LS-208

BIBLIOGRAPHY FOR LS-208

This bibliography was prepared by INTA (Instituto Nacional de Técnica Aeroespacial) at the request of, and with the help of, the Lecture Series Director, Major Francisco Rios Tejada, Spanish Air Force, MC.

Quest Accession Number : 94052220
A94-23055 AEROPLUS Issue: 9405
Modeling human body dynamic response to abrupt acceleration
Author(s): Obergefell, Louise (USAF, Armstrong Lab., Wright-Patterson AFB, OH); Kaleps, Ints (USAF, Armstrong Lab., Wright-Patterson AFB, OH)
Source Info: IN:SAFE Association, Annual Symposium, 31st, Las Vegas, NV, Nov. 8-10, 1993, Proceedings (A94-23015 05-54), Yoncalla, OR, SAFE Association, 1994, p. 341-346
Journal Announcement: IAA9405
Publisher: SAFE Association, Yoncalla, OR
Country of Publication: United States
Publication Year/Date: 1994; 940000
Document Type: CONFERENCE VOLUME - ANALYTIC
Language: English
The predictive simulation of human body dynamic response to abrupt accelerations encountered during emergencies can provide guidance for improved safety and crashworthiness design. The Articulated Total Body (ATB) model, a computer simulation program, is used for the prediction of human body dynamics during aircraft crashes, ejections, emergency escape, and other hazardous environment exposures. It is used to evaluate safety of proposed structures in the aircraft cockpit before prototypes are built or costly tests conducted. Because of its capability to predict both internal forces and external forces acting on the body, the ATB model can also be used in accident investigation. For example, the safety of a cargo plane was evaluated for head strikes with a head up display during a survivable crash, emergency escape through a chute was simulated to investigate body clearances and possible impacts with aircraft structures, body motion and limb flail during ejection were studied, and energy absorbing seats in a helicopter were simulated.
Classification: 54 (MAN-SYSTEM TECHNOLOGY/LIFE SUPPORT)
Controlled Term(s): HUMAN BODY / DYNAMIC RESPONSE / ACCELERATION STRESSES (PHYSIOLOGY) / AIRCRAFT SAFETY / FLIGHT CREWS / CRASHES / COCKPITS / EJECTION SEATS / HELICOPTERS / COMPUTERIZED SIMULATION

Quest Accession Number : 89A49205
89A49205 NASA IAA Journal Article Issue: 21
A study of nonstationary loads during the accelerated and abrupt motion of bodies of various shapes
Issledovanie nestatsionarnykh nagruzok pri uskorennom i vnezapnom dvizhenii tel razlichnoi formy
(AA)PODLUBNYI, V. V.; (AB)FONAREV, A. S.
PMTF - Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (ISSN 0044-4626), May-June 1989, p. 83-88. In Russian., Publ. Date: 890600 Pages: 6 Language: RU (Russian)
The paper is concerned with the accelerated motion of several different bodies (a sphere, a cylinder, and a cone) from the position of rest to specified subsonic or supersonic velocities with various accelerations, including abrupt motion of a body with a specified velocity. The nonstationary aerodynamic characteristics of the bodies are obtained for different accelerations using a numerical method. An analytical procedure is proposed for calculating

the initial pressure distribution and maximum forces in abrupt motion.
V.L.
Category code: 02 (aerodynamics)
Controlled terms: *AERODYNAMIC CHARACTERISTICS /*CLASSICAL MECHANICS /*COMPUTATIONAL FLUID DYNAMICS /*LOADS (FORCES) / ACCELERATION (PHYSICS) / CONICAL BODIES / CRITICAL LOADING / EULER EQUATIONS OF MOTION / SUPERSONIC SPEED /

Quest Accession Number : 80A31592
80A31592# NASA IAA Journal Article Issue: 12
Injury dynamics in aircraft accident
(AA)SINGH, R.
Author Affiliation: (AA)(Indian Air Force, Institute of Aviation Medicine, Bangalore, India)
Aviation Medicine, vol. 23, Dec. 1979, p. 119-124., Publ. Date: 791200 Pages: 6 refs 8 Language: EN (English)
The impact forces encountered in aircraft accidents are generally abrupt accelerations of short duration, usually less than 1 sec., thereby causing mechanical damage that results in injuries to aircraft occupants. The discussion covers human tolerance to abrupt accelerations, along with aircraft crash injuries and dynamics. The basic causes and mechanism of the injuries are discussed. For quick retrieval of information to correlate injuries with aircraft environment during crash, a supplementary form is suggested to be incorporated into the current Form MS 1956.
S.D.
Category code: 54 (man-system technology/life support)
Controlled terms: *AIRCRAFT ACCIDENT INVESTIGATION /*CRASH INJURIES / HARNESSES / HUMAN FACTORS ENGINEERING / HUMAN TOLERANCES / IMPACT ACCELERATION / MAN MACHINE SYSTEMS / MECHANICAL SHOCK / PHYSIOLOGICAL ACCELERATION / SEAT BELTS /

Quest Accession Number : 70N40569
70N40569# NASA STAR Technical Report Issue: 23
Human tolerance to abrupt accelerations. A summary of the literature (Literature survey on human tolerance of abrupt accelerations)
(AA)MC KENNEY, W. R.
Corp. Source: Dynamic Science, Phoenix, Ariz. (D8686424) AVSER FACILITY.
AD-708916; AVSER-70-13 Publ. Date: 700500 Pages: 68 refs 0 Language: EN (English) Avail.: NTIS
Category code: 04 (biosciences)
Controlled terms: *ACCELERATION TOLERANCE /*HUMAN TOLERANCES /*IMPACT TOLERANCES / BIBLIOGRAPHIES / IMPACT ACCELERATION /

Quest Accession Number : 90N22547

90N22547# NASA STAR Technical Report Issue: 16

Aircraft crash survival design guide. Volume 3: Aircraft structural crash resistance / Final Report, Sep. 1986 - Aug. 1989

(AA)ZIMMERMAN, RICHARD E.; (AB)WARRICK, JAMES C.; (AC)LANE, ALAN D.; (AD)MERRITT, NORMAN A.; (AE)BOLUKBASI, AKIF O.

Corp. Source: Simula, Inc., Phoenix, AZ. (SL704492)

AD-A218436; USAAVSCOM-TR-89-D-22C-VOL-3 Contract: DAAJ02-86-C-0028 Publ. Date: 891200 Pages: 265 (Revised) Language: EN (English) Avail: NTIS HC A12/MF A02

This five volume publication was compiled to assist design engineers in understanding the design considerations associated with the development of crash resistant U.S. Army aircraft. A collection of available information and data pertinent to aircraft crash resistance is presented, along with suggested design conditions and criteria. The five volumes of the Aircraft Crash Survival Design Guide cover the following topics: Design Criteria and Checklists; Aircraft Design Crash Impact Conditions and Human Tolerance; Aircraft Structural Crash Resistance; Aircraft Seats, Restraints, Litters and Cockpit/Cabin Delethalization; and Aircraft Postcrash Survival. This volume (Volume 3) contains information on the design of aircraft structures and structural elements for improved crash survivability. Current requirements for structural design of U.S. Army aircraft pertaining to crash resistance are discussed. Principles for crash-resistant design are presented in detail for the landing gear and fuselage subject to a range of crash conditions, including impacts that are primarily longitudinal, vertical or lateral in nature and those that involve more complicated dynamic conditions, such as rollover. Analytical methods for evaluating structural crash resistance are described.

GRA

Category code: 03 (air transportation/safety)

Controlled terms: *AIRFRAMES /*CRASHWORTHINESS /*DYNAMIC STRUCTURAL ANALYSIS /*FUSELAGES /*STRUCTURAL ENGINEERING / AIRCRAFT ACCIDENTS / CHECKOUT / LANDING GEAR / SEATS / SURVIVAL / TOLERANCES (PHYSIOLOGY) / VULNERABILITY /

Quest Accession Number : 80N33385

80N33385# NASA STAR Technical Report Issue: 24

Aircraft crash survival design guide. Volume 3: Aircraft structural crashworthiness / Final Report, Sep. 1977 - Mar. 1980

(AA)LAANANEN, D. H.; (AB)SINGLEY, G. T., III; (AC)TANNER, A. E.; (AD)TURNBOW, J. W.

Corp. Source: Simula, Inc., Tempe, Ariz. (SL704970)

AD-A089104; TR-7821; USARTL-TR-79-22C-VOL-3 Contract: DAAJ02-77-C-0021; DA PROJ. 1L1-62209-AH-76 Publ. Date: 800800 Pages: 274 refs 0 Language: EN (English) Avail.: NTIS HC A12/MF A01

This five volume document has been assembled to assist design engineers in understanding the problems associated with the development of crashworthy U.S. Army aircraft. It includes not only a collection of available information and data pertinent to aircraft crashworthiness but suggested

DYNAMICS / ELASTICITY / ENGINEERING / FACTOR / FREQUENCY / HUMAN / INTEGRATION / MASS / MODEL / PERFORMANCE / PHENOMENON / PHYSIOLOGY / PICKUP / PROBLEM / RESONANCE / RESPONSE / SPINE / SUMMARY / SUPERSONIC / SYSTEM / TOLERANCE / WEIGHT /

Quest Accession Number : 90N22548

90N22548# NASA STAR Technical Report Issue: 16

Aircraft crash survival design guide. Volume 4: Aircraft seats, restraints, litters, and cockpit/cabin delethalization / Final Report, Sep. 1986 - Aug. 1989

(AA)DESJARDINS, S. P.; (AB)ZIMMERMAN, RICHARD E.; (AC)BOLUKBASI, AKIF O.; (AD)MERRITT, NORMAN A.

