BIBLIOGRAPHY OF INTEGRATED SEAT AND OCCUPANT RESTRAINT DESIGN

Volume III of IV

Final Report on Contract FH-11-6685

Appendix B

RFP-142 Project No. 7A

Highway Safety Research Information Center

HIGHWAY SAFETY RESEARCH INSTITUTE The University of Michigan • Ann Arbor

Prepared under Contract No. FH-11-6685 with the U. S. Department of Transportation, National Traffic Safety Bureau.

Available from the Clearinghouse for Federal Scientific and Technical Information. Inquiries should be directed to the Clearinghouse, Code 410.14, Department of Commerce, Springfield, Virginia 22151, or to any Commerce Field Office.

COMPREHENSIVE CONTENTS: VOLUMES I-IV OF FINAL REPORT ON CONTRACT FH-11-6685

INTRODUCTION

Man has always been faced with the problem of organizing information in order to make the best use of it. Two ways of organizing information are (1) categorizing (logical grouping of associated information), and (2) indexing (systematically selecting and arranging the information so that specific information can be located quickly when needed). Both approaches have been used in this bibliography.

The bibliography contains around six hundred and fifty bibliographic references, and their abstracts (when available). Associated references are grouped into ten subject categories to facilitate browsing. Within each subject category the references are in order by personal or corporate author and publication date (or by title if no author was known). References pertinent to several subject categories are entered in each relevant category.

Electronic data processing has facilitated the permuted title index or KWIC (Key-Word-In-Context) index. In the KWIC index, references are entered in alphabetic order by key words from titles. Each reference is entered once for each key word in its title, and the key words are aligned and overprinted (to appear in boldface) in a column. Each key word entry of a given reference includes some or all of the other words immediately preceding and/or following the key word as it appears in the title. Nonsignificant words (articles and conjunctions such as <u>the</u>, <u>of</u>, <u>and</u>, <u>a</u>) are not included.

Appearing to the right of each entry in the KWIC index is a reference code to permit the reader to locate the corresponding entry in the bibliography. The first two digits (01, 02, ..., 10) indicate one of the ten subject categories (see Table of Contents), the last two (e.g., 65) indicate year of publication. The letter characters are the first four letters of the first author's surname, and the author's first and second initials (separated from the surname code by a hyphen). (See Example 1.) If a corporate author was used, the company name is analogously coded. If no author was known and the reference is entered by title, the first words of the title were coded. (See Example 2.) Entries which would otherwise have had identical codes (see Example 3) were distinguished by replacing the 2-digit code for year of publication with a 2-digit sequence code (91, 92, ...). Thus the reference code indicates the order of the references in the bibliography by numerical sequence of subject category, then by alphabetical sequence of author or title, and finally by publication date or sequence code.

EXAMPLE 1:

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01SMIT-HB63
│   │     └── publication date  1963
│   └──────── author            H. B. Smith
└──────────── subject category  01
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EXAMPLE 2:

Subject category 01, author The Seat Belt Company, date 1965: 01SEAT-BC65
Subject category 05, (no author) FAT BELT USER SURVEY, date 1965: 05FAT -BU65

EXAMPLE 3:

Subject category 01, author Brower, J.J., date 1965	01BROW-JJ65	becomes	01BROW-JJ91
Subject category 01, author Brown, J.J., date 1965	01BROW-JJ65		01BROW-JJ92

01. RESTRAINT SYSTEMS (GENERAL)

01ALDM-B 62 (06ALDM-B 62)
Aldman, B.
BIODYNAMIC STUDIES ON IMPACT PROTECTION
Acta Physiologica Scandinavica
Vol. 56, No. 192 (1962)

01ALDM-B 63
Aldman, Bertil
CHILDREN'S PROTECTIVE DEVICES (In Aspects Techniques de la Securite Routiere)
Bulletin D'Information No. 16
CIDITVA (December 1963)
Pp. 7.1-7.9

01AMER-SB64 (09AMER-SB64)
American Seat Belt Council
CHRONOLOGICAL HISTORY OF AUTOMOTIVE SEAT BELTS
American Seat Belt Council
1964
8 pp.

01APPO-FA
Appoldt, F. A.
RESTRAINING DEVICES FOR CHILDREN
United State Public Health Service, Division of Accident Prevention
Tech. Rept. No. 971.01
Contract No. PH86-630165

01AVER-JP65
Avery, James P.
CARGO RESTRAINT CONCEPTS FOR CRASH RESISTANCE
Aviation Safety Engineering and Research, Phoenix, Arizona
June 1965
Contract No. DA-44-177-AMC-116(T)
AD-618493, AvSER-64-13, USAAML-TR-65-30
60 pp., refs.

This report covers an investigation of three cargo restraint concepts: (1) an extensible-net-type restraint (such as a nylon net) secured directly to the airframe, (2) the same extensible net attached to load limiters (attenuators), and (3) an inextensible-net-type restraint (such as a steel net) attached to load limiters. Each concept was investigated analytically using computer simulation to determine the dynamic performance of the system under the action of crash acceleration pulses. Drop tests were also conducted to verify analyses. General comparisons were made to obtain the advantages and shortcomings of each restraint concept as well as the influence of controllable parameters. A substudy of the nature of the probable crash induced acceleration pulse was also undertaken. This led to a proposed standard pulse for cargo restraint design purposes. Author

01AVIA-SE62
Aviation Safety Engineering and Research
UNITED STATES ARMY AVIATION CRASH INJURY RESEARCH
Aviation Safety Engineering and Research, Phoenix, Arizona
Final Report (December 1962)
AVCIR62 29, DA44 177TC802, 1A024701A1210, ARTRECOM, TR63 23
AD-419 210
90 pp.

A final report is prepared by Aviation Crash Injury Research, A Division of the Flight Safety Foundation, Inc. (FSF) under the terms of contract DA44 177TC802. All work was accomplished between 16 September 1961 and 15 December 1962 and is reported under individual work items listed as follows: (1) Field Investigation of Accidents. (2) Crash Safety Design Criteria. (3) Review of Technical Characteristics and Military Specifications. (4) Crash Testing of Full-Scale Aircraft and Dynamic Testing of Components. (5) Special Equipment for Dynamic Crash Tests. (6) Crash Safety Equipment and Procedures. (7) Statistical and Clinical Analysis of Accident Data. (8) Liaison with Groups and Agencies. (9) Training in Crash Injury Investigation. (10) Related Tasks. (11) Synthesis of Impact Acceleration Technology (SIAT). (12) Remote Control Systems. Restraint Systems Study. Author

01AVIA-SE91
Aviation Safety Engineering and Research
PERSONNEL RESTRAINT SYSTEMS STUDY UH-1A AND UH-1B, BELL IROQUOIS HELICOPTERS; SUPPLEMENT
Aviation Safety Engineering and Research, Phoenix, Arizona
March 1964
Contract No. DA44 177AMC888T
AVSER-62-27, 1A024701A12101, TRECOM, TR63 81Suppl.
AD-608 189
64 pp.

Contents: Installation of personnel restraint system; installation of lap belt tie-down strap (pilot's and copilot's seat); modification of aft carriage attachment (crew seat); guide rod assembly (seat back and pilot's shoulder harness); double-inertia reel installation; dust cover inertia reel strap; installation of inertia reel and access through lower panel; flow modification (left-hand side); floor modification (right-hand side); control cable-installation and bolt replacement (crew seat); detail and installation of reinforcement tube (seat rail (front)); detail and installation of reinforcement tube (seat rail (back)); reinforcement and replacement of rear tracks; modification of troop lap belt attachment fittings; installation of personnel restraint system; lap belt tie-down strap; and pilot's tie-down strap.

01AVIA-SE92
Aviation Safety Engineering and Research
CRASH INJURY EVALUATION; SUPPLEMENT TO PERSONNEL RESTRAINT SYSTEMS STUDY, CH-47 VERTOL CHINOOK
Aviation Safety Engineering and Research, Phoenix, Arizona
April 1964
Contract No. DA44 177AMC888T
AVCIR-62-26, 1A024701A12101, TRECOM, TR64 4 Suppl.
AD-607 659
92 pp.

Contents: Installation of personnel restraint system; inertia reel installation (pilot's and copilot's seat); reinforcement of lap belt attachment; reinforcement of cockpit floor and tract modification; installation of tie-down strap (alternate 1); installation of control cable and shoulder harness; reinforcement of vertical track, seat bucket (crew seat); modification of carriage assembly (crew seat); reinforcement of lock-pin assembly (seat base); shoulder harness (troop commander); installation of attachment fitting for shoulders harness; fitting for shoulder harness attachment (left-hand side); fitting for shoulder harness attachment (right-hand side); end fitting for lap belt; lap belt; installation of restraint system; lap belt attachments; lap belt tie-down strap; and pilot's tie-down strap.

01BENT-R 43
Benton, R.
PILOTS' HEAD SUPPORT
USAF, AMC, Wright-Patterson AFB, Ohio
Memo. Rept. No. ENG-49-695-38 (4 November 1943)
AD 39 862

The purpose of this publication is to report examination of a pilot's head support sent to the Aero Medical Laboratory by Avion, Incorporated.

01BIER-HR46
Bierman, H. R., et al.
THE PRINCIPLES OF PROTECTION OF THE HUMAN BODY AS APPLIED IN A RESTRAINING HARNESS FOR AIRCRAFT PILOTS
Naval Medical Research Institute, Bethesda, Maryland
Proj. X-630, Rept. No. 6 (10 May 1946)

A restraining harness for aircraft pilots has been developed which has successfully protected volunteers against 2500 foot-pounds delivered on the impact decelerator by dropping a 500 pound weight five feet. This impact force expended in 0.15 seconds on a dummy enclosed in a semi-rigid harness is featured by 10,000 pound peaks as measured by strain gages.

The factors which contribute to the effectiveness of this harness are: (a) Distribution of the impact load over a large body area. (b) Distribution of the impact load to regions of the body best able to withstand high impact forces. (c) Gradual rate of application of force due to high initial elasticity of the material. (d) Damping of small irregularities during the period of impact. (e) The property of the material to elongate inelastically when the applied force reaches a predetermined tolerable limit, permitting the absorption of large amounts of energy.

01BIER-HR47
Bierman, H. R.
PROTECTION OF THE HUMAN BODY, Principles as Applied in a Restraining Harness for Aircraft Pilots.
Journal of the American Medical Association.
Vol. 133 (1947)
Pp. 522-526

01BOYC-WC61
Boyce, W. C. and H. E. Freeman
CONSIDERATIONS AFFECTING THE DESIGN OF A 60 G PERSONNEL RESTRAINT SYSTEM
Paper, ARS Space Flight Report to the Nation, New York, Oct. 9-15, 1961
ARS Journal
Vol. 32, No. 6 (June 1962)
Pp. 939-942

The design requirements for a personnel restraint system to protect a crewman against omnidirectional abrupt deceleration forces are examined and a system to meet these requirements is described. Personnel restraint is examined and a system to meet these requirements is described. Personnel restraint is examined from the standpoint of body segment weight and unit surface pressures. Seating geometry and its effect on cockpit envelope is discussed. Several restraint concepts examined during this program are shown, while the system selected for development and live, manned testing is described in detail. A newly developed, self-contouring comfort padding with improved rebound characteristics is described. Since test results are not yet available, predictions of system performance are made. (Author)

-HE64
kmann, H. E.
VELOPMENT OF COTTON AND NYLON, KNITTED CLOTH WITH ELASTIC STRETCH CHARACTERISTICS
Systems Engineering Group, AFSC, Wright-Patterson AFB, Ohio
SEG TDR 64-6 (May 1964)

Blends of cotton and synthetic fibers were studied (nylon, polyester). These were knitted into fabrics to evaluate their elastic elongation, gripping characteristics, as well as non-yellowing properties in the case of white. Data are presented on the yarns and fabrics employed. The fabric was designed to provide a clean, snug fitting glove which has good gripping characteristics equal to all cotton.

01BROW-RW35
Brown, R. W. and H. C. Dickinson
CRITERIA ARE SET FOR RIDING COMFORT
SAE Journal
Vol. 37, No. 2 (1935)
Pp. 20-3

Recent efforts to summarize various riding comfort investigations have resulted in the evolution in experimental form of two very practical types of instruments. Two new instruments have been constructed and used extensively for routine measurement of riding comfort. Heretofore extensive measurements of riding comfort have been handicapped apparently by the laboratory nature of the numerous instruments which research has brought forth. Commercial development of instruments has been delayed pending the segregation of essentials from voluminous research data. These "missing links" have now been "forged" and are presented with descriptions of practical applications.

(01BUGA-JS66: see 03BUGA-JS66)

01CANA-GS66
Canadian Government Specifications Board
STANDARD FOR RESTRAINING DEVICES AND ANCHORAGES FOR AUTOMOTIVE VEHICLES
Canadian Government Specifications Board, Ottawa, Canada
1 November 1966
64 pp.

01CHIS-SW63
Chisman, S. W.
RESTRAINT HARNESSES — A REVIEW
Royal Aircraft Establishment, Farnborough, England
RAE TN ME375 (April 1963)
AD 423 358

This paper reviews the development of restraint harnesses used in military aircraft from the early days of flight to the present day. Increasing aircraft performance focussed attention on restraint and much information has been obtained on human tolerance and methods of restraint. The use of harnesses in future emergency escape systems is discussed for the next generation of high speed strike aircraft. Author

01CHUR-HE54
Churchill, H. E., P. G. Hykes and M. Z. Delp
RIDE COMFORT, SAFETY, SUSPENSION REQUISITES
SAE J1
Vol. 54 (1946)
Pp. 74-5

01CICH-WG63
Cichowski, W. G.
A NEW LABORATORY DEVICE FOR PASSENGER CAR SAFETY STUDIES
Society of Automotive Engineers
1963

Scattered references, chiefly p. 8-9 of 13 p. article.

01CLAR-CC61
Clark, C. C.
SOME BODY DISPLACEMENTS AND MEDICAL EFFECTS OF LATERAL ACCELERATIONS DURING NAVY CENTRIFUGE SIMULATION OF EJECTION
Laboratory, Naval Air Development Center, Johnsville, Pennsylvania
Final Report (11 April 1961)
NADC-MA 6044
AD 257 371

For steadily applied lateral loads in the Martin-Baker Mark J5 Ejection Seat and restraint system in use in the YAO-1 aircraft, lateral displacement of the pilot is such as to make questionable safe ejection at 2 G past the canopy beam located 12.5 in from the seat center, even with the restraint harness tighter than would be the case in general flying. With additional equipment on the pilot inside of the restraint harness, lateral displacements will probably be increased. For steadily applied lateral loads above 2G, this study indicates that lateral displacements of the pilot would preclude safe ejection. The theoretical discussion in the previous section indicates that either body motion damping effects, reducing displacements, or resonance overshoot effects, increasing displacments might occur for the shorter duration acceleration pulses of aircraft in-flight accidents.

01CRAN-FJ62
Crandell, F. J., et al.
PACKAGING THE PASSENGER; DESIGN FOR COLLISION PROJECT CAR. Parts I and II
American Society of Mechanical Engineers
Paper No. 62-WA-287
Annual Winter Meeting (1962)

01DEHA-C 62
DeHavilland, C.
PERSONNEL RESTRAINT SYSTEMS
Aviation Crash Injury Research, Phoenix, Arizona
AvCir 62-16 (1962)

01DEHA-H 91
DeHaven, H.
ACCIDENT SURVIVAL—AIRPLANE AND PASSENGER CAR
Society of Automotive Engineers
Preprint No. 716 (1952)

01DEHA-H 92
DeHaven, H.
PACKAGING THE PASSENGER
SAE Journal
Vol. 60, No. 6 (June 1952)
Pp. 55-56

also

J. Aviation Med.
Vol. 23, No. 5 (October 1952)
Pp. 533-534

During the last ten years, there has been a slow but steady increase in the deliberate use of aircraft configuration to protect pilots and passengers in accidents. Many of the developments should be useful in cutting the crash-injury rate in passenger cars.

The most frequent injuries in survivable aircraft and automobile accidents are fractures of the skull, lesions of the brain, smashing of facial bones, and other dangerous head injuries. Studies in 1942 on impact velocities and data from plane accidents led to studies of the injury potential of objects commonly struck by the head. Shoulder harness does an amazing job of protecting the [illegible] but is not even on the horizon for [illegible]. The safety belt does not effective- [illegible] check the velocity of the head but modifies the injury-potential area. Crash-engineering has been built into the instrument panels, windshields, flooring, rudder pedals, controls, et cetera, of aircraft. In six new planes crash-engineering has been extended to the cabin and its adjacent structures. The use of structures to protect the body in accidents is a very young engineering art. Without specific crash-injury data, engineers cannot understand the factors responsible for dangers and cannot judge the need for safer design. The only way to find out is to extend the scope of present accident investigations and, in addition to getting reports on typical causes of accidents, get reports on typical and repeated causes of injury.

01DEHA-H 93
DeHaven, H.
DEVELOPMENT OF CRASH-SURVIVAL DESIGN IN PERSONAL, EXECUTIVE AND AGRICULTURE AIRCRAFT
Crash Injury Research, Cornell Univ. Medical College)
1953

The designs of the CAA-Texas A and M agricultural plane, the Beech Bonanza and Twin-Bonanza, the Helioplane Courier, and the Meyers 145 are discussed in detail. The various methods by which manufacturers have improved these models to provide more complete crash protection for pilots and passengers are described. The appendix contains a reprint from Aviation Week, March 13, 1950, on how lighter planes can be made safer.

01DYE -ER57
Dye, E. R.
DESIGNED FOR LIVING
Cornell Aeronautical Laboratory, Inc.
Research Trends, Vol. 5, No. 3
Fall 1957

Over 60 safety concepts have been incorporated in the Cornell Liberty Safety Car, designed to afford maximum protection to passengers during a crash. "Accordion" doors for easy entrance and exit, bucket seats for better lateral support to the hips, body-restraining panels and seat belts, are among the safety features illustrated here.

01DYE -ER62
Dye, E. R.
AUTOMOBILE CRASH PROTECTION FOR CHILDREN
(In Proceedings of Conference on Passenger Car Design and Highway Safety)
Consumers Union, New York
1962
Pp. 167-83

01EGLI-A 67
Egli, A.
Ford Motor Company
STOPPING THE OCCUPANT OF A CRASHING VEHICLE, A FUNDAMENTAL STUDY
Society of Automotive Engineers
Report No. SAE 670038 (1967)
56 pp., charts, graphs

Occupant motion in a head-on collision is studied through classical solutions of a two-degree-of-freedom mathematical model simulating a colinear vehicle-occupant system. Stoppage of the elastically restrained occupant by general system tuning is demonstrated. Analysis of the system behavior over a range of initial vehicle speeds brings out the fundamental differences due to elastic and inelastic occupant restraint and due to changes of character of vehicle front end collapse. Consideration of practical application of the conclusions, generally, should be limited to systems with well harnessed occupants.

01FARL-NE59
Farley, N. E.
THE SAFETY THE MOTORIST GETS
Society of Automotive Engineers, Inc., New York, New York
Rept. SP 165 (June 1959)

Four papers dealing with the question of what automotive engineers are doing to assure safety in the modern American automobile are included in this report. The specific aspects of the automobile that are treated are: 1) the chassis, 2) the body, 3) electrical-accessory, and 4) overall car appraisal. Various phases of product development to meet the changing requirements of traffic conditions and the human factor in the vehicle-driver complex are discussed. Quality control methods that are used to assure that the safety designed in is actually built into the car are discussed thoroughly.

01FITZ-JG62
Fitzgerald, J. G., Fisher, M. L., and A. J. Barwood
AN EXPERIMENTAL SYSTEM OF PRE-EJECTION BODY RESTRAINT
Flying Personnel Research Committee, Great Britain
FPRC Memo. No. 186 (August 1962)
AD 412 774

In a recent survey of high speed ejections occuring in the United States Air Force, out of a total of twenty ejections at speeds ranging from 550 to 650 knots and at ram pressures in the range of 7-10 lb/sq. in. there were nine fatalities, eight major injuries and three injury-free successful escapes. The production of injury depends upon the degree of seat stability, intensity of the forces, constancy of position, and and the quality of the restraint system. An effective pre-ejection system of restraint should play a large part in minimizing damage to life and limb by positioning the body in an acceptable ejection attitude and by preventing displacement of the head and limbs relative to the trunk. The system described in this report appears to satisfy most, if not all, of the physical requirements for a restraint system.

01FLIG-SF62
Flight Safety Foundation, Inc.
PERSONNEL RESTRAINT SYSTEMS STUDY, BASIC CONCEPTS
Aviation Crash Injury Research, Phoenix, Arizona
TCREC Technical Report 62-94 (December 1962)
Contract No. DA 44-177-TC-802
Task 9R95-20-001-01, AvCIR 62-12, Sponsor: Army Transportation Research Command, Fort Eustis, Virginia
Available DDC

This report covers the basic concepts, applicable to all U. S. Army aircraft, that are pertinent to a personnel restraint systems study. Man's tolerable limits to decelerative loads are reviewed and related to the existing restraint harnesses currently being used in Army aircraft. The magnitude of decelerative loads to which airframes of various aircraft have been dynamically tested, while still maintaining a livable volume in the cabin, are also reviewed and it is noted that man's limits are, in general, higher than airframe limits.

Several practical harness configurations are discussed and the load distribution between the various components of the harness are explored and design strength values are recommended. The dynamic strength of restraint systems is also discussed and related to the static strength.

01FORD-MC58
Ford Motor Company
News Media Release to PM's, Thurs., April 10, 1958
Ford Motor Company, Dearborn, Michigan

Safety engineer's "dream car" includes two-piece sectional front seat, with only the driver's one-third section being adjustable, while the other two-thirds are fixed to the floor. Floor-anchored seat belts; retractable reels; automatic inertia locking devices, activated by a sudden thrust.

01FOX -KR56
Fox, K. R.
ENGINEERING ASPECTS OF TEXTILE STRUCTURES
Mechanical Engineering
Vol. 78, No. 6 (June 1956)
Pp. 517-520

01FRED-RH62
Fredericks, R. H.
PROGRESS IN SAFE VEHICLE DESIGN (In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration Conference, Sept. 14-16, 1961)
1962
Pp. 225-240

01FRED-RH65
Fredricks, R. H.
BARRIER COLLISION INVESTIGATION OF HARNESS RESTRAINING SYSTEMS
7th Stapp Car Crash Conference
1965
Pp. 3-19

Various types of restraining harnesses were worn by anthropomorphic dummy occupants in two 30 m.p.h. barrier crashes of production cars. These tests evaluated the harness systems under the same simulated collision conditions used to determine the dynamic performance of lap-type seat belts. The loads developed in the harness elements were measured and occupant kinematics were studied by analysis of high-speed motion picture film. Restraint applied by the shoulder straps limited upper torso jackknifing, but some of the harness designs did not adequately restrain the lower torsos of the dummy passengers. More complete body restraint was obtained when the lap strap was independent of the shoulder strap. The harnesses imposed restraining loads on the body sufficient to produce structural damage in some of the dummies.

01FREE-HE62
Freeman, H. E.
A RESEARCH PROGRAM TO DEVELOP A 60 "G" PERSONNEL RESTRAINT SYSTEM (In Impact Acceleration Stress: Proceedings of a Symposium With a Comprehensive Chronological Bibliography)
National Academy of Sciences, National Research Council
Publication No. 977 (1962)
Pp. 259-264

A 60 G personnel restraint system was developed. The central components are an individually fitted, fiber glass, torso garment and a similarly fitted seat pan. These rigid components were selected to provide broad support and preserve the normal body shape under inertial loading. A flexible, low-rebound liner is used for comfort and intimate fit. The torso shell is retained to the seat structure with steel cables to minimize stretching and the resultant rebound. A dacron strap system, positi ned by a leather helmet, was chosen to minimize stretching and the resultant rebound. A dacron strap system, positioned by a leather helmet, was chosen to minimize forward head motion. Lateral head supports are mounted on a carriage that adjusts vertically relative to the seat structure for crew-size variation. Low-rebound padding in the helmet cushions the ear area. Arm support is provided by contoured armrests and hand-holds with a strap passed over the crook of the arm holding the arm back and down. The dummy's legs are positioned and restrained by the sides of the shell, a central divider, a contoured leg backrest, and a leg cover. Antisubmarine protection for the torso is also provided by the leg cover, which supports the forward inertial loads of the thighs and legs and stabilizes the pelvis by a direct load path through the femur into the pelvic socket. The contoured lower skirt on the torso backshell and sides of the seat pan reinforce the pelvic socket by limiting lateral shifting of the thighs. The support structure is a tubular steel frame articulated to provide a torso forward position for boost and torso aft position for less stressful flight elements. Full immobilization and restraint are applied in the forward position.

01GELL-CF60 (05GELL-CF60)
Gell, C. F.
BIO-ENGINEERING OF PROTECTIVE SYSTEMS
Paper, 31st Annual Meeting of the Aerospace Medical Association
May 9-11, 1960

01GREG-LW63
Gregg, L. W.
NEW TECHNIQUES FOR ASSESSING DAMAGE FROM ACCIDENT INVESTIGATIONS
United States Army Transportation Research Command, Ft. Eustis, Virginia
TRECOM Rept. No. 63-13 (March 1963)
AD 403 300L

New techniques in assessing damage from aircraft accident investigations, including psychological, mathematical, and systems and communications engineering methods are briefly discussed.

01GRIM-G 63
Grime, G.
EFFECT OF SEAT HARNESS ON MOVEMENT OF CAR OCCUPANTS IN A HEADON COLLISION
HRB Record No. 4 (1963)
Pp. 76-90

In the present paper, no attempt is made to calculate the movements of the parts of the body in detail, but because threequarters of the weight of the body is in those parts which are closely held by the seat harness (the trunk, thighs, and head), it seemed likely that a simplified representation of the human body could be used in calculations to determine the main features of the movement of a car occupant held by a seat harness. It has therefore been assumed that the passenger can be represented by a single mass, negligible compared with that of the car, that he exerts no muscular effort to prevent forward movement relative to the car, and that there is no pivoting about the legs or feet against, for example, the package shelf; the body is assumed to be rigid, not elastic or yielding, and the assumption is made that there is no damping due to friction with the seat or the harness. The mass representing the passenger is restrained by a linear spring; that is, one in which the restraining for force is proportional to the distance moved. This is approximately true for the materials of which seat harnesses are made.

This model is, of course, much simplified, but its behavior may be expected to correspond in many important details with what happens in practice.

01GRIM-G 64
Grime, G.
AUTOMOBILE DESIGN IN RELATION TO PASSENGER SAFETY
Bulletin of the Institute of British Carriage and Automobile Manufacturers
Vol. 28 (New Series), No. 592 (1964)
Pp. 21-32

01GRIM-G 66
Grime, G.
SAFETY CARS
Technical Aspects of Road Safety
No. 26 (June 1966)
Pp. 3.1-3.48

01HAEU-R 55
Haeusler, Roy
DESIGN FACTORS IN AUTOMOTIVE SAFETY
Congress Transactions
Vol. 27 (1955)
Pp. 25-26

01HALE-JL62
Haley, J. L., Jr.
PERSONNEL RESTRAINT SYSTEMS STUDY: BASIC CONCEPTS
United States Army Transportation Research Command, Fort Eustis, Virginia
TREC TR 62-94 (December 1962)
AD 404 305
Available DDC

This report covers the basic concepts, applicable to all U. S. Army aircraft, that are pertinent to a personnel restraint systems study. Man's tolerable limits to decelerative loads are reviewed and related to the existing restraint harnesses currently being used in Army aircraft. The magnitude of decelerative loads to which airframes of various aircraft have been dynamically tested, while still maintaining a livable volume in the cabin, are also reviewed and it is noted that man's limits are, in general, higher than airframe limits. Several practical harness configurations are discussed and the load distribution between the various components of the harness are explored and design strength values are recommended. The dynamic strength of restraint systems is also discussed and related to the static strength.

01HALE-JL64
Haley, J. L., Jr.
PERSONNEL RESTRAINT SYSTEMS STUDY. CH-47 VERTOL CHINOOK
United States Army, Transportation Research Command, Fort Eustis, Virginia
TRECOM Tech. Rept. No. 64-4 (April 1964)
AD 607 658
Available DDC

This report presents detailed recommendations for the improvement of the personnel restraint systems in the U. S. Army CH-47 aircraft. The recommendations pertain primarily to the strengthening of existing components. The modifications proposed indicate the following strength improvements: (1) Cockpit - The crew's restraint system is increased from an 8-12G value to a 25-30G value; (2) Troop Compartment - The troop's lap-belt attachments are increased from a 10-15G value to a 22-28G value.

The above strength increases can be achieved with a weight increase of 7 pounds per aircraft and at a cost of approximately $300 per aircraft.

This report includes the following information: (1) Engineering - Strength analysis of proposed modifications. (2) Administrative - A cost and weight summary of proposed modifications. (3) Detailed engineering drawings are available as a supplement to this report. (a) Parts Procurement or Manufacture - Drawings necessary for the procurement or manufacture of retrofit kits. (b) Installation Procedure - Sufficient information is included in the drawings for installation of retrofit kits by Army personnel.

01HASB-AH58
Hasbrook, A. H.
CRASH SURVIVAL BY DESIGN
Arizona Engineer and Scientist
March 1958

01HASB-AH60
Hasbrook, A. H.
CRASH-SAFE DESIGN CAN MAKE MANY ACCIDENTS SURVIVABLE
Aerospace Engineering
September 1960
Pp. 79-81, 87

01HEND-E 61
Hendler, E.
COMPENDIUM OF ABSTRACTS OF PAPERS AT THE SYMPOSIUM ON BIOMECHANICS OF BODY RESTRAINT AND HEAD PROTECTION
Office of Naval Research, Bureau of Naval Weapons, and Aircrew Equipment Laboratory, Naval Air Material Center, Philadelphia, Pennsylvania
June 14-15, 1961

The objectives of the Symposium were to (1) review and bring up-to-date the theoretical biological knowledge on acceleration injuries, (2) review and bring up-to-date engineering progress in the design of protective devices, and (3) foster the interchange of ideas between the two disciplines with the hope of eventually developing better protection against linear acceleration.

This Compendium contains a copy of the program, those abstracts of papers which were submitted for inclusion herein, and a complete list of attendees.

01HILL-JH59
Hill, J. H.
EVALUATION OF THE TORSO-HEAD RESTRAINT SYSTEM AND THE INTEGRATED HARNESS RESTRAINT SYSTEM UNDER CONDITIONS OF ACCELERATION; Final Letter Report Concerning
United States Naval Air Development Center, Johnsville, Pennsylvania
NADC-MA-LR80 (April 2, 1959)
AD 257 375

A model F4H-1 aircraft ejection seat equipped with the torso-head restraint system was installed on the 50-foot centrifuge and an investigation was carried out to determine its ability to restrain the pilot under conditions of sustained and fluctuating patterns of acceleration to simulate emergency conditions. For sustained acceleration, the play in the head restraint system would be excessive in in-flight emergency with a lateral acceleration of 4G. For the fluctuating acceleration runs made, the restraint was adequate but the acceleration levels were below in-flight emergency levels. The Martin-Baker G-5 seat integrated harness restraint system was tested in a similar manner except that no fluctuating patterns were used. It proved to be adequate for the positive and transverse back-to-chest and lateral runs made.

01HOLC-GA61
Holcomb, G. A.
DEVELOPMENT TEST REPORT RESTRAINT SYSTEM CAPSULE ESCAPE SYSTEM
Stanley Aviation, Denver, Colorado
May 1961

01HUNT-H 55
Hunter, H.
CONVENTIONAL AND NEW TYPE FLIGHT RESTRAINT EQUIPMENT, EVALUATION OF
Naval Air Development Center, Johnsville, Pennsylvania
Project TED ADC AE-6301 (31 Decmber 1955)

The limitation of restraint equipment in present use was determined during "Jostle Runs" on the human centrifuge, Project TED ADC AE 6303.1. Pilots were exposed to fluctuating G forces of from 1.5 to 7 G at rates of changes of G up to 8 G/sec. while rolling and pitching 72 degrees. This simulated uncontrolled flight resulted in jostling so severe that bodily injury was inflicted and thus exposures above this level appeared to be too haxardous to conduct with the present lap belt and shoulder harness restraint.

01JENS-NA46
Jensen, N. A.
FUSELAGE - FLOOR STRUCTURE - SEAT ATTACHMENT, ULTIMATE LOAD TEST, MODEL 240 AIRPLANE
Consolidated Vultee Aircraft Corporation, San Diego, California
October 1946

01JEWE-RJ62
Jewert, R. J.
SAFETY DEVICES FOR YOUR CAR
Kentucky Legislative Research Commission, Committee on Automotive Safety, Frankfort, Kentucky
Informational Bulletin No. 34 (1 November 1962)
13 pp.

01KIEL-IL50
Keiller, I. L., and Wareham, H. A.
DEVELOPMENT OF SAFETY HARNESS FOR GENERAL SERVICE STRETCHER
Mechanical Engineering Department, Royal Aircraft Establishment, Farnborough, England
Technical Note No. Mech. Eng. 56
1950

01LABE-DJ65
LaBelle, Donald J.
BARRIER COLLISION AND RELATED IMPACT SLED TESTS ON BUSES IN INTERCITY SERVICE
7th Stapp Car Crash Conference
1965
Pp. 46-53

Investigation of the use of seat belts in intercity buses led to barrier impact tests on an instrumented bus loaded with dummies. Data on forces and accelerations, gained from the test, were used to guide corresponding impact sled tests. These, in turn, led to considerable improvement both in the structure of the seat and in the methods used to attach the seats to the floor and sidewalls of the bus.

01LAVO-LJ56
LaVoy, Lew J.
SAFETY WITH COMFORT
Citizen Mutual Automobile Insurance
1956
8 pp.

A discussion of the factors involved in the introduction and widespread use of automobile seat belts.

01LEE -H 59
Lee, Henry
Engineering Department, Chrysler Corp. of Canada, Ltd.
SAFETY FEATURES, STANDARD VS. OPTIONAL EQUIPMENT ON AN AUTOMOTIVE VEHICLE
Paper, Automotive Engineering Committee of the Canadian Highway Safety Conference
May 4, 1959

Includes prices and reasons why the equipment is optional; seat belts part of the optional equipment.

01LEVE-SD61
Leverett, S. D., Jr., Whitney, R. U., and Zuidema, G. D.
PROTECTIVE DEVICES AGAINST ACCELERATION (In Gauer, O. H. and G. D. Zuidema, Gravitational Stress in Aerospace Medicine)
Little, Brown, and Co., Boston
1961
Pp. 211-220

01LEWI-ST57
Lewis, Sidney T., and Stapp, J. P.
A CRASH-RESTRAINT DEMONSTRATOR
Holloman Air Development Center, Holloman Air Force Base, New Mexico
TN 57-9 (June 1957)
16 pp.

01LITT-AD66
Little, Arthur D.
Cambridge, Massachusetts
THE STATE OF THE ART OF TRAFFIC SAFETY; A Critical Review and Analysis of the Technical Information on Factors Affecting Traffic Safety
Automobile Manufacturers Association, Incorporated
June 1966
624 pp., charts, bibliography

01LOMB-CF65
Lombard, Charles F., Kuehnegger, W., Magill, Harry S., Gibbons, Charles A., Haley, Joe L., Jr.,
EFFECTIVE PROTECTION BY A RESTRAINT SYSTEM (In 7th Stapp Car Crash Conference)
1965
Pp. 374-385

Multiple and complex problems of providing an adequate restraint system are discussed in these phases: Design, support system details, test criteria, and crash analysis.

Design requires more knowledge of man's critical properties: How and where to provide restraint and support to give man a better chance of surviving crash conditions.

Design detail is of great importance in three major categories: 1) Belts and harnesses. 2) Pads and shock absorption systems. 3) Basic structural items.

Test criteria should provide validation of an initial hypothesis and, as additional research information becomes available, the quality and significance of test programs will improve.

Crash analysis offers authoritative evaluation of a restraint system since no other method can simulate the relation between the fuselage structure and the seats and restraint harness.

01LUND-LC64
Lundstrom, L. C., Jr., Kelly, A. H., and LaBelle, D. J.
CRASH RESEARCH FOR VEHICLE SAFETY
Paper 831A, SAE Meeting
March 30-April 3, 1964
13 pp.

Impact Sled, full-scale laboratory facility which simulates vehicle accidents, has been in use at General Motors Proving Ground since late 1962; facility and supporting instrumentation,and some of many types of tests that were run in first year of operation are reviewed; tests range from tests of complete vehicles loaded with passenger dummies to tests of single components such as seat belts, seat adjusters, door locks, and windshields; barrier collision and related impact sled tests on buses in intercity service in appendix.

01MART-DE67
Martin, D. E., and Kroell, C. K.
General Motors Corporation, Research Laboratories
VEHICLE CRUSH AND OCCUPANT BEHAVIOR
Society of Automotive Engineers
Rept. No. SAE 670034 (1967)
42 pp., tables, graphs

1. Automobile Crashes. 2. Guardrails
3. Impact

An analytical study of right angle barrier crashes has been conducted to evaluate the influence of vehicle crush distance, occupant spacing, and interior crush stiffness on the severity of occupant-interior impact. Particular attention was directed to the influence of the vehicle deceleration-time history wave shape. The study includes an analysis of a simple-point occupant and a more complicated articulated dummy. The results of these analyses are in substantial agreement and indicate that the most important factors in reducing unrestrained occupant impact severity in conventional vehicles are occupant spacing, vehicle crush distance, and interior crush stiffness. Because of practical considerations and the multiplicity of crash conditions, it is concluded that the most direct way to reduce injury and death is through improved vehicle interior crush behavior.

01MILL-CO57
Miller, C. O.
EVALUATION OF TRANSVERSE ACCELERATION (REAR TO FRONT) UTILIZING CONVENTIONAL AND SPECIAL RESTRAINT GEAR
Chance Vought Aircraft, Inc., Dallas, Texas
Rept. No. 10816 (February 1957)

01PALM-FC65
Palmer, Frank C.
WE MUST MAKE A DECISION
In 7th Stapp Car Crash Conference
1965
Pp. 437-442

Because of seat-belt campaigns, the public is better informed than ever before. It is demanding better traffic-safety programs and more effective legislation to support them. An example is the growing interest in the states for physical and mental examination as a part of driver-licensing procedure. Who should make the necessary medical reports; how should they be made; how do medications and drugs affect driving ability; what to do about licensing people admitted to and discharged from mental institutions? Driver-license administrators are asking the public-health and medical professions for help with these medical problems of driver licensure.

01PROV-EL65
Provost, Emile L., and Moore, John O.
DYNAMIC RESEARCH OF HUMAN RESTRAINING DEVICES
In 7th Stapp Car Crash Conference
1965
Pp. 145-154

Dynamic research plays a vital role in testing restraining devices. Such research can establish limitations of the devices and make certain that design specifications are in agreement with these research criteria.

An important tool for this research is the research sled which, with least expense, is capable of creating design and performance criteria for subsequent evaluation in full-scale car crashes. Uses of the sled in specific tests are described and illustrated.

01PROV-EL66
Provost, E. L., and Schrum, D. J.
DYNAMIC RESEARCH OF UPPER TORSO RESTRAINTS
In 9th Stapp Car Crash Conference
1966
Pp. 83-92

These studies were made for the purpose of comparing:

1. The forward movement of the occupant allowed by the various parameters.
2. The possibilities of the occupant moving out of the restraint or to an injury producing position in the restraint during impact.
3. The injury producing potential of restraint itself

In conclusion, the evidence shows that, despite some earlier opinion, the roof rail to the rear of the passenger is an ideal position for upper torso restraint anchorage. Anchorages in the "B" pillar can be less desirable, depending on the rearward distance from the passenger, and the height above the shoulder. An upper torso restraint anchored at the top of the quarter panel of a convertible, will be worthwhile in reducing injury potential. Further, it is evident that as in lap belts, the degree of protection is improved substantially with greater "snugness." Considering this, inertia reels appear to offer added protection, not just greater convenience as generally believed.

01RIXM-W 64
Rixmann, W.
ZUR FRAGE DER SICHERHEITS-KAROSSERIE
Automobiltechnische Zeit
Vol. 66, No. 3 (March 1964)
Pp. 76-80

Safety construction of automobile bodies; Sigma body, designed by Pininfarina, Turin, Italy, is conceived in such way that location of engine unit is completely independent from body construction; special safety features include rigid and strengthened passenger compartment, sliding doors, windscreen and rear window which will be ejected upon impact, special seats and fixtures for seat belts, and other safety features with regard to instrumentation panel and steering system location; schematics

01ROSE-CW65
Rose, Clarence W.
A SAFETY ENGINEERING APPROACH TO CHILD RESTRAINING DEVICES (In 7th Stapp Car Crash Conference)
1965
Pp. 432-436

Stresses the need for child restraining devices from the time the infant leaves the hospital. Discusses the time for "graduation" to an adult safety belt, considers the variations in children's physical, mental and emotional characteristics, defends a child's God-given right to squirm, and calls for rapid and realistic research to determine requirements for adequate, practical child restraints.

01RYAN-JJ58
Ryan, J. J., and Podnieks, E. R.
SAFETY DEVICES FOR AUTOMOTIVE VEHICLES
Automobile Safety Research Project, University of Minnesota
31 July 1958

01RYAN-JJ60
Ryan, James J.
SAFETY DEVICES FOR GROUND VEHICLES
United States Department of Health, Education and Welfare, Public Health Service, National Institutes of Health
Grant No. RG-6284 (C-1) (April 1, 1959-September 1, 1960)

The primary object of this research is the investigation of means to reduce injury and death caused during automotive accidents. The high frequency of crashes make imperative the development of methods for most effectively decelerating the vehicle and properly packaging the occupants. Equipment has been developed for the evaluation of the hydraulic shock-absorbing bumper and the seat belt assembly so essential in accomplishing these goals. Preliminary' testing and modification of these devices is performed on the Project's machine for applying high-impact loads. The data obtained from human tests with seat belts is applicable to most endeavors utilizing human limitations in deceleration. The tests have shown the similarity of the dynamics of a human with an equivalent mechanical figure and have pointed out the effectiveness of force measurement by models in place of a human. The tests have also shown the forces that must be resisted under conditions of deceleration which are established up to the limit of material strengths. The determination of the magnitude of the forces humans can withstand about the pelvic regions and the chest is of great importance and will be sought by further studies.

01RYAN-JJ62
Ryan, J. J.
AUTOMOTIVE HUMAN CRASH STUDIES (In Impact Acceleration Stress: Proceedings of a Symposium With a Comprehensive Chronological Bibliography)
National Academy of Sciences, National Research Council
Publication No. 977 (1962)
Pp. 345-354

The development of safety devices for vehicles has required research into the application of engineering principles for the mechanical reduction of impact forces. It has been shown that the forces exerted on a human supported by a seat-belt may be reduced four times through proper engineering design of the vehicle and the belt. Further studies with human beings in the seat-belt environment using the apparatus available require an extension of the engineering with bio-physics and applied medicine.

01SAFE-FT58
____
SAFETY FOR TOMORROW'S CARS
Journal of the Iowa Medical Society
August 1958

Paragraph on experimental inertial reels on Ford X100 in Traffic Safety section.

01SAFE-HA66
____
SAFETY HARNESS AND OTHER PROTECTIVE DEVICES FOR CHILDREN
International Road Safety and Traffic Review
Summer 1966
Pp. 16-21

01SANA-AM65
San Antonio Air Materiel Area
MINUTES OF THE PERSONAL EQUIPMENT ADVISORY GROUP MEETING
11-12 October 1965, Atlantic City, New Jersey
AD 625 401
72 pp.

01SANT-V 65
Santesso, V.
A PROTECTIVE DEVICE FOR AN OCCUPANT OF A VEHICLE
Patent Office, London
August 1965
5 pp., 11 figs.

A releasable protective covering was patented for part of the body of someone travelling in a vehicle in order to protect the person in the event of an accident.

01SCHM-RV61
Schmidt, R. V., et al.
PASSENGER SAFETY AND COMFORT CRITERIA STUDY IN DYNAMIC ENVIRONMENTS
Northrop Corporation, Norair Division, Hawthorne, California
PB-67 (September 1961)

01SCHR-DJ66
Schrum, D. J., and Provost, E. L.
DYNAMIC RESEARCH OF PASSENGER RESTRAINING DEVICES
In 8th Stapp Car Crash Conference
1966
Pp. 346-353

Studies of the effectiveness of two different passenger restraint systems have been made using the Northrop dynamic test sled with highspeed color photography. A child's harness design was found to be adequate in forward impacts but needed improvement in angular impacts. A redesign is shown to be adequate in impacts in all directions. A second study proves the lap belt to be effective when used with reclining seats.

01SEVE-DM62
Severy, D. M., Mathewson, J. H., and Siegel, A. W.
AUTOMOBILE SIDE-IMPACT COLLISIONS, SERIES II
Society of Automotive Engineers
National Automobile Week, Detroit, Michigan, (March 12-16, 1962)

Engineering methodology and research techniques, applied to 12 intersection-type automobile collision experiments, provided data on four speeds of impact and on three positions of impact. Anthropometric dummy motorists provide collision force and kinematic data for several conditions of restraint. Advanced photographic equipment identify new approaches to solution of the motorist collision injury problem. Specific data include tri-axial acceleration patterns for motorist head and chest and for car passenger compartment; identification of many factors associated with door latch failure and motorist ejection; demonstration of protection provided by the shoulder strap and belt combination; preliminary findings on tempered side window glass breakage and related head-impact accelerations; collision dynamics and why modern car design has reduced probability for intersection collision roll-over; car collision deformation, skid patterns, and cost to repair damages are given for these controlled exposures. Successful programming of collision transducer patterns for data reduction by 7090 computer also is described.

01SMED-HA61
Smedal, H. A., Vykukal, H. C., Gallant, R. P., and Stinnett, G. W.
CREW PHYSICAL SUPPORT AND RESTRAINT IN ADVANCED MANNED FLIGHT SYSTEMS
National Aeronautics and Space Administration, American Research Center, Moffett Field, California
J. Am. Rocket Soc. (November 1961)
Pp. 1544-1548, 9 refs.

A new concept in physical support and restraint for pilots and crews of motion flight simulators or advanced manned flight vehicles is described. The principle of a wear-in restraint that is easily secured to or released from the support structure, which is part of the vehicle, is the basic concept in this support and restraint system. Its capability as a functional support and restraint for vehicle control studies during sustained accelerations has been established by its use in three human centrifuge programs; but its capability for tolerance to impact accelerations is unproved. Further improvement and testing is contemplated to qualify it as an omnidirectional support and restraint system adequate for sustained and impact accelerations of high magnitude.

01SMIT-AC54 (08SMIT-AC54)
Smith, A. C.
THE HUMAN PACKAGING PROBLEM
Cornell Aeronautical Laboratory, Incorporated, Buffalo, New York
Research Trends, Vol. 2, No. 2 (1954)
Pp. 1-6

"Safer packaging" of the human occupant of an automobile may be achieved by either one of two methods; body restraint which prevents damaging impace with interior components of the automobile of reduction of the lethal or injury potential of the objects which the body (with principal emphasis on the head) might strike. Maximum protection is afforded by a combination of the two. Research is being conducted relative to both methods. This report deals with the body restraint methods available for protection of automobile passengers. The seat belt is discussed as the main body restraining device. Crash experiments using seat belts and dummies are also reviewed.

01SMIT-MD54
Smith, M. D.
EVALUATION OF "ENSOLITE" AS A PROTECTIVE PADDING MATERIAL AND THE DEVELOPMENT OF A "BEAM-PAD" INSTRUMENT CONTAINER
Cornell Aeronautical Laboratories, Incorporated
Report No. YB-853-D-1 (1954)

01SMIT-MD55
Smith, M. D.
DEVELOPMENT OF ENERGY ABSORBING STRUCTURES SUITABLE FOR AUTOMOBILE APPLICATION
Cornell Aeronautical Laboratory, Buffalo, New York
June 1955

01SPAC-FE64
Space and Flight Equipment Association
PROCEEDINGS OF 2ND NATIONAL FLIGHT SAFETY SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM
Space and Flight Equipment Association, Rolling Hills, California
Symposium held at San Diego, California, 28-30 October 1964
278 pp., refs.

Symposium papers on oxygen systems and related equipment: survival, search, and rescue: escape, parachutes, and related equipment; protective clothing, restraint equipment and safety are presented.

01STAP-CC63
Stapp Car Crash Conference
STAPP CAR CRASH AND FIELD DEMONSTRATION PROCEEDINGS OF THE SIXTH CONFERENCE
Aeromedical Medical Division, Holloman Air Force Base, New Mexico
November 7, 8, and 9, 1963

This publication contains twenty-three papers presented at the conference.

01STAP-CC65
Stapp Car Crash Conference
THE 7TH STAPP CAR CRASH CONFERENCE. PROCEEDINGS (11-13 November 1963) (D. M. Severy, ed.)
Charles C. Thomas, Publisher
1965
University of California, Institute of Transportation and Traffic Engineering and Extension Division, University of Minnesota, American Association for Automotive Medicine, Public Health Service
594 pp., graphs, illus., tables

01STAP-CC66
Stapp Car Crash Conference
PROCEEDINGS OF THE 10th STAPP CAR CRASH CONFERENCE (8-9 November 1966)
Society of Automotive Engineers
8-9 November 1966
University of California Extension, University of Minnesota, General Extension Division, Biomechanics Research Center of Wayne State University.
210 pp., illus.

01STAP-JP53
Stapp, J. P.
CRASH PROTECTION IN AIR TRANSPORTS
Aeronautical Engineering Review
Vol. 12, No. 4 (1953)
Pp. 71-78

In 1947, tubular steel sled slipper with one to four solid fuel rockets for propulsion was mounted on a standard gage track. Peak decelerations exceeding 100 g would thus be reproduced. Parachute dummies, chimpanzees, and human subjects were used in these experiments. Later a standard ejection seat catapult was developed which was suspended from a monorail. The carriage was decelerated by impinging against a lead cone at the end of the rail. With anesthetized pigs as subjects, motion pictures, instrument readings, and autopsy data provided the bases for analysis. Time-displacement data for human subjects are given in the paper. It was found that humans show the most severe transient physiological effects when subjected to a rate of change of deceleration of 1,370 g per sec. and a peak acceleration of 38.6 g. Protection of human occupants is limited by such factors as dynamic stress limitations of the aircraft, relative positions of seats, specifications of life belts. and sex and age factors.

01STEN-AE62
Stencel Aero Engineering Corporation
MODULAR RESTRAINT, RECOVERY, AND SURVIVAL SYSTEM
Stencel Aero Engineering Corporation, Asheville, North Carolina
Final Engineering Report (August 1962)
AD 292 761

A modular system, consisting of a seat back and bottom with a parachute bridle connected to the structure, provides greatly increased pilot restraint, comfort, and convenience by use of a combined flight and parachute harness. The system offers a survival capability which carries full escape automation beyond the point of either land or water. Development of the modular seat included: bridle geometry studies, opening shock studies, pararaft inflation studies, deceleration device development, various special tests, a system test series, and restraint development yielding a superior restraint system complete with hardware. Operational modes provided for were: automatic water entry with man in inflated raft, seated land touchdown, foot-first land touchdown, overside bailout, and ditching. Further development, already underway with a rocket cushioning device; and later, the addition of the ballistic parachute should give a more highly refined escape system than any presently in use. (Author)

01VESZ-K 64
Vesz, K.
UNTERSUCHUNGEN UBER DEN UNFALLSCHUTZ VON KINDERN IN KRAFTFAHR AEUGEN (Accident Protection for Children in a Vehicle)
Deutsche Kraftfahrfortschung und Strassenverkehrstechnik
Vol. 168, (1964)

01VYKU-HC64
Vykukal, Hubert C.
HUMAN RESTRAINT SYSTEMS DEVELOPMENT FOR USE IN ACCELERATION RESEARCH (In Proceedings of 2nd National Flight Safety, Survival and Personal Equipment Symposium)
National Aeronautics and Space Administration, Ames Research Center, Moffett Field, California
1964
Pp. 225-243, refs.

Various pilot restraint systems were tested and evaluated under simulated high acceleration conditions. The restraint systems are described and include the modified NASA couch, the universal pilot restraint suit, the soft torso restraint, and the restraint harness-pressure suit system. Using the modified NASA couch, pilots were able to perform control functions without undue discomfort, but the couch cannot be molded to the body shape while it is in a high acceleration environment and it lacks universal fit. The universal pilot restraint suit eliminates these problems and pilot performed well while subjected to EBI, EBO, and EBD accelerations. However, it has poor provision for lateral restraint at high EBL and EBR accelerations. The soft torso restraint provides more positive support for EBO, EBL, and EBR than the universal pilot restraint suit, but the lack of rigid support from the axilla to the waist allows the rib cage to flatten under EBI acceleration causing difficulty in breathing.

01WHIT-AJ57
White, Andrew J.
SOME ASPECTS OF PASSENGER RESTRAINING DEVICES AND SAFETY RESEARCH PROBLEMS
Safety Forum, Massachusetts Institute of Technology
April 11, 1957
1957 Motor Vehicle Research
2 pp.

01ZIMM-FP48
Zimmerli, F. P.
PROPER USE OF SPRING MATERIALS
SAE Journal
Vol. 2, No. 1 (January 1, 1948)
Pp. 157-168

02 RESTRAINT SYSTEMS (ECONOMICS)

02ACKE-PC58
Ackerman, P. C.
REMARKS to Meeting of the Governors' Safety Conference
Chrysler Engineering Laboratories
April 11, 1958

Cost of standardizing extras in automobile equipment (padded instrument panel and visors, six safety belts, heating and defrosting units) would be $207.00.

02BARG-SB62
————
BARGAIN SEAT BELTS ARE A HIT: CHEVRON DEALERS IN EAST FIND PROMOTION DEAL A GREAT PULLER-IN OF BUSINESS
Business Week (August 25, 1962)
P. 36

(02CHRY-PI61: see 08CHRY-PI61)

02DUBO-PC62
DuBois, P. C.
LATCHING ON; DEMAND FOR AUTO SEAT BELTS IS RAPIDLY GAINING MOMENTUM
Barrons
Vol. 42 (September 17, 1962)
P. 5+

02DUGG-BC61
Duggar, B. C.
ECONOMIC CONSIDERATIONS IN THE FORWARD VS REARWARD FACING PASSENGER SEATS
Harvard School of Public Health, Boston, Massachusetts
December 1961

02GATE-CB66
Gateway Chemicals
GATEWAY CHEMICALS BUCKLES DOWN PEAK RESULTS WITH NEW SEAT BELT
Barrons
Vol. 46 (January 31, 1966)
P. 23+

02GOOD-B 63
Goodman, Bud
$90 MILLION SALES SEEN FOR SEAT BELTS IN 1963
Automotive News
March 25, 1963
P. 24, 54

02KRAS-K 64
Krasnow, K.
AUTO SEAT BELT INDUSTRY DRIVING FAST
Commercial and Financial Chronicle
Vol. 199 (January 30, 1964)
P. 450

02MCDO-D 62
McDonald, D.
GROWING SEAT BELT BUSINESS IS PRESENTING PROBLEMS FOR AUTOMAKERS
NPN
Vol. 54 (September 1962)
P. 142

03 LEGISLATION

03AUTO-MA61
Automobile Manufacturers Association, Incorporated
STATE LAWS INFORMATION MANUAL
Field Services Department of Automobile Manufacturers Association, Incorporated
October 1961

Map of states requiring anchorage units, approval of seat belts, seat belt and anchorage regulation, requiring seat belts.

03AUTO-MA64
Automobile Manufacturers Association
NEW YORK LAW REGARDING ADULT'S SHOULDER HARNESS TYPE SAFETY BELT
Automobile Manufacturers Association Field Services Bulletin
March 24, 1964

New York H-1756 regulates shoulder harness after June 30, 1965.

03AUTO-SB65
____
AUTO SEAT BELT STANDARDS SET; ESTABLISHED BY ACT OF CONGRESS
NBS Technical News Bulletin
February 1965
P. 30-31

03BUGA-JS66 (01BUGA-JS66)
Bugas, J. S.
A STATEMENT OF THE AUTOMOBILE MANUFACTURERS ASSOCIATION BEFORE THE COMMITTEE ON COMMERCE, UNITED STATES SENATE
Automobile Manufacturers Association
April 5, 1966
58 p. (pp. 10-11)

03NATI-HU67
National Highway Users Conference
HIGHWAY TRANSPORTATION LEGISLATION IN 1966; A SUMMARY OF FEDERAL AND STATE ACTIVITY
National Highway Users Conference, Washington, D.C.
1967
28 p.

Safety seat belts: p. 3

03SEVE-DM (10SEVE-DM)
Severy, D. M., Mathewson, John, Siegel, Arnold W.
STATEMENT OF CRASHWORTHINESS OF AUTOMOBILE SEAT BELTS FOR THE SUBCOMMITTEE OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE OF THE HOUSE OF REPRESENTATIVES
Department of Engineering, Institute of Transportation and Traffic Engineering, University of California, Los Angeles

Deceleration data, impact data, general discussion of test results.

03STAT-LC56
____
STATE LEGISLATORS CONSIDER SAFETY BELTS
Traffic Engineering
May 1956
P. 357

03UNIT-SC57
United States Congress
HEARINGS BEFORE THE HOUSE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE, 85TH CONGRESS, 1ST SESSION ON CRASHWORTHINESS OF AUTOMOBILE SEAT BELTS
1957

04 BIBLIOGRAPHIES

04ASTI- 62
ASTIA (Armed Services Technical Information Agency)
CRASH INJURY: A REPORT BIBLIOGRAPHY
Armed Services Technical Information Agency, Arlington, Virginia
1957-September 1962
AD 447 059

04CAMB-L 63
Cambeis, L.
BIBLIOGRAPHY OF IMPACT ACCELERATION LITERATURE. ANNEX TO SYNTHESIS OF IMPACT ACCELERATION TECHNOLOGY FOR AVIATION CRASH INJURY PREVENTION. (PROJECT SIAT)
United States Army Transportation Research Command, Fort Eustis, Virginia
June 1963
AD 609 939

04CLAR-CC91
Clark, C. C., et al.
A CHRONOLOGICAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFECTS OF IMPACT
The Martin Company, Baltimore, Maryland
September 1961

04CLAR-CC92
Clark, C. C.
ADDITIONS TO A CHRONOLOGICAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFECTS OF IMPACT (Appendix)
The Martin Company, Baltimore, Maryland
November 1961

04CLAR-CC93
Clark, C. C., et al.
A CHRONOLOGICAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFECTS OF IMPACT (Revised)
The Martin Company, Baltimore, Maryland
May 1962

04DEFE-DC62
Defense Documentation Center (DDC)
HUMAN TOLERANCE IN IMPACT LOADING. A REPORT BIBLIOGRAPHY 1953-SEPTEMBER 1962
Defense Documentation Center, Cameron Station, Alexandria, Virginia
1962
AD 447 060

04HANS-R 58
Hansen, R. and Cornog, D. Y.
ANNOTATED BIBLIOGRAPHY OF APPLIED PHYSICAL ANTHROPOLOGY IN HUMAN ENGINEERING
Yoh, H. L., Company, Philadelphia, Pennsylvania
WADC Tech. Rept., No. 56-30 (May 1958)
Contract AF 33(616)2353
AD 155 622

This volume contains condensations of 121 reports in the field of Applied Physical Anthropology. A majority of the annotations are grouped under three headings, Anthropometry, Biomechanics, and Comfort; a few are included in a General Group. Working data and important illustrations are quoted directly from the original papers in most cases. A complete index is arranged by author as well as by subject. An additional list of reports (not annotated) is included as background material. Two appendices containing relevant commentary on Seating Comfort and Anthropomorphic Dummies, are also included. (Author)

04LAKE-GM61
Lakeman, G. M.
SAFETY AND EMERGENCY EQUIPMENT FOR AIRCRAFT CREWS. BIBLIOGRAPHY
Technisch Documentatie en Informatie Centrum Voor de Krijgsmacht, The Hague (Netherlands)
February 1961
AD 256 063

04LAWR-ML46
Lawrence, M. L.
ANNOTATED BIBLIOGRAPHY ON HUMAN FACTORS IN ENGINEERING DESIGN
Aviation Branch, Research Division, Bureau of Medicine and Surgery, Washington, D.C.
Project X-651 (February 1946)
(ASTIA) ATI 82599

An attempt has been made to present such information as could be found concerning human factors in the operation of military equipment. Among topics considered are the following:

Anthropometric Data: Physical measurements, Dynamometric measurements.
Physiology: Bodily movements, Work performance.
Psychology: Measurements of performance, Training.
Instruments: Facing, Illumination, Methods of indication, Association, Auditory factors.
Controls: Shape and coding, Movement, Placement, Sequence of operation.
Work Place: Positioning, Visual Fields, Safety.
Group Operations.

04LIPP-S 91
Lippert, S.
PASSENGER COMFORT: A BIBLIOGRAPHY OF COMPANY LITERATURE
Douglas Aircraft Company, Santa Monica Division, Santa Monica, California
Report No. SM-20163 (26 August 1946, revised 2 November 1948)

04LIPP-S 92
Lippert, S.
A BIBLIOGRAPHY OF SEATING
Douglas Aircraft Company, Incorporated, Santa Monica, California
Report No. SM 13425 (14 December 1948)

04MCCO-IN56
McCollom, I. N. and Chapanis, A.
A HUMAN ENGINEERING BIBLIOGRAPHY
San Diego State College, California
Tech. Rept. No. 15 (November 1956)
Contract Nonr-126801
AD 122 248

CONTENTS:
- General references, methods, facilities, and equipment
- Man-machine systems
- Visual problems
- Auditory problems
- Speech communication
- Other sensory input channels
- Comparison and interaction among sensory input channels

The design of controls and integration of controls with displays
Control systems
Design and layout of workplaces, equipment, and furniture
Body measurements and movements
High mental processes
Simulators and proficiency measuring devices
Environmental effects on human performance
Behavioral efficiency, fatigue, and human capacities
Operator characteristics for specific jobs.

04PETE-GA91
Peters, G. A. and Hall, F. S.
SOURCES OF INFORMATION IN HUMAN FACTORS ENGINEERING, INCLUDING ASSOCIATED AREAS IN SYSTEM SAFETY, MAINTAINABILITY, PERSONNEL SUBSYSTEM, LIFE SCIENCES, QUALITY ASSURANCE, AND RELIABILITY ENGINEERING
Rocketdyne, Canoga Park, California
RH-3398B (15 January 1964)
N64-18490

A comprehensive listing of regulatory and guidance documents pertaining to human-factors engineering and to areas of technical overlap or interdependence is presented. The references are divided into the following groups: (1) regulatory and guidance documents—a listing of documents that specifies what should be done by human-factors activities, including various regulation, specifications, standards, manuals, instructions, and programs requirements that attempt to define the character of the contractors human-factors functions; (2) descriptive publications—a sampling of government agency reports that attempt to describe how various functions might be accomplished, review the state-of-the-art in a given area, present new methods, or list basic data that might be useful in human-factors analysis; (3) illustrative reports—a cross section of contractually required or data submittal reports, representative of what was actually accomplished, how it was done, and the type of organization or approach that was utilized; and (4) reference sources—a guide on where to go for technical information in the field of human-factors engineering.

04PETE-GA92
Peters, G. A. and Hall, F. S.
SOURCES OF INFORMATION IN HUMAN FACTORS ENGINEERING
Rocketdyne, Canoga Park, California
Rept. No. RH-3398-E (1 July 1964)
N64 27351
AD 459 767

This is a compilation of various publications related to all aspects of human-factors engineering, both military and commercial. The bibliography is divided into reference sources, regulatory and guidance documents, descriptive publications, and illustrative reports.

04PETE-GA93
Peters, G. A. and Hall, F. S.
SOURCES OF INFORMATION IN HUMAN FACTORS ENGINEERING, INCLUDING ASSOCIATED AREAS IN SYSTEM SAFETY, MAINTAINABILITY, PERSONNEL SUBSYSTEM, LIFE SCIENCES, QUALITY ASSURANCE, AND RELIABILITY ENGINEERING
Rocketdyne, Canoga Park, California
RH-3398-H (1 January 1965)
N65-15537

The 380 reference sources listed include bibliographies, directories, abstract services, journals and textbooks of technical information in the field of human factors engineering. There are 371 regulatory and guidance documents referred to, including various regulations, specifications, standards, manuals, instructions, and program requirements that attempt to define the character of the contractor's human factors functions. Ninety descriptive publications are a sampling of government agency reports that attempt to describe how various functions might be accomplished, review the state-of-the-art in a given area, present new methods, or list basic data which might be useful in human factors analyses. Sixty-five illustrative reports are a cross section of contractually required or data submittal reports that are representative of what was actually accomplished, how it was done, and the type of organization or approach that was utilized.

04RONC-PG62
Ronco, P. G.
HUMAN ENGINEERING BIBLIOGRAPHY 1960-1961
Office of Naval Research, Washington, D.C.
ONR Rept. ACR-75 (October 1962)
AD 401 667

Personnel responsible for the human factors considerations in the design and development of equipment have a major need for rapid and easy access to the literature pertinent to their work. The fact that the literature associated with human engineering derives from many different journals and periodicals as well as a host of publications from governmental, industrial, and academic laboratories presents a compelling requirement for the development of useful bibliographic aids. This bibliography is one of a planned series of annual bibliographies of literature pertinent to human engineering which has been designed to meet this requirement.

Two major considerations - ease of use and appropriate selections of material - strongly influenced this bibliography. As a result, five main parts exist: (1) a topical outline which defines over 300 topic headings established for this bibliography, (2) an index which associates the approximately 1550 bibliographic entries with the topic headings, (3) an alphabetic index of the common search terms which would aid users of this bibliography who are unfamiliar with the topic headings, (4) an a annotated bibliography of some 1550 citations, and (5) an index of the authors of these citations.

04RONC-PG63
Ronco, P. G.
A BIBLIOGRAPHY AND OVERVIEW OF HUMAN FACTORS REFERENCE WORKS
Human Factors
Volume 5
1963
Pp. 549-468

Presentation of current bibliography prepared from references that actually exist in the files of the Human Engineering Information and Analysis Service at Tufts University. The bibliography is composed of four sections: (1) books, (2) bibliographies, (3) reports, and (4) journals. The current status of reference works in the field of human factors is evaluated.

04SILV-MB62
Silverman, M. B.
ACCIDENTS AND SAFETY MEASURES. A REPORT BIBLIOGRAPHY
Armed Services Technical Information Agency (ASTIA)
June 1962
AD 277 600

05 USER CHARACTERISTICS

05BLOM-GW61
Blomgren, George W., and Scheuneman, T. W.
PSYCHOLOGICAL RESISTANCE TO SEAT BELTS; A DISCUSSION AND EXPERIMENTAL STUDY OF THE VARIABLES RELATED TO EFFECTIVE SEAT BELT ADVERTISING
Northwestern University, Traffic Institute, Evanston, Illinois
1961
42 p.

05BRAN-GC30
Brandenburg, G. C., and Swope, A.
PRELIMINARY STUDY OF RIDING QUALITIES
SAE Journal
Vol. 27, No. 3 (September 1930)
Pp. 355-359

05BREE-C 38
Breer, C.
HUMAN BEINGS AND THE MOTOR CAR
Journal of Applied Physics
Vol. 9 (July 1938)
Pp. 433-437

05BROW-RW35
Brown, R. W., and Dickinson, H. C.
CRITERIA ARE SET FOR RIDING COMFORT RESEARCH
SAE Journal
Vol. 37, No. 2 (August 1935)
Pp. 20-23

05BROW-RW40
Brown, R. W.
ENGINEERING PROPERTIES OF RUBBER IN COMPRESSION
SAE Journal
Vol. 47, No. 4 (October 1940)
Pp. 432-434

05CALI-PH65
California Department of Public Health
SEAT BELTS: OWNERSHIP AND USAGE, STATISTICAL SUPPLEMENT
California Department of Public Health, Family Research Center
1965

05COMF-I 33
____
COMFORT INDEX
Automotive Industries
Vol. 68, No. 25 (June 24, 1933)
Pp. 758-762

05DAMO-A 44
Damon, A., and Randall, F. E.
PHYSICAL ANTHROPOLOGY IN THE A.A.F.
American Journal of Physical Anthropology
Vol. 2, No. 3 (September 1944)

(05DEHA-H 52: see 08DEHA-H 52)

05DILL-DB33
Dill, D. B.
THE NATURE OF FATIGUE
Personnel
Vol. 9 (May 1933)
Pp. 113-116

05DREY-H
Dreyfuss, Henry
DESIGNING FOR PEOPLE
Simon and Schuster, New York

(05GELL-CF60: see 01GELL-CF60)

(05GODD-GE22: see 07GODD-GE22)

05GRIM-G 65
Grime, G.
THE USE OF SEAT BELTS IN BRITAIN. (In 7th Stapp Car Crash Conference)
1965
Pp. 465-467

This is a report advocating the use of diagonal belts in preference to lap belts and citing their value especially in head-on collisions.

05HANA-EP64
Hanavan, E. P., Jr
A MATHEMATICAL MODEL OF THE HUMAN BODY
Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio
AMRL-TR-64-102 (October 1964)
AD 608 463

A mathematical model for predicting the inertial properties of a human body in various positions was developed. Twenty-five standard anthropometric dimensions are used in the model to predict an individual's center of gravity, moments and products of inertia, principal moments, and principal axes. The validity of the model was tested by comparing its predictions with experimental data from 66 subjects. The center of gravity was generally predicted within 0.7 inches and moments of inertia within 10 percent. The principal vertical axis was found to deviate from the longitudinal axis of the body by as much as 50 degrees, depending on the body position assumed. A generalized computer program to calculate the inertial properties of a subject in any body position is presented. The inertial properties of five composite subjects in each of 31 body positions is offered as a design guide. IBM 7094 digital computer programs are appended.

05HERT-HT58
Hertzberg, H.T.E., Dupertuis, C.W., and Emanuel, I.
STEREOPHOTOGRAMMETRY AS AN ANTHROPOMETRIC TOOL
Wright Air Development Center, Wright-Patterson Air Force Base, Ohio
WADC Technical Report 68-67 (February 1958)
AD 150 964

This paper briefly reviews previous biological applications of sterophotogrammetry, and outlines with illustrations the present procedures used to draw human body contours at 1/2 inch intervals. It compares the dimensions derived from plotted profiles with those taken by hand on the subjects themselves. It discusses the utility of stero data for special anthropometric purposes, and mentions further applications for other biological sciences.

05HERT-HT59
Hertzberg, H. T.
THE ANTHROPOMETRIC SURVEY: ITS MILITARY AND COMMERCIAL POTENTIALS
Committee on Anthropometry, AGARD, NATO
November 1959

The design range of a population cannot be adequately known without sound anthropometric data on that population. Design from anything less becomes guesswork. This is the major reason for taking a large number of body dimensions in an anthropometric survey; the resulting knowledge of overall body proportions, both standing and sitting, makes it possible to design general items for either type of endproduct, thus greatly increasing the value of the survey.

05HUMA-VI52
____
HUMAN VARIABLES IN THE DESIGN AND OPERATION OF HIGHWAY TRANSPORT EQUIPMENT
SAE Symposium on Packaging the Passenger, Detroit, Michigan
SAE Preprint 717 (1952)

05JACK-HM36
Jacklin, H. M.
HUMAN REACTIONS TO VIBRATION
SAE Journal
Vol. 39, No. 4 (October 1936)
Pp. 401-408

05KAHN-F 43
Kahn, F.
MAN IN STRUCTURE AND FUNCTION, VOL. 1
Alfred Knopf Company, New York
1943

05KEIG-G 46
Keighley, G.
VIBRATION SENSE AND FATIGUE
Milbank Memorial Fund Quarterly
Vol. 24, No. 1 (January 1946)
Pp. 29-35

05KING-BG51
King, B. G.
ANTHROPOMETRIC DATA IN RELATION TO EQUIPMENT AND HUMAN-SIZING PROBLEMS
C.A.A., Washington, D.C.
June 1951

The compilation and use of physical and physiological measurements of man in relation to the design of equipment offer an approach for reducing accidents. In order to improve the ease, efficiency, and safety of operations of all types of equipment, consideration will be given to (1) the application of anthropometric data to design, (2) sources of anthropometric data, and (3) dynamic body measurements.

