Homemade Turbojet Engine

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Static Sea-level Performance of an Axial-flow-compressor Turbojet Engine with an Air-cooled Turbine
Motorbooks International

Designing and building a miniature aero-engine is an exciting and rewarding task. Whether a professional engineer or an amateur looking to build an engine to fly your model aeroplane, this book will safely guide you through all the stages of designing and constructing an aero-engine in your workshop at home. With practical advice and detailed diagrams throughout, the book includes: machine tools, materials and accessories required; designing the engine, including a focus on proportion, valve timing and engine balancing; the manufacture of carburettors, assembly and setting up and, finally, choosing an aircraft for a home-designed miniature engine. Aimed at home metalworkers, engineers, hobbyist aero-engine builders and miniature aeroplane enthusiasts, and packed full of advice and tips, this new book is both instructional and inspirational. Fully illustrated with 163 colour photographs and 65 diagrams.

The Origins of the Turbojet Revolution

Icon Books Traces the history and development of the jet engine

Frank Whittle (Icon Science) AIAA (American Institute of Aeronautics & Astronautics) The full development history of Westinghouse's four earliest engine models is documented in this volume, the data taken from the original source documents wherever possible. 361 Pages / 191 Illustrations. Early turbojet engine development by Westinghouse began in 1940 as experimental analysis first for the National Advisory Committee for Aeronautics and continued for the U.S. Navy's Bureau of Aeronautics after December 7, 1941. The early impressive successes of the engine models covered in this volume triggered Navy support for later, higher thrust engines. Westinghouse would become a major supplier of turbojet engines for the Navy until the early 1950's. The engine Model 19A deserves to be honored as the first successfully run axial turbojet in the United States, developed in almost total isolation from the jet engine development work being pursued by other firms and nations. The performance of this engine allowed the U.S. Navy to pursue rapid development along several lines and soon the 19B was developed into the 19XB-2B (J30), used in the early McDonnell FD-1 Phantom carrier based fighter. The 9.5A/B (J32) was begun as a scaled down version of the 19A for use in light weight fighter planes and then was shifted for use in several limited target drone applications. The ability of Westinghouse to successfully use the base aerodynamic layout of the 19B in the two other engines was to be demonstrated yet again in their later designs.

Performance of Basic XJ79-GE-1 Turbojet Engine and Its Components I. K. International Pvt Ltd

During the course of an investigation of an axial-flow turbojet engine in the Lewis altitude wind tunnel, limitations on the transient operation of the engine were determined to relation to two altitudes and exhaust-nozzle-areas. Below approximately 70 percent of the generalized engine rotational speed, a high-frequency oscillation (stall) at the compressor inlet limited transient operation of the engine. Over 70 percent of the engine speed, transient operation was limited by a low-frequency oscillation (surge), which occurred throughout the engine.

Effect of Combustor-inlet Conditions on Performance of an Annular Turbojet Combustor AIAA

Characteristics of a basic turbojet engine consisting of compressor, combustor, and turbine can be presented in terms of pumping characteristics; that is, corrected air flow, ratio of engine-outlet to -inlet total pressure, ratio of engine-outlet to -inlet total temperature, Reynolds number index, corrected engine speed, and corrected fuel-air ratio. Such a presentation describes the engine independently of the characteristics of other elements of the propulsion system. This method of presentation also permits rapid estimation of performance of complex propulsion systems involving the basic tubojet engine.

Simulator for Use in Development of Jet Engine Controls BoD – Books on Demand

The story of the jet engine has everything: genius, tragedy, heroism, a world war, the individual vs. the state, and an idea that would change the world. Frank Whittle always maintained that he was held back by a lack of government support. At the very moment in 1943 when his invention was unveiled to the world, his company, Power Jets, was forcibly nationalised. Yet Whittle's brilliance, charm and charisma helped him recruit major support from the British government and the RAF, who gave him the green light to build a jet engine at a time when to do so made little sense. Here is a story of what pushing technology to its limits can achieve - and the effect that such achievement can have on those involved.