Corp. Source: Simula, Inc., Phoenix, AZ. (SL704492)

AD-A218437; USAAVSCOM-TR-89-D-22D-VOL-4 Contract: DAAJ02-86-C-0028 Publ. Date: 891200 Pages: 271 (Revised) Language: EN (English) Avail: NTIS HC A12/MF A02

This five-volume publication was compiled to assist design engineers in understanding the design considerations associated with the development of crash-resistant U.S. Army aircraft. A collection of available information and data pertinent to aircraft crash resistance is presented, along with suggested design conditions and criteria. The five volumes of the Aircraft Crash Survival Design Guide cover the following topics: Design Criteria and Checklists; Aircraft Design Crash Impact Conditions and Human Tolerance; Aircraft Structural Crash Resistance; Aircraft Seats, Restraints, Litters and Cockpit/Cabin Delethalization; and Aircraft Postcrash Survival. This Volume (4) contains information on aircraft seats, litters, personnel restraint systems, and hazards on the occupant's immediate environment. Requirements for design of seats, litters, and restraints systems are discussed, as well as design principles for meeting these requirements and testing for verification that the systems perform as desired. Energy-absorbing devices for use in seats are described, as are various types of cushions. Delethalization of cockpit and cabin interiors is discussed, including the use of protective padding and the design of controls for prevention of injury. Finally, computerized methods of analysis for evaluation of seats, restraints, and the occupant's immediate environment are presented.
GRA

Category code: 03 (air transportation/safety)

Controlled terms: *AIRCRAFT ACCIDENTS /*CRASHWORTHINESS /* ENERGY ABSORPTION /*STRAPS /*SURVIVAL / AIRCRAFT COMPARTMENTS / AIRFRAMES / CHECKOUT / COCKPITS / COMPUTER TECHNIQUES / CUSHIONS / INJURIES / SEATS / STRUCTURAL ANALYSIS / TOLERANCES (PHYSIOLOGY) / VULNERABILITY /

Quest Accession Number : 66A29447
66A29447# NASA IAA Issue: 15
Problem of the resistance of man to the effect of intensive short-term angular accelerations (Abrupt angular acceleration effect on man, noting physiological responses such as blood pressure, EKG, EEG, cardiovascular, respiratory and nervous reactions, etc)
K voprosu ob ustoichivosti cheloveka k vozdeistviiu kratkovremennykh uglovykh uskorenii bol'shikh velichin
(AA)ORLOV, S. F.; (AB)TARDOV, V. M.; (AC)USTIUSHIN, B. V.
IN- PROBLEMS OF SPACE BIOLOGY. VOLUME 4 <PROBLEMY KOSMICHESKOI BIOLOGII. VOLUME 4<. EDITED BY N. M. SISAKIAN. MOSCOW, IZDATEL'STVO NAUKA, 1965, P. 70-74. IN RUSSIAN. Publ. Date: 650000 Pages: 5 Language: RU (Russian)
Category code: 04 (biosciences)
Controlled terms: *ACCELERATION STRESS /*ANGULAR ACCELERATION /*HUMAN TOLERANCE /*PHYSIOLOGICAL RESPONSE / ACCELERATION / ANGULAR / BIOLOGICAL / EFFECT / HUMAN / MEDICINE / PHYSIOLOGY / RESPONSE / SPACE / STRESS /BIOL/ / TOLERANCE /BIOL/ /

Quest Accession Number : 63N11793
63N11793# NASA STAR Technical Report Issue: 04
(Thrombopenia following abrupt acceleration and impact)
(AA)TAYLOR, E. R.
Corp. Source: Aerospace Medical Div. Aeromedical Research Lab. (6571st), Holloman AFB, N. Mex. (AG575685)
ARL-TDR-62-30 AEROSPACE MEDICAL DIV., AEROMEDICAL RESEARCH LAB. /6571ST/, HOLLOMAN AFB, N. MEX. THROMBOCYTOPENIA FOLLOWING ABRUPT DECELERATION. A PRELIMINARY COMMUNICATION ELLIS R. TAYLOR DEC. 1962 17P 12 REFS /ARL-TDR-62-30/ Publ. Date: 621200 Pages: 17 Language: 00
Category code: 16 (masers)
Controlled terms: *BLOOD /*HUMAN BODY /*IMPACT /* PHYSIOLOGICAL ACCELERATION /*THROMBOPENIA / ACCELERATION / COUNT / DECELERATION / DECREASE / FACE / FORWARD / HUMAN / ONSET / PLATELET / POST / PROGRESSION / RATE / SEVERITY / SLED / SUBJECT / TEST /

Quest Accession Number : 62N10967
62N10967*# NASA STAR Technical Report Issue: 04
(The dynamic model - an engineering approach to the problem of tolerance to abrupt accelerations)
(AA)SHAPLAND, D. J.
Corp. Source: Stanley Aviation Corp., Denver, Colo. (S0463044)
SAC-59 Contract: NASR-37 STANLEY AVIATION CORP., DENVER, COLO. THE DYNAMIC MODEL - AN ENGINEERING APPROACH TO THE PROBLEM OF TOLERANCE TO ABRUPT ACCELERATIONS. DAVID J. SHAPLAND. <1961< 21 P. 7 REFS. /SAC-59/ /NASA CONTRACT NASR-37/ OTS- PH $2.60, MI $0.83. Publ. Date: 610000 Pages: 21 Language: 00
Category code: 16 (masers)
Controlled terms: *ACCELERATION /*DYNAMIC MODEL /*HUMAN PERFORMANCE /*HUMAN TOLERANCE /*PHYSIOLOGICAL ACCELERATION / AIRCRAFT / ANALOG / AXIS / COEFFICIENT / COMPUTER / DAMPING / DEFORMATION / DEGREE OF FREEDOM / DIGIT / DURATION /

design conditions and criteria as well. Volume 3 contains information on the design of aircraft structures and structural elements for improved crash survivability. Current requirements for structural design of U.S. Army aircraft pertaining to crashworthiness are discussed. Principles for crashworthy design are presented in detail for the landing gear and fuselage subject to a range of crash conditions, including impacts that are primarily longitudinal, vertical, or lateral in nature and those that involve more complicated dynamic conditions, such as rollover. Analytical methods for evaluating structural crashworthiness are described.
GRA
Category code: 03 (air transportation/safety)
Controlled terms: *AERONAUTICAL ENGINEERING /*AIRCRAFT DESIGN /*AIRFRAMES /*CRASHES /*DYNAMIC RESPONSE /*FLIGHT TESTS /*STRUCTURAL DESIGN / AIRCRAFT STRUCTURES / STRUCTURAL DESIGN CRITERIA / SYSTEMS ENGINEERING /

Quest Accession Number : 80N32358
80N32358# NASA STAR Technical Report Issue: 23
Aircraft crash survival design guide. Volume 4: Aircraft seats, restraints, litters, and padding / Final Report, Sep. 1977 - Feb. 1980
(AA)DESJARDINS, S. P.; (AB)LAANANEN, D. H.
Corp. Source: Simula, Inc., Tempe, Ariz. (SL704970) A2024546
AD-A088441; TR-7822-VOL-4; USARTL-TR-79-22D Contract: DAAJ02-77-C-0021; DA PROJ. 1L1-62209-AH-76 Publ. Date: 800600 Pages: 275 refs 0 (Revised) Language: EN (English) Avail.: NTIS HC A12/MF A01
This five volume document has been assembled to assist design engineers with the development of crashworthy U.S. Army aircraft. The five volumes of the Aircraft Crash Survival Design Guide cover the following topics: Volume 1 - Design Criteria and Checklists; Volume 2 - Aircraft Crash Environment and Human Tolerance: Volume 3 - Aircraft Structural Crashworthiness; Volume 4 - Aircraft Seats, Restraints, Litters, and Padding; Volume 5 - Aircraft Postcrash Survival. This volume (Volume 4) contains information on aircraft seats, litters, personnel restraint systems, and hazards in the occupant's immediate environment. Requirements for design of seats, litters, and restraint systems are discussed, as well as design principles for meeting these requirements and testing for verification that the systems perform as desired. Energy absorbing devices for use in seat are described, as are various types of cushions. Delethalization of cockpit and cabin interiors is discussed, including the use of protective padding and the design of controls for prevention of injury. Finally, computerized methods of analysis for evaluation of seats, restraints, and the occupant's immediate environment are presented.
GRA
Category code: 03 (air transportation/safety)
Controlled terms: *AIRCRAFT ACCIDENTS /*AIRCRAFT SURVIVABILITY /*FLIGHT SAFETY /*HARNESSES /*SEAT BELTS / ENERGY ABSORPTION / HUMAN FACTORS ENGINEERING / IMPACT RESISTANCE / SAFETY DEVICES /

Quest Accession Number : 96033384
A96-12346 AEROPLUS Issue: 9601
Design and testing of passenger seats for crash survival
Author(s): Brehaut, Wilfred H., Jr. (General Dynamics Corp., Convair Div., San Diego, CA)
Source Info: IN:Aircraft crashworthiness (A96-12340 01-03), Warrendale, PA, Society of Automotive Engineers, Inc., 1995, p. 41-44
Journal Announcement: IAA9601
Publisher: Society of Automotive Engineers, Inc., Warrendale, PA
Country of Publication: United States
Publication Year/Date: 1995; 950000
Document Type: REPRINT
Language: English
This paper defines a survivable crash and then describes the typical passenger seat available at the beginning of the jet age. The ground rules established at General Dynamics/Convair for the passenger seat to be used in the 880 and 990 series aircraft are enumerated. The static and dynamic testing of these seats is outlined, and the future direction of seat design and testing is speculated upon.
Classification: 03 (AIR TRANSPORTATION/SAFETY)
Controlled Term(s): PASSENGER AIRCRAFT / AIRCRAFT ACCIDENTS / SURVIVAL / SEATS / STRUCTURAL DESIGN / IMPACT TESTS / CRASHWORTHINESS