05LAY -WE41
Lay, W. E.
RIDING COMFORT
Michigan Technic
Vol. 59, No. 8 (May 1941)
Pp. 9-11, 32

05LOWM-CL41
Lowman, C. L.
SITTING POSITION IN RELATION TO PELVIC STRESS
Physiotherapy Review
Vol. 21 (January - February 1941)
Pp. 30-33

05MANH-D 66
Manheimer, Dean, Millinger, Glen D., and Crossley, Helen M.
A FOLLOW-UP STUDY OF SEAT BELT USAGE
Traffic Safety Research Review
Vol. 10, No. 1 (March 1966)

Detailed personal interviews were conducted with approximately 900 seat belt owners and an equivalent number of non-owners in Greater Oakland, California. This article focuses primarily on patterns of seat belt use among owners and on changes in habits of use over time. Regular users and those who use belts less regularly are compared with respect to personal background, psychological make-up and acceptance of specific arguments for and against seat belts.

Among drivers whose cars were equipped with belts, comparative data are also presented on use of seat belts by those who participated in the decision to purchase belts and those who did not. Author

05MAYE-AF55
Mayerhofer, A. F.
SEAT BELT ACCEPTANCE SURVEY
Spector Mid-States Freight Lines., Inc., Chicago, Illinois
September 1955

05MCCO-FP58
McCourt, F. P.
AN ANALYSIS OF SOME HUMAN FACTORS TO BE CONSIDERED IN DEVELOPING PROTECTIVE DEVICES FOR ARMY AVIATORS
Headquarters Quartermaster Research and Engineering Command, Natick, Massachusetts
January 1958

05MCCO-IN56
McCollom, I. N.
FINAL REPORT
San Diego State College, California
Contract Nonr-126801
1 December 1956
AD 118 905

Work involved in compiling a human engineering guide for equipment design is outlined. Bibliographies, abstracts, translations, experimental studies, and special reports were prepared in the following areas: (1) comparison and interaction among sensory input channels (AD-95 131); (2) disorientation; (3) effect on human performance of acceleration, motion, and vibration; (4) effect on human performance of ventilation, temperature, and humidity; (5) man-machine integration (AD-106 677); (6) motion sickness (AD-95 139) and therapeutic drugs; (7) simulators and proficiency measuring devices; (8) speech communication; (9) systems considerations; and (10) work and fatigue (AD-95 133, AD-95 137). A special human-engineering bibliography of 5600 entries was assembled and published.

05MCCO-JT63
McConville, J. T., and Alexander, M.
ANTHROPOMETRIC DATA IN THREE-DIMENSIONAL FORM: DEVELOPMENT AND FABRICATION OF USAF HEIGHT-WEIGHT MANIKINS
6570th Aerospace Medical Research Laboratory, Aerospace Medical Division, Wright-Patterson Air Force Base, Ohio
Rept. No. AMRL-TDR-63-55 (June 1963)
AD 411 556

This report describes the development of data and the sculpturing of manikins for use in designing Air Force protective garments and associated personal equipment, as part of a long-range program to present designers of protective flight equipment with a variety of anthropometric data in three-dimensional form. In part, the data are based on a re-analysis of the body statistics reported in WADC Technical Report 56-365, A Height-Weight Sizing System for Flying Clothing, with certain changes in the statistical rationale required by either functional or technical factors. The choice and application of the statistical data used are discussed in detail. Information is also given concerning the sculpturing techniques used in the fabrication of the body forms. Supplementary anthropometric statistics describing the human body in a seated position are presented. The statistics are analysed in accordance with the Eight-Size Height-Weight sizing system.

05MCFA-RA53
McFarland, R. A., et al.
HUMAN BODY SIZE AND CAPABILITIES IN THE DESIGN AND OPERATION OF VEHICULAR EQUIPMENT
Harvard School of Public Health, Boston, Massachusetts
1953

The purpose of this manual is to enable medical and engineering officers in the

Armed Forces and civilian manufacturers to guide and evaluate the design of land vehicles with respect to how the operator's body size and movements affect his efficiency, safety, and health. Designers of vehicles of all types, including trucks, tractors, cranes, tanks, etc., in industry as well as in the military services should find this data useful.

05MCFA-RA54
McFarland, R. A.
HUMAN-ENGINEERING ASPECTS OF SAFETY
Mechanical Engineering
Vol. 76 (1954)
Pp. 400-410

Engineering and biological sciences are being integrated in the field of study referred to as "human engineering." A primary objective is to improve safety by designing equipment in terms of human capabilities and limitations—to design machines from the man outward. Thus instruments and controls may be considered as extensions of his nervous system and body appendages. One of the first steps in insuring safety on the job is to make an analysis of what is required of the individual and to study the more critical features of each job. Also, anthropometric data should be recorded and used by engineers in their designs and in a dynamic setting.

05MCFA-RA55
McFarland, R. A., and Stoudt, H. W.
PHYSICAL VARIABLES INFLUENCING DRIVER COMFORT. (In Harvard School of Public Health, "Efficiency and Safety")
March 1, 1955

05MCFA-RA56
McFarland, R. A.
HUMAN FACTORS IN HIGHWAY TRANSPORT SAFETY
SAE Transactions
Vol. 64 (1956)
Pp. 730-747

A broad research program in the field of highway safety has been in progress at the Harvard School of Public Health during the past six years. Since 1951 the Commission on Accidental Trauma of the Armed Forces Epidemiological Board, Department of Defense has sponsored research on the human factors in vehicular accidents at Harvard and at a number of other universities and research institutions. Thus far the research program has stressed basic causes in the areas of: 1. Identifying traits of personality and behavior which lead to repeated errors. 2. Defects in the design of equipment (human engineering). 3. Injuries and fatalities resulting from vehicular crashes. 4. Mathematical studies of the various inter-relationships of contributory causes in accidents. An extensive review of these and other studies of human factors in highway safety, which has recently been completed as a part of this project, is given here.

05MCFA-RA60
McFarland, R. A., and Stoudt, H. W.
HUMAN BODY SIZE AND PASSENGER VEHICLE DESIGN
Society of Automotive Engineers, Inc., New York, New York
Rept. No. AP 142A (1960)

This study deals with the derivation of seat and workspace dimensions of passenger cars from anthropological data descriptive of the general driving public. The 5th, 50th, and 95th percentiles of static body measurements of passenger-car drivers are interpolated from selected anthropometric studies on various segments of the United States population. The manner of utilizing such data in car design is discussed in general and specifically in regard to dimensions for driver's seat and workspace. Additional aspects of seat design, such as seat comfort, are mentioned.

05MEAD-LC52
Mead, Leonard C.
HANDBOOK OF HUMAN ENGINEERING DATA—SECOND EDITION (REVISED)
Institute for Applied Experimental Psychology, Tufts College
Under Contract for the Special Devices Center
1952
AD 43 650

Up to the present, we have been able to keep up with technological progress by education and training. But we have now reached the point where the machine has dwarfed the man, for the characteristics of the individual—the human machine—have not changed in the memory of man and will not change for countless generations to come, while the man-made engine is capable of ever increasing power, scope, and speed of operation. Our machines must be manned by the average human being, their operator must be governed by his capabilities under the influence of mental stress, fatigue, and sudden change: consequently the average man's capabilities must be analyzed, measured and made available to the designer and engineer to make good our progress from now on. This book represents only the beginning of what is hoped to be a continuing and ever expanding compilation of data which will provide the planner and designer with the probable characteristics of the average individuals who will man the machines of the future.

(05MORR-CW47: see 07MORR-CW47)

05NATI-SC60
National Safety Council
FINAL REPORT—SURVEY OF SEAT BELT USE AMONG MOTOR VEHICLE FLEET OPERATORS, WHO ARE NATIONAL SAFETY COUNCIL MEMBERS
Traffic Safety Research Review Supplement
December 1960
P. 14-17

also

National Safety Council, Traffic Operations Division
1960
7 p.

(05NOBL-H 61: see 07NOBL-H 61)

05POST-F 44
Postlethwaite, F.
HUMAN SUSCEPTABILITY TO VIBRATION
Engineering
Vol. 157, No. 4072 (January 28, 1944)
Pp. 61-63

(05RADK-AO56: see 07RADK-AO56)

05SANT-WR63
Santschi, W. R., Dubois, J., and Omoto, C.
MOMENTS OF INERTIA AND CENTERS OF GRAVITY OF THE LIVING HUMAN BODY
Behavioral Sciences Laboratories, 6570th Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio
AMRL-TDR-63-36 (May 1963)
AD 410 451

A study was conducted to determine the moments of inertia and centers of gravity of a sample of 66 living male subjects representative of the Air Force population in stature and weight. Eight body positions were investigated: Standing; Standing, Arms Over Head; Spread Eagle; Sitting; Sitting, Forearms Down; Sitting, Thighs Elevated; Mercury Configuration; Relaxed (Weightless). The procedure was based upon the compound pendulum having a theoretical accuracy of approximately ± 2 to ± 8 per cent depending upon position and axis. Orthogonal axes, defined as the intersections of the sagittal, frontal, and transverse planes through the standing body, were designated as X, Y, and Z. A set of 50 anthropometric dimensions was taken on each subject, as well as photographs of each subject in each position. Results of the study show that the average moment of inertia varied in this sample from 11 lb. in sec.^{2} about the Z axis to 152 lb. in sec.^{2} about the X axis. Linear regression analysis of moments of inertia vs. stature and weight yielded correlation coefficients ranging between 0.77 and 0.98.

05SCHI-R 41
Schilling, R., and Fuchs, H. O.
MODERN PASSENGER CAR RIDE CHARACTERISTICS
Journal of Applied Mechanics
Vol. 8, No. 2 (June 1941)
Pp. A49-A66

(05SCHO-BR64: see 08SCHO-BR64)

05SCOT-BY63 (08SCOT-BY63)
Scott, B. Y.
HOW WILL DRIVERS REACT TO FACTORY-INSTALLED SEAT BELTS? STUDY CONDUCTED IN WISCONSIN BY NEW YORK STATE YIELDS CLUES
Traffic Safety
Vol. 63, No. 6 (1963)
Pp. 11-12, 37

also

Road Abstracts
Vol. 30, No. 12 (1963)
P. 288

05SEAT-BI61

SEAT BELT INSTALLATION AND USE POLL
Highway Traffic
September 1961
P. 17

05SIED-RR62
Siedell, R. R., and Guadagnolic, M. J.
METHOD OF PREDICTING CENTER OF GRAVITY AND MASS MOMENT OF INERTIA OF THE HUMAN BODY IN ANY POSITION
Paper, Twenty-First National Conference of the Society of Aeronautical Weight Engineers, Incorporated, Seattle, Washington (May 14-17, 1962)
Tech. Paper No. 319

The accurate prediction of mass moment of inertia of the human being has considerable influence on small space vehicles and systems during preliminary design. Modern weight accounting methods have been accomplished by the use of an IBM machine for inertial computations. Body segmentation provides shapes more suited for inertial calculations, thereby producing better results and flexibility for various body positions. Therefore, special consideration should be given to body segment weights and mass distributions as a primary objective in future anthropology studies concerning dismemberment techniques.

05SNYD-RG66 (06SNYD-RG66)
Snyder, Richard G., Snow, Clyde C., Crosby, M.D., Hanson, Capt. Peter, Fineg, Maj. Jerry, D.V.M., and Prine, Lt. Col. James, D.V.M.
IMPACT INJURY TO THE PREGNENT FEMALE AND FETUS IN LAP BELT RESTRAINT. (In 10th Stapp Car Crash Conference)
November 1966
Pp. 151-155

Although it has been well established that the lap (seat) belt offers considerable protection against injury or death in crash environments, there has long been controversy over the injury potential to the pregnant female. This question is of importance in consideration of restraint and seat protective environments for both aircraft and automotive vehicles. Most of the 4 million pregnant women per year in the United States travel by automobile, with a large number traveling by Commercial Civil Aircraft or the Military Air Transport Service. Thus a sizeable population is involved.

This combined study by the Civil Aeromedical Institute, F.A.A., 6571st Aeromedical Research Laboratory, Holloman Air Force Base, and the University of Oklahoma School of Medicine, has been concerned with the clinical, experimental, and applied aspects. Tests utilizing pregnant baboons (Papio doguera) have been run on the Holloman Air Force Base Daisy Decelerator, and clinical case histories have been obtained in automotive accidents involving late term pregnant women through cooperation of the California and Oklahoma Highway Patrol and individual obstetricians. This paper will outline the medical evidence for concern and note the experimental findings to date.

(05STER-A 66: see 08STER-A 66)

05STER-S 61
Sternick, S., Stimmel, D. T., and Sattinger, I. J.
HUMAN REACTION TO MILITARY VEHICLE RIDE
Institute of Science and Technology, The University of Michigan, Ann Arbor, Michigan
Report No. 2889-17-F (January 1961)
AD 250 099

The results of an investigation conducted at Willow Run Laboratories (now Institute of Science and Technology), of The University of Michigan, into the effects of ride on both passengers and crewmembers of military ground vehicles are described. A general analysis of these effects is given as a basis for defining the problems associated with vehicle ride and of recommending an experimental program to obtain quantitative information on the effects of ride on comfort and performance. Test techniques and test equipment requirements for comfort tests using the Method of Adjustment and for performance tests using tracking, driving, visual recognition, and information handling tasks are outlined. These tests are based on the use of a vehicle-motion simulator which would subject human beings to prescribed sinusoidal and transient motions. As an example of how the various test phases can be performed, a suggested first year's test program is developed to obtain data on the subjective evaluations of sinusoidal and nonsinusoidal motions in pitch and roll.

05TEA -CA33
Tea, C. A.
CHRYSLER RIDING QUALITY ACCELEROMETER
SAE Journal
Vol. 32, No. 3 (March 1933)
Pp. 24-26

05UNIT-SP41
United States Public Health Service
FATIGUE AND HOURS OF SERVICE OF INTERSTATE TRUCK DRIVERS
United States Public Health Service, Washington, D.C.
United States Public Health Service Bulletin No. 265 (1941)

(05WACH-RA59: see 07WACH-RA59)

05WEIN-AP38
Weinbach, A. P.
CONTOUR MAPS, CENTER OF GRAVITY, MOMENT OF INERTIA AND SURFACE AREA OF THE HUMAN BODY
Human Biology
Vol. 10, No. 3 (1938)
Pp. 356-371

The construction of volume contour maps of the human body offers a means of following the relative growth of the parts of the individual. The center of gravity or its parts may be determined approximately from these maps. The volume contour maps are obtained by means of direct measurement or by the use of two photographs, one a front view, the other a side view. A detailed account is presented of the following tasks: volume contour maps from photographs; volume contour maps from direct measurements; center of gravity from volume contour map; moment of inertia from volume contour map; surface area from photographs; and surface area from direct measurements.

(05WISN-A 64: see 07WISN-A 64)

05WOOD-WE54
Woodson, Wesley E.
HUMAN ENGINEERING GUIDE FOR EQUIPMENT DESIGNERS
University of California Press, Berkeley, California
1954

05WOLF-RA61 (08WOLF-RA61)
Wolf, Robert A.
THE EFFECTIVENESS AND USE OF SEAT BELTS IN THE UNITED STATES
NSC Transactions
Vol. 24 (1961)
Pp. 28-36

06 INJURY

06ABDO-IF65

ABDOMINAL INJURIES FROM AUTO BELTS CITED
Medical Tribune
December 15, 1965
P. 26

06ACIR-FS62 (07ACIR-FS62)
ACIR Flight Safety Foundation
MILITARY TROOP SEAT DESIGN CRITERIA: REPORT OF CRASH INJURY EVALUATION
ACIR, Flight Safety Foundation, Inc., Phoenix, Arizona
Rept. No. AvCIR 62-9 (November 1962)

06ALDM-B 62
Aldman, Bertil
BIOLOGICAL TOLERANCE IN DECELERATION CAR SAFETY BELTS
International Road Safety Congress, Theme 5; Special Reports, etc.
1962
OTA
1 p.

(06ALDM-B 62: see 01ALDM-B 62)

06BABI-RW56
Babione, R. W.
ACCIDENTAL DEATHS IN MILITARY VEHICLES. In Relation to the Use of Seat Belts.
United States Armed Forces Medical Journal
Vol. 8, No. 10 (October 1956)
Pp. 1500-1505

Deaths of Navy and Marine Corps personnel in government-owned ground vehicles are analyzed for a three-year period. More than half of these (41 out of 72) occurred in open-top military-type vehicles, a higher proportion than would be expected during peacetime. Provision of seat belts in open-top vehicles would probably not have reduced but would more likely have increased these fatalities. In only five deaths did this type of vehicle remain upright when involved in an accident, whereas in 33 it rolled over. By comparison, 10 persons who escaped death in rollover accidents by being thrown out would probably have been killed if they had been kept in by seat belts.

In hard-top vehicles involved in accidents, 15 of 20 deaths would probably have been prevented if the victim had been wearing a seat belt, although in two cases he was too drunk to have used one. In 12 of the deaths, the victim was thrown from the cab, with or without rollover. Front seat passengers in ambulances appear to be especially at risk when not provided with seat belts.

Seven deaths, or one out of 10, occurred in falls from fire and crash trucks when the vehicle was merely making a turn. In two of these, the man slid off a seat. In these two cases, seat belts would certainly have prevented the accidents had they been worn. Quick-release belts for standees should also be considered for this type of vehicle.

If seat belts are used in hard-top vehicles, potential monetary savings on deaths alone amount to $470,000 in three years. In addition, many serious and costly injuries would be prevented.

Weighing the cost of preventive measures against their savings, both in deaths and in the far more frequent nonfatal but costly injuries, requires more detailed reporting of the causes of trauma in serious and fatal vehicular accidents.

06BARE-CJ57
Barecki, C. J.
AUTO-CRASH SAFETY RESEARCH
American Seating Company, Grand Rapids, Michigan
1957

In analyzing the prevention of injury to an automobile occupant during crash deceleration, it seems logical that the answer should be based on natural physical laws pertaining to motion and energy. The occupant's motion must be suspended until the energy of the impact is dissipated or absorbed. The device developed by the American Seating Company, as described, is based on this logic. The adaptation of this inertia-locking body-restrainer will not require any modification in automobile design. Although the cost of this device will be higher in comparison with the lap belt alone, the benefit in human life and welfare should be worth any investment.

06BENS-0043
Benson, O. O.
CRASH INJURIES
Aero Medical Laboratory, Wright Field, Dayton, Ohio
January 13, 1943

The Aero Medical Laboratory of the Engineering Division, Materiel Center, is interested in gathering information on crash injuries in order that a program dealing with preventive measures may be developed. In order to obtain this information the Chief of the laboratory sent questionnaires to Flight Surgeons. The questionnaires dealing with crash injuries and the returned answers are included in this publication.

06BEZR-AA61
Bezreh, A. A.
ARMY EXPERIENCE WITH CRASH INJURIES AND PROTECTIVE EQUIPMENT
Paper, Symposium on Biomechanics of Body Restraint and Head Protection, Naval Air Materiel Center, Philadelphia, Pennsylvania
June 14-15, 1961

Reports data representing some features of Army experience, as a user of light fixed wing aircraft and of helicopters, with respect to crash injuries and protective equipment. Because of the performance characteristics of Army aircraft such as relatively low speed, most accidents, approximately 97%, are theoretically survivable. However, far less accidents are actually survived. The development and incorporation of crashworthiness characteristics and improved personal protective equipment, therefore, is of crucial importance if the discrepancy between survivable and survived accidents is to be eliminated.

Some statistical findings are given which illustrate the effectiveness of items of personal protective equipment. Injury patterns are given with respect to injury severity, type, and location; and a comparison between fixed wing and rotary wing injury patterns reveals no striking differences, except that injuries incurred in helicopter accidents appear to have been somewhat more when used in the position of a seat type parachute.

The dramatic effect of post-crash fire upon mortality is illustrated statistically. Although only 5.7% of all major accidents, both fixed and rotary wing, were complicated by post-crash fire, this relatively small percent of accidents accounted for 49.6% of all fatalities, pointing out the serious need for crash-resistant fuel systems.

06BIER-HR46
Bierman, H. R. and Larsen, V. R.
REACTIONS OF THE HUMAN TO IMPACT FORCES REVEALED BY HIGH SPEED MOTION PICTURE
Naval Medical Research Institute, Bethesda, Maryland
Rept. No. 5 (25 April 1946)
Research Project X-630

also

J. Aviation Med.
Vol. 5, No. 5 (1946)
Pp. 407-412

The effects of impact upon human subjects on the impact decelerator were studied by high speed cinematography. The motion pictures were taken at a rate of 3,000 frames a second. Interpretation of these films has shown that the pilot's conventional shoulder straps elongate under impact load simultaneously with the shortening of the long axis of the body. This causes the straps to slide over the skin during the onset of impact. The widening of the transverse axis of the body has been observed during impact. The compression of the body under a maximal impact load of 3,500 lbs. is estimated to be 5.5 centimeters. With the seat free to rotate, rapid accelerations of the head and neck have been obtained and a temporary alteration of the facial contour has been observed during impact. Various forms of weave transmissions in the skin and underlying tissues have been observed during impact.

06BRAU-PW91
Braunstein, P. W.
MEDICAL ASPECTS OF AUTOMOTIVE CRASH INJURY RESEARCH
J.A.M.A.
Vol. 163, No. 3 (1957)
Pp. 250-255

06BRAU-PW92
Braunstein, P. W., Moore, J. O., and Wade, P. A.
PRELIMINARY FINDINGS OF THE EFFECT OF AUTOMOTIVE SAFETY DESIGN ON INJURY PATTERNS
Surgery, Gynecology and Obstetrics
Vol. 105, No. 3 (September 1957)
Pp. 257-262

Several thousand cases of injury-producing automobile accidents have been studied. The incidence of multiple injuries as well as multiple body areas injured is striking. Specific objects that cause injuries following crash impact are discussed and their relative importance is listed. Recent safety design engineering in its relative infancy apparently has decreased frequency and severity of injury as determined by the preliminary comparison with representative control data.

Seat belts, as studied in 162 cases of automobile accidents, seem to lessen dramatically the severity and frequency of injuries. It is believed that these forward steps in safety design have been concrete in their accomplishments. This type of engineering solution is based on medical findings and when linked with public acceptance of the inherent value of such protection may well lessen the toll on the lives and well-being of more than 150 million people who use the automobile as the common denominator of transport. (Author)

06BRAU-PW93
Braunstein, Paul W., and Moore, John O.
THE FALLACY OF THE TERM "WHIPLASH INJURY"
American Journal of Surgery
Vol. 97 (April 1959)
Pp. 522-529

06CAMP-HE64
Campbell, H. E.
THE AUTOMOBILE SEAT BELT AND ABDOMINAL INJURY
Surgery, Gynecology, and Obstetrics
Vol. 119 (1964)
Pp. 591-592

06CART-RL59
Carter, R. L.
HUMAN TOLERANCE TO AUTOMATIC POSITIONING AND RESTRAINT SYSTEMS FOR SUPERSONIC ESCAPE
North American Aviation, Inc.
Rept. No. NA5H-220 (22 April 1959)

06COCK-WM63
Cocke, William M. and Meyer, Kenneth
SPLENIC RUPTURE DUE TO IMPROPER PLACEMENT OF AUTOMOBILE SAFETY BELT
The Journal of the American Medical Association
February 23, 1963
P. 167

06CORN-GA61
Cornell-Guggenheim Aviation Safety Center
RELATIONSHIP BETWEEN IMPACT VARIABLES AND INJURIES SUSTAINED IN LIGHTPLANE ACCIDENTS
Cornell-Guggenheim Aviation Safety Center, New York
AVCIR 61-5 (August 1961)
DA 44 177TC707
AD 263 676

Impact conditions are related to injuries sustained by 248 occupants involved in lightplane crashes.

Seat tie-down and belt restraint were considered effective and structural collapse was generally not extensive, yet one of every four occupants was killed. Injury severity, fatality rate, and incidence of injury to all areas of the body--except the lower torso and thoracic-lumbar spine--were directly related to impact velocity and to angle of impact but inversely related to stopping distance. Lumbar and thoracic spine injuries occured more frequently in low angle, long deceleration crashes. It was concluded that crucial injuries largely stem from flailing of the body against injury-producing structures within the occupant's environment. Belt restraint is thus seen to play only a moderate role in reducing injury severity. The need for additional safety measures is emphasized. (Author)

06CRAS-IR47
Crash Injury Research
THE RARE OCCURRENCE OF INTERNAL ABDOMINAL INJURY FROM SAFETY BELTS OR OTHER CAUSES IN SERIOUS AIRCRAFT ACCIDENTS
Crash Injury Research, Phoenix, Arizona
October 1947

06DEHA-H 48
DeHaven, H.
CAN THE HUMAN BODY TOLERATE VIOLENT CRASHES?
Research Reviews
15 May 1948
Pp. 18-25

In order to determine the basic dangers of crash force, and the relationship between structure and force that causes or spares serious or fatal injuries in survivable aircraft accidents, a research project was undertaken in 1942 by the Cornell Committee on Air Safety Research. In addition to studying typical causes of injury in survivable accidents, the Project has made estimates of the force of deceleration which is transmitted to the occupants of ships by the safety belt and shoulder harness, and the magnitude of force that can be tolerated by the human body. It was found that one of the surest causes of dangerous crash-injury is the failure of surrounding cabin structure. The human body can tolerate severe crash loads and many crash fatalities in survivable accidents result solely from a collapse of structure. However, most aircraft have been designed solely with the thought of increasing safety in flights.

06DEHA-H 52
DeHaven, H.
CRASH STUDY CAN REDUCE CHANGES OF INJURY
Public Safety
June 1952
Pp. 8-9, 28-29

In order to provide a program for the prevention of traffic accidents, the causes of accidents must be collected and studied. Furthermore, usable data must be developed on the causes of injuries in accidents if safety engineers are to include features in motor cars which will reduce the chances of injuries in crashes. The first principle followed by safety packaging engineers in designing automobiles and airplanes is that the package should not open up and spill its contents and should not collapse under expected conditions of force and thereby expose objects inside it to damage. The second principle is that packaging structures which shield the inner container should resist force by yielding and absorbing energy. The third principle provides that articles in the package should be held and immobilized inside the outer structure. The fourth principle is that wadding, blocks or means for holding an object inside a shipping container must transmit forces to the strongest parts of the contained objects.

06DEHA-H 53
DeHaven, H., Tourin, B., and Macri, S.
AIRCRAFT SAFETY BELTS: THEIR INJURY EFFECT ON THE HUMAN BODY
Crash Injury Research, Cornell University Medical College, New York, New York)
July 1953
AD 14 643

An examination was made of the injuries sustained by 1039 survivors of 670 light-plane crashes. Chi-square methods were employed in statistical analyses to relate the use of the belt and body injuries of survivors. Safety belts were shown to be an infrequent cause of injury and to serve as effective protection. Severe snubbing action of safety belts as seen in 80 cases showed no significant correlation with the occurrence of intra-abdominal and lumbar spine injuries. Critical intra-abdominal and lumbar spine injuries appeared related to each other and to vertically acting forces. Bruises and minor contusions were attributable to safety belts. Injuries which occurred without any signs of snubbing were jolt loads transmitted by supporting structures and seats. Injuries of the upper and lower torso were associated with and increased by failure of safety belt installations. The percentage of all trunk injuries sustained by users and nonusers of safety belts was similar. No increased frequency was observed in injuries to the torso, neck and spine by the use of the belt. Survivors not using safety belts suffered more serious injury than those that used them. Upper and lower torso injuries were also related to failure of belt installations. Dangerous-to-life injuries of head and body were associated and increased with vertical crash forces.

06DEHA-H 60 (10DEHA-H 60)
DeHaven, H.
CRASH DECELERATION, CRASH ENERGY, AND THEIR RELATIONSHIP TO CRASH INJURY.
Medical College, Cornell University
TR 6242 (December 1960)

06DELV-RJ63
Del Vecchio, R. J.
PASSENGER TOLERANCE TO TRANSVERSE ACCELERATION AND DECELERATION FORCES (EYE-BALLS IN; EYE-BALLS OUT)
National Aerospace and Space Administration, Washington, D.C.
N64-22075 (21 February 1963)

An investigation of the tolerance of a passenger to acceleration or deceleration (using a lap belt and shoulder harness for restraint) is discussed. The investigation used as subjects young flying personnel. Conclusions are as follows: (1) lap belts and shoulder harnesses are absolutely necessary for body restraint and tolerance to gravity forces. (2) Restraint-system tension depends upon the physical stature and conditioning of the passenger. (3) Young, healthy men and women can tolerate up to 5.5 g for a time duration of 4 minutes. (4) It is practically impossible to state a universal g tolerance for all types of passengers under all statures and physical conditions.

06DOWL-JJ64
Dowling, J. J.
"WHIPLASH" INJURIES.
American Association of Industrial Nurses Journal
Vol. 12, No. 12-15 (May 1964
Pp. 34-35

Various aspects of the mechanics of whiplash injury are discussed in the light of more recent information. Sites of injury in the neck and vertebral column are identified and discussed from a clinical point of view. Symptoms and specific effects in damaged areas are described. The significance of diagnosis by X-ray is stressed, and treatment by immobilization and rest recommended.

(06DYE -ER50: see 10DYE -ER50)

(06DYE -ER56; see 10DYE -ER56)

06FASO-A 50
Fasola, A.
ANATOMICAL TOLERANCE OF THE HUMAN PECTORAL GIRDLE TO RAPID DECELERATION.
Ohio State University, Master's Thesis
1950

The structures of the human pectoral girdle were subjected to stress, the force pounds being recorded by both mechanical and electronic means. The structures of the scapula- coracoid, acromion and coraco-acromial ligament are vulnerable to forces of approximately 170, 170, and 200 pounds respectively (dry state). An additional force of about 40 pounds is necessary to cause fracture in the fresh state. Two experiments on the intact human (cadaver) with safety harness adjusted in the axillary region were subjected to stresses of 5400 pounds in one test and 4000 pounds in the second test with a period of energy absorption equal to about 0.100 second. The nature of the fracture of the processes of the scapula and nature of the tear of the capsule showed strikingly similar results in both the isolated and intact state. Since, however, the auxillary region appears so dangerously vulnerable to forces of approximately 2000 pounds, this region alone is not suitable for the location of industrial safety belts.

06FISH-P 91
Fisher, P.
AUTOMOBILE INJURIES, A NATIONAL EPIDEMIC
Archives of Environmental Health
Vol. 9, No. 6 (December 1964)
Pp. 798-805

also

United States Navy Medical News Letter
Vol. 45, No. 3 (February 12, 1965)
Pp. 13-18

A comprehensive review of the present status of knowledge of factors relating to automobile injuries is presented. The general disregard of proved safety measures is emphasized. Suggestions for significantly lessening the incidence and degree of injury and frequency of fatality are presented. Most prominent among these is restraint--the seat belt. Almost as important, but much less easily achieved in view of past failures, is the need for better automobile design, inside and out.

06FISH-P 92
Fisher, P.
CRITICAL INJURIES PRODUCED BY SEAT BELTS
Paper, American Association for Automotive Medicine
October 1964
4 pp.

06FISH-P 93
Fisher, Peter
INJURY PRODUCED BY SEAT BELTS: REPORT OF 2 CASES
Journal of Occupational Medicine
May 1965
Pp. 211-212

06FRAZ-RG61
Frazier, Robert G.
HAZARDS TO HEALTH: EFFECTIVENESS OF SEAT BELTS IN PREVENTING MOTOR-VEHICLE INJURIES
New England Journal of Medicine
June 15, 1961

06FREE-HE62
Freeman, Howard E., Boyce, William C., and Gell, C. F.
INVESTIGATION OF A PERSONNEL RESTRAINT SYSTEM FOR ADVANCE MANNED FLIGHT VEHICLES
Chance Vought Corporation, Dallas, Texas
December 1962
AF 33 600 41418
6570 AMRL TDR62 128
AD 296 896

Design of personnel restraint systems for advanced manned flight vehicles. Human tolerance to acceleration and structural analysis of the human body.

06GANS-RV66
Ganslen, Richard V.
HUMAN TOLERANCE TO AUTOMATIC RESTRAINT HARNESS ACTIVATOR FORCES. (In 9th Stapp Car Crash Conference)
1966
Pp. 13-18

Onset rates at the buckle in G/sec., onset rates of the straps, initial and residual lock-in tension in the straps as well as strap reel-in velocity were recorded.

It was demonstrated, during static tests, that lock-in tension of the system for sustained restraint must be defined because of circulatory and respiratory effects. Pressure on nerve plexi may occur in the auxillary area. Tolerance to high reel-in rates, high onset G's in excess of 1×10^4 G/second was demonstrated.

G tolerance levels from impact data are definitely not applicable to restraint harness systems without considerable modification when the force is being applied in a specific area.

(06GARR-JW62: see 08GARR-JW62)

06GOLD-DE46
Goldman, D. E.
MECHANICAL FORCES - TABLE I. ESTIMATED TOLERANCES OF UNPROTECTED HUMAN BODY TO VARIOUS MECHANICAL FORCES.
J. Aviation Med.
Vol. 17, No. 5 (October 1946)
Pp. 426-430

Aviation personnel, especially those in military service, are subjected to a wide variety of mechanical forces including changes in ambient pressure, acceleration, wind blast and vibration as well as the forces associated with parachute escape, crashes, explosions and missile casualties. Little is known of the actions of these forces or of means of protection against them.

Eventually it should be possible to accumulate a background of information sufficient to permit generalizations and to allow specific predictions to be made as to tolerances and requirements for protection.

A listing of complexities must be made to methods for handling problems which must be solved.

A first step, the performance of a structural analysis of the human body, involves a study of the geometrical and physical layout and the determination of the elastic properties of the various parts and connections.

Secondly, a vibration analysis should yield considerable information of value.

Resonance measurements can be used to find natural frequencies, damping coefficients, effective masses and spring constants.

From such orderly investigations, it should be possible to learn a great deal about basic physiology and some of its practical consequences. A table of human tolerance limits of various grades and for various forces is essential for engineers concerned with the design of aircraft and of other machinery involving close human association.

(06GRAY-RF63: see 10GRAY-RF63)

06HALE-JL91
Haley, Joseph L., Jr. and Avery, James P.
Ft. Eustis, Virginia, Army Transportation Res. Command
CRASH INJURY EVALUATION. PERSONNEL RESTRAINT SYSTEMS STUDY: UH-1A AND UH-1B BELL IROQUOIS HELICOPTERS
Aviation Safety Engineering and Research, Phoenix, Arizona
AvSER-62-27, TRECOM-TR-63-81 (March 1964)
AD 608 192
48 p. refs.

The crew and passenger restraint systems installed in the UH-1A and UH-1B aircraft are evaluated, and a practical method of modifying these systems to provide increased protection is proposed. The modifications proposed indicate the following strength improvements: (1) Cockpit—The crew's restraint system is increased from a 10 to 12 G value to a 20 to 25 G value. (2) Troop compartment—The troop's lap belt attachments are increased from a 12 to 15 G value to a 22 to 25 G value. The above strength increases can be achieved with a weight increase of 7 pounds per aircraft and a cost of approximately $70 per aircraft.

06HALE-JL92
Haley, J. L., Jr.
SAFETY ENGINEERING FOR CRASH INJURY PREVENTION. (In Annual Aerospace Reliability and Maintainability Conference, 3rd, Washington, D.C., June 29-July 1, 1964 Proceedings).
Society of Automotive Engineers, Inc., New York, New York
1964
Pp. 387-400, 22 refs.

Discussion of methods of achieving crashworthiness in general. Specific conclusions are drawn with regard to the design loads for occupant restraint systems. A "programmed break" concept for the fuselage of large aircraft is presented, and additional research which is needed to provide increased survival in accidents is suggested. It is concluded that: (1) the tiedown strength of seats should be increased to a value approaching the survivable limits of declerative force for man; (2) research in the area of response and passenger systems to typical crash forces is needed to aid the design and production of lightweight seats which can sustain the indicated load levels; (3) the location of galleys, coat closets, or lavatories, in expected or programmed fuselage "break areas," appears feasible; and (4) the application of limit design (or large deformation analysis), together with the use of ductile members, can be effective in achieving lightweight, crashworthy structures.

(06HASB-AH62: see 07HASB-AH62)

(06HASK-LT57: see 08HASK-LT57)

06HESS-JL56
Hess, J. L.
THE APPROXIMATION OF THE RESPONSE OF THE HUMAN TORSO TO LARGE RAPIDLY APPLIED UPWARD ACCELERATIONS BY THAT OF AN ELASTIC ROD AND COMPARISON WITH EJECTION SEAT DATA
Douglas Aircraft Company, El Segundo, California
November 1956

06HURW-ES65
Hurwitt, Elliot S., and Silver, Carl E.
SEAT-BELT HERNIA
Journal of the American Medical Association
November 15, 1965
Pp. 829-831

06KEAR-JD64
Kearney, J.de
L'ASPECT MEDICAL DES CEINTURES DE SECURITE
Ingenieurs de l'Automobile (S.I.A)
Vol. 37, No. 7 (July 1964)
Pp. 371-8

Medical aspects of seat belts; review of research carried out with particular reference to experimentation by Crash Injuries

Research Board of Cornell University (New York), Institute of Transportation and Traffic Engineering (Los Angeles), and Ford Motor Co; types of seat belts; accident statistics from various countries relative to use of seat belts; advantages and disadvantages of seat belts.

06KNOW-SR58
Knowles, W. R.
CRASH DESIGN FROM CRASH INJURY RESEARCH
United States Army Aviation Digest
Vol. 4, (1958)
Pp. 12-15

06KRAF-MA61
Kraft, Merwyn A.
AVIATION CRASH INJURY RESEARCH—REVIEW OF THE FLIGHT SAFETY FOUNDATION IMPACT WORK AND PLANS. (In Natl. Acad. of Sci: Impact Acceleration Stress, A Symposium Held at Brooks AFB, Tex., November 27-29, 1961.
Flight Safety Foundation, Woods Hole, Massachusetts
See N63-1284407-16)
Pp. 39-43

Flight Safety Foundation impact work encompasses: (1) On-the-scene investigation of military and civilian, fixed-wing and rotary-wing accidents; (2) statistical analysis of data for the purpose of determining injury-causative factors; (3) trend analysis of accident rates, injury severity rates, installation and utilization of safety equipment, and structural design features related to injuries; (4) medical studies of the frequency and pattern of injuries; (5) specialized training in the art and techniques of aircraft accident investigation with emphasis on crash injury and survival; (6) human factor studies where information relative to injuries and causative agents is correlated and interpreted in a clinical manner with emphasis on occupant restraint, occupant environment, protective equipment, and emergency evacuation; and (7) the conduction of full-scale crash tests of aircraft and the dynamic testing of components.

06LAMB-EH45
Lambert, E. H., et al.
MAN'S ABILITY TO WITHSTAND TRANSVERSE ACCELERATION WHEN IN THE SITTING POSITION
National Research Council, Washington, D.C.
March 1945

06LATH-F 58
Latham, F.
LINEAR DECELERATION STUDIES AND HUMAN TOLERANCE
Clinical Science
Vol. 17, No. 1 (February 1958)
P. 121

The physiological effects of decelerations up to 16 g, with a maximal rate of change of 300 g/second, were studied in human subjects on a rocket-propelled trolley apparatus. Four types of restraining harness were compared, including a conventional Royal Force "Z" harness comprised of shoulder and lap straps, a four-point harness incorporating leg (crutch), lap, and shoulder straps, and two three-point variations of the latter harness. Decelerations up to 12 g were found to produce no undue discomfort or bruising with any harness tested, provided that the head was flexed to an angle of 45^{o} prior to impact. Above 12 g, bruising in the region of the lap belt and shoulder straps occurred, particularly in the absence of crutch straps. Location of the feet in aircraft rudder pedals resulted in a noticeable reduction in lap belt load, although no reflex leg muscle action could be distinguished until 100 milliseconds after the start of deceleration. Peak intra-abdominal pressures of 200-450 mm. Hg were recorded during deceleration. Electrocardiograms were normal immediately following impact, and pulse rates returned to normal resting rates (from 100-140 beats/minute during runs) within several minutes. It is concluded that the leg, lap, and shoulder harness gives protection up to 17 g but that serious injury is likely above this level. It is suggested that the safe limit of deceleration might be increased to 20 g with additional leg restraint, and to 25 g with a jerkin harness and arm, leg, and head restraints.

06LIST-RD63
Lister, R. D., and Milsom, Barbara M.
CAR SEAT BELTS—AN ANALYSIS OF THE INJURIES SUSTAINED BY CAR OCCUPANTS
The Practitioner
Vol. 191 (September 1963)
Pp. 332-340

06MCRO-JW65
McRoberts, J. W.
SEAT BELT INJURIES AND LEGAL ASPECTS.
Industrial Medicine and Surgery
November 1965
Pp. 866-869

06NAHU-AM65
Nahum, Alan M.
FACIAL TRAUMA IN AUTOMOBILE COLLISIONS
Transactions American Academy of Ophthalmology and Otolaryngology
May-June 1965
Pp. 396-404

06ODON-JB66
O'Donoghue, John B., Jr., and Peniche, Ramon
ABDOMINAL INJURIES RESULTING FROM THE STANDARD AUTOMOBILE SEAT BELT
Medical Staff Newsletter, Little Company of Mary Hospital
1966
6 p.

06OMMA-AK63
Ommaya, A. K.
HEAD INJURIES: ASPECTS AND PROBLEMS
Medical Annals of District of Columbia
Vol. 32, No. 1 (1963)
Pp. 18-23

06PAYN-PR61
Payne, Peter R.
THE DYNAMICS OF HUMAN RESPONSE TO ACCELERATIONS
Paper, 32nd Annual Meeting, Aerospace Medical Association, Chicago, April 1961

06PEAR-RG61
Pearson, Richard G.
INJURY SEVERITY AS RELATED TO SEAT TIE-DOWN AND BELT FAILURE IN LIGHTPLANE ACCIDENTS
Aviation Safety Engineering and Research, Phoenix, Arizona
TREC Tech. Rept. 61-96 (August 1961)
AD 265 092L

The purpose of this study was to evaluate the relationship between tie-down effectiveness and injuries sustained by 1,025 occupants of lightplanes involved in ground-object collisions, or in spin-stall crashes. Critical injuries to the head and upper torso were found to occur even though there was adequate seat-belt restraint. In approximately one-third of the 1,025 cases either seat failure or belt failure, or both, occurred. Belt failure occurred more frequently than seat failure, yet injury severity was greater when seats failed than when belts failed. The need for additional safety measures is emphasized by the findings. (Author)

06PEAR-RG62
Pearson, R. G., and Piazza, M. H.
MECHANISMS OF INJURY IN MODERN LIGHTPLANE CRASHES
Transportation Research Command, United States Army
Tech. Rept. 62-82 (1962)
AD 294 904 L

This study was undertaken to evaluate the interrelationship between primary impact variables, seat and belt tiedown effectiveness, and injuries sustained by occupants of 342 lightplanes involved in spin-stall crashes or collisions with the ground while in flight. The data were obtained during the period 1953-1960 and are to be contrasted with data previously reported for the period 1942-1952 (when light aircraft were primarily of fabric-skin covering.)

Contrary to the earlier findings, seat failure now occurs more frequently than belt failure. The curve of belt failure plotted as a function of impact velocity does not accelerate as rapidly as that from the earlier data, whereas the seat-failure curves from the two sets of data are comparable. Since injuries are found to be more severe when seats fail than when belts fail, there is a suggestion that seat tiedown improvements may not have kept pace with improvements in seat belt manufacture and installation. Overall, however, when tiedown is considered to be effective, injuries are less severe for the more recent data, thereby suggesting that better overall protection is afforded today's pilots. Occupants wearing shoulder harnesses were least severely injured although some still received facial and skull fractures. Since structural collapse was generally not extensive for these data, flailing of the body against injury-producing structures within the occupant's environment is seen to be a significant source of injuries. Injury severity was found to increase little as a function of impact velocity, but did increase rapidly as a function of angle of impact.

06RESW-JB61
Reswick, J. B.
DEVICES FOR MEASURING CONTACT-PRESSURES EXERTED ON THE HUMAN BODY
Case Institute of Technology, Cleveland, Ohio
February 1961

06RUFF-S 91
Ruff, S.
CONCERNING THE ORIGIN OF SEVERE INTERNAL INJURIES IN GLIDER ACCIDENTS
Luftfahrtmed
Vol. 3 (1939)
Pp. 267-276

06RUFF-S 92
Ruff, S.
CONCERNING HUMAN TOLERANCE OF ACCELERATION AS IT APPLIES TO CERTAIN JERKING TYPES OF ACCELERATION WHICH OCCUR IN FLYING
Transaction
Vol. 47
German Academy of Aviation Development
DDC ATI 47 632
Pp. 1-9

06RUFF-S 93
Ruff, S.
ON RESISTANCE IN MEN TO CERTAIN JERKING TYPES OF ACCELERATION WHICH OCCUR IN FLYING
Paper, Der Deutschen Akadamie der Luftfahrtforschung, vertetragen
31 October 1941

The effect of jerking accelerations on man depends partly on their degree and their direction but chiefly on their duration and on the manner in which the forces are distributed. If the forces of inertia are carried through the abdominal belt, as frequently occurs in crash landings, the body tolerates, with the proper application of the belt, up to 1700 kg, corresponding to 26 g, without injury. According to the experiments to date on the impact of parachute opening, about 2000 kg can be absorbed via the leg straps of the harness without great danger to the organism. If the forces are taken up by the seat, as is the case when a seat catapult is used, the experiments show that 20 g is the limit of endurance. When a parachute jumper leaves a fast plane, the wind forces which attack his body can be tolerated, even by the face, up to 500 km/h without tissue destruction.

06RYAN-JJ60
Ryan, J. J.
CRASH DECELERATION TESTS WITH HUMAN SUBJECTS
Paper, Fourth Annual Meeting of the Human Factors Society, Boston, Massachusetts
September 14, 1960

06SCHR-HA51
Schroeder, H. A.
PREVENTION OF INJURIES DUE TO CRASH
J. Avia. Med
Vol. 22 (August 1951)
Pp. 306-311

06SEVE-DM60
Severy, D. M., Mathewson, J. H., and Siegel, A. W.
COLLISION STUDIES REVEAL GRUESOME FACTS
SAE Journal
Vol. 68 (May 1960)
SP-174
P. 87

Tests were conducted to determine what would happen to cars and occupants when two cars, traveling at 30 mph, collide at an intersection. The studies demonstrated the value of restraining belts in a dramatic fashion. The paper presents a detailed description of the photographic, electronic mechanical, and physiological instrumentation used, describes and illustrates each of the tests, and summarizes the results of cars and occupants.

06SNIV-GG61
Snively, G. G.
IMPACT ATTENUATION IN PROTECTION AGAINST CONCUSSION
Snell Memorial Foundation, Inc., San Francisco, California
September 1961

(06SNYD-RG66: see 05SNYD-RG66)

(06STAP-JP58: see 08STAP-JP58)

(06STAP-JP63: see 08STAP-JP63)

06STAP-JP91
Stapp, J. P.
HUMAN EXPOSURES TO LINEAR DECELERATION, PT. II, THE FORWARD FACING POSITION AND THE DEVELOPMENT OF A CRASH HARNESS
Wright Air Development Center, Wright-Patterson Air Force Base, Dayton, Ohio
December 1951

06STAP-JP92
Stapp, J. P.
HUMAN DECELERATION
Biophysics Br. Aeromedical Lab., Wright Air Development Center, Ohio
Accomplishment Summary (July 1950-June 1951)

Tests were conducted to determine the tolerance of the human body for linear forces of short duration. Over a period of 4 years, 231 experimental runs were made by 73 human volunteers, 80 chimpanzees, and 78 anthropomorphic dummies. Human tolerance was determined up to 45 plus g in the forward facing seated position, and 35 plus g in the backward facing seated position, with rate of change of deceleration at 1000 g per second or less. Rates of change of deceleration exceeding 1200 g per second greatly diminished tolerance, although chimpanzees survived 40 g at 3400 plus g per second rate of change of deceleration. The aft facing position was proven feasible for air transport passengers. Crash restraints were developed for the forward facing and sidewise seated positions.

06STAP-JP93
Stapp, J. P., Mosely, J. D., Lombard, C. F., and Nelson, G. A.
BIODYNAMICS OF MAXIMAL DECELERATIONS (In Analysis and Biodynamics of Selected Rocket-Sled Experiments)
United States School of Aerospace Medicine, Brooks Air Force Base, Texas
July 1964
N65-19677
AD 609 412

The methods and procedures used to expose adult anesthetized chimpanzee subjects to high levels of deceleration during 23 experiments on the rocket sled are presented. Deceleration was accomplished by programmed water inertia braking where trapezoidal patterns were produced. Onsets of deceleration ranged from 450 to 36000 g per second with plateau levels ranging from 33 to 107 g with duration from 87 to 527 msec. The test sled was accelerated by rockets at a maximum of 7 g up to a maximum velocity of 1194 ft per sec. These experiments show the injurious effects of exposure to acceleration ($-g_x$) correlated with the rate of onset of g the peak level of g, and the progressive improvement of the restraint system. One subject exposed to a maximal (96 g at 8500 g/sec onset) $+g_x$ sustained no persistent injury. All the other exposures were $-g_x$. Survival limits of the test subjects are roughly four times the known tolerance limits of human volunteers. The results are presented of a study made to determine the relationship of the many variables involved when a restrained subject is exposed to an abrupt deceleration by the application of a basic forcing function to the supporting vehicle. The studies include the response of the restraints under both static and dynamic loads.

06STAR-JH60
Starks, J. H.
CRASH INJURY WORK OF THE ROAD RESEARCH LABORATORY OF THE UNITED KINGDOM
Paper, Ist International Meeting on Research into Road Safety, O.E.E.C., Road Research Laboratory, Langley (United Kingdom), July 1960.
O.E.E.C. Pamphlet, Research Into Road Safety (1960)
Pp. 35-37

06STEE-WI66

STEERING WHEEL INJURY OF THE LIVER PRESENTS GROWING SURGICAL PROBLEM
Medical Tribune
January 31, 1966
P. 25

(06SWEA-JJ62: see 10SWEA-JJ62)

06SWEA-JJ66
Swearingen, John J.
EVALUATION OF HEAD AND FACE INJURY POTENTIAL OF CURRENT AIRLINE SEATS DURING CRASH DECELERATIONS
Federal Aviation Agency, Oklahoma City, Oklahoma
June 1, 1966
AM-66-18
20 p. refs

A large percentage of deaths in commercial-airline crashes is produced as the body and lower limbs fall around the seat belt. According to a previous study, a 10-foot-diameter sphere of clear area would be necessary to prevent a person from striking some portion of his body against surrounding structures. This study is concerned primarily with head impacts that may occur against most portions of the seats. Thirty-five impact studies were made with an instrumented dummy head against various portions of eight different makes of airline seats to determine the "g" time-force parameters of metal deformation and seat break-over. Until recently these data could not be interpreted in terms of head injury or unconsciousness because data on human tolerance to impact against deformable structures were not available; however, a recently published study presents detailed data concerning these tolerances. These data are used here to determine the injury potential of the eight seats studied. Applying the earlier data to the seat-impact studies, 30% of these impacts would have produced fatal head injuries, 80% would have caused facial fractures, 97% would have rendered the passenger unconscious, and only 3% would have caused no injury or unconsciousness. (Author)

06TOLI-SH64 (08TOLI-SH64)
Tolins, Stephen H.
AN UNUSUAL INJURY DUE TO THE SEAT BELT
The Journal of Trauma
May 1964
Pp. 397-399

06TOUR-B 53
Tourin, B., and Macri, S.
AIRCRAFT SAFETY BELTS: THEIR INJURY EFFECT ON THE HUMAN BODY
Aviation Crash Injury Research, Phoenix, Arizona
1953

(06TOUR-B 60: see 08TOUR-B 60)

06TOUR-B 60
Tourin, B., and Garrett, J. W.
A COMPARISON OF INJURIES TO USERS AND NON-USERS OF SAFETY BELTS. SAFETY BELT EFFECTIVENESS IN RURAL CALIFORNIA
Highway Patrol and Automotive Crash Injury Research of Cornell University
February 1960

06VONG-HE64
von Gierke, H. E.
BIODYNAMIC RESPONSE OF THE HUMAN BODY
Paper, Southwest Research Institute and United States Air Force, 34d International Symposium on Bioastronautics

and the Exploration of Space, San Antonio, Texas
November 16-18, 1964)

Review of recent findings (since 1956) concerning the dynamic-mechanical properties of the human body and its reaction to various mechanical force environments. The status and value of mathematical models for studying the body's response to pressure (infrasonic noise and blast) and force changes (vibration and impact) are discussed and consideration is given to the practical application of these models to physiology, pathology, protection engineering and biomedicine, in general, and to the prediction of the body's response to force environments as yet unexperienced. A table gives the density, Young's modulus, volume compressibility, shear elasticity, shear viscosity, sound velocity, acoustic impedance, tensile strength, shearing strength, and breaking index of soft tissue and compact bone. Graphs include the relationship between breaking strength and stiffness from fresh cadaver vertebrae; a comparison of the impedance of a sitting Himalayan bear with the impedance of man and dummy; and the spinal positive injury curve for 50% probability of a compressive fracture due to a rectangular acceleration pulse.

06ZABO-AV91
Zaborowski, Albert V.
HUMAN TOLERANCE TO LATERAL IMPACT WITH LAP BELT ONLY (In 8th Stapp Car Crash and Field Demonstration Conference)
1966
P. 34

A series of controlled deceleration experiments was performed with 37 human male volunteers to determine, if possible, human tolerance to lateral impacts while restrained in a seat with a lap belt. The subjects were exposed in 50 different experiments at average impact G of 3.25 to 9.02 for durations of 0.3 to 0.1 seconds. No permanent physiological changes were noted. Minor physical complaints were reported by 50 per cent of the subjects when exposed to 6.25 average G or more. Increasing danger from lateral flexion of up to 30^{o} from the vertical halted the experiments at the 9.02 average G.

06ZABO-AV92
Zaborowski, Albert V.
LATERAL IMPACT STUDIES (LAP BELT SHOULDER HARNESS INVESTIGATIONS). (In 9th Stapp Car Crash Conference)
1966
Pp. 93-128

A series of controlled deceleration experiments was performed with 52 young human male volunteers to determine, if possible, human tolerance to lateral impacts while restrained with a combination seat belt and torso (two straps attached to the seat at the shoulder line, passed over the shoulders parallel to the vertebral column and attached to the lap belt) harness. The subjects were exposed in 87 different experiments at average impact G's of 4.47 to 11.59 and durations of 0.22 to 0.09 seconds, respectively. No permanent physiological changes were noted.

Minor subjective physical complaints were reported by more than 60% of the subjects when exposed to 8.8 average G's or more. The possibility of cardiovascular involvement halted the experiments after two subjects were exposed to the 11.59 average G pattern (12 G series).

06ZIFF-D 65
Ziffer, D.
NOTES ON THE MECHANICAL RESISTANCE OF THE HUMAN BODY AND TISSUES. INFLUENCE ON THE MANUFACTURE OF PROTECTIVE HELMETS AND SAFETY BELTS FOR MOTORISTS. (Part I.)
Tech. Aspects of Road Safety
No. 22 (1965)
Pp. 2.1-2.51

07 SEAT

07ADAM-AJ65
Adams, A. J.
DRIVER AND PASSENGER SEATING REQUIREMENTS FOR LONG DISTANCE COACHES
Automotive Design Engineering
Vol. 4 (July 1965)
P. 59, illus.

07AERO-FS59

AEROMED FACILITY STUDIES SHOCK ABSORBER SEATS FOR JET PASSENGERS
Aviation Week
Vol. 70, No. 21 (May 1959)
P. 136

07AERO-B 60
The Aerotherm Corporation
CONDUCT STUDY, DESIGN, DEVELOP AND FURNISH PROTOTYPES OF ENERGY ABSORPTION SYSTEMS FOR AIRCRAFT SEATS
Navy Bureau of Aeronautics
Progress Reports No. 1-30 (January 2 to February 29, 1960)
Contract NOa(s)57-367-C
AD 269 485

Work is in progress in the general problem "regions where it appears that the deliberate incorporation of evergy absorbing features in the design of aircraft seats could be beneficial and those regions where it would be futile and possibly actually dangerous."

Preliminary calculations on this phase are approximately 80% complete.

07AIR -TA61
Air Transport Association of America
AFT VS FORWARD FACING SEATS IN TRANSPORT AIRCRAFT
A.T.A., Washington, D. C.
Memo (June 1961)

07AKER- 51
Akerblom
THE MAIN PRINCIPLES OF RESTFUL SITTING AND THEIR SIGNIFICANCE IN THE CONSTRUCTION OF COMFORTABLE SEATS
Paper presented at Ergonomics Research Society, 18-20 April 1951, in the Department of Anatomy at the University of Birmingham, Birmingham, England
1951

The following principles of seating were presented: a) The seat should permit the occupant to change his position; i.e., it should not be form fitting. (Seats such as tractor seats are very inadequate with respect to this criterion.) b) The seat should be near enough to the floor so that the weight of the body does not rest on the soft tissues of the thighs. Dr. Akerblom said a good mean height is about 17 inches. At present, most chairs are about 19 inches off the floor. c) The table should be compatible with the chair height. Dr. Akerblom recommended a height of 27-28 inches, which is two or three inches lower than most tables. d) The ordinary table chair should be approximately 16-17 inches off the floor and have a seat that is approximately 15-1/2 inches deep and slopes back a little. The lower eight inches of the back should be vertical, at which point the remainder of the back should slope back at an angle of ten degrees to the vertical.

07ALDM-B 66
Aldman, Bertil
A PROTECTIVE SEAT FOR CHILDREN (In 8th Stapp Car Crash Conference)
1966
Pp. 320

Small children as automobile occupants need support in normal driving at turning and braking and protection in accidents at collisions and roll-overs. Ordinary restraints, such as the adult seat belt, are less suitable for children between one and six years, mainly because the body proportions are different in children.

A protective seat, adequately rigid and resistant to penetration, with a high, shock-absorbing back rest, can be placed facing rearwards in the front seat of the car. After extensive testing, such a seat is now being manufactured in Sweden.

07AUTO-MA91
Automobile Manufacturers Association
A PROPOSAL FOR AN INITIAL FEDERAL MOTOR VEHICLE SAFETY STANDARD ON ANCHORAGE OF SEATS FOR PASSENGER CARS
Automobile Manufacturers Association, Incorporated, Detroit, Michigan
Report No. AMA S-6 (17 October 1966)
50 pp. (approx.), tables, diagrams

07AUTO-MA92
Automobile Manufacturers Association
A PROPOSAL FOR AN INITIAL FEDERAL MOTOR VEHICLE SAFETY STANDARD ON OCCUPANT IMPACT PROTECTION FOR PASSENGER CAR SEAT BACKS
Automobile Manufacturers Association, Incorporated, Detroit, Michigan
Report No. AMA S-15 (17 October 1966)
60 pp. (approx.), tables, diagrams

07BABB-FW65
Babbs, F. W., and Hilton, B. C.
THE PACKAGING OF CAR OCCUPANTS - A BRITISH APPROACH TO SEAT DESIGN (In 7th Stapp Car Crash Conference)
1965
Pp. 456-454

Findings of Dr. William Gissane and others led to the development of the new car seat described here. The seat incorporates a strengthened frame, special anchorages, seat belts which retract within the frame, cushions shaped to the body and capable of giving firm support, a soft, adjustable headrest, and attractive appearance. Not yet fully developed, the seat is to be subjected to a testing program.

07BACA-GA60
Bacas, G. A.
A4D ESCAPE SYSTEM, EVALUATION OF MODIFIED HEAD-REST INSTALLED BY A4D AIRCRAFT SERVICE CHANGE NO. 157C FOR ACCEPTABLE HEAD POSITIONING
Naval Air Test Center, Patuxent River, Maryland
Report No. 1 (5 August 1960)
Project TED, No. PTR RAAE-23004, Serial No. AT311-276
AD 267 383

The Service Test Division conducted an evaluation of a modified headrest configuration (A4D ASC 157C) for the RAPEC low level ejection system to determine if the headrest configuration afforded acceptable pilot head positioning during catapult launches. The modified headrest configuration was considered satisfactory for service use; however, incorporation of firmer headrest material is considered desirable for improved service use. Author

07BACK-FS50

A BACKWARD FACING SEAT INVESTIGATION
Aircraft Engineering
Vol. 22 (1950)
Pp. 372-374

07BECK-LC59
Beckett, L. C.
PASSENGER SEAT DESIGN AS APPLIED TO THE CONVAIR 880
Paper, The American Society of Mechanical Engineers, Aviation Conference, Los Angeles, California
9-12 March 1959

07BELG-WJ63
Belgrove, W. J.
AUTOMOBILE PASSENGER SEATING REQUIREMENTS: DESIGN, CONSTRUCTION AND CHARACTERISTICS
Bulletin of the British Car Manufacturers
Vol. 27 (April 1963)
Pp. 19-24

07BOST-K 52
Bostrom, K.
MILITARY TRANSPORT SEATING
Bostrom Research Laboratories, Milwaukee, Wisconsin
Publication No. 105 (1952)

The complex limiting factors of human physiology, neuro-physiology and psychology have been either casually appreciated, or not at all in the design of military and commercial vehicles. In 1945, a report was issued stating that 90% of low back injuries seen from one service were from the services' truck transport organizations. At that time, the Bostrom Manufacturing Co. had already developed a suspension seating system to absorb shock and vibration to a degree that was not possible by any type of padding meterial or cushion spring system.

In Bostrom Manufacturing Co., a set of intra-company objectives brought about a keen interest in the man-machine relationship as applicable to commercial trucks and farm tractors. Being manufacturers of seating for trucks, crawler tractor and farm tractors, emphasis on the man-machine relationship was carried over into design and development work on various products.

There is a trend in the machinery building and machinery operating fields.

07BREH-WH62
Brehaut, W. H.
DESIGNING PASSENGER SEATS FOR CRASH SURVIVAL
S.A.E. Journal
Vol. 70, No. 5 (May 1962)
Pp. 59-60

Exhaustive and costly tests have developed four ground rules for designing a seat to keep the passenger safe: (1) a seat belt to airframe structural chain must be maintained throughout the crash; (2) structural materials must be ductile to absorb energy, and must be secured mechanically, by rivets or bolts rather than by welding; (3) seat backs and other nearby objects must be de-lethalized; and (4) an absorbing device to attenuate some of the high peaks of crash energy should be developed and tested.

07BRIT-MC65
British Motor Car Association
CAR CUSHIONS BY BMC
Rubber & Plastics Age
Vol. 46 (June 1965)
Pp. 634-5, illus.

07BROW-RW39
Brown, R. W.
MEASUREMENT OF SEAT CUSHION CHARACTERISTICS
Automotive Research Division, Firestone Tire and Rubber Company
January 6, 1939

07BURN-HL58
Burns, H. L., et al.
DESIGN AND DEVELOPMENT OF A PRESSURE AND CYCLE CONTROL FOR DYNAMIC SEAT CUSHIONS
Wright-Patterson Air Force Base, Ohio
December 1958

07CARR-R 66
Carr, R.
SEAT TO MAKE CARS SAFER
Design
October 1966
Pp. 33-35

07CART-EO57
Cartwright, E. O., Edwards, H. H., and Held, S. F.
SHOCK ABSORBING SAFETY SEAT
Chance Vought Corp., Dallas, Texas
November 1957
U. S. Patent 2,981,317

07CASE-FR66

CASE FOR RUBBER-DIAPHRAGM SEAT SPRINGING
Automotive Design Engineering
Vol. 5 (February 1966)
Pp. 56+

07CASE-FS66

CASE FOR SUSPENSION SEATING
Automotive Design Engineering
Vol. 5 (February 1966)
Pp. 54-55

07CHIS-J 65
Chisholme, J.
ARE YOU SITTING COMFORTABLY? (Microcell Seats)
Autocar
Vol. 123 (6 August 1965)
Pp. 262-3, illus.

07CLEA-DE54
Cleaver, D. E.
DRIVING SEATS; APPRAISAL OF THE MECHANICAL BASIS OF COMFORT
Automobile Engineering
Vol. 44 (1954)
Pp. 237

07COER-R 64
Coermann, R., and Rieck A.
EINE VERFEINERTE METHODE ZUR BESTIMMUNG DES KOMFORTGRADES VON SITZEN. (A Refined Method of Determining the Degree of Comfort of Chairs)
Int. Z. Angew. Physiol.
Vol. 20 (1964)
Pp. 376-397

A refined method to measure seat comfort was developed, based on experiments carried out by E. M. Grandjean (Int. Z. Angew. Physiol. 18:101-106, 1960), recording intensity and frequency of involuntary movements in sitting subjects. Intensity was expressed in terms of displacement of point of gravity brought about by positional changes of the experimental subjects. Frequency and intensity of movements per 10 kilopound (kp) of the subjects' weight were considered in the overall evaluation. To determine agreement of objective and subjective findings, the subjects were asked to fill out a questionnaire after sitting periods of 15 minutes and 2 hours, to express their judgment regarding the chair tested from 12 different points of view. The results show agreement between subjective and objective findings in the case of distinct differences in sitting comfort. When the differences were minor, neither the opinions expressed by the subjects nor the results of the measurements are meaningful, if a large group of test subjects are employed and testing conditions are uniform.

07COOK-E 48
Cook, E.
STUDY OF SEATING UNDER VARIOUS WEATHER CONDITIONS
Great Britain Naval Motion Study Unit
Report 24 (September 1948)

07CUSH-AS33

CUSHION AND SQUAB FILLINGS
Automotive Engineer
Vol. 23, No. 304 (March 1933)
Pp. 355-356

07DEHA-H 52
DeHaven, H.
CURRENT SAFETY CONSIDERATIONS IN THE DESIGN OF PASSENGER SEATS FOR TRANSPORT AIRCRAFT
Crash Injury Research, Cornell University Medical College, New York, New York
June 1952
ATI-155 851

Well designed forward facing seats--and secure tie-down for "20g" safety belts--should give high degrees of protection in civil air transports, up to the point where flooring and surrounding cabin structures are destroyed. Although Crash Injury Research has developed considerable data on the effectiveness of safety belts, harness and forward facing seats, very limited information from a actual crashes has become available on the protective values of various types of rearward facing seats. Some of the current military installations suggest hazards which, except under the most fortuitous crash conditions, may cause dangers which are not present in the design of improved forward facing passenger seats. Merely building "beefed up" seats and turning them around is not the answer--safety-wise. Rearward facing seats must be carefully designed and their protective qualities--as well as their deficiencies--must be thoroughly analyzed from accident-injury studies, so that the full value of rearward facing seats can be developed. Details of survivable crashes in civilian, as well as military transports, should be studied from the crash-injury point of view, so that valid conclusions can be reached on: 1) The magnitude, direction and duration of crash forces in survivable transport accidents; 2) The desirable strength for seats and safety belt installations; 3) The effectiveness of safety features in seat design; 4) The relative merits of forward facing and rearward facing seats.
Author

07DEMP-CA62
Dempsey, C. A.
THE AIR FORCE STUDIES SEAT DESIGN: BODY SUPPORT/RESTRAINT
Product Engineering
Vol. 33 (April 16, 1962)
Pp. 106-117

07DREY-H 60
Dreyfuss, H.
SEATS FOR PEOPLE
Machine Design
Vol. 76, (November 10, 1960)
Pp. 152-157

An ideal seat should provide restful packaging of the occupant after many hours of sitting. Ample proportions of the seat bottom and arm rests contribute to the first impression. A properly designed seat maintains normal good posture. The seat has enough tilt to throw the chest gently outward and allows the shoulders to drop back slightly. The seat should support the middle and upper region of the spine. All comfortable seating postures have one thing in common -- they maintain an angle of at least 90 deg. between the hips and knees. However, no one position remains comfortable for very long. A good seat allows many comfortable postures--the more the better. When seated, the human body is best supported if most of the weight rests on the two bony points of the pelvis. Arm rests are valuable only if they help the elbows support some of the weight of the upper body.

07ELDE-HE35
Elden, H. E.
PROPERTIES OF CELLULAR RUBBER FOR PASSENGER CAR CUSHIONING
India Rubber World
Vol. 92 (August 1935)
Pp. 25-28

07ELLI-EE39
Ellies, E. E.
THE DEVELOPMENT OF FOAMED LATEX CUSHIONING
SAE Journal
Vol. 43, No. 3 (March 1939)
Pp. 93-96

also

Rubber Age
Vol. 44 (March 1939)
Pp. 331-334

07FISH-J 65
Fish, Jay, and Wright, Robert H.
THE SEAT BELT SYNDROME--DOES IT EXIST?
The Journal of Trauma
November 1965
Pp. 746-750

07FORD-MC47
Ford Motor Company
FATIGUE TEST OF CUSHION PAD SUPPORTS
Ford Automotive Research Department
August 12, 1947

07FORR-J 59
Forrest, J., et al.
COMFORT EVALUATION OF THE C-124 CREW SEAT (Weber)
Wright-Patterson Air Force Base, Ohio
October 1959

07FRYE-DI58
Fryer, D. I.
AIRCRAFT PASSENGER SEAT DESIGN AND CRASH SURVIVAL
RAF, Institute of Aviation Medicine, Farnsborough, England
FPRC No. 1055
August 1958

In this review, an attempt is made to describe the forces likely to be encountered in an accident and the best means by which to minimize their various effect on passengers.

07GENE-SA60 (09GENE-SA60)
General Services Administration
FEDERAL SPECIFICATION; BELT; SEAT, PASSENGER TYPE, AUTOMOTIVE (Includes Amendment-3)
General Services Administration
January 19, 1960
JJ-B-185a
11 pp.

07GLAI-DH61
Glaister, D. H.
PROPERTIES OF POLYURETHANE FOAMS IN RELATION TO THEIR USE AS EJECTION SEAT CUSHION MATERIAL
Flying Personnel Research Committee, RAF Institute of Aviation Medicine, Farnsborough, Hants, England
FPRC Report No. 1184, Memo Report No. 158, (August 1961)
AD 279 574

Polyester and polyether grades of polyurethane foams have been subjected to a number of tests to determine their physical properties in relation to their suitability for use as cushions on ejection seats. Properties measured were density, compressibility, permanent deformation following prolonged compression, rates of recovery following brief compression, and measures of damping under lightly and heavily loaded conditions.

07GODD-GE22 (05GODD-GE22)
Goddard, G. E.
BODY SEATING DIMENSIONS
SAE Journal
Vol. 10, No. 2 (February 1922)
Pp. 117-120

07GRAH-CH49
Graham, C. H.
PRODUCTION TRIM ENGINEERING AS APPLIED TO AUTOMOTIVE SEATING
SAE National Passenger Car, Body, and Production Meeting
Detroit, Michigan (March 8-10, 1949)

07GRIF-F 65
Griffiths, F.
DESIGN, DEVELOPMENT AND MANUFACTURE OF PLASTICS FOAM SEATS
Automotive Body Engineering
Vol. 135 (January 1965)
Pp. 10-12

07GILB-EA52
Gilbert, E. A.
BACKWARD SEATING
SAE Journal
Vol. 60, No. 6 (June 1952)
P. 56

also

J. Aviation Medicine
Vol. 23, No. 5 (October 1952)
P. 533

Most passenger fatalities in aircraft result from impact in crash landings and not from burning, according to current medical opinion. Injuries prevent the passenger from escaping a crash fire. Also, the present safety belt is inadequate because it only restrains the lower part of the body, letting the torso act as a weighted lever driving the ten-pound human head forward and subjecting it to an impact force greater than that acting on the aircraft structure at that point. Therefore it became logical for investigators to experiment with a rear-facing seat. The general reaction to this proposal was that "people do not like to ride backwards." However, this was not borne out by investigation. The Military Air Transport Service provided for rearward facing seats in part of its Boeing C-97 fleet, using a seat designed to take a 16 g forward load based on a passenger weight of 225 pounds. With a normal passenger weight of 175 pounds, the permissible forward g load increases to approximately twenty-four. The seat can be folded against the side of the fuselage to make room for cargo.

