

Boeing 747 400 Engine Maintenance Cycle

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in Scientific and technical aerospace reports (STAR) and International aerospace abstracts (IAA)

The story of how diesel engines and gas turbines, used to power cargo ships and jet airplanes, made today's globally integrated economy possible. The many books on globalization published over the past few years range from claims that the world is flat to an unlikely rehabilitation of Genghis Khan as a pioneer of global commerce. Missing from these accounts is a consideration of the technologies behind the creation of the globalized economy. What makes it possible for us to move billions of tons of raw materials and manufactured goods from continent to continent? Why are we able to fly almost anywhere on the planet within twenty-four hours? In *Prime Movers of Globalization*, Vaclav Smil offers a history of two key technical developments that have driven globalization: the high-compression non-sparking internal combustion engines invented by Rudolf Diesel in the 1890s and the gas turbines designed by Frank Whittle and Hans-Joachim Pabst von Ohain in the 1930s. The massive diesel engines that power cargo ships and the gas turbines that propel jet engines, Smil argues, are more important to the global economy than any corporate structure or international trade agreement. Smil compares the efficiency and scale of these two technologies to prime movers of the past, including the sail and the steam engine. The lengthy processes of development, commercialization, and diffusion that the diesel engine and the gas turbine went through, he argues, provide

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perfect examples of gradual technical advances that receive little attention but have resulted in epochal shifts in global affairs and the global economy.

"Giving a largely descriptive overview of all aspects of the design process, this well-illustrated account provides an insight into the requirements of each specialist in an aircraft design team. After discussing the need for new designs, the text assesses the merits of different aircraft shapes from micro-lights and helicopters to super-jumbos and V/STOL aircraft."--Back cover.

The travel industry has been through exceptional upheaval and change. Plunkett's Airline, Hotel & Travel Industry Almanac will be your complete guide to this fascinating industry. After reeling from the effects of the September 11, 2001 tragedies, the travel business is now emerging as a more streamlined, efficient and focused industry. Many of the biggest, most successful firms are becoming extremely global in nature. Meanwhile, most airlines are struggling to return to profitability, while low-cost providers Southwest Airlines and JetBlue continue to set the standard for air travel.

Deregulation is opening up huge travel markets in India and China. On the hotel side, massive management firms, development companies and real estate investment trusts are gaining in scale and influence. The booking of travel online is perhaps the most successful niche of all of the world's e-commerce efforts. Consumers use the Internet to become better informed and to seek bargains. Online sites like Travelocity, Priceline and Orbitz steer millions of consumers toward specific airlines and hotels in a manner that lowers prices and improves satisfaction among consumers. The exciting new reference book (which includes a fully-featured database on CD-ROM) will give you access to the complete scope of the travel industry, including: Analysis of major trends; Market research; Statistics and historical tables;

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Airlines; Hotel operators; Entertainment destinations such as resorts and theme parks; Tour operators; The largest travel agencies; E-commerce firms; Cruise lines; Casino hotels; Car rental; and much, much more. You'll find a complete overview, industry analysis and market research report in one superb, value-priced package. It contains thousands of contacts for business and industry leaders, industry associations, Internet sites and other resources. This book also includes statistical tables, a travel industry glossary, industry contacts and thorough indexes. The corporate profile section of the book includes our proprietary, in-depth profiles of over 300 leading companies in all facets of the travel industry. Purchasers of either the book or PDF version can receive a free copy of the company profiles database on CD-ROM, enabling key word search and export of key information, addresses, phone numbers and executive names with titles for every company profiled.

The immense, global transportation and logistics sector is vital to businesses of all types. This carefully-researched book covers exciting trends in supply chain and logistics management, transportation, just in time delivery, warehousing, distribution, intermodal shipment systems, logistics services, purchasing and advanced technologies such as RFID. This reference tool includes thorough market analysis as well as our highly respected trends analysis. You'll find a complete overview, industry analysis and market research report in one superb, value-priced package. It contains thousands of contacts for business and industry leaders, industry associations, Internet sites and other

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resources. This book also includes statistical tables, an industry glossary and thorough indexes. The corporate profiles section of the book includes our proprietary, in-depth profiles of the 500 leading companies in all facets of the transportation and logistics industry. Here you'll find complete profiles of the hot companies that are making news today, the largest, most successful corporations in the business. Purchasers of either the book or PDF version can receive a free copy of the company profiles database on CD-ROM, enabling key word search and export of key information, addresses, phone numbers and executive names with titles for every company profiled.

Covers various trends in supply chain and logistics management, transportation, just in time delivery, warehousing, distribution, inter modal shipment systems, logistics services, purchasing and advanced technologies such as RFID. This book includes one page profiles of transportation, supply chain and logistics industry firms.

A comprehensive index to company and industry information in business journals.

This study supports the NASA Glenn Research Center and the U.S. Air Force Research Laboratory in their efforts to evaluate the effect of water injection on aircraft engine performance and emissions. In this study, water is only injected during the takeoff and initial climb phase of a flight. There is no water

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injection during engine start or ground operations, nor during climb, cruise, descent, or landing. This study determined the maintenance benefit of water injection during takeoff and initial climb and evaluated the feasibility of retrofitting a current production engine, the PW4062 (Pratt & Whitney, East Hartford, CT), with a water injection system. Predicted NO(x) emissions based on a 1:1 water-to-fuel ratio are likely to be reduced between 30 to 60 percent in Environmental Protection Agency parameter (EPAP). The maintenance cost benefit for an idealized combustor water injection system installed on a PW4062 engine in a Boeing 747-400ER aircraft (The Boeing Company, Chicago, IL) is computed to be \$22 per engine flight hour (EFH). Adding water injection as a retrofit kit would cost up to \$375,000 per engine because of the required modifications to the fuel system and addition of the water supply system. There would also be significant nonrecurring costs associated with the development and certification of the system that may drive the system price beyond affordability. When it first rolled off the assembly line in the 1960s, the Boeing 747 took on the mantle of the largest commercial airliner in the world, a position it has still to relinquish after more than 30 years. The 747-400 model is the latest and largest in Boeing's evolution of the giant. Its story is told here. Including numerous pictures, it is the latest in the popular abc series of airliner and airline

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books.