Quest Accession Number : 95N34378
95N34378# NASA STAR Technical Report Issue: 12
OH-58 pilot display unit (PDU) simulated crash tests / Final Report
(AA)HALEY, JOSEPH L., JR.; (AB)MCENTIRE, B. J.
Corp. Source: Army Aeromedical Research Lab., Fort Rucker, AL. (AY826435)
AD-A294049; USAARL-95-10 Contract: DA PROJ. 301-62787-A-878 Publ. Date: 941200 Pages: 54 Language: EN (English) Avail: CASI HC A04/MF A01
The pilot display unit (PDU) is designed to be placed directly in front of the pilot's eyes in the OH-58 helicopter to provide targeting and a missile status display. The location and the 7-pound mass of the unit creates a potentially hazardous head impact surface. In order to determine the degree of the hazard, a damaged OH-58 cockpit section was exposed to five survivable simulated crashes of moderate to severe impact vectors with an instrumented dummy pilot in the right seat behind the PDU. The cockpit floor was exposed to crash force up to 8 G in the vertical (z) axis and 19 G along the longitudinal (x) axis with velocity changes of 24 fps and 36 fps, respectively. These exposures did not exceed acceptable levels of human tolerance for neck and head forces when a properly fitted flight helmet was worn so that impact occurred on the helmet and not the head.
DTIC
Category code: 54 (man-system technology/life support)
Controlled terms: *CRASHES /*DISPLAY DEVICES /*FLIGHT CLOTHING /*HAZARDS /*HELMETS /*INJURIES /*OH-58 HELICOPTER / AIRCRAFT SAFETY / COCKPITS / HEAD (ANATOMY) / NECK (ANATOMY) / TOLERANCES (PHYSIOLOGY) /

Quest Accession Number : 94N33749

94N33749* NASA STAR Technical Report Issue: 10

Crash impact survival in light planes / (Videotape)

Corp. Source: National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. (ND315753)

NASA-TM-109799; NONP-VT-94-12927 Publ. Date: 940000 Pages: 0 Videotape: 7 min. 45 sec. playing time, in color, with sound Language: EN (English) Avail: CASI VHS A01/BETA A22

This video explains the effects on aircraft and passengers of light plane crashes. The explanation is provided through the use of simulated light planes and dummies.

CASI

Category code: 03 (air transportation/safety)

Controlled terms: *AIRCRAFT ACCIDENTS /*CIVIL AVIATION /* CRASHES /*GENERAL AVIATION AIRCRAFT /*LIGHT AIRCRAFT /* PASSENGERS / AIRCRAFT SAFETY / CRASHWORTHINESS / DUMMIES / SURVIVAL /

Quest Accession Number : 92U05263
EAD Conference Paper NN=EE92U03030-034
Helicopter crash survival at sea: United States Navy/Marine Corps experience 1977-1990
Barker, C. O. ; Yacavone, W. ; Borowsky, M. S. ; Williamson, D. W.
Naval Safety Center, Norfolk, VA. (NT252649)
In AGARD, Aircraft Accidents: Trends in Aerospace Medical Investigation Techniques 8 p (SEE NN=EE92U03030) pp. 8 PD: 920900 Language: ENGLISH
Avail.: ESA-IRS, unrestricted distribution
The U.S. Navy/Marine Corps (USN) experience with helicopter class A water mishaps for the period from 1977 to 1990 is examined. There were 137 helicopter class A flight mishaps over water during this period with an overall survival rate of 83% in survivable water crashes. During this period, the USN developed several programs to improve survivability. The helicopter Water Survival Training Device (WSTD or 9-D-5 device) was instituted in 1982. The Helicopter Emergency Escape Device System (HEEDS) and the Helicopter Emergency Lighting System (HEELS) were implemented in 1987. The question of whether or not these programs have improved survival since their implementation is addressed and the types of operational problems encountered with these devices are reviewed. The results indicate that the WSTD and HEEDS may have contributed to the statistically significant improved survival seen among Navy aircrew in night crashes. They may have also contributed to the improvement (not satistically significant) in survival among passengers in night crashes. The data were inconclusive with respect to the effects of HEELS because of its not being implemented throughout the fleet. Operational problems with these devices were minor and the benefits of each program far outweigh any risks. In night crashes aircrew had significantly higher likelihood of survival than passengers who were essentially untrained occupants. Other factors, in addition to the devices studied, may have also affected survival probabilities.
Subject Category: 03 (AIR TRANSPORTATION/SAFETY)
Controlled terms: *AIRCRAFT ACCIDENTS /*ARMED FORCES (UNITED STATES) /*DITCHING (LANDING) /*ESCAPE SYSTEMS /* HELICOPTERS /*MORTALITY /*SURVIVAL / ACCIDENT INVESTIGATION / CRASHES / EDUCATION / FLIGHT CREWS / NIGHT FLIGHTS (AIRCRAFT) / PASSENGERS / STATISTICAL ANALYSIS /

Quest Accession Number : 90N22549
90N22549# NASA STAR Technical Report Issue: 16
Aircraft crash survival design guide. Volume 5: Aircraft postcrash survival / Final Report, Sep. 1986 - Aug. 1989
(AA)JOHNSON, N. B.; (AB)ROBERTSON, S. H.; (AC)HALL, D. S.
Corp. Source: Simula, Inc., Phoenix, AZ. (SL704492)
AD-A218438; USAAVSCOM-TR-89-D-22E-VOL-5 Contract: DAAJ02-86-C-0028 Publ. Date: 891200 Pages: 219 (Revised) Language: EN (English) Avail: NTIS HC A10/MF A02
This five-volume publication was compiled to assist design engineers in understanding the design considerations associated with the development of crash-resistant U.S. Army aircraft. A collection of available information and data pertinent to aircraft crash resistance is presented, along

with suggested design conditions and criteria. The five volumes of the Aircraft Crash Survival Design Guide cover the following topics: Design Criteria and Checklists; Aircraft Design Crash Impact Conditions and Human Tolerance; Aircraft Structural Crash Resistance; Aircraft Seats, Restraints, Litters and Cockpit/Cabin Delethalization; and Aircraft Postcrash Survival. This volume (Volume 5) contains information on the aircraft postcrash environment and design techniques that can be used to reduce postcrash hazards. Topics include the postcrash fire environment, crashworthy fuel systems, ignition source control, fire behavior of interior materials, ditching survival, emergency escape, and crash locator beacons.
GRA

Category code: 03 (air transportation/safety)

Controlled terms: *AIRCRAFT ACCIDENTS /*AIRFRAME MATERIALS /*CRASHWORTHINESS /*FIRES /*FUEL SYSTEMS /*SURVIVAL / CHECKOUT / DITCHING (LANDING) / ENVIRONMENTAL CONTROL / ESCAPE SYSTEMS / HUMAN BEHAVIOR / IGNITION / SEATS / STRUCTURAL ANALYSIS / TOLERANCES (PHYSIOLOGY) /

Quest Accession Number : 90N22546

90N22546# NASA STAR Technical Report Issue: 16

Aircraft crash survival design guide. Volume 2: Aircraft design crash impact conditions and human tolerance / Final Report, Sep. 1986 - Aug. 1989

(AA)COLTMAN, J. W.; (AB)INGEN, C. V.; (AC)JOHNSON, N. B.; (AD)ZIMMERMAN, RICHARD E.

Corp. Source: Simula, Inc., Phoenix, AZ. (SL704492)

AD-A218435; USAAVSCOM-TR-89-D-22B-VOL-2 Contract: DAAJ02-86-C-0028 Publ. Date: 891200 Pages: 132 (Revised) Language: EN (English) Avail: NTIS HC A07/MF A01

This five-volume publication was compiled to assist design engineers in understanding the design considerations associated with the development of crash-resistant U.S. Army aircraft. A collection of available information and data pertinent to aircraft crash resistance is presented, along with suggested design conditions and criteria. The five volumes of the Aircraft Crash Survival Design guide cover the following topics: Design Criteria and Checklists; Aircraft Design Crash Impact Conditions and Human Tolerance; Aircraft Structural Crash Resistance; Aircraft Seats, Restraints, Litters and Cockpit/Cabin Delethalization; and Aircraft Postcrash Survival. This volume (Volume 2) contains information on the aircraft crash environment, human tolerance to impact, occupant motion during a crash, human anthropometry, and crash test dummies, all of which serves as background for the design information presented in the other volumes.
GRA

Category code: 03 (air transportation/safety)

Controlled terms: *AIRCRAFT ACCIDENTS /*AIRCRAFT DESIGN /* CRASH LANDING /*CRASHWORTHINESS /*IMPACT LOADS /*IMPACT TOLERANCES /*TOLERANCES (PHYSIOLOGY) / AIRFRAMES / ANTHROPOMETRY / BIODYNAMICS / CHECKOUT / HUMAN TOLERANCES / LANDING LOADS / SEATS / STRUCTURAL ANALYSIS / SURVIVAL /