07GUIL-FA47
Guillermety, F. A.
SEAT PRESSURE PAD - FIRST MONTHLY PROGRESS REPORT
Fisher Body Engineering Division, Experimental and Development Section
Structures Memorandum 72-1 (December 16, 1947)

07HANN-TD57
Hanna, T. D., and Libber, L. M.
DEVELOPMENT AND TEST OF PNEUMATIC SEAT CUSHIONS: EVALUATION OF PROTOTYPE SEAT CUSHIONS
Air Crew Equipment Laboratory, Naval Air Material Center, Philadelphia, Pennsylvania
Report No. NAMC-ACEL-321 (8 February 1957)
Proj. TED no. NAMC-AE-5225.1
AD 221 885

To relieve fatigue encountered in prolonged flight, a project was initiated to improve seat cushions used in combat aircraft. Eight types of seat cushions were evaluated in an exploratory laboratory study and in operational squadrons. By means of a quantifiable questionnaire the operational evaluation indicated that the most beneficial seat cushion assembly was the pulsating type covered with Trilok. This tri-dimensional fabric was found to be most helpful in relieving thermal discomfort and in minimizing perspiration under the buttocks and thighs. Due to certain inherent disadvantages in the motor driven compressor unit used with the pulsating seat cushion it is recommended that: (1) further effort be expended to develop an improved miniaturized motor driven compressor, (2) a further attempt be made to utilize the existing air sources within the aircraft; and (3) that a redesigned static air cushion be operationally evaluated to determine its suitability as an interim seat cushion. (Author)

07HANN-TD58
Hanna, T. D., and Libber, L. M.
THE PRESENT STATUS OF THE NAVY FATIGUE-RELIEVING PNEUMATIC SEAT CUSHION
Journal of Aviation Medicine
Vol. 29, No. 3 (March 1958)
Pp. 237

A static air cushion and two types of pulsating air cushion covered with trilok were submitted to an operational squadron for evaluation. Results obtained from a structure questionnaire revealed the static air cushion to be the most acceptable design considered.

07HARR-A 65
Harrison, A.
RUBBER AND PLASTICS IN AUTOMOBILE SEATS
Automotive Body Engineering
Vol. 135 (May 1965)
Pp. 12+

07HASB-AH62 (06HASB-AH62)
Hasbrook, A. H., and Earley, J. C.
FAILURE OF REARWARD FACING SEATBACKS AND RESULTING INJURIES IN A SURVIVABLE TRANSPORT ACCIDENT
U. S. Civil Aeromed. Res. Inst., Oklahoma City, Oklahoma
62-7 (April 1962)

Photographs with captions showing seat-back failures and their causes and a description of the injuries sustained in a relatively low force transport accident are presented.

07HAWT-R 59 (10HAWT-R 59)
Hawthorne, R.
ENERGY ABSORPTION APPLIED TO SEAT DESIGN
Space Aeronautics
October 1959
Pp. 70-74, 76, 77

How can the seat anchorage be kept from failing in survivable aircraft crashes? By designing to the energy absorption principle, answers Aerotherm, which has done just that with the seats for Pan Am's 707s.

07HEND-E 54 (10HEND-E 54)
Hendler, E., and Evans, R. G.
EVALUATION OF COLLAPSIBLE TYPE DITCHING SEAT
Aeronautical Medical Equipment Laboratory Naval Air Experimental Station, Philadelphia, Pennsylvania
Rept. TED no. NAM AE-6316 (15 November 1954)
AD 50 046

"Three types of aft-facing collapsible ditching seats, differing mainly in materials used in their construction, were statically and dynamically tested to determine their ditching and crash protective properties. Dynamic tests were made using the HG-1 catapult and an anthropomorphic dummy. Average accelerations applied to the catapult car, upon which the test load was mounted, ranged from about 10 to 38G, lasted from about 0.22 to 0.12 seconds and were approximately square wave in shape. Over shoot of acceleration measured in the dummy reached values more than twice that applied to the catapult car. Tensions measured in each lower seat suspension strap were as high as 1.5 times the total load computed as the product of mass and applied acceleration, while in each upper seat suspension strap, tensions as high as the total load, computed as above, were measured. With certain modifications to the basic structure, it is concluded that a nylon mesh and strap collapsible ditching seat would provide adequate protection for personnel against forces engendered during aircraft ditching and crashes. It is therefore recommended that this type of modified seat be accepted for use in multi-place long range type aircraft."

07HENR-JP45
Henry, J. P.
A METHOD FOR THE ASSESSMENT OF SEAT COMFORT WITH A DESCRIPTION OF SOME RESULTS OBTAINED WITH THE PILOT'S SEAT OF THE DOUGLAS BT2D BOMBER
Com. Aviation M. U. S. Research Council, Washington, D. C.
1945

07HICK-WE51
Hicks, W. E.
SAFER SEATING
Aeronautics
Vol. 24, No. 4 (May 1951)

also

J. Aviation Med.
Vol. 23, No. 1
Pp. 94

In a typical severe plane crash, complete crumpling of the fuselage extends roughly halfway back along the inhabited portion. The only occupants who can escape without more than minor injuries are those in the intact part of the fuselage. If they are stowed immovably, the only question is if they can endure the shock of deceleration. Properly supported, they can stand brief deceleration up to 40 g, the force achieved by a moderate-sized airliner moving 205 mph at time of impact. The fore part of the fuselage cushions the shock to the rear part, so that occupants (if adequately supported) have a good chance of survival.

07HILT-BC66
Hilton, Bernard C.
THE DEVELOPMENT OF SAFETY SEATING FOR INJURY PREVENTION (In 10th Stapp Car Crash Conference)
November 1966
Pp. 124-131

British medical and road safety research teams have revealed the need for improvement in vehicle seating designs to eliminate serious injuries and deaths arising from car occupant movement and ejection during impact.

The paper describes the main requirements of safety seating and the result of three years development work in Britain to produce effective seats and mountings of low cost, capable of being fitted into conventional vehicles and of coping with forward loads of over 30 G. It is estimated that the adoption of such seats would increase the vehicle cost by less than 2%.

07HODG-VR63
Hodgson, V. R., Lissner, H. R., and Patrick, L. M.
RESPONSE OF THE SEATED HUMAN CADAVER TO ACCELERATION AND JERK WITH AND WITHOUT SEAT CUSHIONS
Human Factors
Vol. 5 (October 1963)
Pp. 505-523

Human cadavers were subjected to seat-to-head accelerations to a maximum acceleration and jerk (rate of change of acceleration) of 18 g and 2600 g/sec, respectively, with six different types of seat cushions. Strain gages were cemented to the vertebral column and accelerometers were attached to bone at several levels of the body. The object of the experiments was to observe the effects of varying magnitude of acceleration, jerk, and seat cushions on the strain and acceleration response of the cadaver. Results indicate that dynamic load factor (ratio of peak to mean response) increases with jerk at low jerk levels to a maximum and thereafter remains relatively independent of jerk; increases with mean or terminal acceleration in the range of these tests; and increases for all types of cushions used in these tests. Strains measured on the body of vertebrae, particularly in the lumbar region, correspond closely to body accelerations, but strains measured in the rear of vertebrae were not related to body accelerations.

07HOEH-VH47
Hoehn, V. H.
FOAM RUBBER AND SEATING COMFORT
Paper, Meeting of the American Society of Body Engineers
Detroit, Michigan (November 6, 1947)

07HOOT-C 46

HOOTON'S CHAIR
Life
Vol. 23, No. 37 (February 11, 1946)
Pp. 33-34, 38

07IS -TT65

IS THIS THE SEATING OF THE FUTURE?
Automotive Design Engineering
Vol. 5 (March 1965)
Pp. 56-7, illus.

07KEEG-JJ64
Keegan, J. J. and Radke, A. O.
DESIGNING VEHICLE SEATS FOR GREATER COMFORT
SAE Journal
Vol. 72 (September 1964)
Pp. 50-55

07KENN-PS36

KENNINGTON PIVOTED SEAT FRAME
Automobile Engineer
Vol. 26, No. 6 (July 1936)
Pp. 298

07KIRC-OE91
Kirchner, O. E.
A COMPARISON OF THE ADVANTAGES AND DISADVANTAGES OF FORWARD VS. REARWARD FACING AIR TRANSPORT PASSENGER SEATS
Flight Safety Foundation, New York
March 1958

07KIRC-OE92
Kirchner, O. E.
CRASH FORCES AND SEATING
Paper, Eleventh Annual International Air Safety Seminar, Atlantic City, New Jersey
November 11, 1958

(07LAMM-AC61: see 09LAMM-AC61)

07LANG-EW48
Lange, Eric W.
A STUDY OF PASSENGER CAR SEATING
March 1, 1948

07LAPP-AN49
Lappin, A. N.
DESIGN OF ROTATABLE SEAT FOR ACCELERATION ALLEVIATION
Cornell Aeronautical Laboratory, Incorporated, Buffalo, New York
Report BC-531-S-16 (December 1949)
ASTIA ATI 125 505

The rotatable seat, described in this report, is an acceleration sensitive device which automatically causes the pilot's or passenger's body to be oriented into a position which greatly increases his tolerance to high acceleration.

07LEDE-J 59
Lederer, J.
RESEARCH IN OCCUPANT SAFETY, DYNAMIC TESTING OF SEATS
Flight Safety Foundation, New York, New York
November 1959

In order to provide a more realistic dynamic test of aircraft seats a new program and facility will be required. Some of the items in the proposed program include the following: Passenger seat crashworthiness, evaluation of injury protection in seats that do not fail; Delethalization; Cargo Crash protection; Facility specifications; and Personnel required.

07LAY -WE40
Lay, W. E., and Fisher, L. C.
RIDING COMFORT AND CUSHIONS
SAE Journal
Vol. 47, No. 5 (November 1940)
Pp. 482, 496

07LEAF-SS40

LEAF SPRING SEAT FOR AUTOMOBILES
Iron Age
Vol. 145, No. 5 (February 1, 1949)
Pp. 88

07LIPP-S 49
Lippert, S.
DESIGNING FOR COMFORT IN AIRCRAFT SEATS

Douglas Aircraft Company, Incorporate
Long Beach, California
Report No. SM-14741, 7/20/49, revised 10/10/52 and 5/15/53

The dimensional and dynamic aspects of seat design are presented in a design sequence based on fitting groups on which statistically reliable measurements are available. The graphs and tables incorporate data from many seat and related studies and form a working body of information for the seat designer and for the seat purchaser. Author

07LIPP-S 57
Lippert, S.
CELLULAR PLASTICS IN AIRCRAFT SEAT DESIGN
Douglas Aircraft, Santa Monica, California
January 1957

07MCCO-CE47
McCormick, C. E.
AUTOMOBILE SEATS-EFFICIENT SUPPORT OF THE HUMAN BODY IN MOVING VEHICLES AND RECENT DEVELOPMENTS IN SEAT CONSTRUCTION
Paper, American Society of Body Engineers, Incorporated, Technical Convention, Detroit, Michigan (November 6, 1947)

07MCSU-A 52
McSurely, A.
GOOD SEATING ENGINEERING SAVES LIVES
Aviation Week
24 November 1952

The importance of seat design and construction is exemplified by the analysis of an airplane crash involving a Convair 240 (in Flushing Bay near La Guardia Airport, New York, on January 14, 1952). The plane ditched in 15 ft. of water at a speed of about 135 mph., and a normal rate of descent of about 500 ft per minute. Peak decelerations in the range of 10 to 15 g were absorbed by hull and wings. Failure of some seat anchorages indicated that standard load specifications of 6 g forward, 6.6 g downward, and 1.5 g sideways were exceeded. Still, no major injuries were incurred by the passengers due to the resilient structure of seat ba backs and the firm anchorage of the seats. The following improvements are recommended: (1) seats which will stand 15 g loads; (2) seat backs of ductile metal that will cushion body or head shock; (3) firm ancho anchoring of passengers to their seats with snugly tightened 3000-lb. load seat belts.

07MCWI-RL50
McWilliams, R. L.
AUTOMOTIVE SEATING
Summer Round Table Meeting
1950

07MODE-S 39

MODERN SEATING
Automobile Engineer
Vol. 39, No. 390 (November 1939)
Pp. 400-401

07MONR-AE
Monroe Auto Equipment Company
MONROE E-Z-RIDE TRUCK SEAT
Monroe Auto Equipment Co., Monroe, Michigan
Advertising Brochure

07MORR-CW47 (05MORR-CW47)
Morris, C. W.
ANATOMY AND STATISTICS AID DESIGN OF PASSENGER SEATS
SAE Journal
Vol. 55 (September 1947)

also

(PASSENGER SEATS CAN BE COMFORTABLE)
SAE Preprint (April 1947)

07MURR-CA45
Murray Corporation of America
MURRAY MANUAL: AUTOMOBILE CUSHION SPRINGS (A Graphic Manual)
Murray Corporation of America, Detroit, Michigan
1945

07NEYH-AE47
Neyhart, A. E., and Seashore, C. G.
SEATING AND OTHER ASPECTS OF THE DRIVER'S ENVIRONMENT
Paper, SAE Summer Meeting
June 3, 1947

07NOBL-H 61 (05NOBL-H 61)
Noble, H., and Domzalski, L. P.
EVALUATION OF HUMAN SUBJECT REACTION IN THE FORWARD AND AFT FACING SEATED POSITIONS
Air Crew Equipment Laboratory, U. S. Naval Air Material Center, Philadelphia, Pennsylvania
Rept. NAMC-ACEL-424 (February 1961)
AD 259 071

This report presents a comparative examination of the reactions of human subjects to simulated crash acceleration forces, when seated in a standard Navy passenger seat aligned in either the forward or aft facing position. Environmental parameters such as seat acceleration, end velocity; anthropomorphic dummy motion and acceleration; human subject motion and acceleration; and distribution of seat member loads during a series of simulated crashes are discussed. The tests were conducted on the Air Crew Equipment Laboratory Horizontal Linear Accelerator.

07PATO-CR40 (10PATO-CR40)
Paton, C. R., Rickard, E. C., and Hoehn, V. H.
SEAT CUSHIONS AND THE RIDE PROBLEM
SAE Journal
Vol. 47, No. 1 (July 1940)
Pp. 273-283

07PATT-DI
Patt, D. I., and Randall, F. E.
PRINCIPLES OF SEATING IN FIGHTER TYPE AIRCRAFT
Aero Medical Laboratory, AAF, ATSC, Engineering Division
T-SEAL-3-695-58

07PATT-DI45
Patt, D. I.
COMFORT EVALUATION OF THE HAMMOCK-TYPE FIGHTER SEAT
Wright-Patterson Air Force Base, Ohio
WADC TR No. TSEAL 3-65-32EE (1945)

07PINK-II57
Pinkel, I. I., and Rosenberg, E. G.
SEAT DESIGN FOR CRASH WORTHINESS
NACA Rept. 1332, 1957 (Supersedes NACA TN 3777)
AD 109 316

On the basis of deceleration data obtained in full-scale crashes, a description of crash deceleration pulses is presented which is suitable for seat design. Charts are presented for obtaining the maximum deceleration loads experienced by the seat and passenger in response to their crash deceleration pulses. Finally, a method is presented for determining the seat strength, spring stiffness, and deformation beyond the elastic limit required to serve in a crash deceleration pulse of given description. Measurement of passenger decelerations in full-scale laboratory and crash studies shows that the general principles presented in the report apply.

07RADK-AO56 (05RADK-AO56)
Radke, A. O.
THE APPLICATION OF HUMAN ENGINEERING DATA TO VEHICULAR SEAT DESIGN
Bostrom Research Laboratories, Milwaukee, Wisconsin
Publication No. 117 (1956)

A detailed report including graphs and pictures of vehicle seats with the areas of position, posture, static comfort and vibration isolation integrated into the final design.

07RAND-FE46
Randall, F. E.
SEAT COMFORT
Mechanical Engineering
Vol. 68, No. 12 (December 1946)
Pp. 1056-1058

07REAR-FS66

REAR-FACING SEATS CALLED SAFEST TYPE FOR CHILDREN
Automotive News
July 18, 1966
Pp. 106

07ROEG-HF60
Roegner, H. F.
CRASH INJURY BULLETIN: PART I - ATTACHMENT OF SEAT BELTS IN THE HU-1A HELICOPTER; PART II - STOWAGE OF EQUIPMENT UNDER TROOP SEATS
Aviation Crash Injury Research, Phoenix, Arizona
AvCIR 69-0-120, TREC Tech. Rept. No. 60-61 (September 1960)

This report gives detailed instructions on the correct and incorrect method of installation of the seat belt in the HU-1A helicopter. In the second section, the stowage of equipment under troop seats is discussed. Accident experience with seats in this aircraft indicates that the seats will fail when under moderate crash loads. It is, therefore, important that the area directly beneath all occupied troop seats be kept free of loose equipment.

07ROGE-K 43
Rogers, K.
STATIC TESTS OF PLYWOOD SEAT ASSEMBLY
Boeing Airplane Company, Wichita Division Kansas
Report No. 75-6321 (March 1943)
ATI-104 192

Tests were made to see if the seat was structurally satisfactory to meet the requirements and to determine the ultimate strength of the seat for the shoulder harness load.

07ROTH-VE63
Rothe, V. E., Turnbow, J. W., Roegner, H. F., and Bruggnik, G. M.
CREW SEAT DESIGN CRITERIA FOR ARMY AIRCRAFT
United States Army, Trans. Res. Com., Fort Eustix, Virginia
TRECOM Tech. Rept. 63-4 (February 1963)
AD 404 561L

Strength requirements set forth in military specifications governing the design and fabrication of nonejection-type crew seats currently utilized in Army aircraft were analyzed. The analysis was made in light of accident experience with this seat, human tolerance as presently known, and accelerations and forces which may be anticipated in accidents involving Army aircraft. The analysis revealed that the strength requirements quoted in current military specifications are consid-

erably lower than (1) those which would be dictated by the upper limit of accelerations which can be tolerated by the occupants of the seats and (2) the accelerations and forces that are associated with Army aircraft accidents. This substantiates the observation by the Army that these seats fail under relatively moderate accident conditions, thus subjecting the occupant to further hazards, especially in increased contact injuries. On the basis of the detailed examination of current specifications, human tolerance, and impact acceleration data, it is recommended that the crew seat specifications be revised and that dynamic load factors of 25G for 0.20 second plus 45G for 0.10 second, measured in the pelvic region of a suitable anthropomorphic dummy, be adopted for crew seat design in the longitudinal and lateral directions, and 25G for 0.20 second for the vertical direction. In addition, an energy absorption capability must be incorporated into the seat system to reduce the vertical accelerations, which will frequently exceed 25G, to a tolerable level.

07RUBB-SF34

RUBBER SEATS FOR AUTOMOBILES
Rubber Age
Vol. 35 (September 1934)
Pp. 278

07SEAT-CI63

SEAT COMFORT IMPROVED BY SPECIAL MEASURING DEVICE
Automotive Industries
Vol. 129, No. 6 (September 15, 1963)
Pp. 72-3

Comfort Oscar, developed by Opel, Ruesselsheim, West Germany, to evaluate seat comfort, consists of seat pan of light metal, corresponding to body shape, to which back pan is connected by joint at hip point; lower segment of leg, including foot, is connected to seat pan in kneed joint; each of parts is loaded to weight of same human body parts; measurements taken and optimum seat comfort diagram obtained, used as basis for development of new seats.

07SEAT-CS65

SEATS—COMFORT AND SAFETY
Automobile Engineering
Vol. 55 (October 1965)
P. 425

07SEAT-HB44

SEATING HUMAN BEINGS
SAE Journal
Vol. 52, No. 10 (October 1944)
Pp. 44-46

07SEAT-IS51

SEATING INNOVATION STIRS INDUSTRY INTEREST
American Aviation
Vol. 14, No. 27 (22 January 1951)
Pp. 28-29

07SEAT-T 64
Seather, T.
ELASTOMERIC DIAPHRAGM FOR AUTOMOTIVE SEATING
Automotive Industries
Vol. 130, No. 11 (June 1, 1964)
Pp. 50-2

Requirements for automobile seats; factors to consider in selection of materials and design, and relationship of basic seat design and configuration to human anatomy; research work done at Acushnet Process Co. in developing ElastaSeat platforms, made of especially compounded rubber; construction of platform and machine designed for life testing platforms under continuous stress cycling; comfort level or deflection of elastomeric platform is determined by number of variable factors which are enumerated; applicability to passenger car, bus and aircraft seats.

07SELF-TM51
Self, T. M.
MATS ADOPTS REARWARD SEATING
Aviation Week
Vol. 54, No. 26 (June 25, 1951)
Pp. 59-60

also

Journal of Aviation
Vol. 23, No. 1
Pp. 88

Military Air Transport Service announces that all the future transport planes it orders will be equipped with seats facing the rear of the plane. MATS carried members of the Aviation Writers Association to their annual convention in New York in the first Boeing C-97 to be fitted with permanent rearward-facing seats; 20 more C-97's are to be similarly outfitted.

Thirty pairs of double folding seats, arranged in two rows, are built to withstand 16 G. Built according to designs by the Aero Medical Laboratory of the Air Force's Air Materiel Command, at first glance they seem rather spare. They have only an inch-thick foam rubber cushion over contoured seat and back pads, and arm rests, and another small pad at the back of the head. But they actually are more comfortable and less fatiguing than the deep cushions used on commercial aircraft.

The primary object of the seats is safety. Crash deceleration is absorbed by entire back, neck, and head, and parts of the arms and legs. Laboratory tests show the body can take 40 G for short periods without injury. Some transport manufacturers are afraid of the psychological factors involved in rearward seating. The two main arguments: (1) Passengers will wonder why all planes are not equipped with them, will be nervous about flying in ships with present forward-facing seats, and will be too crash conscious; (2) Americans are used to facing forward and will resist any change. A foreign flag carrier spokesman discounts both these arguments. The British and Australians have used rearward seating for some time with success. The Airworthiness Division of ICAO has decided to continue rearward-facing seats as a recommended project. International Air Transport Assn. feels the idea is theoretically sound but wants evidence of benefits counterbalancing the cost and effort involved.

MATS' recent switch is a result of five years' investigation and development by the Air Materiel Command in conjunction with MATS.

07SEWA-WH66
Seward, W. H.
SEATING CAN CONTRIBUTE TO SAFETY
Automotive Design Engineer
May 1966
Pp. 83-85

07SHER-WF62
Sherman, W. F.
DRIVER/PASSENGER SEATING CRITERIA AND DEVELOPMENT OF TECHNIQUE FOR DESIGN OF AUTOMOBILE SEATING
AMA Engineering and Technical Department
AMA Engineering Notes 623 (April 1962)

07SHOC-AS57
____
SHOCK ABSORBING SEAT REDUCES INJURIES
Aviation Week
Vol. 66, No. 61 (April 1957)

07SIFU-SS58 (10SIFU-SS58)
Sifuentes, S. S.
SEAT BACK-PASSENGER-IMPACT ABSORPTION CHARACTERISTICS DEVELOPMENTAL TEST MODEL 22
Convair, San Diego, California;
Rept. No. SL58-177 (16 June 1958)

07SLEC-RF91
Slechta, R. F., Wade, E. A., Carter, W. K., and Forrest, J.
COMPARATIVE EVALUATION OF AIRCRAFT SEATING ACCOMMODATION
Wright Air Development Center, Wright-Patterson Air Force Base, Ohio
WADC TR 57-136 (April 1957)
NOTE: CARI P&S 4.23aa
AD-118 097

Three inter-related purposes were accomplished: (1) A series of seats currently in use in operational aircraft were comparatively tested for adequacy in limiting pilot and crew fatigue and discomfort. (2) Several subjective methods of comfort testing were devised and evaluated to determine efficient and economical means of seat evaluation. (3) The test data were analyzed for basic information about the nature and progression of seating discomfort. The approach was experimental, using techniques and orientations of an inter-disciplinary research team. Eighteen subjects, selected to represent a wide range of body sizes in the Air Force population, were seated in each of six seats for tests up to 7 hours in duration. Six by six Latin Squares were utilized for purposes of counterbalancing Summaries of data and discussions of statistical techniques are presented in appendices. Results are summarized in an introductory overview and in the conclusions section. Results of several comfort testing techniques were found consistent one with the others. Statistical separation of the seats was demonstrated in analyses of data from voluntary sitting time and other techniques. Statistical treatment of sitting time data from twelve subjects gave essentially the same results as those obtained with 18 subjects. Localized discomfort in the back and buttocks was found more important than discomfort in the thighs, neck, shoulders, and lower legs in producing general discomfort. Seat parts were analyzed for their relative importances in achieving comfortable seating.

07SLEC-RF92
Slechta, Robert F. and Forrest, J.
COMFORT EVALUATION OF THE C-97A/KC97E PILOT SEAT (WEBER)
Bio-Mechanics Laboratory, Department of Sociology, Tufts University
WADC Technical Report 58-313 (November 1959)
Contract No. AF 33(616)-3068, Proj. No. 7215, Task No. 71724
AD 235 130

Certain design characteristics of the C-97A/KC-97E Pilot Seat (Weber) are evaluated in terms of human comfort. Evaluation consisted primarily of a battery of subjective and behavioral lab tests administered through hourly questionnaires presented to 16 subjects during a voluntary sitting period of 7 hours max duration. The max duration of sitting time permitted was 420 min, the voluntary time was 365.6 min. With intolerable discomfort rated (-10) and ideal comfort (+10), the average was +3.57. Hourly scale evaluations revealed that comfort decreased with time, but that at no point during the first 5 hours did the rating fall into the discomfort zone. For all body regions the average onset of discomfort was 198.0 min and that most discomfort was experienced in the buttocks, back and neck, in that order. Individual seat parts revealed certain inadequacies in the seat and back cushions, armrests, headrest, and manipulation of controls. Recommendations for seat design improvements are included.

07SLEC-RF93
Slechta, R. F., and Forrest, J.
COMFORT EVALUATION OF THE C-118 PILOT SEAT (AEROTHERM)
Wright Air Development Division, Wright-Patterson Air Force Base, Ohio
WADD TR 58-312 (March 1959)
NOTE: CARI P&S 4.23
AD 212 559

This study was undertaken in order to evaluate certain design characteristics of the C-118 Pilot Seat (Aerotherm) in terms of their adequacy for the maintenance of human comfort. The method of evaluation consisted primarily of subjective and behavioral laboratory tests administered by means of hourly questionnaires presented to seventeen subjects during a voluntary sitting period of seven hours maximum duration. On the basis of test data and specific comments made by the subjects, recommendations for seat design improvements were made.

07SLEC-RF94
Slechta, R. F., Forrest, J., and Carter, W. K., et al.
COMFORT EVALUATION OF THE C-124A PILOT SEAT (WEBER)
Wright Air Development Center, Wright-Patterson Air Force Base, Ohio
WADC TR 58-314 (November 1959)
AD 233 462

Certain design characteristics of the C-124A Pilot Seat (Weber) were evaluated in terms of their adequacy for the maintenance of human comfort. The evaluation method consisted primarily of subjective and behavioral laboratory tests through the use of hourly questionnaires presented to 18 subjects during a voluntary sitting period of 7 hours maximum duration. Although the maximum permitted sitting time was 420 minutes, the average voluntary time was 375.5 min. On a comfort scale ranging from intolerable discomfort (-10) to ideal comfort (+10), the average was +5.24. Hourly scale evaluations revealed that comfort began to decrease after 2 hours, but that the average rating did not fall into the discomfort for all body regions was 189.2 minutes, and that most discomfort was in the buttocks and the back. Individual seat part evaluation revealed inadequacies on seat and back cushions, armrests, headrest, and manipulation of controls. Recommendations for seat design improvements are included.

07SMIT-LD51
Smith, L. D.
CRASH OR DITCHING SEAT FOR B.47 AIRCRAFT
Wright Air Development Center, Wright-Patterson Air Force Base, Ohio
Memo Rept. WCRDC-666-25D (31 October 1951)

To design and develop a safety restraint device suitable for the protection of aircrew personnel in the event of crash or ditching. The crash ditching seat as described in the aforementioned report is a more satisfactory item for the use of aircrew personnel, other than pilot or co-pilot on the Type B-47 aircraft in the event of crash or ditching operations than the Ditching Vest, Drawing.

07SMIT-TA61
Smit, T. A.
DYNAMIC CALCULATION ON AIRCRAFT SEATS
Royal Netherlands Aircraft Factories Fokker
Rept. No. FS-9 (25 May 1961)

07SOCI-AE
Society of Automotive Engineers
SEATING MANUAL
Soc. Automotive Engineers, 29 W. 39th St., New York, New York
SAE Publication No. S.P. 135

07SOCI-AE50
Society of Automotive Engineers
CURRENT AUTOMOTIVE SEATING PROBLEMS AND DESIGNS
SAE Body Engineering
Subcommittee on Automobile Seating (June 22, 1950)

07SOCI-AE51
Society of Automotive Engineers
CURRENT AUTOMOTIVE SEATING PROBLEMS AND DESIGNS
SAE Summer Meeting, French Lick, Indiana June 4, 1951

07SOCI-AE58
Society of Automotive Engineers

SAE SUMMER MEETING. Panel Discussion: Seats Can Be Made Safer and More Comfortable
Atlantic City, New Jersey (June 12, 1958)

1) Evolution of automotive seating, J. F. Hern, American Metal Products Company.
2) Where do we find space for seats? P. O. Johnson, Fisher Body Division.
3) Urethane foams for seat pads, W. J. McCortney, General Tire and Rubber Company.
4) Natural and synthetic latex foam cushioning, W. B. Kelly, Goodyear.

07STAP-JP51
Stapp, Maj. John P.
HUMAN EXPOSURE TO LINEAR DECELERATIVE FORCE IN THE BACKWARD AND FORWARD FACING SEATED POSITIONS.
The Military Surgeon
Vol. 109 (July, December, 1951)

07STAP-JP61
Stapp, J. P., and Nutt, B.
CRASH PROTECTION OF AIR TRANSPORT PASSENGERS BY IMPROVED SEAT MATERIALS DESIGN
Paper, 1961 Meeting of Aerospace Medical Association, Chicago
April 24-27

USAF and RAF crash experience data with forward- and aft-facing passenger seats are reviewed. Human tolerance data derived from quantitative human and animals crash experiments are presented for both forward- and aft-facing seated exposures. A new type of aft-facing seat made with nylon netting in a tubular steel frame is described, in which optimum comfort and protection are combined with minimum weight. Passenger safety requirements of present and future air transports are discussed for both military and civilian operations. Recommendations are made for optimum acceptable protective measures.

07STON-PT65
Stone, P. T.
APPROACH TO THE ASSESSMENT OF THE COMFORT OF FOAM CUSHIONING
Automotive Body Engineering
Vol. 135 (January 1965)
Pp. 28-30, ill.

07SWEA-JJ62
Swearingen, J. J., Wheelwright, C. D., and Garner, J. D.
AN ANALYSIS OF SITTING AREAS AND PRESSURES OF MAN
Civil Aeromedical Research Institute, Federal Aviation Agency, Oklahoma City, Oklahoma
CARI Rept. No. 62-1 (January 1962)
AD 271 138

Studies of sitting area on a plane rigid surface for a group of 104 male subjects were made. Area was found to vary with height and weight and to increase with age up to 40 years after which there is a steady decline. Means were 179.4 sq. in. for area and .92 pounds/sq. in. for average pressure. Sitting contact area was found to increase with experimentally applied force of magnitudes up to something less than body weight. Analysis of pressure distribution in the sitting area reveals that nearly half of the body weight is supported on 8% of the sitting area. This high pressure area is under or adjacent to the ischial tuberosities. Over one-third of the body weight on the sitting area is removed by the addition of a footrest, chair arms, and a slightly sloping seat back. (Author)

07TEA -CA38
Tea, C. A.
AUTOMOBILE SEAT CUSHIONS AND RIDING COMFORT
SAE Journal
Vol. 43, No. 1 (July 1938)
Pp. 26-29

07THIE-RH63
Thier, R. H.
MEASUREMENT OF SEAT COMFORT
Automobile Engineer
Vol. 53, No. 2 (February 1963)
Pp. 64-66

As result of investigations into seats of many motor vehicles, device for measuring seat comfort is developed, which allows objective evaluation to be made; studies were based on model of human body, developed from anthropometric measurements; device consists of light metal seat pan, embossed according to Oscar's body contours, to which backrest pan is connected by joint in hip; lower part of leg, including foot, is connected to seat pan at knee joint, each of parts is loaded to correspond exactly with weight of human body; evaluation of measurements.

07THIE-R 64
Thier, R.
MESSGERAET ZUR ENTWICKLUNG UND BEURTEILUNG VON KRAFTFAHRZEUGSITZEN
Automobiltechnische Zeit
Vol. 66, No. 3 (March 1964)
Pp. 83-4

Measuring instrument for development and evaluation of automobile seats; Comfort Oscar, developed to evaluate seat comfort, consists of seat pan of light metal to which back pan is connected by joint at hip point; lower segment of leg and foot is connected to seat pan in knee joint; how measurements are taken and evaluated.

07THOM-DF64

Thompson, D. F., and Harper, P.
ARMOR PROTECTION FOR PILOT/COPILOT SEAT WITH CRASH SAFETY FEATURES FOR CH-47A HELICOPTER
Vertol Division, Boeing Company, Morton, Pennsylvania
Tech. Rept. TRECOM TR 64 73 (December 1964)
AD 610 587

Pilot/copilot protected crash-safety seat was designed and manufactured. Optimum seat and torso protection was attempted. Detail load and stress analysis for accelerations of 20 g vertically and 45 g longitudinally and laterally was made. By using crushable honeycomb type material, an improved torso restraint system and a variable attenuation mechanism were adopted. The feasibility of using protection media as a load bearing structure was demonstrated. (Author)

07TURN-JW62

Turnbow, J. W., Rothe, V. E., Bruggink, G. M., and Roegner, H. F.
CRASH INJURY EVALUATION: MILITARY TROOP SEAT DESIGN CRITERIA
Aviation Crash Injury Research, Phoenix, Arizona
TCREC Tech. Rept. No. 62-79 (November 1962)

This report is made of results of careful analysis of military troop seat deficiencies conducted over a three year period. Available data have been translated into terminology, meaningful to engineering personnel. Utilization of the information presented would produce a seat representative of the current state of the art and greatly reduce incidence of needless injury and death attributable to troop seat failure in survivable-type Army aircraft accidents.

07TURN-JW63 (10TURN-JW63)

Turnbow, J. W., Robertson, S. H., and Carroll, D. F.
DYNAMIC TEST OF AN EXPERIMENTAL TROOP SEAT INSTALLATION IN AN H-21 HELICOPTER
Aviation Crash Injury Research, Phoenix, Arizona
Rept. No. TR AvSER 63 7 (November 1963)
AD 429 129L

On 12 September 1962, an experimental wall-and ceiling-mounted, energy-absorbing troop seat was dynamically tested by being subjected to an actual aircraft crash. The seat was installed as a side-mounted seat, and its occupant was a standard 95th-percentile, 200 pound anthropomorphic dummy. Postcrash evaluation revealed that no failures in the seat, the energy-absorbing assembly, or the tiedown chain occurred. The environment surrounding the seat was exposed to vertical accelerations in the 100G to 200G range for short intervals. The seat limited the occupant acceleration to 25G in an impact having an initial velocity in excess of 40 ft./sec. in the vertical direction. The restraint system used was found to prevent the occupant from shifting position within the seat during impact, yet allowed the occupant and seat together to displace with respect to the airframe.

07TWO -CS66

TWO CAR SEATS FOR BABIES
Consumer Bulletin
October 1966
Pp. 8-9

07UNIT-SR

United States Rubber Company
THE ART OF CUSHIONING (Advertising Brochure)
Koylon Foam Division, United States Rubber Company, Mishawaka, Indiana

07WACH-RA59 (05WACH-RA59)

Wachsler, R. A., and Learner, D. B.
AN ANALYSIS OF SOME FACTORS INFLUENCING SEAT COMFORT
Ergonomics
Vol. 3 (1959)
Pp. 315-320

This study presents a re-analysis by correlation and factor analysis of data on the relative comfort of six Air Force pilot and crew seats. On the basis of the results obtained, the following conclusions may be drawn: 1) Seats are rated in the same relative order of comfort after only 5 min of sitting time has elapsed as after 4 or more hours of sitting on the seats. 2) People tend to rate the overall comfort of a seat mainly on the basis of the comfort of their backs and buttocks. The comfort of the neck and shoulders plays a secondary role while thigh and leg comfort seems to have little relationship to judgments of the overall comfort of a seat. It was found that the following seven types of measurements were measures of the same quantity, Overall Comfort of a seat: a) Actual time a subject is willing to sit in a seat (up to a maximum of seven hours). b) Ratings of overall comfort after 5 min of sitting. c) Predictions of total time he would be willing to sit in the seat made after 5 min of sitting. d) Time of onset of first signs of discomfort. e) Ratings of overall comfort after 4 to 7 hours of sitting. f) Comfort of the back. g) Comfort of the buttocks.

07WEIN-LW65 (10WEIN-LW65)
Weinberg, L. W. T.
CRASHWORTHINESS EVALUATION OF AN ENERGY ABSORPTION EXPERIMENTAL TROOP SEAT CONCEPT
Aviation Safety Engineering and Research, Phoenix, Arizona
AvSER-64-11; TRECOM-TR-65-6 (February 1965)
AD 614 582

The basic concept was a single-passenger, side-facing, bucket seat. Anthropomorphic dummies, restrained by lap belts and single diagonal chest straps, provided simulated human loading characteristics during impact. Accelerometers mounted in the pelvic cavity of the dummies permitted recording of impact decelerations. Floor accelerations were measured near the seat installations. Tensiometers recorded the belt forces. Highspeed cameras recorded the reaction of the dummies and experimental seats during the crash sequences. Seats were divided into two basic functional units: a seat base incorporating an energy-absorbing strut to provide the vertical support; and a curved nylon seat back designed to provide restraint in the lateral and longitudinal directions. The test series demonstrated the effectiveness of strut-type energy absorption as a method of attenuating crash forces. (Author)

07WHAR-TP60
Wharton, T. P.
PRINCIPLES OF CUSHIONING DESIGN
Industrial Packaging Products, Inc., Riverton, New Jersey
November 1960

07WHIT-RK59
Whittenberger, R. K.
IMPROVED SEAT AND BACK CUSHIONS
Aero Medical Laboratory, Wright-Patterson Air Force Base, Ohio
WADC TR 59-376 (1959)

07WILL-RL50
Williams, R. L.
AUTOMOBILE SEATS (In Report of 1950 Summer Meeting Round Table, SAE Seating Reports, Vol. 2)

07WISN-A 61
Wisner, A.
QUELQUES PROBLEMES POSES PAR LES SIEGES DE VOITURES (Some problems of car seats) (In Problemes Physiologiques poses par les Transports)
Revue de Metrologie (Paris)
1961

07WISN-A 64 (05WISN-A 64)
Wisner, A., Donnadieu, A., and Berthoz, A.
BIOMECHANICAL MODEL OF MAN FOR STUDY OF VEHICLE SEAT AND SUSPENSION
Int. J. Production Research
Vol. 3, No. 4 (1964)
Pp. 285-315.

Man-seat system study was performed taking into account subject's size, weight, posture, type of seat and excitation amplitude; results enable dynamic evaluation of seats during steady state vibrations and shocks; repetitive experiments give numerical evaluation of model parameters, although important differences are found between subjects and also for same subject in varying postures; it is noted that mechanical properties of human body cannot be considered as varying linearly with intensity of excitation, which makes reaction to random stimulations usual in working conditions even more complex, 26 refs.

08 BELTS

08ARE -SB62
ARE SEAT BELTS GOOD FOR TRUCKS?
Commercial Car Journal
October 1962
P. 77

08ASHA-V 62
Ashar, Vijay
SEAT BELT SURVEY
ACIR Bulletin
June 1, 1962

08AUTO-CI63
Automotive Crash Injury Research
A STUDY OF SEAT BELTS IN WISCONSIN AUTOMOBILE ACCIDENTS
Automotive Crash Injury Research, Buffalo, New York
9 September 1963
Cal Report No: VJ-1823-R3, Grant: AC 00101-01
Sponsor: Public Health Service, Division of Accident Prevention/Automobile Manufacturers Association, Inc.
Illus., ref., tables

Examination of rural injury-producing accidents, investigated by the Wisconsin State Patrol from July 1961 to June 1963, showed that seat belts were installed in 19.4% of all cars reported and were used by 51.7% of the occupants who had belts available.

Seat belt installation was mandatory in 1962-63 Wisconsin cars, but not in the other cars studied. Wisconsin and out-of-state cars manufactured during the periods 1958-61 and 1962-63 were compared.

08AUTO-MA66
Automobile Manufacturers Association, Inc.
A PROPOSAL FOR AN INITIAL FEDERAL MOTOR VEHICLE SAFETY STANDARD ON MANDATORY SEAT BELT INSTALLATIONS IN PASSENGER CARS.
Automobile Manufacturers Association, Inc., Detroit, Michigan
Report No. AMA S-19 (17 October 1966
39 p., diagrams

08AUTO-SB57

AUTOMOBILE SAFETY BELTS
Consumers' Research Bulletin
March 1957
P. 23

08AUTO-SB60

AUTO SEAT BELTS? GOVERNMENT SAFETY ENGINEERS AND RESEARCH EXPERTS SAY: "YES."
Safety Standards
September-October 1960
P. 1-4

08AUTO-SB62

AUTO SAFETY BELTS
Consumer Bulletin
September 1962
P. 25-27

08AUTO-SB63

AUTOMATIC SAFETY BELT
Mechanical Engineering
Vol. 85 (October 1963)
Pp. 66-67

08AVIA-CI56
Aviation Crash Injury Research
HV HARNESS AND REEL QUESTIONNAIRE
Aviation Crash Injury Research, a Division of Flight Safety Foundation, Inc., Phoenix, Arizona
Report AvCIR-6-F-70 (October 1956)

08AYER-WH56
Ayers, Walter H.
A SURVEY OF AUTOMOTIVE SEAT BELTS: OWNER EXPERIENCE AND NON-OWNER ATTITUDES
Copyright 1956 by E. I. DuPont de Nemours and Company Textile Fibers Department

Purchase intentions, public awareness, indications for future merchandising. Includes a questionnaire in the appendix.

08BACK-TB59

BACKGROUND TO BELTS. A summary of known facts about a little-known but vital subject
Motor, London
Vol. 115, No. 2973 (1959)
Pp. 243-7

08BARN-B 62
Barnes, B.
SEAT BELT PROMOTION GETS GOOD RESULTS BUT RAISES QUESTIONS
Vol. 54 (June 1962)
Pp. 29-30

08BASS-LW65
Bass, Lee W., and Wilson, Thrulow R.
THE ROLE OF A PHYSICIAN'S INFLUENCE ON INSTALLATION OF SEAT BELTS
7th Stapp Car Crash Conference
1965
Pp. 302-311

For many years the American Academy of Pediatrics has recommended that pediatricians discuss safety with parents. Value and effectiveness of this type of discussion have been questioned. In the following study, an effort was made to determine whether a physician is able to implement safety education by recommending that his patients install seat belts. The purpose of the study was to measure the effectiveness of personal influence and specifically to determine if the personal urging of a pediatrician was more influential than mass media in effecting the installation of seat belts.

08BAYL-CH54
Bayley, C. H.
DETERIORATION OF RCAF SEAT HARNESS WEBBING
NRC, Toronto
NRC Memorandum M48-17-10A-17, Toronto (6 January 1954)

08BLOM-GW61
Blomgren, G. W.
AN EXPERIMENTAL EVALUATION OF TWO APPROACHES TO SEAT BELT PROMOTION
Northwestern University Traffic Institute, 405 Church St., Evanston, Illinois
1961 Unpublished Report

08BOHL-NI66
Bohlin, N. I.
STUDIES OF THREE-POINT RESTRAINT HARNESS SYSTEMS IN FULL-SCALE BARRIER CRASHES AND SLED RUNS
8th Stapp Car Crash and Field Demonstration Conference
1966
P. 258

A series of full-scale car barrier crashes and an additional series of sled tests were carried out. The tests involved two types of three-point restraint harness, anthropomorphic dummies, and in some tests a human subject. These tests evaluated the effectiveness of the harnesses under various conditions, i.e., different hardness of seat cushion, slack in harness loops, and angled frontal impacts. The loads in anchorage points and the retardation of the dummy as well as that of the vehicle were recorded. The restraint kinematics were further evaluated by means of high-speed motion-picture cameras. The effectiveness of the two harness systems was found to be high and about equal, but, with respect to retardation and general restraint features at the rebound stage, somewhat favorable to the harness system which employed a single sliding strap at the strap junction. Harder seat cushions and slack in harness gave increased retardation and loading figures in some recording points. The harnesses offered good restraint features in angled frontal impacts up to 30°.

08BREN-B
Brenner, B.
AUTOMOBILES WITH SEAT BELTS IN ALLEN COUNTY, INDIANA
Division of Accident Prevention, Department of Health, Education and Welfare, Washington
Unpublished Manuscript

08BRIT-SI61
The British Standard Institution
SEAT BELT ASSEMBLIES FOR MOTOR VEHICLES
Engineering
Vol. 191, No. 4947 (1961)
P. 220

also

Highway Research Abstracts
Vol. 31, No. 5
P. 2

08BROW-JB65
Browning, J. B.
RETRACTABLE SEAT BELT UNIT
Patent Office, London
3 pp., 6 fig.

The patented seat belt unit has a rugged housing with a positive belt retaining means and a simple retracting spring mechanism, with improved means of attachment. It can be adapted for use with a variety of vehicles, and its mounting permits positioning of the unit for free belt operation.

08BRUG-GM61
Bruggink, G. M., and Schneider, Daniel J.
LIMITS OF SEAT-BELT PROTECTION DURING CRASH DECELERATIONS
Aviation Crash Injury Research, Phoenix, Arizona
Rept. No. AVCIR 61-8 (September 1961)
TREC TR 61-115
AD 265 868L

The protective limits of aircraft seat-belt protection, as discussed in the available literature, are compared with recent crash injury experience. To insure maximum survivability under the most adverse conditions, the strength of a seat-belt restraint system should be based on the threshold between the injurious and fatal limits of seat-belt restraint. The study indicates that an aircraft seat-belt restraint with an energy absorbing capability of 25 G's (occupant weight, 200 pounds) for a duration of at least .2 second may form a realistic compromise between the ideal and the practicable strength of such a system. (Author)

08CAMP-BJ91
Campbell, B.J.
PRELIMINARY SEAT BELT INSTALLATION SURVEY
ACIR Bulletin
June 1, 1962

08CAMP-BJ92
Campbell, B. J.
SEAT BELTS IN CONVERTIBLE CAR ACCIDENTS
ACIR Bulletin
No. 3 (October 1962)

08CAMP-BJ93
Campbell, B. J., and Lieberman, Susan
A REVIEW OF AUTOMOBILE SEAT BELT INSTALLATION TRENDS AND A SURVEY OF NEW JERSEY EXPERIENCE
ACIR Bulletin
No. 5 (1963)

08CAMP-BJ94
Campbell, B. J., and Kihlberg, Jaakko K.
SEAT BELT EFFECTIVENESS IN THE NON-EJECTION SITUATION
7th Stapp Car Crash Conference
1965
Pp. 177-188

08CAMP-HE62
Campbell, Dr. Horace E.
FEDERAL SAFETY SPECIFICATIONS FOR AUTOMOBILES, TRUCKS, BUSES
Nebraska State Medical Journal
Vol. 47, No. 9 (September 1962)
P. 510

Discussion of energy absorbing properties of seat-lap belts.

08CANA-SA63
Canadian Standards Association
MOTOR VEHICLE SEAT BELTS
CSA Standard D159.1
1963

08CHAN-LS62

Change of Location of Seat Belt Moorings to the Seat Itself in SAE; Standard for 25% Stretch Mentioned
News from Motor Age
December 1962

08CHRY-PI61 (02CHRY-PI61)
Chrysler Press Information Service
Chrysler President Announces Safety Seat Belts Will be Offered at Cost to Boost Their Use
January 30, 1961

08COLE-BC53
Coles, B. C.
SAFETY HARNESS - CRAIG TYPE
Institute of Aviation Medicine, Toronto
Letter IAM 1015A (CO) (13 November 1953)

08CONS-U 91
Consumer's Union
AUTO SEAT BELTS, A PERSPECTIVE VIEW
Consumer Reports
May 1961
Pp. 230-231

08CONS-U 92
Consumer's Union
AUTO SEAT BELTS: A SWEDISH GOVERNMENT AGENCY USED CRASH-TEST METHODS TO HELP CU ARRIVE AT RATINGS OF 52 MODELS
Consumer Reports
October 1961
Pp. 541-546

08CONS-U 93
Consumer's Union
SEAT HARNESSES: A TECHNOLOGICAL LAG
Consumer Reports
April 1963
P. 148

08CONS-U 94
Consumer's Union
DO RETRACTORS DAMAGE SEAT BELTS?
Consumer Reports
Vol. 31, No. 10 (October 1966)
P. 496

08COX -EG66
Cox, Ernest G.
SEAT BELTS FOR BUSES?
Traffic Safety
August 1966
Pp. 22-23, 34-35

08CRUN-TH65
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"CRUNCHY" TO HELP ANSWER SEAT BELT QUESTION
Traffic Safety
September 1965
P. 12

School bus.

08DARR-J 53
Darras, Jules
SHOULDER HARNESS WEBBING: A COMPARISON OF DACRON, NYLON, AND COTTON
Douglas Aircraft Company, Inc.
Report No. ES-17449 (October 1953)

08DEAN-DA60
Deans, D. A.
SAFETY HARNESS - SABRE AND SILVER STAR AIRCRAFT
Royal Canadian Air Force, Central Experimental and Proving Establishment, Climatic Detachment, Namao, Alberta
Report 2068 (June 1960)
AD 241 729

Because of user complaints on "Z" type safety harnesses in both Sabre and Silver Star aircraft, tests were conducted to determine if more suitable combinations and arrangements of harnesses and buckles could be achieved. It was found that, while certain complaints were due to defects in seat pack retention and other causes not solely the fault of the harnesses, there were several defects in the harnesses themselves. As a result of the tests, the most suitable combination and arrangement of webbing and buckles, using currently available materials, was determined. It is recommended that safety harnesses for these aircraft incorporate the recommendations made in this report.

08DEBO-EF52
DeBois, E. F.
SAFETY BELTS ARE NOT DANGEROUS
Britain Medical Journal
Vol. 2 (1952)
Pp. 685-686

08DECE-LA62
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DECELERATION LOCKS AUTO SAFETY BELT
Machine Design
Vol. 34 (October 25, 1962)
P. 156

08DEHA-H 52 (05DEHA-H 52)
DeHaven, H., and Hasbrook, A. H.
SHOULDER HARNESS: ITS USE AND EFFECTIVENESS
Medical College, Cornell University
1 November 1952

08DEHA-H 56
DeHaven, Hugh, and Hasbrook, A. Howard
SHOULDER HARNESS: ITS USE AND EFFECTIVENESS
Aviation Crash Injury Research of Cornell University
Rept. No. 32-0-38 (1956)

08DELA-AA63
Delaney, Arthur A.
SEAT BELTS FOR SCHOOL BUSES?
Safety Education
October 1963
Pp. 24-26

08DUNL-DR65
Dunlop, Donald R.
SAFETY HARNESS RESEARCH-CALIFORNIA

7th Stapp Car Crash Conference
1965
Pp. 127-137

The intent of this report is to present a resume of the dynamic evaluation of lap-type safety harness testing at the Testing Agency for the California Highway Patrol. The report includes the design considerations for the system, a summary of early tests, and a resume of current tests indicating the type of belt failures which did, and still are occurring. Included also are the changes in California's test specifications along with the reasons for these changes.

The Testing Agency is presently constructing a new research and test facility. The horizontal sled's capabilities are described and the proposed research is outlined. We will, by the end of this year, be verifying the field test data now available, and under controlled laboratory conditions, be investigating the interaction of the body and restraint systems.

08EIFF-AL61
Eiffel, R. Le Grain
MEMORANDUM ON SAFETY BELTS AND SAFETY HARNESS FOR MOTOR VEHICLES, INCLUDING NATIONAL SPECIFICATIONS AND STANDARDS FOR U.S.A. AND SOME EUROPEAN COUNTRIES
International Road Safety and Traffic Review
Summer 1961
Pp. 35-39

08FALE-ED58
Fales, E. D., Jr.
SEAT BELTS: SAFE OR HAZARDOUS?
Today's Health
October 1958
AMA Reprint

This publication contains the answers to questions commonly asked about seat belts. It also reviews the opinions of several safety experts concerning the actual need for seat belts in case of accidents.

08FAST-YS62

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FASTEN YOUR SEAT BELT
Safety Review
November 1962
Pp. 6-8

Excuses for not wearing, and facts which disprove the excuses.

08FRED-RH65
INTERNATIONAL ORGANIZATION FOR STANDARDIZATION, RECOMMENDATIONS FOR SEAT BELT ASSEMBLIES (In 7th Stapp Car Crash Conference Proceedings)
Charles C. Thomas, Publisher
1965
Pp. 163-165

08FRYE-DI62
Fryer, D.I.
RAF EXPERIENCE WITH SAFETY HARNESSES
Am. Occup. Hyg.
Vol. 5 (1962)
Pp. 113-127

In the development of safety harness from its earliest stages to the present complex systems in current aircraft, a number of important strides have been made and these are briefly reviewed. The main advances have been in the provision of shoulder harness, the recognition of the need for attachment to the airfram rather than the seat, the design of harness such that the centre of gravity of the body is not lower than the junction point of the straps, and the construction of harness such that it will withstand the forces encountered in very severe impacts. The three principal aims of harness in aircraft are to provide restraint during various in-flight manoeuvres, to provide retention during crash decelerations and to maintain optimum body posistioning during operation of the ejection seat. The relevance of the features of current harness to the requirements for safety belts for motor vehicles is briefly discusses.

08FULT-JL66
Fulton, J. L.
SEAT BELTS VERSUS SHOULDER HARNESS
Society of Automotive Engineers
1966
6 p.

08GARR-JW62 (06GARR-JW62)
Garrett, J. W., and Braunstein, P. W.
THE SEAT BELT SYNDROME
The Journal of Trauma
Vol. 2, No. 3 (May 1962)

The data examined in this study were based on accident and medical records drawn from a total of 2,778 automobiles in each of which at least one occupant was wearing a seat belt when an accident occurred. These cars contained 3,673 occupants; 3,325 occupants wore seat belts and of these, 944 were injured.

A total of 150 occupants received some injury to the lower torso; 26 of these except in one case, but the injury was not related to seat belt use; both car and occupant were completely crashed in a collision with a bus. The frequency of lower torso injuries among injured seat belt users was essentially similar to that observed among occupants in injury-producing accidents without belts (about 15 per cent for both).

In the majority of the 26 cases where serious lower torso injuries occurred, accident circumstances were rather severe. Only 7 of these patients showed any evidence of severe seat belt application—bruises, contusions, etc.

08GENE-SA66
General Services Administration
ANCHORAGE OF SEATS FOR AUTOMOTIVE VEHICLES
General Services Administration
Federal Standard No. 515/6 (September 28, 1966)
3 pp.

08GRIM-G 91
Grime, Geoffrey
EFFECT OF SEAT HARNESS ON MOVEMENT OF CAR OCCUPANT IN A HEAD-ON COLLISION
HRB Record
No. 4 (1963)
Pp. 76-90

08GRIM-G 92
Grime, G.
THE EFFECTIVENESS OF CAR SEAT BELTS
International Road Safety and Traffic Review
Vol. 11, No. 3 (1963)

08GRIM-G 93
Grime, G.
SAFETY GLASS AND SAFETY BELTS FOR AUTOMOBILES
Charles C. Thomas, Publisher
1963
Road Research Laboratory
21 p.

08GRIS-RW55
Griswold, R. W., and DeHaven, Hugh
COMBINATION SHOULDER AND LAP SAFETY BELTS
Elizabeth M. Griswold, Griswold Company, Old Lyme, Connecticut
14 June 1955
U.S. Patent 2,710,649

08GUGG-AS61
Guggenheim Aviation Safety Center
LIMITS OF SEAT BELT PROTECTION DURING ABRUPT TRANSVERSE DECELERATIONS
Guggenheim Aviation Safety Center, New York, New York
April 1961

08GUTT-JM65
Guttridge, J. M.
SAFETY BELTS IN HEAVIES NEED RESEARCH
Commercial Vehicles
Vol. 39 (December 1965)
P. 39+

08HAES-A 62
Haesner, A.
SAFETY BELTS FOR DRIVERS FROM A TECHNICAL POINT OF VIEW
Zbl. Verk. Med.
Vol. 8, No. 4 (1962)
Pp. 206-211

also
Road Abstracts
Vol. 31, No. 1 (1964)
P. 24

08HAEU-RC63
Haeusler, Roy C.
SEAT BELTS AND SCHOOL BUSES
NSC Transactions
Vol. 17 (1963)
Pp. 77-84

08HASB-AH55
Hasbrook, A. H.
SAFETY BELT (BUCKLE) SLIPPAGE, AND/OR INADVERTENT RELEASE
Aviation Crash Injury Research of Cornell University, New York
Rept. No. 40-0-52 (May 1955)

08HASB-AH56
Hasbrook, A. H.
PHOTO AND CAPTION RELEASE OF HV HARNESS MOCK-UP
Aviation Crash Injury Research, A Division of Flight Safety Foundation, Inc., Phoenix, Arizona
Report AvCIR-4-PCR-76 (November 1956)

08HASK-LT57 (06HASK-LT57)
Haskell Laboratory for Toxicology and Industrial Medicine
A STUDY OF THE EFFECTS OF SEAT BELTS ON AUTOMOBILE AND TRUCK DRIVERS
Haskell Laboratory for Toxicology and Industrial Medicine
Report No. 22-57 (July 8, 1957)
Medical Research Project No. MR-355

Questionnaire on physiological and psychological history of subjects strain gauge pneumograph of lower chest, accelerometers for both vehicle and driver, pulses taken, reaction times, ventilation rates, pulse rate.

08HERB-DC60
Herbert, D. C.
INJURY REDUCTION BY THE USE OF SAFETY BELTS IN MOTOR CARS
Snowy Mountains Hydro-Electric Authority, Scientific Service Division, New South Wales, Australia
Rept. No. S.M. 1252 (August 1960)

08HERB-DC61
Herbert, D. C.
DIAGONAL BELTS ARE BEST IN CAR ACCIDENTS
Engineering
Vol. 191 (May 26, 1961)
P. 718

08HITC-FA47
Hitchcock, F. A.
PHYSIOLOGY OF SAFETY BELTS AND HARNESSES
Ohio State University
9 October 1947

08HONT-H 64
Hontschik, H.
UNTERSUCHUNGEN UBER DIE WIRKSAMKEIT VON KRAFTFAHRZEUG-SICHERHEITSGURTEN BEI SCHRAGEN AUFPRALL (Safety Belt Effectiveness in Broad-Side Collision)
Deutsche Kraftfahrtforschung und Strassenverkehrstechnik
Vol. 168 (1964

08HOW -SA62

HOW SAFE ARE YOUR SEAT BELTS?
Safety Maintenance
Vol. 124 (December 1962)
Pp. 21-22+

08KALO-JG56
Kalogeris, J. G.
PILOT EMERGENCY ESCAPE UPPER TORSO HARNESS SUPPORT DEVELOPMENT TEST MODEL F 106A
General Dynamics Division, Convair Aircraft Corporation
Convair Rept. No. 9999 (August 1956)
AD 144 950

An upper torso harness was developed to relieve a share of the forces resulting from accelerations above 20 g. The harness was fabricated from standard CVAC FAB 375 (nylon cloth), CVAC WEB 217 (1 3/4- x 1/8-in. nylon webbing) and standard parachute hardware. Initial seat drop tests were conducted with a fully anthropomorphic test dummy without the upper torso harness to determine the various loads the torso is subjected to under varying g forces. The harness was then secured to the body in a manner which simulated the instant prior to actual ejection. Drop tests were then conducted with the torso harness from 5 to 28 g's. About 10 human drops at accelerations up to 11 g's were conducted with and without the harness. Satisfactory seat and spinal load relief (about 50% of the loads were relieved) was realized with the harness. About 70% of the spinal and pelvic loads were relieved with the harness and proportional load system combination. The harness maintained its effectiveness when worn over several combinations of flight clothing. No physical discomforts were reported during the drop tests.

08KEIL-E 62
Keil, E., and Werner, H.
SAFETY BELTS FOR MOTOR VEHICLES
ATZ
Vol. 64, No. 5 (May 1962)
AD 291 415

The importance of safety belts in minimizing the consequences of accidents is generally recognized today. Safety, however, exists only if the belts which are commercially available fulfill certain minimum requirements. Introduction of the Acceptance Office requirements resulted in a general improvement in quality and a guarantee that auto safety belts which reach service are capable of offering their wearers sufficient protection in most accidents.

08KEIL-E 66
Keil, E., Werner, H., and Ewald, J.
EINFLUSZ DER GURTBANDANORDNUNG AUF KRAFTVERTEILUNG AND VERFORMUNGSGROSZEN VON SICHERHEITSGURTEN
Deutsche Kraftfahrtforschung and strassenverkehrstechnik
Vol. 185 (1966

Influence of safety belt design on force distribution and extent of deformation in the belt.

(08LANG-FC60: see 10LANG-FC60)

08LHOT-DC61
Lhotka, D. C.
A PROGRESS REPORT OF THE JOINT NATIONAL EDUCATIONAL SEAT BELT PROGRAM. (In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration Conference, September 14-16, 1961)
Pp. 241-242

08LIST-RD66
Lister, R. D., and Nelson, I. D.
THE EFFECTIVENESS OF SAFETY BELTS
Road Research Laboratory
Report No. 16 (1966)
6 p.

The effectiveness of safety belts in car accidents has been assessed by analyzing forms returned by people whose cars have been involved in accidents. Information obtained from about 2000 wearers of safety belts was analyzed and it is shown that serious injuries were reduced by about 70 per cent when belts were worn. All types of belt with shoulder restraint were found to be efficient though lap and diagonal belts appeared to be significantly less effective than full harnesses and single diagonal belts. The possible reasons for this last result are considered in detail. Estimates are given of the percentage of cars fitted with safety belts and of the percentage of belts that are used.

08MICH-I 61
Michelson, I., and Tourin, B.
CONSUMERS UNION'S DYNAMIC TESTS OF SEAT BELTS. (In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration, September 14-16, 1961)
Pp. 243-248

(08MICH-I 63: see 10MICH-I 63)

08MORE-JD62
Moreland, J. D.
SAFETY BELTS IN MOTOR CARS: AN ASSESSMENT OF THEIR EFFECTIVENESS
Ann. Occup. Hyg.
Vol. 5 (1962)
Pp. 95-111

08NEFF-RJ61
Neff, R. J.
A REPORT ON CONSIDERATIONS OF SEAT BELTS FOR INFANTS AND SMALL CHILDREN. (In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration, September 14-16, 1961)
Pp. 249-252

08NEFF-RJ65
Neff, R. J.
SAE MOTOR VEHICLE SEAT BELT ACTIVITIES
7th Stapp Car Crash Conference
1965
Pp. 56-65

This report is a discussion of those activities which have been conducted under the auspices of the Society of Automotive Engineers pertaining to motor vehicle seat belt assemblies and related occupant restraint devices such as shoulder harnesses. This report summarizes the activities of the groups in the Society active in this work, and covers in more detail the specifications which have been produced by these groups.

08NEW -HL55

NEW HARNESS LETS YOU MOVE FREELY
Aviation Age
Vol. 24, No. 5 (1955)
Pp. 206-207

08NEW -RP62

NEW RECOMMENDED PRACTICE FIXES MOTOR VEHICLE SEAT BELT ANCHORAGE GEOMETRY AND STRENGTH REQUIREMENTS
SAE Journal
Vol. 70, No. 7 (July 1962)
Pp. 50-51

08NEW -ST62

NEW STEP TOWARD AUTO SAFETY: SHOULDER HARNESS PROMOTION
Medical Tribune
November 30, 1962
Pp. 1, 12

08NYLO-SS61

NYLON SAFETY STRAPS
Engineering
Vol. 191 (February 3, 1961)
P. 179

08ODEL-B 57
Odelgard, B., and Weman, P. E.
SAFETY BELTS FOR MOTORCARS
Küngl. Vattenfallstyrelsen
Bla-vita serien (Blue-White Series) 18 (1957)
Swedish State Power Board, Stockholm

In English.

08PACI-SC91
Pacific Scientific Company
REEL-O-MATIC SAFETY HARNESS
Pacific Scientific Company, Anaheim, California
Bulletin RB-701

The Reel-O-Matic offers the advantages of a shoulder harness but without the restriction except in an emergency. The Reel-O-Matic is completely mechanical—needs no lubrication, and can be mounted in any position with only four bolts.

08PACI-SC92
Pacific Scientific Company
REEL-O-MATIC "SAM BROWNE" SAFETY RESTRAINT SYSTEM
Pacific Scientific Company, Anaheim, California
Bulletin RB-702

The Reel-O-Matic "Sam Browne" Safety Restraint System offers all the advantages of a shoulder harness but without restriction except in an emergency. The Reel-O-Matic is completely mechanical—needs no lubrication, and is easily mounted with only four bolts.

08PACI-SC93
Pacific Scientific Company
REEL-O-MATIC DUAL STRAP SAFETY HARNESS
Pacific Scientific Company, Anaheim, California
Bulletin RB-704

The Dual Strap Reel-O-Matic offers the protection of a shoulder harness in emergencies while providing freedom of movement during normal flight. Each reel operates independently exerting a nearly undetectable tension in each strap. The dual strap Reel-O-Matic is completely mechanical—needs no lubrication, and can be mounted in any position with only six bolts.

08PACI-SC94
Pacific Scientific Company
ROTARY BUCKLE LAP BELT ASSEMBLY
Pacific Scientific Company, Anaheim, California
Bulletin RB-707

This new buckle was designed specifically to allow plug-in convenience for both the lap belts and the shoulder harness. All straps are plugged in by pushing blet fitting into slot in the buckle. A one-fourth turn of the handle on the buckle in either direction instantly disengages. shoulder straps and seat belt. Shoulder straps may be released separately. An optional crotch strap may be ordered permantently attained to buckle if desired.

08PIRE-RW63

PIRELLI RESILIENT WEBBING
Engineering
Vol. 195 (April 26, 1963)
Pp. 586-587

08PISA-FT64
IMPROVEMENT OF LAP BELT TIGHTENER
Army Frankford Arsenal, Philadelphia, Pennsylvania
AFA M64 23 (1 February 1964)
DA Proj. 502 06 001
AD 432 687

Analytical and design studies were conducted on the aircraft lap belt tightener mechanism. Substitution of a ball type initial lock mechanism for the Belleville spring increased the lap belt tightener tension load capacity and use of a high strength material increased the loop load capacity. A minor configuration change in the piston locking mechanism provided more reliable operation. In the final ballistic tests, the M67 cartridges were substituted for the M75. The M67 cartridge generated the desired gas pressure in the system and operated the lap belt tightener within the specified limits. (Author)

08PROP-PW61

PROPRIETARY PROTECTIVE WEBS
Engineering
Vol. 191 (February 17, 1961)
P. 261

08REDF-FA65
Redfern, F. A.
AUTOMATIC LOCKING AND RETRACTABLE BELTS, THEIR USE AND TESTING IN THE UNITED KINGDOM
CIDITVA No. 21 (March 1965)
Pp. 2.1-2.16

08ROBE-SH62
Robertson, S. H., Shook, W. H., and Haley, J. L., Jr.
CRASH INJURY BULLETIN: MODIFICATIONS TO THE PASSENGER SEAT BELT TIEDOWN ATTACHMENTS IN THE U.S. ARMY HU-1 SERIES BELL IROQUOIS HELICOPTER.
Aviation Crash Injury Research, Phoenix, Arizona
AvCIR 62-1, TREC Tech. Rept. 62-45 (May 1962)

Report is made of weaknesses in the occupant tiedown system in the HU-1 Series helicopter as disclosed by analysis of several accidents. A quick "off-the-shelf" interim fix is presented to make the existing system four times more effective.

A permanent fix is suggested that would ensure the strength of the tiedown to be equal to the seat-belt strength. (Author)

08ROSE-CW52
Rose, C.W.
SAFETY BELTS AND HARNESS
National Safety News
Vol. 65 (1952)
P. 120

08RYAN-JJ60
Ryan, J. J.
AUTOMATIC SEAT BELTS
University of Minnesota
May 9-11, 1960

In this paper, it is suggested that if automatic seat-belts were installed in automobiles the public would be glad to utilize them as an injury prevention device. The automatic seat-belts are attached to the seat by a mechanism which continually keeps them retracted to the rear of the seat in proper position for immediate use. When the ends of the seat-belt on each side of the passenger are clasped and pulled forward slowly, the belt may be easily fastened in front. If the belt is pulled rapidly the automatic locking device clamps it. The driver is not restrained in forward, lateral, or rotary motion. When the buckle is released the two ends of the seat-belt retract to the back of the seat. If a sudden force is applied by the body on the seat-belt as in an accident the belt is locked tight and the passenger is restrained securely. Several safety factors are added to the seat locking device to insure protection. The seat is anchored to the floor with cables in such a way that it may only move for the adjustments established by the car manufacturers. The use of automatic seat-belts will prevent the distaste observed by the present haphazard arrangement and will allow convenience and security.

08SAFE-BB62

SAFETY BELTS: BACK TO THE PRAM
Economist
Vol. 204 (July 7, 1962)
P. 68

08SAFE-BR62

SAFETY BELT RESEARCH STUDY

Driver's Digest
January 1962
P. 2

08SAFE-BT63

SAFETY BELT THAT REACTS TO CAR MOTIONS
Engineering
Vol. 195 (June 14, 1963)
P. 801

08SAFE-BW63

SAFETY BELT WITH PENDULUM CONTROL
Engineering
Vol. 196 (November 8, 1963)
P. 592

08SAFE-HA66

SAFETY HARNESS AND OTHER PROTECTIVE DEVICES FOR CHILDREN
Int. Rd. Saf. Traff. Rev.
Vol. 14, No. 3 (1966)
Pp. 16-21

Safety belt protection and restraining devices for children are classified according to the child's age group, namely, babies, one to five-year-olds and six to ten-year-olds. Various types of safety chair combined with harnesses are referred to and the problem of designing them to allow adequate freedom is also discussed. British Standards Specifications and Which? Test are given along with a list of manufacturers.

08SAFE-SB39

SAFETY SHOULDER BELT DEVELOPED AT WRIGHT FIELD
Air Corps News Letter
Vol. 22, No. 20 (October 1939)
Pp. 1-2

08SAFE-SB61

SAFETY SEAT BELT PROGRAM ADOPTED
Safety Maintenance
Vol. 123 (April 1962)
P. 19

08SAFE-SB62

SAFETY SEAT BELT STANDARDS
Safety Maintenance
Vol. 122 (November 1961)
P. 11

08SCHO-BR64 (05SCHO-BR64)

SCHOOL BUS RIDERS APPROVE SEAT BELTS
Wisconsin Traffic Safety Reporter
April 1964
P. 4

08SCHR-DJ62
Schrum, D. J.
SEAT BELTS—ONE YEAR LATER
Traffic Safety
Vol. 61, No. 2 (August 1962)
P. 10

Press conference statement by D. J. Schrum of Studebaken on increase in seat belt sales 962% during past eight months over same period one year ago, amounting to 12.7% of cars sold.

08SCIE-LA63

SCIENCE LOOKS AT SEAT BELTS
Journal of American Insurance
June 1963
Pp. 22-23

(08SCOT-BY63: see 05SCOT-BY63)

08SEAT-BA67

SEAT BELTS AND CONTRIBUTORY NEGLIGENCE
South Dakota Law Review
Vol. 12 (Winter 1967)
P. 130

08SEAT-BC63
Seat Belt Committee
UNCONFIRMED MINUTES OF A MEETING OF THE CHILDREN'S SEAT BELT SUBCOMMITTEE
Motor Vehicle Seat Belt Committee
September 19, 1963
Rackham Building, Detroit, Michigan

08SEAT-BH58

SEAT BELTS HOLD IN ACTUAL CRASHES
Traffic Safety Quarterly Research Review
June 1958
P. 10

Only 11 of 712 belts failed in accidents.