Ramjet Engines

Air World

Three test programs were conducted to provide thepreliminary groundwork for thedesign of a small turbojet engine from turbocharger rotorcomponents for possible Uninhabited Aerial Vehicle applications. The first program involved the performance mapping of the Garrett T2 turbocharger centrifugal compressor. The second program involved the bench testing of a small turbojet engine, the Sophia J450, at 115000 RPM, and comparing the results to another small turbojet, the

JPX-240, from previously documented research. The compressor radii of the two engines were identical but greater than that of the Garrett compressor. The two engines, despite their physical similarities, had different fuel requirements. The J450 used heavy fuel (fuel pump required) while the JPX used liquid propane (pressurized fuel tank required). The third program involved the performance prediction of the J450 using GASTURB cycle analysis software. The compressor map generated from the Garrett T2 test was imported into GASTURB and used to predict the J450 performance at 94000,105000,115000, and 123000 RPM. The performance predictions agreed reasonably well with actual J450 performance.

Determining Operational States of Turbojet Engines with Variable-area Tail Nozzle Independently Published

A nonlinear analog simulation of a turbojet engine was developed. The purpose of the study was to establish simulation techniques applicable to propulsion system dynamics and controls research. A schematic model was derived from a physical description of a J85-13 turbojet engine. Basic conservation equations were applied to each component along with their individual performance characteristics to derive a mathematical representation. The simulation was mechanized on an analog computer. The simulation was verified in both steady-state and dynamic modes by comparing analytical results with experimental data obtained from tests performed at the Lewis Research Center with a J85-13 engine. In addition, comparison was also made with performance data obtained from the engine manufacturer. The comparisons established the validity of the simulation technique.

Experimental Investigation of an Air-cooled Turbine Operating in a Turbojet Engine at Turbine Inlet Temperatures Up to 2500 Degrees F

The combustion performance and particularly the phenomenon of altitude operational limits was studied by operating the annular combustor of a turbojet engine over a range of conditions of air flow, inlet pressure, inlet temperature, and fuel flow. The combustor investigated was not the latest version of this combustor and the data are presented primarily because they are indicative of general trends and phenomena that apply to a large class of turbojet combustors.

Aircraft Turbine Engines

Lærebogsagtig beskrivelse af teorien og principperne i f.m. gasturbine- og jetmotorer

The Development of Jet and Turbine Aero Engines

"Pratt & Whitney engines helped to win World War II by powering much of the U.S. fighter fleet as well as many British planes. They also powered 98 percent of all transport planes used by the military during that war. Since then, they've powered such record-breaking aircraft as the Boeing B-50, the first airplane to fly nonstop around the globe, and the Air Force F-100 Super Sabre becoming the first aircraft to break the speed of sound in horizontal flight. In July 1976, Pratt & Whitney J58 engines powered an SR-71 spy plane to a world altitude record of 84,069 feet (25,624 kilometers) and a second Blackbird to a world speed record of 2,193 miles per hour (3,529 kilometers per hour). These dependable engines are also responsible for powering the first generation of commercial jet transports bringing the world to our front doors - the Boeing 707 and Douglas DC-8. Pratt & Whitney's JT8D, powering the Boeing 727 and 737, as well as the Douglas DC-9, has totaled more than half a billion hours of service with more than 350 operators since its commercial service began. In fact, they've been used in most of the world's civil, commercial and military aircraft. Over the years, Pratt & Whitney has patented hundreds of innovations, from heat-resistant coatings to aerodynamic blades - technologies that make air travel more cost effective, comfortable and dependable. Today Pratt and Whitney engines provide power for everything from land based power stations, business jets and helicopters to large commercial aircraft, fifth generation fighters, and manned & unmanned space vehicles."The story of Pratt & Whitney" offers broad insight into the history of aviation itself and the people who built the industry." --Résumé de l'éditeur.

The Jet Engine

Popular Science gives our readers the information and tools to improve their technology and their world. The core belief that Popular Science and our readers share: The future is going to be better, and science and technology are the driving forces that will help make it better.