Quest Accession Number : 90N22545
90N22545# NASA STAR Technical Report Issue: 16
Aircraft crash survival design guide. Volume 1: Design criteria and checklists / Final Report, Sep. 1986 - Aug. 1989
(AA)ZIMMERMAN, RICHARD E.; (AB)MERRITT, NORMAN A.
Corp. Source: Simula, Inc., Phoenix, AZ. (SL704492)
AD-A218434; USAAVSCOM-TR-89-D-22A-VOL-1 Contract: DAAJ02-86-C-0028 Publ. Date: 891200 Pages: 217 (Revised) Language: EN (English) Avail: NTIS HC A10/MF A02
This five-volume publication was compiled to assist design engineers in understanding the design considerations associated with the development of crash-resistant U.S. Army aircraft. A collection of available information and data pertinent to aircraft crash resistance is presented, along with suggested design conditions and criteria. The five volumes of the Aircraft Crash Survival Design Guide cover the following topics: Design Criteria and Checklists; Aircraft Design Crash Impact Conditions and Human Tolerance; Aircraft Structural Crash Resistance; Aircraft Seats, Restraints, Litters and Cockpit/Cabin Delethalization; and Aircraft Postcrash Survival. This volume (Volume 1) contains concise criteria drawn from Volumes 2 through 5, supplemented by checklists intended to assist designers in implementing the criteria.
GRA
Category code: 03 (air transportation/safety)
Controlled terms: *AIRCRAFT ACCIDENTS /*AIRCRAFT DESIGN /* CRASHWORTHINESS /*DESIGN ANALYSIS /*FUEL SYSTEMS /*SURVIVAL / AERONAUTICAL ENGINEERING / AIRFRAMES / ANTHROPOMETRY / CHECKOUT / CRASHES / CUSHIONS / EMERGENCIES / ESCAPE SYSTEMS / FIRES / SEATS / STRUCTURAL ANALYSIS / TOLERANCES (PHYSIOLOGY) /

Quest Accession Number : 84N26584
84N26584# NASA STAR Conference Paper Issue: 17
Crash Position Indicator/Crash Survival Flight Data Recorder (CPI/CSFDR): Ejectable versus nonejectable
(AA)WATTERS, D. M.
Corp. Source: Naval Air Test Center, Patuxent River, Md. (NO894573)
In DFVLR Proc. of 12th Symp. on Aircraft Integrated Data Systems p 509-534 (SEE N84-26565 17-01). Publ. Date: 840200 Pages: 26 refs 0 Language: EN (English) Avail.: NTIS HC A25/MF A01
The use by carrier aircraft of nonejectable, and by military aircraft of both ejectable and nonejectable crash position indicator/crash survival flight data recorder/crash survival cockpit voice recorder (CPI/CSFDR/CSCVR) systems is discussed. The relevance of aircraft mission, acquisition and maintenance costs, complexity, reliability, record survivability, weight, volume, and power are considered. Ejectable CPI/CSFDR/CSCVR systems should be used on aircraft that operate over water. All other aircraft could use either ejectable or nonejectable systems.
Author (ESA)
Category code: 06 (aircraft instrumentation)
Controlled terms: *CRASHWORTHINESS /*EJECTION /*FLIGHT RECORDERS /*RADIO DIRECTION FINDERS / AIRCRAFT ACCIDENT INVESTIGATION / EQUIPMENT SPECIFICATIONS / JETTISONING /

Quest Accession Number : 81N16997

81N16997# NASA STAR Technical Report Issue: 08

Aircraft crash survival design guide. Volume 1: Design criteria and checklists, revision / Final Report

(AA)DESJARDINS, S. P.; (AB)LAANANEN, D. H.; (AC)SINGLEY, G. T., III

Corp. Source: Simula, Inc., Tempe, Ariz. (SL704970) A2024546

AD-A093784; TR-7927; USARTL-TR-79-22A Contract: DAAJ02-77-C-0021; DA PROJ. 1L1-62209-AH-79 Publ. Date: 801200 Pages: 272 refs 0 Language: EN (English) Avail.: NTIS HC A12/MF A01

This five-volume document has been assembled to assist design engineers in understanding the problems associated with the development of crashworthy U. S. Army aircraft. Contained herein are not only a collection of available information and data pertinent to aircraft crashworthiness but suggested design conditions and criteria as well. The five volumes of the Aircraft Crash Survival Design Guide cover the following topics: Volume 1 - Design Criteria and Checklists; Volume 2 - Aircraft Crash Environment and Human Tolerance; Volume 3 - Aircraft Structural Crashworthiness; Volume 4 - Aircraft Seats, Restraints, Litters, and Padding; and Volume 5 - Aircraft Postcrash Survival. This volume contains concise criteria drawn from Volumes 2 - 5, supplemented by checklists intended to assist designers in implementation of the criteria.

GRA

Category code: 03 (air transportation/safety)

Controlled terms: *AERONAUTICAL ENGINEERING /*AIRCRAFT ACCIDENTS /*AIRCRAFT SURVIVABILITY /*CRASHES / AIRCRAFT DESIGN / MILITARY AIRCRAFT /

Quest Accession Number : 90N26496
90N26496# NASA STAR Technical Report Issue: 20
Human factors: The human interface with aircraft interiors
(AA)CHAMBERS, RANDALL; (AB)FERNANDEZ, JEFFREY; (AC)NANDIGAM, SRIKANTH; (AD)PALANISWAMY, VANKATESH
Corp. Source: Wichita State Univ., KS. (W0802171) National Inst. for Aviation Research.
NIAR-90-18 Publ. Date: 900600 Pages: 29 Language: EN (English) Avail: NTIS HC A03/MF A01
The pilot, crew, and passengers interface with the aircraft's interior, its operational performance, its protective features and crash worthiness, its utilization during linear and angular accelerations and decelerations, and its management during crisis of a severe stress of impact and fire. Human factors considerations enter into the measurement and evaluation of crashworthiness performance, especially in the design criteria for seats, seat belts, shoulder harness, air bags, floors, and wall structures. Human factors considerations and design criteria also enter into the measurement and evaluation of performance, especially in crisis management and control, and performance of flight crew and passengers during fire, escape, depressurization, and other emergency situations. The human interface for protection in Gx accelerations and decelerations, and in Gy and Gz, have important design criteria for seats, back angle, shoulder straps and seat belts, dynamic and static supports, for head, neck, and torso. Body size and position for adults and for children require special considerations within acceleration fields produced within varying transportation systems. Subjective judgments of ride quality, comfort, and well-being are important in the human use of restraints and other interior protective components. Similarily, physiological indices and specific body distortions during deceleration, impact and burn provide important design criteria. Human use of controls and displays during emergency preparations and escape add specific design criteria and requirements for aircraft interior development.
Author
Category code: 54 (man-system technology/life support)
Controlled terms: *AIR BAG RESTRAINT DEVICES /*AIRCRAFT COMPARTMENTS /*COMFORT /*CONSTRAINTS /*CRASHWORTHINESS /* EMERGENCIES /*FLIGHT CREWS /*HARNESSES /*HUMAN FACTORS ENGINEERING /*PASSENGERS /*RIDING QUALITY /*SEAT BELTS /* SEATS / CHILDREN / DECELERATION / DESIGN ANALYSIS / PHYSIOLOGY / PRESSURE REDUCTION / STRAPS / TORSO / TRANSPORTATION /

Quest Accession Number : 79A52694
79A52694*# NASA IAA Conference Paper Issue: 23
NASA/FAA general aviation crash dynamics program - An update
(AA)HAYDUK, R. J.; (AB)THOMSON, R. G.; (AC)CARDEN, H. D.
Author Affiliation: (AC)(NASA, Langley Research Center, Hampton, Va.)
Corp. Source: National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. (ND210491)

International Society of Air Safety Investigators, Annual Seminar, Montreal, Canada, Sept. 24-27, 1979, Paper. 12 p.,
Publ. Date: 790900 Pages: 12 refs 15 Language: EN (English)

Work in progress in the NASA/FAA General Aviation Crash Dynamics Program for the development of technology for increased crash-worthiness and occupant survivability of general aviation aircraft is presented. Full-scale crash testing facilities and procedures are outlined, and a chronological summary of full-scale tests conducted and planned is presented. The Plastic and Large Deflection Analysis of Nonlinear Structures and Modified Seat Occupant Model for Light Aircraft computer programs which form part of the effort to predict nonlinear geometric and material behavior of sheet-stringer aircraft structures subjected to large deformations are described, and excellent agreement between simulations and experiments is noted. The development of structural concepts to attenuate the load transmitted to the passenger through the seats and subfloor structure is discussed, and an apparatus built to test emergency locator transmitters in a realistic environment is presented.

A.L.W.

Category code: 03 (air transportation/safety)

Controlled terms: *AIRCRAFT SAFETY /*CRASH LANDING /* GENERAL AVIATION AIRCRAFT /*IMPACT DAMAGE /*SEATS /*TEST FACILITIES / AIRCRAFT COMPARTMENTS / AIRCRAFT STRUCTURES / COMPOSITE STRUCTURES / COMPUTERIZED SIMULATION / GRAPHS (CHARTS) / NASA PROGRAMS / STRUCTURAL DESIGN CRITERIA /

Quest Accession Number : 69A41133

69A41133# NASA IAA Issue: 22

Design for safety - Third generation and ahead. (Safety standards for DC 10 aircraft, considering cockpit design, hydraulic, electric power, autoland and direct lift control systems, structural safety and crash worthiness)

(AA)HEIMERDINGER, A. G.

(AA)/MCDONNELL DOUGLAS CORP., ST. LOUIS, MO./.