08SEAT-BF62

SEAT BELT FASTENERS FOR 1962 CARS
Traffic Safety
April 1961
P. 11

08SEAT-BP61

SEAT BELTS PASSE? INSURANCE FIRM STUDIES OTHER FEATURES
Automotive News
August 14, 1961
P. 15

08SEAT-BP63

SEAT BELT PROTECTION FOR CHILDREN
The California Highway Patrolman
June 1963
Pp. 39, 49

08SEAT-BS63

SEAT BELTS STANDARD ON '64 AUTO MODELS
Steel
Vol. 153 (September 9, 1963)
P. 120

08SEGA-MD59
Segal, M. D.
SAFETY BELTS CATCH ON
Traffic Safety
Vol. 55, No. 5 (1959)
Pp. 32-3

Survey shows decided increase in commercial vehicle use of belts - mostly by passenger car fleets.

08SHAR-JE61
Sharp, J. E.
CONSIDERATIONS FOR A LAP-BELT-SHOULDER HARNESS ASSEMBLY. (In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration
September 14-16, 1961
Pp. 253-254

08SHAR-JE64
Sharp, Jonathan E.
ARE ORDINARY SEAT BELTS ENOUGH?
National Safety News
February 1962
Pp. 21, 64

08SHAR-JE65
Sharp, Jonathan E., and Lininger, Roy
PROBLEMS WITH THE THREE-POINT BELT INSTALLATIONS AND POSSIBLE SOLUTIONS. Parts I & II.
7th Stapp Car Crash Conference
1965
Pp. 155-162

This paper re-affirms the sentiment that motorists should obtain seat belts and use them all the time. This recommendation is based on the estimate that belts could save 5000 or more lives annually. This saving would be realized exclusively through prevention of ejection—the situation in which a person is thrown out of the car (usually through an opened door) during the impact sequence.

This current paper is an attempt to assess the likelihood that lap belts can provide additional protection (beyond ejection control) inside the car through reducing or preventing contact with interior objects. An analysis of a small sample of 232 matched pairs of occupants—half wearing belts—fails to show substantial additional benefits from belts.
The tentative conclusion is that while lap belts can save thousands of lives, substantial further increases in protection will probably require use of upper body restraint in addition to pelvic restraint.

(08SMIT-AC54: see 01SMIT-AC54)

08SOCI-AE91
Society of Automotive Engineers
SAE RECOMMENDS TEST PROCEDURES FOR MOTOR VEHICLE LAP BELTS
SAE Journal
Vol. 63, No. 12 (December 1955)
Pp. 45-47

08SOCI-AE92
Society of Automotive Engineers
MOTOR VEHICLE SEAT BELT ASSEMBLIES, SAE RECOMMENDED PRACTICE
Society of Automotive Engineers, New York, New York
Report of Motor Vehicle Seat Belt Committee approved November 1955 and last revised May 1958
SAE SBA4, TR-219

08SOCI-AE93
Society of Automotive Engineers
MOTOR VEHICLE SEAT BELT ANCHORAGE
Society of Automotive Engineers, Body Engineering and Motor Vehicle Seat Belt Committee
SAE J787a (November 1963)
2 p., illus.

08SOCI-AE94
Society of Automotive Engineers
SAE SUBCOMMITTEE STUDIES NEED FOR DYNAMIC TESTING OF SEAT BELTS
SAE Journal
Vol. 71 (May 1963)
Pp. 115-116

08SOCI-AE95
Society of Automotive Engineers
MOTOR VEHICLE SEAT BELT ANCHORAGE
Society of Automotive Engineers, Body Engineering and Motor Vehicle Seat Belt Committee
Report No. SAE J787b (September 1966)
3 p., illus.

08STAP-JP58 (06STAP-JP58)
Stapp, J. P., and Enfield, D. L.
EVALUATION OF THE LAP-TYPE AUTOMOBILE SAFETY BELT WITH REFERENCE TO HUMAN TOLERANCE
Society of Automotive Engineers, New York
SAE Preprint 62A (1958)
10 pp., illus.

In this study, data was obtained from high speed moving pictures of anthropometric dummies and human volunteers being subjected to deceleration in simulated accidents in which parameters of exposure ranged from 10 g at 500g/s rate of onset for 0.5 seconds to 27g at 2000g/s rate of onset lasting .005 seconds. Accelerometer oscillograph recordings were plotted and their significance is discussed. From an analysis of the data, recommendations are made for a revision of safety belt standards and for modifications of vehicle interiors.

08STAP-JP62
Stapp, J. P.
AFTER SEAT BELTS . . . . WHAT? (In Cragun, M. K., ed., The Fifth Stapp Automotive Crash and Field Demonstration, September 14-16, 1961.
Pp. 259-263

08STAP-JP63 (06STAP-JP63)
Stapp, J. P.
MEDICAL ASPECTS OF SAFETY SEAT BELT DEVELOPMENT. (In Proceedings of the Sixth Stapp Conference
University of Minnesota
1963
Pp. 160-66

08STAT-JD65
States, John D., and Benedict, James F.
SAFE AND UNSAFE UPPER TORSO RESTRAINTS FOR OCCUPANT PROTECTION IN MOTOR VEHICLES
7th Stapp Car Crash Conference
1965
Pp. 312-323

Studies of racing car accidents suggest that the shoulder harness or upper torso restraint is of definite value and will give additional driver protection. A single upper torso strap should be used in all current production and sports cars. The occupant must be able to slide laterally from beneath the upper torso restraint in response to lateral forces from the opposite side of the car. The upper torso restraint should not be interconnected with the lap belt so that tightening one will cause the other to tighten; the lap belt can be snug and comfortable while the shoulder strap has to be looser to permit the use of the vehicle controls.

08STER-A 66 (05STER-A 66)
Stern, A.
SEAT BELT UTILIZATION
Automotive Crash Injury Research
Bulletin No. 8 (January 1966)
7 p.

08STET-CH64
Stetson, C. H., Jr., Parks, W. G., Genest, R., and Katz, F.
INVESTIGATION OF SEAT BELT WEBBING SERVICE LIFE
United States Federal Aviation Agency, Washington, D.C.
Tech. Rept. ADS-22 (September 1964)
AD 613 347

The purpose of the project was to seek a sound technical basis for determining the ordinary service life of seat belt webbing. If a relationship could be established between strength and age of the webbing and the environmental conditions under which the webbing was used, a basis for determining a service life of a safety belt might be indicated, Accordingly, various models of belts of different ages were collected in two climatic zones in the United States and subjected to a uniform testing procedure.

The outstanding features resulting from the field work included the revelation that the sample pattern as originally planned could not be fulfilled, and the confirmation of a marked lack of interest in seat belts by plane owners and servicing people at airports. A large quantity of belts over ten years old (pre TSO) were found still in use.

The laboratory tests showed that of 399 seat belt samples tested, 42 percent failed to meet the minimum strength requirements of Technical Standard TSO c22. Cotton webbing belts showed a higher incidence of failure than belts made with synthetic fiber webbing. Laboratory tests showed more assembly failures than webbing failures.

The performance of all cotton belts tested leads to the conclusion that cotton webbing should not be used in aircraft safety belts. We recommend raising the minimum strength requirements for both webbing and assemblies. We recommend improved administrative procedures for the enforcement of minimum aircraft safety belt standards.

08STIN-NE57
Stingely, N. E.
AEROMEDICAL EVACUATION LITTER PATIENT SAFETY HARNESS
Wright-Patterson Air Force Base, Dayton, Ohio
January 1957

08STOC-HC61
Stockbridge, H. C. W., and Dennis, J. P.
SAFETY HARNESSES FOR CARS
Ergonomics
Vol. 4, No. 3 (July 1961)
P. 276

The paper consists of a review of work on safety harnesses for cars carried out in America, Sweden and the United Kingdom. The probability of a crash is estimated at one every 30 years or so. In 1959 some 1582 people were killed and 115,451 injured while travelling in vehicles. American workers have estimated than an adequate restraining device would halve the number of deaths from car accidents. This restraining harness prevents occupants from being flung about inside the car and from damaging their heads and faces. In the U.S.A. about half the crashes are as a result of front end impacts which decelerates the car rapidly while the body continues to move. A deceleration from 40 Mph to rest in 2·7 ft represents 20 g. Types and makes of belts are described as the 'the parachute harness'; 'the diagonal' or ' the lap belt', each of whose effectiveness depends on the anchor points to the car and to consumer acceptability in ease of donning and doffing. Two particular dangers are the 'whiplash' and 'jack knife' effects. Excessive elasticity in the harness slams its wearer back into his seat, while if only a lap belt is worn the body may 'jack knife' onto the fascia panel. In conclusion the British Standard is described and the need for further research indicated.

08STON-MM54
Stone, M. M.
AUTOMOBILE SAFETY SEAT BELT ASSEMBLIES
Davis Aircraft Products, New York, New York
January 1954

08STRE-AS58
____
STRESS AND SEAT BELTS
Traffic Safety Quarterly Research Review
June 1958
P. 10

Holloman Base tests show how restrained human body stands up under stress.

08STUD-C 63
Studebaker Corporation
SPECIFICATIONS FOR 1963 STUDEBAKER CARS
Studebaker Corporation, South Bend, Indiana

P. 10: Seat belt plates, bucket seats.

08STUD-SB65
____
STUDY SEAT BELTS IN SCHOOL BUSES
Traffic Safety
July 1965
P. 17

08THOM-W 59
Thomsen, W.
ORTHOPEDIC ASSUMPTION FOR THE CONSTRUCTION OF AUTOMOBILE SEATS
United States Department of Commerce
Tech. Transla. 59-17369 (1959)
Order from SLA Translation Center, The John Crerar Library, 86 East Randolph St., Chicago 1, Illinois)

(08TOLI-SH64: see 06TOLI-SH64)

08TOUR-B 91
Tourin, B., and Garrett, H. W.
A REPORT ON SAFETY BELTS TO THE CALIFORNIA LEGISLATURE: SUMMARY AND ANALYSIS OF CALIFORNIA HIGHWAY PATROL REPORTS AND OPINIONS ON 54,348 AUTOMOBILE ACCIDENTS
California Highway Patrol, Automotive Crash Injury Research, Buffalo, New York
1958
Sponsor: Army, Office of the Surgeon General, Armed Forces Epidemiological Board, National Institutes of Health, Automobile Manufacturers Association
30 p., tables

The California legislature required, in a 1957 statute, compilation of the opinions of state highway patrolmen investigating highway accidents as to the effect of available and used safety belts in controlling death or injury in 1958 accidents, as well as the effect they could have had if they had been available and used. The California Highway Patrol entered into a cooperative study agreement with ACIR of Cornell University whereby the California Highway Patrol would collect the necessary data and ACIR would compile, analyze and report the findings. Summarized below are the study results which emerged from investigation of 54,348 automobiles involved in rural accidents during the months of January through June, 1958.

08TOUR-B 92 (06TOUR-B 60)
Tourin, Boris, and Garrett, John W.
SAFETY BELT EFFECTIVENESS IN RURAL CALIFORNIA AUTOMOBILE ACCIDENTS
Automotive Crash Injury Research, New York, Cornell University
1960
23 pp., illus.

In this study a statistically valid comparison is made of injury frequencies and severities among 933 drivers and right front seat passenger automobile occupants who used seat belts and 8,784 drivers and right front seat occupants who did not use belts, with due regard for the influence of specific accident factors. It was found that users of safety belts sustained approximately 35 per cent less "major-fatal" grade injuries than did non-users. Other conclusions to be drawn from the study are less clear except that it is evident that the reduction of "major-fatal" injuries among belt users is due to the fact that belts prevent occupants from being ejected from the automobile.

08TOUR-B 93
Tourin, Boris, and Garrett, John W.
A REPORT OF SAFETY BELTS TO THE CALIFORNIA LEGISLATURE: SUMMARY AND ANALYSIS OF CALIFORNIA HIGHWAY PATROL REPORTS AND OPINIONS ON 54,348 AUTOMOBILE ACCIDENTS
Automobile Crash Injury Research, New York, Cornell University
1960
6 pp.

In this investigation it was found that 3.5 per cent of passenger automobiles involved in accidents had one or more safety belts. Of these in only one third were all of the belts in use. It was found that members of the California Highway Patrol were overwhelmingly in favor of safety belts as an actual or potential control of death and injury accidents, but their opinions seem to have been biased according to the presence or absence of safety belts and by the observed accident results.

08TOUR-B 94
Tourin, B., Aldman, B., Michelson, I., and Mitchell, J.
RESTRAINING CHARACTERISTICS OF HARNESSES. (In Proceedings of the Sixth Stapp Conference)
University of Minnesota
1963
Pp. 138-49

08VALU-SB66

VALUE OF SEAT BELTS IN SCHOOL BUSES DISCUSSED IN NEW YORK
Automotive News
September 12, 1966
P. 37

08WADE-PA62
Wade, Preston A.
THE SEAT BELT—HELPFUL OR HARMFUL?
The Journal of Trauma
May 1962
Pp. 303-304

08WHIT-JR52
Whiting, J. R. Sturge
A SELF-RELEASING SEAT BELT
Flight (London)
Vol. 61 (June 1952)
P. 767

(08WILL-JH62: see 10WILL-JH62)

08WILL-JS66
Williams, James S., et al.
AUTOMOTIVE SAFETY BELT: IN SAVING A LIFE MAY PRODUCE INTRA-ABDOMINAL INJURIES
The Journal of Trauma
May 1966
Pp. 303-315

(08WOLF-RA61: see 05WOLF-RA61)

08WRON-D 67

WRONG DISH
Advertising Age
Vol. 38 (April 3, 1967)
P. 92

Ad for Rover 2000 Safety Harness.

08YOUN-JW66
Young, Joseph W.
RECOMMENDATIONS FOR SHOULDER RESTRAINT INSTALLATION IN GENERAL AVIATION AIRCRAFT
Federal Aviation Agency
Aviation Medical Report (September 1966)
16 Pp., illus.

09 RESTRAINT SYSTEMS OTHER THAN BELTS

(09AMER-SB64: see 01AMER-SB64)

09ARRO-P 61
Arrowhead Products
COCKPIT RETENTION AND PARACHUTE SUSPENSION GARMENT
Department of Navy, Bureau of Naval Weapons, Airborne Equipment Division
Final Engr. Rept. (October 27, 1961)
Contract NOw 60-0053
AD 269 824

Cockpit retention and parachute suspension flight clothing which can distribute high acceleration forces over large areas of the body was studied to reduce injuries occurring in present day high performance aircraft. It was found that a flexible, inelastic nylon-netting garment could be utilized in distributing acceleration loads over the body torso. By crossing the fibers of a material over each other and biasing them at 45 degrees to the external load, a Chinese finger grip containment action can be developed. This containment action (axial compression load) is applied when acceleration forces are applied to the cockpit seat or the risers. Several restraint garments were constructed for evaluation. Hip and shoulder restraint straps were integrated into the netting pattern for attachment to the risers and cockpit seat. The final garment had a cover and liner for additional comfort and ease of donning and doffing. (Author)

09BLEC-C 65
Blechschmidt, C., Clark, C., and Gordon, F.
IMPACT PROTECTION BY THE AIRSTOP RESTRAINT SYSTEM
Paper, 36th Annual Meeting of the Aerospace Medical Association, New York City
April 26-29, 1965

also

Aerospace Medicine
Vol. 36, No. 2 (February 1965)
P. 137

Martin Company experiments, under NASA contract, of a human airbag restraint system for airline passenger protection during an impact event have shown the advantage of load isolation by the allowed motion of the subject with respect to the vehicle.

This system called "airstop" provides controlled deceleration in the longitudinal direction (G_x) by a low pressure (3 to 10 inches H_2O) upper torso inflatable airbag, and in the vertical direction (G_z) by an inflated structure called "airseat," which at 1G looks and feels like any present-day aircraft seat, but under dynamic loading provides controlled load isolation by deforming downward and forward under the impact condition. Most significantly the seat can be deflated after the crash opening up the entire cabin as an escape corridor.

Manned and dummy experimental impact tests in an impact sled of airline seating configuration have been conducted. Swing impact tests of the complete system, with airseat, for example showed an attenuation of $-54G_x$ on the test vehicle impacting at 16 ft./sec. to $-5.8G_x$ on the subject's chest.

Full scale crash tests by the FAA (DC-7 aircraft crash test) and the Army (C-45 aircraft crash test) have included the "airstop" system to evaluate the effectiveness under real crash situations.

This paper will emphasize the testing program and the design problems of the use of the airbag restraint system in commercial and military aircraft.

09CLAR-C 91
Clark, Carl, and Blechschmidt, Carl
HUMAN TRANSPORTATION FATALITIES AND PROTECTION AGAINST REAR AND SIDE CRASH LOADS BY THE AIRSTOP RESTRAINT
9th Stapp Car Crash Conference
1966
Pp. 19-64

Fatalities in various modes of transportation are reviewed, with the point being made that distance death rates must decrease as mankind's average trip distances increase. The multiple origins of airbag restraint concepts are traced. The possibility is presented of having no restraint other than the seats prior to a crash situation, then automatically inflating transparent chest airbags to "grab the wife and kids" if a crash is developing. The driver would wear a lap belt and shoulder straps. The bags would automatically deflate after the crash. Analytical models of automobile crash loads, and of passenger motions in the airstop restraint, consisting of a chest airbag and an inflated "airseat," are reviewed, with emphasis on rear and side collisions. For higher speed crashes, additional protection is suggested by using a 10,000 pound loop strength lap belt on the airseat, and within 0.03 seconds after impact preloading the chest airbag to a higher pressure proportional to speed. A lateral crash protection door structure with a lateral bumper to prevent penetration, improved padding, and a transparent airbag inflated upwards over the windows is suggested. The fact that a dummy remained in an inflated airseat through an 80 mph C-45 aircraft crash with aircraft loads estimated at more than $-30G_x$ is presented. A preliminary directional analysis of car crashes indicates that half of our present fatalities are occurring with passenger compartment accelerations of less than 20G. Other features of a safety car design are tabulated.

09CLAR-C 92
Clark, Carl, Blechschmidt, Carl, and Gordon, Fay
IMPACT PROTECTION WITH THE "AIRSTOP" RESTRAINT SYSTEM
8th Stapp Car Crash and Field Demonstration Conference Proceedings
1966
P. 79

Development is progressing of an improved airbag restraint system for passenger vehicles which we call "airstop." It consists of an airbag in front of the chest, an airbag in front of the feet and under the seat, and an inflated airseat. This system has an impact load transmission to the subject of one-third or less of the vehicle longitudinal or vertical loads.

The experimental work leading to the airstop design is reviewed, with acceleration data presented for vertical and inclined drops of initial full-length airbag system and an astronaut airbag restraint system, swing and drop impacts of airstop systems, and a DC-7 crash test of a chest and foot airbag system.

The airstop system is designed for automatic deflation of the bags and the seats after a crash, greatly facilitating fire escape from the aircraft. The weight of the airseat system is less than the weight of present seats.

09DYE -ER58
Dye, E. R., and Smith, M. D.
IMPACT PROTECTION WITH FOAM PLASTICS
Mechanical Engineering
Vol. 80, No. 12 (December 1958)
Pp. 65-67

Paper discusses the methods of selection of a low-density cellular plastic of the right dimensions and mechanical properties to protect the head during impact.

09ESGA-JB60

Esgar, J. B., and Morgan, W. C.
ANALYTICAL STUDY OF SOFT LANDINGS ON GAS-FILLED BAGS
National Aeronautics and Space Administration
NASA TR R-75 (1960)
AD 242 357

An analytical procedure was developed that is valid for bags of various arbitrary shapes and is applicable to planetary or lunar landings for sinking speeds that are small compared to the sonic velocity of the gas within the bag. For landing on the earth at speeds consistent with normal parachute descent, the relative merits of four bag shapes were evaluated both with and without gas bleed from the bags. Deceleration and onset rates acceptable for well-supported humans seem feasible.

(09GENE-SA60: see 07GENE-SA60)

09HOLC-GA60

Holcomb, Galen A.
THE DEVELOPMENT OF AN AUTO-ADJUSTING AND POSITIONING SINGLE DISCONNECT TORSO RESTRAINT HARNESS FOR THE B-58 ESCAPE CAPSULE
Paper, 31st Meeting of the Aerospace Medical Association, Miami, Florida
May 1960

09IRVI-ND64

IRVIN-NORRIS DYNALOCK
Automobile Engineering
Vol. 54 (February 1964)
Pp. 62-64

09KENT-SJ61

Kent, S. J., White, A. E.
DEVELOPMENT AND QUALIFICATION OF THRUSTER, CARTRIDGE ACTUATED, T30
Frankford Arsenal, Philadelphia, Pennsylvania
ASD TR61 454 (October 1961)
AD 271 390

The T30 thruster is intended to operate the integrated harness release mechanism used by aircraft personnel. The thruster provides an automatic means of releasing the harness from the pilot or crew member during an emergency escape, thereby eliminating the possibility of human error. The thruster is mechanically initiated by a lanyard during the emergency escape cycle. During development, several models of a thruster, designated the T30 thruster, were fabricated and tested and the resultant test data analyzed. Modifications in the interest of better performance, simplicity, and interchangeability was made. When a satisfactory level of performance was achieved, various operational tests were conducted to qualify the thruster. The final model of the T30 thruster satisfied all performance requirements, and its operational characteristics were reproducible.

09LAMM-AC61 (07LAMM-AC61)

Lamm Aircraft Company, Incorporated
THE AIR BAG SEAT FOR PASSENGER AIRCRAFT
Lamm Aircraft Company, Incorporated, Oakland, California
Rept. No. 200 (25 July 1961)

In order to make aircraft seats more crashworthy and to prevent the loss of life due to violent seat displacement during certain types of accidents it would be best to eliminate the metal structure of present passenger seats and use instead an inflatable Air Bag seat. The Air Bag seat is an inflatable passenger seat for use in transport aircraft. It is made of rubber, rubberized air pressure sealed nylon and high tensile strength nylon cloth. The Air Bag seat consists of an inflatable cellular air bag which rests on the aircraft floor. The seat is designed to hold the passenger in one relative position in the fuselage during rapid deceleration of the aircraft; and to prevent either the passenger or seat from being displaced from this relative position by not more than approximately 24 inches while both the passenger and seat are being subjected to various loads.

09MASO-JK62

Mason, J. K.
OTHER RELEVANT SAFETY EQUIPMENT. (In Aviation Accident Pathology, A Study of Fatalities)
Butterworths & Co., Ltd. London
1962
Pp. 45-57

Some form of harness restraint is necessary to retain a person in his seat during an aircraft crash. Deceleration forces should be spread over the maximum area of the body possible. Modern aircraft are being equipped with a combined restraining and parachute harness, emergency release from the seat being achieved at the seat attachments rather than the locking box.

Three main considerations affect the stressing of seats in aircraft. First, the stronger the seat the greater will be the weight penalty. Second, there is no advantage in stressing a seat to withstand forces beyond the limits of human survival. Third, there is little to be gained by strengthening the seats beyond the forces anticipated in a crash.

Thereis both positive and negative evidence that protective helmets are of value in aircraft accidents. Case histories indicate that helmet protection is more likely to be achieved in aircraft of low performance.

09NICH-G 55
Nichols, George
REPORT
Northrop Aircraft Company
1955

Introduction. Discussion of restrained subject response. Analysis of idealized mechanical system: variations of restraint stiffness, and forcing function characteristics. Harness strap properties. Subject response—IBM analysis—simplified restraint and mass system: using actual strap properties with variations in forcing function characteristics. Discontinuities in restraint systems: slack strap, constant force elements, initial pre-load of harness.

09POPP-JR38
Poppen, J. R.
EFFECTIVENESS OF PNEUMATIC BELTS IN COUNTERACTING ACCELERATION
J. Aviation Med.
Vol. 9 (1938)
Pp. 214-215, 233

09SNYD-RZ58
Snyder, R. Z.
CONVENTIONAL AND NEW TYPE FLIGHT RESTRAINT EQUIPMENT
United States Naval Air Development Center, Johnsville, Pennsylvania
NADC-MA-LR43 (March 26, 1958)

The integrated anti-blackout suit was evaluated for its restraint characteristics. It had been noted that the single point shoulder harness used in past centrifuge simulations of flight accelerations allowed excessive lateral movement of the body when exposed to lateral force. It is recommended that both the conventional and integrated suit shoulder restraints have a two-point attachment, one directly in back of each shoulder so that each shoulder is restrained to provide the pilot adequate support against lateral movements.

09VANP-RE64
Van Patten, Robert E.
A RESTRAINT SYSTEM FOR APPLICATION IN R_Z AND $-G_X$ ACCELERATION ENVIRONMENTS WITH EMPHASIS UPON KNEE AND LOWER LEG RESTRAINTS. Final Report for December 1963 - February 1964
Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio
AMRL-TR-64-144 7222 (December 1964)
AD 612 957

This report describes the development of a lower leg restraint system design suitable for use in yaw (R_Z) and transverse P-A G ($-G_X$) acceleration environments. The design is based upon the principle of avoiding restraining force concentrations along the anterior chest of the tibia and has been worn with comfort for periods of up to three minutes with the legs in a 9.8 G field. (Author)

10 RESTRAINT SYSTEMS MECHANICS AND TESTING

10ALDM-B 65
Aldman, Bertil
REQUIREMENTS FOR TESTING OF INERTIA REELS FOR HARNESSES
7th Stapp Car Crash Conference
1965
Pp. 533-540

Defines the use of inertia reels, stresses the necessity for performance specifications, and describes a simple and convenient machine capable of making the necessary performance tests.

10AMER-SC63
American Seating Company
FLIGHT TESTS OF INERTIA REEL SHOULDER HARNESS TAKE-UP MECHANISM
American Seating Company
EX-2927, Letter Report No. 1 (18 September 1953)
Proj. TED No. PTR AE-6305.2, Serial No. ST31-120

10APPO-FA66
Appoldt, F. A.
DYNAMIC TESTS OF RESTRAINTS FOR CHILDREN
8th Stapp Car Crash Conference
1966
Pp. 329-345

Seven restraining devices, designed to protect a small child in the event of an automobile collision, were tested dynamically for the Division of Accident Prevention, Public Health Service, U.S. Department of Health, Education, and Welfare, by New York University. The tests were conducted at the Dynamic Test Facility, of the American Safety Equipment Corporation. The tests simulated both head-on and intersection collisions.

Basic to this study is the recognition that adequate restraining devices specifically designed for children are essential, that those currently available can prevent injuries or lessen the severity of injuries in some accidents, and that new knowledge gained through research can be applied in developing more effective devices for the protection of children in automobiles. We also recognize that this study is but one step, and that continued progress will depend on a continuing search for knowledge in biomechanics.

The evaluation of these devices is based, in part, upon the results of the dynamic test. In addition, the ease with which the device is adjusted to fit the child and the method of attachment to the automobile is taken into account. In rating the devices tested, neither the Public Health Service nor New York University implies endorsement of any product.

The deceleration of the anthropometric dummy exceeds that of the sled by 30 to 230 per cent. The major deficiency in all of the devices is their lack of lateral restraint.

The conclusions drawn from these tests should be of value to the designers of restraining devices for children.

10AVIA-CI63
Aviation Crash Injury Research
ANALYSIS OF THE DYNAMICS OF AUTOMOTIVE PASSENGER RESTRAINT SYSTEMS
Aviation Crash Injury Research
ACIR Report No. VJ-1823-R1 (May 31, 1963)

10BAYL-CH58
Bayley, C. H., and Mitton, M.
EXAMINATION OF NYLON SEAT HARNESS WEBBING
National Academy of Sciences—National Research Council, Washington, D.C.
NRC Rept. No. C.81-58S (1958)

10BIER-HR46
Bierman, H. R., and Larsen, V.
DISTRIBUTION OF IMPACT FORCES ON THE HUMAN THROUGH RESTRAINING DEVICES
Naval Medical Research Institute, Bethesda, Maryland
Proj. X-630, Rept. No. 4 (March 21, 1946)

The distribution of impact pressures transmitted to the human body through the regulation shoulder straps and seat belt of aircraft has been investigated. The seat belt exerts a maximal impact pressure to the body at the umbilicus through the center of the belt. Maximal impact pressures are exerted by the shoulder straps to the body at the clavicular areas. An improved design of the present restraining devices in aircraft allowing a more equal distribution of the impact pressures on the body may permit increased tolerance to such pressures.

10BRIT-DS62
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BRITISH DUMMY SNAP-TESTS AUTO SEAT BELTS
Machine Design
Vol. 34 (July 19, 1962)
P. 8

10BRIT-SI63
British Standards Institution
DYNAMIC TESTING OF CAR SEAT BELTS
Standards Institution, Hertfordshire, England
January 1963

In order to dynamically test car seat belts a test facility was designed, manufactured, and installed that is capable of the following: A maximum speed of 40 mph with built-in facility of obtaining any intermediate speed up to the maximum; a method of decelerating the trolley at any speed up to the maximum in stopping distances adjustable between the range of 3" and 36"; the trolley drive is to be released before the point of collision in order that it would "free wheel" into the decelerating mechanism and the recoil should be reduced to a minimum; the trolley should be reduced to a minimum; the trolley should incorporate all of the necessary fixings for all types of seat belts plus a rotatable turret in order that angled collisions might be simulated; A articulated dummy be designed so that the weight could be adjusted between 150 pounds and 200 pounds; and the instrumentation authorized include the accurate measurement of the terminal speed of the trolley, the linear measurement of the stopping distance and the provision of high-speed photographic equipment to enable the complete collision phase to be photographed. A line drawing of the facility is included.

10CARR-J 60
Carroll, Jack
U. S. ARMY YHU-1D BELL IROQUOIS HELICOPTER MOCKUP EVALUATION, FORT WORTH, TEXAS, 7 JULY 1960, 19-20 JANUARY 1961. Final Report of Crash Injury Evaluation
Aviation Safety Engineering and Research, Phoenix, Arizona
AVCIR 16-PV-127 (February 1961)
DA44 177TC624
TRECOM, TR-60-74
AD-610 997

Two crash injury evaluations of the mockup of the YHU-1D were conducted by AVCIR at the request of the U. S. Army Transportation Research Command (TRECOM). The first evaluation was conducted on 7 July 1960, at which time many of the design details had not been completed. A subsequent evaluation was made on 19-20 January 1961. The purpose of the evaluations was to: (1) evaluate overall crash safety of the basic aircraft structure; (2) determine the existence, if any, of features which could lead to unnecessary exposure of crew members and passengers to serious or fatal injury in the event of an accident involving crash conditions of a survivable-nature; (3) make recommendations for remedial action in the areas where deficiencies exist in order to improve the overall crash safety aspects of the aircraft; and (4) point out desirable crash safety features revealed through inspection of the mockup, engineering drawings, and detailed specifications.

10CHIS-SW59
CHISMAN, S. W.
DYNAMIC TESTS OF TELEFLEX INERTIA REELS AND HARNESSES
Royal Aircraft Establishment, Farnborough, England
Mechanical Engineering Department Test Note No. 750 (1959)

(10DEHA-H 60: see 06DEHA-H 60)

10DYE -ER50 (06DYE -ER50)
Dye, E. R.
KINEMATIC BEHAVIOR OF THE HUMAN BODY DURING CRASH DECELERATION
ACIR, Buffalo, New York
January 4, 1950

Two-dimensional model of human seated figure, jointed for proper torque responses, data obtained by decelerating the figure.

10DYE -ER56 (06DYE -ER56)
Dye, E. R.
KINEMATICS OF THE HUMAN BODY UNDER CRASH CONDITIONS
Clinical Orthopedics
Vol. 8 (1956)
Pp. 305-309

10EDEL-WE57
Edelman, W. E.
THE DYNAMICS OF SEAT BELT DESIGN
Master's Thesis for MS in ME, University of Minnesota
December 1957

10EIBA-AM53
Eiband, A. M., Simpkinson, S. H., and Black, D. O.
ACCELERATIONS AND PASSENGER HARNESS LOADS MEASURED IN FULL-SCALE LIGHT-AIRPLANE CRASHES
National Advisory Committee for Aeronautics, Washington, D.C.
NACA TN 2991 (August 1953)
AD 15 669

Full-scale light-airplane crashes simulating stall-spin accidents were conducted to determine the decelerations to which occupants are exposed and the resulting harness forces encountered in this type of accident. Crashes at impact speeds from 42 to 60 miles per hour were studied. The airplanes used were of the familiar steel-tube, fabric-covered, tandem, two-seat type. In crashes up to an impact speed of 60 miles per hour, crumpling of the forward fuselage structure prevented the maximum deceleration at the rear-seat location from exceeding 26 to 33 g. This maximum g value appeared independent of the impact speed. Restraining forces in the seat belt—shoulder-harness combination reached 5800 pounds. The rear-seat occupant can survive crashes of the type studied at impact speeds up to 60 miles per hour, if body movement is restrainted by an adequate seat belt—shoulder-harness combination, so as to prevent injurious contact with obstacles normally present in the cabin. Inwardly collapsing cabin structure, however, is a potential hazard in the higher-speed crashes. (NACA)

10FINC-DM57
Finch, D. M., and Palmer, J. D.
DYNAMIC TESTING OF SEAT BELTS
SAE Transactions
Vol. 65 (1957)
Pp. 541-50

This paper describes the apparatus used and procedures followed in tests conducted at the University of California, which simulated the actual dynamic loading that a seat belt might receive in a traffic accident resulting in a 20-g deceleration uniformly applied for 50 millisec.

10FINW-PE65
Finwall, P. E.
ANALYTICAL EVALUATION OF RESTRAINING HARNESS MATERIALS
7th Stapp Car Crash Conference
1965
Pp. 275-283

This paper describes the work accomplished under contract AF 33(616)-8429 (Task Study No. 5) "Feasibility cf Determining the Transfer Function for Selected Support Restraint Materials." A brief discussion of the mathematical model, describing the webbing material, is presented. Verification of the model by test and the limitations imposed by model representation are also described.

This presentation describes only the first step in resolving whether or not there exists a practical method of dynamic analysis of restraint materials.

10FORD-AR47
Ford Automotive Research Department
DEVELOPMENT AND TEST OF AUTOMOTIVE TYPE SEATS
Ford Automotive Research Department
August 22, 1947

10FORD-MC
Ford Motor Company
FATIGUE TEST ON SEAT BACK SPRINGS,
Falls Spring and Wire Company, Dearborn, Michigan

10GAND-HK62
Gandelot, H. K., and Skeels, P. C.
CONSIDERATIONS IN CRASH ENERGY ABSORPTION. (In M. K. Cragun, ed., The Fifth Stapp Automotive Crash and Field Demonstration Conference, September 14-16, 1961)
1962
Pp. 219-224

10GIVE-GA64
Givens, G. A.
CODE H33 FARM TRACTOR, CODE H34 FRONT END LOADERS AND H24 TRACTORS - INSTALLATION OF ROLL BARS, SAFETY BELTS AND CABS
Central Experimental and Proving Establishment, Rockcliffe, Ontario
July 1964
AD 454 433
18 p.

There is a requirement, under extreme weather conditions, for installation of cabs, canopies or shrouds on tractors and industrial equipment. However, due to the increased hazard to operators enclosed in a cab, present policy discourages the use of these devices in most cases, and prohibits their use in all cases where the vehicles are to be operated on lakes (in winter), or in precipitous areas. The possibility that operator safety could be maintained while using cabs, canopies or shrouds, by installing roll bars and safety belts was investigated under this T + DI. This report describes, (in three sections), the tests performed and the results obtained in the installation of roll bars, safety belts and cabs on a code H33 tractor agricultural, a code H24 tractor crawler and a code H34 Michigan front end loader. (Author)

10GRAY-RF63 (06GRAY-RF63)
Gray, R. F.
POWERED TORSO HARNESS: MECHANICAL SYSTEM AND HUMAN TOLERANCE EVALUATION
United States Air Development Center, Johnsville, Pennsylvania
NADC-MA-6330 (31 December 1963)
AD 428 065L

A multi-actuating shoulder harness system designed to aid air crew members in positioning themselves back in their seats despite high accelerations and for pre-ejection positioning, was tested and evaluated at the Aviation Medical Acceleration Laboratory. This report is concerned with the performance characteristics of this harness system. Subjects proved tolerant to shoulder strap pressures of between 350 and 600 psi maintained for 5 seconds. They also were tolerant to the stopping impacts associated with the maximum possible speed of retraction of the harness.

10HALE-JL91
Haley, Joseph L., Jr.
EFFECT OF RAPID LOADING RATES ON THE STRESS-STRAIN PROPERTIES OF RESTRAINT WEBBING. (In Proceedings of 10th Stapp Car Crash Conference)
Society of Automotive Engineers, New York
A67-20609 08-05 (1967)
Contract No. NSR-33-026-003
Pp. 132-136, 5 refs.

Stress-strain data for nylon and dacron webbing of 5500- and 6000-lb strengths are presented for quasi-static and very rapid loading rates up to about 450,000 lb/sec. The preliminary data indicate that the stress-strain slope is about twice as great with both materials for the rapid loading rates. The results also indicate that the failure load is the slightly higher (6 to 18%) for the rapid loading. The variation of the stress-strain slope with a changed loading rate will undoubtedly have an effect on the prediction of loads and accelerations for crash restraint systems in all types of vehicles. (Author)

10HALE-JL92
Haley, Joseph L., Jr., and Turnbow, W.
IMPACT TEST METHODS AND RETENTION HARNESS CRITERIA FOR U.S. ARMY AIRCREWMAN PROTECTIVE HEADGEAR, Final Technical Report.
Army Aviation Material Laboratories
AvSER-65-15; USAAVLABS-TR-66-29 (March 1966)
Contract DA-44-177-AMC-254(T)
Aviation Safety Engineering and Research, Phoenix, Arizona
AD 631 493

On the basis of simple analyses and some experimental testing, recommendations are made for the design and testing of helmet retention harnesses. A 'collar-type' retention harness is recommended, and two tests are suggested as a method of insuring a good design. Impact tests were conducted by an impactor-drop method and a head-form drop method. These test methods employ one movable piece and one fixed piece rather than two movable pieces as are currently used by most test agencies. On the basis of the impact test results, it is recommended that the impactor-drop method be used for the qualification of U.S. Army aircrew helmets. Probable head impact velocities and impact surfaces are discussed, and impact test conditions are specified.

(10HAWT-R 59: see 07HAWT-R 59)

(10HEND-E 54: see 07HEND-E 54)

10HEND-E 55
Hendler, E.
EVALUATION OF AIR ASSOCIATES, INCORPORATED SINGLE STRAP SHOULDER HARNESS AND LAP BELT.
Naval Air Material Center, Philadelphia, Pennsylvania
Rept. NAM EA 6314 (17 March 1955)

10HIRO-Y 55
Hiroshige, Y., and Hackman, L. E.
THE DYNAMICS OF CRASH RESTRAINT HARNESSES
Air Research and Development Command, Air Force Flight Test Center, Edwards Air Force Base, California
AFFTC-TR-55-24 (September 1955)
AD 81 564

This report presents a method of determining the dynamic response of safety harnesses used for the protection of aircraft crew members. A nonlinear single degree of freedom differential equation is established, the solution of which is obtained graphically by means of the phase-plane delta method developed by L. S. Jacobsen. The results of this solution are compared with those obtained from experimental tests conducted at the Air Force Flight Test Center Deceleration Track Facility. Reasonably good agreement was obtained between the analytical and experimental results. This agreement ranged from 80 to 93 percent. Since the investigation reported herein is of a preliminary nature, further investigations will be conducted to more completely resolve the dynamics problem.

10KEIL-E 91
Keil, E., and Werner, H.
VERHALTEN VON SICHERHEITSGURTEN BEI DYNAMISCHER BELASTUNG
Materialpruefung-Materials Testing-Materiaux
Vol. 6, No. 7 (July 1964)
Pp. 229-35

Behavior of automobile safety belts under dynamic stress; apparatus for dynamic testing is described and methods of evaluating results are analyzed; values obtained for polyester and polyamide webbings and for complete belt assemblies were compared with properties under static load and found to be approximately alike.

10KEIL-E 92
Keil, E., and Werner, H.
DIE BEANSPRUCHUNG VON AUTOSICHERHEITSGURTEN
Automobiltechnische Zeit
Vol. 66, No. 7 (July 1964)
Pp. 189-97

Stresses of automobile seat belts; attempt is made by means of mathematical analysis to determine nature and magnitude of belt forces under influence of vehicle and belt rigidity, in particular, influence of belt looseness, of mass ratio, of nonlinearity of belt characteristics, and of vehicle elasticity; pertinent equations are given and conclusions drawn with respect to seat belt construction.

10KEIL-E 93
Keil, E., Werner, H., Ewald, H., Hontschik, H., and Rinza, P.
STATISCHE AND DYNAMISCHE PRUFUNG FON SICHERHEITSGURTEN. Deutsche Kraftfahrtforschung und Strassenverkehrstechnik (Static and Dynamic Tests on Safety Belts.)
Vol. 180 (1965)

10KELL-AH64
Kelly, A. H.
TESTS OF PERSONNEL RESTRAINING DEVICES
General Motors Corporation Proving Ground, Detroit, Michigan
Beginning 1964

10KENN-JE57
Kennedy, J. E.
EXAMINATION OF SEAT HARNESS
Defense Research Medical Laboratories, Toronto, Canada
Physical Testing Report No. 31 (1957)

10KENN-JE58
Kennedy, J. E.
EXAMINATION OF SEAT BELT HARNESS
Defense Research Medical Laboratories, Toronto, Canada
Physical Testing Reports No. 36 and 39 (1958)

10KOCH-RJ66
Kochevar, Raymond J., and Rader, Don A.
PERSONNEL ACCOMMODATIONS XB-70A. Summary Test Report 21 September 64-6 August 66.
North American Aviation Inc., Los Angeles, California
NA-66-373 (October 1966)
AF 33(657)-12395
AD 800 262
26 p.

This report contains the summary of the pilot's subjective evaluations of the personnel accommodations as utilized in flight tests of the XB-70A. No personnel accommodations instrumentation other than pilot's personal observations are used in subject tests. The report describes crew task overloading when automatic equipment fails, difficulty of maintaining precise flight conditions with 1950 vintage flight instruments, and other controls and displays details. Lighting conditions encountered under high alti-

tude daylight flying conditions are described and recommendations to improve such lighting conditions are reported. Operational vision from a vehicle providing 11 degrees over-the-nose vision is summarized for flight conditions of take off, landing and cruise with the nose ramp up. Safety equipment is discussed where non-emergency tests could be made to determine adequacy of such equipment. The escape capsules are discussed as to pre-flight tests and usage. Crew seating and restraint equipment is discussed as to suitability and pilot requested shoulder harness improvement. Liquid oxygen and pressure suit ventilation systems are described as to usage, improvements incorporated, and recommendations for future systems. Crew clothing and personal equipment are described as to function, discrepancies encountered in standard equipment, modifications made to improve standard equipment operation.

10LANG-FC60 (08LANG-FC60)
Langner, F. C.
CONDUCT STUDY, DESIGN AND FURNISH PROTOTYPES OF ENERGY ABSORPTION SYSTEMS FOR AIRCRAFT SEATS
Aerotec Industries, Bantam, Connecticut
March 1960

10LIST-RD63
Lister, R. D., and Farr, B. N.
PERFORMANCE OF SEAT BELT ASSEMBLIES IN CONTROLLED IMPACT TESTS.
Bulletin of the Motor Industry Research Association
No. 1 (1963)
Pp. 8-14

10MATH-JH53
Mathewson, J. H., and Severy, D. M.
RAPID-DECELERATION TESTS FOR CHEST-LEVEL SAFETY BELTS
Highway Research Board, Washington, D.C.
HRB Bulletin No. 73 (1953)
Pp. 42-52; discussion, pp. 52-54

10MCHE-RA62
McHenry, R. A.
ANALYSIS OF SEAT BELT DYNAMIC TEST PROCEDURES
Cornell Aeronautical Laboratories, Inc., Vehicle Dynamics Department, 4455 Genessee St., Buffalo, New York
1962

10MCHE-RR65
McHenry, Raymond R.
ANALYSIS OF THE DYNAMICS OF AUTOMOBILE PASSENGER-RESTRAINT SYSTEMS
7th Stapp Car Crash Conference
1965
Pp. 207-249

A seven-degree-of-freedom nonlinear mathematical model of a human body and a restraint system (lap belt or combination of lap belt and shoulder restraint) has been formulated, and a digital computer calculation has been programmed, for purposes of investigating the dynamic behavior of automobile restraint systems. The system response is calculated in the form of time histories of the forces, accelerations, velocities, and displacements at various points in the dynamic system for either: 1) an experimental or idealized time history of vehicle deceleration, entered as a forcing function, or 2) deceleration by a specified form of vehicle-stopping mechanism.

A lack of detailed parameter and test data has prevented complete validation of the model; however, comparisons between calculated (estimated parameters) and experimental (from the literature) responses indicate a good agreement.

Major system parameters (e.g., belt properties, stopping distance, deceleration pulse shape, etc.) have been varied to explore their effects on restraint system performance, and preliminary conclusions are presented.

10MICH-I 63 (08MICH-I 63)
Michelson, I., Aldman, B., Tourin, B., and Mitchell, J.
DYNAMIC TESTS OF AUTOMOBILE PASSENGER RESTRAINING DEVICES
Highway Research Board
HRB Record No. 4 (1963)
Pp. 62-75

10MORG-H 55
Morgan, H.
BEHAVIOR OF TEXTILES UNDER IMPACT CONDITIONS; AND OTHER ABSTRACTS
Paper, 22nd Shock and Vibration Symposium, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio
22-23 March 1955

10MOSE-JC53
Moser, J. C.
ACCELERATIONS AND HARNESS FORCES MEASURED IN FULL-SCALE CRASH STUDIES
NACA, Washington, D.C.
February 1953

In view of recent experimental evidence indicating that human beings can withstand decelerations in excess of those imposed in airplane crashes involving extensive damage to the airplane structure, the NACA Lewis Laboratory has engaged in a study of the loads transmitted to airplane personnel compartments in a crash. The data obtained are intended as a contribution to the general background of engineering information required for the design of improved seats and personnel safety harness. This work is part of a general program on crash survival, in which instrumented aircraft are crashed under circumstances simulating a take-off of landing accident. In this program several of the aircraft carried dummy passengers and were instrumented to measure loads imposed on various portions of the aircraft structure. These loads were related to the events in the crash experience. In this study data were obtained with small, two-passenger J-3 type airplanes and large C-82 cargo-type aircraft.

10MOTO-VS62

MOTOR VEHICLE SEAT BELT ANCHORAGE GEOMETRY AND STRENGTH REQUIREMENTS
SAE Journal
Vol. 70 (July 1962)
Pp. 50-51

10NAVA-AT66
Naval Air Test Center
MARTIN-BAKER MKGRU5 ESCAPE SYSTEM, SURVIVAL KIT/LAP BELT RESTRAINT SYSTEM EVALUATION PROGRAM (September 65 - January 66)
Naval Air Test Center, Patuxent River, Maryland
Report No. 1 (Final) (March 1966)
ST-13R-66 RAE20P030
AD 478 678L
11 p.

10NICH-G 64
Nichols, G.
ANALYSIS AND BIODYNAMICS OF SELECTED ROCKET-SLED EXPERIMENTS. PART II. DYNAMIC RESPONSE OF RESTRAINED SUBJECT DURING ABRUPT DECELERATION
USAF School of Aero. Med., Brooks Air Force Base, Texas
July 1964
Contract No. AF41(609)-2317 by Northrop Space Laboratory, Hawthorne, California
AD 609 412

This report consists of two parts: Part I, Biodynamics of Rocket-Sled Maximal Decelerations, and Part II, Dynamic Response of Restrained Subject During Abrupt Deceleration.

Part II presents the results of a study made to determine the relationship of the many variables involved when a restrained subject is exposed to an abrupt deceleration by the application of a basic forcing function to the supporting vehicle. The studies include the response of the restraints under both static and dynamic loads.

The decelerative forces were similar to crash conditions, and were applied in rectangular, triangular, trapezoidal, and sinusoidal patterns; the straps were of waist, shoulder, and harness designs. The main factors in the experimentation were varied deceleration rates and levels, subject mass and position, and degree of strap stiffness and energy-absorbing capacity. Observations in linear and nonlinear restraint tests were of maximum subject force, rate of buildup, and displacement. It was found, in general, that slack restraint is hazardous.

(10PATO-CR: see 07PATO-CR40)

10PATR-LM66
Patrick, L. M., Mertz, H. J., Jr., and Kroell, C. K.
IMPACT DYNAMICS OF UNRESTRAINED, LAP BELTED, AND LAP DIAGONAL CHEST BELTED VEHICLE OCCUPANTS
10th Stapp Car Crash Conference
November 1966
Pp. 22-53

A comparison is presented of the forces, accelerations, and kinematics of an anthropomorphic dummy for identical sled impacts for unrestrained, lap belted, and lap and diagonal chest restrainted conditions. Biaxial accelerometers were mounted in the head, chest, and on the proximal end of the femur to obtain the accelerations during the impacts. Seat belt load cells were put in series with the belts at each anchor point. Biaxial load cells were positioned to be impacted by the head, chest, and each knee for the unrestrained condition and by the head and chest for the lap belted configuration. For the lap and diagonal chest restrained condition these load cells were not used. Impacts of 10 and 20 miles per hour were made with sled stopping distance of 4 and 9 inches, respectively.

At twenty miles per hour the head struck with a force of 1580 pounds in the unrestrained mode, 600 pounds with the lap belt, and did not hit with the lap and shoulder harness. The corresponding A-P head accelerations were 3500 pounds for the lap belt only. With the lap and cross chest combination the lap belt load was 2260 pounds and the cross chest belt load was 2245 pounds for a total load of 4505 pounds. Displacements of the hip, shoulder, and head were measured from the high speed movies and are presented graphically.

10PAYN-PR62
Payne, Peter R.
THE DYNAMICS OF HUMAN RESTRAINT SYSTEMS. (In Impact Acceleration Stress: Proceedings of a Symposium With a Comprehensive Chronological Bibliography)

National Academy of Sciences, National Research Council
Publication No. 977 (1962)
Pp. 195-257

Human dynamics is in its infancy, and like all young sciences, must proceed in a series of steps which alternate between theoretical and experimental investigations.

In the sub-division of body-restraint dynamics a great deal of experimental data has now been amassed, and further progress seems to depend upon a thorough investigation of the basic principles of restraint, and the use of dynamic theory to correlate the existing experimental information. This report is primarily concerned with proposing such a program, and with discussing in depth the approaches that should be used.

Since a satisfactory dynamic model of the human body is an essential prerequisite to a meaningful analysis of restraint dynamics, however, a fairly detailed description of our latest "human models" is also included.

10PAYN-PR64
Payne, Peter R.
PERSONNEL RESTRAINT SYSTEM STUDY, CH-47 VERTOL CHINOOK. CRASH INJURY EVALUATION, SUPPLEMENT
Army Transportation Research Command, Ft. Eustis, Virginia
TRECOM-TR-64-4 Suppl.; AvCIR-62-26 Suppl. (1964)
Contract DA-44-177-AMC-888(T)
Aviation Safety Engineering and Research, Phoenix, Arizona
AD 607 659

Components of the individual restraint system for the passengers of the CH-47 helicopter are described, and their installation is outlined.

10PAYN-PR65
Payne, Peter R.
PERSONNEL RESTRAINT AND SUPPORT SYSTEM DYNAMICS
Wright-Patterson Air Force Base, Ohio, AMRL
AMRL-TR-65-127 (October 1965)
Contract AF 33(657)-9414
Frost Engineering Development Corporation Englewood, Colorado
AD 624 487

Like any other complex dynamic system the human body responds in a complex way to acceleration inputs which vary rapidly with time. The need to avoid stresses large enough to cause injury to the body usually imposes limits on the permissible input acceleration. The restraint system interposed between a vehicle and its occupant can modify the physiological effects of a vehicle's acceleration-time history. This modification should be made as favorable as possible by minimizing the stresses generated in the vehicle's occupant. To determine optimum dynamic characteristics for the restraint system, its important characteristics, and those of the human body, need to be represented in terms of a mathematical or 'dynamic' model. Through suitable analysis, either mathematical or by means of a computer, those dynamic characteristics of the restraint system can be determined which will minimize the peak stresses developed in its human occupant. A general theory of suitable dynamic models is developed for this type of problem. Closed form solutions for a number of simple cases are presented. In addition a method is shown which permits development of simple dynamic models for the human body utilizing existing experimental data.

10RAND-FE49
Randall, F. E.
THEORY AND PRACTICE IN THE USE OF SCALE MANIKINS
Iowa Transit
December 1949

10REED-JL65
Reed, J. L., and Holland H. W.
UH-1D AIRCREW ARMORED SEAT: CRASH SURVIVAL ANALYSES - PRELIMINARY REPORT
Army Aviation Materiel Labs, Fort Eustis, Virginia
USAAVLABS-TR-65-59 (August 1965)
DA-1P121401A15003
AD 624 119
49 p.

This report contains the results of preliminary crash survival analyses of a UH-1D helicopter aircrew armor seat. The data used in this study were developed from manufacturers' drawings, military specifications, and other sources. Further effort is required to determine the quantitative effects of the incorporation of an aircrew armor system into the incorporation of an aircrew amror system into the existing UH-1D seat frame and restraint system.

However, preliminary analyses and tests indicate that the new system, as configured, will contribute to a marginal crash survival condition for the aircraft occupants. Therefore, a program of redesign should be given serious consideration. (Author)

10ROTH-JD66
Rothstein, Jerry D., and Brown, William K.
FEASIBILITY STUDY: LATERAL IMPACT WITH STANDARD AIRCRAFT HARNESS CONFIGURATION
Aerospace Medical Div., Aeromedical Research Lab. (6571st), Holloman, Air Force Base, New Mexico
ARL-TR-66-3 (February 1966)
AD 629 077
27 p., refs.

A series of 11 impact tests using the daisy decelerator was accomplished to evaluate the adequacy of restraint from lateral impact forces of up to 14 sled G using as minimal restraint, standard aircraft harness and a non-contoured seat. Standard harness would offer greater range of movement to the restrained subject than would be offered by a more complex harness previously proposed and tested for project Apollo. Results of these 11 tests demonstrated adequacy of a restraint with the standard harness at tested impact profiles. It was also observed that when the torso was not laterally supported a shallow, 5.08 cm (2-inch) deep head support was adequate at sled G less than 10 g; above 10 sled G this shallow head support was preferred to a deeper, 17.8 cm (7-inch) head support so that at impact the subject's head can rise out and over the shallow support thereby minimizing the shearing force between the head and laterally moving torso. It was also observed that amplification of G from seat to subject was about the same for both harnesses even though input force was greater in the series using standard harness. This observation suggested greater absorption of impact force by torso movement and strap stretch with standard harness than almost entire force absorption by the rigidly restrained body with more complex harness.

10RYAN-JJ61
Ryan, J. J.
HUMAN CRASH DECELERATION TESTS ON SEAT-BELTS
Paper, Annual Meeting of the Aerospace Med. Assoc., Chicago, Illinois
also

Aerospace Med.
Vol. 32, No. 3 (March 1961) (26 April 1961)
P. 246

Tests have shown that seat-belt forces applied to the human subject in deceleration are sinusoidal in character, are determined by the natural frequency of the spring-mass system and by damping, and are dependent upon the time history of the forces applied at the belt connections. The development of favorable seat-belt characteristics is described. The limiting forces are dependent upon the ability of the pelvic bone system to transmit the sinusoidal rearward and downward forces exerted by the belt on the body. A secondary problem is the rotation of the upper torso about the seat-belt after impact. The results of these force applications from tests are noted. Criteria of aircraft design are suggested to allow maximum impacts without immobilizing injury, permitting immediate evacuation.

10SCHW-ER46
Schwarz, E. R., and Hamburger, W. J.
IMPACT INVESTIGATION ON TEXTILE MATERIALS
Textile Division, Massachusetts Institute of Technology
June 30, 1946
MIT Div. of Industrial Cooperation Contract #2-6343; Fabric Research Laboratories, Inc., Contract #C45589; U. S. Army Air Corps, Materiel Div., Wright Field, Dayton, Ohio, Order #N33-038 AC-12462
ASTIA ATI No. 87219

Theoretical Discussion of Physical Requirements of Suspension Lines

A. Energy Absorption,

B. The effective Gage Length Method for Determining Load-Elongation Diagrams,

C. Elongation Balance in the Conventional Core, and Sleeve Type Braided Suspension Line,

D. Inherent Yarn Elongation, Crisp and Helix Effects,

Energy Absorption of Properties of Sleeve Yarns
Energy Absorption Properties of Core Yarns
Energy Absorption Properties of Suspension Lines
Shock Loading Characteristics of Parachute Suspension Lines
Energy Absorption Properties of Formic Acid Treated Sleeve Yarn
Energy Absorption Properties of Formic Acid Treated 26-Pick Conventional
Core and Sleeve Yarns
Comparison of Undrawn, Partially Drawn, and Fully Drawn Nylon
Energy Absorption Properties of Fiber "A" Compared with Nylon

(10SEVE-DM: see 03SEVE-DM)

10SHAR-JE66
Sharp, Jonathan E., Campbell, Horace E., and Utans, Paul
ANALYSIS OF LAP SHOULDER BELT EFFECTIVENESS IN ACCIDENTS

9th Stapp Car Crash Conference
1966
Pp. 65-82

We are defining the problem at hand and illustrating how the lap shoulder belt meets the problem—the virtues as well as the limitations.

It is definite that the more restraint afforded an individual in a crash situation, the less danger there is of death or injury to the person.

Our investigations show that there are four basic advantages which a lap shoulder belt possesses over a lap belt.

(10SIFU-SS58: see 07SIFU-SS58)

10SOCI-AE53
Society of Automotive Engineers
AUTOMOTIVE SEATING—TESTING AND EVALUATION BY INSTRUMENTATION
Paper, Summer Meeting of Society of Automotive Engineers
June 9, 1953

10SOCI-AE54
Society of Automotive Engineers
THE USE OF OSCAR IN SEAT DESIGN
Society Automotive Engineers
SAE Publication No. 209 (1954)

10SOCI-AE64
Society of Automotive Engineers
DYNAMIC TESTING OF SEAT BELTS
Society of Automotive Engineers, Seat Belt Committee
Report No. 1 to Committee (February 13, 1964)

10STET-CH64
Stetson, Carl H., Jr., Parks, George W., Genest, Roger, and Katz, Frank
INVESTIGATION OF SEAT BELT WEBBING SERVICE LIFE (Final Report)
National Labs. for Research and Testing, Inc., Pawtucket, Rhode Island
September 1964
Contract FAA/BRD-408
92 p.

The purpose of the project was to seek a sound technical basis for determining the ordinary service life of seat belt webbing. Various models of belts of different ages were collected in two climatic zones in the United States and subjected to a uniform testing procedure. The laboratory tests showed that of 399 seat belt samples tested, 42% failed to meet minimum strength requirements. Cotton webbing belts showed a higher incidence of failure than belts made with synthetic fiber webbing. Laboratory tests showed more assembly than webbing failures. The performance of all cotton belts tested leads to the conclusion that cotton webbing should not be used in aircraft safety belts. We recommend raising the minimum strength requirements for both webbing and assemblies. We recommend improved administrative procedures for the enforcement of minimum aircraft safety belt standards.

10SWEA-JJ51
Swearingen, J. J.
DESIGN AND CONSTRUCTION OF A CRASH DUMMY FOR TESTING SHOULDER HARNESS AND SAFETY BELTS
Civil Aeronautics Medical Research Lab., Oklahoma City, Oklahoma
Preliminary Report (April 1951)

10SWEA-JJ56
Swearingen, J. J., and Morrow, D. J.
MOTIONS OF THE HEAD AND TRUNK ALLOWED BY SAFETY BELT RESTRAINT DURING IMPACT
Civil Aeronautics Medical Research Laboratory, Federal Aviation Agency, Oklahoma City, Oklahoma
June 1956
Project No. 53-204

This study was conducted to record and describe the actual path of motion of the head and trunk as it is propelled forward or to the side over a safety belt in a crash. Records of these orbits of motion for one hundred male subjects are presented in the three figures immediately following: Because of the low forces (about 1 g) used to displace the body in this study, the measurements presented here must be considered as minimal protective distances. In the crash situation two factors will certainly act to permit greater movements of the body. These are: (a) the greater forces involved in crashes; and (b) the practice of passengers wearing their lap safety belt more loosely than the standard maintained for these tests. In this connection laboratory tests were conducted, and even under the 1 g forward loading, it was demonstrated that the soft tissues of the abdomen are compressed until the safety belt is virtually a straight line across the iliac crest of the pelvis. Hence the forward displacement of the body will be increased one inch for every two inches of safety belt not pulled through the buckle.

10SWEA-JJ62 (06SWEA-JJ62)
Swearingen, J. J., Hasbrook, A. H., Snyder, R. G., and McFadden, E. B.
KINEMATIC BEHAVIOR OF THE HUMAN BODY DURING DECELERATION
Civil Aeromedical Research Institute, Federal Aviation Agency, Oklahoma City, Oklahoma

Rept. 62-13 (June 1962)
AD 283 938

also

Aerospace Medicine
Vol. 33 (February 1962)
Pp. 188-197

The geometry of motion of the head, trunk and appendages was established for one hundred male subjects restrained by a safety belt during forward and side dynamic loadings. Lethal structures of present aircraft seating and cockpit arrangements are revealed by correlating crash injuries with these kinematic data. In addition an analysis of the forces created by body kinematics during forward deceleration sheds new light on seat anchorage problems. (Author)

10TAKA-J 65
Takada, Juichiro
A BRIEF REPORT ON CAR COLLISONS (Japan)
7th Stapp Car Crash Conference
1965
Pp. 66-77

These tests were carried out, first to examine conditions of the two dummies, one wearing a safety belt and the other without one, when the test car collides with the barrier, and secondly, to measure the deceleration at impact for the car body and the belt-wearing dummy.

10TAPL-BD60
Tapley, B. D.
STRESS-STRAIN CHARACTERISTICS OF MATERIALS AT HIGH STRAIN RATES, PART VI, THE PROPAGATION OF PLASTIC WAVES IN FINITE CYLINDERS OF A STRAIN-RATE-DEPENDENT MATERIAL
University of Texas, Austin, Texas
Rept. SCDC-2156 (August 1960)
Rep/3955

This work seeks to determine indirectly, by studying the propagation of plastic waves, the basic dynamic-stress strain characteristics of materials. It represents the first successful effort to incorporate in the mathematical analysis of plastic wave propagation in bars, a correction for the effects of lateral inertia and shear.

10TURN-JW61
Turnbow, James W.
UNITED STATES ARMY H-25 HELICOPTER DROP TEST
Cornell-Guggenheim Aviation Safety Center, New York
AVCIR 2 TR 125, TREC TR60 76 (March 1961)
DA 44 177TC624
AD 261 961

This report presents the results of an exploratory, experimental study. A Piasecki Model H-25A helicopter has been employed in recreating a typical accident approximating an unsuccessful attempt to attain auto-rotation from a low altitude power failure.

Relatively high (50G to 100G) vertical and longitudinal accelerations have been observed for periods in the order of 10 milliseconds in an impact leaving the cabin area of the airframe reasonably intact.

Failure of all seats occurred without failure of either seat belts or shoulder harness. The instrumentation and research techniques used in (1) the measurement of the impact forces and accelerations, (2) the determination of the feasibility of the utilization of on-board recorders, and (3) the evaluation of certain problems inherent in the dynamic crash testing of full-scale helicopter and VTOL aircraft were presented in an earlier preliminary report (AVCIR-1-TR 124).

(10TURN-JW63: see 07TURN-JW63)

(10WEIN-LW65: see 07WEIN-LW65)

10WILL-JH62 (08WILL-JH62)
Willich, J. H., Hontschik, H., and Kusters, H.
INVESTIGATION INTO SAFETY BELTS FOR MOTOR VEHICLES USING A TEST DUMMY AND ACCELERATED SEAT
Deutsche Kraftfahrtforschung and Strassenverkehrstechnik
Heft 158, Dusseldorf (1962) (In German)

also

Road Abstracts
Vol. 30, No. 4 (1963)
P. 85

10WILL-JH64
Willich, J. H.
ANALYSE DER DYNAMIK VON SICHERHEITSGURTEN FUER KRAFTFAHRER
Automobiltechnische Zeit
Vol. 66, No. 7 (July 1964)
Pp. 197-202, 27 refs

Analysis of dynamics of car passenger seat belts; effect of seat belt and reproducibility of crash tests depend on factors such as traveling speed, braking distance, deceleration characteristics, vehicle weight, size weight and human similarity of dummy, rigidity of joints of dummy, seat construction, and belt looseness; properties of seat belts include energy absorption, dynamic stress characteristics, and hysteresis; analytical study employing mathematical model with seven degrees of freedom; two different occurrences were calculated on computer;

comparison of analytical results with
those obtained from crash studies.

10WURZ-EM48
Wurzel, Edward M., Polansky, Lewis, J.,
and Metcall, Earl E.
MEASUREMENTS OF THE LOADS REQUIRED TO
BREAK COMMERCIAL AVIATION SAFETY BELTS
AS AN INDICATION OF THE ABILITY OF THE
HUMAN BODY TO WITHSTAND HIGH IMPACT
FORCES
Naval Medical Research Institute, Bethesda,
Maryland
Report No. 12 (16 March 1948)
Project MN 001 006 X-630

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ERTAIN JERKING TYPES OF	**ACCELERATION**	WHICH OCCUR IN FLYING=	6RUFF-S 93
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*The digit in the first column of the entry code denotes the section in which the entry is located alphabetically by the letters which follow. A blank in the first column denotes an entry located in Section 10.

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A SURVIVABLE TRANSPORT	**ACCIDENT=** FAILURE OF REARWARD FACING	7HASB-AH62
ES.=	**ACCIDENTAL** DEATHS IN MILITARY VEHICL	6BABI-RW56
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AND	**AGRICULTURE** AIRCRAFT=	1DEHA-H 53
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*The digit in the first column of the entry code denotes the section in which the entry is located alphabetically by the letters which follow. A blank in the first column denotes an entry located in Section 10.

*The digit in the first column of the entry code denotes the section in which the entry is located alphabetically by the letters which follow. A blank in the first column denotes an entry located in Section 10.