Please note that the content of this book primarily consists of articles available from Wikipedia or other free sources online. Pages: 51. Chapters: Boeing 747-400, Boeing 747-8, Boeing 747SP, Boeing 747 Large Cargo Freighter, Boeing E-4, Boeing VC-25, Boeing YAL-1, List of Boeing 747 operators, Shuttle Carrier Aircraft.

Excerpt: The Boeing 747 is a wide-body commercial airliner and cargo transport aircraft, often referred to by its original nickname, Jumbo Jet, or Queen of the Skies. It is among the world's most recognizable aircraft, and was the first wide-body ever produced. Manufactured by Boeing's Commercial Airplane unit in the United States, the original version of the 747 was two and a half times the size of the Boeing 707, one of the common large commercial aircraft of the 1960s. First flown commercially in 1970, the 747 held the passenger capacity record for 37 years. The four-engine 747 uses a double deck configuration for part of its length. It is available in passenger, freighter and other versions. Boeing designed the 747's hump-like upper deck to serve as a first class lounge or (as is the general rule today) extra seating, and to allow the aircraft to be easily converted to a cargo carrier by removing seats and installing a front cargo door. Boeing did so because the company expected supersonic airliners (whose development was announced in the early 1960s) to render the 747 and other subsonic airliners obsolete, while believing that the demand for subsonic cargo aircraft would be robust into the future. The 747 in particular was expected to become obsolete after 400

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were sold, but it exceeded its critics' expectations with production passing the 1,000 mark in 1993. By September 2012, 1,448 aircraft had been built, with 81 of the 747-8 variants remaining on order. The 747-400, the most common passenger version in service, is among the fastest airliners in service with a high-subsonic cruise speed of Mach 0.85-0.855 (up to 570 mph or 920 km/h)....

Aircraft Propulsion and Gas Turbine Engines, Second Edition builds upon the success of the book's first edition, with the addition of three major topic areas: Piston Engines with integrated propeller coverage; Pump Technologies; and Rocket Propulsion. The rocket propulsion section extends the text's coverage so that both Aerospace and Aeronautical topics can be studied and compared. Numerous updates have been made to reflect the latest advances in turbine engines, fuels, and combustion. The text is now divided into three parts, the first two devoted to air breathing engines, and the third covering non-air breathing or rocket engines.

This study supports the NASA Glenn Research Center and the U.S. Air Force Research Laboratory in their efforts to evaluate the effect of water injection on aircraft engine performance and emissions. In this study, water is only injected during the takeoff and initial climb phase of a flight. There is no water injection during engine start or ground operations, nor during climb, cruise, descent, or landing. This study determined the maintenance benefit of water injection during takeoff and initial climb and evaluated the feasibility of retrofitting a current production engine, the PW4062 (Pratt & Whitney, East

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Hartford, CT), with a water injection system. Predicted NO(x) emissions based on a 1:1 water-to-fuel ratio are likely to be reduced between 30 to 60 percent in Environmental Protection Agency parameter (EPAP).

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The Boeing 747-400 is a complete revision of the basic 747 design. Its increased range and capacity, new-generation technology and cost savings, have all improved the original Jumbo Jet. This volume covers the design, technical specifications, engine choice and production of this aircraft. This series provides the enthusiast with a first-ever look at the structure, design, systems, and operation of these high tech wonders of the air. Contains engineering drawings, tech manual excerpts, exploded views, overhaul handbooks, cockpit photos, pilot manual excerpts, factory assembly photos, and more.

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The author writes on the unsafe practices by commercial airlines and tells of poor treatment of employees. Boeing's 747 'heavy' has achieved a fifty-year reign of the airways, but now airlines are retiring their fleets as a different type of long-haul airliner emerges. Yet the ultimate development of the 747, the -800 model, will ply the airways for many years to come. Even as twin-engine airliners increasingly dominate long-haul operations and the story of the four-engine Airbus A380 slows, the world is still a different place thanks to the great gamble that Boeing took with its 747. From early, difficult days designing and proving the world's biggest-ever airliner, the 747 has grown into a 400-ton leviathan capable of encircling the world. Boeing took a massive billion-dollar gamble and won. Taking its maiden flight in February 1969, designing and building the 747 was a huge challenge and involved new fields of aerospace technology. Multiple fail-safe systems were designed, and problems developing the engines put the whole programme at risk. Yet the issues were solved and the 747 flew like a dream said pilots – belying its size and sheer scale. With its distinctive hump and an extended upper-deck allied to airframe, avionics and engine developments, 747 became both a blue-riband airliner and, a mass-economy class travel device. Fitted with ultra-efficient Rolls-Royce engines, 747s became long-haul champions all over the world, notably on Pacific routes. across the Atlantic in January 1970, 747 became the must-have, four-engine, long haul airframe. Japan Airlines, for example, operated over sixty 747s in the world's biggest 747 fleet. By the renowned aviation author Lance Cole, this book provides a detailed yet engaging commentary on the design engineering and operating life and times of civil aviation's greatest sub-sonic achievement.

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