FLIGHT SAFETY FOUNDATION, INC.,, ARLINGTON, VA.,, Publ. Date: 680000 Pages: 5 IN- FLIGHT SAFETY FOUNDATION, ANNUAL INTERNATIONAL AIR SAFETY SEMINAR, 21ST, ANAHEIM, CALIF., OCT. 8-11, 1968, TECHNICAL SUMMARY. P. 44-48. /A69-41127 22-02/. Language: EN (English)

Category code: 02 (aircraft)

Controlled terms: *AIRCRAFT DESIGN /*AIRCRAFT SAFETY /*DC 10 AIRCRAFT /*SAFETY FACTORS /*STRUCTURAL RELIABILITY / AIRCRAFT HYDRAULIC SYSTEMS / AUTOMATIC LANDING CONTROL / AUXILIARY POWER SOURCES / COCKPITS / CONFERENCES / CRASHES / LIFT DEVICES /

Quest Accession Number : 66N39479
66N39479# NASA STAR Technical Report Issue: 24
Principles for improving structural crash worthiness for STOL and CTOL aircraft (Crash behavior analysis of STOL and CTOL AIRCRAFT)
(AA)AVERY, J. P.; (AB)REED, W. H., III
Corp. Source: Aviation Safety Engineering and Research, Phoenix, Ariz. (A9921291) AZ142325
AVSER-65-18; USAAVLABS-TR-66-39; AD-637133 Contract: DA-44-177-AMC-254/T/ FT. EUSTIS, VA., ARMY AVIATION MATER. LABS., JUN. 1966 73 P REFS Publ. Date: 660600 Pages: 73 Language: EN (English) Avail.: NTIS
Category code: 02 (aircraft)
Controlled terms: *AIRCRAFT SAFETY /*CRASH /*STOL AIRCRAFT /*STRUCTURAL DESIGN / ABSORPTION / AIRFRAME / ANALYSIS / AVIATION / BEHAVIOR / DEFORMATION / ENERGY / IMPACT / INJURY / LONGITUDINAL / MASS / SHOCK / VERTICAL /

Quest Accession Number : 96N50693
96053804# NASA STAR Conference Paper Issue: 9623
CogScreen-Aeromedical Edition in the Assessment of the Head Injured Military Aviator
(AA)Moore, J. L.; (AB)Kay, G. G.
Author Affiliation: (AA)(Naval Aerospace Medical Inst., Pensacola, FL United States); (AB)(Naval Aerospace Medical Inst., Pensacola, FL United States)
Corp. Source: Naval Aerospace Medical Inst., Pensacola, FL United States (NN868269)
Publ. Date: 19960401 Pages: 6p FRFR Language: English
Avail: CASI A02 Hardcopy/CASI A03 Microfiche
CogScreen-Aeromedical Edition (CogScreen-AE) is a computer administered and scored cognitive screening instrument designed to rapidly assess deficits or changes in attention, immediate and short-term memory, spatial-perceptual functions, calculation skills, reaction time, simultaneous information processing, and executive functions. The test was designed to detect subtle changes in cognitive functioning, which left un-noticed may result in poor pilot judgment or slow reaction time in critical operational situations. Normative data have been collected on over 800 commercial airline pilots and an equal number of military aviators. This paper will focus on applications of CogScreen-AE in the evaluation of head injured military aviation personnel. The CogScreen test results from a group of 24 mild to severely injured military aviators who were tested up to 90 months following head injury, and five of whom received serial evaluations, are presented. The results of the serial evaluations of five head injured military aviators are also discussed. Results demonstrate the sensitivity of the test to initial injury severity and recovery of function. The combination of conventional neuropsychological instruments and CogScreen-AE may expedite the return of head injured aviators to flying duties and actual control of aircraft.
Derived from text
Category code: 52 (aerospace medecine)
Controlled terms: *AEROSPACE MEDICINE /*AIRCRAFT PILOTS /*INJURIES /*HEAD (ANATOMY) / COGNITIVE PSYCHOLOGY / COMMERCIAL AIRCRAFT / DATA PROCESSING / FLYING PERSONNEL / PSYCHOLOGICAL TESTS / JUDGMENTS /

Quest Accession Number : 96U03587

EAD Conference Paper NN=EE96U05380-010

CogScreen-Aeromedical Edition in the assessment of the head injured military aviator

Moore, J. L. ; Kay, G. G.

Naval Aerospace Medical Inst., Pensacola, FL. (NN868269)

In AGARD, Neurological Limitations of Aircraft Operations: Human Performance Implications p 13,1-13,5 (SEE NN=EE96U05380) pp. 5 PD:960400 Language: ENGLISH

Avail.: ESA-IRS, unrestricted distribution

The CogScreen-Aeromedical Edition is a computer administered and stored cognitive screening instrument designed to rapidly assess deficits or changes in attention, immediate and short term memory, spatial-perceptual functions, calculation skills, reaction time, simultaneous information processing and executive functions. The test was designed to detect subtle changes in cognitive functioning that would, if left undetected, lead to poor pilot judgement or slow reaction times in critical operational situations. The applications of the system in the evaluation of military aviation personnel with head injuries are described. Test results from a group of injured aviators are presented and discussed. The results demonstrate the sensitivity of the test to the initial injury sensitivity and the recovery function.

Subject Category: 52 (AEROSPACE MEDICINE)

Controlled terms: *PILOT PERFORMANCE /*PILOT SELECTION /* HEAD (ANATOMY) /*INJURIES / COGNITION / MENTAL PERFORMANCE / WORKLOADS (PSYCHOPHYSIOLOGY) / REACTION TIME /

Quest Accession Number : 95A68894

95A68894 NASA IAA Journal Article Issue: 05

Regional lung hematocrit variation and assessment of acute lung injury

(AA)KANAZAWA, MINORU; (AB)HASEGAWA, NOKI; (AC)URANO, TESTUYA; (AD)SAYAMA, KOICHI; (AE)TASAKA, SADATOMO; (AF)SAKAMAKI, FUMIO; (AG)NAKAMURA, HIDETOSHI; (AH)WAKI, YASUHIRO; (AI)TERASHIMA, TAKESHI; (AJ)FUJISHIMA, SEITARO

Author Affiliation: (AA)Keio Univ., Tokyo, Japan; (AB)Keio Univ., Tokyo, Japan; (AC)Keio Univ., Tokyo, Japan; (AD)Keio Univ., Tokyo, Japan; (AE)Keio Univ., Tokyo, Japan; (AF)Keio Univ., Tokyo, Japan; (AG)Keio Univ., Tokyo, Japan; (AH)Keio Univ., Tokyo, Japan; (AI)Keio Univ., Tokyo, Japan; (AJ)Keio Univ., Tokyo, Japan

HTN-95-A0111 Journal of Applied Physiology (ISSN 8750-7587), vol. 77, no. 2, August 1994, p. 567-573 Publ. Date: 940800 Pages: 7 Language: EN (English)

Estimating blood content in the lung remains a key step in calculating lung water volume and microvascular permeability. We studied the effect of regional lung hematocrit (Hct) variation on assessment of acute lung injury. Escherichia coli endotoxin was administered in guinea pigs intravenously. Lung injury was evaluated by measuring the wet-to-dry weight ratio (W/D) and transvascular I-125-labeled albumin leakage for 3 h (tissue-to-plasma I-125-albumin ratio (T/P)) in five tissue samples from each animal. Residual blood content was corrected using either Cr-51-red blood cells as a blood cell marker, (99m)Tc-albumin as a plasma marker, or both, injected 10 min before the guinea pigs were killed. Lung Hct, estimated from the marker counts of lung and peripheral blood samples, was lower than peripheral blood Hct; intraindividual variation, represented by the standard deviation in each subject, was 0.024 +/- 0.015 for the control group (coefficient of variation 8.0 +/- 5.1%) and 0.026 +/- 0.013 for the endotoxin group (coefficient of variation 8.5 +/- 4.1%). Uncorrected W/D for residual blood content was greater than the corrected W/D. (99m)Tc-albumin correction gave values closer to the W/D corrected by both markers. T/P corrected by (99m)Tc-albumin showed smaller data variations than the values obtained with Cr-51-red blood cell correction, which was affected by variations in lung Hct. We recommend using a plasma marker to correct for blood content in assessing acute lung injury by W/D and T/P. Author (Herner)

Category code: 51 (life sciences)

Controlled terms: *ENDOTOXINS /*INJURIES /*LUNGS /* MOISTURE CONTENT /*PERMEABILITY /*PULMONARY CIRCULATION /* TECHNETIUM / ALBUMINS / ESCHERICHIA / GUINEA PIGS / HEMATOCRIT RATIO / RESPIRATORY PHYSIOLOGY / WATER BALANCE /

Quest Accession Number : 95055508
A95-23877 AEROPLUS Issue: 9505
Six degree of freedom (6 DOF) modeling as an analytical tool for prediction of small air crew injury potential
Author(s): Quartuccio, John J. (U.S. Navy, Naval Air Warfare Center, Warminster, PA); Nichols, Jeffrey P. (U.S. Navy, Naval Air Warfare Center, Warminster, PA); Marquette, Thomas J. (U.S. Navy, Naval Air Warfare Center, Warminster, PA)
Source Info: IN:SAFE Association, Annual Symposium, 32nd, Reno, NV, Oct. 10-12, 1994, Proceedings (A95-23851 05-54), Cottage Grove, OR, SAFE Association, 1994, p. 175-183
Journal Announcement: IAA9505
Publisher: SAFE Association, Cottage Grove, OR
Country of Publication: United States
Publication Year/Date: 1994; 940000
Document Type: CONFERENCE VOLUME - ANALYTIC
Language: English
With the Navy's recent expansion of the air crew population to include a greater percentage of aviators, both male and female, the accommodation of small aircrew has become an important issue. The GRU-7 ejection seat currently used in the F-14A aircraft was designed and test qualified to be used by 140 to 204 lb male aviators. This seat has not been test qualified for fiight by air crew smaller than a 140 lb male. Such air crew may be subjected to higher risk of injury in the event of an ejection. This presentation reviews the results of an effort conducted by the Naval Air Warfare Center, Aircraft Division, Warminster to quantify the risk of injury to small aviators in GRU-7 ejections.
Classification: 54 (MAN-SYSTEM TECHNOLOGY/LIFE SUPPORT)
Controlled Term(s): DEGREES OF FREEDOM / INJURIES / F-14 AIRCRAFT / FLIGHT CREWS / ANTHROPOMETRY / ROCKET ENGINES / NAVY / AERODYNAMIC LOADS / DRAG CHUTES