		ENTRY CODE*
NGER-RESTRAINT SYSTEMS=	**ANALYSIS** OF THE DYNAMICS OF AUTOMOBI	MCHE-RR65
NGER RESTRAINT SYSTEMS=	**ANALYSIS** OF THE DYNAMICS OF AUTOMOTI	AVIA-CI63
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IN ENGINEERING DESIGN=	**ANNOTATED** BIBLIOGRAPHY ON HUMAN FACT	4LAWR-ML46
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ENERGY ABSORPTION	**APPLIED** TO SEAT DESIGN=	7HAWT-R 59
ASSENGER SEAT DESIGN AS	**APPLIED** TO THE CONVAIR 880= P	7BECK-LC59
TORSO TO LARGE RAPIDLY	**APPLIED** UPWARD ACCELERATIONS BY THAT	6HESS-JL56
E OF ACCELERATION AS IT	**APPLIES** TO CERTAIN JERKING TYPES OF	6RUFF-S 92
COMFORT= DRIVING SEATS,	**APPRAISAL** OF THE MECHANICAL BASIS OF	7CLEA-DE54
S= A SAFETY ENGINEERING	**APPROACH** TO CHILD RESTRAINING DEVICE	1ROSE-CW65
R OCCUPANTS - A BRITISH	**APPROACH** TO SEAT DESIGN= THE PACKAGI	7BABB-FW65
ORT OF FOAM CUSHIONING=	**APPROACH** TO THE ASSESSMENT OF THE CO	7STON-PT65
ENTAL EVALUATION OF TWO	**APPROACHES** TO SEAT BELT PROMOTION= A	8BLOM-GW61
SCHOOL BUS RIDERS	**APPROVE** SEAT BELTS=	8SCHO-BR64
EJECTION SEAT DATA= THE	**APPROXIMATION** OF THE RESPONSE OF THE	6HESS-JL56
ESS= BARGAIN SEAT BELTS	**ARE** A HIT. CHEVRON DEALERS IN EAST	2BARG-SB62
DIAGONAL BELTS	**ARE** BEST IN CAR ACCIDENTS=	8HERB-DC61
LE FLEET OPERATORS, WHO	**ARE** NATIONAL SAFETY COUNCIL MEMBERS=	5NATI-SC60
SAFETY BELTS	**ARE** NOT DANGEROUS=	8DEBO-EF52
	ARE ORDINARY SEAT BELTS ENOUGH.=	8SHAR-JE64
	ARE SEAT BELTS GOOD FOR TRUCKS.=	8ARE -SB62

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		ENTRY CODE*
NCUSSION= IMPACT	**ATTENUATION** IN PROTECTION AGAINST CO	6SNIV-GG61
XPERIENCE AND NON-OWNER	**ATTITUDES=** A SURVEY OF AUTOMOTIVE SE	8AYER-WH56
Z DER GURTBANDANORDNUNG	**AUF** KRAFTVERTEILUNG AND= EINFLUS	8KEIL-E 66
ABDOMINAL INJURIES FROM	**AUTO** BELTS CITED=	6ABDO-IF65
T BELTS STANDARD ON '64	**AUTO** MODELS= SEA	8SEAT-BS63
DECELERATION LOCKS	**AUTO** SAFETY BELT=	8DECE-LA62
	AUTO SAFETY BELTS=	8AUTO-SB62
TION= NEW STEP TOWARD	**AUTO** SAFETY. SHOULDER HARNESS PROMO	8NEW -ST62
=	**AUTO** SEAT BELT INDUSTRY DRIVING FAST	2KRAS-K 64
HED BY ACT OF CONGRESS=	**AUTO** SEAT BELT STANDARDS SET, ESTABL	3AUTO-SB65
LATCHING ON, DEMAND FOR	**AUTO** SEAT BELTS IS RAPIDLY GAINING M	2DUBO-PC62
H EXPERTS SAY. 'YES.'=	**AUTO** SEAT BELTS. GOVERNMENT SAFETY	8AUTO-SB60
	AUTO SEAT BELTS, A PERSPECTIVE VIEW=	8CONS-U 91
T RATINGS OF 52 MODELS=	**AUTO** SEAT BELTS, A SWEDISH GOVERNMEN	8CONS-U 92
RITISH DUMMY SNAP-TESTS	**AUTO** SEAT BELTS= B	BRIT-DS62
= THE DEVELOPMENT OF AN	**AUTO-ADJUSTING** AND POSITIONING SINGL	9HOLC-GA60
	AUTO-CRASH SAFETY RESEARCH=	6BARE-CJ57
PRESENTING PROBLEMS FOR	**AUTOMAKERS=** GROWING SEAT BELT BUSINE	2MCDO-D 62
IN THE UNITED KINGDOM=	**AUTOMATIC** LOCKING AND RETRACTABLE BE	8REDF-FA65
APE= HUMAN TOLERANCE TO	**AUTOMATIC** POSITIONING AND RESTRAINT	6CART-RL59
ES.= HUMAN TOLERANCE TO	**AUTOMATIC** RESTRAINT HARNESS ACTIVATO	6GANS-RV66
	AUTOMATIC SAFETY BELT=	8AUTO-SB63
	AUTOMATIC SEAT BELTS=	8RYAN-JJ60
SEAT BELTS IN WISCONSIN	**AUTOMOBILE** ACCIDENTS SEAT BELT SURVE	8ASHA-V 62
AND OPINIONS ON 54,348	**AUTOMOBILE** ACCIDENTS= A REPORT OF SA	8TOUR-B 93
AND OPINIONS ON 54,348	**AUTOMOBILE** ACCIDENTS= A REPORT ON SA	8TOUR-B 91
SEAT BELTS IN WISCONSIN	**AUTOMOBILE** ACCIDENTS= A STUDY OF	8AUTO-CI63
ESS IN RURAL CALIFORNIA	**AUTOMOBILE** ACCIDENTS= SAFETY BELT EF	8TOUR-B 92
FFECTS OF SEAT BELTS ON	**AUTOMOBILE** AND TRUCKDRIVERS= A STUDY	8HASK-LT57
STRUCTURES SUITABLE FOR	**AUTOMOBILE** APPLICATION= DEVELOPMENT	1SMIT-MD55
FACIAL TRAUMA IN	**AUTOMOBILE** COLLISIONS=	6NAHU-AM65
DREN=	**AUTOMOBILE** CRASH PROTECTION FOR CHIL	1DYE -ER62
	AUTOMOBILE CUSHION SPRINGS=	7MURR-CA45
SENGER SAFETY=	**AUTOMOBILE** DESIGN IN RELATION TO PAS	1GRIM-G 64
EMIC=	**AUTOMOBILE** INJURIES, A NATIONAL EPID	6FISH-P 91
ATE= A STATEMENT OF THE	**AUTOMOBILE** MANUFACTURERS ASSOCIATION	3BUGA-JS66
ICES= DYNAMIC TESTS OF	**AUTOMOBILE** PASSENGER RESTRAINING DEV	MICH-I 63
ON AND CHARACTERISTICS=	**AUTOMOBILE** PASSENGER SEATING REQUIRE	7BELG-WJ63
YSIS OF THE DYNAMICS OF	**AUTOMOBILE** PASSENGER-RESTRAINT SYSTE	MCHE-RR65
LUATION OF THE LAP-TYPE	**AUTOMOBILE** SAFETY BELT WITH REFERENC	8STAP-JP58
O IMPROPER PLACEMENT OF	**AUTOMOBILE** SAFETY BELT= SPLENIC RUPT	6COCK-WM63
	AUTOMOBILE SAFETY BELTS=	8AUTO-SB57
ES=	**AUTOMOBILE** SAFETY SEAT BELT ASSEMBLI	8STON-MM54
NJURY= THE	**AUTOMOBILE** SEAT BELT AND ABDOMINAL I	6CAMP-HE64
IENCE ACIR= A REVIEW OF	**AUTOMOBILE** SEAT BELT INSTALLATION TR	CAMP-BJ93
LTING FROM THE STANDARD	**AUTOMOBILE** SEAT BELT= ABDOMINAL INJU	6ODON-JB66
T OF CRASHWORTHINESS OF	**AUTOMOBILE** SEAT BELTS FOR THE SUBCOM	3SEVE-DM
COMFORT 7=	**AUTOMOBILE** SEAT CUSHIONS AND RIDING	7TEA -CA38
TECHNIQUE FOR DESIGN OF	**AUTOMOBILE** SEATING= DRIVER/PASSENGER	7SHER-WF62

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S IN SEAT CONSTRUCTION=	**AUTOMOBILE** SEATS-EFFICIENT SUPPORT O	7MCCO-CE47
RUBBER AND PLASTICS IN	**AUTOMOBILE** SEATS=	7HARR-A 65
	AUTOMOBILE SEATS=	7WILL-RL50
FOR THE CONSTRUCTION OF	**AUTOMOBILE** SEATS= ORTHOPEDIC ASSUMPT	8THOM-W 59
ERIES II=	**AUTOMOBILE** SIDE-IMPACT COLLISIONS, S	1SEVE-DM62
COUNTY, INDIANA=	**AUTOMOBILES** WITH SEAT BELTS IN ALLEN	8BREN-B
FETY SPECIFICATIONS FOR	**AUTOMOBILES,** TRUCKS, BUSES= FEDERAL	8CAMP-HE62
LEAF SPRING SEAT FOR	**AUTOMOBILES=**	7LEAF-SS40
RUBBER SEATS FOR	**AUTOMOBILES=**	7RUBB-SF34
SS AND SAFETY BELTS FOR	**AUTOMOBILES=** SAFETY GLA	8GRIM-G 93
MEDICAL ASPECTS OF	**AUTOMOTIVE** CRASH INJURY RESEARCH=	6BRAU-PW91
	AUTOMOTIVE HUMAN CRASH STUDIES=	1RYAN-JJ62
YSIS OF THE DYNAMICS OF	**AUTOMOTIVE** PASSENGER RESTRAINT SYSTE	AVIA-CI63
TRA-ABDOMINAL INJURIES=	**AUTOMOTIVE** SAFETY BELT. IN SAVING A	8WILL-JS66
NDINGS OF THE EFFECT OF	**AUTOMOTIVE** SAFETY DESIGN ON INJURY P	6BRAU-PW92
DESIGN FACTORS IN	**AUTOMOTIVE** SAFETY=	1HAEV-R 55
ATTITUDES= A SURVEY OF	**AUTOMOTIVE** SEAT BELTS. OWNER EXPERI	8AYER-WH56
HRONOLOGICAL HISTORY OF	**AUTOMOTIVE** SEAT BELTS= C	1AMER-SB64
GNS= CURRENT	**AUTOMOTIVE** SEATING PROBLEMS AND DESI	7SOCI-AE50
GNS= CURRENT	**AUTOMOTIVE** SEATING PROBLEMS AND DESI	7SOCI-AE51
ION BY INSTRUMENTATION=	**AUTOMOTIVE** SEATING--TESTING AND EVAL	SOCI-AE53
	AUTOMOTIVE SEATING=	7MCWI-RL50
GINEERING AS APPLIED TO	**AUTOMOTIVE** SEATING= PRODUCTION TRIM	7GRAH-CH49
DEVELOPMENT AND TEST OF	**AUTOMOTIVE** TYPE SEATS=	FORD-AR47
PTIONAL EQUIPMENT ON AN	**AUTOMOTIVE** VEHICLE= SAFETY FEATURES,	1LEE -H 59
SAFETY DEVICES FOR	**AUTOMOTIVE** VEHICLES=	1RYAN-JJ58
ANCHORAGE OF SEATS FOR	**AUTOMOTIVE** VEHICLES=	8GENE-SA66
ICES AND ANCHORAGES FOR	**AUTOMOTIVE** VEHICLES= STANDARD FOR RE	1CANA-GS66
ASTOMERIC DIAPHRAGM FOR	**AUTOMOTIVE=** EL	7SEAT-T 64
, SEAT, PASSENGER TYPE,	**AUTOMOTIVE=** FEDERAL SPECIFICATION, B	7GENE-SA60
DIE BEANSPRUCHUNG VON	**AUTOSICHERHEITSGURTEN=**	KEIL-E 92
INSTALLATION IN GENERAL	**AVIATION** AIRCRAFT= RECOMMENDATIONS F	8YOUN-JW66
LERATION TECHNOLOGY FOR	**AVIATION** CRASH INJURY PREVENTION.= B	4CAMB-L 63
IMPACT WORK AND PLANS.=	**AVIATION** CRASH INJURY RESEARCH--REVI	6KRAF-MA61
UNITED STATES ARMY	**AVIATION** CRASH INJURY RESEARCH=	1AVIA-SE62
RED TO BREAK COMMERCIAL	**AVIATION** SAFETY BELTS AS AN INDICATI	WURZ-EM48
ECTIVE DEVICES FOR ARMY	**AVIATORS=** AN ANALYSIS OF SOME HUMAN	5MCCO-FP58
HEAD-REST INSTALLED BY	**A4D** AIRCRAFT SERVICE CHANGE NO. 157C	7BACA-GA60
TABLE HEAD POSITIONING=	**A4D** ESCAPE SYSTEM, EVALUATION OF MOD	7BACA-GA60
SH OR DITCHING SEAT FOR	**B.47** AIRCRAFT= CRA	7SMIT-LD51
STRAINT HARNESS FOR THE	**B-58** ESCAPE CAPSULE= THE DEVELOPMENT	9HOLC-GA60
TWO CAR SEATS FOR	**BABIES=**	7TWO -CS66
IMPROVED SEAT AND	**BACK** CUSHIONS=	7WHIT-RK59
FATIGUE TEST ON SEAT	**BACK** SPRINGS=	FORD-MC
SAFETY BELTS.	**BACK** TO THE PRAM=	8SAFE-BB62
TAL TEST MODEL 22= SEAT	**BACK-PASSENGER-**IMPACT ABSORPTION CHA	7SIFU-SS58
	BACKGROUND TO BELTS=	8BACK-TB59
FOR PASSENGER CAR SEAT	**BACKS=** STANDARD ON OCCUPANT IMPACT P	7AUTO-MA92
CELERATIVE FORCE IN THE	**BACKWARD** AND FORWARD FACING SEATED P	7STAP-JP51
A	**BACKWARD** FACING SEAT INVESTIGATION=	7BACK-FS50
	BACKWARD SEATING=	7GILB-EA52

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THE AIR	BAG SEAT FOR PASSENGER AIRCRAFT=	9LAMM-AC61
LANDINGS ON GAS-FILLED	BAGS= ANALYTICAL STUDY OF SOFT	9ESGA-JB60
PULLER-IN OF BUSINESS=	BARGAIN SEAT BELTS ARE A HIT. CHEVR	2BARG-SB62
ES ININTERCITY SERVICE=	BARRIER COLLISION AND RELATED IMPACT	1LABE-DJ65
SS RESTRAINING SYSTEMS=	BARRIER COLLISION INVESTIGATION OF H	1FRED-RH65
S SYSTEMS IN FULL-SCALE	BARRIER CRASHES AND SLED RUNS= STUDI	8BOHL-NI66
- INSTALLATION OF ROLL	BARS, SAFETY BELTS AND CABS= CODE H3	GIVE-GA64
ESTRAINT SYSTEMS STUDY,	BASIC CONCEPTS= PERSONNEL R	1FLIG-SF62
ESTRAINT SYSTEMS STUDY.	BASIC CONCEPTS= PERSONNEL R	1HALE-JL62
AISAL OF THE MECHANICAL	BASIS OF COMFORT= DRIVING SEATS, APP	7CLEA-DE54
F SOME HUMAN FACTORS TO	BE CONSIDERED IN DEVELOPING PROTECTI	5MCCO-FP58
THE DEVELOPMENT OF A '	BEAM-PAD' INSTRUMENT CONTAINER= EVAL	1SMIT-MD54
TEN= DIE	BEANSPRUCHUNG VON AUTOSICHERHEITSGUR	KEIL-E 92
NUFACTURERS ASSOCIATION	BEFORE THE COMMITTEE OF COMMERCE, UN	3BUGA-JS66
S, AND OTHER ABSTRACTS=	BEHAVIOR OF TEXTILES UNDER IMPACT CO	MORG-H 55
DECELERATION= KINEMATIC	BEHAVIOR OF THE HUMAN BODY DURING CR	DYE -ER50
CELERATION= KINEMATIC	BEHAVIOR OF THE HUMAN BODY DURING DE	SWEA-JJ62
ICLE CRUSH AND OCCUPANT	BEHAVIOR= VEH	1MART-DE67
N VON SICHERHEITSGURTEN	BEI DYNAMISCHER BELASTUNG= VERHALTE	KEIL-E 91
HUMAN	BEINGS AND THE MOTOR CAR=	5BREE-C 38
SEATING HUMAN	BEINGS SAE=	7SEAT-HB44
SGURTEN BEI DYNAMISCHER	BELASTUNG= VERHALTEN VON SICHERHEIT	KEIL-E 91
1961= U.S. ARMY YHU-1D	BELL IROQUOIS HELICOPTER MOCKUP EVAL	CARR-J 60
E U.S. ARMY HU-1 SERIES	BELL IROQUOIS HELICOPTER= CRASH INJU	8ROBE-SH62
STUDY. UH-1A AND UH-1B	BELL IROQUOIS HELICOPTERS= CRASH INJ	6HALE-JL91
ERTENT RELEASE= SAFETY	BELT (BUCKLE) SLIPPAGE, AND/OR INADV	8HASB-AH55
SEAT	BELT ACCEPTANCE SURVEY=	5MAYE-AF55
SAE MOTOR VEHICLE SEAT	BELT ACTIVITIES=	8NEFF-RJ65
LATED TO EFFECTIVE SEAT	BELT ADVERTISING= PSYCHOLOGICAL RESI	5BLOM-GW61
SAE= MOTOR VEHICLE SEAT	BELT ANCHORAGE GEOMETRY AND STRENGTH	MOTO-VS62
IXES MOTOR VEHICLE SEAT	BELT ANCHORAGE GEOMETRY AND STRENGTH	8NEW -RP62
MOTOR VEHICLE SEAT	BELT ANCHORAGE=	8SOCI-AE93
MOTOR VEHICLE SEAT	BELT ANCHORAGE=	8SOCI-AE95
THE AUTOMOBILE SEAT	BELT AND ABDOMINAL INJURY=	6CAMP-HE64
SEAT	BELT ASSEMBLIES FOR MOTOR VEHICLES=	8BRIT-SI61
TS= PERFORMANCE OF SEAT	BELT ASSEMBLIES IN CONTROLLED IMPACT	LIST-RD63
ICE= MOTOR VEHICLE SEAT	BELT ASSEMBLIES, SAE RECOMMENDED PRA	8SOCI-AE92
AUTOMOBILE SAFETY SEAT	BELT ASSEMBLIES=	8STON-MM54
ECOMMENDATIONS FOR SEAT	BELT ASSEMBLIES= INTERNATIONAL ORGAN	8FRED-RH65
ROTARY BUCKLE LAP	BELT ASSEMBLY=	8PACI-SC94
UTOMAKERS= GROWING SEAT	BELT BUSINESS IS PRESENTING PROBLEMS	2MCDO-D 62
THE DYNAMICS OF SEAT	BELT DESIGN=	EDEL-WE57
SAFETY SHOULDER	BELT DEVELOPED AT WRIGHT FIELD=	8SAFE-SB39
ASPECTS OF SAFETY SEAT	BELT DEVELOPMENT= MEDICAL	8STAP-JP63
ANALYSIS OF SEAT	BELT DYNAMIC TEST PROCEDURES=	MCHE-RA62
NALYSIS OF LAP SHOULDER	BELT EFFECTIVENESS IN ACCIDENTS= A	SHAR-JE66
LISIONS= SAFETY	BELT EFFECTIVENESS IN BROAD-SIDE COL	8HONT-H 64
F SAFETY BELTS. SAFETY	BELT EFFECTIVENESS IN RURAL CALIFORN	6TOUR-B 60
OBILE ACCIDENTS= SAFETY	BELT EFFECTIVENESS IN RURAL CALIFORN	8TOUR-B 92

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ON SITUATION= SEAT	BELT	EFFECTIVENESS IN THE NON-EJECTI	CAMP-BJ94
TED TO SEAT TIEDOWN AND	BELT	FAILURE IN LIGHTPLANE ACCIDENTS	6PEAR-RG61
SEAT	BELT	FASTENERS FOR 1962 CARS=	8SEAT-BF62
EXAMINATION OF SEAT	BELT	HARNESS=	KENN-JE58
AUTO SEAT	BELT	INDUSTRY DRIVING FAST=	2KRAS-K 64
SEAT	BELT	INJURIES AND LEGAL ASPECTS.=	6MCRO-JW65
SEAT	BELT	INSTALLATION AND USE POLL=	5SEAT-BI61
PRELIMINARY SEAT	BELT	INSTALLATION SURVEY=	8CAMP-BJ91
VIEW OF AUTOMOBILE SEAT	BELT	INSTALLATION TRENDS AND A SURVE	CAMP-BJ93
MS WITH THE THREE-POINT	BELT	INSTALLATIONS AND POSSIBLE SOLU	8SHAR-JE65
NDARD ON MANDATORY SEAT	BELT	INSTALLATIONS IN PASSENGER CARS	8AUTO-MA66
LATERAL IMPACT WITH LAP	BELT	ONLY= HUMAN TOLERANCE TO	6ZABO-AV91
SAFETY SEAT	BELT	PROGRAM ADOPTED=	8SAFE-SB62
TIONAL EDUCATIONAL SEAT	BELT	PROGRAM= A PROGRESS REPORT OF T	8LHOT-DC61
RAISES QUESTIONS= SEAT	BELT	PROMOTION GETS GOOD RESULTS BUT	8BARN-B 62
TWO APPROACHES TO SEAT	BELT	PROMOTION= AN EXPERIMENTAL EVAL	8BLOM-GW61
ERSE= LIMITS OF SEAT	BELT	PROTECTION DURING ABRUPT TRANSV	8GUGG-AS61
SEAT	BELT	PROTECTION FOR CHILDREN=	8SEAT-BP63
HY' TO HELP ANSWER SEAT	BELT	QUESTION= 'CRUNC	8CRUN-TH65
SAFETY	BELT	RESEARCH STUDY=	8SAFE-BR62
TRUNK ALLOWED BY SAFETY	BELT	RESTRAINT DURING IMPACT= MOTION	SWEA-JJ56
YSTEM, SURVIVAL KIT/LAP	BELT	RESTRAINT SYSTEM EVALUATION PRO	NAVA-AT66
FEMALE AND FETUS IN LAP	BELT	RESTRAINT.= IMPACT INJURY TO TH	5SNYD-RG66
RAL IMPACT STUDIES (LAP	BELT	SHOULDER HARNESS INVESTIGATIONS	6ZABO-AV92
OF CONGRESS= AUTO SEAT	BELT	STANDARDS SET, ESTABLISHED BY A	3AUTO-SB65
SAFETY SEAT	BELT	STANDARDS=	8SAFE-SB61
TOMOBILE ACCIDENTS SEAT	BELT	SURVEY= A STUDY OF SEAT BELTS I	8ASHA-V 62
THE SEAT	BELT	SYNDROME--DOES IT EXIST.=	7FISH-J 65
THE SEAT	BELT	SYNDROME=	8GARR-JW62
SAFETY	BELT	THAT REACTS TO CAR MOTIONS=	8SAFE-BT63
S TO THE PASSENGER SEAT	BELT	TIEDOWN ATTACHMENTS IN THE U.S.	8ROBE-SH62
IMPROVEMENT OF LAP	BELT	TIGHTENER=	8PISA-FT64
RETRACTABLE SEAT	BELT	UNIT=	8BROW-JB65
FOLLOW-UP STUDY OF SEAT	BELT	USAGE= A	5MANH-D 66
REPORT--SURVEY OF SEAT	BELT	USE AMONG MOTOR VEHICLE FLEET O	5NATI-SC60
SEAT	BELT	UTILIZATION=	8STER-A 66
INVESTIGATION OF SEAT	BELT	WEBBING SERVICE LIFE=	STET-CH64
INVESTIGATION OF SEAT	BELT	WEBBING SERVICE LIFE=	8STET-CH64
SAFETY	BELT	WITH PENDULUM CONTROL=	8SAFE-BW63
-TYPE AUTOMOBILE SAFETY	BELT	WITH REFERENCE TO HUMAN TOLERAN	8STAP-JP58
RIES= AUTOMOTIVE SAFETY	BELT.	IN SAVING A LIFE MAY PRODUCE	8WILL-JS66
THE SEAT	BELT--HELPFUL	OR HARMFUL.=	8WADE-PA62
FEDERAL SPECIFICATION,	BELT,	SEAT, PASSENGER TYPE, AUTOMOTI	7GENE-SA60
AUTOMATIC SAFETY	BELT=		8AUTO-SB63
FASTEN YOUR SEAT	BELT=		8FAST-YS62
A SELF-RELEASING SEAT	BELT=		8WHIT-JR52
TANDARD AUTOMOBILE SEAT	BELT=	ABDOMINAL INJURIES RESULTING F	6ODON-JB66
INJURY DUE TO THE SEAT	BELT=	AN UNUSUAL	6TOLI-SH64
ATION LOCKS AUTO SAFETY	BELT=	DECELER	8DECE-LA62
HOULDER HARNESS AND LAP	BELT=	EVALUATION OF AIR ASSOCIATES,	HEND-E 55
K RESULTS WITH NEW SEAT	BELT=	GATEWAY CHEMICALS BOCKLES DOWN	2GATE-CB66

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DER HARNESS TYPE SAFETY BELT= NEW YORK LAW REGARDING ADULT'S	3AUTO-MA64
NT OF AUTOMOBILE SAFETY BELT= SPLENIC RUPTURE DUE TO IMPROPE	6COCK-WM63
AND LAP DIAGONAL CHEST BELTED VEHICLE OCCUPANTS= IMPACT DYN	PATR-LM66
CS OF UNRESTRAINED, LAP BELTED, AND LAP DIAGONAL CHEST BELTE	PATR-LM66
ON OF ROLL BARS, SAFETY BELTS AND CABS= CODE H33 FARM TRACTO	GIVE-GA64
SEAT BELTS AND CONTRIBUTORY NEGLIGENCE=	8SEAT-BA67
SAFETY BELTS AND HARNESS=	9ROSE-CW52
PHYSIOLOGY OF SAFETY BELTS AND HARNESSES=	8HITC-FA47
S= MEMORANDUM ON SAFETY BELTS AND SAFETY HARNESS FOR MOTOR V	8EIFF-AL61
SEAT BELTS AND SCHOOL BUSES=	8HAEU-RC63
BUSINESS= BARGAIN SEAT BELTS ARE A HIT. CHEVRON DEALERS IN	2BARG-SB62
DIAGONAL BELTS ARE BEST IN CAR ACCIDENTS=	8HERB-DC61
SAFETY BELTS ARE NOT DANGEROUS=	8DEBO-EF52
MERCIAL AVIATION SAFETY BELTS AS AN INDICATION OF THE ABILIT	WURZ-EM48
SAFETY BELTS CATCH ON=	8SEGA-MD59
INAL INJURIES FROM AUTO BELTS CITED= ABDOM	6ABDO-IF65
ARE ORDINARY SEAT BELTS ENOUGH.=	8SHAR-JE64
SAFETY GLASS AND SAFETY BELTS FOR AUTOMOBILES=	8GRIM-G 93
SEAT BELTS FOR BUSES.=	8COX -EG66
OINT OF VIEW= SAFETY BELTS FOR DRIVERS FROM A TECHNICAL P	8HAES-A 62
CONSIDERATIONS OF SEAT BELTS FOR INFANTS AND SMALL CHILDREN	8NEFF-RJ61
VESTIGATION INTO SAFETY BELTS FOR MOTOR VEHICLES USING A TES	WILL-JH62
SAFETY BELTS FOR MOTOR VEHICLES=	8KEIL-E 62
SAFETY BELTS FOR MOTORCARS=	8ODEL-B 57
CTIVE HELMETSAND SAFETY BELTS FOR MOTORISTS.= NOTES ON THE M	6ZIFF-D 65
SEAT BELTS FOR SCHOOL BUSES.=	8DELA-AA63
NESS OF AUTOMOBILE SEAT BELTS FOR THE SUBCOMMITTEE OF THE CO	3SEVE-DM
ARE SEAT BELTS GOOD FOR TRUCKS.=	8ARE -SB62
SEAT BELTS HOLD IN ACTUAL CRASHES=	8SEAT-BH58
AUTOMOBILES WITH SEAT BELTS IN ALLEN COUNTY, INDIANA=	8BREN-B
THE USE OF SEAT BELTS IN BRITAIN.=	5GRIM-G 65
CIR= SEAT BELTS IN CONVERTIBLE CAR ACCIDENTS A	CAMP-BJ92
ECTIVENESS OF PNEUMATIC BELTS IN COUNTERACTING ACCELERATION=	9POPP-JR38
SAFETY BELTS IN HEAVIES NEED RESEARCH=	8GUTT-JM65
R EFFECTIVENESS= SAFETY BELTS IN MOTOR CARS. AN ASSESSMENT	8MORE-JD62
ON BY THE USE OF SAFETY BELTS IN MOTOR CARS= INJURY REDUCTI	8HERB-DC60
EFFECTIVENESS OF SEAT BELTS IN PREVENTING MOTOR-VEHICLE IN	6FRAZ-RG61
EW YORK= VALUE OF SEAT BELTS IN SCHOOL BUSES DISCUSSED IN N	8VALU-SB66
STUDY SEAT BELTS IN SCHOOL BUSES=	8STUD-SB65
IVENESS AND USE OF SEAT BELTS IN THE UNITED STATES= THE EFFE	5WOLF-RA61
SURVEY= A STUDY OF SEAT BELTS IN WISCONSIN AUTOMOBILE ACCIDE	8ASHA-V 62
NTS= A STUDY OF SEAT BELTS IN WISCONSIN AUTOMOBILE ACCIDE	8AUTO-CI63
ION SALES SEEN FOR SEAT BELTS IN 1963= $90 MILL	2GOOD-B 63
I - ATTACHMENT OF SEAT BELTS INTHE HU-1A HELICOPTER, PART I	7ROEG-HF60
N, DEMAND FOR AUTO SEAT BELTS IS RAPIDLY GAINING MOMENTUM= L	2DUBO-PC62
OF THE EFFECTS OF SEAT BELTS ON AUTOMOBILE AND TRUCKDRIVERS	8HASK-LT57
OTHER FEATURES= SEAT BELTS PASSE. INSURANCE FIRM STUDIES	8SEAT-BP61
SEAT BELTS STANDARD ON '64 AUTO MODELS=	8SEAT-BS63
NTS= A REPORT ON SAFETY BELTS TO THE CALIFORNIA LEGISLATURE.	8TOUR-B 91

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		ENTRY CODE*
NTS= A REPORT OF SAFETY	BELTS TO THE CALIFORNIA LEGISLATURE.	8TOUR-B 93
SEAT	BELTS VERSUS SHOULDER HARNESS=	8FULT-JL66
SAFETY	BELTS. BACK TO THE PRAM=	8SAFE-BB62
SAY. 'YES.'= AUTO SEAT	BELTS. GOVERNMENT SAFETY ENGINEERS	8AUTO-SB60
RVEY OF AUTOMOTIVE SEAT	BELTS. OWNER EXPERIENCE AND NON-OWN	8AYER-WH56
INJURY PRODUCED BY SEAT	BELTS. REPORT OF 2 CASES=	6FISH-P 93
SEAT	BELTS. SAFE OR HAZARDOUS.=	8FALE-ED58
AND NON-USERS OF SAFETY	BELTS. SAFETY BELT EFFECTIVENESS IN	6TOUR-B 60
N BODY= AIRCRAFT SAFETY	BELTS. THEIR INJURY EFFECT ON THE H	6DEHA-H 53
N BODY= AIRCRAFT SAFETY	BELTS. THEIR INJURY EFFECT ON THE H	6TOUR-B 53
FACTORY-INSTALLED SEAT	BELTS. STUDY CONDUCTED IN WISCONSIN	5SCOT-BY63
AFTER SEAT	BELTS....WHAT.=	8STAP-JP62
HOW SAFE ARE YOUR SEAT	BELTS.=	8HOW -SA62
RETRACTORS DAMAGE SEAT	BELTS.= DO	8CONS-U 94
CAR OCCUPANTS= CAR SEAT	BELTS--AN ANALYSIS OF THE INJURIES S	6LIST-RD63
SEAT	BELTS--ONE YEAR LATER=	8SCHR-DJ62
ICAL RESISTANCE TO SEAT	BELTS, A DISCUSSION AND EXPERIMENTAL	5BLOM-GW61
AUTO SEAT	BELTS, A PERSPECTIVE VIEW=	8CONS-U 91
OF 52 MODELS= AUTO SEAT	BELTS, A SWEDISH GOVERNMENT AGENCY U	8CONS-U 92
LOCKING AND RETRACTABLE	BELTS, THEIR USE AND TESTING IN THE	8REDF-FA65
DYNAMIC TESTING OF SEAT	BELTS=	FINC-DM57
DYNAMIC TESTING OF SEAT	BELTS=	SOCI-AE64
AUTOMOBILE SAFETY	BELTS=	8AUTO-SB57
AUTO SAFETY	BELTS=	8AUTO-SB62
BACKGROUND TO	BELTS=	8BACK-TB59
MOTOR VEHICLE SEAT	BELTS=	8CANA-SA63
AUTOMATIC SEAT	BELTS=	8RYAN-JJ60
SCIENCE LOOKS AT SEAT	BELTS=	8SCIE-LA63
STRESS AND SEAT	BELTS=	8STRE-AS58
DECELERATION CAR SAFETY	BELTS= BIOLOGICAL TOLERANCE IN	6ALDM-B 62
MY SNAP-TESTS AUTO SEAT	BELTS= BRITISH DUM	BRIT-DS62
TORY OF AUTOMOTIVE SEAT	BELTS= CHRONOLOGICAL HIS	1AMER-SB64
SHOULDER AND LAP SAFETY	BELTS= COMBINATION	8GRIS-RW55
S DYNAMIC TESTS OF SEAT	BELTS= CONSUMERS UNION'	8MICH-I 61
JURIES PRODUCED BY SEAT	BELTS= CRITICAL IN	6FISH-P 92
LDER HARNESS AND SAFETY	BELTS= DESIGN AND CONSTRUCTION OF A	SWEA-JJ51
MIC TESTING OF CAR SEAT	BELTS= DYNA	BRIT-SI63
ERTIES OF EXISTING SEAT	BELTS= PROP	8BAST-JC63
FOR CHEST-LEVEL SAFETY	BELTS= RAPID-DECELERATION TESTS	MATH-JH53
S FOR MOTOR VEHICLE LAP	BELTS= SAE RECOMMENDS TEST PROCEDURE	8SOCI-AE91
DYNAMIC TESTING OF SEAT	BELTS= SAE SUBCOMMITTEE STUDIES NEED	8SOCI-AE94
BUS RIDERS APPROVE SEAT	BELTS= SCHOOL	8SCHO-BR64
SLATORS CONSIDER SAFETY	BELTS= STATE LEGI	3STAT-LC56
EFFECTIVENESS OF SAFETY	BELTS= THE	8LIST-RD66
FECTIVENESS OF CAR SEAT	BELTS= THE EF	8GRIM-G 92
ON INSTALLATION OF SEAT	BELTS= THE ROLE OF A PHYSICIAN'S INF	8BASS-LW65
OF THE CHILDREN'S SEAT	BELTSUBCOMMITTEE= UNCONFIRMED MINUTE	8SEAT-BC63
DIAGONAL BELTS ARE	BEST IN CAR ACCIDENTS=	8HERB-DC61
VERFEINERTE METHODE ZUR	BESTIMMUNG DES KOMFORTGRADES VON SIT	7COER-R 64
ACCIDENTS= RELATIONSHIP	BETWEEN IMPACT VARIABLES AND INJURIE	6CORN-GA61
AET ZUR ENTWICKLUNG UND	BEURTEILUNG UON KRAFTFAHRZEUGSI TZEN	7THIE-R 64

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TORS REFERENCE WORKS= A BIBLIOGRAPHY AND OVERVIEW OF HUMAN F	4RONC-PG63
ENGINEERING= ANNOTATED BIBLIOGRAPHY OF APPLIED PHYSICAL ANT	4HANS-R 58
PASSENGER COMFORT. A BIBLIOGRAPHY OF COMPANY LITERATURE=	4LIPP-S 91
ASH INJURY PREVENTION.= BIBLIOGRAPHY OF IMPACT ACCELERATION	4CAMB-L 63
A BIBLIOGRAPHY OF SEATING=	4LIPP-S 92
ERING DESIGN= ANNOTATED BIBLIOGRAPHY ON HUMAN FACTORS IN ENG	4LAWR-ML46
IMPACT= A CHRONOLOGICAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFEC	4CLAR-CC91
IONS TO A CHRONOLOGICAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFEC	4CLAR-CC92
IMPACT= A CHRONOLOGICAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFEC	4CLAR-CC93
MPACT LOADING. A REPORT BIBLIOGRAPHY 1953-SEPTEMBER 1962= HU	4DEFE-DC62
HUMAN ENGINEERING BIBLIOGRAPHY 1960-1961=	4RONC-PG62
CRASH INJURY. A REPORT BIBLIOGRAPHY=	4ASTI- 62
A HUMAN ENGINEERING BIBLIOGRAPHY=	4MCCO-IN56
FETY MEASURES. A REPORT BIBLIOGRAPHY= ACCIDENTS AND SA	4SILU-MB62
ENT FOR AIRCRAFT CREWS. BIBLIOGRAPHY= SAFETY AND EMERGENCY E	4LAKE-GM61
S= BIO-ENGINEERING OF PROTECTIVE SYSTEM	1GELL-CF60
Y= BIODYNAMIC RESPONSE OF THE HUMAN BOD	6VONG-HE64
ION= BIODYNAMIC STUDIES ON IMPACT PROTECT	1ALDM-B 62
= BIODYNAMICS OF MAXIMAL DECELERATIONS	6STAP-JP93
ELERATION= ANALYSIS AND BIODYNAMICS OF SELECTED ROCKET-SLED	NICH-G 64
CAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFECTS OF IMPACT= A CHRO	4CLAR-CC91
CAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFECTS OF IMPACT= A CHRO	4CLAR-CC93
CAL BIBLIOGRAPHY ON THE BIOLOGICAL EFFECTS OF IMPACT= ADDITI	4CLAR-CC92
CAR SAFETY BELTS= BIOLOGICAL TOLERANCE IN DECELERATION	6ALDM-B 62
LE SEAT AND SUSPENSION= BIOMECHANICAL MODEL OF MAN FOR STUDY	7WISN-A 64
ERS AT THE SYMPOSIUM ON BIOMECHANICS OF BODY RESTRAINT AND H	1HEND-E 61
CAR CUSHIONS BY BMC=	7BRIT-MC65
BELT= GATEWAY CHEMICALS BOCKLES DOWN PEAK RESULTS WITH NEW S	2GATE-CB66
RESISTANCE OF THE HUMAN BODY AND TISSUES. INFLUENCE ON THE	6ZIFF-D 65
PROTECTION OF THE HUMAN BODY AS APPLIED INA RESTRAINING HARN	1BIER-HR46
ATION OF EJECTION= SOME BODY DISPLACEMENTS AND MEDICAL EFFEC	1CLAR-CC61
C BEHAVIOR OF THE HUMAN BODY DURING CRASH DECELERATION= KINE	DYE -ER50
C BEHAVIOR OF THE HUMAN BODY DURING DECELERATION= KINEMATI	SWEA-JJ62
OF INERTIA OF THE HUMAN BODY IN ANY POSITION= METHOD OF PRED	5SIED-RR62
NT SUPPORT OF THE HUMAN BODY IN MOVING VEHICLES AND RECENT D	7MCCO-CE47
SIUM ON BIOMECHANICS OF BODY RESTRAINT AND HEAD PROTECTION=	1HEND-E 61
SYSTEM OF PRE-EJECTION BODY RESTRAINT= AN EXPERIMENTAL	1FITZ-JG62
BODY SEATING DIMENSIONS SAE=	7GODD-GE22
ICULAR EQUIPMENT= HUMAN BODY SIZE AND CAPABILITIES IN THE DE	5MCFA-RA53
GN= HUMAN BODY SIZE AND PASSENGER VEHICLE DESI	5MCFA-RA60
STUDIES SEAT DESIGN. BODY SUPPORT/RESTRAINT=THE AIR FORCE	7DEMP-CA62
ES OF UNPROTECTED HUMAN BODY TO VARIOUS MECHANICAL FORCES.=	6GOLD-DE46
THE ABILITY OF THEHUMAN BODY TO WITHSTAND HIGH IMPACT FORCES	WURZ-EM48
CAN THE HUMAN BODY TOLERATE VIOLENT CRASHES.=	6DEHA-H 48
KINEMATICS OF THE HUMAN BODY UNDER CRASH CONDITIONS=	DYE -ER56
PROTECTION OF THE HUMAN BODY=	1BIER-HR47
ICAL MODEL OF THE HUMAN BODY= A MATHEMAT	5HANA-EP64
URY EFFECT ON THE HUMAN BODY= AIRCRAFT SAFETY BELTS. THEIR	6DEHA-H 53
URY EFFECT ON THE HUMAN BODY= AIRCRAFT SAFETY BELTS. THEIR	6TOUR-B 53

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CELERATIONS DURING NAVY	**CENTRIFUGE** SIMULATION OF EJECTION= S	1CLAR-CC61
RATION AS IT APPLIES TO	**CERTAIN** JERKING TYPES OF ACCELERATIO	6RUFF-S 92
ON RESISTANCE IN MEN TO	**CERTAIN** JERKING TYPES OF ACCELERATIO	6RUFF-S 93
RESTRAINT SYSTEM STUDY,	**CH-47** VERTOL CHINOOK. CRASH INJURY E	PAYN-PR64
ESTRAINT SYSTEMS STUDY,	**CH-47** VERTOL CHINOOK= CRASH INJURY E	1AVIA-SE92
TRAINT SYSTEMS STUDY.	**CH-47** VERTOL CHINOOK=PERSONNEL RES	1HALE-JL64
ASH SAFETY FEATURES FOR	**CH-47A** HELICOPTER= ARMOR PROTECTION	7THOM-DF64
HOOTON'S	**CHAIR=**	7HOOT-C 46
BY A4D AIRCRAFT SERVICE	**CHANGE** NO. 157C FOR ACCEPTABLE HEAD	7BACA-GA60
CRASH STUDY CAN REDUCE	**CHANGES** OF INJURY=	6DEHA-H 52
ENGER-IMPACT ABSORPTION	**CHARACTERISTICS** DEVELOPMENTAL TEST M	7SIFU-SS58
RESTRAINING	**CHARACTERISTICS** OF HARNESSES=	8TOUR-B 94
MATERIAL= STRESS-STRAIN	**CHARACTERISTICS** OF MATERIALS AT HIGH	TAPL-BD60
ESIGN, CONSTRUCTION AND	**CHARACTERISTICS=** AUTOMOBILE PASSENGE	7BELG-WJ63
TH WITH ELASTIC STRETCH	**CHARACTERISTICS=** DEVELOPMENT OF COTT	1BROC-HE64
UREMENT OF SEAT CUSHION	**CHARACTERISTICS=** MEAS	7BROW-RW39
DERN PASSENGER CAR RIDE	**CHARACTERISTICS=** MO	5SCHI-R 41
NEW SEAT BELT= GATEWAY	**CHEMICALS** BOCKLES DOWN PEAK RESULTS	2GATE-CB66
ELTED, AND LAP DIAGONAL	**CHEST** BELTED VEHICLE OCCUPANTS= IMPA	PATR-LM66
-DECELERATION TESTS FOR	**CHEST-LEVEL** SAFETY BELTS= RAPID	MATH-JH53
SEAT BELTS ARE A HIT.	**CHEVRON** DEALERS IN EAST FIND PROMOTI	2BARG-SB62
ENGINEERING APPROACH TO	**CHILD** RESTRAINING DEVICES= A SAFETY	1ROSE-CW65
ACCIDENT PROTECTION FOR	**CHILDREN** IN A VEHICLE=	1VESZ-K 64
RESTRAINING DEVICES FOR	**CHILDREN=**	1APPO-FA
A PROTECTIVE SEAT FOR	**CHILDREN=**	7ALDM-B 66
S FOR INFANTS AND SMALL	**CHILDREN=** A REPORT ON CONSIDERATIONS	8NEFF-RJ61
LE CRASH PROTECTION FOR	**CHILDREN=** AUTOMOBI	1DYE -ER62
TESTS OF RESTRAINTS FOR	**CHILDREN=** DYNAMIC	APPO-FA66
CALLED SAFEST TYPE FOR	**CHILDREN=** REAR-FACING SEATS	7REAR-FS66
EAT BELT PROTECTION FOR	**CHILDREN=** S	8SEAT-BP63
PROTECTIVE DEVICES FOR	**CHILDREN=** SAFETY HARNESS AND OTHER	1SAFE-HA66
PROTECTIVE DEVICES FOR	**CHILDREN=** SAFETY HARNESS AND OTHER	8SAFE-HA66
	CHILDREN'S PROTECTIVE DEVICES=	1ALDM-B 63
TES OF A MEETING OF THE	**CHILDREN'S** SEAT BELTSUBCOMMITTEE= UN	8SEAT-BC63
TEM STUDY, CH-47 VERTOL	**CHINOOK.** CRASH INJURY EVALUATION, SU	PAYN-PR64
EMS STUDY, CH-47 VERTOL	**CHINOOK=** CRASH INJURY EVALUATION, SU	1AVIA-SE92
MS STUDY. CH-47 VERTOL	**CHINOOK=** PERSONNEL RESTRAINT SYSTE	1HALE-JL64
AL EFFECTS OF IMPACT= A	**CHRONOLOGICAL** BIBLIOGRAPHY ON THE BI	4CLAR-CC91
IMPACT= ADDITIONS TO A	**CHRONOLOGICAL** BIBLIOGRAPHY ON THE BI	4CLAR-CC92
AL EFFECTS OF IMPACT= A	**CHRONOLOGICAL** BIBLIOGRAPHY ON THE BI	4CLAR-CC93
SEAT BELTS=	**CHRONOLOGICAL** HISTORY OF AUTOMOTIVE	1AMER-SB64
	CHRYSLER PRESS INFORMATION SERVICE=	8CHRY-PI61
R SAE JOURNAL=	**CHRYSLER** RIDING QUALITY ACCELEROMETE	5TEA -CA33
NJURIES FROM AUTO BELTS	**CITED=** ABDOMINAL I	6ABDO-IF65
TTON AND NYLON, KNITTED	**CLOTH** WITH ELASTIC STRETCH CHARACTER	1BROC-HE64
Y NEW YORK STATE YIELDS	**CLUES=** HOW WILL DRIVERS REACT TO FAC	5SCOT-BY63
	COACHES=	7ADAM-AJ6K
SAFETY BELTS AND CABS=	**CODE** H33 FARM TRACTOR, CODE H34 FRON	GIVE-GA64
CODE H33 FARM TRACTOR,	**CODE** H34 FRONT END LOADERS AND H24 T	GIVE-GA64
EVALUATION OF	**COLLAPSIBLE** TYPE DITCHING SEAT=	7HEND-E 54
ERCITY SERVICE= BARRIER	**COLLISION** AND RELATED IMPACT SLED TE	1LABE-DJ65

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R OCCUPANT IN A HEAD-ON	**COLLISION**	HRB= EFFECT OF SEAT HARNES	8GRIM-G 91
AINING SYSTEMS= BARRIER	**COLLISION**	INVESTIGATION OF HARNESS R	1FRED-RH65
E PASSENGER, DESIGN FOR	**COLLISION**	PROJECT CAR.= PACKAGING TH	1CRAN-FJ62
CTS SAE JOURNAL=	**COLLISION**	STUDIES REVEAL GRUESOME FA	6SEVE-DM60
R OCCUPANTS IN A HEADON	**COLLISION=**	EFFECT OF SEAT HARNESS ON	1GRIM-G 63
AUTOMOBILE SIDE-IMPACT	**COLLISIONS,**	SERIES II=	1SEVE-DM62
A BRIEF REPORT ON CAR	**COLLISIONS=**		TAKA-J 65
AL TRAUMA IN AUTOMOBILE	**COLLISIONS=**	FACI	6NAHU-AM65
CTIVENESS IN BROAD-SIDE	**COLLISIONS=**	SAFETY BELT EFFE	8HONT-H 64
BELTS=	**COMBINATION**	SHOULDER AND LAP SAFETY	8GRIS-RW55
EAT CUSHIONS AND RIDING	**COMFORT**	7= AUTOMOBILE S	7TEA -CA38
RIDING	**COMFORT**	AND CUSHIONS SAE=	7LAY -WE40
S= PASSENGER SAFETY AND	**COMFORT**	CRITERIA STUDY IN DYNAMIC EN	1SCHM-RV61
T SEAT (AEROTHERM)=	**COMFORT**	EVALUATION OF THE C-118 PILO	7SLEC-RF93
SEAT=	**COMFORT**	EVALUATION OF THE C-124 CREW	7FORR-J 59
OT SEAT (WEBER)=	**COMFORT**	EVALUATION OF THE C-124A PIL	7SLEC-RF94
E PILOT SEAT (WEBER)=	**COMFORT**	EVALUATION OF THE C-97A/KC97	7SLEC-RF92
PE FIGHTER SEAT=	**COMFORT**	EVALUATION OF THE HAMMOCK-TY	7PATT-DI45
G DEVICE= SEAT	**COMFORT**	IMPROVED BY SPECIAL MEASURIN	7SEAT-CI63
DESIGNING FOR	**COMFORT**	IN AIRCRAFT SEATS=	7LIPP-S 49
	COMFORT	INDEX=	5COMF-I 33
O THE ASSESSMENT OF THE	**COMFORT**	OF FOAM CUSHIONING= APPROACH	7STON-PT65
ERIA ARE SET FOR RIDING	**COMFORT**	RESEARCH SAE= CRIT	5BROW-RW35
ERIA ARE SET FOR RIDING	**COMFORT**	SAE JOURNAL= CRIT	1BROW-RW35
THE ASSESSMENT OF SEAT	**COMFORT**	WITH A DESCRIPTION OF SOME R	7HENR-JP45
LITERATURE= PASSENGER	**COMFORT.**	A BIBLIOGRAPHY OF COMPANY	4LIPP-S 91
BLES INFLUENCING DRIVER	**COMFORT.=**	PHYSICAL VARIA	5MCFA-RA55
ES= RIDE	**COMFORT,**	SAFETY, SUSPENSION REQUISIT	1CHUR-HE54
SAFETY WITH	**COMFORT=**		1LAVO-LJ56
RIDING	**COMFORT=**		5LAY -WE41
FOAM RUBBER AND SEATING	**COMFORT=**		7HOEH-UH47
SEAT	**COMFORT=**		7RAND-FE46
MEASUREMENT OF SEAT	**COMFORT=**		7THIE-RH63
ACTORS INFLUENCING SEAT	**COMFORT=**	AN ANALYSIS OF SOME F	7WACH-RA59
HICLE SEATS FOR GREATER	**COMFORT=**	DESIGNING VE	7KEEG-JJ64
THE MECHANICAL BASIS OF	**COMFORT=**	DRIVING SEATS, APPRAISAL OF	7CLEA-DE54
IN THE CONSTRUCTION OF	**COMFORTABLE**	SEATS= THE MAIN PRINCIPL	7AKER- 51
ARE YOU SITTING	**COMFORTABLY.=**		7CHIS-J 65
INTERSTATE AND FOREIGN	**COMMERCE**	OF THE HOUSE OF REPRESENTAT	3SEVE-DM
BEFORE THE COMMITTEE OF	**COMMERCE,**	UNITED STATES SENATE= A ST	3BUGA-JS66
LOADS REQUIRED TO BREAK	**COMMERCIAL**	AVIATION SAFETY BELTS AS	WURZ-EM48
RVEY. ITS MILITARY AND	**COMMERCIAL**	POTENTIALS= THE ANTHROPOM	5HERT-HT59
ASSOCIATION BEFORE THE	**COMMITTEE**	OF COMMERCE, UNITED STATES	3BUGA-JS66
THE SUBCOMMITTEE OF THE	**COMMITTEE**	ON INTERSTATE AND FOREIGN	3SEVE-DM
ORT. A BIBLIOGRAPHY OF	**COMPANY**	LITERATURE= PASSENGER COMF	4LIPP-S 91
EATING ACCOMMODATION=	**COMPARATIVE**	EVALUATION OF AIRCRAFT S	7SLEC-RF91
ER HARNESS WEBBING. A	**COMPARISON**	OF DACRON, NYLON, AND COT	8DARR-J 53
IN RURAL CALIFORNIA= A	**COMPARISON**	OF INJURIES TO USERS AND	6TOUR-B 60
PORT PASSENGER SEATS= A	**COMPARISON**	OF THE ADVANTAGES AND DIS	7KIRC-OE91

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		ENTRY CODE*
T OF AN ELASTIC ROD AND	**COMPARISON** WITH EJECTION SEAT DATA=	6HESS-JL56
NT AND HEAD PROTECTION=	**COMPENDIUM** OF ABSTRACTS OF PAPERS AT	1HEND-E 61
PROPERTIES OF RUBBER IN	**COMPRESSION** SAE= ENGINEERING	5BROW-RW40
EXPERIMENTAL TROOP SEAT	**CONCEPT=** CRASHWORTHINESS EVALUATION	7WEIN-LW65
CARGO RESTRAINT	**CONCEPTS** FOR CRASH RESISTANCE=	1AVER-JP65
NT SYSTEMS STUDY, BASIC	**CONCEPTS=** PERSONNEL RESTRAI	1FLIG-SF62
NT SYSTEMS STUDY. BASIC	**CONCEPTS=** PERSONNEL RESTRAI	1HALE-JL62
WHICH OCCUR IN FLYING=	**CONCERNING** HUMAN TOLERANCE OF ACCELE	6RUFF-S 92
ES IN GLIDER ACCIDENTS=	**CONCERNING** THE ORIGIN OF SEVERE INTE	6RUFF-S 91
N IN PROTECTION AGAINST	**CONCUSSION=** IMPACT ATTENUATIO	6SNIV-GG61
RESTRAINT SYSTEM UNDER	**CONDITIONS** OF ACCELERATION= EVALUATI	1HILL-JH59
F TEXTILES UNDER IMPACT	**CONDITIONS,** AND OTHER ABSTRACTS= BEH	MORG-H 55
HUMAN BODY UNDER CRASH	**CONDITIONS=** KINEMATICS OF THE	DYE -ER56
G UNDER VARIOUS WEATHER	**CONDITIONS=** STUDY OF SEATIN	7COOK-E 48
EMS FOR AIRCRAFT SEATS=	**CONDUCT** STUDY, DESIGN AND FURNISH PR	LANG-FC60
EMS FOR AIRCRAFT SEATS=	**CONDUCT** STUDY, DESIGN, DEVELOP AND F	7AERO-C 60
ALLED SEAT BELTS. STUDY	**CONDUCTED** IN WISCONSIN BY NEW YORK S	5SCOT-BY63
THE 7TH STAPP CAR CRASH	**CONFERENCE.** PROCEEDINGS=	1STAP-CC65
HE 10TH STAPP CAR CRASH	**CONFERENCE=** PROCEEDINGS OF T	1STAP-CC66
F THE GOVERNORS' SAFETY	**CONFERENCE=** REMARKS TO MEETING O	2ACKE-PC58
ROCEEDINGS OF THE SIXTH	**CONFERENCE=** STAPP CAR CRASH AND FIEL	1STAP-CC63
ANDARD AIRCRAFT HARNESS	**CONFIGURATION=** FEASIBILITY STUDY. L	ROTH-JD66
UNITED STATES	**CONGRESS=**	3UNIT-SC57
, ESTABLISHED BY ACT OF	**CONGRESS=** AUTO SEAT BELT STANDARDS S	3AUTO-SB65
STATE LEGISLATORS	**CONSIDER** SAFETY BELTS=	3STAT-LC56
ONNEL RESTRAINT SYSTEM=	**CONSIDERATIONS** AFFECTING THE DESIGN	1BOYC-WC61
ER HARNESS ASSEMBLY=	**CONSIDERATIONS** FOR A LAP-BELT-SHOULD	8SHAR-JE61
SSENGER SEATS= ECONOMIC	**CONSIDERATIONS** I THE FORWARD VS REA	2DUGG-BC61
PTION=	**CONSIDERATIONS** IN CRASH ENERGY ABSOR	GAND-HK62
IRCRAFT= CURRENT SAFETY	**CONSIDERATIONS** IN THE DESIGN OF PASS	7DEHA-H 52
L CHILDREN= A REPORT ON	**CONSIDERATIONS** OF SEAT BELTS FOR INF	8NEFF-RJ61
OME HUMAN FACTORS TO BE	**CONSIDERED** IN DEVELOPING PROTECTIVE	5MCCO-FP58
REQUIREMENTS. DESIGN,	**CONSTRUCTION** AND CHARACTERISTICS= AU	7BELG-WJ63
AFETY BELTS= DESIGN AND	**CONSTRUCTION** OF A CRASH DUMMY FOR TE	SWEA-JJ51
EDIC ASSUMPTION FOR THE	**CONSTRUCTION** OF AUTOMOBILE SEATS= OR	8THOM-W 59
EIR SIGNIFICANCE IN THE	**CONSTRUCTION** OF COMFORTABLE SEATS= T	7AKER- 51
NT DEVELOPMENTS IN SEAT	**CONSTRUCTION=** AUTOMOBILE SEATS-EFFIC	7MCCO-CE47
EAT BELTS=	**CONSUMERS** UNION'S DYNAMIC TESTS OF S	8MICH-I 61
= DEVICES FOR MEASURING	**CONTACT-PRESSURES** EXERTED ON THE HUM	6RESW-JB61
A 'BEAM-PAD' INSTRUMENT	**CONTAINER=** EVALUATION OF 'ENSOLITE'	1SMIT-MD54
AREA OF THE HUMAN BODY=	**CONTOUR** MAPS, CENTER OF GRAVITY, MOM	5WEIN-AP38
SEATING CAN	**CONTRIBUTE** TO SAFETY=	7SEWA-WH66
SEAT BELTS AND	**CONTRIBUTORY** NEGLIGENCE=	8SEAT-BA67
OF A PRESSURE AND CYCLE	**CONTROL** FOR DYNAMIC SEAT CUSHIONS= D	7BURN-HL58
FETY BELT WITH PENDULUM	**CONTROL=** SA	8SAFE-BW63
SEAT BELT ASSEMBLIES IN	**CONTROLLED** IMPACT TESTS= PERFORMANCE	LIST-RD63
ESIGN AS APPLIED TO THE	**CONVAIR** 880= PASSENGER SEAT D	7BECK-LC59
UIPMENT, EVALUATION OF=	**CONVENTIONAL** AND NEW TYPE FLIGHT RES	1HUNT-H 55
TRAINT EQUIPMENT=	**CONVENTIONAL** AND NEW TYPE FLIGHT RES	9SNYD-RZ58
REAR TO REAR) UTILIZING	**CONVENTIONAL** AND SPECIAL RESTRAINT G	1MILL-CO57
SEAT BELTS IN	**CONVERTIBLE** CAR ACCIDENTS ACIR=	CAMP-BJ92

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		ENTRY CODE*
PILOT/COPILOT SEAT WITH	**CRASH** SAFETY FEATURES FOR CH-47A HEL	7THOM-DF64
AUTOMOTIVE HUMAN	**CRASH** STUDIES=	1RYAN-JJ62
MEASURED IN FULL+SCALE	**CRASH** STUDIES= ACCELERATIONS AND HAR	MOSE-JC53
JURY=	**CRASH** STUDY CAN REDUCE CHANGES OF IN	6DEHA-H 52
AIRCREW ARMORED SEAT.	**CRASH** SURVIVAL ANALYSES - PRELIMINAR	REED-JL65
	CRASH SURVIVAL BY DESIGN=	1HASB-AH58
SSENGER SEAT DESIGN AND	**CRASH** SURVIVAL= AIRCRAFT PA	7FRYE-DI58
ING PASSENGER SEATS FOR	**CRASH** SURVIVAL= DESIGN	7BREH-WH62
SEAT DESIGN FOR	**CRASH** WORTHINESS NACA=	7PINK-II57
A	**CRASH-RESTRAINT** DEMONSTRATOR=	1LEWI-ST57
DENTS SURVIVABLE=	**CRASH-SAFE** DESIGN CAN MAKE MANY ACCI	1HASB-AH60
ECUTIVE= DEVELOPMENT OF	**CRASH-SURVIVAL** DESIGN IN PERSONAL, E	1DEHA-H 93
GOVERNMENT AGENCY USED	**CRASH-TESTMETHODS** TO HELP CU ARRIVE	8CONS-U 92
TION OF INJURIES DUE TO	**CRASH=** PREVEN	6SCHR-HA51
S IN FULL-SCALE BARRIER	**CRASHES** AND SLED RUNS= STUDIES OF TH	8BOHL-NI66
N BODY TOLERATE VIOLENT	**CRASHES.=** CAN THE HUMA	6DEHA-H 48
LL-SCALE LIGHT AIRPLANE	**CRASHES=** ACCELERATIONS AND PASSENGER	EIBA-AM53
RY IN MODERN LIGHTPLANE	**CRASHES=** MECHANISMS OF INJU	6PEAR-RG62
AT BELTS HOLD IN ACTUAL	**CRASHES=** SE	8SEAT-BH58
PPING THE OCCUPANT OF A	**CRASHING** VEHICLE, A FUNDAMENTAL STUD	1EGLI-A 67
TAL TROOP SEAT CONCEPT=	**CRASHWORTHINESS** EVALUATION OF AN ENE	7WEIN-LW65
ENTATIVES= STATEMENT OF	**CRASHWORTHINESS** OF AUTOMOBILE SEAT B	3SEVE-DM
MANNED FLIGHT SYSTEMS=	**CREW** PHYSICAL SUPPORT AND RESTRAINT	1SMED-HA61
IRCRAFT=	**CREW** SEAT DESIGN CRITERIA FOR ARMY A	7ROTH-VE63
EVALUATION OF THE C-124	**CREW** SEAT= COMFORT	7FORR-J 59
EQUIPMENT FOR AIRCRAFT	**CREWS.** BIBLIOGRAPHY= SAFETY AND EMER	4LAKE-GM61
RIVER/PASSENGER SEATING	**CRITERIA** AND DEVELOPMENT OF TECHNIQU	7SHER-WF62
SAE JOURNAL=	**CRITERIA** ARE SET FOR RIDING COMFORT	1BROW-RW35
RESEARCH SAE=	**CRITERIA** ARE SET FOR RIDING COMFORT	5BROW-RW35
CREW SEAT DESIGN	**CRITERIA** FOR ARMY AIRCRAFT=	7ROTH-VE63
S AND RETENTION HARNESS	**CRITERIA** FOR U.S. ARMY AIRCREWMAN PR	HALE-JL92
NGER SAFETY AND COMFORT	**CRITERIA** STUDY IN DYNAMIC ENVIRONMEN	1SCHM-RV61
ITARY TROOP SEAT DESIGN	**CRITERIA.** REPORT OF CRASH INJURYEVA	6ACIR-FS62
ITARY TROOP SEAT DESIGN	**CRITERIA=** CRASH INJURY EVALUATION.	7TURN-JW62
ELTS=	**CRITICAL** INJURIES PRODUCED BY SEAT B	6FISH-P 92
STION= '	**CRUNCHY'** TO HELP ANSWER SEAT BELT QU	8CRUN-TH65
VEHICLE	**CRUSH** AND OCCUPANT BEHAVIOR=	1MART-DE67
ASH-TESTMETHODS TO HELP	**CU** ARRIVE AT RATINGS OF 52 MODELS= A	8CONS-U 92
ACE INJURY POTENTIAL OF	**CURRENT** AIRLINE SEATS DURING CRASH D	6SWEA-JJ66
AND DESIGNS=	**CURRENT** AUTOMOTIVE SEATING PROBLEMS	7SOCI-AE50
AND DESIGNS=	**CURRENT** AUTOMOTIVE SEATING PROBLEMS	7SOCI-AE51
FOR TRANSPORT AIRCRAFT=	**CURRENT** SAFETY CONSIDERATIONS IN THE	7DEHA-H 52
	CUSHION AND SQUAB FILLINGS=	7CUSH-AS33
MEASUREMENT OF SEAT	**CUSHION** CHARACTERISTICS=	7BROW-RW39
IR USE AS EJECTION SEAT	**CUSHION** MATERIAL= PROPERTIES OF POLY	7GLAI-DH61
FATIGUE TEST OF	**CUSHION** PAD SUPPORTS=	7FORD-MC47
AUTOMOBILE	**CUSHION** SPRINGS=	7MURR-CA45
ELIEVING PNEUMATIC SEAT	**CUSHION=** THE PRESENT STATUS OF THE N	7HANN-TD58
PRINCIPLES OF	**CUSHIONING** DESIGN=	7WHAR-TP60
LOPMENT OF FOAMED LATEX	**CUSHIONING** SAE JOURNAL= THE DEVE	7ELLI-EE39
THE ART OF	**CUSHIONING,** (ADVERTISING BROCHURE)=	7UNIT-SR

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OF THE COMFORT OF FOAM	**CUSHIONING**= APPROACH TO THE ASSESSME	7STON-PT65
UBBER FOR PASSENGER CAR	**CUSHIONING**= PROPERTIES OF CELLULAR R	7ELDE-HE35
AUTOMOBILE SEAT	**CUSHIONS** AND RIDING COMFORT 7=	7TEA -CA38
SEAT	**CUSHIONS** AND THE RIDE PROBLEM SAE=	7PATO-CR40
CAR	**CUSHIONS** BY BMC=	7BRIT-MC65
RIDING COMFORT AND	**CUSHIONS** SAE=	7LAY -WE40
TEST OF PNEUMATIC SEAT	**CUSHIONS**.= DEVELOPMENT AND	7HANN-TD57
IMPROVED SEAT AND BACK	**CUSHIONS**=	7WHIT-RK59
ONTROL FOR DYNAMIC SEAT	**CUSHIONS**= DESIGN AND DEVELOPMENT OF	7BURN-HL58
K WITH AND WITHOUT SEAT	**CUSHIONS**= JER	7HOGD-VR63
PMENT OF A PRESSURE AND	**CYCLE** CONTROL FOR DYNAMIC SEAT CUSHI	7BURN-HL58
PLASTIC WAVES IN FINITE	**CYLINDERS** OF A STRAIN-RATE-DEPENDENT	TAPL-BD60
BBING. A COMPARISON OF	**DACRON**, NYLON, AND COTTON= SHOULDER	8DARR-J 53
ECHNIQUES FOR ASSESSING	**DAMAGE** FROM ACCIDENT INVESTIGATIONS=	1GREG-LW63
DO RETRACTORS	**DAMAGE** SEAT BELTS.=	8CONS-U 94
SAFETY BELTS ARE NOT	**DANGEROUS**=	8DEBO-EF52
C.A.A.= ANTHROPOMETRIC	**DATA** IN RELATION TO EQUIPMENT AND HU	5KING-BG51
MANIKNS= ANTHROPOMETRIC	**DATA** IN THREE-DIMENSIONAL FORM. DEV	5MCCO-JT63
ON OF HUMAN ENGINEERING	**DATA** TO VEHICULAR SEAT DESIGN= THE A	7RADK-AO56
OK OF HUMAN ENGINEERING	**DATA--SECOND** EDITION (REVISED)= HAND	5MEAD-LC52
ISON WITH EJECTION SEAT	**DATA**= THE APPROXIMATION OF THE RESPO	6HESS-JL56
T MEDICAL DES CEINTURES	**DE** SECURITE= L'ASPEC	6KEAR-JD64
ES POSES PAR LES SIEGES	**DE** VOITURES= QUELQUES PROBLEM	7WISN-A 61
IN EAST FIND PROMOTION	**DEAL** A GREAT PULLER-IN OF BUSINESS=	2BARG-SB62
LTS ARE A HIT. CHEVRON	**DEALERS** IN EAST FIND PROMOTION DEAL	2BARG-SB62
ACCIDENTAL	**DEATHS** IN MILITARY VEHICLES.=	6BABI-RW56
BIOLOGICAL TOLERANCE IN	**DECELERATION** CAR SAFETY BELTS=	6ALDM-B 62
SVERSE ACCELERATION AND	**DECELERATION** FORCES (EYE-BALLS IN, E	6DELV-RJ63
	DECELERATION LOCKS AUTO SAFETY BELT=	8DECE-LA62
ANCE= LINEAR	**DECELERATION** STUDIES AND HUMAN TOLER	6LATH-F 58
HUMAN CRASH	**DECELERATION** TESTS ON SEATBELTS=	RYAN-JJ61
TS= CRASH	**DECELERATION** TESTS WITH HUMAN SUBJEC	6RYAN-JJ60
TO CRASH INJURY= CRASH	**DECELERATION**, CRASH ENERGY, AND THEI	6DEHA-H 60
MAN EXPOSURES TO LINEAR	**DECELERATION**, PT. II, THE FORWARD FA	6STAP-JP91
HUMAN	**DECELERATION**=	6STAP-JP92
D SUBJECT DURING ABRUPT	**DECELERATION**= ANALYSIS AND BIODYNAMI	NICH-G 64
ECTORAL GIRDLE TO RAPID	**DECELERATION**= ANATOMICAL TOLERANCE O	6FASO-A 50
F THE HUMAN BODY DURING	**DECELERATION**= KINEMATIC BEHAVIOR O	SWEA-JJ62
HUMAN BODY DURING CRASH	**DECELERATION**= KINEMATIC BEHAVIOR OF	DYE -ER50
BIODYNAMICS OF MAXIMAL	**DECELERATIONS**=	6STAP-JP93
	DECELERATIONS=	8GOGG-AS61
LINE SEATS DURING CRASH	**DECELERATIONS**= EVALUATION OF HEAD AN	6SWEA-JJ66
PROTECTION DURING CRASH	**DECELERATIONS**= LIMITS OF SEAT-BELT	BRUG-GM61
UMAN EXPOSURE TO LINEAR	**DECELERATIVE** FORCE IN THE BACKWARD A	7STAP-JP51
WE MUST MAKE A	**DECISION**=	1PALM-FC65
MOMENTUM= LATCHING ON,	**DEMAND** FOR AUTO SEAT BELTS IS RAPIDL	2DUBO-PC62
APP CAR CRASH AND FIELD	**DEMONSTRATION** PROCEEDINGS OF THE SIX	1STAP-CC63
A CRASH-RESTRAINT	**DEMONSTRATOR**=	1LEWI-ST57
ER KRAFTFAHRER= ANALYSE	**DER** DYNAMIK VON SICHERHEITSGURTEN FU	WILL-JH64

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IN AN H-21 HELICOPTER=	**DYNAMIC**	TEST OF AN EXPERIMENTAL TROO	7TURN-JW63
ANALYSIS OF SEAT BELT	**DYNAMIC**	TEST PROCEDURES=	MCHE-RA62
	DYNAMIC	TESTING OF CAR SEAT BELTS=	BRIT-SI63
	DYNAMIC	TESTING OF SEAT BELTS=	FINC-DM57
	DYNAMIC	TESTING OF SEAT BELTS=	SOCI-AE64
MITTEE STUDIES NEED FOR	**DYNAMIC**	TESTING OF SEAT BELTS= SAE S	8SOCI-AE94
RCH IN OCCUPANT SAFETY,	**DYNAMIC**	TESTING OF SEATS= RESEA	7LEDE-J 59
R RESTRAINING DEVICES=	**DYNAMIC**	TESTS OF AUTOMOBILE PASSENGE	MICH-I 63
DREN=	**DYNAMIC**	TESTS OF RESTRAINTS FOR CHIL	APPO-FA66
CONSUMERS UNION'S	**DYNAMIC**	TESTS OF SEAT BELTS=	8MICH-I 61
ELS AND HARNESSES=	**DYNAMIC**	TESTS OF TELEFLEX INERTIA RE	CHIS-SW59
YSTEMS= ANALYSIS OF THE	**DYNAMICS**	OF AUTOMOBILE PASSENGER-RES	MCHE-RR65
YSTEMS= ANALYSIS OF THE	**DYNAMICS**	OF AUTOMOTIVE PASSENGER RES	AVIA-CI63
S= THE	**DYNAMICS**	OF CRASH RESTRAINT HARNESSE	HIRO-Y 55
RATIONS= THE	**DYNAMICS**	OF HUMAN RESPONSE TO ACCELE	6PAYN-PR61
THE	**DYNAMICS**	OF HUMAN RESTRAINT SYSTEMS=	PAYN-PR62
THE	**DYNAMICS**	OF SEAT BELT DESIGN=	EDEL-WE57
HICLE OCCUPANTS= IMPACT	**DYNAMICS**	OF UNRESTRAINED, LAP BELTED	PATR-LM66
AINT AND SUPPORT SYSTEM	**DYNAMICS=**	PERSONNEL RESTR	PAYN-PR65
RAFTFAHRER= ANALYSE DER	**DYNAMIK**	VON SICHERHEITSGURTEN FUER K	WILL-JH64
RTEN= STATISCHE AND	**DYNAMISCHE**	PRUFUNG FON SICHERHEITSGU	KEIL-E 93
N SICHERHEITSGURTEN BEI	**DYNAMISCHER**	BELASTUNG= VERHALTEN VO	KEIL-E 91
MONROE	**E-Z-RIDE**	TRUCK SEAT=	7MONR-AE
IT. CHEVRON DEALERS IN	**EAST**	FIND PROMOTION DEAL A GREAT PUL	2BARG-SB62
FACING PASSENGER SEATS=	**ECONOMIC**	CONSIDERATIONS I THE FORWA	2DUGG-BC61
NGINEERING DATA--SECOND	**EDITION**	(REVISED)= HANDBOOK OF HUMAN	5MEAD-LC52
T OF THE JOINT NATIONAL	**EDUCATIONAL**	SEAT BELT PROGRAM= A PRO	8LHOT-DC61
IMINARY FINDINGS OF THE	**EFFECT**	OF AUTOMOTIVE SAFETY DESIGN O	6BRAU-PW92
S OF RESTRAINT WEBBING=	**EFFECT**	OF RAPID LOADING RATES ON THE	HALE-JL91
IN A HEADON COLLISION=	**EFFECT**	OF SEAT HARNESS ON MOVEMENT O	1GRIM-G 63
HEAD-ON COLLISION HRB=	**EFFECT**	OF SEAT HARNESS ON MOVEMENT O	8GRIM-G 91
TY BELTS. THEIR INJURY	**EFFECT**	ON THE HUMAN BODY= AIRCRAFT S	6DEHA-H 53
TY BELTS. THEIR INJURY	**EFFECT**	ON THE HUMAN BODY= AIRCRAFT S	6TOUR-B 53
SYSTEM=	**EFFECTIVE**	PROTECTION BY A RESTRAINT	1LOMB-CF65
HE VARIABLES RELATED TO	**EFFECTIVE**	SEAT BELT ADVERTISING= PSY	5BLOM-GW61
THE UNITED STATES= THE	**EFFECTIVENESS**	AND USE OF SEAT BELTS	5WOLF-RA61
IS OF LAP SHOULDER BELT	**EFFECTIVENESS**	IN ACCIDENTS= ANALYS	SHAR-JE66
NS= SAFETY BELT	**EFFECTIVENESS**	IN BROAD-SIDE COLLISIO	8HONT-H 64
ACCIDENTS= SAFETY BELT	**EFFECTIVENESS**	IN RURAL CALIFORNIA AU	8TOUR-B 92
ETY BELTS. SAFETY BELT	**EFFECTIVENESS**	IN RURAL CALIFORNIA= A	6TOUR-B 60
TUATION= SEAT BELT	**EFFECTIVENESS**	IN THE NON-EJECTION SI	CAMP-BJ94
THE	**EFFECTIVENESS**	OF CAR SEAT BELTS=	8GRIM-G 92
TERACTING ACCELERATION=	**EFFECTIVENESS**	OF PNEUMATIC BELTS IN	9POPP-JR38
THE	**EFFECTIVENESS**	OF SAFETY BELTS=	8LIST-RD66
S= HAZARDS TO HEALTH.	**EFFECTIVENESS**	OF SEAT BELTS IN PREVE	6FRAZ-RG61
AN ASSESSMENT OF THEIR	**EFFECTIVENESS=**	SAFETY BELTS IN MOTOR	8MORE-JD62
R HARNESS. ITS USE AND	**EFFECTIVENESS=**	SHOULDE	8DEHA-H 52
R HARNESS. ITS USE AND	**EFFECTIVENESS=**	SHOULDE	8DEHA-H 56
RAPHY ON THE BIOLOGICAL	**EFFECTS**	OF IMPACT= A CHRONOLOGICAL B	4CLAR-CC91