Popular Science

Flying is today part of our life. We can sit in comfortable seats and reach nearly every destination around the world. Few passengers know that the engines one can see through the cabin window have been invented and built and tested just 85 years ago. At the beginning there were inventors, small engines and small aircraft, which have grown in the course of decades into big aircraft, powerful engines and mighty companies.The story of this development is highly fascinating and entertaining. Who wants to know more finds in this book a lot of informations and technical details. Never before a book with this range of inventors, jet engines, jet aircraft and jet companies has been published.

Factors that Affect Operational Reliability of Turbojet Engines

From propellers to turbofans, this illustrated history of engines will be “ of interest to modelers and aviation historians alike ” (AMPS Indianapolis). The first efforts of man to fly were limited by his ability to generate sufficient power to lift a heavier-than-air machine off the ground. Propulsion and thrust have therefore been the most fundamental elements in the development of aircraft engines. From the simple propellers of the first airliners of the 1920s and 1930s, to the turboprops and turbojets of the modern era, the engines used in airliners have undergone dramatic development over a century of remarkable change. These advances are examined in detail by aeronautical engineer Reiner Decher, who provides a layman ’ s guide to the engines that have, and continue to, power the aircraft that carry millions of travelers across millions of miles each year. Decher also looks at the development of aero engines during the Second World War and how that conflict drove innovation and explains the nature of wing design, from the early twentieth century to the present. To enable an easy understanding of this intriguing subject, Powering the World ’ s Airliners is profusely illustrated, transporting readers back to the time of each major development and introducing them to the key individuals of the aero industry in each era. After reading this comprehensive yet engaging story of the machines that power the aircraft in which we fly, no journey will ever seem quite the same again.

Application of Atomic Engines in Aviation

Compressor performance and turbine performance are presented in the form of performance maps at selected values of Reynolds number index; the effects of Reynolds number on performance are summarized. The effects of variable stator angle and high inlet-air temperatures on compressor performance are also shown. Over-all engine performance (net thrust and specific fuel consumption) is presented for a flight Mach number of 0.9 at rated engine conditions over a range of altitudes to illustrate performance losses resulting from decreased Reynolds number index.

Powering the World's Airliners

Examines the theory of air breathing engines - or more precisely aircraft engines. These engines take air from the atmosphere, accelerate and produce thrust to the aircraft. Gas turbine forms the basic unit and is gas generator.

The components of the gas turbines are given in detail. The book will be useful for aeronautical engineering students. Jet - The story of jet propulsion Annotation A design textbook attempting to bridge the gap between traditional academic textbooks, which emphasize individual concepts and principles; and design handbooks, which provide collections of known solutions. The airbreathing gas turbine engine is the example used to teach principles and methods. The first edition appeared in 1987. The disk contains supplemental material. Annotation c. Book News, Inc., Portland, OR (booknews.com).

Determination of Surge and Stall Limits of an Axial-flow Turbojet Engine for Control Applications Professors Wild and Davis, both of Purdue University, have updated the classic Aircraft Turbine Engines textbook to create the second edition. This new edition contains the latest in turbine engine technology and manufacturing practices. Of course, it still covers the unchanging principles of heat engines, performance factors, and all the terminology that goes with them.This book was written for powerplant technicians and crewmembers who service, maintain, and operate gas turbine engines used on today's aircraft. Comprehensive diagrams and images are used throughout the text to illustrate key concepts. Turbine engine practices and techniques provide background information on standard industry practices.Turbofan , turboprop, and turboshaft engines are explored, emphasizing their differences and how they fulfill unique requirements. Example engine models are explored in detail for each type. Readers can easily understand engine systems and components and their function as part of the overall engine operation.Topics?History and advancement of turbine engines?Turbine principles?Terms and engine types?Turbine design?Turbine engine systems and maintenance?Testing and operation?Turbofan engines?Turboprop engines?Turboshaft engines and APUs?Inspection and maintenance?Fault analysis?Turbine engine manufacturing

Experimental Investigation of Air-cooled Turbine Blades in Turbojet Engine

Early Westinghouse Axial Turbojets