Quest Accession Number : 94N13972
94N13972# NASA STAR Technical Report Issue: 02
An assessment of the potential for neck injury due to padding of aircraft interior walls for head impact protection / Final Report
(AA)ARMENIA-COPE, R.; (AB)MARCUS, J. H.; (AC)GOWDY, R. V.; (AD)DEWEESE, R. L.
Corp. Source: Civil Aeromedical Inst., Oklahoma City, OK. (CP949112)
DOT/FAA/AM-93/14 Publ. Date: 930800 Pages: 13
Language: EN (English) Avail: CASI HC A03/MF A01
This report describes a short test program to assess the potential for neck injury induced by placing padding on the interior walls of an aircraft cabin to reduce the possibility of a head injury during a crash. Such padding is a possible mechanism of achieving the heightened impact protection requirements adopted by the Federal Aviation Administration in 1988. The report reviews the literature on impact induced neck injury, and reports neck injury criteria developed and reported by others. The type of test device to use with the neck injury criteria is also discussed. Using the reported neck injury criteria, and a Hybrid 3 test dummy with neck instrumentation, the testing program found that neck injury, with one exception, was not likely in either the tested pad or unpadded case. The one exception was neck extension injuries for which both the unpadded and padded tests exceeded the injury criteria. The tested pad, in comparison to the unpadded case, substantially decreased the neck extension moment, implying a reduction in neck injury risk.
Author (revised)
Category code: 54 (man-system technology/life support)
Controlled terms: *AIRCRAFT ACCIDENTS /*AIRCRAFT COMPARTMENTS /*CRASHES /*CUSHIONS /*DUMMIES /*HUMAN TOLERANCES /*IMPACT RESISTANCE /*IMPACT TESTS /*INJURIES /* NECK (ANATOMY) /*PROTECTION /*WALLS / CRASHWORTHINESS / RISK /

Quest Accession Number : 93A13720
93A13720 NASA IAA Journal Article Issue: 02
Identification of degree of head injury caused by impact loads in dog and rabbit
(AA)WU, GUIRONG
Author Affiliation: (AA)(Inst. of Space Medico-Engineering, Beijing, China)
Space Medicine & Medical Engineering (ISSN 1002-0837), vol. 3, no. 4, 1990, p. 261-266. Publ. Date: 900000
Pages: 6 refs 11 Language: CH (Chinese)
Impacts on occiputs of dogs and rabbits were given by simple impact equipment to observe changes of CPK in cerebrospinal fluid and intracranial pressure with different degrees of head injury. The results indicate that CPK and intracranial pressure increase exponentially with the degree of head injury. It seems that they might serve as indices in judging the degree of animal head injury. Special behavioral and psychological responses were also observed in the animals developing brain concussion. They could serve as signs for preliminary diagnosis.
Author

Category code: 51 (life sciences)
Controlled terms: *BRAIN CIRCULATION /*IMPACT LOADS /* INJURIES /*PHYSIOLOGICAL RESPONSES / DOGS / RABBITS / RADIOIMMUNOASSAY /

Quest Accession Number : 93N11285
93N11285# NASA STAR Conference Paper Issue: 02
Mechanisms of immune failure in burn injury
(AA)SPARKES, BRIAN G.
Corp. Source: Defence and Civil Inst. of Environmental Medicine, North York (Ontario). (DG869614)
In AGARD, Allergic, Immunological and Infectious Disease Problems in Aerospace Medicine 12 p (SEE N93-11283 02-52).
Publ. Date: 920400 Pages: 12 Language: EN (English)
Avail: CASI HC A03/MF A03

The burden on military medical services in handling burn casualties is daunting as all physiological systems will become affected. Severe burns in a battlefield setting have a very low salvage rate, to a great degree because of the immune failure which invariably develops. Evaluations of responses of lymphocytes taken from burn patients over several weeks following the burn (greater than 30 percent TBSA), have revealed that the immune failure which follows thermal injury involves T cell activation events. Interleukin 2, which is normally produced by activated T lymphocytes, is very poorly produced by cells cultivated in vitro taken from non-surviving patients, whereas some production continues, although at below normal levels, in patients who ultimately survive their injury. IL2 exogenously added to lymphocyte cultures enhances the proliferation of cells from surviving patients but gives no such help to cells from nonsurvivors. The TAC portion of the IL2 receptor (IL2R alpha), expressed on the T cell surface, appears to be responsible for this difference, as the number of lymphocytes able to express ILR2 alpha falls post-burn. A lipid protein complex (LPC) produced in skin by burning has been shown to inhibit the immune response in vivo and the growth of IL2-dependent lymphocytes in culture. Cerium nitrate, applied topically to the burn patient, is thought to fix the LPC in the burn eschar and prevents its entry into the circulation. In a study of 10 patients, bathed in cerium nitrate, some T lymphocyte activities were found to be in the normal range rather than suppressed. Such a treatment promises to be useful in improving chances of survival in severe burn injury.
Author

Category code: 52 (aerospace medecine)
Controlled terms: *BURNS (INJURIES) /*IMMUNITY /* IMMUNOLOGY /*LYMPHOCYTES /*MEDICAL SERVICES /*MILITARY OPERATIONS /*PHYSIOLOGICAL RESPONSES /*PHYSIOLOGY /*SURVIVAL / CASUALTIES / CERIUM COMPOUNDS / LIPIDS / NITRATES / PATIENTS / PROTEINS /

Quest Accession Number : 92A45947
92A45947 NASA IAA Journal Article Issue: 19
Analysis of the mechanism and protection of upper limb windblast flailing injury
(AA)ZHANG, YUN-RAN
Author Affiliation: (AA)(Institute of Space Medico-Engineering, Beijing, People's Republic of China)
Space Medicine & Medical Engineering (ISSN 1002-0837), vol. 5, no. 1, 1992, p. 19-24. In Chinese., Publ. Date: 920000 Pages: 6 refs 3 Language: CH (Chinese)
The mechanism of the upper limb windblast flailing injury of pilots during ejection was investigated analytically. The constraining equations for steady states were developed and were used to calculate the value of constraining force needed for the protection of the upper limb at steady-state ejection. Calculations of the lowest constraining forces needed for the upper limb, under the configuration of hands on the top of the thighs and hands on alternate firing handle showed that the optimal location to exert minimal constraining forces on upper limbs is close to the elbow joints and the carpus joints. The design of an arm-restraint plate and the optimum ejection attitude are discussed.
I.S.
Category code: 52 (aerospace medecine)
Controlled terms: *BLAST LOADS /*EJECTION INJURIES /* EJECTION SEATS /*LIMBS (ANATOMY) /*SAFETY DEVICES / FLIGHT CREWS / STEADY STATE /

Quest Accession Number : 92N30844
92N30844# NASA STAR Technical Report Issue: 21
Adapting the ADAM manikin technology for injury probability assessment / Final Report, 5 Jul. 1991 - 19 Feb. 1992
(AA)RADDIN, J. H., JR.; (AB)SCOTT, W. R.; (AC)BOMAR, J. B. ; (AD)SMITH, H. L.; (AE)BENEDICT, J. V.
Corp. Source: Biodynamic Research Corp., San Antonio, TX. (BO770470)
AD-A252332; AL-TR-1992-0062 Contract: F41624-91-C-6003 Publ. Date: 920219 Pages: 251 Language: EN (English) Avail: CASI HC A12/MF A03
An approach is presented for the general definition of regional injury human impact criteria with particular attention to the articulated ADAM test manikin and the escape environment. A review of literature and ejection injury data confirmed that injuries of greatest interest were those to the head, neck, thoracolumbar spine, and proximal extremities. A substantial literature review was pursued, demonstrating consistent findings of strain rate-dependent injury behavior over a wide range of injury types and body regions. Building upon previous work on the Dynamic Response Index, a comprehensive proposal is advanced for the conceptual definition of regional viscoelastic strain models for injury probability assessment. The proposed form for a head injury criterion assesses both translation and angular acceleration stress in terms of viscoelastic strain while also incorporating a means to account for their interaction. The neck criterion is based on a viscoelastic strain model of axial stress in association with shear and moment effects. The thoracolumbar

spine criterion also proposes an extension of the prior DRI approach to account for interacting effects of moments and shear stresses. Approaches for the proximal extremities are formulated in a similar fashion. An outline is proposed for quantitative formulation and validation of the concept.
GRA
Category code: 54 (man-system technology/life support)
Controlled terms: *ANGULAR ACCELERATION /*DYNAMIC RESPONSE /*EJECTION /*EJECTION SEATS /*HEAD (ANATOMY) /*INJURIES /* MODELS /*NECK (ANATOMY) /*PROBABILITY THEORY /*SPINE /* STRAIN RATE /*TECHNOLOGY ASSESSMENT / EVALUATION / IMPACT / PERFORMANCE TESTS / SHEAR STRESS /