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RAPHY ON THE BIOLOGICAL	**EFFECTS**	OF IMPACT= A CHRONOLOGICAL B	4CLAR-CC93
RAPHY ON THE BIOLOGICAL	**EFFECTS**	OF IMPACT= ADDITIONS TO A CH	4CLAR-CC92
SPLACEMENTS AND MEDICAL	**EFFECTS**	OF LATERAL ACCELERATIONS DUR	1CLAR-CC61
DRIVERS= A STUDY OF THE	**EFFECTS**	OF SEAT BELTS ON AUTOMOBILE	8HASK-LT57
MFORTGRADES VON SITZEN=	**EINE**	VERFEINERTE METHODE ZUR BESTIMM	7COER-R 64
RAFTVERTEILUNG AND=	**EINFLUSZ**	DER GURTBANDANORDNUNG AUF K	8KEIL-E 66
ELATION TO THEIR USE AS	**EJECTION**	SEAT CUSHION MATERIAL= PROP	7GLAI-DH61
ROD AND COMPARISON WITH	**EJECTION**	SEAT DATA= THE APPROXIMATIO	6HESS-JL56
ENTRIFUGE SIMULATION OF	**EJECTION=**	SOME BODY DISPLACEMENTS AN	1CLAR-CC61
LERATIONS BY THAT OF AN	**ELASTIC**	ROD AND COMPARISON WITH EJEC	6HESS-JL56
LON, KNITTED CLOTH WITH	**ELASTIC**	STRETCH CHARACTERISTICS= DEV	1BROC-HE64
=	**ELASTOMERIC**	DIAPHRAGM FOR AUTOMOTIVE	7SEAT-T 64
IBLIOGRAPHY= SAFETY AND	**EMERGENCY**	EQUIPMENT FOR AIRCRAFT CRE	4LAKE-GM61
EST MODEL F 106A= PILOT	**EMERGENCY**	ESCAPE UPPER TORSO HARNESS	8KALO-JG56
ATION ENVIRONMENTS WITH	**EMPHASIS**	UPON KNEE AND LOWER LEG RES	9VANP-RE64
TRACTOR, CODE H34 FRONT	**END**	LOADERS AND H24 TRACTORS - INSTA	GIVE-GA64
ICATION= DEVELOPMENT OF	**ENERGY**	ABSORBING STRUCTURES SUITABLE	1SMIT-MD55
SIGN=	**ENERGY**	ABSORPTION APPLIED TO SEAT DE	7HAWT-R 59
HINESS EVALUATION OF AN	**ENERGY**	ABSORPTION EXPERIMENTAL TROOP	7WEIN-LW65
D FURNISH PROTOTYPES OF	**ENERGY**	ABSORPTION SYSTEMS FOR AIRCRA	LANG-FC60
D FURNISH PROTOTYPES OF	**ENERGY**	ABSORPTION SYSTEMS FOR AIRCRA	7AERO-C 60
CONSIDERATIONS IN CRASH	**ENERGY**	ABSORPTION=	GAND-HK62
ASH DECELERATION, CRASH	**ENERGY,**	AND THEIR RELATIONSHIP TO CR	6DEHA-H 60
IGNERS= HUMAN	**ENGINEERING**	GUIDE FOR EQUIPMENT DES	5WOOD-WE54
INING DEVICES= A SAFETY	**ENGINEERING**	APPROACH TO CHILD RESTRA	1ROSE-CW65
EATING= PRODUCTION TRIM	**ENGINEERING**	AS APPLIED TO AUTOMOTIVE	7GRAH-CH49
TURES=	**ENGINEERING**	ASPECTS OF TEXTILE STRUC	1FOX -KR56
HUMAN	**ENGINEERING**	BIBLIOGRAPHY 1960-1961=	4RONC-PG62
A HUMAN	**ENGINEERING**	BIBLIOGRAPHY=	4MCCO-IN56
HE APPLICATION OF HUMAN	**ENGINEERING**	DATA TO VEHICULAR SEAT D	7RADK-AO56
SED)= HANDBOOK OF HUMAN	**ENGINEERING**	DATA--SECOND EDITION (RE	5MEAD-LC52
PHY ON HUMAN FACTORS IN	**ENGINEERING**	DESIGN= ANNOTATED BIBLIO	4LAWR-ML46
ION.= SAFETY	**ENGINEERING**	FOR CRASH INJURY PREVENT	6HALE-JL92
COMPRESSION SAE=	**ENGINEERING**	PROPERTIES OF RUBBER IN	5BROW-RW40
GOOD SEATING	**ENGINEERING**	SAVES LIVES=	7MCSU-A 52
MATION IN HUMAN FACTORS	**ENGINEERING,**	INCLUDING ASSOCIATED AR	4PETE-GA91
MATION IN HUMAN FACTORS	**ENGINEERING,**	INCLUDING ASSOCIATED AR	4PETE-GA93
L ANTHROPOLOGY IN HUMAN	**ENGINEERING=**	ANNOTATED BIBLIOGRAPHY	4HANS-R 58
MATION IN HUMAN FACTORS	**ENGINEERING=**	SOURCES OF INFOR	4PETE-GA92
URANCE, AND RELIABILITY	**ENGINEERING=**	SOURCES OF INFORMATION	4PETE-GA91
SURANCE, ANDRELIABILITY	**ENGINEERING=**	SOURCES OF INFORMATION	4PETE-GA93
LTS. GOVERNMENT SAFETY	**ENGINEERS**	AND RESEARCH EXPERTS SAY.	8AUTO-SB60
ARE ORDINARY SEAT BELTS	**ENOUGH.=**		8SHAR-JE64
TAINER= EVALUATION OF '	**ENSOLITE'**	AS A PROTECTIVE PADDING MA	1SMIT-MD54
SI TZEN= MESSGERAET ZUR	**ENTWICKLUNG**	UND BEURTEILUNG UON KRAF	7THIE-R 64
ASPECTS OF THE DRIVER'S	**ENVIRONMENT=**	SEATING AND OTHER	7NEYH-AE47
ICATION IN ACCELERATION	**ENVIRONMENTS**	WITH EMPHASIS UPON KNEE	9VANP-RE64
ITERIA STUDY IN DYNAMIC	**ENVIRONMENTS=**	PASSENGER SAFETY AND C	1SCHM-RV61
LE INJURIES, A NATIONAL	**EPIDEMIC=**	AUTOMOBI	6FISH-P 91
MINUTES OF THE PERSONAL	**EQUIPMENT**	ADVISORY GROUP MEETING=	1SANT-AM65
RIC DATA IN RELATION TO	**EQUIPMENT**	AND HUMAN- SIZING PROBLEMS	5KING-BG51

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		ENTRY CODE*
SEAT BELT	FASTENERS FOR 1962 CARS=	8SEAT-BF62
T= HUMAN TRANSPORTATION	FATALITIES AND PROTECTION AGAINST RE	9CLAR-C 91
RSTATE TRUCK DRIVERS=	FATIGUE AND HOURS OF SERVICE OF INTE	5UNIT-SP41
SENT STATUS OF THE NAVY	FATIGUE RELIEVING PNEUMATIC SEAT CUS	7HANN-TD58
=	FATIGUE TEST OF CUSHION PAD SUPPORTS	7FORD-MC47
	FATIGUE TEST ON SEAT BACK SPRINGS=	FORD-MC
THE NATURE OF	FATIGUE=	5DILL-DB33
VIBRATION SENSE AND	FATIGUE=	5KEIG-G 46
HARNESS CONFIGURATION=	FEASIBILITY STUDY. LATERAL IMPACT W	ROTH-JD66
SEAT WITH CRASH SAFETY	FEATURES FOR CH-47A HELICOPTER= ARMO	7THOM-DF64
OMOTIVE VEHICLE= SAFETY	FEATURES, STANDARD VS. OPTIONAL EQUI	1LEE -H 59
ANCE FIRM STUDIES OTHER	FEATURES= SEAT BELTS PASSE. INSUR	8SEAT-BP61
N IN 1966, A SUMMARY OF	FEDERAL AND STATE ACTIVITY= HIGHWAY	2NATI-HU67
PROPOSAL FOR AN INITIAL	FEDERAL MOTOR VEHICLE SAFETY STANDAR	8AUTO-MA66
PROPOSAL FOR AN INITIAL	FEDERAL MOTOR VEHICLE SAFETY= A	7AUTO-MA91
MOBILES, TRUCKS, BUSES=	FEDERAL SAFETY SPECIFICATIONS FOR AU	8CAMP-HE62
ENGER TYPE, AUTOMOTIVE=	FEDERAL SPECIFICATION, BELT, SEAT, P	7GENE-SA60
INJURY TO THE PREGNENT	FEMALE AND FETUS IN LAP BELT RESTRAI	5SNYD-RG66
THE PREGNENT FEMALE AND	FETUS IN LAP BELT RESTRAINT.= IMPACT	5SNYD-RG66
CE= STAPP CAR CRASH AND	FIELD DEMONSTRATION PROCEEDINGS OF T	1STAP-CC63
ELT DEVELOPED AT WRIGHT	FIELD= SAFETY SHOULDER B	8SAFE-SB39
ION OF THE HAMMOCK-TYPE	FIGHTER SEAT= COMFORT EVALUAT	7PATT-DI45
RINCIPLES OF SEATING IN	FIGHTER TYPE AIRCRAFT= P	7PATT-DI
CUSHION AND SQUAB	FILLINGS=	7CUSH-AS33
SAFETY COUNCIL MEMBERS=	FINAL REPORT--SURVEY OF SEAT BELT US	5NATI-SC60
	FINAL REPORT=	5MCCO-IN56
CHEVRON DEALERS IN EAST	FIND PROMOTION DEAL A GREAT PULLER-I	2BARG-SB62
Y PATTERNS= PRELIMINARY	FINDINGS OF THE EFFECT OF AUTOMOTIVE	6BRAU-PW92
ION OF PLASTIC WAVES IN	FINITE CYLINDERS OF A STRAIN-RATE-DE	TAPL-BD60
BELTS PASSE. INSURANCE	FIRM STUDIES OTHER FEATURES= SEAT	8SEAT-BP61
SEAT PRESSURE PAD -	FIRST MONTHLY PROGRESS REPORT=	7GUIL-FA47
EW RECOMMENDED PRACTICE	FIXES MOTOR VEHICLE SEAT BELT ANCHOR	8NEW -RP62
USE AMONG MOTOR VEHICLE	FLEET OPERATORS, WHO ARE NATIONAL SA	5NATI-SC60
NVENTIONAL AND NEW TYPE	FLIGHT RESTRAINT EQUIPMENT, EVALUATI	1HUNT-H 55
NVENTIONAL AND NEW TYPE	FLIGHT RESTRAINT EQUIPMENT= CO	9SNYD-RZ58
RESEARCH--REVIEW OF THE	FLIGHT SAFETY FOUNDATION IMPACT WORK	6KRAF-MA61
EEDINGS OF 2ND NATIONAL	FLIGHT SAFETY SURVIVAL AND PERSONAL	1SPAC-FE64
AINT IN ADVANCED MANNED	FLIGHT SYSTEMS= CREW PHYSICAL SUPPOR	1SMED-HA61
NESS TAKE-UP MECHANISM=	FLIGHT TESTS OF INERTIA REEL SHOULDE	AMER-SC63
STEM FOR ADVANCE MANNED	FLIGHT VEHICLES= INVESTIGATION OF A	6FREE-HE62
O AIRPLANE= FUSELAGE -	FLOOR STRUCTURE - SEAT ATTACHMENT, U	1JENS-NA46
LERATION WHICH OCCUR IN	FLYING= CONCERNING HUMAN TOLERANCE O	6RUFF-S 92
LERATION WHICH OCCUR IN	FLYING= ON RESISTANCE IN MEN TO CERT	6RUFF-S 93
SMENT OF THE COMFORT OF	FOAM CUSHIONING= APPROACH TO THE ASS	7STON-PT65
IMPACT PROTECTION WITH	FOAM PLASTICS=	9DYE -ER58
	FOAM RUBBER AND SEATING COMFORT=	7HOEH-UH47
MANUFACTURE OF PLASTICS	FOAM SEATS= DESIGN, DEVELOPMENT AND	7GRIF-F 65
THE DEVELOPMENT OF	FOAMED LATEX CUSHIONING SAE JOURNAL=	7ELLI-EE39
PERTIES OF POLYURETHANE	FOAMS IN RELATION TO THEIR USE AS EJ	7GLAI-DH61

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			ENTRY CODE*
RE INTERNAL INJURIES IN	**GLIDER**	ACCIDENTS= CONCERNING THE ORI	6RUFF-S 91
ARE SEAT BELTS	**GOOD**	FOR TRUCKS.=	8ARE -SB62
EAT BELT PROMOTION GETS	**GOOD**	RESULTS BUT RAISES QUESTIONS= S	8BARN-B 62
=	**GOOD**	SEATING ENGINEERING SAVES LIVES	7MCSU-A 52
O SEAT BELTS, A SWEDISH	**GOVERNMENT**	AGENCY USED CRASH-TESTMET	8CONS-U 92
S.'= AUTO SEAT BELTS.	**GOVERNMENT**	SAFETY ENGINEERS AND RESE	8AUTO-SB60
MARKS TO MEETING OF THE	**GOVERNORS'**	SAFETY CONFERENCE= RE	2ACKE-PC58
OF PREDICTING CENTER OF	**GRAVITY**	AND MASS MOMENT OF INERTIA O	5SIED-RR62
INERTIA AND CENTERS OF	**GRAVITY**	OF THE LIVING HUMAN BODY= MO	5SANT-WR63
CONTOUR MAPS, CENTER OF	**GRAVITY,**	MOMENT OF INERTIA AND SURFA	5WEIN-AP38
T FIND PROMOTION DEAL A	**GREAT**	PULLER-IN OF BUSINESS= BARGAIN	2BARG-SB62
GNING VEHICLE SEATS FOR	**GREATER**	COMFORT= DESI	7KEEG-JJ64
SAFETY DEVICES FOR	**GROUND**	VEHICLES=	1RYAN-JJ60
ONAL EQUIPMENT ADVISORY	**GROUP**	MEETING= MINUTES OF THE PERS	1SANT-AM65
ROBLEMS FOR AUTOMAKERS=	**GROWING**	SEAT BELT BUSINESS IS PRESEN	2MCDO-D 62
Y OF THE LIVER PRESENTS	**GROWING**	SURGICALPROBLEM= STEERING WH	6STEE-WI66
OLLISION STUDIES REVEAL	**GRUESOME**	FACTS SAE JOURNAL= C	6SEVE-DM60
HUMAN ENGINEERING	**GUIDE**	FOR EQUIPMENT DESIGNERS=	5WOOD-WE54
G AND= EINFLUSZ DER	**GURTBANDANORDNUNG**	AUF KRAFTVERTEILUN	8KEIL-E 66
SEAT INSTALLATION IN AN	**H-21**	HELICOPTER= DYNAMIC TEST OF AN	7TURN-JW63
UNITED STATES ARMY	**H-25**	HELICOPTER DROP TEST=	TURN-JW61
MFORT EVALUATION OF THE	**HAMMOCK-TYPE**	FIGHTER SEAT= CO	7PATT-DI45
COND EDITION (REVISED)=	**HANDBOOK**	OF HUMAN ENGINEERING DATA--	5MEAD-LC52
E SEAT BELT--HELPFUL OR	**HARMFUL.=**	TH	8WADE-PA62
SAFETY	**HARNESS**	- CRAIG TYPE=	8COLE-BC53
RAFT= SAFETY	**HARNESS**	- SABRE AND SILVER STAR AIRC	8DEAN-DA60
TO AUTOMATIC RESTRAINT	**HARNESS**	ACTIVATOR FORCES.= HUMAN TOL	6GANS-RV66
D SINGLE STRAP SHOULDER	**HARNESS**	AND LAP BELT= EVALUATION OF	HEND-E 55
FOR CHILDREN= SAFETY	**HARNESS**	AND OTHER PROTECTIVE DEVICES	1SAFE-HA66
FOR CHILDREN= SAFETY	**HARNESS**	AND OTHER PROTECTIVE DEVICES	8SAFE-HA66
HV	**HARNESS**	AND REEL QUESTIONNAIRE=	8AVIA-CI56
MY FOR TESTING SHOULDER	**HARNESS**	AND SAFETY BELTS= DESIGN AND	SWEA-JJ51
FOR A LAP-BELT-SHOULDER	**HARNESS**	ASSEMBLY= CONSIDERATIONS	8SHAR-JE61
WITH STANDARD AIRCRAFT	**HARNESS**	CONFIGURATION= FEASIBILITY S	ROTH-JD66
T METHODS AND RETENTION	**HARNESS**	CRITERIA FOR U.S. ARMY AIRCR	HALE-JL92
APPLIED INA RESTRAINING	**HARNESS**	FOR AIRCRAFT PILOTS= THE PRI	1BIER-HR46
= DEVELOPMENT OF SAFETY	**HARNESS**	FOR GENERAL SERVICE STRETCHE	1KIEL-IL50
SAFETY BELTS AND SAFETY	**HARNESS**	FOR MOTOR VEHICLES, INCLUDIN	8EIFF-AL61
CONNECT TORSO RESTRAINT	**HARNESS**	FOR THE B-58 ESCAPE CAPSULE=	9HOLC-GA60
DIES= ACCELERATIONS AND	**HARNESS**	FORCES MEASURED IN FULL-SCAL	MOSE-JC53
DIES (LAP BELT SHOULDER	**HARNESS**	INVESTIGATIONS).= LATERAL IM	6ZABO-AV92
NEW	**HARNESS**	LETS YOU MOVE FREELY=	8NEW -HL55
LERATIONS AND PASSENGER	**HARNESS**	LOADS MEASURED IN FULL-SCALE	EIBA-AM53
ALUATION OF RESTRAINING	**HARNESS**	MATERIALS= ANALYTICAL EV	FINW-PE65
D CAPTION RELEASE OF HV	**HARNESS**	MOCK-UP= PHOTO AN	8HASB-AH56
ION HRB= EFFECT OF SEAT	**HARNESS**	ON MOVEMENT OF CAR OCCUPANT	8GRIM-G 91
LLISION= EFFECT OF SEAT	**HARNESS**	ON MOVEMENT OF CAR OCCUPANTS	1GRIM-G 63
AUTO SAFETY. SHOULDER	**HARNESS**	PROMOTION= NEW STEP TOWARD	8NEW -ST62
SAFETY	**HARNESS**	RESEARCH-CALIFORNIA=	8DUNL-DR65

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			ENTRY CODE*
LISION INVESTIGATION OF	HARNESS	RESTRAINING SYSTEMS= BARRIER	1FRED-RH65
STEM AND THE INTEGRATED	HARNESS	RESTRAINT SYSTEM UNDER CONDI	1HILL-JH59
ENCY ESCAPE UPPER TORSO	HARNESS	SUPPORT DEVELOPMENT TEST MOD	8KALO-JG56
F THREE-POINT RESTRAINT	HARNESS	SYSTEMS IN FULL-SCALE BARRIE	8BOHL-NI66
F INERTIA REEL SHOULDER	HARNESS	TAKE-UP MECHANISM= FLIGHT TE	AMER-SC63
ARDING ADULT*S SHOULDER	HARNESS	TYPE SAFETY BELT= NEW YORK L	3AUTO-MA64
N, AND COTTON= SHOULDER	HARNESS	WEBBING. A COMPARISON OF DA	8DARR-J 53
ERIORATION OF RCAF SEAT	HARNESS	WEBBING= DET	8BAYL-CH54
AMINATION OF NYLON SEAT	HARNESS	WEBBING= EX	BAYL-CH58
SHOULDER	HARNESS.	ITS USE AND EFFECTIVENESS=	8DEHA-H 52
SHOULDER	HARNESS.	ITS USE AND EFFECTIVENESS=	8DEHA-H 56
ALUATION= POWERED TORSO	HARNESS.	MECHANICAL SYSTEM AND HUMA	GRAY-RF63
EXAMINATION OF SEAT	HARNESS=		KENN-JE57
REEL-O-MATIC SAFETY	HARNESS=		8PACI-SC91
SAFETY BELTS AND	HARNESS=		9ROSE-CW52
N LITTER PATIENT SAFETY	HARNESS=	AEROMEDICAL EVACUATIO	8STIN-NE57
XAMINATION OF SEAT BELT	HARNESS=	E	KENN-JE58
DEVELOPMENT OF A CRASH	HARNESS=	HUMAN EXPOSURES TO LINEAR D	6STAP-JP91
MATIC DUAL STRAP SAFETY	HARNESS=	REEL-O-	8PACI-SC93
T BELTS VERSUS SHOULDER	HARNESS=	SEA	8FULT-JL66
SAFETY	HARNESSES	FOR CARS=	8STOC-HC61
SEAT	HARNESSES.	A TECHNOLOGICAL LAG=	8CONS-U 93
RESTRAINT	HARNESSES--A	REVIEWW=	1CHIS-SW63
EFLEX INERTIA REELS AND	HARNESSES=	DYNAMIC TESTS OF TEL	CHIS-SW59
OGY OF SAFETY BELTS AND	HARNESSES=	PHYSIOL	8HITC-FA47
EXPERIENCE WITH SAFETY	HARNESSES=	RAF	8FRYE-DI62
NG OF INERTIA REELS FOR	HARNESSES=	REQUIREMENTS FOR TESTI	ALDM-B 65
NING CHARACTERISTICS OF	HARNESSES=	RESTRAI	8TOUR-B 94
MICS OF CRASH RESTRAINT	HARNESSES=	THE DYNA	HIRO-Y 55
SEAT BELTS. SAFE OR	HAZARDOUS.=		8FALE-ED58
MOTOR-VEHICLE INJURIES=	HAZARDS	TO HEALTH. EFFECTIVENESS OF	6FRAZ-RG61
ERATIONS= EVALUATION OF	HEAD	AND FACE INJURY POTENTIAL OF CU	6SWEA-JJ66
IMPACT= MOTIONS OF THE	HEAD	AND TRUNK ALLOWED BY SAFETY BEL	SWEA-JJ56
=	HEAD	INJURIES. ASPECTS AND PROBLEMS	6OMMA-AK63
NO. 157C FOR ACCEPTABLE	HEAD	POSITIONING= A4D ESCAPE SYSTEM,	7BACA-GA60
S OF BODY RESTRAINT AND	HEAD	PROTECTION= COMPENDIUM OF ABSTR	1HEND-E 61
PILOTS'	HEAD	SUPPORT=	1BENT-R 43
NT OF CAR OCCUPANT IN A	HEAD-ON	COLLISION HRB= EFFECT OF SEA	8GRIM-G 91
EVALUATION OF MODIFIED	HEAD-REST	INSTALLED BY A4D AIRCRAFT	7BACA-GA60
Y AIRCREWMAN PROTECTIVE	HEADGEAR=	IMPACT TEST METHODS AND RE	HALE-JL92
T OF CAR OCCUPANTS IN A	HEADON	COLLISION= EFFECT OF SEAT HAR	1GRIM-G 63
LE INJURIES= HAZARDS TO	HEALTH.	EFFECTIVENESS OF SEAT BELTS	6FRAZ-RG61
SAFETY BELTS IN	HEAVIES	NEED RESEARCH=	8GUTT-JM65
AND FABRICATION OF USAF	HEIGHT-WEIGHT	MANIKNS= ANTHROPOMETRI	5MCCO-JT63
UNITED STATES ARMY H-25	HELICOPTER	DROP TEST=	TURN-JW61
MY YHU-1D BELL IROQUOIS	HELICOPTER	MOCKUP EVALUATION, FORT W	CARR-J 60
SEAT BELTS INTHE HU-1A	HELICOPTER,	PART II - STOWAGE OF EQU	7ROEG-HF60
ETY FEATURES FOR CH-47A	HELICOPTER=	ARMOR PROTECTION FOR PIL	7THOM-DF64
-1 SERIES BELL IROQUOIS	HELICOPTER=	CRASH INJURY BULLETIN.	8ROBE-SH62
INSTALLATION IN AN H-21	HELICOPTER=	DYNAMIC TEST OF AN EXPER	7TURN-JW63
AND UH-1B, BELL IROQUOIS	HELICOPTERS,	SUPPLEMENT= PERSONNEL R	1AVIA-SE91

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PACT COLLISIONS, SERIES	II= AUTOMOBILE SIDE-IM	1SEVE-DM62
NTION.= BIBLIOGRAPHY OF	IMPACT ACCELERATION LITERATURE. ANNE	4CAMB-L 63
. ANNEX TO SYNTHESIS OF	IMPACT ACCELERATION TECHNOLOGY FOR A	4CAMB-L 63
INST CONCUSSION=	IMPACT ATTENUATION IN PROTECTION AGA	6SNIV-GG61
AVIOR OF TEXTILES UNDER	IMPACT CONDITIONS, AND OTHER ABSTRAC	MORG-H 55
LTED VEHICLE OCCUPANTS=	IMPACT DYNAMICS OF UNRESTRAINED, LAP	PATR-LM66
EVICES= DISTRIBUTION OF	IMPACT FORCES ON THE HUMAN THROUGH R	BIER-HR46
ACTIONS OF THE HUMAN TO	IMPACT FORCES REVEALED BY HIGH SPEED	6BIER-HR46
BODY TO WITHSTAND HIGH	IMPACT FORCES= MEASUREMENTS OF THE L	WURZ-EM48
IN LAP BELT RESTRAINT.=	IMPACT INJURY TO THE PREGNENT FEMALE	5SNYD-RG66
RIALS=	IMPACT INVESTIGATION ON TEXTILE MATE	SCHW-ER46
962= HUMAN TOLERANCE IN	IMPACT LOADING. A REPORT BIBLIOGRAPH	4DEFE-DC62
TRAINT SYSTEM=	IMPACT PROTECTION BY THE AIRSTOP RES	9BLEC-C 65
S= STANDARD ON OCCUPANT	IMPACT PROTECTION FOR PASSENGER CAR	7AUTO-MA92
=	IMPACT PROTECTION WITH FOAM PLASTICS	9DYE -ER58
RESTRAINT SYSTEM=	IMPACT PROTECTION WITH THE 'AIRSTOP'	9CLAR-C 92
BIODYNAMIC STUDIES ON	IMPACT PROTECTION=	1ALDM-B 62
R COLLISION AND RELATED	IMPACT SLED TESTS ON BUSSES ININTERC	1LABE-DJ65
VESTIGATIONS).= LATERAL	IMPACT STUDIES (LAP BELT SHOULDER HA	6ZABO-AV92
AN PROTECTIVE HEADGEAR=	IMPACT TEST METHODS AND RETENTION HA	HALE-JL92
SSEMBLIES IN CONTROLLED	IMPACT TESTS= PERFORMANCE OF SEAT BE	LIST-RD63
S= RELATIONSHIP BETWEEN	IMPACT VARIABLES AND INJURIES SUSTAI	6CORN-GA61
AN TOLERANCE TO LATERAL	IMPACT WITH LAP BELT ONLY= HUM	6ZABO-AV91
IBILITY STUDY. LATERAL	IMPACT WITH STANDARD AIRCRAFT HARNES	ROTH-JD66
LIGHT SAFETY FOUNDATION	IMPACT WORK AND PLANS.= AVIATION CRA	6KRAF-MA61
E BIOLOGICAL EFFECTS OF	IMPACT= A CHRONOLOGICAL BIBLIOGRAPHY	4CLAR-CC91
E BIOLOGICAL EFFECTS OF	IMPACT= A CHRONOLOGICAL BIBLIOGRAPHY	4CLAR-CC93
E BIOLOGICAL EFFECTS OF	IMPACT= ADDITIONS TO A CHRONOLOGICAL	4CLAR-CC92
Y BELT RESTRAINT DURING	IMPACT= MOTIONS OF THE HEAD AND TRUN	SWEA-JJ56
SPLENIC RUPTURE DUE TO	IMPROPER PLACEMENT OF AUTOMOBILE SAF	6COCK-WM63
= SEAT COMFORT	IMPROVED BY SPECIAL MEASURING DEVICE	7SEAT-CI63
	IMPROVED SEAT AND BACK CUSHIONS=	7WHIT-RK59
TRANSPORT PASSENGERS BY	IMPROVED SEAT MATERIALS DESIGN= CRAS	7STAP-JP61
	IMPROVEMENT OF LAP BELT TIGHTENER=	8PISA-FT64
E HUMAN BODY AS APPLIED	INA RESTRAINING HARNESS FOR AIRCRAFT	1BIER-HR46
UCKLE) SLIPPAGE, AND/OR	INADVERTENT RELEASE= SAFETY BELT (B	8HASB-AH55
AN FACTORS ENGINEERING,	INCLUDING ASSOCIATED AREAS IN SYSTEM	4PETE-GA91
AN FACTORS ENGINEERING,	INCLUDING ASSOCIATED AREAS IN SYSTEM	4PETE-GA93
ESS FOR MOTOR VEHICLES,	INCLUDING NATIONAL SPECIFICATIONS AN	8EIFF-AL61
TION OF AIR ASSOCIATES,	INCORPORATED SINGLE STRAP SHOULDER H	HEND-E 55
COMFORT	INDEX=	5COMF-I 33
BELTS IN ALLEN COUNTY,	INDIANA= AUTOMOBILES WITH SEAT	8BREN-B
TION SAFETY BELTS AS AN	INDICATION OF THE ABILITY OF THEHUMA	WURZ-EM48
AUTO SEAT BELT	INDUSTRY DRIVING FAST=	2KRAS-K 64
EATING INNOVATION STIRS	INDUSTRY INTEREST= S	7SEAT-IS51
HUMAN BODY= MOMENTS OF	INERTIA AND CENTERS OF GRAVITY OF TH	5SANT-WR63
R OF GRAVITY, MOMENT OF	INERTIA AND SURFACE AREA OF THE HUMA	5WEIN-AP38
VITY AND MASS MOMENT OF	INERTIA OF THE HUMAN BODY IN ANY POS	5SIED-RR62
HANISM= FLIGHT TESTS OF	INERTIA REEL SHOULDER HARNESS TAKE-U	AMER-SC63

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NAMIC TESTS OF TELEFLEX	INERTIA	REELS AND HARNESSES= DY	CHIS-SW59
IREMENTS FOR TESTING OF	INERTIA	REELS FOR HARNESSES= REQU	ALDM-B 65
TIONS OF SEAT BELTS FOR	INFANTS	AND SMALL CHILDREN= A REPORT	8NEFF-RJ61
E ROLE OF A PHYSICIAN'S	INFLUENCE	ON INSTALLATION OF SEAT BE	8BASS-LW65
MAN BODY AND TISSUES.	INFLUENCE	ON THE MANUFACTURE OF PROT	6ZIFF-D 65
PHYSICAL VARIABLES	INFLUENCING	DRIVER COMFORT.=	5MCFA-RA55
NALYSIS OF SOME FACTORS	INFLUENCING	SEAT COMFORT= AN A	7WACH-RA59
ENGINEERING= SOURCES OF	INFORMATION	IN HUMAN FACTORS ENGINEE	4PETE-GA91
RING= SOURCES OF	INFORMATION	IN HUMAN FACTORS ENGINEE	4PETE-GA92
ENGINEERING= SOURCES OF	INFORMATION	IN HUMAN FACTORS ENGINEE	4PETE-GA93
STATE LAWS	INFORMATION	MANUAL=	3AUTO-MA61
CHRYSLER PRESS	INFORMATION	SERVICE=	8CHRY-PI61
CT SLED TESTS ON BUSSES	ININTERCITY	SERVICE= BARRIER COLLISI	1LABE-DJ65
= A PROPOSAL FOR AN	INITIAL	FEDERAL MOTOR VEHICLE SAFETY	7AUTO-MA91
CARS= A PROPOSAL FOR AN	INITIAL	FEDERAL MOTOR VEHICLE SAFETY	8AUTO-MA66
SEAT BELT	INJURIES	AND LEGAL ASPECTS.=	6MCRO-JW65
Y EXPERIENCE WITH CRASH	INJURIES	AND PROTECTIVE EQUIPMENT= A	6BEZR-AA61
PREVENTION OF	INJURIES	DUE TO CRASH=	6SCHR-HA51
ABDOMINAL	INJURIES	FROM AUTO BELTS CITED=	6ABDO-IF65
SEATBACKS AND RESULTING	INJURIES	IN A SURVIVABLE TRANSPORT A	7HASB-AH62
IGIN OF SEVERE INTERNAL	INJURIES	IN GLIDER ACCIDENTS= CONCER	6RUFF-S 91
CRITICAL	INJURIES	PRODUCED BY SEAT BELTS=	6FISH-P 92
LE SEAT BELT= ABDOMINAL	INJURIES	RESULTING FROM THE STANDARD	6ODON-JB66
LTS--AN ANALYSIS OF THE	INJURIES	SUSTAINED BY CAR OCCUPANTS=	6LIST-RD63
EN IMPACT VARIABLES AND	INJURIES	SUSTAINEDIN LIGHTPLANE ACCI	6CORN-GA61
FORNIA= A COMPARISON OF	INJURIES	TO USERS AND NON-USERS OF S	6TOUR-B 60
HEAD	INJURIES.	ASPECTS AND PROBLEMS=	6OMMA-AK63
AUTOMOBILE	INJURIES,	A NATIONAL EPIDEMIC=	6FISH-P 91
CRASH	INJURIES=		6BENS-OO43
'WHIPLASH'	INJURIES=		6DOWL-JJ64
PRODUCE INTRA-ABDOMINAL	INJURIES=	AUTOMOTIVE SAFETY BELT. I	8WILL-JS66
REVENTING MOTOR-VEHICLE	INJURIES=	HAZARDS TO HEALTH. EFFECT	6FRAZ-RG61
ABSORBING SEAT REDUCES	INJURIES=	SHOCK	7SHOC-AS57
QUOIS HELICOPTER= CRASH	INJURY	BULLETIN. MODIFICATIONS TO T	8ROBE-SH62
DER TROOP SEATS= CRASH	INJURY	BULLETIN. PART I - ATTACHMEN	7ROEG-HF60
AN UNUSUAL	INJURY	DUE TO THE SEAT BELT=	6TOLI-SH64
FT SAFETY BELTS. THEIR	INJURY	EFFECT ON THE HUMAN BODY= AIR	6DEHA-H 53
FT SAFETY BELTS. THEIR	INJURY	EFFECT ON THE HUMAN BODY= AIR	6TOUR-B 53
DESIGN CRITERIA= CRASH	INJURY	EVALUATION. MILITARY TROOP S	7TURN-JW62
UOIS HELICOPTERS= CRASH	INJURY	EVALUATION. PERSONNEL RESTRAI	6HALE-JL91
7 VERTOL CHINOOK= CRASH	INJURY	EVALUATION, SUPPLEMENT TO PER	1AVIA-SE92
7 VERTOL CHINOOK. CRASH	INJURY	EVALUATION, SUPPLEMENT= PERSO	PAYN-PR64
E OF INTERNAL ABDOMINAL	INJURY	FROM SAFETYBELTS OR OTHER CAU	6CRAS-IR47
MECHANISMS OF	INJURY	IN MODERN LIGHTPLANE CRASHES=	6PEAR-RG62
PROBLEM= STEERING WHEEL	INJURY	OF THE LIVER PRESENTS GROWING	6STEE-WI66
MOTIVE SAFETY DESIGN ON	INJURY	PATTERNS= PRELIMINARY FINDING	6BRAU-PW92
UATION OF HEAD AND FACE	INJURY	POTENTIAL OF CURRENT AIRLINE	6SWEA-JJ66
LOGY FOR AVIATION CRASH	INJURY	PREVENTION.= BIBLIOGRAPHY OF	4CAMB-L 63
Y ENGINEERING FOR CRASH	INJURY	PREVENTION.= SAFET	6HALE-JL92
T OF SAFETY SEATING FOR	INJURY	PREVENTION= THE DEVELOPMEN	7HICT-BC66
RT OF 2 CASES=	INJURY	PRODUCED BY SEAT BELTS. REPO	6FISH-P 93

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Y BELTS IN MOTOR CARS=	INJURY REDUCTION BY THE USE OF SAFET	8HERB-DC60
PLANS.= AVIATION CRASH	INJURY RESEARCH--REVIEW OF THE FLIGH	6KRAF-MA61
CRASH DESIGN FROM CRASH	INJURY RESEARCH=	6KNOW-WR58
CTS OF AUTOMOTIVE CRASH	INJURY RESEARCH= MEDICAL ASPE	6BRAU-PW91
TES ARMY AVIATION CRASH	INJURY RESEARCH= UNITED STA	1AVIA-SE62
N LIGHTPLANE ACCIDENTS=	INJURY SEVERITY AS RELATED TO SEAT T	6PEAR-RG61
BELT RESTRAINT.= IMPACT	INJURY TO THE PREGNENT FEMALE AND FE	5SNYD-RG66
E UNITED KINGDOM= CRASH	INJURY WORK OF THE ROAD RESEARCH LAB	6STAR-JH60
CRASH	INJURY. A REPORT BIBLIOGRAPHY=	4ASTI- 62
R RELATIONSHIP TO CRASH	INJURY= CRASH DECELERATION, CRASH EN	6DEHA-H 60
Y CAN REDUCE CHANGES OF	INJURY= CRASH STUD	6DEHA-H 52
SEAT BELT AND ABDOMINAL	INJURY= THE AUTOMOBILE	6CAMP-HE64
Y OF THE TERM 'WHIPLASH	INJURY'= THE FALLAC	6BRAU-PW93
TERIA. REPORT OF CRASH	INJURYEVALUATION= MILITARY TROOP SEA	6ACIR-FS62
SEATING	INNOVATION STIRS INDUSTRY INTEREST=	7SEAT-IS51
SEAT BELT	INSTALLATION AND USE POLL=	5SEAT-BI61
EXPERIMENTAL TROOP SEAT	INSTALLATION IN AN H-21 HELICOPTER=	7TURN-JW63
FOR SHOULDER RESTRAINT	INSTALLATION IN GENERAL AVIATION AIR	8YOUN-JW66
ERS AND H24 TRACTORS -	INSTALLATION OF ROLL BARS, SAFETY BE	GIVE-GA64
HYSICIAN'S INFLUENCE ON	INSTALLATION OF SEAT BELTS= THE ROLE	8BASS-LW65
PRELIMINARY SEAT BELT	INSTALLATION SURVEY=	8CAMP-BJ91
OF AUTOMOBILE SEAT BELT	INSTALLATION TRENDS AND A SURVEY OF	CAMP-BJ93
TH THE THREE-POINT BELT	INSTALLATIONS AND POSSIBLE SOLUTIONS	8SHAR-JE65
ON MANDATORY SEAT BELT	INSTALLATIONS IN PASSENGER CARS= A P	8AUTO-MA66
N OF MODIFIED HEAD-REST	INSTALLED BY A4D AIRCRAFT SERVICE CH	7BACA-GA60
LOPMENT OF A 'BEAM-PAD'	INSTRUMENT CONTAINER= EVALUATION OF	1SMIT-MD54
STING AND EVALUATION BY	INSTRUMENTATION= AUTOMOTIVE SEATING-	SOCI-AE53
S= SEAT BELTS PASSE.	INSURANCE FIRM STUDIES OTHER FEATURE	8SEAT-BP61
ESTRAINT SYSTEM AND THE	INTEGRATED HARNESS RESTRAINT SYSTEM	1HILL-JH59
NOVATION STIRS INDUSTRY	INTEREST= SEATING IN	7SEAT-IS51
THE RARE OCCURRENCE OF	INTERNAL ABDOMINAL INJURY FROM SAFET	6CRAS-IR47
NG THE ORIGIN OF SEVERE	INTERNAL INJURIES IN GLIDER ACCIDENT	6RUFF-S 91
R SEAT BELT ASSEMBLIES=	INTERNATIONAL ORGANIZATION FOR STAND	8FRED-RH65
TEE OF THE COMMITTEE ON	INTERSTATE AND FOREIGN COMMERCE OF T	3SEVE-DM
AND HOURS OF SERVICE OF	INTERSTATE TRUCK DRIVERS= FATIGUE	5UNIT-SP41
TTACHMENT OF SEAT BELTS	INTHE HU-1A HELICOPTER, PART II - ST	7ROEG-HF60
TED SEAT= INVESTIGATION	INTO SAFETY BELTS FOR MOTOR VEHICLES	WILL-JH62
VING A LIFE MAY PRODUCE	INTRA-ABDOMINAL INJURIES= AUTOMOTIVE	8WILL-JS66
Y AND ACCELERATED SEAT=	INVESTIGATION INTO SAFETY BELTS FOR	WILL-JH62
MANNED FLIGHT VEHICLES=	INVESTIGATION OF A PERSONNEL RESTRAI	6FREE-HE62
TEMS= BARRIER COLLISION	INVESTIGATION OF HARNESS RESTRAINING	1FRED-RH65
ERVICE LIFE=	INVESTIGATION OF SEAT BELT WEBBING S	STET-CH64
ERVICE LIFE=	INVESTIGATION OF SEAT BELT WEBBING S	8STET-CH64
IMPACT	INVESTIGATION ON TEXTILE MATERIALS=	SCHW-ER46
A BACKWARD FACING SEAT	INVESTIGATION=	7BACK-FS50
P BELT SHOULDER HARNESS	INVESTIGATIONS$.= LATERAL IMPACT STU	6ZABO-AV92
NG DAMAGE FROM ACCIDENT	INVESTIGATIONS= NEW TECHNIQUES FOR A	1GREG-LW63
= U.S. ARMY YHU-1D BELL	IROQUOIS HELICOPTER MOCKUP EVALUATIO	CARR-J 60
. ARMY HU-1 SERIES BELL	IROQUOIS HELICOPTER= CRASH INJURY BU	8ROBE-SH62

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		ENTRY CODE*
DY UH-1A AND UH-1B,BELL	**IROQUOIS** HELICOPTERS, SUPPLEMENT= PE	1AVIA-SE91
Y. UH-1A AND UH-1B BELL	**IROQUOIS** HELICOPTERS= CRASH INJURY E	6HALE-JL91
	IRVIN-NORRIS DYNALOCK=	9IRVI-ND64
WING SEAT BELT BUSINESS	**IS** PRESENTING PROBLEMS FOR AUTOMAKER	2MCDO-D 62
AND FOR AUTO SEAT BELTS	**IS** RAPIDLY GAINING MOMENTUM= LATCHIN	2DUBO-PC62
	IS THIS THE SEATING OF THE FUTURE=	7IS -TT65
ANCE OF ACCELERATION AS	**IT** APPLIES TO CERTAIN JERKING TYPES	6RUFF-S 92
EAT BELT SYNDROME--DOES	**IT** EXIST.= THE S	7FISH-J 65
NTHROPOMETRIC SURVEY.	**ITS** MILITARY AND COMMERCIAL POTENTIA	5HERT-HT59
SHOULDER HARNESS.	**ITS** USE AND EFFECTIVENESS=	8DEHA-H 52
SHOULDER HARNESS.	**ITS** USE AND EFFECTIVENESS=	8DEHA-H 56
XAS, 7 JULY 1960, 19-20	**JANUARY** 1961= U.S. ARMY YHU-1D BELL	CARR-J 60
	JERK WITH AND WITHOUT SEAT CUSHIONS=	7HOGD-VR63
S IT APPLIES TO CERTAIN	**JERKING** TYPES OF ACCELERATION WHICH	6RUFF-S 92
TANCE IN MEN TO CERTAIN	**JERKING** TYPES OF ACCELERATION WHICH	6RUFF-S 93
NDS AND A SURVEY OF NEW	**JERSEY** EXPERIENCE ACIR= A REVIEW OF	CAMP-BJ93
HOCK ABSORBER SEATS FOR	**JET** PASSENGERS= AEROMED FACILITY STU	7AERO-PS59
PROGRESS REPORT OF THE	**JOINT** NATIONAL EDUCATIONAL SEAT BELT	8LHOT-DC61
ALITY ACCELEROMETER SAE	**JOURNAL=** CHRYSLER RIDING QU	5TEA -CA33
VEAL GRUESOME FACTS SAE	**JOURNAL=** COLLISION STUDIES RE	6SEVE-DM60
FOR RIDING COMFORT SAE	**JOURNAL=** CRITERIA ARE SET	1BROW-RW35
OF RIDING QUALITIES SAE	**JOURNAL=** PRELIMINARY STUDY	5BRAN-GC30
ED LATEX CUSHIONING SAE	**JOURNAL=** THE DEVELOPMENT OF FOAM	7ELLI-EE39
N, FORT WORTH, TEXAS, 7	**JULY** 1960, 19-20 JANUARY 1961= U.S.	CARR-J 60
	KENNINGTON PIVOTED SEAT FRAME=	7KENN-PS36
ING CRASH DECELERATION=	**KINEMATIC** BEHAVIOR OF THE HUMAN BODY	DYE -ER50
DURING DECELERATION=	**KINEMATIC** BEHAVIOR OF THE HUMAN BODY	SWEA-JJ62
RASH CONDITIONS=	**KINEMATICS** OF THE HUMAN BODY UNDER C	DYE -ER56
D TESTING IN THE UNITED	**KINGDOM=** AUTOMATIC LOCKING AND RETRA	8REDF-FA65
ABORATORY OF THE UNITED	**KINGDOM=** CRASH INJURY WORK OF THE RO	6STAR-JH60
ESCAPE SYSTEM, SURVIVAL	**KIT/LAP** BELT RESTRAINT SYSTEM EVALUA	NAVA-AT66
ENTS WITH EMPHASIS UPON	**KNEE** AND LOWER LEG RESTRAINTS= A RES	9VANP-RE64
NT OF COTTON AND NYLON,	**KNITTED** CLOTH WITH ELASTIC STRETCH C	1BROC-HE64
HODE ZUR BESTIMMUNG DES	**KOMFORTGRADES** VON SITZEN= EINE VERFE	7COER-R 64
SICHERHEITSGURTEN FUER	**KRAFTFAHRER=** ANALYSE DER DYNAMIK VON	WILL-JH64
UNG UND BEURTEILUNG UON	**KRAFTFAHRZEUGSI** TZEN= MESSGERAET ZUR	7THIE-R 64
R GURTBANDANORDNUNG AUF	**KRAFTVERTEILUNG** AND= EINFLUSZ DE	8KEIL-E 66
CURITE=	**L'ASPECT** MEDICAL DES CEINTURES DE SE	6KEAR-JD64
SAFETY STUDIES= A NEW	**LABORATORY** DEVICE FOR PASSENGER CAR	1CICH-WG63
RK OF THE ROAD RESEARCH	**LABORATORY** OF THE UNITED KINGDOM= CR	6STAR-JH60
ESSES. A TECHNOLOGICAL	**LAG=** SEAT HARN	8CONS-U 93
NALYTICAL STUDY OF SOFT	**LANDINGS** ON GAS-FILLED BAGS= A	9ESGA-JB60
ROTARY BUCKLE	**LAP** BELT ASSEMBLY=	8PACI-SC94
TO LATERAL IMPACT WITH	**LAP** BELT ONLY= HUMAN TOLERANCE	6ZABO-AV91
ENT FEMALE AND FETUS IN	**LAP** BELT RESTRAINT.= IMPACT INJURY T	5SNYD-RG66
ATERAL IMPACT STUDIES (	**LAP** BELT SHOULDER HARNESS INVESTIGAT	6ZABO-AV92
IMPROVEMENT OF	**LAP** BELT TIGHTENER=	8PISA-FT64
AP SHOULDER HARNESS AND	**LAP** BELT= EVALUATION OF AIR ASSOCIAT	HEND-E 55
NAMICS OF UNRESTRAINED,	**LAP** BELTED, AND LAP DIAGONAL CHEST B	PATR-LM66
DURES FOR MOTOR VEHICLE	**LAP** BELTS= SAE RECOMMENDS TEST PROCE	8SOCI-AE91
RAINED, LAP BELTED, AND	**LAP** DIAGONAL CHEST BELTED VEHICLE OC	PATR-LM66

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OMBINATION SHOULDER AND	**LAP** SAFETY BELTS= C	8GRIS-RW55
CCIDENTS= ANALYSIS OF	**LAP** SHOULDER BELT EFFECTIVENESS IN A	SHAR-JE66
CONSIDERATIONS FOR A	**LAP-BELT-SHOULDER** HARNESS ASSEMBLY=	8SHAR-JE61
ANCE= EVALUATION OF THE	**LAP-TYPE** AUTOMOBILE SAFETY BELT WITH	8STAP-JP58
E OF THE HUMAN TORSO TO	**LARGE** RAPIDLY APPLIED UPWARD ACCELER	6HESS-JL56
PIDLY GAINING MOMENTUM=	**LATCHING** ON, DEMAND FOR AUTO SEAT BE	2DUBO-PC62
SEAT BELTS--ONE YEAR	**LATER=**	8SCHR-DJ62
AND MEDICAL EFFECTS OF	**LATERAL** ACCELERATIONS DURING NAVY CE	1CLAR-CC61
RNESS INVESTIGATIONS).=	**LATERAL** IMPACT STUDIES (LAP BELT SHO	6ZABO-AV92
HUMAN TOLERANCE TO	**LATERAL** IMPACT WITH LAP BELT ONLY=	6ZABO-AV91
N= FEASIBILITY STUDY.	**LATERAL** IMPACT WITH STANDARD AIRCRAF	ROTH-JD66
E DEVELOPMENT OF FOAMED	**LATEX** CUSHIONING SAE JOURNAL= TH	7ELLI-EE39
E SAFETY BELT= NEW YORK	**LAW** REGARDING ADULT'S SHOULDER HARNE	3AUTO-MA64
STATE	**LAWS** INFORMATION MANUAL=	3AUTO-MA61
	LEAF SPRING SEAT FOR AUTOMOBILES=	7LEAF-SS40
SIS UPON KNEE AND LOWER	**LEG** RESTRAINTS= A RESTRAINT SYSTEM F	9VANP-RE64
SEAT BELT INJURIES AND	**LEGAL** ASPECTS.=	6MCRO-JW65
HIGHWAY TRANSPORTATION	**LEGISLATION** IN 1966, A SUMMARY OF FE	2NATI-HU67
STATE	**LEGISLATORS** CONSIDER SAFETY BELTS=	3STAT-LC56
BELTS TO THE CALIFORNIA	**LEGISLATURE.** SUMMARY AND ANALYSIS OF	8TOUR-B 91
BELTS TO THE CALIFORNIA	**LEGISLATURE.** SUMMARY AND ANALYSIS OF	8TOUR-B 93
UES PROBLEMES POSES PAR	**LES** SIEGES DE VOITURES= QUELQ	7WISN-A 61
NEW HARNESS	**LETS** YOU MOVE FREELY=	8NEW -HL55
FETY BELT. IN SAVING A	**LIFE** MAY PRODUCE INTRA-ABDOMINAL INJ	8WILL-JS66
Y, PERSONNEL SUBSYSTEM,	**LIFE** SCIENCES, QUALITY ASSURANCE, AN	4PETE-GA93
Y, PERSONNEL SUBSYSTEM,	**LIFE** SCIENCES,. QUALITY ASSURANCE, A	4PETE-GA91
AT BELT WEBBING SERVICE	**LIFE=** INVESTIGATION OF SE	STET-CH64
AT BELT WEBBING SERVICE	**LIFE=** INVESTIGATION OF SE	8STET-CH64
MEASURED IN FULL-SCALE	**LIGHT** AIRPLANE CRASHES= ACCELERATION	EIBA-AM53
OWN AND BELT FAILURE IN	**LIGHTPLANE** ACCIDENTS= INJURY SEVERIT	6PEAR-RG61
ND INJURIES SUSTAINEDIN	**LIGHTPLANE** ACCIDENTS= RELATIONSHIP B	6CORN-GA61
SMS OF INJURY IN MODERN	**LIGHTPLANE** CRASHES= MECHANI	6PEAR-RG62
G ABRUPT TRANSVERSE=	**LIMITS** OF SEAT BELT PROTECTION DURIN	8GUGG-AS61
G CRASH DECELERATIONS=	**LIMITS** OF SEAT-BELT PROTECTION DURIN	BRUG-GM61
N TOLERANCE=	**LINEAR** DECELERATION STUDIES AND HUMA	6LATH-F 58
ESS= HUMAN EXPOSURES TO	**LINEAR** DECELERATION, PT. II, THE FOR	6STAP-JP91
IONS= HUMAN EXPOSURE TO	**LINEAR** DECELERATIVE FORCE IN THE BAC	7STAP-JP51
OF IMPACT ACCELERATION	**LITERATURE.** ANNEX TO SYNTHESIS OF IM	4CAMB-L 63
BIBLIOGRAPHY OF COMPANY	**LITERATURE=** PASSENGER COMFORT. A	4LIPP-S 91
AEROMEDICAL EVACUATION	**LITTER** PATIENT SAFETY HARNESS=	8STIN-NE57
ING WHEEL INJURY OF THE	**LIVER** PRESENTS GROWING SURGICALPROBL	6STEE-WI66
ATING ENGINEERING SAVES	**LIVES=** GOOD SE	7MCSU-A 52
NTERS OF GRAVITY OF THE	**LIVING** HUMAN BODY= MOMENTS OF INERTI	5SANT-WR63
DESIGNED FOR	**LIVING=**	1DYE -ER57
AT ATTACHMENT, ULTIMATE	**LOAD** TEST, MODEL 240 AIRPLANE= FUSEL	1JENS-NA46
TOR, CODE H34 FRONT END	**LOADERS** AND H24 TRACTORS - INSTALLAT	GIVE-GA64
EBBING= EFFECT OF RAPID	**LOADING** RATES ON THE STRESS-STRAIN P	HALE-JL91
MAN TOLERANCE IN IMPACT	**LOADING.** A REPORT BIBLIOGRAPHY 1953-	4DEFE-DC62
NST REAR AND SIDE CRASH	**LOADS** BY THE AIRSTOP RESTRAINT= HUMA	9CLAR-C 91

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S AND PASSENGER HARNESS	**LOADS** MEASURED IN FULL-SCALE LIGHT A	EIBA-AM53
ES= MEASUREMENTS OF THE	**LOADS** REQUIRED TO BREAK COMMERCIAL A	WURZ-EM48
ITED KINGDOM= AUTOMATIC	**LOCKING** AND RETRACTABLE BELTS, THEIR	8REDF-FA65
DECELERATION	**LOCKS** AUTO SAFETY BELT=	8DECE-LA62
EATING REQUIREMENTS FOR	**LONG** DISTANCE= DRIVER AND PASSENGER	7ADAM-AJ65
SCIENCE	**LOOKS** AT SEAT BELTS=	8SCIE-LA63
EMPHASIS UPON KNEE AND	**LOWER** LEG RESTRAINTS= A RESTRAINT SY	9VANP-RE64
COMFORTABLE SEATS= THE	**MAIN** PRINCIPLES OF RESTFUL SITTING A	7AKER- 51
AREAS IN SYSTEM SAFETY,	**MAINTAINABILITY,** PERSONNEL SUBSYSTEM	4PETE-GA91
AREAS IN SYSTEM SAFETY,	**MAINTAINABILITY,** PERSONNEL SUBSYSTEM	4PETE-GA93
WE MUST	**MAKE** A DECISION=	1PALM-FC65
SEAT TO	**MAKE** CARS SAFER=	7CARR-R 66
CRASH-SAFE DESIGN CAN	**MAKE** MANY ACCIDENTS SURVIVABLE=	1HASB-AH60
BIOMECHANICAL MODEL OF	**MAN** FOR STUDY OF VEHICLE SEAT AND SU	7WISN-A 64
1=	**MAN** IN STRUCTURE AND FUNCTION, VOL.	5KAHN-F 43
AREAS AND PRESSURES OF	**MAN=** AN ANALYSIS OF SITTING	7SWEA-JJ62
N THE SITTING POSITION=	**MAN'S** ABILITY TO WITHSTAND TRANSVERS	6LAMB-EH45
ICLE SAFETY STANDARD ON	**MANDATORY** SEAT BELT INSTALLATIONS IN	8AUTO-MA66
ICE IN THE USE OF SCALE	**MANIKINS=** THEORY AND PRACT	RAND-FE49
N OF USAF HEIGHT-WEIGHT	**MANIKNS=** ANTHROPOMETRIC DATA IN THRE	5MCCO-JT63
D RESTRAINT IN ADVANCED	**MANNED** FLIGHT SYSTEMS= CREW PHYSICAL	1SMED-HA61
AINT SYSTEM FOR ADVANCE	**MANNED** FLIGHT VEHICLES= INVESTIGATIO	6FREE-HE62
STATE LAWS INFORMATION	**MANUAL=**	3AUTO-MA61
SEATING	**MANUAL=**	7SOCI-AE
DESIGN, DEVELOPMENT AND	**MANUFACTURE** OF PLASTICS FOAM SEATS=	7GRIF-F 65
SUES. INFLUENCE ON THE	**MANUFACTURE** OF PROTECTIVE HELMETSAND	6ZIFF-D 65
EMENT OF THE AUTOMOBILE	**MANUFACTURERS** ASSOCIATION BEFORE THE	3BUGA-JS66
SH-SAFE DESIGN CAN MAKE	**MANY** ACCIDENTS SURVIVABLE= CRA	1HASB-AH60
THE HUMAN BODY= CONTOUR	**MAPS,** CENTER OF GRAVITY, MOMENT OF I	5WEIN-AP38
TEM EVALUATION PROGRAM=	**MARTIN-BAKER** MKGRU5 ESCAPE SYSTEM, S	NAVA-AT66
G CENTER OF GRAVITY AND	**MASS** MOMENT OF INERTIA OF THE HUMAN	5SIED-RR62
AS A PROTECTIVE PADDING	**MATERIAL** AND THE DEVELOPMENT OF A 'B	1SMIT-MD54
S EJECTION SEAT CUSHION	**MATERIAL=** PROPERTIES OF POLYURETHANE	7GLAI-DH61
A STRAIN-RATE-DEPENDENT	**MATERIAL=** STRESS-STRAIN CHARACTERIST	TAPL-BD60
RAIN CHARACTERISTICS OF	**MATERIALS** AT HIGH STRAIN RATES, PART	TAPL-BD60
ENGERS BY IMPROVED SEAT	**MATERIALS** DESIGN= CRASH PROTECTION O	7STAP-JP61
PROPER USE OF SPRING	**MATERIALS=**	1ZIMM-FP48
OF RESTRAINING HARNESS	**MATERIALS=** ANALYTICAL EVALUATION	FINW-PE65
NVESTIGATION ON TEXTILE	**MATERIALS=** IMPACT I	SCHW-ER46
= A	**MATHEMATICAL** MODEL OF THE HUMAN BODY	5HANA-EP64
	MATS ADOPTS REARWARD SEATING=	7SELF-TM51
BIODYNAMICS OF	**MAXIMAL** DECELERATIONS=	6STAP-JP93
BELT. IN SAVING A LIFE	**MAY** PRODUCE INTRA-ABDOMINAL INJURIES	8WILL-JS66
IONS AND HARNESS FORCES	**MEASURED** IN FULL-SCALE CRASH STUDIES	MOSE-JC53
PASSENGER HARNESS LOADS	**MEASURED** IN FULL-SCALE LIGHT AIRPLAN	EIBA-AM53
	MEASUREMENT OF SEAT COMFORT=	7THIE-RH63
RISTICS=	**MEASUREMENT** OF SEAT CUSHION CHARACTE	7BROW-RW39
AND HIGH IMPACT FORCES=	**MEASUREMENTS** OF THE LOADS REQUIRED T	WURZ-EM48
ACCIDENTS AND SAFETY	**MEASURES.** A REPORT BIBLIOGRAPHY=	4SILU-MB62
HUMAN BODY= DEVICES FOR	**MEASURING** CONTACT-PRESSURES EXERTED	6RESW-JB61
ORT IMPROVED BY SPECIAL	**MEASURING** DEVICE= SEAT COMF	7SEAT-CI63

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SEATS, APPRAISAL OF THE	MECHANICAL BASIS OF COMFORT= DRIVING	7CLEA-DE54
OUS MECHANICAL FORCES.=	MECHANICAL FORCES - TABLEI. ESTIMATE	6GOLD-DE46
D HUMAN BODY TO VARIOUS	MECHANICAL FORCES.= MECHANICAL FORCE	6GOLD-DE46
OTORISTS.= NOTES ON THE	MECHANICAL RESISTANCE OF THE HUMAN B	6ZIFF-D 65
OWERED TORSO HARNESS.	MECHANICAL SYSTEM AND HUMAN TOLERANC	GRAY-RF63
HOULDER HARNESS TAKE-UP	MECHANISM= FLIGHT TESTS OF INERTIA R	AMER-SC63
PLANE CRASHES=	MECHANISMS OF INJURY IN MODERN LIGHT	6PEAR-RG62
INJURY RESEARCH=	MEDICAL ASPECTS OF AUTOMOTIVE CRASH	6BRAU-PW91
DEVELOPMENT=	MEDICAL ASPECTS OF SAFETY SEAT BELT	8STAP-JP63
L'ASPECT	MEDICAL DES CEINTURES DE SECURITE=	6KEAR-JD64
BODY DISPLACEMENTS AND	MEDICAL EFFECTS OF LATERAL ACCELERAT	1CLAR-CC61
NCONFIRMED MINUTES OF A	MEETING OF THE CHILDREN'S SEAT BELTS	8SEAT-BC63
FERENCE= REMARKS TO	MEETING OF THE GOVERNORS' SAFETY CON	2ACKE-PC58
SAE SUMMER	MEETING=	7SOCI-AE58
QUIPMENT ADVISORY GROUP	MEETING= MINUTES OF THE PERSONAL E	1SANT-AM65
NATIONAL SAFETY COUNCIL	MEMBERS= FINAL REPORT--SURVEY OF SEA	5NATI-SC60
OME EUROPEAN COUNTRIES=	MEMORANDUM ON SAFETY BELTS AND SAFET	8EIFF-AL61
LYING= ON RESISTANCE IN	MEN TO CERTAIN JERKING TYPES OF ACCE	6RUFF-S 93
N KRAFTFAHRZEUGSI TZEN=	MESSGERAET ZUR ENTWICKLUNG UND BEURT	7THIE-R 64
DOUGLAS BT2D BOMBER= A	METHOD FOR THE ASSESSMENT OF SEAT CO	7HENR-JP45
N BODY IN ANY POSITION=	METHOD OF PREDICTING CENTER OF GRAVI	5SIED-RR62
ITZEN= EINE VERFEINERTE	METHODE ZUR BESTIMMUNG DES KOMFORTGR	7COER-R 64
E HEADGEAR= IMPACT TEST	METHODS AND RETENTION HARNESS CRITER	HALE-JL92
ROPOMETRIC SURVEY. ITS	MILITARY AND COMMERCIAL POTENTIALS=	5HERT-HT59
	MILITARY TRANSPORT SEATING=	7BOST-K 52
CRASH INJURYEVALUATION=	MILITARY TROOP SEAT DESIGN CRITERIA.	6ACIR-FS62
SH INJURY EVALUATION.	MILITARY TROOP SEAT DESIGN CRITERIA=	7TURN-JW62
HUMAN REACTION TO	MILITARY VEHICLE RIDE=	5STER-S 61
ACCIDENTAL DEATHS IN	MILITARY VEHICLES.=	6BABI-RW56
1963= $90	MILLION SALES SEEN FOR SEAT BELTS IN	2GOOD-B 63
BCOMMITTEE= UNCONFIRMED	MINUTES OF A MEETING OF THE CHILDREN	8SEAT-BC63
VISORY GROUP MEETING=	MINUTES OF THE PERSONAL EQUIPMENT AD	1SANT-AM65
N PROGRAM= MARTIN-BAKER	MKGRU5 ESCAPE SYSTEM, SURVIVAL KIT/L	NAVA-AT66
N RELEASE OF HV HARNESS	MOCK-UP= PHOTO AND CAPTIO	8HASB-AH56
ELL IROQUOIS HELICOPTER	MOCKUP EVALUATION, FORT WORTH, TEXAS	CARR-J 60
UPPORT DEVELOPMENT TEST	MODEL F 106A= PILOT EMERGENCY ESCAPE	8KALD-JG56
SPENSION= BIOMECHANICAL	MODEL OF MAN FOR STUDY OF VEHICLE SE	7WISN-A 64
A MATHEMATICAL	MODEL OF THE HUMAN BODY=	5HANA-EP64
TICS DEVELOPMENTAL TEST	MODEL 22= SEAT BACK-PASSENGER-IMPACT	7SIFU-SS58
NT, ULTIMATE LOAD TEST,	MODEL 240 AIRPLANE= FUSELAGE - FLOOR	1JENS-NA46
ARRIVE AT RATINGS OF 52	MODELS= AUTO SEAT BELTS, A SWEDISH G	8CONS-U 92
TS STANDARD ON '64 AUTO	MODELS= SEAT BEL	8SEAT-BS63
MECHANISMS OF INJURY IN	MODERN LIGHTPLANE CRASHES=	6PEAR-RG62
STICS=	MODERN PASSENGER CAR RIDE CHARACTERI	5SCHI-R 41
	MODERN SEATING=	7MODE-S 39
RASH INJURY BULLETIN.	MODIFICATIONS TO THE PASSENGER SEAT	8ROBE-SH62
E SYSTEM, EVALUATION OF	MODIFIED HEAD-REST INSTALLED BY A4D	7BACA-GA60
VIVAL SYSTEM=	MODULAR RESTRAINT, RECOVERY, AND SUR	1STEN-AE62
APS, CENTER OF GRAVITY,	MOMENT OF INERTIA AND SURFACE AREA O	5WEIN-AP38

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TER OF GRAVITY AND MASS	**MOMENT** OF INERTIA OF THE HUMAN BODY	5SIED-RR62
THE LIVING HUMAN BODY=	**MOMENTS** OF INERTIA AND CENTERS OF GR	5SANT-WR63
ELTS IS RAPIDLY GAINING	**MOMENTUM=** LATCHING ON, DEMAND FOR AU	2DUBO-PC62
	MONROE E-Z-RIDE TRUCK SEAT=	7MONR-AE
AT PRESSURE PAD - FIRST	**MONTHLY** PROGRESS REPORT= SE	7GUIL-FA47
REVEALED BY HIGH SPEED	**MOTION** PICTURE= REACTIONS OF THE HUM	6BIER-HR46
ESTRAINT DURING IMPACT=	**MOTIONS** OF THE HEAD AND TRUNK ALLOWE	SWEA-JJ56
BELT THAT REACTS TO CAR	**MOTIONS=** SAFETY	8SAFE-BT63
HUMAN BEINGS AND THE	**MOTOR** CAR=	5BREE-C 38
VENESS= SAFETY BELTS IN	**MOTOR** CARS. AN ASSESSMENT OF THEIR	8MORE-JD62
USE OF SAFETY BELTS IN	**MOTOR** CARS= INJURY REDUCTION BY THE	8HERB-DC60
OF SEAT BELT USE AMONG	**MOTOR** VEHICLE FLEET OPERATORS, WHO A	5NATI-SC60
NDS TEST PROCEDURES FOR	**MOTOR** VEHICLE LAP BELTS= SAE RECOMME	8SOCI-AE91
FOR AN INITIAL FEDERAL	**MOTOR** VEHICLE SAFETY STANDARD ON MAN	8AUTO-MA66
FOR AN INITIAL FEDERAL	**MOTOR** VEHICLE SAFETY= A PROPOSAL	7AUTO-MA91
SAE	**MOTOR** VEHICLE SEAT BELT ACTIVITIES=	8NEFF-RJ65
ENGTH REQUIREMENTS SAE=	**MOTOR** VEHICLE SEAT BELT ANCHORAGE GE	MOTO-VS62
OMMENDED PRACTICE FIXES	**MOTOR** VEHICLE SEAT BELT ANCHORAGE GE	8NEW -RP62
	MOTOR VEHICLE SEAT BELT ANCHORAGE=	8SOCI-AE93
	MOTOR VEHICLE SEAT BELT ANCHORAGE=	8SOCI-AE95
E RECOMMENDED PRACTICE=	**MOTOR** VEHICLE SEAT BELT ASSEMBLIES,	8SOCI-AE92
	MOTOR VEHICLE SEAT BELTS=	8CANA-SA63
N INTO SAFETY BELTS FOR	**MOTOR** VEHICLES USING A TEST DUMMY AN	WILL-JH62
AND SAFETY HARNESS FOR	**MOTOR** VEHICLES, INCLUDING NATIONAL S	8EIFF-AL61
SAFETY BELTS FOR	**MOTOR** VEHICLES=	8KEIL-E 62
EAT BELT ASSEMBLIES FOR	**MOTOR** VEHICLES= S	8BRIT-SI61
OCCUPANT PROTECTION IN	**MOTOR** VEHICLES= SAFE AND UNSAFE UPPE	8STAT-JD65
EAT BELTS IN PREVENTING	**MOTOR-VEHICLE** INJURIES= HAZARDS TO H	6FRAZ-RG61
SAFETY BELTS FOR	**MOTORCARS=**	8ODEL-B 57
THE SAFETY THE	**MOTORIST** GETS=	1FARL-NE59
ETSAND SAFETY BELTS FOR	**MOTORISTS.=** NOTES ON THE MECHANICAL	6ZIFF-D 65
NEW HARNESS LETS YOU	**MOVE** FREELY=	8NEW -HL55
FECT OF SEAT HARNESS ON	**MOVEMENT** OF CAR OCCUPANT IN A HEAD-O	8GRIM-G 91
FECT OF SEAT HARNESS ON	**MOVEMENT** OF CAR OCCUPANTS IN A HEADO	1GRIM-G 63
RT OF THE HUMAN BODY IN	**MOVING** VEHICLES AND RECENT DEVELOPME	7MCCO-CE47
WE	**MUST** MAKE A DECISION=	1PALM-FC65
GN FOR CRASH WORTHINESS	**NACA=** SEAT DESI	7PINK-II57
ESS REPORT OF THE JOINT	**NATIONAL** EDUCATIONAL SEAT BELT PROGR	8LHOT-DC61
AUTOMOBILE INJURIES, A	**NATIONAL** EPIDEMIC=	6FISH-P 91
IUM= PROCEEDINGS OF 2ND	**NATIONAL** FLIGHT SAFETY SURVIVAL AND	1SPAC-FE64
LEET OPERATORS, WHO ARE	**NATIONAL** SAFETY COUNCIL MEMBERS= FIN	5NATI-SC60
TOR VEHICLES, INCLUDING	**NATIONAL** SPECIFICATIONS AND STANDARD	8EIFF-AL61
THE	**NATURE** OF FATIGUE=	5DILL-DB33
AL ACCELERATIONS DURING	**NAVY** CENTRIFUGE SIMULATION OF EJECTI	1CLAR-CC61
E PRESENT STATUS OF THE	**NAVY** FATIGUE RELIEVING PNEUMATIC SEA	7HANN-TD58
AE SUBCOMMITTEE STUDIES	**NEED** FOR DYNAMIC TESTING OF SEAT BEL	8SOCI-AE94
SAFETY BELTS IN HEAVIES	**NEED** RESEARCH=	8GUTT-JM65
BELTS AND CONTRIBUTORY	**NEGLIGENCE=** SEAT	8SEAT-BA67
	NEW HARNESS LETS YOU MOVE FREELY=	8NEW -HL55
TRENDS AND A SURVEY OF	**NEW** JERSEY EXPERIENCE ACIR= A REVIEW	CAMP-BJ93
CAR SAFETY STUDIES= A	**NEW** LABORATORY DEVICE FOR PASSENGER	1CICH-WG63

