



bmep, Inc.

Piston Engine Engineering
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Curriculum Vitae
James William Brogdon

EDUCATION

Bachelor of Mechanical Engineering, 1968, Georgia Institute of Technology

PROFESSIONAL EXPERIENCE

bmep, Inc. Pensacola FL (www.bmepinc.com)

September '11 to present, Chief Engineer

Mr. Brogdon performs engineering consulting work for a variety of clients. This work has included evaluations of engines for specific applications, patent research and drafting (both engines and special applications), determination of the cause of aircraft engine spark plug insulator cracking, aircraft engine valve failure investigation, aircraft engine litigation investigation and testimony, engine patent litigation and arbitration testimony, and engineering input for new engine designs (two projects).

Teledyne Continental Motors, Mobile AL

May '07 to December '10, Chief Engineer

Mr. Brogdon directed the design and project engineering functions within TCM's Engineering department. He was responsible for the sustaining engineering of the entire product line of aircraft piston engines and the design and development of new engine models. The Sustaining Engineering function required a close coordination with TCM manufacturing where essentially all major engine components such as crankshafts, crankcases, and cylinder assemblies were made from raw castings and forgings, then assembled into finished engines and tested. Sustaining Engineering determined the disposition of non-conforming parts, made design improvements and maintained design data in accordance with FAA approved procedures. Technical liaison with suppliers was also an important Sustaining Engineering function; this entailed routine design changes and non-conforming parts disposition through to resolution of major supplier induced durability issues.

Mr. Brogdon directed major design changes to engine models to meet customer needs. A significant project was the introduction of the O200D engine for the new Cessna 162 Light Sport Aircraft that required the reduction of engine weight from 225 pounds to less than 200 pounds. This engine was FAA certified and is now in serial production.

Mr. Brogdon also directed TCM activities for future unleaded aviation fuels. This activity included testing of existing TCM engines on potential unleaded fuels, determining strategies for converting existing fleet engines to unleaded fuels, evaluation of competing unleaded fuels, and participation in the ASTM release of the specification for 94 octane unleaded fuel. He directed TCM's preliminary design of a completely new aircraft diesel engine and the technical due diligence evaluation of an existing design aircraft diesel engine that was ultimately purchased by TCM.

Superior Air Parts, Coppell TX

November '06 to May '07, Vice President Engineering

Mr. Brogdon directed the Engineering and Quality departments at Superior, a manufacturer of PMA parts, experimental and certified aircraft engines. He was charged with rebuilding the engineering and quality departments that were reduced as a result of a change in company ownership. He directed the new design of a cold air induction system and oil sump for



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Superior's experimental line of engines that significantly improved durability and reduced cost compared to the components replaced. One of his major activities was managing service difficulties including FAA liaison, Service Bulletins and component redesign.

Ricardo, Inc., Chicago IL

June '98 to October '06, Design Manager and Chief Program Engineer

Mr. Brogdon directed design studies, design projects and failure investigations across a full range of engine sizes and engine types. Mr. Brogdon directed designs for: a large diesel unit construction cylinder head; a marine version of a high volume truck engine; a high output military version of the Cummins ISB diesel, several small gasoline engines; a Stirling engine lower end; an exhaust brake actuation system; very high output military aviation and ground diesels; and military auxiliary power systems. He directed studies for: increasing the power output of a large, air cooled diesel engine by 50%; up-rate designs for a large gas engine; sizing for a new truck diesel; design options for a 1 liter/cylinder tractor diesel; performance increase for single cylinder industrial engines; reduced emission/increased durability industrial engines; stroke change options for a 110 bore diesel; gasoline engine friction; military marine engine selection; very high output-high speed military demonstrator engine; and future aircraft engine design options. Mr. Brogdon directed investigations of: bearing failures in a 16 cylinder diesel; crankcase ventilation difficulties in another 16 cylinder diesel, bearing failures in several nuclear standby engines; and a shaft failure investigation of a large two stroke diesel engine. Mr. Brogdon was a member of Ricardo, Inc.'s Advanced Engineering Council.