Quest Accession Number : 92U05240
EAD Conference Paper. NN=EE92U03030-011
Is axial loading a primary mechanism of injury to the lower limb in an impact aircraft accident?
Rowles, J. M. ; Brownson, P. ; Wallace, W. A. ; Anton, D. J. (Royal Air Force Inst. of Aviation Medicine, Farnborough (United Kingdom).)
Nottingham Univ. (United Kingdom). (N7525947) Dept. of Orthopaedic and Accident Surgery.
In AGARD, Aircraft Accidents: Trends in Aerospace Medical Investigation Techniques 8 p (SEE NN=EE92U03030) pp. 8 PD: 920900 Language: ENGLISH
Avail.: ESA-IRS, unrestricted distribution
Following the crash of a Boeing 737-400 aircraft on the motorway near Kegworth (England) on 8 Jan. 1989, it became apparent that a large number of pelvic and lower limb injuries were sustained by the survivors. Had there been a fire this would have severely hindered the ability of the occupants to escape. The mechanism of pelvic and lower limb injuries in impact accidents has been related to flailing of the limbs and axial loading of the femur. The validity of axial loading of the femur as a primary mechanisms of femoral fracture in an impact aircraft accident is questioned. Two methods of study were used to investigate the impact biomechanics of the pelvis and lower limb: clinical review and impact testing using anthropomorphic dummies. The study suggests that in the presence of intact occupant protection systems, bending of the femur over the front spar of passenger seats is the primary mechanisms of causation of femoral fractures. Occupant protection systems designed for civil aircraft should be modified to accommodate loading of the femur over the front of the seat.
Subject Category: 03 (AIR TRANSPORTATION/SAFETY)
Controlled terms: *AIRCRAFT ACCIDENTS /*AXIAL LOADS /* BIODYNAMICS /*IMPACT /*INJURIES /*LEG (ANATOMY) /*PELVIS / ANTHROPOMETRY / CLINICAL MEDICINE / CRASHES / DUMMIES / ENGLAND / IMPACT TESTS / SITTING POSITION /

Quest Accession Number : 90N25479

90N25479# NASA STAR Conference Paper Issue: 19

Measurement techniques, evaluation criteria and injury probability assessment methodologies developed for Navy ejection and crashworthy seat evaluations

(AA)FRISCH, GEORGE D.; (AB)KINKER, LAWRENCE E.; (AC)FRISCH, PAUL H.

Author Affiliation: (AC)(Applied Physics, Inc., Nanuet, NY.)

Corp. Source: Naval Air Development Center, Warminster, PA. (NO000154)

In AGARD, Neck Injury in Advanced Military Aircraft Environments 8 p (SEE N90-25459 19-52). Publ. Date: 900200

Pages: 8 Language: EN (English) Avail: NTIS HC A10/MF A02; Non-NATO Nationals requests available only from AGARD/Scientific Publications Executive

Head and neck injuries are of particular concern to Navy researchers and extensive programs were initiated to address head and neck response of both live human subjects and human analogs to crash impact forces. This concern was somewhat heightened by the apparently conflicting operational requirements of having canopy penetration as the principal means of ejection in several aircraft prototypes, coupled to the requirement of introducing night vision capability in attack aircraft. The latter will most probably lead to increased helmet volume, and possibly weight, which increases the probability of helmet canopy acrylic interaction during canopy penetration. Increased helmet weight and center of gravity shifts, together with altered helmet to head coupling, will certainly change head and neck response to even presumably safe exposure levels. In order to adequately parameterize head and neck response and relate the gathered data to known living human subject and cadaver data, both inertial response and load data must be obtained at well defined, anatomically correctable points. A modified Hybrid 3 type head and neck complex was developed, ballasted to be in compliance with Navy generated head and neck mass distribution parameters, and fully instrumented at the head center of gravity (CG), occipital condyles, and the base of the neck. The fully instrumented head and neck system was utilized to evaluated various helmet configurations and the effect on head and neck response with changes in helmet weight and geometry. Additionally, neck extension, compression, shear forces, and torques were obtained during dynamic ejection tests ranging from 0/0 to 720 KEAS. At the higher speeds, the effects of aerodynamic lift can be identified on the monitored neck compression-tension values. With such data, injury modalitiens and probabilities can be addressed in considerably greater detail than the present norm and the effectiveness of protective equipment established.
Author

Category code: 52 (aerospace medecine)

Controlled terms: *CANOPIES /*CRASHES /*DYNAMIC TESTS /* EJECTION SEATS /*HEAD (ANATOMY) /*HELMET MOUNTED DISPLAYS /* INJURIES /*PENETRATION /*PROBABILITY THEORY /*PROTOTYPES / ACRYLIC RESINS / ATTACK AIRCRAFT / CENTER OF GRAVITY / EJECTION / EXPOSURE / LOADS (FORCES) / MASS DISTRIBUTION / NIGHT VISION / TORQUE /

Quest Accession Number : 90A17428

90A17428 NASA IAA Conference Paper Issue: 05

Spinal response/injury assessment during various ejection and crash scenarios employing manikin based load and torque measurements

(AA)FRISCH, GEORG D.; (AB)MILLER, KENNETH; (AC)FRISCH, PAUL H.

Author Affiliation: (AB)(U.S. Navy, Naval Air Development Center, Warminster, PA); (AC)(Applied Physics, Inc., Nanuet, NY)

IN: Annual SAFE Symposium, 26th, Las Vegas, NV, Dec. 5-8, 1988, Proceedings (A90-17401 05-54). Newhall, CA, SAFE Association, 1989, p. 220-226., Publ. Date: 890000 Pages: 7 Language: EN (English)

Manikin-based instrumentation requirements have been standardized to include load measurements (compression, shear, torques) at the pelvic-lumbar spine junction, thoracic-cervical spine interface, and occipital condyles. A series of horizontal accelerator and ejection tower tests have been completed to establish baseline values for these measures under a variety of initial position and restraint configurations. For the head and neck system, the sensitivity of the resulting measured values to changes in head weight and center of gravity was also established. These data are the baseline values against which new helmet configurations (such as night vision) will be compared and from which relative safety assessments can be made. Spinal loads during dynamic ejection have also been obtained for a variety of airspeeds (0, 450 KEAS) and canopy penetration conditions. These baseline values demonstrate a highly improved technique to analyze and quantify canopy penetration severity and helmet lift forces during high 'Q' escape.

C.E.

Category code: 09 (research and support facilities (air))

Controlled terms: *CRASH INJURIES /*EJECTION INJURIES /* SPINAL CORD /*TORQUEMETERS / ACCELERATION (PHYSICS) / COMPRESSION LOADS / FLIGHT TESTS /

Quest Accession Number : 89A45340
89A45340 NASA IAA Journal Article Issue: 19
An evaluation of proposed causal mechanisms for `ejection associated` neck injuries
(AA)GUILL, FREDERICK C.; (AB)HERD, G. RONALD
Author Affiliation: (AB)(U.S. Navy, Crew Systems Div., Washington, DC)
Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 60, July 1989, p. A26-A47., Publ. Date: 890700 Pages: 22 refs 8 Language: EN (English)
Possible causal factors and mechanisms responsible for neck injuries associated with various phases of aircraft ejection (i.e., preejection, ejection through catapult boost, postboost, and postparachute opening) were identified using data from the data bank at the Naval Weapons Engineering Support Activity. The body motions and forces associated with through-the-canopy ejection are analyzed and the spectral range neck fractures and sprains/strains, and the ranges of their severity are examined. The relations between the severity of neck injury and the ejection speed, aircraft series, aircraft maneuver load and speed, the type of ejection seat, the factor of lost helmet, the body position, and the parachute opening shock are investigated. Evidence is presented that many of the reported neck injuries were the consequence of system malfunction.
I.S.
Category code: 52 (aerospace medecine)
Controlled terms: *AIRCRAFT /*AIRCRAFT ACCIDENTS /* EJECTION SEATS /*INJURIES /*NECK (ANATOMY) / BIODYNAMICS / FRACTURING / VERTEBRAE /

Quest Accession Number : 89A45339
89A45339 NASA IAA Journal Article Issue: 19
Mechanism of injury in aircraft accidents - A theoretical approach
(AA)HILL, I. R.
Author Affiliation: (AA)(RAF, Institute of Pathology and Tropical Medicine, Halton, England)
Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 60, July 1989, p. A18-A25., Publ. Date: 890700 Pages: 8 refs 29 Language: EN (English)
The mechanisms of injury produced in aircraft accidents are discussed. Consideration is given to the causes of injury, which include crushing within a collapsing airframe, entrapment within the wreckage, the absence or failure of restraint, impacts by loose objects, escape mishaps, and explosive decompression. Particular attention is given to the possibility of correlating the topography of a wound with its cause. It is shown that the injuruy production in aircraft accidents is a complex issue that cannot be easily resolved, because not all of the basic science is known, and even the principles are controversial. It is emphasized that the limiting factor in survivability may be the pathophysiological response of the biological system, and that this fact, combined with varying physiochemical properties of given tissues, may be the key factor to tolerance to injury.
I.S.