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		ENTRY CODE*
ENGTH REQUIREMENTS SAE=	**NEW** RECOMMENDED PRACTICE FIXES MOTOR	8NEW -RP62
DOWN PEAK RESULTS WITH	**NEW** SEAT BELT= GATEWAY CHEMICALS BOC	2GATE-CB66
ER HARNESS PROMOTION=	**NEW** STEP TOWARD AUTO SAFETY. SHOULD	8NEW -ST62
CCIDENT INVESTIGATIONS=	**NEW** TECHNIQUES FOR ASSESSING DAMAGE	1GREG-LW63
ON OF= CONVENTIONAL AND	**NEW** TYPE FLIGHT RESTRAINT EQUIPMENT,	1HUNT-H 55
CONVENTIONAL AND	**NEW** TYPE FLIGHT RESTRAINT EQUIPMENT=	9SNYD-RZ58
RNESS TYPE SAFETY BELT=	**NEW** YORK LAW REGARDING ADULT'S SHOUL	3AUTO-MA64
NDUCTED IN WISCONSIN BY	**NEW** YORK STATE YIELDS CLUES= HOW WIL	5SCOT-BY63
HOOL BUSES DISCUSSED IN	**NEW** YORK= VALUE OF SEAT BELTS IN SC	8VALU-SB66
AIRCRAFT SERVICE CHANGE	**NO.** 157C FOR ACCEPTABLE HEAD POSITIO	7BACA-GA60
LT EFFECTIVENESS IN THE	**NON-EJECTION** SITUATION= SEAT BE	CAMP-BJ94
. OWNER EXPERIENCE AND	**NON-OWNER** ATTITUDES= A SURVEY OF AUT	8AYER-WH56
F INJURIES TO USERS AND	**NON-USERS** OF SAFETY BELTS. SAFETY B	6TOUR-B 60
SAFETY BELTS ARE	**NOT** DANGEROUS=	8DEBO-EF52
Y BELTS FOR MOTORISTS.=	**NOTES** ON THE MECHANICAL RESISTANCE O	6ZIFF-D 65
	NYLON SAFETY STRAPS=	8NYLO-SS61
EXAMINATION OF	**NYLON** SEAT HARNESS WEBBING=	BAYL-CH58
A COMPARISON OF DACRON,	**NYLON,** AND COTTON= SHOULDER HARNESS	8DARR-J 53
VELOPMENT OF COTTON AND	**NYLON,** KNITTED CLOTH WITH ELASTIC ST	1BROC-HE64
RIPTION OF SOME RESULTS	**OBTAINED** WITH THE PILOT'S SEAT OF TH	7HENR-JP45
VEHICLE CRUSH AND	**OCCUPANT** BEHAVIOR=	1MART-DE67
SEAT BACKS= STANDARD ON	**OCCUPANT** IMPACT PROTECTION FOR PASSE	7AUTO-MA92
NESS ON MOVEMENT OF CAR	**OCCUPANT** IN A HEAD-ON COLLISION HRB=	8GRIM-G 91
TAL STUDY= STOPPING THE	**OCCUPANT** OF A CRASHING VEHICLE, A FU	1EGLI-A 67
ROTECTIVE DEVICE FOR AN	**OCCUPANT** OF A VEHICLE= A P	1SANT-V 65
ER TORSO RESTRAINTS FOR	**OCCUPANT** PROTECTION IN MOTOR VEHICLE	8STAT-JD65
SEATS= RESEARCH IN	**OCCUPANT** SAFETY, DYNAMIC TESTING OF	7LEDE-J 59
N= THE PACKAGING OF CAR	**OCCUPANTS** - A BRITISH APPROACH TO SE	7BABB-FW65
NESS ON MOVEMENT OF CAR	**OCCUPANTS** IN A HEADON COLLISION= EFF	1GRIM-G 63
JURIES SUSTAINED BY CAR	**OCCUPANTS=** CAR SEAT BELTS--AN ANALYS	6LIST-RD63
AL CHEST BELTED VEHICLE	**OCCUPANTS=** IMPACT DYNAMICS OF UNREST	PATR-LM66
S OF ACCELERATION WHICH	**OCCUR** IN FLYING= CONCERNING HUMAN TO	6RUFF-S 92
S OF ACCELERATION WHICH	**OCCUR** IN FLYING= ON RESISTANCE IN ME	6RUFF-S 93
AFT ACCIDENTS= THE RARE	**OCCURRENCE** OF INTERNAL ABDOMINAL INJ	6CRAS-IR47
AL IMPACT WITH LAP BELT	**ONLY=** HUMAN TOLERANCE TO LATER	6ZABO-AV91
ABLES IN THE DESIGN AND	**OPERATION** OF HIGHWAY TRANSPORT EQUIP	5HUMA-VI52
ITIES IN THE DESIGN AND	**OPERATIONOF** VEHICULAR EQUIPMENT= HUM	5MCFA-RA53
ONG MOTOR VEHICLE FLEET	**OPERATORS,** WHO ARE NATIONAL SAFETY C	5NATI-SC60
HWAY PATROL REPORTS AND	**OPINIONS** ON 54,348 AUTOMOBILE ACCIDE	8TOUR-B 91
HWAY PATROL REPORTS AND	**OPINIONS** ON 54,348 AUTOMOBILE ACCIDE	8TOUR-B 93
FEATURES, STANDARD VS.	**OPTIONAL** EQUIPMENT ON AN AUTOMOTIVE	1LEE -H 59
ARE	**ORDINARY** SEAT BELTS ENOUGH.=	8SHAR-JE64
SEMBLIES= INTERNATIONAL	**ORGANIZATION** FOR STANDARDIZATION, RE	8FRED-RH65
CIDENTS= CONCERNING THE	**ORIGIN** OF SEVERE INTERNAL INJURIES I	6RUFF-S 91
ON OF AUTOMOBILE SEATS=	**ORTHOPEDIC** ASSUMPTION FOR THE CONSTR	8THOM-W 59
THE USE OF	**OSCAR** IN SEAT DESIGN=	SOCI-AE54
IMPACT CONDITIONS, AND	**OTHER** ABSTRACTS= BEHAVIOR OF TEXTILE	MORG-H 55
NMENT= SEATING AND	**OTHER** ASPECTS OF THE DRIVER'S ENVIRO	7NEYH-AE47
URY FROM SAFETYBELTS OR	**OTHER** CAUSES IN SERIOUS AIRCRAFT ACC	6CRAS-IR47

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INSURANCE FIRM STUDIES	**OTHER** FEATURES= SEAT BELTS PASSE.	8SEAT-BP61
N= SAFETY HARNESS AND	**OTHER** PROTECTIVE DEVICES FOR CHILDRE	1SAFE-HA66
N= SAFETY HARNESS AND	**OTHER** PROTECTIVE DEVICES FOR CHILDRE	8SAFE-HA66
	OTHER RELEVANT SAFETY EQUIPMENT=	9MASC-JK62
EYE-BALLS IN, EYE-BALLS	**OUT)=** PASSENGER TOLERANCE TO TRANSVE	6DELV-RJ63
RKS= A BIBLIOGRAPHY AND	**OVERVIEW** OF HUMAN FACTORS REFERENCE	4RONC-PG63
UTOMOTIVE SEAT BELTS.	**OWNER** EXPERIENCE AND NON-OWNER ATTIT	8AYER-WH56
ACH TO SEAT DESIGN= THE	**PACKAGING** OF CAR OCCUPANTS - A BRITI	7BABB-FW65
THE HUMAN	**PACKAGING** PROBLEM=	1SMIT-AC54
COLLISION PROJECT CAR.=	**PACKAGING** THE PASSENGER, DESIGN FOR	1CRAN-FJ62
	PACKAGING THE PASSENGER=	1DEHA-H 92
SEAT PRESSURE	**PAD** - FIRST MONTHLY PROGRESS REPORT=	7GUIL-FA47
FATIGUE TEST OF CUSHION	**PAD** SUPPORTS=	7FORD-MC47
SOLITE' AS A PROTECTIVE	**PADDING** MATERIAL AND THE DEVELOPMENT	1SMIT-MD54
PENDIUM OF ABSTRACTS OF	**PAPERS** AT THE SYMPOSIUM ON BIOMECHAN	1HEND-E 61
UELQUES PROBLEMES POSES	**PAR** LES SIEGES DE VOITURES= Q	7WISN-A 61
RASH INJURY BULLETIN.	**PART** I - ATTACHMENT OF SEAT BELTS IN	7ROEG-HF60
INTHE HU-1A HELICOPTER,	**PART** II - STOWAGE OF EQUIPMENT UNDER	7ROEG-HF60
KET-SLED EXPERIMENTS.	**PART** II. DYNAMIC RESPONSE OF RESTRA	NICH-G 64
S AT HIGH STRAIN RATES,	**PART** VI, THE PROPAGATION OF PLASTIC	TAPL-BD60
FEATURES= SEAT BELTS	**PASSE.** INSURANCE FIRM STUDIES OTHER	8SEAT-BP61
THE AIR BAG SEAT FOR	**PASSENGER** AIRCRAFT=	9LAMM-AC61
OF CELLULAR RUBBER FOR	**PASSENGER** CAR CUSHIONING= PROPERTIES	7ELDE-HE35
MODERN	**PASSENGER** CAR RIDE CHARACTERISTICS=	5SCHI-R 41
W LABORATORY DEVICE FOR	**PASSENGER** CAR SAFETY STUDIES= A NE	1CICH-WG63
T IMPACT PROTECTION FOR	**PASSENGER** CAR SEAT BACKS= STANDARD O	7AUTO-MA92
A STUDY OF	**PASSENGER** CAR SEATING=	7LANG-EW48
SURVIVAL--AIRPLANE AND	**PASSENGER** CAR= ACCIDENT	1DEHA-H 91
T BELT INSTALLATIONS IN	**PASSENGER** CARS= A PROPOSAL FOR AN IN	8AUTO-MA66
F COMPANY LITERATURE=	**PASSENGER** COMFORT. A BIBLIOGRAPHY O	4LIPP-S 91
SHES= ACCELERATIONS AND	**PASSENGER** HARNESS LOADS MEASURED IN	EIBA-AM53
OBLEMS= SOME ASPECTS OF	**PASSENGER** RESTRAINING DEVICES AND SA	1WHIT-AJ57
DYNAMIC RESEARCH OF	**PASSENGER** RESTRAINING DEVICES=	1SCHR-DJ66
MIC TESTS OF AUTOMOBILE	**PASSENGER** RESTRAINING DEVICES= DYNA	MICH-I 63
DYNAMICS OF AUTOMOTIVE	**PASSENGER** RESTRAINT SYSTEMS= ANALYSI	AVIA-CI63
N DYNAMIC ENVIRONMENTS=	**PASSENGER** SAFETY AND COMFORT CRITERI	1SCHM-RV61
E DESIGN IN RELATION TO	**PASSENGER** SAFETY= AUTOMOBIL	1GRIM-G 64
. MODIFICATIONS TO THE	**PASSENGER** SEAT BELT TIEDOWN ATTACHME	8ROBE-SH62
IVAL= AIRCRAFT	**PASSENGER** SEAT DESIGN AND CRASH SURV	7FRYE-DI58
THE CONVAIR 880=	**PASSENGER** SEAT DESIGN AS APPLIED TO	7BECK-LC59
NG DISTANCE= DRIVER AND	**PASSENGER** SEATING REQUIREMENTS FOR L	7ADAM-AJ65
ACTERISTICS= AUTOMOBILE	**PASSENGER** SEATING REQUIREMENTS. DES	7BELG-WJ63
DESIGNING	**PASSENGER** SEATS FOR CRASH SURVIVAL=	7BREH-WH62
ATIONS IN THE DESIGN OF	**PASSENGER** SEATS FOR TRANSPORT AIRCRA	7DEHA-H 52
RD FACING AIR TRANSPORT	**PASSENGER** SEATS= A COMPARISON OF THE	7KIRC-OE91
TATISTICS AID DESIGN OF	**PASSENGER** SEATS= ANATOMY AND S	7MORR-CW47
WARD VS REARWARD FACING	**PASSENGER** SEATS= ECONOMIC CONSIDERAT	2DUGG-BC61
LLS IN, EYE-BALLS OUT)=	**PASSENGER** TOLERANCE TO TRANSVERSE AC	6DELV-RJ63
CIFICATION, BELT, SEAT,	**PASSENGER** TYPE, AUTOMOTIVE= FEDERAL	7GENE-SA60
HUMAN BODY SIZE AND	**PASSENGER** VEHICLE DESIGN=	5MCFA-RA60
DYNAMICS OF AUTOMOBILE	**PASSENGER-RESTRAINT** SYSTEMS= ANALYSI	MCHE-RR65

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ECT CAR.= PACKAGING THE	PASSENGER, DESIGN FOR COLLISION PROJ	1CRAN-FJ62
PACKAGING THE	PASSENGER=	1DEHA-H 92
ECTION OF AIR TRANSPORT	PASSENGERS BY IMPROVED SEAT MATERIAL	7STAP-JP61
ABSORBER SEATS FOR JET	PASSENGERS= AEROMED FACILITY STUDIES	7AERO-PS59
DICAL EVACUATION LITTER	PATIENT SAFETY HARNESS= AEROME	8STIN-NE57
S OF CALIFORNIA HIGHWAY	PATROL REPORTS AND OPINIONS ON 54,34	8TOUR-B 91
S OF CALIFORNIA HIGHWAY	PATROL REPORTS AND OPINIONS ON 54,34	8TOUR-B 93
SAFETY DESIGN ON INJURY	PATTERNS= PRELIMINARY FINDINGS OF TH	6BRAU-PW92
CHEMICALS BOCKLES DOWN	PEAK RESULTS WITH NEW SEAT BELT= GAT	2GATE-CB66
TOLERANCE OF THE HUMAN	PECTORAL GIRDLE TO RAPID DECELERATIO	6FASO-A 50
POSITION IN RELATION TO	PELVIC STRESS= SITTING	5LOWM-CL41
SAFETY BELT WITH	PENDULUM CONTROL=	8SAFE-BW63
DESIGNING FOR	PEOPLE=	5DREY-H
SEATS FOR	PEOPLE=	7DREY-H 60
ONTROLLED IMPACT TESTS=	PERFORMANCE OF SEAT BELT ASSEMBLIES	LIST-RD63
ETING= MINUTES OF THE	PERSONAL EQUIPMENT ADVISORY GROUP ME	1SANT-AM65
GHT SAFETY SURVIVAL AND	PERSONAL EQUIPMENT SYMPOSIUM= PROCEE	1SPAC-FE64
RASH-SURVIVAL DESIGN IN	PERSONAL, EXECUTIVE= DEVELOPMENT OF	1DEHA-H 93
	PERSONNEL ACCOMMODATIONS XB-70A=	KOCH-RJ66
TESTS OF	PERSONNEL RESTRAINING DEVICES=	KELL-AH64
EM DYNAMICS=	PERSONNEL RESTRAINT AND SUPPORT SYST	PAYN-PR65
LES= INVESTIGATION OF A	PERSONNEL RESTRAINT SYSTEM FOR ADVAN	6FREE-HE62
EVALUATION, SUPPLEMENT=	PERSONNEL RESTRAINT SYSTEM STUDY, CH	PAYN-PR64
RAM TO DEVELOP A 60 'G'	PERSONNEL RESTRAINT SYSTEM= A RESEAR	1FREE-HE62
NG THE DESIGN OF A 60 G	PERSONNEL RESTRAINT SYSTEM= CONSIDER	1BOYC-WC61
ELICOPTERS, SUPPLEMENT=	PERSONNEL RESTRAINT SYSTEMS STUDY UH	1AVIA-SE91
CH-47 VERTOL CHINOOK=	PERSONNEL RESTRAINT SYSTEMS STUDY.	1HALE-JL64
ASIC CONCEPTS=	PERSONNEL RESTRAINT SYSTEMS STUDY. B	1HALE-JL62
RASH INJURY EVALUATION.	PERSONNEL RESTRAINT SYSTEMS STUDY. U	6HALE-JL91
ASIC CONCEPTS=	PERSONNEL RESTRAINT SYSTEMS STUDY, B	1FLIG-SF62
ALUATION, SUPPLEMENT TO	PERSONNEL RESTRAINT SYSTEMS STUDY, C	1AVIA-SE92
	PERSONNEL RESTRAINT SYSTEMS=	1DEHA-C 62
AFETY, MAINTAINABILITY,	PERSONNEL SUBSYSTEM, LIFE SCIENCES,	4PETE-GA93
AFETY, MAINTAINABILITY,	PERSONNEL SUBSYSTEM, LIFE SCIENCES,.	4PETE-GA91
AUTO SEAT BELTS, A	PERSPECTIVE VIEW=	8CONS-U 91
ESS MOCK-UP=	PHOTO AND CAPTION RELEASE OF HV HARN	8HASB-AH56
BIBLIOGRAPHY OF APPLIED	PHYSICAL ANTHROPOLOGY IN HUMAN ENGIN	4HANS-R 58
	PHYSICAL ANTHROPOLOGY IN THE A.A.F.=	5DAMO-A 44
ED FLIGHT SYSTEMS= CREW	PHYSICAL SUPPORT AND RESTRAINT IN AD	1SMED-HA61
R COMFORT.=	PHYSICAL VARIABLES INFLUENCING DRIVE	5MCFA-RA55
AT BELTS= THE ROLE OF A	PHYSICIAN'S INFLUENCE ON INSTALLATIO	8BASS-LW65
SSES=	PHYSIOLOGY OF SAFETY BELTS AND HARNE	8HITC-FA47
ED BY HIGH SPEED MOTION	PICTURE= REACTIONS OF THE HUMAN TO I	6BIER-HR46
MENT TEST MODEL F 106A=	PILOT EMERGENCY ESCAPE UPPER TORSO H	8KALO-JG56
EVALUATION OF THE C-118	PILOT SEAT (AEROTHERM)= COMFORT	7SLEC-RF93
VALUATION OF THE C-124A	PILOT SEAT (WEBER)= COMFORT E	7SLEC-RF94
TION OF THE C-97A/KC97E	PILOT SEAT (WEBER)= COMFORT EVALUA	7SLEC-RF92
R= ARMOR PROTECTION FOR	PILOT/COPILOT SEAT WITH CRASH SAFETY	7THOM-DF64
SULTS OBTAINED WITH THE	PILOT'S SEAT OF THE DOUGLAS BT2D BOM	7HENR-JP45

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NG HARNESS FOR AIRCRAFT	**PILOTS**= THE PRINCIPLES OF PROTECTION	1BIER-HR46
	PILOTS' HEAD SUPPORT=	1BENT-R 43
	PIRELLI RESILIENT WEBBING=	8PIRE-RW63
KENNINGTON	**PIVOTED** SEAT FRAME=	7KENN-PS36
RUPTURE DUE TO IMPROPER	**PLACEMENT** OF AUTOMOBILE SAFETY BELT=	6COCK-WM63
NDATION IMPACT WORK AND	**PLANS.**= AVIATION CRASH INJURY RESEAR	6KRAF-MA61
VI, THE PROPAGATION OF	**PLASTIC** WAVES IN FINITE CYLINDERS OF	TAPL-BD60
MENT AND MANUFACTURE OF	**PLASTICS** FOAM SEATS= DESIGN, DEVELOP	7GRIF-F 65
CELLULAR	**PLASTICS** IN AIRCRAFT SEAT DESIGN=	7LIPP-S 57
RUBBER AND	**PLASTICS** IN AUTOMOBILE SEATS=	7HARR-A 65
CT PROTECTION WITH FOAM	**PLASTICS**= IMPA	9DYE -ER58
STATIC TESTS OF	**PLYWOOD** SEAT ASSEMBLY=	7ROGE-K 43
ATION= EFFECTIVENESS OF	**PNEUMATIC** BELTS IN COUNTERACTING ACC	9POPP-JR38
NAVY FATIGUE RELIEVING	**PNEUMATIC** SEAT CUSHION= THE PRESENT	7HANN-TD58
DEVELOPMENT AND TEST OF	**PNEUMATIC** SEAT CUSHIONS.=	7HANN-TD57
RIVERS FROM A TECHNICAL	**POINT** OF VIEW= SAFETY BELTS FOR D	8HAES-A 62
LT INSTALLATION AND USE	**POLL**= SEAT BE	5SEAT-BI61
MATERIAL= PROPERTIES OF	**POLYURETHANE** FOAMS IN RELATION TO TH	7GLAI-DH61
QUELQUES PROBLEMES	**POSES** PAR LES SIEGES DE VOITURES=	7WISN-A 61
II, THE FORWARD FACING	**POSITION** AND THE DEVELOPMENT OF A CR	6STAP-JP91
S= SITTING	**POSITION** IN RELATION TO PELVIC STRES	5LOWM-CL41
ION WHEN IN THE SITTING	**POSITION**= MAN'S ABILITY TO WITHSTAND	6LAMB-EH45
F THE HUMAN BODY IN ANY	**POSITION**= METHOD OF PREDICTING CENTE	5SIED-RR62
TOLERANCE TO AUTOMATIC	**POSITIONING** AND RESTRAINT SYSTEMS FO	6CART-RL59
F AN AUTO-ADJUSTING AND	**POSITIONING** SINGLE DISCONNECT TORSO	9HOLC-GA60
57C FOR ACCEPTABLE HEAD	**POSITIONING**= A4D ESCAPE SYSTEM, EVAL	7BACA-GA60
D AND AFT FACING SEATED	**POSITIONS**= EVALUATION OF HUMAN SUBJE	7NOBL-H 61
D FORWARD FACING SEATED	**POSITIONS**= HUMAN EXPOSURE TO LINEAR	7STAP-JP51
BELT INSTALLATIONS AND	**POSSIBLE** SOLUTIONS= PROBLEMS WITH TH	8SHAR-JE65
OF HEAD AND FACE INJURY	**POTENTIAL** OF CURRENT AIRLINE SEATS D	6SWEA-JJ66
MILITARY AND COMMERCIAL	**POTENTIALS**= THE ANTHROPOMETRIC SURVE	5HERT-HT59
N TOLERANCE EVALUATION=	**POWERED** TORSO HARNESS. MECHANICAL S	GRAY-RF63
TS SAE= NEW RECOMMENDED	**PRACTICE** FIXES MOTOR VEHICLE SEAT BE	8NEW -RP62
S= THEORY AND	**PRACTICE** IN THE USE OF SCALE MANIKIN	RAND-FE49
MBLIES, SAE RECOMMENDED	**PRACTICE**= MOTOR VEHICLE SEAT BELT AS	8SOCI-AE92
ETY BELTS. BACK TO THE	**PRAM**= SAF	8SAFE-BB62
EXPERIMENTAL SYSTEM OF	**PRE-EJECTION** BODY RESTRAINT= AN	1FITZ-JG62
ANY POSITION= METHOD OF	**PREDICTING** CENTER OF GRAVITY AND MAS	5SIED-RR62
.= IMPACT INJURY TO THE	**PREGNENT** FEMALE AND FETUS IN LAP BEL	5SNYD-RG66
IGN ON INJURY PATTERNS=	**PRELIMINARY** FINDINGS OF THE EFFECT O	6BRAU-PW92
SH SURVIVAL ANALYSES -	**PRELIMINARY** REPORT= UH-1D AIRCREW AR	REED-JL65
URVEY=	**PRELIMINARY** SEAT BELT INSTALLATION S	8CAMP-BJ91
S SAE JOURNAL=	**PRELIMINARY** STUDY OF RIDING QUALITIE	5BRAN-GC30
MATIC SEAT CUSHION= THE	**PRESENT** STATUS OF THE NAVY FATIGUE R	7HANN-TD58
G SEAT BELT BUSINESS IS	**PRESENTING** PROBLEMS FOR AUTOMAKERS=	2MCDO-D 62
EEL INJURY OF THE LIVER	**PRESENTS** GROWING SURGICALPROBLEM= ST	6STEE-WI66
CHRYSLER	**PRESS** INFORMATION SERVICE=	8CHRY-PI61
GN AND DEVELOPMENT OF A	**PRESSURE** AND CYCLE CONTROL FOR DYNAM	7BURN-HL58
S REPORT= SEAT	**PRESSURE** PAD - FIRST MONTHLY PROGRES	7GUIL-FA47
IS OF SITTING AREAS AND	**PRESSURES** OF MAN= AN ANALYS	7SWEA-JJ62
VENESS OF SEAT BELTS IN	**PREVENTING** MOTOR-VEHICLE INJURIES= H	6FRAZ-RG61

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		ENTRY CODE*
	PREVENTION OF INJURIES DUE TO CRASH=	6SCHR-HA51
R AVIATION CRASH INJURY	PREVENTION.= BIBLIOGRAPHY OF IMPACT	4CAMB-L 63
EERING FOR CRASH INJURY	PREVENTION.= SAFETY ENGIN	6HALE-JL92
FETY SEATING FOR INJURY	PREVENTION= THE DEVELOPMENT OF SA	7HICT-BC66
	PRINCIPLES OF CUSHIONING DESIGN=	7WHAR-TP60
OR AIRCRAFT PILOTS= THE	PRINCIPLES OF PROTECTION OF THE HUMA	1BIER-HR46
ORTABLE SEATS= THE MAIN	PRINCIPLES OF RESTFUL SITTING AND TH	7AKER- 51
E AIRCRAFT=	PRINCIPLES OF SEATING IN FIGHTER TYP	7PATT-DI
T CUSHIONS AND THE RIDE	PROBLEM SAE= SEA	7PATO-CR40
THE HUMAN PACKAGING	PROBLEM=	1SMIT-AC54
ITURES= QUELQUES	PROBLEMES POSES PAR LES SIEGES DE VO	7WISN-A 61
RENT AUTOMOTIVE SEATING	PROBLEMS AND DESIGNS= CUR	7SOCI-AE50
RENT AUTOMOTIVE SEATING	PROBLEMS AND DESIGNS= CUR	7SOCI-AE51
PMENT AND HUMAN- SIZING	PROBLEMS C.A.A.= ANTHROPOMETRIC DATA	5KING-BG51
BUSINESS IS PRESENTING	PROBLEMS FOR AUTOMAKERS= GROWING SEA	2MCDO-D 62
AND POSSIBLE SOLUTIONS=	PROBLEMS WITH THE THREE-POINT BELT I	8SHAR-JE65
INJURIES. ASPECTS AND	PROBLEMS= HEAD	6OMMA-AK63
CES AND SAFETY RESEARCH	PROBLEMS= SOME ASPECTS OF PASSENGER	1WHIT-AJ57
TS= SAE RECOMMENDS TEST	PROCEDURES FOR MOTOR VEHICLE LAP BEL	8SOCI-AE91
SEAT BELT DYNAMIC TEST	PROCEDURES= ANALYSIS OF	MCHE-RA62
AND FIELD DEMONSTRATION	PROCEEDINGS OF THE SIXTH CONFERENCE=	1STAP-CC63
ASH CONFERENCE=	PROCEEDINGS OF THE 10TH STAPP CAR CR	1STAP-CC66
AL EQUIPMENT SYMPOSIUM=	PROCEEDINGS OF 2ND NATIONAL FLIGHT S	1SPAC-FE64
CAR CRASH CONFERENCE.	PROCEEDINGS=THE 7TH STAPP	1STAP-CC65
. IN SAVING A LIFE MAY	PRODUCE INTRA-ABDOMINAL INJURIES= AU	8WILL-JS66
CASES= INJURY	PRODUCED BY SEAT BELTS. REPORT OF 2	6FISH-P 93
CRITICAL INJURIES	PRODUCED BY SEAT BELTS=	6FISH-P 92
TO AUTOMOTIVE SEATING=	PRODUCTION TRIM ENGINEERING AS APPLI	7GRAH-CH49
SAFETY SEAT BELT	PROGRAM ADOPTED=	8SAFE-SB62
AINT SYSTEM= A RESEARCH	PROGRAM TO DEVELOP A 60 'G' PERSONNE	1FREE-HE62
L EDUCATIONAL SEAT BELT	PROGRAM= A PROGRESS REPORT OF THE JO	8LHOT-DC61
RAINT SYSTEM EVALUATION	PROGRAM= MARTIN-BAKER MKGRU5 ESCAPE	NAVA-AT66
	PROGRESS IN SAFE VEHICLE DESIGN=	1FRED-RH62
AL SEAT BELT PROGRAM= A	PROGRESS REPORT OF THE JOINT NATIONA	8LHOT-DC61
URE PAD - FIRST MONTHLY	PROGRESS REPORT= SEAT PRESS	7GUIL-FA47
R, DESIGN FOR COLLISION	PROJECT CAR.= PACKAGING THE PASSENGE	1CRAN-FJ62
ON DEALERS IN EAST FIND	PROMOTION DEAL A GREAT PULLER-IN OF	2BARG-SB62
ES QUESTIONS= SEAT BELT	PROMOTION GETS GOOD RESULTS BUT RAIS	8BARN-B 62
APPROACHES TO SEAT BELT	PROMOTION= AN EXPERIMENTAL EVALUATIO	8BLOM-GW61
FETY. SHOULDER HARNESS	PROMOTION= NEW STEP TOWARD AUTO SA	8NEW -ST62
AIN RATES, PART VI, THE	PROPAGATION OF PLASTIC WAVES IN FINI	TAPL-BD60
	PROPER USE OF SPRING MATERIALS=	1ZIMM-FP48
SSENGER CAR CUSHIONING=	PROPERTIES OF CELLULAR RUBBER FOR PA	7ELDE-HE35
	PROPERTIES OF EXISTING SEAT BELTS=	8BAST-JC63
SEAT CUSHION MATERIAL=	PROPERTIES OF POLYURETHANE FOAMS IN	7GLAI-DH61
ES ON THE STRESS-STRAIN	PROPERTIES OF RESTRAINT WEBBING= EFF	HALE-JL91
SAE= ENGINEERING	PROPERTIES OF RUBBER IN COMPRESSION	5BROW-RW40
R VEHICLE SAFETY= A	PROPOSAL FOR AN INITIAL FEDERAL MOTO	7AUTO-MA91
NS IN PASSENGER CARS= A	PROPOSAL FOR AN INITIAL FEDERAL MOTO	8AUTO-MA66

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		ENTRY CODE*
	PROPRIETARY PROTECTIVE WEBS=	8PROP-PW61
IMPACT ATTENUATION IN	**PROTECTION** AGAINST CONCUSSION=	6SNIV-GG61
ORTATION FATALITIES AND	**PROTECTION** AGAINST REAR AND SIDE CRA	9CLAR-C 91
EFFECTIVE	**PROTECTION** BY A RESTRAINT SYSTEM=	1LOMB-CF65
SYSTEM= IMPACT	**PROTECTION** BY THE AIRSTOP RESTRAINT	9BLEC-C 65
LIMITS OF SEAT BELT	**PROTECTION** DURING ABRUPT TRANSVERSE=	8GUGG-AS61
S= LIMITS OF SEAT-BELT	**PROTECTION** DURING CRASH DECELERATION	8RUG-GM61
= ACCIDENT	**PROTECTION** FOR CHILDREN IN A VEHICLE	1VESZ-K 64
AUTOMOBILE CRASH	**PROTECTION** FOR CHILDREN=	1DYE -ER62
SEAT BELT	**PROTECTION** FOR CHILDREN=	8SEAT-BP63
DARD ON OCCUPANT IMPACT	**PROTECTION** FOR PASSENGER CAR SEAT BA	7AUTO-MA92
H-47A HELICOPTER= ARMOR	**PROTECTION** FOR PILOT/COPILOT SEAT WI	7THOM-DF64
CRASH	**PROTECTION** IN AIR TRANSPORTS=	1STAP-JP53
RESTRAINTS FOR OCCUPANT	**PROTECTION** IN MOTOR VEHICLES= SAFE A	8STAT-JD65
MATERIALS DESIGN= CRASH	**PROTECTION** OF AIR TRANSPORT PASSENGE	7STAP-JP61
LOTS= THE PRINCIPLES OF	**PROTECTION** OF THE HUMAN BODY AS APPL	1BIER-HR46
	PROTECTION OF THE HUMAN BODY=	1BIER-HR47
IMPACT	**PROTECTION** WITH FOAM PLASTICS=	9DYE -ER58
INT SYSTEM= IMPACT	**PROTECTION** WITH THE 'AIRSTOP' RESTRA	9CLAR-C 92
NAMIC STUDIES ON IMPACT	**PROTECTION=** BIODY	1ALDM-B 62
BODY RESTRAINT AND HEAD	**PROTECTION=** COMPENDIUM OF ABSTRACTS	1HEND-E 61
A VEHICLE= A	**PROTECTIVE** DEVICE FOR AN OCCUPANT OF	1SANT-V 65
ION=	**PROTECTIVE** DEVICES AGAINST ACCELERAT	1LEVE-SD61
ONSIDERED IN DEVELOPING	**PROTECTIVE** DEVICES FOR ARMY AVIATORS	5MCCO-FP58
AFETY HARNESS AND OTHER	**PROTECTIVE** DEVICES FOR CHILDREN= S	1SAFE-HA66
AFETY HARNESS AND OTHER	**PROTECTIVE** DEVICES FOR CHILDREN= S	8SAFE-HA66
CHILDREN'S	**PROTECTIVE** DEVICES=	1ALDM-B 63
WITH CRASH INJURIES AND	**PROTECTIVE** EQUIPMENT= ARMY EXPERIENC	6BEZR-AA61
OR U.S. ARMY AIRCREWMAN	**PROTECTIVE** HEADGEAR= IMPACT TEST MET	HALE-JL92
E ON THE MANUFACTURE OF	**PROTECTIVE** HELMETSAND SAFETY BELTS F	6ZIFF-D 65
TION OF 'ENSOLITE' AS A	**PROTECTIVE** PADDING MATERIAL AND THE	1SMIT-MD54
A	**PROTECTIVE** SEAT FOR CHILDREN=	7ALDM-B 66
BIO-ENGINEERING OF	**PROTECTIVE** SYSTEMS=	1GELL-CF60
PROPRIETARY	**PROTECTIVE** WEBS=	8PROP-PW61
UDY, DESIGN AND FURNISH	**PROTOTYPES** OF ENERGY ABSORPTION SYST	LANG-FC60
GN, DEVELOP AND FURNISH	**PROTOTYPES** OF ENERGY ABSORPTION SYST	7AERO-C 60
TATISCHE AND DYNAMISCHE	**PRUFUNG** FON SICHERHEITSGURTEN= S	KEIL-E 93
SEAT BELT ADVERTISING=	**PSYCHOLOGICAL** RESISTANCE TO SEAT BEL	5BLOM-GW61
TO LINEAR DECELERATION,	**PT.** II, THE FORWARD FACING POSITION	6STAP-JP91
PROMOTION DEAL A GREAT	**PULLER-IN** OF BUSINESS= BARGAIN SEAT	2BARG-SB62
D, T30= DEVELOPMENT AND	**QUALIFICATION** OF THRUSTER, CARTRIDGE	9KENT-SJ61
IMINARY STUDY OF RIDING	**QUALITIES** SAE JOURNAL= PREL	5BRAN-GC30
CHRYSLER RIDING	**QUALITY** ACCELEROMETER SAE JOURNAL=	5TEA -CA33
SYSTEM, LIFE SCIENCES,.	**QUALITY** ASSURANCE, AND RELIABILITY E	4PETE-GA91
BSYSTEM, LIFE SCIENCES,	**QUALITY** ASSURANCE, ANDRELIABILITY EN	4PETE-GA93
GES DE VOITURES=	**QUELQUES** PROBLEMES POSES PAR LES SIE	7WISN-A 61
O HELP ANSWER SEAT BELT	**QUESTION=** 'CRUNCHY' T	8CRUN-TH65
HV HARNESS AND REEL	**QUESTIONNAIRE=**	8AVIA-CI56
GOOD RESULTS BUT RAISES	**QUESTIONS=** SEAT BELT PROMOTION GETS	8BARN-B 62
=	**RAF** EXPERIENCE WITH SAFETY HARNESSES	8FRYE-DI62
N GETS GOOD RESULTS BUT	**RAISES** QUESTIONS= SEAT BELT PROMOTIO	8BARN-B 62

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		ENTRY CODE*
UMAN PECTORAL GIRDLE TO	**RAPID** DECELERATION= ANATOMICAL TOLER	6FASO-A 50
AINT WEBBING= EFFECT OF	**RAPID** LOADING RATES ON THE STRESS-ST	HALE-JL91
EVEL SAFETY BELTS=	**RAPID-DECELERATION** TESTS FOR CHEST-L	MATH-JH53
HE HUMAN TORSO TO LARGE	**RAPIDLY** APPLIED UPWARD ACCELERATIONS	6HESS-JL56
FOR AUTO SEAT BELTS IS	**RAPIDLY** GAINING MOMENTUM= LATCHING O	2DUBO-PC62
AIRCRAFT ACCIDENTS= THE	**RARE** OCCURRENCE OF INTERNAL ABDOMINA	6CRAS-IR47
EFFECT OF RAPID LOADING	**RATES** ON THE STRESS-STRAIN PROPERTIE	HALE-JL91
ATERIALS AT HIGH STRAIN	**RATES,** PART VI, THE PROPAGATION OF P	TAPL-BD60
DS TO HELP CU ARRIVE AT	**RATINGS** OF 52 MODELS= AUTO SEAT BELT	8CONS-U 92
DETERIORATION OF	**RCAF** SEAT HARNESS WEBBING=	8BAYL-CH54
CLUES= HOW WILL DRIVERS	**REACT** TO FACTORY-INSTALLED SEAT BELT	5SCOT-BY63
UATION OF HUMAN SUBJECT	**REACTION** IN THE FORWARD AND AFT FACI	7NOBL-H 61
HUMAN	**REACTION** TO MILITARY VEHICLE RIDE=	5STER-S 61
H SPEED MOTION PICTURE=	**REACTIONS** OF THE HUMAN TO IMPACT FOR	6BIER-HR46
HUMAN	**REACTIONS** TO VIBRATION SAE=	5JACK-HM36
SAFETY BELT THAT	**REACTS** TO CAR MOTIONS=	8SAFE-BT63
AND PROTECTION AGAINST	**REAR** AND SIDE CRASH LOADS BY THE AIR	9CLAR-C 91
ANSVERSE ACCELERATION (	**REAR** TO REAR) UTILIZING CONVENTIONAL	1MILL-CO57
E ACCELERATION (REAR TO	**REAR)** UTILIZING CONVENTIONAL AND SPE	1MILL-CO57
FOR CHILDREN=	**REAR-FACING** SEATS CALLED SAFEST TYPE	7REAR-FS66
DVANTAGES OF FORWARDVS.	**REARWARD** FACING AIR TRANSPORT PASSEN	7KIRC-OE91
TIONS I THE FORWARD VS	**REARWARD** FACING PASSENGER SEATS= ECO	2DUGG-BC61
RT ACCIDENT= FAILURE OF	**REARWARD** FACING SEATBACKS AND RESULT	7HASB-AH62
MATS ADOPTS	**REARWARD** SEATING=	7SELF-TM51
IN MOVING VEHICLES AND	**RECENT** DEVELOPMENTS IN SEAT CONSTRUC	7MCCO-CE47
ON FOR STANDARDIZATION,	**RECOMMENDATIONS** FOR SEAT BELT ASSEMB	8FRED-RH65
ERAL AVIATION AIRCRAFT=	**RECOMMENDATIONS** FOR SHOULDER RESTRAI	8YOUN-JW66
H REQUIREMENTS SAE= NEW	**RECOMMENDED** PRACTICE FIXES MOTOR VEH	8NEW -RP62
AT BELT ASSEMBLIES, SAE	**RECOMMENDED** PRACTICE= MOTOR VEHICLE	8SOCI-AE92
VEHICLE LAP BELTS= SAE	**RECOMMENDS** TEST PROCEDURES FOR MOTOR	8SOCI-AE91
MODULAR RESTRAINT,	**RECOVERY,** AND SURVIVAL SYSTEM=	1STEN-AE62
CRASH STUDY CAN	**REDUCE** CHANGES OF INJURY=	6DEHA-H 52
SHOCK ABSORBING SEAT	**REDUCES** INJURIES=	7SHOC-AS57
IN MOTOR CARS= INJURY	**REDUCTION** BY THE USE OF SAFETY BELTS	8HERB-DC60
HV HARNESS AND	**REEL** QUESTIONNAIRE=	8AVIA-CI56
FLIGHT TESTS OF INERTIA	**REEL** SHOULDER HARNESS TAKE-UP MECHAN	AMER-SC63
TRAINT SYSTEM=	**REEL-O-MATIC** 'SAM BROWNE' SAFETY RES	8PACI-SC92
SS=	**REEL-O-MATIC** DUAL STRAP SAFETY HARNE	8PACI-SC93
	REEL-O-MATIC SAFETY HARNESS=	8PACI-SC91
STS OF TELEFLEX INERTIA	**REELS** AND HARNESSES= DYNAMIC TE	CHIS-SW59
FOR TESTING OF INERTIA	**REELS** FOR HARNESSES= REQUIREMENTS	ALDM-B 65
MOBILE SAFETY BELT WITH	**REFERENCE** TO HUMAN TOLERANCE= EVALUA	8STAP-JP58
ERVIEW OF HUMAN FACTORS	**REFERENCE** WORKS= A BIBLIOGRAPHY AND	4RONC-PG63
FETY BELT= NEW YORK LAW	**REGARDING** ADULT'S SHOULDER HARNESS T	3AUTO-MA64
= BARRIER COLLISION AND	**RELATED** IMPACT SLED TESTS ON BUSSES	1LABE-DJ65
STUDY OF THE VARIABLES	**RELATED** TO EFFECTIVE SEAT BELT ADVER	5BLOM-GW61
NTS= INJURY SEVERITY AS	**RELATED** TO SEAT TIEDOWN AND BELT FAI	6PEAR-RG61
ANTHROPOMETRIC DATA IN	**RELATION** TO EQUIPMENT AND HUMAN- SIZ	5KING-BG51
AUTOMOBILE DESIGN IN	**RELATION** TO PASSENGER SAFETY=	1GRIM-G 64

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SITTING POSITION IN	**RELATION** TO PELVIC STRESS=	5LOWM-CL41
F POLYURETHANE FOAMS IN	**RELATION** TO THEIR USE AS EJECTION SE	7GLAI-DH61
N LIGHTPLANE ACCIDENTS=	**RELATIONSHIP** BETWEEN IMPACT VARIABLE	6CORN-GA61
CRASH ENERGY, AND THEIR	**RELATIONSHIP** TO CRASH INJURY= CRASH	6DEHA-H 60
PHOTO AND CAPTION	**RELEASE** OF HV HARNESS MOCK-UP=	8HASB-AH56
AGE, AND/OR INADVERTENT	**RELEASE**= SAFETY BELT (BUCKLE) SLIPP	8HASB-AH55
OTHER	**RELEVANT** SAFETY EQUIPMENT=	9MASO-JK62
QUALITY ASSURANCE, AND	**RELIABILITY** ENGINEERING= SOURCES OF	4PETE-GA91
TUS OF THE NAVY FATIGUE	**RELIEVING** PNEUMATIC SEAT CUSHION= TH	7HANN-TD58
SAFETY CONFERENCE=	**REMARKS** TO MEETING OF THE GOVERNORS'	2ACKE-PC58
CE IN IMPACT LOADING. A	**REPORT** BIBLIOGRAPHY 1953-SEPTEMBER 1	4DEFE-DC62
CRASH INJURY. A	**REPORT** BIBLIOGRAPHY=	4ASTI- 62
AND SAFETY MEASURES. A	**REPORT** BIBLIOGRAPHY= ACCIDENTS	4SILU-MB62
SEAT DESIGN CRITERIA.	**REPORT** OF CRASH INJURYEVALUATION= MI	6ACIR-FS62
AUTOMOBILE ACCIDENTS= A	**REPORT** OF SAFETY BELTS TO THE CALIFO	8TOUR-B 93
ELT PROGRAM= A PROGRESS	**REPORT** OF THE JOINT NATIONAL EDUCATI	8LHOT-DC61
ODUCED BY SEAT BELTS.	**REPORT** OF 2 CASES=INJURY PR	6FISH-P 93
A BRIEF	**REPORT** ON CAR COLLISIONS=	TAKA-J 65
S AND SMALL CHILDREN= A	**REPORT** ON CONSIDERATIONS OF SEAT BEL	8NEFF-RJ61
AUTOMOBILE ACCIDENTS= A	**REPORT** ON SAFETY BELTS TO THE CALIFO	8TOUR-B 91
YSTEM= DEVELOPMENT TEST	**REPORT** RESTRAINT SYSTEM CAPSULE ESCA	1HOLC-GA61
COUNCIL MEMBERS= FINAL	**REPORT--SURVEY** OF SEAT BELT USE AMON	5NATI-SC60
FINAL	**REPORT**=	5MCCO-IN56
	REPORT=	9NICH-G 55
FIRST MONTHLY PROGRESS	**REPORT**= SEAT PRESSURE PAD -	7GUIL-FA47
ANALYSES - PRELIMINARY	**REPORT**= UH-1D AIRCREW ARMORED SEAT.	REED-JL65
LIFORNIA HIGHWAY PATROL	**REPORTS** AND OPINIONS ON 54,348 AUTOM	8TOUR-B 91
LIFORNIA HIGHWAY PATROL	**REPORTS** AND OPINIONS ON 54,348 AUTOM	8TOUR-B 93
OMMERCE OF THE HOUSE OF	**REPRESENTATIVES**= STATEMENT OF CRASHW	3SEVE-DM
ASUREMENTS OF THE LOADS	**REQUIRED** TO BREAK COMMERCIAL AVIATIO	WURZ-EM48
R AND PASSENGER SEATING	**REQUIREMENTS** FOR LONG DISTANCE= DRIV	7ADAM-AJ65
REELS FOR HARNESSES=	**REQUIREMENTS** FOR TESTING OF INERTIA	ALDM-B 65
E GEOMETRY AND STRENGTH	**REQUIREMENTS** SAE= MOTOR VEHICLE SEAT	MOTO-VS62
E GEOMETRY AND STRENGTH	**REQUIREMENTS** SAE= NEW RECOMMENDED PR	8NEW -RP62
OBILE PASSENGER SEATING	**REQUIREMENTS**. DESIGN, CONSTRUCTION	7BELG-WJ63
ORT, SAFETY, SUSPENSION	**REQUISITES**= RIDE COMF	1CHUR-HE54
NT SAFETY ENGINEERS AND	**RESEARCH** EXPERTS SAY. 'YES.'= AUTO	8AUTO-SB60
CRASH	**RESEARCH** FOR VEHICLE SAFETY=	1LUND-LC64
TESTING OF SEATS=	**RESEARCH** IN OCCUPANT SAFETY, DYNAMIC	7LEDE-J 59
INJURY WORK OF THE ROAD	**RESEARCH** LABORATORY OF THE UNITED KI	6STAR-JH60
S= DYNAMIC	**RESEARCH** OF HUMAN RESTRAINING DEVICE	1PROV-EL65
VICES= DYNAMIC	**RESEARCH** OF PASSENGER RESTRAINING DE	1SCHR-DJ66
DYNAMIC	**RESEARCH** OF UPPER TORSO RESTRAINTS=	1PROV-EL66
NING DEVICES AND SAFETY	**RESEARCH** PROBLEMS= SOME ASPECTS OF P	1WHIT-AJ57
NEL RESTRAINT SYSTEM= A	**RESEARCH** PROGRAM TO DEVELOP A 60 'G'	1FREE-HE62
SET FOR RIDING COMFORT	**RESEARCH** SAE= CRITERIA ARE	5BROW-RW35
SAFETY BELT	**RESEARCH** STUDY=	8SAFE-BR62
= AVIATION CRASH INJURY	**RESEARCH--REVIEW** OF THE FLIGHT SAFET	6KRAF-MA61
SAFETY HARNESS	**RESEARCH-CALIFORNIA**=	8DUNL-DR65
AUTO-CRASH SAFETY	**RESEARCH**=	6BARE-CJ57
ESIGN FROM CRASH INJURY	**RESEARCH**= CRASH D	6KNOW-WR58

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			ENTRY CODE*
FOR USE IN ACCELERATION	RESEARCH=	HUMAN RESTRAINT SYSTEMS DE	1VYKU-HC64
AUTOMOTIVE CRASH INJURY	RESEARCH=	MEDICAL ASPECTS OF	6BRAU-PW91
Y BELTS IN HEAVIES NEED	RESEARCH=	SAFET	8GUTT-JM65
Y AVIATION CRASH INJURY	RESEARCH=	UNITED STATES ARM	1AVIA-SE62
PIRELLI	RESILIENT	WEBBING=	8PIRE-RW63
ICH OCCUR IN FLYING= ON	RESISTANCE	IN MEN TO CERTAIN JERKING	6RUFF-S 93
NOTES ON THE MECHANICAL	RESISTANCE	OF THE HUMAN BODY AND TIS	6ZIFF-D 65
ERTISING= PSYCHOLOGICAL	RESISTANCE	TO SEAT BELTS, A DISCUSSI	5BLOM-GW61
AINT CONCEPTS FOR CRASH	RESISTANCE=	CARGO RESTR	1AVER-JP65
NTS. PART II. DYNAMIC	RESPONSE	OF RESTRAINED SUBJECT DURIN	NICH-G 64
BIODYNAMIC	RESPONSE	OF THE HUMAN BODY=	6VONG-HE64
HE APPROXIMATION OF THE	RESPONSE	OF THE HUMAN TORSO TO LARGE	6HESS-JL56
TO ACCELERATION AND=	RESPONSE	OF THE SEATED HUMAN CADAVER	7HODG-VR63
THE DYNAMICS OF HUMAN	RESPONSE	TO ACCELERATIONS=	6PAYN-PR61
THE MAIN PRINCIPLES OF	RESTFUL	SITTING AND THEIR SIGNIFICAN	7AKER- 51
I. DYNAMIC RESPONSE OF	RESTRAINED	SUBJECT DURING ABRUPT DEC	NICH-G 64
SSES=	RESTRAINING	CHARACTERISTICS OF HARNE	8TOUR-B 94
VEHICLES= STANDARD FOR	RESTRAINING	DEVICES AND ANCHORAGES F	1CANA-GS66
ME ASPECTS OF PASSENGER	RESTRAINING	DEVICES AND SAFETY RESEA	1WHIT-AJ57
	RESTRAINING	DEVICES FOR CHILDREN=	1APPO-FA
TESTS OF PERSONNEL	RESTRAINING	DEVICES=	KELL-AH64
ERING APPROACH TO CHILD	RESTRAINING	DEVICES= A SAFETY ENGINE	1ROSE-CW65
ES ON THE HUMAN THROUGH	RESTRAINING	DEVICES= DISTRIBUTION OF	BIER-HR46
NAMIC RESEARCH OF HUMAN	RESTRAINING	DEVICES= DY	1PROV-EL65
C RESEARCH OF PASSENGER	RESTRAINING	DEVICES= DYNAMI	1SCHR-DJ66
OF AUTOMOBILE PASSENGER	RESTRAINING	DEVICES= DYNAMIC TESTS	MICH-I 63
MAN BODY AS APPLIED INA	RESTRAINING	HARNESS FOR AIRCRAFT PIL	1BIER-HR46
NALYTICAL EVALUATION OF	RESTRAINING	HARNESS MATERIALS= A	FINW-PE65
NVESTIGATION OF HARNESS	RESTRAINING	SYSTEMS= BARRIER COLLISI	1FRED-RH65
ON BIOMECHANICS OF BODY	RESTRAINT	AND HEAD PROTECTION= COMPE	1HEND-E 61
S= PERSONNEL	RESTRAINT	AND SUPPORT SYSTEM DYNAMIC	PAYN-PR65
NCE= CARGO	RESTRAINT	CONCEPTS FOR CRASH RESISTA	1AVER-JP65
ALLOWED BY SAFETY BELT	RESTRAINT	DURING IMPACT= MOTIONS OF	SWEA-JJ56
NAL AND NEW TYPE FLIGHT	RESTRAINT	EQUIPMENT, EVALUATION OF=	1HUNT-H 55
NAL AND NEW TYPE FLIGHT	RESTRAINT	EQUIPMENT= CONVENTIO	9SNYD-RZ58
ONVENTIONAL AND SPECIAL	RESTRAINT	GEAR= EVALUATION OF TRANSV	1MILL-CO57
TOLERANCE TO AUTOMATIC	RESTRAINT	HARNESS ACTIVATOR FORCES.=	6GANS-RV66
SINGLE DISCONNECT TORSO	RESTRAINT	HARNESS FOR THE B-58 ESCAP	9HOLC-GA60
STUDIES OF THREE-POINT	RESTRAINT	HARNESS SYSTEMS IN FULL-SC	8BOHL-NI66
	RESTRAINT	HARNESSES--A REVIEWW=	1CHIS-SW63
THE DYNAMICS OF CRASH	RESTRAINT	HARNESSES=	HIRO-Y 55
EW PHYSICAL SUPPORT AND	RESTRAINT	IN ADVANCED MANNED FLIGHT	1SMED-HA61
MENDATIONS FOR SHOULDER	RESTRAINT	INSTALLATION IN GENERAL AV	8YOUN-JW66
ATION OF THE TORSO-HEAD	RESTRAINT	SYSTEM AND THE INTEGRATED	1HILL-JH59
DEVELOPMENT TEST REPORT	RESTRAINT	SYSTEM CAPSULE ESCAPE SYST	1HOLC-GA61
, SURVIVAL KIT/LAP BELT	RESTRAINT	SYSTEM EVALUATION PROGRAM=	NAVA-AT66
TIGATION OF A PERSONNEL	RESTRAINT	SYSTEM FOR ADVANCE MANNED	6FREE-HE62
LOWER LEG RESTRAINTS= A	RESTRAINT	SYSTEM FOR APPLICATION IN	9VANP-RE64
, SUPPLEMENT= PERSONNEL	RESTRAINT	SYSTEM STUDY, CH-47 VERTOL	PAYN-PR64

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		ENTRY CODE*
THE INTEGRATED HARNESS	**RESTRAINT** SYSTEM UNDER CONDITIONS OF	1HILL-JH59
ELOP A 60 'G' PERSONNEL	**RESTRAINT** SYSTEM= A RESEARCH PROGRAM	1FREE-HE62
IGN OF A 60 G PERSONNEL	**RESTRAINT** SYSTEM= CONSIDERATIONS AFF	1BOYC-WC61
FECTIVE PROTECTION BY A	**RESTRAINT** SYSTEM= EF	1LOMB-CF65
OTECTION BY THE AIRSTOP	**RESTRAINT** SYSTEM= IMPACT PR	9BLEC-C 65
TION WITH THE 'AIRSTOP'	**RESTRAINT** SYSTEM= IMPACT PROTEC	9CLAR-C 92
TIC 'SAM BROWNE' SAFETY	**RESTRAINT** SYSTEM= REEL-O-MA	8PACI-SC92
ERATION RESEARCH= HUMAN	**RESTRAINT** SYSTEMS DEVELOPMENT FOR US	1VYKU-HC64
TOMATIC POSITIONING AND	**RESTRAINT** SYSTEMS FOR SUPERSONIC ESC	6CART-RL59
, SUPPLEMENT= PERSONNEL	**RESTRAINT** SYSTEMS STUDY UH-1A AND UH	1AVIA-SE91
OL CHINOOK= PERSONNEL	**RESTRAINT** SYSTEMS STUDY. CH-47 VERT	1HALE-JL64
PTS= PERSONNEL	**RESTRAINT** SYSTEMS STUDY. BASIC CONCE	1HALE-JL62
Y EVALUATION. PERSONNEL	**RESTRAINT** SYSTEMS STUDY. UH-1A AND U	6HALE-JL91
PTS= PERSONNEL	**RESTRAINT** SYSTEMS STUDY, BASIC CONCE	1FLIG-SF62
SUPPLEMENT TO PERSONNEL	**RESTRAINT** SYSTEMS STUDY, CH-47 VERTO	1AVIA-SE92
THE DYNAMICS OF HUMAN	**RESTRAINT** SYSTEMS=	PAYN-PR62
PERSONNEL	**RESTRAINT** SYSTEMS=	1DEHA-C 62
OF AUTOMOTIVE PASSENGER	**RESTRAINT** SYSTEMS= ANALYSIS OF THE D	AVIA-CI63
SS-STRAIN PROPERTIES OF	**RESTRAINT** WEBBING= EFFECT OF RAPID L	HALE-JL91
E AND FETUS IN LAP BELT	**RESTRAINT.**= IMPACT INJURY TO THE PRE	5SNYD-RG66
STEM= MODULAR	**RESTRAINT,** RECOVERY, AND SURVIVAL SY	1STEN-AE62
EM OF PRE-EJECTION BODY	**RESTRAINT**= AN EXPERIMENTAL SYST	1FITZ-JG62
SH LOADS BY THE AIRSTOP	**RESTRAINT**= HUMAN TRANSPORTATION FATA	9CLAR-C 91
DYNAMIC TESTS OF	**RESTRAINTS** FOR CHILDREN=	APPO-FA66
AND UNSAFE UPPER TORSO	**RESTRAINTS** FOR OCCUPANT PROTECTION I	8STAT-JD65
UPON KNEE AND LOWER LEG	**RESTRAINTS**= A RESTRAINT SYSTEM FOR A	9VANP-RE64
RESEARCH OF UPPER TORSO	**RESTRAINTS**= DYNAMIC	1PROV-EL66
ELT= ABDOMINAL INJURIES	**RESULTING** FROM THE STANDARD AUTOMOBI	6ODON-JB66
RD FACING SEATBACKS AND	**RESULTING** INJURIES IN A SURVIVABLE T	7HASB-AH62
ELT PROMOTION GETS GOOD	**RESULTS** BUT RAISES QUESTIONS= SEAT B	8BARN-B 62
H A DESCRIPTION OF SOME	**RESULTS** OBTAINED WITH THE PILOT'S SE	7HENR-JP45
ICALS BOCKLES DOWN PEAK	**RESULTS** WITH NEW SEAT BELT= GATEWAY	2GATE-CB66
IMPACT TEST METHODS AND	**RETENTION** HARNESS CRITERIA FOR U.S.	HALE-JL92
= AUTOMATIC LOCKING AND	**RETRACTABLE** BELTS, THEIR USE AND TES	8REDF-FA65
	RETRACTABLE SEAT BELT UNIT=	8BROW-JB65
DO	**RETRACTORS** DAMAGE SEAT BELTS.=	8CONS-U 94
COLLISION STUDIES	**REVEAL** GRUESOME FACTS SAE JOURNAL=	6SEVE-DM60
HUMAN TO IMPACT FORCES	**REVEALED** BY HIGH SPEED MOTION PICTUR	6BIER-HR46
RSEY EXPERIENCE ACIR= A	**REVIEW** OF AUTOMOBILE SEAT BELT INSTA	CAMP-BJ93
RESTRAINT HARNESSES--A	**REVIEWW**=	1CHIS-SW63
DATA--SECOND EDITION (	**REVISED)**= HANDBOOK OF HUMAN ENGINEER	5MEAD-LC52
MODERN PASSENGER CAR	**RIDE** CHARACTERISTICS=	5SCHI-R 41
UISITES=	**RIDE** COMFORT, SAFETY, SUSPENSION REQ	1CHUR-HE54
SEAT CUSHIONS AND THE	**RIDE** PROBLEM SAE=	7PATO-CR40
ION TO MILITARY VEHICLE	**RIDE**= HUMAN REACT	5STER-S 61
SCHOOL BUS	**RIDERS** APPROVE SEAT BELTS=	8SCHO-BR64
OBILE SEAT CUSHIONS AND	**RIDING** COMFORT 7= AUTOM	7TEA -CA38
	RIDING COMFORT AND CUSHIONS SAE=	7LAY -WE40
CRITERIA ARE SET FOR	**RIDING** COMFORT RESEARCH SAE=	5BROW-RW35
CRITERIA ARE SET FOR	**RIDING** COMFORT SAE JOURNAL=	1BROW-RW35
	RIDING COMFORT=	5LAY -WE41

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		ENTRY CODE*
R INADVERTENT RELEASE=	SAFETY BELT (BUCKLE) SLIPPAGE, AND/O	8HASB-AH55
IDE COLLISIONS=	SAFETY BELT EFFECTIVENESS IN BROAD-S	8HONT-H 64
SERS OF SAFETY BELTS.	SAFETY BELT EFFECTIVENESS IN RURAL C	6TOUR-B 60
A AUTOMOBILE ACCIDENTS=	SAFETY BELT EFFECTIVENESS IN RURAL C	8TOUR-B 92
	SAFETY BELT RESEARCH STUDY=	8SAFE-BR62
AD AND TRUNK ALLOWED BY	SAFETY BELT RESTRAINT DURING IMPACT=	SWEA-JJ56
NS=	SAFETY BELT THAT REACTS TO CAR MOTIO	8SAFE-BT63
	SAFETY BELT WITH PENDULUM CONTROL=	8SAFE-BW63
THE LAP-TYPE AUTOMOBILE	SAFETY BELT WITH REFERENCE TO HUMAN	8STAP-JP58
AL INJURIES= AUTOMOTIVE	SAFETY BELT. IN SAVING A LIFE MAY P	8WILL-JS66
AUTOMATIC	SAFETY BELT=	8AUTO-SB63
DECELERATION LOCKS AUTO	SAFETY BELT=	8DECE-LA62
S SHOULDER HARNESS TYPE	SAFETY BELT= NEW YORK LAW REGARDING	3AUTO-MA64
PLACEMENT OF AUTOMOBILE	SAFETY BELT= SPLENIC RUPTURE DUE TO	6COCK-WM63
TALLATION OF ROLL BARS,	SAFETY BELTS AND CABS= CODE H33 FARM	GIVE-GA64
	SAFETY BELTS AND HARNESS=	9ROSE-CW52
PHYSIOLOGY OF	SAFETY BELTS AND HARNESSES=	8HITC-FA47
OUNTRIES= MEMORANDUM ON	SAFETY BELTS AND SAFETY HARNESS FOR	8EIFF-AL61
	SAFETY BELTS ARE NOT DANGEROUS=	8DEBO-EF52
EAK COMMERCIAL AVIATION	SAFETY BELTS AS AN INDICATION OF THE	WURZ-EM48
	SAFETY BELTS CATCH ON=	8SEGA-MD59
SAFETY GLASS AND	SAFETY BELTS FOR AUTOMOBILES=	8GRIM-G 93
NICAL POINT OF VIEW=	SAFETY BELTS FOR DRIVERS FROM A TECH	8HAES-A 62
EAT= INVESTIGATION INTO	SAFETY BELTS FOR MOTOR VEHICLES USIN	WILL-JH62
	SAFETY BELTS FOR MOTOR VEHICLES=	8KEIL-E 62
	SAFETY BELTS FOR MOTORCARS=	8ODEL-B 57
F PROTECTIVE HELMETSAND	SAFETY BELTS FOR MOTORISTS.= NOTES O	6ZIFF-D 65
H=	SAFETY BELTS IN HEAVIES NEED RESEARC	8GUTT-JM65
OF THEIR EFFECTIVENESS=	SAFETY BELTS IN MOTOR CARS. AN ASSE	8MORE-JD62
REDUCTION BY THE USE OF	SAFETY BELTS IN MOTOR CARS= INJURY	8HERB-DC60
ACCIDENTS= A REPORT ON	SAFETY BELTS TO THE CALIFORNIA LEGIS	8TOUR-B 91
ACCIDENTS= A REPORT OF	SAFETY BELTS TO THE CALIFORNIA LEGIS	8TOUR-B 93
	SAFETY BELTS. BACK TO THE PRAM=	8SAFE-BB62
USERS AND NON-USERS OF	SAFETY BELTS. SAFETY BELT EFFECTIVE	6TOUR-B 60
HE HUMAN BODY= AIRCRAFT	SAFETY BELTS. THEIR INJURY EFFECT O	6DEHA-H 53
HE HUMAN BODY= AIRCRAFT	SAFETY BELTS. THEIR INJURY EFFECT O	6TOUR-B 53
AUTOMOBILE	SAFETY BELTS=	8AUTO-SB57
AUTO	SAFETY BELTS=	8AUTO-SB62
THE EFFECTIVENESS OF	SAFETY BELTS=	8LIST-RD66
NCE IN DECELERATION CAR	SAFETY BELTS= BIOLOGICAL TOLERA	6ALDM-B 62
NATION SHOULDER AND LAP	SAFETY BELTS= COMBI	8GRIS-RW55
NG SHOULDER HARNESS AND	SAFETY BELTS= DESIGN AND CONSTRUCTIO	SWEA-JJ51
N TESTS FOR CHEST-LEVEL	SAFETY BELTS= RAPID-DECELERATIO	MATH-JH53
TE LEGISLATORS CONSIDER	SAFETY BELTS= STA	3STAT-LC56
	SAFETY CARS=	1GRIM-G 66
ETING OF THE GOVERNORS'	SAFETY CONFERENCE= REMARKS TO ME	2ACKE-PC58
SPORT AIRCRAFT= CURRENT	SAFETY CONSIDERATIONS IN THE DESIGN	7DEHA-H 52
ATORS, WHO ARE NATIONAL	SAFETY COUNCIL MEMBERS= FINAL REPORT	5NATI-SC60
HE EFFECT OF AUTOMOTIVE	SAFETY DESIGN ON INJURY PATTERNS= PR	6BRAU-PW92
	SAFETY DEVICE FOR YOUR CAR=	1JEWE-RJ62
ES=	SAFETY DEVICES FOR AUTOMOTIVE VEHICL	1RYAN-JJ58

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		ENTRY CODE*
	SAFETY DEVICES FOR GROUND VEHICLES=	1RYAN-JJ60
RESTRAINING DEVICES= A	SAFETY ENGINEERING APPROACH TO CHILD	1ROSE-CW65
PREVENTION.=	SAFETY ENGINEERING FOR CRASH INJURY	6HALE-JL92
SEAT BELTS. GOVERNMENT	SAFETY ENGINEERS AND RESEARCH EXPERT	8AUTO-SB60
OTHER RELEVANT	SAFETY EQUIPMENT=	9MASO-JK62
COPILOT SEAT WITH CRASH	SAFETY FEATURES FOR CH-47A HELICOPTE	7THOM-DF64
AN AUTOMOTIVE VEHICLE=	SAFETY FEATURES, STANDARD VS. OPTION	1LEE -H 59
	SAFETY FOR TOMORROW'S CARS=	1SAFE-FT58
H--REVIEW OF THE FLIGHT	SAFETY FOUNDATION IMPACT WORK AND PL	6KRAF-MA61
TOMOBILES=	SAFETY GLASS AND SAFETY BELTS FOR AU	8GRIM-G 93
	SAFETY HARNESS - CRAIG TYPE=	8COLE-BC53
AR AIRCRAFT=	SAFETY HARNESS - SABRE AND SILVER ST	8DEAN-DA60
DEVICES FOR CHILDREN=	SAFETY HARNESS AND OTHER PROTECTIVE	1SAFE-HA66
DEVICES FOR CHILDREN=	SAFETY HARNESS AND OTHER PROTECTIVE	8SAFE-HA66
RETCHER= DEVELOPMENT OF	SAFETY HARNESS FOR GENERAL SERVICE S	1KIEL-IL50
DUM ON SAFETY BELTS AND	SAFETY HARNESS FOR MOTOR VEHICLES, I	8EIFF-AL61
	SAFETY HARNESS RESEARCH-CALIFORNIA=	8DUNL-DR65
REEL-O-MATIC	SAFETY HARNESS=	8PACI-SC91
REEL-O-MATIC DUAL STRAP	SAFETY HARNESS=	8PACI-SC93
ACUATION LITTER PATIENT	SAFETY HARNESS= AEROMEDICAL EV	8STIN-NE57
	SAFETY HARNESSES FOR CARS=	8STOC-HC61
RAF EXPERIENCE WITH	SAFETY HARNESSES=	8FRYE-DI62
HY= ACCIDENTS AND	SAFETY MEASURES. A REPORT BIBLIOGRAP	4SILU-MB62
RESTRAINING DEVICES AND	SAFETY RESEARCH PROBLEMS= SOME ASPEC	1WHIT-AJ57
AUTO-CRASH	SAFETY RESEARCH=	6BARE-CJ57
EL-O-MATIC 'SAM BROWNE'	SAFETY RESTRAINT SYSTEM= RE	8PACI-SC92
RS IN HIGHWAY TRANSPORT	SAFETY SAE= HUMAN FACTO	5MCFA-RA56
AUTOMOBILE	SAFETY SEAT BELT ASSEMBLIES=	8STON-MM54
MEDICAL ASPECTS OF	SAFETY SEAT BELT DEVELOPMENT=	8STAP-JP63
	SAFETY SEAT BELT PROGRAM ADOPTED=	8SAFE-SB62
	SAFETY SEAT BELT STANDARDS=	8SAFE-SB61
SHOCK ABSORBING	SAFETY SEAT=	7CART-EO57
= THE DEVELOPMENT OF	SAFETY SEATING FOR INJURY PREVENTION	7HICT-BC66
IGHT FIELD=	SAFETY SHOULDER BELT DEVELOPED AT WR	8SAFE-SB39
TRUCKS, BUSES= FEDERAL	SAFETY SPECIFICATIONS FOR AUTOMOBILE	8CAMP-HE62
L FEDERAL MOTOR VEHICLE	SAFETY STANDARD ON MANDATORY SEAT BE	8AUTO-MA66
NYLON	SAFETY STRAPS=	8NYLO-SS61
EVICE FOR PASSENGER CAR	SAFETY STUDIES= A NEW LABORATORY D	1CICH-WG63
OF 2ND NATIONAL FLIGHT	SAFETY SURVIVAL AND PERSONAL EQUIPME	1SPAC-FE64
THE	SAFETY THE MOTORIST GETS=	1FARL-NE59
	SAFETY WITH COMFORT=	1LAVO-LJ56
NEW STEP TOWARD AUTO	SAFETY. SHOULDER HARNESS PROMOTION=	8NEW -ST62
RESEARCH IN OCCUPANT	SAFETY, DYNAMIC TESTING OF SEATS=	7LEDE-J 59
OCIATED AREAS IN SYSTEM	SAFETY, MAINTAINABILITY, PERSONNEL S	4PETE-GA91
OCIATED AREAS IN SYSTEM	SAFETY, MAINTAINABILITY, PERSONNEL S	4PETE-GA93
RIDE COMFORT,	SAFETY, SUSPENSION REQUISITES=	1CHUR-HE54
E OF THE ART OF TRAFFIC	SAFETY,= THE STAT	1LITT-AD66
SEATS--COMFORT AND	SAFETY=	7SEAT-CS65
L FEDERAL MOTOR VEHICLE	SAFETY= A PROPOSAL FOR AN INITIA	7AUTO-MA91

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N RELATION TO PASSENGER	SAFETY= AUTOMOBILE DESIGN I	1GRIM-G 64
SH RESEARCH FOR VEHICLE	SAFETY= CRA	1LUND-LC64
N FACTORS IN AUTOMOTIVE	SAFETY= DESIG	1HAEV-R 55
-ENGINEERING ASPECTS OF	SAFETY= HUMAN	5MCFA-RA54
ATING CAN CONTRIBUTE TO	SAFETY= SE	7SEWA-WH66
L ABDOMINAL INJURY FROM	SAFETYBELTS OR OTHER CAUSES IN SERIO	6CRAS-IR47
$90 MILLION	SALES SEEN FOR SEAT BELTS IN 1963=	2GOOD-B 63
REEL-O-MATIC '	SAM BROWNE' SAFETY RESTRAINT SYSTEM=	8PACI-SC92
OOD SEATING ENGINEERING	SAVES LIVES= G	7MCSU-A 52
OTIVE SAFETY BELT. IN	SAVING A LIFE MAY PRODUCE INTRA-ABDO	8WILL-JS66
RS AND RESEARCH EXPERTS	SAY. 'YES.'= AUTO SEAT BELTS. GOVE	8AUTO-SB60
PRACTICE IN THE USE OF	SCALE MANIKINS= THEORY AND	RAND-FE49
=	SCHOOL BUS RIDERS APPROVE SEAT BELTS	8SCHO-BR64
VALUE OF SEAT BELTS IN	SCHOOL BUSES DISCUSSED IN NEW YORK=	8VALU-SB66
SEAT BELTS FOR	SCHOOL BUSES.=	8DELA-AA63
SEAT BELTS AND	SCHOOL BUSES=	8HAEU-RC63
STUDY SEAT BELTS IN	SCHOOL BUSES=	8STUD-SB65
	SCIENCE LOOKS AT SEAT BELTS=	8SCIE-LA63
RSONNEL SUBSYSTEM¼ LIFE	SCIENCES, QUALITY ASSURANCE, ANDRELI	4PETE-GA93
RSONNEL SUBSYSTEM¼ LIFE	SCIENCES,. QUALITY ASSURANCE, AND RE	4PETE-GA91
TION OF THE C-118 PILOT	SEAT (AEROTHERM)= COMFORT EVALUA	7SLEC-RF93
ION OF THE C-124A PILOT	SEAT (WEBER)= COMFORT EVALUAT	7SLEC-RF94
F THE C-97A/KC97E PILOT	SEAT (WEBER)= COMFORT EVALUATION O	7SLEC-RF92
IMPROVED	SEAT AND BACK CUSHIONS=	7WHIT-RK59
AN FOR STUDY OF VEHICLE	SEAT AND SUSPENSION= BIOMECHANICAL M	7WISN-A 64
STATIC TESTS OF PLYWOOD	SEAT ASSEMBLY=	7ROGE-K 43
GE - FLOOR STRUCTURE -	SEAT ATTACHMENT, ULTIMATE LOAD TEST,	1JENS-NA46
FATIGUE TEST ON	SEAT BACK SPRINGS=	FORD-MC
OPMENTAL TEST MODEL 22=	SEAT BACK-PASSENGER-IMPACT ABSORPTIO	7SIFU-SS58
CTION FOR PASSENGER CAR	SEAT BACKS= STANDARD ON OCCUPANT IMP	7AUTO-MA92
	SEAT BELT ACCEPTANCE SURVEY=	5MAYE-AF55
SAE MOTOR VEHICLE	SEAT BELT ACTIVITIES=	8NEFF-RJ65
ES RELATED TO EFFECTIVE	SEAT BELT ADVERTISING= PSYCHOLOGICAL	5BLOM-GW61
ENTS SAE= MOTOR VEHICLE	SEAT BELT ANCHORAGE GEOMETRY AND STR	MOTO-VS62
ICE FIXES MOTOR VEHICLE	SEAT BELT ANCHORAGE GEOMETRY AND STR	8NEW -RP62
MOTOR VEHICLE	SEAT BELT ANCHORAGE=	8SOCI-AE93
MOTOR VEHICLE	SEAT BELT ANCHORAGE=	8SOCI-AE95
THE AUTOMOBILE	SEAT BELT AND ABDOMINAL INJURY=	6CAMP-HE64
LES=	SEAT BELT ASSEMBLIES FOR MOTOR VEHIC	8BRIT-SI61
T TESTS= PERFORMANCE OF	SEAT BELT ASSEMBLIES IN CONTROLLED I	LIST-RD63
PRACTICE= MOTOR VEHICLE	SEAT BELT ASSEMBLIES, SAE RECOMMENDE	8SOCI-AE92
AUTOMOBILE SAFETY	SEAT BELT ASSEMBLIES=	8STON-MM54
ON, RECOMMENDATIONS FOR	SEAT BELT ASSEMBLIES= INTERNATIONAL	8FRED-RH65
FOR AUTOMAKERS= GROWING	SEAT BELT BUSINESS IS PRESENTING PRO	2MCDO-D 62
THE DYNAMICS OF	SEAT BELT DESIGN=	EDEL-WE57
DICAL ASPECTS OF SAFETY	SEAT BELT DEVELOPMENT= ME	8STAP-JP63
ANALYSIS OF	SEAT BELT DYNAMIC TEST PROCEDURES=	MCHE-RA62
JECTION SITUATION=	SEAT BELT EFFECTIVENESS IN THE NON-E	CAMP-BJ94
	SEAT BELT FASTENERS FOR 1962 CARS=	8SEAT-BF62
EXAMINATION OF	SEAT BELT HARNESS=	KENN-JE58
AUTO	SEAT BELT INDUSTRY DRIVING FAST=	2KRAS-K 64