Teledyne Continental Motors, Mobile, AL

May, '76 to March, '79 & November, '80 to June, 98

Mr. Brogdon worked much of his time at TCM in the Design department, first as a Design Engineer, and later as Design Manager. His piston engine design projects have included: reducing the weight of a version of the TCM 520 engine from 465 to 400 pounds; design of all power section components of a new four cylinder engine; design of the liquid cooled four cylinder engine that powered the Voyager around the world record flight; the preliminary designs for a liquid cooled spark ignition V-8 and liquid cooled flat eight Diesel of unique design; design direction for the liquid cooled six cylinder engine and the accompanying two in series turbochargers for the altitude and endurance record setting Boeing Condor High Altitude Long Endurance (HALE) aircraft; the design of the liquid cooled engine produced for the RAM 414 airplane; and the design of a cross flow liquid cooled cylinder head. Mr. Brogdon designed the double reduction planetary propeller drive gearbox, torque meter and accessory gearbox for TCM's FAA certified 500 horsepower single shaft gas turbine engine. He also did the preliminary design for a propeller drive gearbox for a HALE piston engine powered aircraft. In the area of rotary (Wankel) engines, he directed the design of two aircraft adaptations of rotary engines, the design of a rotary engine heat pump application and the new design of a rotary engine for heat pumps. Mr. Brogdon directed the design for a new 4 cylinder, 4 liter aircraft Diesel engine developed by TCM under a NASA cost-sharing project. He has also managed a number of technical proposals. Three of the largest were: the NASA GAP diesel engine; a lightweight Diesel engine for the U.S. Air Force Light Engine Generator; and an adaptation of the TP 500 aircraft gas turbine for an APU for the Boeing 777 aircraft.



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Mr. Brogdon held the position of Director of Piston Engine Projects from September of '89 until December of '90. Projects under his direction included: the design, testing and certification of a liquid cooled engine for an STC installation in a Beech Bonanza; the design and testing of liquid cooled, geared engine for a proposed STC for the Piper Chieftain; the design, development and certification of the IO 360 ES engine; a Naval Air Development Center contract for the preliminary design of a HALE, heavy fuel engine resulting in a 500 hp flat twelve Diesel engine design of exceptionally low specific weight; initiation of the project that lead to the certification of the TSIO 550 B engine for Harbin, China; the development and certification of weld repair procedures for crankcase overhaul; the design and testing of a liquid cooled 550 engine for marine application; the preliminary design of a new four cylinder engine; the preliminary evaluation of a two stroke engine based on existing crankcases; a Gas Research Institute rotary engine heat pump project; and Marketing liaison on numerous piston and rotary engine proposals.

From December of '90 until December of '93 as Manager of Technical Engineering, Mr. Brogdon directed Design and Stress Analysis Engineers in new product design, analysis and correction of Service and Production difficulties, new engine concept research, and technical support of Marketing activities.

Mr. Brogdon was appointed FAA Designated Engineering Representative (DER) in 1990. As DER he directed new engine certification activities, reviewed and approved minor changes to certified engines and coordinated Service Difficulty actions with the FAA. In addition to these routine DER functions, he was a contributing member of the FAA / Industry team on Certification Simplification and a participant in Unapproved Parts resolution activities.

From December of '93 until June of '95, he was assigned to TCM's Quality department to assist in the development of Supplier Quality and Supplier Certification systems.

Ogeechee Technical Services, Richmond Hill, GA

March, '79 to November '80

As a partner in a small civil and mechanical engineering company, Mr. Brogdon intended to become rich and independent. He became independent.

International Harvester Motor Truck Division, Ft. Wayne, IN

April '68 to February, '70 & May, '73 to May '76

As a Design Engineer in the Engine Design group, Mr. Brogdon performed design work on all major engine components with an emphasis on camshafts, cam profiles, valve gear, cylinder heads and exhaust manifolds. He developed a new method of cam design, programmed several standard design techniques in FORTRAN, and performed the first Finite Element Analysis done at I.H. Motor Truck Engineering.

U.S. Peace Corps, Alor Setar and Kuala Lumpur, Malaysia

February, '70 to April, '72

Mr. Brogdon took a three-year leave of absence from International Harvester to serve in the Peace Corps in Malaysia where he did engineering work on agricultural processing facilities. He became moderately proficient in the language of Malaysia, Bahasa Malaysia. Following the Peace Corps, he traveled extensively through Asia and Europe.



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PATENTS

Mr. Brogdon holds seventeen U.S. patents related to engine and engine accessory design.

PUBLICATIONS

- SAE 2005-01-1547 A High Power Density, Commercially Based, Diesel Engine for FCS Vehicles
- Airplane Diesel Engines – Presentation to the Aircraft Engine Historical Society May 10, 2012 (Updated version on bmepinc.com website)
- Champion Aircraft Spark Plug Insulator Report April 18, 2012
- Aero diesels on Diesel Air Newsletter (<http://www.dieselair.com/> May 31, 2011)

AFFILIATIONS

Society of Automotive Engineers (SAE), Member
Experimental Aircraft Association (EAA)
Aircraft Owners and Pilots Association (AOPA)
American Society for Metals (ASM)
ASTM
ASME

LICENSES

Registered Professional Engineer (not current)
Private Pilot, ASEL, Instrument rated, 1000 hours Pilot-in-Command

SPECIAL COURSES

NTSB Aircraft Accident Investigation Course September 17-28, 2018
University of Wisconsin Performance Development of Internal Combustion Engines
Auburn University ME 516 Internal Combustion Engine Design
SAE Piston Ring Design/Materials
ASM Heat Treatment of Steel
ASM How Components Fail

CONTACT

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