different notch-length-to-specimen-width ratios is presented. Surface strains in the facesheets of the undamaged specimens are presented and compared with results from finite element analyses. Reductions in strength of as much as 53.1 percent for the impacted specimens and 64.7 percent for the notched specimens are observed.

McGowan, D. M., and Anderson, M. S., "Development of Curved Plate Elements for the Exact Buckling Analysis of Composite Plate Assemblies Including Transverse Shear Effects," Proceedings of the 38th AIAA/ ASME/ ASCE/ AHS/ ASC Structure, Structural Dynamics and Materials Conference, AIAA Paper 97-1305, Kissimmee, Florida, USA, April 1997, pp. 2678-2692.