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		ENTRY CODE*
.=	SEAT BELT INJURIES AND LEGAL ASPECTS	6MCRO-JW65
	SEAT BELT INSTALLATION AND USE POLL=	5SEAT-BI61
PRELIMINARY	SEAT BELT INSTALLATION SURVEY=	8CAMP-BJ91
A REVIEW OF AUTOMOBILE	SEAT BELT INSTALLATION TRENDS AND A	CAMP-BJ93
Y STANDARD ON MANDATORY	SEAT BELT INSTALLATIONS IN PASSENGER	8AUTO-MA66
SAFETY	SEAT BELT PROGRAM ADOPTED=	8SAFE-SB62
NT NATIONAL EDUCATIONAL	SEAT BELT PROGRAM= A PROGRESS REPORT	8LHOT-DC61
S BUT RAISES QUESTIONS=	SEAT BELT PROMOTION GETS GOOD RESULT	8BARN-B 62
ON OF TWO APPROACHES TO	SEAT BELT PROMOTION= AN EXPERIMENTAL	8BLOM-GW61
RANSVERSE= LIMITS OF	SEAT BELT PROTECTION DURING ABRUPT T	8GUGG-AS61
	SEAT BELT PROTECTION FOR CHILDREN=	8SEAT-BP63
CRUNCHY' TO HELP ANSWER	SEAT BELT QUESTION= '	8CRUN-TH65
Y ACT OF CONGRESS= AUTO	SEAT BELT STANDARDS SET, ESTABLISHED	3AUTO-SB65
SAFETY	SEAT BELT STANDARDS=	8SAFE-SB61
IN AUTOMOBILE ACCIDENTS	SEAT BELT SURVEY= A STUDY OF SEAT BE	8ASHA-V 62
THE	SEAT BELT SYNDROME--DOES IT EXIST.=	7FISH-J 65
THE	SEAT BELT SYNDROME=	8GARR-JW62
ATIONS TO THE PASSENGER	SEAT BELT TIEDOWN ATTACHMENTS IN THE	8ROBE-SH62
RETRACTABLE	SEAT BELT UNIT=	8BROW-JB65
A FOLLOW-UP STUDY OF	SEAT BELT USAGE=	5MANH-D 66
FINAL REPORT--SURVEY OF	SEAT BELT USE AMONG MOTOR VEHICLE FL	5NATI-SC60
	SEAT BELT UTILIZATION=	8STER-A 66
INVESTIGATION OF	SEAT BELT WEBBING SERVICE LIFE=	STET-CH64
INVESTIGATION OF	SEAT BELT WEBBING SERVICE LIFE=	8STET-CH64
THE	SEAT BELT--HELPFUL OR HARMFUL.=	8WADE-PA62
FASTEN YOUR	SEAT BELT=	8FAST-YS62
A SELF-RELEASING	SEAT BELT=	8WHIT-JR52
THE STANDARD AUTOMOBILE	SEAT BELT= ABDOMINAL INJURIES RESULT	6ODON-JB66
USUAL INJURY DUE TO THE	SEAT BELT= AN UN	6TOLI-SH64
N PEAK RESULTS WITH NEW	SEAT BELT= GATEWAY CHEMICALS BOCKLES	2GATE-CB66
CE=	SEAT BELTS AND CONTRIBUTORY NEGLIGEN	8SEAT-BA67
	SEAT BELTS AND SCHOOL BUSES=	8HAEU-RC63
IN OF BUSINESS= BARGAIN	SEAT BELTS ARE A HIT. CHEVRON DEALE	2BARG-SB62
ARE ORDINARY	SEAT BELTS ENOUGH.=	8SHAR-JE64
	SEAT BELTS FOR BUSES.=	8COX -EG66
RT ON CONSIDERATIONS OF	SEAT BELTS FOR INFANTS AND SMALL CHI	8NEFF-RJ61
	SEAT BELTS FOR SCHOOL BUSES.=	8DELA-AA63
ORTHINESS OF AUTOMOBILE	SEAT BELTS FOR THE SUBCOMMITTEE OF T	3SEVE-DM
ARE	SEAT BELTS GOOD FOR TRUCKS.=	8ARE -SB62
	SEAT BELTS HOLD IN ACTUAL CRASHES=	8SEAT-BH58
AUTOMOBILES WITH	SEAT BELTS IN ALLEN COUNTY, INDIANA=	8BREN-B
THE USE OF	SEAT BELTS IN BRITAIN.=	5GRIM-G 65
NTS ACIR=	SEAT BELTS IN CONVERTIBLE CAR ACCIDE	CAMP-BJ92
ALTH. EFFECTIVENESS OF	SEAT BELTS IN PREVENTING MOTOR-VEHIC	6FRAZ-RG61
IN NEW YORK= VALUE OF	SEAT BELTS IN SCHOOL BUSES DISCUSSED	8VALU-SB66
STUDY	SEAT BELTS IN SCHOOL BUSES=	8STUD-SB65
FFECTIVENESS AND USE OF	SEAT BELTS IN THE UNITED STATES= THE	5WOLF-RA61
BELT SURVEY= A STUDY OF	SEAT BELTS IN WISCONSIN AUTOMOBILE A	8ASHA-V 62
CCIDENTS= A STUDY OF	SEAT BELTS IN WISCONSIN AUTOMOBILE A	8AUTO-CI63

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		ENTRY CODE*
MILLION SALES SEEN FOR	SEAT BELTS IN 1963= $90	2GOOD-B 63
PART I - ATTACHMENT OF	SEAT BELTS INTHE HU-1A HELICOPTER, P	7ROEG-HF60
ING ON, DEMAND FOR AUTO	SEAT BELTS IS RAPIDLY GAINING MOMENT	2DUBO-PC62
STUDY OF THE EFFECTS OF	SEAT BELTS ON AUTOMOBILE AND TRUCKDR	8HASK-LT57
DIES OTHER FEATURES=	SEAT BELTS PASSE. INSURANCE FIRM STU	8SEAT-BP61
LS=	SEAT BELTS STANDARD ON '64 AUTO MODE	8SEAT-BS63
	SEAT BELTS VERSUS SHOULDER HARNESS=	8FULT-JL66
ERTS SAY. 'YES.'* AUTO	SEAT BELTS. GOVERNMENT SAFETY ENGIN	8AUTO-SB60
A SURVEY OF AUTOMOTIVE	SEAT BELTS. OWNER EXPERIENCE AND NO	8AYER-WH56
INJURY PRODUCED BY	SEAT BELTS. REPORT OF 2 CASES=	6FISH-P 93
	SEAT BELTS. SAFE OR HAZARDOUS.=	8FALE-ED58
CT TO FACTORY-INSTALLED	SEAT BELTS. STUDY CONDUCTED IN WISCO	5SCOT-BY63
AFTER	SEAT BELTS....WHAT.=	8STAP-JP62
DO RETRACTORS DAMAGE	SEAT BELTS.=	8CONS-U 94
HOW SAFE ARE YOUR	SEAT BELTS.=	8HOW -SA62
D BY CAR OCCUPANTS= CAR	SEAT BELTS--AN ANALYSIS OF THE INJUR	6LIST-RD63
	SEAT BELTS--ONE YEAR LATER=	8SCHR-DJ62
HOLOGICAL RESISTANCE TO	SEAT BELTS, A DISCUSSION AND EXPERIM	5BLOM-GW61
AUTO	SEAT BELTS, A PERSPECTIVE VIEW=	8CONS-U 91
INGS OF 52 MODELS* AUTO	SEAT BELTS, A SWEDISH GOVERNMENT AGE	8CONS-U 92
DYNAMIC TESTING OF CAR	SEAT BELTS=	BRIT-SI63
DYNAMIC TESTING OF	SEAT BELTS=	FINC-DM57
DYNAMIC TESTING OF	SEAT BELTS=	SOCI-AE64
PROPERTIES OF EXISTING	SEAT BELTS=	8BAST-JC63
MOTOR VEHICLE	SEAT BELTS=	8CANA-SA63
AUTOMATIC	SEAT BELTS=	8RYAN-JJ60
SCIENCE LOOKS AT	SEAT BELTS=	8SCIE-LA63
STRESS AND	SEAT BELTS=	8STRE-AS58
H DUMMY SNAP-TESTS AUTO	SEAT BELTS= BRITIS	BRIT-DS62
L HISTORY OF AUTOMOTIVE	SEAT BELTS= CHRONOLOGICA	1AMER-SB64
NION'S DYNAMIC TESTS OF	SEAT BELTS= CONSUMERS U	8MICH-I 61
AL INJURIES PRODUCED BY	SEAT BELTS= CRITIC	6FISH-P 92
FOR DYNAMIC TESTING OF	SEAT BELTS= SAE SUBCOMMITTEE STUDIES	8SOCI-AE94
HOOL BUS RIDERS APPROVE	SEAT BELTS= SC	8SCHO-BR64
HE EFFECTIVENESS OF CAR	SEAT BELTS= T	8GRIM-G 92
ENCE ON INSTALLATION OF	SEAT BELTS= THE ROLE OF A PHYSICIAN'	8BASS-LW65
ETING OF THE CHILDREN'S	SEAT BELTSUBCOMMITTEE= UNCONFIRMED M	8SEAT-BC63
SURING DEVICE=	SEAT COMFORT IMPROVED BY SPECIAL MEA	7SEAT-CI63
D FOR THE ASSESSMENT OF	SEAT COMFORT WITH A DESCRIPTION OF S	7HENR-JP45
	SEAT COMFORT=	7RAND-FE46
MEASUREMENT OF	SEAT COMFORT=	7THIE-RH63
OME FACTORS INFLUENCING	SEAT COMFORT= AN ANALYSIS OF S	7WACH-RA59
TION EXPERIMENTAL TROOP	SEAT CONCEPT= CRASHWORTHINESS EVALUA	7WEIN-LW65
RECENT DEVELOPMENTS IN	SEAT CONSTRUCTION= AUTOMOBILE SEATS-	7MCCO-CE47
MEASUREMENT OF	SEAT CUSHION CHARACTERISTICS=	7BROW-RW39
O THEIR USE AS EJECTION	SEAT CUSHION MATERIAL= PROPERTIES OF	7GLAI-DH61
GUE RELIEVING PNEUMATIC	SEAT CUSHION= THE PRESENT STATUS OF	7HANN-TD58
= AUTOMOBILE	SEAT CUSHIONS AND RIDING COMFORT 7	7TEA -CA38
AE=	SEAT CUSHIONS AND THE RIDE PROBLEM S	7PATO-CR40
T AND TEST OF PNEUMATIC	SEAT CUSHIONS.= DEVELOPMEN	7HANN-TD57
JERK WITH AND WITHOUT	SEAT CUSHIONS=	7HOGD-VR63

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		ENTRY CODE*
CLE CONTROL FOR DYNAMIC	SEAT CUSHIONS= DESIGN AND DEVELOPMEN	7BURN-HL58
OMPARISON WITH EJECTION	SEAT DATA= THE APPROXIMATION OF THE	6HESS-JL56
AIRCRAFT PASSENGER	SEAT DESIGN AND CRASH SURVIVAL=	7FRYE-DI58
R 880= PASSENGER	SEAT DESIGN AS APPLIED TO THE CONVAI	7BECK-LC59
FT= CREW	SEAT DESIGN CRITERIA FOR ARMY AIRCRA	7ROTH-VE63
LUATION= MILITARY TROOP	SEAT DESIGN CRITERIA. REPORT OF CRA	6ACIR-FS62
UATION. MILITARY TROOP	SEAT DESIGN CRITERIA= CRASH INJURY E	7TURN-JW62
A=	SEAT DESIGN FOR CRASH WORTHINESS NAC	7PINK-II57
= THE AIR FORCE STUDIES	SEAT DESIGN. BODY SUPPORT/RESTRAINT	7DEMP-CA62
THE USE OF OSCAR IN	SEAT DESIGN=	SOCI-AE54
AR PLASTICS IN AIRCRAFT	SEAT DESIGN= CELLUL	7LIPP-S 57
Y ABSORPTION APPLIED TO	SEAT DESIGN= ENERG	7HAWT-R 59
ERING DATA TO VEHICULAR	SEAT DESIGN= THE APPLICATION OF HUMA	7RADK-AO56
- A BRITISH APPROACH TO	SEAT DESIGN= THE PACKAGING OF CAR OC	7BABB-FW65
DESIGN OF ROTATABLE	SEAT FOR ACCELERATION ALLEVIATION=	7LAPP-AN49
LEAF SPRING	SEAT FOR AUTOMOBILES=	7LEAF-SS40
CRASH OR DITCHING	SEAT FOR B.47 AIRCRAFT=	7SMIT-LD51
A PROTECTIVE	SEAT FOR CHILDREN=	7ALDM-B 66
THE AIR BAG	SEAT FOR PASSENGER AIRCRAFT=	9LAMM-AC61
KENNINGTON PIVOTED	SEAT FRAME=	7KENN-PS36
ON COLLISION= EFFECT OF	SEAT HARNESS ON MOVEMENT OF CAR OCCU	1GRIM-G 63
OLLISION HRB= EFFECT OF	SEAT HARNESS ON MOVEMENT OF CAR OCCU	8GRIM-G 91
EXAMINATION OF NYLON	SEAT HARNESS WEBBING=	BAYL-CH58
DETERIORATION OF RCAF	SEAT HARNESS WEBBING=	8BAYL-CH54
EXAMINATION OF	SEAT HARNESS=	KENN-JE57
=	SEAT HARNESSES. A TECHNOLOGICAL LAG	8CONS-U 93
F AN EXPERIMENTAL TROOP	SEAT INSTALLATION IN AN H-21 HELICOP	7TURN-JW63
A BACKWARD FACING	SEAT INVESTIGATION=	7BACK-FS50
PASSENGERS BY IMPROVED	SEAT MATERIALS DESIGN= CRASH PROTECT	7STAP-JP61
TAINED WITH THE PILOT'S	SEAT OF THE DOUGLAS BT2D BOMBER= A M	7HENR-JP45
OGRESS REPORT=	SEAT PRESSURE PAD - FIRST MONTHLY PR	7GUIL-FA47
SHOCK ABSORBING	SEAT REDUCES INJURIES=	7SHOC-AS57
SE FOR RUBBER-DIAPHRAGM	SEAT SPRINGING= CA	7CASE-FR66
SEVERITY AS RELATED TO	SEAT TIEDOWN AND BELT FAILURE IN LIG	6PEAR-RG61
	SEAT TO MAKE CARS SAFER=	7CARR-R 66
CTION FOR PILOT/COPILOT	SEAT WITH CRASH SAFETY FEATURES FOR	7THOM-DF64
= UH-1D AIRCREW ARMORED	SEAT. CRASH SURVIVAL ANALYSES - PRE	REED-JL65
	SEAT-BELT HERNIA=	6HURW-ES65
CELERATIONS= LIMITS OF	SEAT-BELT PROTECTION DURING CRASH DE	BRUG-GM61
AL SPECIFICATION, BELT,	SEAT, PASSENGER TYPE, AUTOMOTIVE= FE	7GENE-SA60
SHOCK ABSORBING SAFETY	SEAT=	7CART-EO57
MONROE E-Z-RIDE TRUCK	SEAT=	7MONR-AE
ATION OF THE C-124 CREW	SEAT= COMFORT EVALU	7FORR-J 59
HE HAMMOCK-TYPE FIGHTER	SEAT= COMFORT EVALUATION OF T	7PATT-DI45
LLAPSIBLE TYPE DITCHING	SEAT= EVALUATION OF CO	7HEND-E 54
T DUMMY AND ACCELERATED	SEAT= INVESTIGATION INTO SAFETY BELT	WILL-JH62
LURE OF REARWARD FACING	SEATBACKS AND RESULTING INJURIES IN	7HASB-AH62
H DECELERATION TESTS ON	SEATBELTS= HUMAN CRAS	RYAN-JJ61
AND= RESPONSE OF THE	SEATED HUMAN CADAVER TO ACCELERATION	7HODG-VR63

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		ENTRY CODE*
FORWARD AND AFT FACING	SEATED POSITIONS= EVALUATION OF HUMA	7NOBL-H 61
WARD AND FORWARD FACING	SEATED POSITIONS= HUMAN EXPOSURE TO	7STAP-JP51
EVALUATION OF AIRCRAFT	SEATING ACCOMMODATION= COMPARATIVE	7SLEC-RF91
VER'S ENVIRONMENT=	SEATING AND OTHER ASPECTS OF THE DRI	7NEYH-AE47
	SEATING CAN CONTRIBUTE TO SAFETY=	7SEWA-WH66
FOAM RUBBER AND	SEATING COMFORT=	7HOEH-UH47
ATING= DRIVER/PASSENGER	SEATING CRITERIA AND DEVELOPMENT OF	7SHER-WF62
BODY	SEATING DIMENSIONS SAE=	7GODD-GE22
GOOD	SEATING ENGINEERING SAVES LIVES=	7MCSU-A 52
E DEVELOPMENT OF SAFETY	SEATING FOR INJURY PREVENTION= TH	7HICT-BC66
	SEATING HUMAN BEINGS SAE=	7SEAT-HB44
PRINCIPLES OF	SEATING IN FIGHTER TYPE AIRCRAFT=	7PATT-DI
TEREST=	SEATING INNOVATION STIRS INDUSTRY IN	7SEAT-IS51
	SEATING MANUAL=	7SOCI-AE
IS THIS THE	SEATING OF THE FUTURE=	7IS -TT65
CURRENT AUTOMOTIVE	SEATING PROBLEMS AND DESIGNS=	7SOCI-AE50
CURRENT AUTOMOTIVE	SEATING PROBLEMS AND DESIGNS=	7SOCI-AE51
E= DRIVER AND PASSENGER	SEATING REQUIREMENTS FOR LONG DISTAN	7ADAM-AJ65
S= AUTOMOBILE PASSENGER	SEATING REQUIREMENTS. DESIGN, CONST	7BELG-WJ63
IONS= STUDY OF	SEATING UNDER VARIOUS WEATHER CONDIT	7COOK-E 48
RUMENTATION= AUTOMOTIVE	SEATING--TESTING AND EVALUATION BY I	SOCI-AE53
A BIBLIOGRAPHY OF	SEATING=	4LIPP-S 92
MILITARY TRANSPORT	SEATING=	7BOST-K 52
CASE FOR SUSPENSION	SEATING=	7CASE-FS66
BACKWARD	SEATING=	7GILB-EA52
SAFER	SEATING=	7HICK-WE51
CRASH FORCES AND	SEATING=	7KIRC-OE92
AUTOMOTIVE	SEATING=	7MCWI-RL50
MODERN	SEATING=	7MODE-S 39
MATS ADOPTS REARWARD	SEATING=	7SELF-TM51
STUDY OF PASSENGER CAR	SEATING= A	7LANG-EW48
OR DESIGN OF AUTOMOBILE	SEATING= DRIVER/PASSENGER SEATING CR	7SHER-WF62
S APPLIED TO AUTOMOTIVE	SEATING= PRODUCTION TRIM ENGINEERING	7GRAH-CH49
N= REAR-FACING	SEATS CALLED SAFEST TYPE FOR CHILDRE	7REAR-FS66
TIAL OF CURRENT AIRLINE	SEATS DURING CRASH DECELERATIONS= EV	6SWEA-JJ66
RUBBER	SEATS FOR AUTOMOBILES=	7RUBB-SF34
ANCHORAGE OF	SEATS FOR AUTOMOTIVE VEHICLES=	8GENE-SA66
TWO CAR	SEATS FOR BABIES=	7TWO -CS66
DESIGNING PASSENGER	SEATS FOR CRASH SURVIVAL=	7BREH-WH62
DESIGNING VEHICLE	SEATS FOR GREATER COMFORT=	7KEEG-JJ64
STUDIES SHOCK ABSORBER	SEATS FOR JET PASSENGERS= AEROMED FA	7AERO-PS59
	SEATS FOR PEOPLE=	7DREY-H 60
THE DESIGN OF PASSENGER	SEATS FOR TRANSPORT AIRCRAFT= CURREN	7DEHA-H 52
AFT VS FORWARD FACING	SEATS IN TRANSPORT AIRCRAFT=	7AIR -TA61
	SEATS--COMFORT AND SAFETY=	7SEAT-CS65
ONSTRUCTION= AUTOMOBILE	SEATS-EFFICIENT SUPPORT OF THE HUMAN	7MCCO-CE47
SIS OF COMFORT= DRIVING	SEATS, APPRAISAL OF THE MECHANICAL B	7CLEA-DE54
AUTOMOBILE	SEATS=	7WILL-RL50
AIR TRANSPORT PASSENGER	SEATS= A COMPARISON OF THE ADVANTAGE	7KIRC-OE91
AID DESIGN OF PASSENGER	SEATS= ANATOMY AND STATISTICS	7MORR-CW47
ON SYSTEMS FOR AIRCRAFT	SEATS= CONDUCT STUDY, DESIGN AND FUR	LANG-FC60

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		ENTRY CODE*
ON SYSTEMS FOR AIRCRAFT	SEATS= CONDUCT STUDY, DESIGN, DEVELO	7AERO-C 60
EQUIPMENT UNDER TROOP	SEATS= CRASH INJURY BULLETIN. PART	7ROEG-HF60
ACTURE OF PLASTICS FOAM	SEATS= DESIGN, DEVELOPMENT AND MANUF	7GRIF-F 65
FOR COMFORT IN AIRCRAFT	SEATS= DESIGNING	7LIPP-S 49
TEST OF AUTOMOTIVE TYPE	SEATS= DEVELOPMENT AND	FORD-AR47
CALCULATION ON AIRCRAFT	SEATS= DYNAMIC	7SMIT-TA61
ARWARD FACING PASSENGER	SEATS= ECONOMIC CONSIDERATIONS I TH	2DUGG-BC61
STRUCTION OF AUTOMOBILE	SEATS= ORTHOPEDIC ASSUMPTION FOR THE	8THOM-W 59
ETY, DYNAMIC TESTING OF	SEATS= RESEARCH IN OCCUPANT SAF	7LEDE-J 59
PLASTICS IN AUTOMOBILE	SEATS= RUBBER AND	7HARR-A 65
TRUCTION OF COMFORTABLE	SEATS= THE MAIN PRINCIPLES OF RESTFU	7AKER- 51
EDICAL DES CEINTURES DE	SECURITE= L'ASPECT M	6KEAR-JD64
$90 MILLION SALES	SEEN FOR SEAT BELTS IN 1963=	2GOOD-B 63
YSIS AND BIODYNAMICS OF	SELECTED ROCKET-SLED EXPERIMENTS. P	NICH-G 64
A	SELF-RELEASING SEAT BELT=	8WHIT-JR52
COMMERCE, UNITED STATES	SENATE= A STATEMENT OF THE AUTOMOBIL	3BUGA-JS66
VIBRATION	SENSE AND FATIGUE=	5KEIG-G 46
S IN THE U.S. ARMY HU-1	SERIES BELL IROQUOIS HELICOPTER= CRA	8ROBE-SH62
SIDE-IMPACT COLLISIONS,	SERIES II= AUTOMOBILE	1SEVE-DM62
ELTS OR OTHER CAUSES IN	SERIOUS AIRCRAFT ACCIDENTS= THE RARE	6CRAS-IR47
STALLED BY A4D AIRCRAFT	SERVICE CHANGE NO. 157C FOR ACCEPTAB	7BACA-GA60
ON OF SEAT BELT WEBBING	SERVICE LIFE= INVESTIGATI	STET-CH64
ON OF SEAT BELT WEBBING	SERVICE LIFE= INVESTIGATI	8STET-CH64
FATIGUE AND HOURS OF	SERVICE OF INTERSTATE TRUCK DRIVERS=	5UNIT-SP41
ETY HARNESS FOR GENERAL	SERVICE STRETCHER= DEVELOPMENT OF SA	1KIEL-IL50
S ON BUSSES ININTERCITY	SERVICE= BARRIER COLLISION AND RELAT	1LABE-DJ65
YSLER PRESS INFORMATION	SERVICE= CHR	8CHRY-PI61
CRITERIA ARE	SET FOR RIDING COMFORT RESEARCH SAE=	5BROW-RW35
CRITERIA ARE	SET FOR RIDING COMFORT SAE JOURNAL=	1BROW-RW35
UTO SEAT BELT STANDARDS	SET, ESTABLISHED BY ACT OF CONGRESS=	3AUTO-SB65
ONCERNING THE ORIGIN OF	SEVERE INTERNAL INJURIES IN GLIDER A	6RUFF-S 91
PLANE ACCIDENTS= INJURY	SEVERITY AS RELATED TO SEAT TIEDOWN	6PEAR-RG61
EROMED FACILITY STUDIES	SHOCK ABSORBER SEATS FOR JET PASSENG	7AERO-PS59
	SHOCK ABSORBING SAFETY SEAT=	7CART-EO57
S=	SHOCK ABSORBING SEAT REDUCES INJURIE	7SHOC-AS57
COMBINATION	SHOULDER AND LAP SAFETY BELTS=	8GRIS-RW55
ELD= SAFETY	SHOULDER BELT DEVELOPED AT WRIGHT FI	8SAFE-SB39
ENTS= ANALYSIS OF LAP	SHOULDER BELT EFFECTIVENESS IN ACCID	SHAR-JE66
CORPORATED SINGLE STRAP	SHOULDER HARNESS AND LAP BELT= EVALU	HEND-E 55
CRASH DUMMY FOR TESTING	SHOULDER HARNESS AND SAFETY BELTS= D	SWEA-JJ51
MPACT STUDIES (LAP BELT	SHOULDER HARNESS INVESTIGATIONS).= L	6ZABO-AV92
P TOWARD AUTO SAFETY.	SHOULDER HARNESS PROMOTION=NEW STE	8NEW -ST62
T TESTS OF INERTIA REEL	SHOULDER HARNESS TAKE-UP MECHANISM=	AMER-SC63
K LAW REGARDING ADULT'S	SHOULDER HARNESS TYPE SAFETY BELT= N	3AUTO-MA64
RON, NYLON, AND COTTON=	SHOULDER HARNESS WEBBING. A COMPARI	8DARR-J 53
TIVENESS=	SHOULDER HARNESS. ITS USE AND EFFEC	8DEHA-H 52
TIVENESS=	SHOULDER HARNESS. ITS USE AND EFFEC	8DEHA-H 56
SEAT BELTS VERSUS	SHOULDER HARNESS=	8FULT-JL66
FT= RECOMMENDATIONS FOR	SHOULDER RESTRAINT INSTALLATION IN G	8YOUN-JW66

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ZUR FRAGE DER	**SICHERHEITS-KAROSSERIE=**	1RIXM-W 64
LASTUNG= VERHALTEN VON	**SICHERHEITSGURTEN** BEI DYNAMISCHER BE	KEIL-E 91
ANALYSE DER DYNAMIK VON	**SICHERHEITSGURTEN** FUER KRAFTFAHRER=	WILL-JH64
VERFORMUNGSGROSZEN VON	**SICHERHEITSGURTEN=**	8KIEL-E 66
DYNAMISCHE PRUFUNG FON	**SICHERHEITSGURTEN=** STATISCHE AND	KEIL-E 93
ECTION AGAINST REAR AND	**SIDE** CRASH LOADS BY THE AIRSTOP REST	9CLAR-C 91
AUTOMOBILE	**SIDE-IMPACT** COLLISIONS, SERIES II=	1SEVE-DM62
PROBLEMES POSES PAR LES	**SIEGES** DE VOITURES= QUELQUES	7WISN-A 61
STFUL SITTING AND THEIR	**SIGNIFICANCE** IN THE CONSTRUCTION OF	7AKER- 51
ETY HARNESS - SABRE AND	**SILVER** STAR AIRCRAFT= SAF	8DEAN-DA60
DURING NAVY CENTRIFUGE	**SIMULATION** OF EJECTION= SOME BODY DI	1CLAR-CC61
JUSTING AND POSITIONING	**SINGLE** DISCONNECT TORSO RESTRAINT HA	9HOLC-GA60
SSOCIATES, INCORPORATED	**SINGLE** STRAP SHOULDER HARNESS AND LA	HEND-E 55
N PRINCIPLES OF RESTFUL	**SITTING** AND THEIR SIGNIFICANCE IN TH	7AKER- 51
AN ANALYSIS OF	**SITTING** AREAS AND PRESSURES OF MAN=	7SWEA-JJ62
ARE YOU	**SITTING** COMFORTABLY.=	7CHIS-J 65
IC STRESS=	**SITTING** POSITION IN RELATION TO PELV	5LOWM-CL41
CCELERATION WHEN IN THE	**SITTING** POSITION= MAN'S ABILITY TO W	6LAMB-EH45
ESS IN THE NON-EJECTION	**SITUATION=** SEAT BELT EFFECTIVEN	CAMP-BJ94
G DES KOMFORTGRADES VON	**SITZEN=** EINE VERFEINERTE METHODE ZUR	7COER-R 64
TION PROCEEDINGS OF THE	**SIXTH** CONFERENCE= STAPP CAR CRASH AN	1STAP-CC63
R EQUIPMENT= HUMAN BODY	**SIZE** AND CAPABILITIES IN THE DESIGN	5MCFA-RA53
HUMAN BODY	**SIZE** AND PASSENGER VEHICLE DESIGN=	5MCFA-RA60
TO EQUIPMENT AND HUMAN-	**SIZING** PROBLEMS C.A.A.= ANTHROPOMETR	5KING-BG51
ALE BARRIER CRASHES AND	**SLED** RUNS= STUDIES OF THREE-POINT RE	8BOHL-NI66
SION AND RELATED IMPACT	**SLED** TESTS ON BUSSES ININTERCITY SER	1LABE-DJ65
= SAFETY BELT (BUCKLE)	**SLIPPAGE,** AND/OR INADVERTENT RELEASE	8HASB-AH55
T BELTS FOR INFANTS AND	**SMALL** CHILDREN= A REPORT ON CONSIDER	8NEFF-RJ61
BRITISH DUMMY	**SNAP-TESTS** AUTO SEAT BELTS=	BRIT-DS62
ANALYTICAL STUDY OF	**SOFT** LANDINGS ON GAS-FILLED BAGS=	9ESGA-JB60
TALLATIONS AND POSSIBLE	**SOLUTIONS=** PROBLEMS WITH THE THREE-P	8SHAR-JE65
FETY RESEARCH PROBLEMS=	**SOME** ASPECTS OF PASSENGER RESTRAININ	1WHIT-AJ57
SIMULATION OF EJECTION=	**SOME** BODY DISPLACEMENTS AND MEDICAL	1CLAR-CC61
TANDARDS FOR U.S.A. AND	**SOME** EUROPEAN COUNTRIES= MEMORANDUM	8EIFF-AL61
T= AN ANALYSIS OF	**SOME** FACTORS INFLUENCING SEAT COMFOR	7WACH-RA59
VIATORS= AN ANALYSIS OF	**SOME** HUMAN FACTORS TO BE CONSIDERED	5MCCO-FP58
T WITH A DESCRIPTION OF	**SOME** RESULTS OBTAINED WITH THE PILOT	7HENR-JP45
ELIABILITY ENGINEERING=	**SOURCES** OF INFORMATION IN HUMAN FACT	4PETE-GA91
ORS ENGINEERING=	**SOURCES** OF INFORMATION IN HUMAN FACT	4PETE-GA92
ELIABILITY ENGINEERING=	**SOURCES** OF INFORMATION IN HUMAN FACT	4PETE-GA93
EAT COMFORT IMPROVED BY	**SPECIAL** MEASURING DEVICE= S	7SEAT-CI63
LIZING CONVENTIONAL AND	**SPECIAL** RESTRAINT GEAR= EVALUATION O	1MILL-CO57
PE, AUTOMOTIVE= FEDERAL	**SPECIFICATION,** BELT, SEAT, PASSENGER	7GENE-SA60
LES, INCLUDING NATIONAL	**SPECIFICATIONS** AND STANDARDS FOR U.S	8EIFF-AL61
, BUSES= FEDERAL SAFETY	**SPECIFICATIONS** FOR AUTOMOBILES, TRUC	8CAMP-HE62
ARS=	**SPECIFICATIONS** FOR 1963 STUDEBAKER C	8STUD-C 63
FORCES REVEALED BY HIGH	**SPEED** MOTION PICTURE= REACTIONS OF T	6BIER-HR46
AUTOMOBILE SAFETY BELT=	**SPLENIC** RUPTURE DUE TO IMPROPER PLAC	6COCK-WM63
PROPER USE OF	**SPRING** MATERIALS=	1ZIMM-FP48
LEAF	**SPRING** SEAT FOR AUTOMOBILES=	7LEAF-SS40
R RUBBER-DIAPHRAGM SEAT	**SPRINGING=** CASE FO	7CASE-FR66

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		ENTRY CODE*
AUTOMOBILE CUSHION	SPRINGS=	7MURR-CA45
TIGUE TEST ON SEAT BACK	SPRINGS= FA	FORD-MC
CUSHION AND	SQUAB FILLINGS=	7CUSH-AS33
Y. LATERAL IMPACT WITH	STANDARD AIRCRAFT HARNESS CONFIGURAT	ROTH-JD66
RIES RESULTING FROM THE	STANDARD AUTOMOBILE SEAT BELT= ABDOM	6ODON-JB66
OR AUTOMOTIVE VEHICLES=	STANDARD FOR RESTRAINING DEVICES AND	1CANA-GS66
SEAT BELTS	STANDARD ON '64 AUTO MODELS=	8SEAT-BS63
AL MOTOR VEHICLE SAFETY	STANDARD ON MANDATORY SEAT BELT INST	8AUTO-MA66
SSENGER CAR SEAT BACKS=	STANDARD ON OCCUPANT IMPACT PROTECTI	7AUTO-MA92
HICLE= SAFETY FEATURES,	STANDARD VS. OPTIONAL EQUIPMENT ON A	1LEE -H 59
TIONAL ORGANIZATION FOR	STANDARDIZATION, RECOMMENDATIONS FOR	8FRED-RH65
ONAL SPECIFICATIONS AND	STANDARDS FOR U.S.A. AND SOME EUROPE	8EIFF-AL61
ONGRESS= AUTO SEAT BELT	STANDARDS SET, ESTABLISHED BY ACT OF	3AUTO-SB65
SAFETY SEAT BELT	STANDARDS=	8SAFE-SB61
F THE SIXTH CONFERENCE=	STAPP CAR CRASH AND FIELD DEMONSTRAT	1STAP-CC63
INGS= THE 7TH	STAPP CAR CRASH CONFERENCE. PROCEED	1STAP-CC65
PROCEEDINGS OF THE 10TH	STAPP CAR CRASH CONFERENCE=	1STAP-CC66
NESS - SABRE AND SILVER	STAR AIRCRAFT= SAFETY HAR	8DEAN-DA60
SUMMARY OF FEDERAL AND	STATE ACTIVITY= HIGHWAY TRANSPORTATI	2NATI-HU67
	STATE LAWS INFORMATION MANUAL=	3AUTO-MA61
LTS=	STATE LEGISLATORS CONSIDER SAFETY BE	3STAT-LC56
THE	STATE OF THE ART OF TRAFFIC SAFETY,=	1LITT-AD66
N WISCONSIN BY NEW YORK	STATE YIELDS CLUES= HOW WILL DRIVERS	5SCOT-BY63
USE OF REPRESENTATIVES=	STATEMENT OF CRASHWORTHINESS OF AUTO	3SEVE-DM
UNITED STATES SENATE= A	STATEMENT OF THE AUTOMOBILE MANUFACT	3BUGA-JS66
SEARCH= UNITED	STATES ARMY AVIATION CRASH INJURY RE	1AVIA-SE62
T= UNITED	STATES ARMY H-25 HELICOPTER DROP TES	TURN-JW61
UNITED	STATES CONGRESS=	3UNIT-SC57
TEE OF COMMERCE, UNITED	STATES SENATE= A STATEMENT OF THE AU	3BUGA-JS66
EAT BELTS IN THE UNITED	STATES= THE EFFECTIVENESS AND USE OF	5WOLF-RA61
Y=	STATIC TESTS OF PLYWOOD SEAT ASSEMBL	7ROGE-K 43
SICHERHEITSGURTEN=	STATISCHE AND DYNAMISCHE PRUFUNG FON	KEIL-E 93
EATS= ANATOMY AND	STATISTICS AID DESIGN OF PASSENGER S	7MORR-CW47
AT CUSHION= THE PRESENT	STATUS OF THE NAVY FATIGUE RELIEVING	7HANN-TD58
ROWING SURGICALPROBLEM=	STEERING WHEEL INJURY OF THE LIVER P	6STEE-WI66
ARNESS PROMOTION= NEW	STEP TOWARD AUTO SAFETY. SHOULDER H	8NEW -ST62
ETRIC TOOL=	STEREOPHOTOGRAMMETRY AS AN ANTHROPOM	5HERT-HT58
SEATING INNOVATION	STIRS INDUSTRY INTEREST=	7SEAT-IS51
E, A FUNDAMENTAL STUDY=	STOPPING THE OCCUPANT OF A CRASHING	1EGLI-A 67
HELICOPTER, PART II -	STOWAGE OF EQUIPMENT UNDER TROOP SE	7ROEG-HF60
CS OF MATERIALS AT HIGH	STRAIN RATES, PART VI, THE PROPAGATI	TAPL-BD60
N FINITE CYLINDERS OF A	STRAIN-RATE-DEPENDENT MATERIAL= STRE	TAPL-BD60
REEL-O-MATIC DUAL	STRAP SAFETY HARNESS=	8PACI-SC93
ES, INCORPORATED SINGLE	STRAP SHOULDER HARNESS AND LAP BELT=	HEND-E 55
NYLON SAFETY	STRAPS=	8NYLO-SS61
ANCHORAGE GEOMETRY AND	STRENGTH REQUIREMENTS SAE= MOTOR VEH	MOTO-VS62
ANCHORAGE GEOMETRY AND	STRENGTH REQUIREMENTS SAE= NEW RECOM	8NEW -RP62
	STRESS AND SEAT BELTS=	8STRE-AS58
ATE-DEPENDENT MATERIAL=	STRESS-STRAIN CHARACTERISTICS OF MAT	TAPL-BD60

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		ENTRY CODE*
ID LOADING RATES ON THE	STRESS-STRAIN PROPERTIES OF RESTRAIN	HALE-JL91
N IN RELATION TO PELVIC	STRESS= SITTING POSITIO	5LOWM-CL41
TTED CLOTH WITH ELASTIC	STRETCH CHARACTERISTICS= DEVELOPMENT	1BROC-HE64
ESS FOR GENERAL SERVICE	STRETCHER= DEVELOPMENT OF SAFETY HAR	1KIEL-IL50
PLANE= FUSELAGE - FLOOR	STRUCTURE - SEAT ATTACHMENT, ULTIMAT	1JENS-NA46
MAN IN	STRUCTURE AND FUNCTION, VOL. 1=	5KAHN-F 43
ENT OF ENERGY ABSORBING	STRUCTURES SUITABLE FOR AUTOMOBILE A	1SMIT-MD55
RING ASPECTS OF TEXTILE	STRUCTURES= ENGINEE	1FOX -KR56
SPECIFICATIONS FOR 1963	STUDEBAKER CARS=	8STUD-C 63
TIONS).= LATERAL IMPACT	STUDIES (LAP BELT SHOULDER HARNESS I	6ZABO-AV92
LINEAR DECELERATION	STUDIES AND HUMAN TOLERANCE=	6LATH-F 58
BELTS= SAE SUBCOMMITTEE	STUDIES NEED FOR DYNAMIC TESTING OF	8SOCI-AE94
CRASHES AND SLED RUNS=	STUDIES OF THREE-POINT RESTRAINT HAR	8BOHL-NI66
BIODYNAMIC	STUDIES ON IMPACT PROTECTION=	1ALDM-B 62
S PASSE. INSURANCE FIRM	STUDIES OTHER FEATURES= SEAT BELT	8SEAT-BP61
URNAL= COLLISION	STUDIES REVEAL GRUESOME FACTS SAE JO	6SEVE-DM60
ESTRAINT= THE AIR FORCE	STUDIES SEAT DESIGN. BODY SUPPORT/R	7DEMP-CA62
NGERS= AEROMED FACILITY	STUDIES SHOCK ABSORBER SEATS FOR JET	7AERO-PS59
AUTOMOTIVE HUMAN CRASH	STUDIES=	1RYAN-JJ62
OR PASSENGER CAR SAFETY	STUDIES= A NEW LABORATORY DEVICE F	1CICH-WG63
RED IN FULL-SCALE CRASH	STUDIES= ACCELERATIONS AND HARNESS F	MOSE-JC53
CRASH	STUDY CAN REDUCE CHANGES OF INJURY=	6DEHA-H 52
Y-INSTALLED SEAT BELTS.	STUDY CONDUCTED IN WISCONSIN BY NEW	5SCOT-BY63
TY AND COMFORT CRITERIA	STUDY IN DYNAMIC ENVIRONMENTS= PASSE	1SCHM-RV61
A	STUDY OF PASSENGER CAR SEATING=	7LANG-EW48
L= PRELIMINARY	STUDY OF RIDING QUALITIES SAE JOURNA	5BRAN-GC30
A FOLLOW-UP	STUDY OF SEAT BELT USAGE=	5MANH-D 66
NTS SEAT BELT SURVEY= A	STUDY OF SEAT BELTS IN WISCONSIN AUT	8ASHA-V 62
OMOBILE ACCIDENTS= A	STUDY OF SEAT BELTS IN WISCONSIN AUT	8AUTO-CI63
ER CONDITIONS=	STUDY OF SEATING UNDER VARIOUS WEATH	7COOK-E 48
BAGS= ANALYTICAL	STUDY OF SOFT LANDINGS ON GAS-FILLED	9ESGA-JB60
ILE AND TRUCKDRIVERS= A	STUDY OF THE EFFECTS OF SEAT BELTS O	8HASK-LT57
USSION AND EXPERIMENTAL	STUDY OF THE VARIABLES RELATED TO EF	5BLOM-GW61
ANICAL MODEL OF MAN FOR	STUDY OF VEHICLE SEAT AND SUSPENSION	7WISN-A 64
	STUDY SEAT BELTS IN SCHOOL BUSES=	8STUD-SB65
ONNEL RESTRAINT SYSTEMS	STUDY UH-1A AND UH-1B,BELL IROQUOIS	1AVIA-SE91
ONNEL RESTRAINT SYSTEMS	STUDY. CH-47 VERTOL CHINOOK= PERS	1HALE-JL64
FIGURATION= FEASIBILITY	STUDY. LATERAL IMPACT WITH STANDARD	ROTH-JD66
ONNEL RESTRAINT SYSTEMS	STUDY. BASIC CONCEPTS= PERS	1HALE-JL62
ONNEL RESTRAINT SYSTEMS	STUDY. UH-1A AND UH-1B BELL IROQUOIS	6HALE-JL91
ONNEL RESTRAINT SYSTEMS	STUDY, BASIC CONCEPTS= PERS	1FLIG-SF62
SONNEL RESTRAINT SYSTEM	STUDY, CH-47 VERTOL CHINOOK. CRASH I	PAYN-PR64
ONNEL RESTRAINT SYSTEMS	STUDY, CH-47 VERTOL CHINOOK= CRASH I	1AVIA-SE92
AIRCRAFT SEATS= CONDUCT	STUDY, DESIGN AND FURNISH PROTOTYPES	LANG-FC60
AIRCRAFT SEATS= CONDUCT	STUDY, DESIGN, DEVELOP AND FURNISH P	7AERO-C 60
SAFETY BELT RESEARCH	STUDY=	8SAFE-BR62
VEHICLE, A FUNDAMENTAL	STUDY= STOPPING THE OCCUPANT OF A CR	1EGLI-A 67
BILE SEAT BELTS FOR THE	SUBCOMMITTEE OF THE COMMITTEE ON INT	3SEVE-DM
TING OF SEAT BELTS= SAE	SUBCOMMITTEE STUDIES NEED FOR DYNAMI	8SOCI-AE94
RESPONSE OF RESTRAINED	SUBJECT DURING ABRUPT DECELERATION=	NICH-G 64
NS= EVALUATION OF HUMAN	SUBJECT REACTION IN THE FORWARD AND	7NOBL-H 61

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		ENTRY CODE*
RATION TESTS WITH HUMAN	**SUBJECTS=** CRASH DECELE	6RYAN-JJ60
NTAINABILITY, PERSONNEL	**SUBSYSTEM,** LIFE SCIENCES, QUALITY AS	4PETE-GA93
NTAINABILITY, PERSONNEL	**SUBSYSTEM,** LIFE SCIENCES,. QUALITY A	4PETE-GA91
GY ABSORBING STRUCTURES	**SUITABLE** FOR AUTOMOBILE APPLICATION=	1SMIT-MD55
CALIFORNIA LEGISLATURE.	**SUMMARY** AND ANALYSIS OF CALIFORNIA H	8TOUR-B 91
CALIFORNIA LEGISLATURE.	**SUMMARY** AND ANALYSIS OF CALIFORNIA H	8TOUR-B 93
LEGISLATION IN 1966, A	**SUMMARY** OF FEDERAL AND STATE ACTIVIT	2NATI-HU67
SAE	**SUMMER** MEETING=	7SOCI-AE58
D RESTRAINT SYSTEMS FOR	**SUPERSONIC** ESCAPE= HUMAN TOLERANCE T	6CART-RL59
RASH INJURY EVALUATION,	**SUPPLEMENT** TO PERSONNEL RESTRAINT SY	1AVIA-SE92
RASH INJURY EVALUATION,	**SUPPLEMENT=** PERSONNEL RESTRAINT SYST	PAYN-PR64
L IROQUOIS HELICOPTERS,	**SUPPLEMENT=** PERSONNEL RESTRAINT SYST	1AVIA-SE91
SYSTEMS= CREW PHYSICAL	**SUPPORT** AND RESTRAINT IN ADVANCED MA	1SMED-HA61
APE UPPER TORSO HARNESS	**SUPPORT** DEVELOPMENT TEST MODEL F 106	8KALO-JG56
OMOBILE SEATS-EFFICIENT	**SUPPORT** OF THE HUMAN BODY IN MOVING	7MCCO-CE47
PERSONNEL RESTRAINT AND	**SUPPORT** SYSTEM DYNAMICS=	PAYN-PR65
DIES SEAT DESIGN. BODY	**SUPPORT/RESTRAINT=** THE AIR FORCE STU	7DEMP-CA62
PILOTS' HEAD	**SUPPORT=**	1BENT-R 43
GUE TEST OF CUSHION PAD	**SUPPORTS=** FATI	7FORD-MC47
, MOMENT OF INERTIA AND	**SURFACE** AREA OF THE HUMAN BODY= CONT	5WEIN-AP38
LIVER PRESENTS GROWING	**SURGICALPROBLEM=** STEERING WHEEL INJU	6STEE-WI66
NON-OWNER ATTITUDES= A	**SURVEY** OF AUTOMOTIVE SEAT BELTS. OW	8AYER-WH56
STALLATION TRENDS AND A	**SURVEY** OF NEW JERSEY EXPERIENCE ACIR	CAMP-BJ93
ALS= THE ANTHROPOMETRIC	**SURVEY.** ITS MILITARY AND COMMERCIAL	5HERT-HT59
SEAT BELT ACCEPTANCE	**SURVEY=**	5MAYE-AF55
ILE ACCIDENTS SEAT BELT	**SURVEY=** A STUDY OF SEAT BELTS IN WIS	8ASHA-V 62
SEAT BELT INSTALLATION	**SURVEY=** PRELIMINARY	8CAMP-BJ91
RESULTING INJURIES IN A	**SURVIVABLE** TRANSPORT ACCIDENT= FAILU	7HASB-AH62
CAN MAKE MANY ACCIDENTS	**SURVIVABLE=** CRASH-SAFE DESIGN	1HASB-AH60
EW ARMORED SEAT. CRASH	**SURVIVAL** ANALYSES - PRELIMINARY REPO	REED-JL65
NATIONAL FLIGHT SAFETY	**SURVIVAL** AND PERSONAL EQUIPMENT SYMP	1SPAC-FE64
CRASH	**SURVIVAL** BY DESIGN=	1HASB-AH58
R MKGRU5 ESCAPE SYSTEM,	**SURVIVAL** KIT/LAP BELT RESTRAINT SYST	NAVA-AT66
ESTRAINT, RECOVERY, AND	**SURVIVAL** SYSTEM= MODULAR R	1STEN-AE62
= ACCIDENT	**SURVIVAL--AIRPLANE** AND PASSENGER CAR	1DEHA-H 91
R SEAT DESIGN AND CRASH	**SURVIVAL=** AIRCRAFT PASSENGE	7FRYE-DI58
SSENGER SEATS FOR CRASH	**SURVIVAL=** DESIGNING PA	7BREH-WH62
HUMAN	**SUSCEPTABILITY** TO VIBRATION=	5POST-F 44
RIDE COMFORT, SAFETY,	**SUSPENSION** REQUISITES=	1CHUR-HE54
CASE FOR	**SUSPENSION** SEATING=	7CASE-FS66
UDY OF VEHICLE SEAT AND	**SUSPENSION=** BIOMECHANICAL MODEL OF M	7WISN-A 64
NALYSIS OF THE INJURIES	**SUSTAINED** BY CAR OCCUPANTS= CAR SEAT	6LIST-RD63
VARIABLES AND INJURIES	**SUSTAINEDIN** LIGHTPLANE ACCIDENTS= RE	6CORN-GA61
ELS= AUTO SEAT BELTS, A	**SWEDISH** GOVERNMENT AGENCY USED CRASH	8CONS-U 92
TRACTS OF PAPERS AT THE	**SYMPOSIUM** ON BIOMECHANICS OF BODY RE	1HEND-E 61
AND PERSONAL EQUIPMENT	**SYMPOSIUM=** PROCEEDINGS OF 2ND NATION	1SPAC-FE64
THE SEAT BELT	**SYNDROME--DOES** IT EXIST.=	7FISH-J 65
THE SEAT BELT	**SYNDROME=**	8GARR-JW62
ON LITERATURE. ANNEX TO	**SYNTHESIS** OF IMPACT ACCELERATION TEC	4CAMB-L 63

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			ENTRY CODE*
SO HARNESS. MECHANICAL	**SYSTEM**	AND HUMAN TOLERANCE EVALUATIO	GRAY-RF63
HE TORSO-HEAD RESTRAINT	**SYSTEM**	AND THE INTEGRATED HARNESS RE	1HILL-JH59
T TEST REPORT RESTRAINT	**SYSTEM**	CAPSULE ESCAPE SYSTEM= DEVELO	1HOLC-GA61
L RESTRAINT AND SUPPORT	**SYSTEM**	DYNAMICS= PERSONNE	PAYN-PR65
KIT/LAP BELT RESTRAINT	**SYSTEM**	EVALUATION PROGRAM= MARTIN-BA	NAVA-AT66
F A PERSONNEL RESTRAINT	**SYSTEM**	FOR ADVANCE MANNED FLIGHT VEH	6FREE-HE62
RESTRAINTS= A RESTRAINT	**SYSTEM**	FOR APPLICATION IN ACCELERATI	9VANP-RE64
T= AN EXPERIMENTAL	**SYSTEM**	OF PRE-EJECTION BODY RESTRAIN	1FITZ-JG62
ING ASSOCIATED AREAS IN	**SYSTEM**	SAFETY, MAINTAINABILITY, PERS	4PETE-GA91
ING ASSOCIATED AREAS IN	**SYSTEM**	SAFETY, MAINTAINABILITY, PERS	4PETE-GA93
NT= PERSONNEL RESTRAINT	**SYSTEM**	STUDY, CH-47 VERTOL CHINOOK.	PAYN-PR64
RATED HARNESS RESTRAINT	**SYSTEM**	UNDER CONDITIONS OF ACCELERAT	1HILL-JH59
POSITIONING= A4D ESCAPE	**SYSTEM,**	EVALUATION OF MODIFIED HEAD-	7BACA-GA60
TIN-BAKER MKGRU5 ESCAPE	**SYSTEM,**	SURVIVAL KIT/LAP BELT RESTRA	NAVA-AT66
'G' PERSONNEL RESTRAINT	**SYSTEM=**	A RESEARCH PROGRAM TO DEVELO	1FREE-HE62
O G PERSONNEL RESTRAINT	**SYSTEM=**	CONSIDERATIONS AFFECTING THE	1BOYC-WC61
T SYSTEM CAPSULE ESCAPE	**SYSTEM=**	DEVELOPMENT TEST REPORT REST	1HOLC-GA61
OTECTION BY A RESTRAINT	**SYSTEM=**	EFFECTIVE PR	1LOMB-CF65
Y THE AIRSTOP RESTRAINT	**SYSTEM=**	IMPACT PROTECTION B	9BLEC-C 65
THE 'AIRSTOP' RESTRAINT	**SYSTEM=**	IMPACT PROTECTION WITH	9CLAR-C 92
RECOVERY, AND SURVIVAL	**SYSTEM=**	MODULAR RESTRAINT,	1STEN-AE62
ROWNE' SAFETY RESTRAINT	**SYSTEM=**	REEL-O-MATIC 'SAM B	8PACI-SC92
SEARCH= HUMAN RESTRAINT	**SYSTEMS**	DEVELOPMENT FOR USE IN ACCEL	1VYKU-HC64
ES OF ENERGY ABSORPTION	**SYSTEMS**	FOR AIRCRAFT SEATS= CONDUCT	LANG-FC60
ES OF ENERGY ABSORPTION	**SYSTEMS**	FOR AIRCRAFT SEATS= CONDUCT	7AERO-C 60
SITIONING AND RESTRAINT	**SYSTEMS**	FOR SUPERSONIC ESCAPE= HUMAN	6CART-RL59
POINT RESTRAINT HARNESS	**SYSTEMS**	IN FULL-SCALE BARRIER CRASHE	8BOHL-NI66
NT= PERSONNEL RESTRAINT	**SYSTEMS**	STUDY UH-1A AND UH-1B,BELL I	1AVIA-SE91
= PERSONNEL RESTRAINT	**SYSTEMS**	STUDY. CH-47 VERTOL CHINOOK	1HALE-JL64
PERSONNEL RESTRAINT	**SYSTEMS**	STUDY. BASIC CONCEPTS=	1HALE-JL62
ON. PERSONNEL RESTRAINT	**SYSTEMS**	STUDY. UH-1A AND UH-1B BELL	6HALE-JL91
PERSONNEL RESTRAINT	**SYSTEMS**	STUDY, BASIC CONCEPTS=	1FLIG-SF62
TO PERSONNEL RESTRAINT	**SYSTEMS**	STUDY, CH-47 VERTOL CHINOOK=	1AVIA-SE92
PERSONNEL RESTRAINT	**SYSTEMS=**		1DEHA-C 62
IVE PASSENGER RESTRAINT	**SYSTEMS=**	ANALYSIS OF THE DYNAMICS OF	AVIA-CI63
ILE PASSENGER-RESTRAINT	**SYSTEMS=**	ANALYSIS OF THE DYNAMICS OF	MCHE-RR65
OF HARNESS RESTRAINING	**SYSTEMS=**	BARRIER COLLISION INVESTIGA	1FRED-RH65
GINEERING OF PROTECTIVE	**SYSTEMS=**	BIO-EN	1GELL-CF60
ADVANCED MANNED FLIGHT	**SYSTEMS=**	CREW PHYSICAL SUPPORT AND R	1SMED-HA61
MICS OF HUMAN RESTRAINT	**SYSTEMS=**	THE DYNA	PAYN-PR62
.= MECHANICAL FORCES -	**TABLEI.**	ESTIMATED TOLERANCES OF UNPR	6GOLD-DE46
A REEL SHOULDER HARNESS	**TAKE-UP**	MECHANISM= FLIGHT TESTS OF I	AMER-SC63
ELTS FOR DRIVERS FROM A	**TECHNICAL**	POINT OF VIEW= SAFETY B	8HAES-A 62
ERIA AND DEVELOPMENT OF	**TECHNIQUE**	FOR DESIGN OF AUTOMOBILE S	7SHER-WF62
ENT INVESTIGATIONS= NEW	**TECHNIQUES**	FOR ASSESSING DAMAGE FROM	1GREG-LW63
SEAT HARNESSES. A	**TECHNOLOGICAL**	LAG=	8CONS-U 93
OF IMPACT ACCELERATION	**TECHNOLOGY**	FOR AVIATION CRASH INJURY	4CAMB-L 63
= DYNAMIC TESTS OF	**TELEFLEX**	INERTIA REELS AND HARNESSES	CHIS-SW59
THE FALLACY OF THE	**TERM**	'WHIPLASH INJURY'=	6BRAU-PW93
MOTOR VEHICLES USING A	**TEST**	DUMMY AND ACCELERATED SEAT= INV	WILL-JH62
ECTIVE HEADGEAR= IMPACT	**TEST**	METHODS AND RETENTION HARNESS C	HALE-JL92

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		ENTRY CODE*
ESS SUPPORT DEVELOPMENT	TEST MODEL F 106A= PILOT EMERGENCY E	8KALO-JG56
TERISTICS DEVELOPMENTAL	TEST MODEL 22= SEAT BACK-PASSENGER-I	7SIFU-SS58
-21 HELICOPTER= DYNAMIC	TEST OF AN EXPERIMENTAL TROOP SEAT I	7TURN-JW63
DEVELOPMENT AND	TEST OF AUTOMOTIVE TYPE SEATS=	FORD-AR47
FATIGUE	TEST OF CUSHION PAD SUPPORTS=	7FORD-MC47
DEVELOPMENT AND	TEST OF PNEUMATIC SEAT CUSHIONS.=	7HANN-TD57
FATIGUE	TEST ON SEAT BACK SPRINGS=	FORD-MC
P BELTS= SAE RECOMMENDS	TEST PROCEDURES FOR MOTOR VEHICLE LA	8SOCI-AE91
IS OF SEAT BELT DYNAMIC	TEST PROCEDURES= ANALYS	MCHE-RA62
APE SYSTEM= DEVELOPMENT	TEST REPORT RESTRAINT SYSTEM CAPSULE	1HOLC-GA61
TACHMENT, ULTIMATE LOAD	TEST, MODEL 240 AIRPLANE= FUSELAGE -	1JENS-NA46
MY H-25 HELICOPTER DROP	TEST= UNITED STATES AR	TURN-JW61
LE BELTS, THEIR USE AND	TESTING IN THE UNITED KINGDOM= AUTOM	8REDF-FA65
DYNAMIC	TESTING OF CAR SEAT BELTS=	BRIT-SI63
ES= REQUIREMENTS FOR	TESTING OF INERTIA REELS FOR HARNESS	ALDM-B 65
DYNAMIC	TESTING OF SEAT BELTS=	FINC-DM57
DYNAMIC	TESTING OF SEAT BELTS=	SOCI-AE64
TUDIES NEED FOR DYNAMIC	TESTING OF SEAT BELTS= SAE SUBCOMMIT	8SOCI-AE94
CCUPANT SAFETY, DYNAMIC	TESTING OF SEATS= RESEARCH IN O	7LEDE-J 59
ON OF A CRASH DUMMY FOR	TESTING SHOULDER HARNESS AND SAFETY	SWEA-JJ51
RAPID-DECELERATION	TESTS FOR CHEST-LEVEL SAFETY BELTS=	MATH-JH53
INING DEVICES= DYNAMIC	TESTS OF AUTOMOBILE PASSENGER RESTRA	MICH-I 63
KE-UP MECHANISM= FLIGHT	TESTS OF INERTIA REEL SHOULDER HARNE	AMER-SC63
ES=	TESTS OF PERSONNEL RESTRAINING DEVIC	KELL-AH64
STATIC	TESTS OF PLYWOOD SEAT ASSEMBLY=	7ROGE-K 43
DYNAMIC	TESTS OF RESTRAINTS FOR CHILDREN=	APPO-FA66
NSUMERS UNION'S DYNAMIC	TESTS OF SEAT BELTS= CO	8MICH-I 61
HARNESSES= DYNAMIC	TESTS OF TELEFLEX INERTIA REELS AND	CHIS-SW59
AND RELATED IMPACT SLED	TESTS ON BUSSESININTERCITY SERVICE=	1LABE-DJ65
UMAN CRASH DECELERATION	TESTS ON SEATBELTS= H	RYAN-JJ61
CRASH DECELERATION	TESTS WITH HUMAN SUBJECTS=	6RYAN-JJ60
ES IN CONTROLLED IMPACT	TESTS= PERFORMANCE OF SEAT BELT ASSE	LIST-RD63
EVALUATION, FORT WORTH,	TEXAS, 7 JULY 1960, 19-20 JANUARY 19	CARR-J 60
IMPACT INVESTIGATION ON	TEXTILE MATERIALS=	SCHW-ER46
ENGINEERING ASPECTS OF	TEXTILE STRUCTURES=	1FOX -KR56
ABSTRACTS= BEHAVIOR OF	TEXTILES UNDER IMPACT CONDITIONS, AN	MORG-H 55
UPWARD ACCELERATIONS BY	THAT OF AN ELASTIC ROD AND COMPARISO	6HESS-JL56
SAFETY BELT	THAT REACTS TO CAR MOTIONS=	8SAFE-BT63
ATION OF THE ABILITY OF	THEHUMAN BODY TO WITHSTAND HIGH IMPA	WURZ-EM48
CARS. AN ASSESSMENT OF	THEIR EFFECTIVENESS= SAFETY BELTS IN	8MORE-JD62
IRCRAFT SAFETY BELTS.	THEIR INJURY EFFECT ON THE HUMAN BOD	6DEHA-H 53
IRCRAFT SAFETY BELTS.	THEIR INJURY EFFECT ON THE HUMAN BOD	6TOUR-B 53
TION, CRASH ENERGY, AND	THEIR RELATIONSHIP TO CRASH INJURY=	6DEHA-H 60
OF RESTFUL SITTING AND	THEIR SIGNIFICANCE IN THE CONSTRUCTI	7AKER- 51
AND RETRACTABLE BELTS,	THEIR USE AND TESTING IN THE UNITED	8REDF-FA65
NE FOAMS IN RELATION TO	THEIR USE AS EJECTION SEAT CUSHION M	7GLAI-DH61
ALE MANIKINS=	THEORY AND PRACTICE IN THE USE OF SC	RAND-FE49
IS	THIS THE SEATING OF THE FUTURE=	7IS -TT65
ANTHROPOMETRIC DATA IN	THREE-DIMENSIONAL FORM. DEVELOPMENT	5MCCO-JT63

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		ENTRY CODE*
IONS= PROBLEMS WITH THE	**THREE-POINT** BELT INSTALLATIONS AND P	8SHAR-JE65
D SLED RUNS= STUDIES OF	**THREE-POINT** RESTRAINT HARNESS SYSTEM	8BOHL-NI66
ACT FORCES ON THE HUMAN	**THROUGH** RESTRAINING DEVICES= DISTRIB	BIER-HR46
NT AND QUALIFICATION OF	**THRUSTER,** CARTRIDGE ACTUATED, T30= D	9KENT-SJ61
RITY AS RELATED TO SEAT	**TIEDOWN** AND BELT FAILURE IN LIGHTPLA	6PEAR-RG61
THE PASSENGER SEAT BELT	**TIEDOWN** ATTACHMENTS IN THE U.S. ARMY	8ROBE-SH62
IMPROVEMENT OF LAP BELT	**TIGHTENER=**	8PISA-FT64
E OF THE HUMAN BODY AND	**TISSUES.** INFLUENCE ON THE MANUFACTU	6ZIFF-D 65
ANICAL SYSTEM AND HUMAN	**TOLERANCE** EVALUATION= POWERED TORSO	GRAY-RF63
BELTS= BIOLOGICAL	**TOLERANCE** IN DECELERATION CAR SAFETY	6ALDM-B 62
3-SEPTEMBER 1962= HUMAN	**TOLERANCE** IN IMPACT LOADING. A REPOR	4DEFE-DC62
LYING= CONCERNING HUMAN	**TOLERANCE** OF ACCELERATION AS IT APPL	6RUFF-S 92
ECELERATION= ANATOMICAL	**TOLERANCE** OF THE HUMAN PECTORAL GIRD	6FASO-A 50
UPERSONIC ESCAPE= HUMAN	**TOLERANCE** TO AUTOMATIC POSITIONING A	6CART-RL59
CTIVATOR FORCES.= HUMAN	**TOLERANCE** TO AUTOMATIC RESTRAINT HAR	6GANS-RV66
BELT ONLY= HUMAN	**TOLERANCE** TO LATERAL IMPACT WITH LAP	6ZABO-AV91
E-BALLS OUT)= PASSENGER	**TOLERANCE** TO TRANSVERSE ACCELERATION	6DELV-RJ63
WITH REFERENCE TO HUMAN	**TOLERANCE=** EVALUATION OF THE LAP-TYP	8STAP-JP58
ATION STUDIES AND HUMAN	**TOLERANCE=** LINEAR DECELER	6LATH-F 58
CES - TABLEI. ESTIMATED	**TOLERANCES** OF UNPROTECTED HUMAN BODY	6GOLD-DE46
CAN THE HUMAN BODY	**TOLERATE** VIOLENT CRASHES.=	6DEHA-H 48
SAFETY FOR	**TOMORROW'S** CARS=	1SAFE-FT58
RY AS AN ANTHROPOMETRIC	**TOOL=** STEREOPHOTOGRAMMET	5HERT-HT58
EMERGENCY ESCAPE UPPER	**TORSO** HARNESS SUPPORT DEVELOPMENT TE	8KALO-JG56
NCE EVALUATION= POWERED	**TORSO** HARNESS. MECHANICAL SYSTEM AN	GRAY-RF63
ONING SINGLE DISCONNECT	**TORSO** RESTRAINT HARNESS FOR THE B-58	9HOLC-GA60
= SAFE AND UNSAFE UPPER	**TORSO** RESTRAINTS FOR OCCUPANT PROTEC	8STAT-JD65
NAMIC RESEARCH OF UPPER	**TORSO** RESTRAINTS= DY	1PROV-EL66
E RESPONSE OF THE HUMAN	**TORSO** TO LARGE RAPIDLY APPLIED UPWAR	6HESS-JL56
TION= EVALUATION OF THE	**TORSO-HEAD** RESTRAINT SYSTEM AND THE	1HILL-JH59
S PROMOTION= NEW STEP	**TOWARD** AUTO SAFETY. SHOULDER HARNES	8NEW -ST62
AND CABS= CODE H33 FARM	**TRACTOR,** CODE H34 FRONT END LOADERS	GIVE-GA64
ONT END LOADERS AND H24	**TRACTORS** - INSTALLATION OF ROLL BARS	GIVE-GA64
THE STATE OF THE ART OF	**TRAFFIC** SAFETY,=	1LITT-AD66
NJURIES IN A SURVIVABLE	**TRANSPORT** ACCIDENT= FAILURE OF REARW	7HASB-AH62
FORWARD FACING SEATS IN	**TRANSPORT** AIRCRAFT= AFT VS	7AIR -TA61
OF PASSENGER SEATS FOR	**TRANSPORT** AIRCRAFT= CURRENT SAFETY C	7DEHA-H 52
ND OPERATION OF HIGHWAY	**TRANSPORT** EQUIPMENT= HUMAN VARIABLES	5HUMA-VI52
VS. REARWARD FACING AIR	**TRANSPORT** PASSENGER SEATS= A COMPARI	7KIRC-OE91
CRASH PROTECTION OF AIR	**TRANSPORT** PASSENGERS BY IMPROVED SEA	7STAP-JP61
UMAN FACTORS IN HIGHWAY	**TRANSPORT** SAFETY SAE= H	5MCFA-RA56
MILITARY	**TRANSPORT** SEATING=	7BOST-K 52
IRSTOP RESTRAINT= HUMAN	**TRANSPORTATION** FATALITIES AND PROTEC	9CLAR-C 91
STATE ACTIVITY= HIGHWAY	**TRANSPORTATION** LEGISLATION IN 1966,	2NATI-HU67
CRASH PROTECTION IN AIR	**TRANSPORTS=**	1STAP-JP53
INT GEAR= EVALUATION OF	**TRANSVERSE** ACCELERATION (REAR TO REA	1MILL-CO57
PASSENGER TOLERANCE TO	**TRANSVERSE** ACCELERATION AND DECELERA	6DELV-RJ63
'S ABILITY TO WITHSTAND	**TRANSVERSE** ACCELERATION WHEN IN THE	6LAMB-EH45
ROTECTION DURING ABRUPT	**TRANSVERSE=** LIMITS OF SEAT BELT P	8GUGG-AS61
FACIAL	**TRAUMA** IN AUTOMOBILE COLLISIONS=	6NAHU-AM65
SEAT BELT INSTALLATION	**TRENDS** AND A SURVEY OF NEW JERSEY EX	CAMP-BJ93

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			ENTRY CODE*
ROP TEST=	**UNITED**	STATES ARMY H-25 HELICOPTER D	TURN-JW61
	UNITED	STATES CONGRESS=	3UNIT-SC57
COMMITTEE OF COMMERCE,	**UNITED**	STATES SENATE= A STATEMENT OF	3BUGA-JS66
SE OF SEAT BELTS IN THE	**UNITED**	STATES= THE EFFECTIVENESS AND	5WOLF-RA61
ESTIMATED TOLERANCES OF	**UNPROTECTED**	HUMAN BODY TO VARIOUS ME	6GOLD-DE46
NTS= IMPACT DYNAMICS OF	**UNRESTRAINED,**	LAP BELTED, AND LAP DI	PATR-LM66
OTOR VEHICLES= SAFE AND	**UNSAFE**	UPPER TORSO RESTRAINTS FOR OC	8STAT-JD65
AN	**UNUSUAL**	INJURY DUE TO THE SEAT BELT=	6TOLI-SH64
ICKLUNG UND BEURTEILUNG	**UON**	KRAFTFAHRZEUGSI TZEN= MESSGERAET	7THIE-R 64
IRONMENTS WITH EMPHASIS	**UPON**	KNEE AND LOWER LEG RESTRAINTS=	9VANP-RE64
PILOT EMERGENCY ESCAPE	**UPPER**	TORSO HARNESS SUPPORT DEVELOPM	8KALO-JG56
HICLES= SAFE AND UNSAFE	**UPPER**	TORSO RESTRAINTS FOR OCCUPANT	8STAT-JD65
DYNAMIC RESEARCH OF	**UPPER**	TORSO RESTRAINTS=	1PROV-EL66
O LARGE RAPIDLY APPLIED	**UPWARD**	ACCELERATIONS BY THAT OF AN E	6HESS-JL56
MENT AND FABRICATION OF	**USAF**	HEIGHT-WEIGHT MANIKNS= ANTHROPO	5MCCO-JT63
W-UP STUDY OF SEAT BELT	**USAGE=**	A FOLLO	5MANH-D 66
RT--SURVEY OF SEAT BELT	**USE**	AMONG MOTOR VEHICLE FLEET OPERAT	5NATI-SC60
SHOULDER HARNESS\ ITS	**USE**	AND EFFECTIVENESS=	8DEHA-H 52
SHOULDER HARNESS\ ITS	**USE**	AND EFFECTIVENESS=	8DEHA-H 56
ETRACTABLE BELTS, THEIR	**USE**	AND TESTING IN THE UNITED KINGDO	8REDF-FA65
MS IN RELATION TO THEIR	**USE**	AS EJECTION SEAT CUSHION MATERIA	7GLAI-DH61
SYSTEMS DEVELOPMENT FOR	**USE**	IN ACCELERATION RESEARCH= HUMAN	1VYKU-HC64
THE	**USE**	OF OSCAR IN SEAT DESIGN=	SOCI-AE54
INJURY REDUCTION BY THE	**USE**	OF SAFETY BELTS IN MOTOR CARS=	8HERB-DC60
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