Category code: 52 (aerospace medecine)
Controlled terms: *AEROSPACE MEDICINE /*AIRCRAFT ACCIDENTS /*HUMAN PATHOLOGY /*INJURIES / BIODYNAMICS / BLASTS / CRUSHING / EJECTION SEATS / IMPACT DAMAGE / PRESSURE REDUCTION /

Quest Accession Number : 85N21976
85N21976# NASA STAR Technical Report Issue: 12
The clinical and radiological assessment of cervical injury, Annex A
Corp. Source: French Air Force, Paris. (F7184220)
In AGARD Rept. on the Working Group on the Clinical and Biomedical Evaluation of Trauma and Fatalities Associated with Aircrew Ejection and Crash p 34-66 (SEE N85-21969 12-52). Publ. Date: 841200 Pages: 33 refs 0 Language: EN (English) Avail.: NTIS HC A05/MF A01
The cervical spine is the most mobile portion of the spine. During trauma, this mobility is compounded by inertia forces at the skull and the presence of the spinal cord, which is less well protected here than in other portions of the spine. Injuries following ejection would seem to be unusual, but when they do occur may take a variety of forms: fracture dislocations, dislocations, severe strains. If these lesions are unstable, dramatic neurological complications may occur immediately or after some delay. The task of identifying factors of instability of a cervical lesion falls to the radiological examination. It should be recalled that radiological exploration of the whole spine, segment by segment, of any survivors is obligatory in the Armee de l'Air Francaise (French Air Force), following ejection or any accident involving the flight deck. The radiological examination of the cervical spine is difficult; it is based on the findings of the clinical examination of the subject and the plates are difficult to interpret. The initial radiological methods and incidences used (routine plates, tomograms and sometimes dynamic radiography) are considered. The more demanding secondary examinations, such as the scanner, myelogram or angiogram are not discussed.
Author
Category code: 52 (aerospace medecine)
Controlled terms: *CLINICAL MEDICINE /*EJECTION INJURIES /*NECK (ANATOMY) /*SPINE /*X RAY ANALYSIS / CONSCIOUSNESS / MOBILITY / NEUROLOGY / PATHOLOGY / POSITION (LOCATION) /

Quest Accession Number : 84A10748
84A10748 NASA IAA Conference Paper Issue: 01
The correlation and description of windflail injury mechanisms in the windblast environment
(AA)SMITH-LAGNESE, S. D.; (AB)KAZARIAN, L. E.
Author Affiliation: (AB)(USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH)
IN: SAFE Association, Annual Symposium, 20th, Las Vegas, NV, December 6-10, 1982, Proceedings (A84-10706 01-01). Van Nuys, CA, SAFE Association, 1983, p. 293-296., Publ. Date: 830000 Pages: 4 refs 9 Language: EN (English)
A biomechanical assessment is applied to classify extremity windblast injuries incurred during seat ejection from an aircraft in order to identify the causative factors for the injuries. Data from ejections from F-4 aircraft during 1967-1978 are examined, including airspeed, attitude, body position at ejection, type of injury, location, and reported causal factors. Attention was focused on fracture and fracture/dislocation injuries. A total of 40 aircraft containing 78 aircrew members were included in the study, which covered 50 sustained injuries. The type and extent of the trauma was found to be a function of airspeed, attitude, and initial body position. Radiographic techniques are recommended for delineating the causal factor that produced a particular injury pattern.
M.S.K.
Category code: 03 (air transportation/safety)
Controlled terms: *BIODYNAMICS /*BLAST LOADS /*EJECTION INJURIES /*F-4 AIRCRAFT /*FLIGHT CREWS /*WIND EFFECTS / AIRSPEED / ATTITUDE (INCLINATION) / MUSCULOSKELETAL SYSTEM /

Quest Accession Number : 83N19428
83N19428# NASA STAR Conference Paper Issue: 09
Injury mechanisms in frontal collisions involving glance-off
(AA)REIDELBACH, W.; (AB)ZEIDLER, F.
Corp. Source: Daimler-Benz A.G., Stuttgart (West Germany). (DA229785)
In AGARD Impact Injury Caused by Linear Acceleration: 4 p (SEE N83-19421 09-51). Publ. Date: 821000 Pages: 4 refs 0 Language: EN (English) Avail.: NTIS HC A21/MF A01
Among frontal car collisions offset impact collisions are three times more frequent than symmetrical ones. In case of small overlap and high collision speed the colliding vehicles glance-off. The definition and application of the energy equivalent speed helps to evaluate crash severity and to distinguish glance-off from non-glance-off collisions. The investigation of frequency and severity of injuries to belted occupants unveils that in case of glance-off, due to he impact-shock syndrome, the injury risk of lower extremities in increased, the injury risk of remaining body regions is reduced when compared to non-glance-off cases.
Author
Category code: 52 (aerospace medecine)
Controlled terms: *AUTOMOBILE ACCIDENTS /*COLLISION PARAMETERS /*CRASH INJURIES / IMPACT DAMAGE / RISK / SEAT BELTS /

Quest Accession Number : 83N19423
83N19423# NASA STAR Conference Paper Issue: 09
Mechanisms of head impact injury and modification by helmet protection
(AA)NAHUM, A. M.; (AB)WARD, C.
Author Affiliation: (AB)(Biodynamic/Engineering, Inc.)
Corp. Source: California Univ., San Diego. (CD305309) Medical Center.
In AGARD Impact Injury Caused by Linear Acceleration: 29 p (SEE N83-19421 09-51). Publ. Date: 821000 Pages: 29 refs 0 Language: EN (English) Avail.: NTIS HC A21/MF A01
Head protection provided by helmets or padding on the impacted cadaver skull surface was examined. Using unembalmed human cadaver subjects, frontal and lateral head impacts were conducted. Head acceleration and intracranial pressures were measured in order to determine the head and brain responses. Brain response was further analyzed with the aid of a finite element brain model; each impact was simulated on the computer to determine brain stresses and displacement during the impact. The degree of protection provided can be quantified by comparing head acceleration and brain pressures for equivalent energy impacts.
Author
Category code: 52 (aerospace medecine)
Controlled terms: *BRAIN /*HEAD (ANATOMY) /*HELMETS /* IMPACT TESTS /*INJURIES /*SKULL / COMPUTERIZED SIMULATION / FINITE ELEMENT METHOD / MATHEMATICAL MODELS /

Quest Accession Number : 83N19421
83N19421# NASA STAR Conference Proceedings Issue: 09
Impact Injury Caused by Linear Acceleration: Mechanisms, Prevention and Cost
(AA)HALEY, J. L., JR.
(AA)ed.
Author Affiliation: (AA)(Army Aeromedical Research Lab.)
Corp. Source: Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). (AD455458)
AD-A123814; ISBN-92-835-0317-0; AGARD-CP-322 London, Publ. Date: 821000 Pages: 495 refs 0 Conf. held in Cologne, 26-29 Apr. 1982. Language: AA (Mixed) Avail.: NTIS HC A21/MF A01
Spinal column injuries under compressive, bending, and tensile loads; leg, head, and neck injuries; injury data collection; injury preventing hardware; seat/man models; and crashworthiness are addressed. For individual titles, see N83-19422 through N83-19454.
Category code: 51 (life sciences)
Controlled terms: *CONFERENCES /*CRASH INJURIES /* CRASHWORTHINESS /*HELICOPTERS /*IMPACT ACCELERATION /*IMPACT DAMAGE /*IMPACT TESTS /*INJURIES / AUTOMOBILE ACCIDENTS / DATA ACQUISITION / HARDWARE / HEAD (ANATOMY) / HUMAN FACTORS ENGINEERING / LEG (ANATOMY) / LOADS (FORCES) / NECK (ANATOMY) / SPINE /

Quest Accession Number : 82N22879
82N22879# NASA STAR Technical Report Issue: 13
Analysis of vertebral stress distributions and ejection-related injury mechanisms / Final Technical Report, 1 Jul. 1977 - Jan. 1980
(AA)PLESHA, M.; (AB)BELYTSCHKO, T.
Corp. Source: Northwestern Univ., Evanston, Ill. (N6683851) Dept. of Civil Engineering. AG749748
AD-A098639; AFAMRL-TR-80-67 Contract: F33615-77-C-0526 AFAMRL, Wright-Patterson AFB, Ohio, Publ. Date: 810200 Pages: 51 refs 0 Language: EN (English) Avail.: NTIS HC A04/MF A01
Stress analyses of lumbar vertebrae were performed by a three dimensional finite element method for the purposes of evaluating simplified models of the vertebrae which are suitable as injury postprocessors, and gaining a better understanding of injury mechanisms. The finite element analyses were linear and elastic. Axial and moment loads were applied over the end plates to simulate G(Z) impact and on the facets to simulate load transmission between the articular facets and the vertebral bodies. The finite element model predicts that the maximum stresses under axial load are perpendicular to the axis of the vertebral body, which are called axial stresses; this is consistent with the predominance of compressive and wedge fractures. However, the maximum stresses predicted by the finite element model are only about a third of those predicted by the simplified injury model. This discrepancy is due to the fact that a substantial portion of the total load is transmitted through the vertebral centrum which is neglected in the simplified model.
S.L.
Category code: 52 (aerospace medecine)
Controlled terms: *AXIAL LOADS /*EJECTION INJURIES /* MOMENT DISTRIBUTION /*STRESS CONCENTRATION /*TORSIONAL STRESS /*VERTEBRAE / BENDING MOMENTS / BIODYNAMICS / FINITE ELEMENT METHOD / MAXIMUM LIKELIHOOD ESTIMATES / PREDICTION ANALYSIS TECHNIQUES / SPINE /

Quest Accession Number : 82A11032
82A11032 NASA IAA Journal Article Issue: 01
Retro-hyperflexion luxation - Mechanism of cervical spinal cord contusion injury during ejection sequence
(AA)HAZZARD, R. C.
Author Affiliation: (AA)(U.S. Marine Corps Air Station, Yuma, AZ)
(Joint Committee on Aviation Pathology, Scientific Session, 12th, Aylesbury, Bucks., England, Oct. 14-16, 1980.) Aviation, Space, and Environmental Medicine, vol. 52, Oct. 1981, p. 625, 626., Publ. Date: 811000 Pages: 2 Language: EN (English)
Category code: 52 (aerospace medecine)
Controlled terms: *AEROSPACE MEDICINE /*AIRCRAFT PILOTS /* BACK INJURIES /*EJECTION INJURIES /*SPINAL CORD / MILITARY AVIATION / PARACHUTING INJURY /