

# CLIFFORD R. CARLSON

## PROFILE

Creative, accomplished **Engineering Project Technical Manager**, who “consistently contributed to the success of leading edge technology within the company.” Skilled in providing project development and leadership as evidenced by involvement in pioneering concepts. Expertise encompasses component, subsystem and total system levels, particularly in the areas of propulsion system controls, hardware, and vehicle integration. Proven motivator and team player who leads by example. Holder of 7 patents and 71 records of invention.

## AWARDS and PATENTS

- Received 1995 Boss Kettering Award (General Motors’ highest corporate technical award) for invention of Stepper Motor Air Bleed idle Speed Control, used in most fuel injected vehicles worldwide today.
- Recognized by General Motors with extraordinary Accomplishment Award for the High Value Six Program. One of only two such awards given in 1991.
- Hold 5 GM patents for the following:
  - Engine idle air control valve with position reset
  - Internal combustion engine transient fuel acceleration enrichment
  - Idle air control for integral combustion engine and control algorithms (Boss Kettering Award)
  - Mixture forming assembly for closed loop fuel control metering system
  - Closed loop fuel control system
- Hold 2 Ford Patents for the following:
  - Starting logic for a Free Piston engine
  - Combustion control for a Free Piston engine
- Hold 46 GM records of invention for mechanical systems
- Hold 25 Ford records of invention for mechanical systems

## EDUCATION

University of Michigan – Dearborn, MI  
Bachelor of Science – Mechanical Engineering (1970)

## AFFILIATION

Society of Automotive Engineers

Engineering Society of Detroit

## HIGHLIGHTS of CAREER

### ADVANCED PROPULSION TECHNOLOGY

**Chief Program Manager**

(Nov. 15, 2004-Nov. 2005)

### FORD MOTOR CORPORATION

**Senior Technical Specialist** – Advanced Power train Architecture and Propulsion Concepts  
Hydraulic Launch Assist Project Co-Leader

(1998-2004)

- Conceived an all new hydraulic energy recovery system that can be applied to commercial trucks increasing fuel economy by 100%, production intent 2007 MY.
- Led Ford/EPA team in generating the first EPA and industry joint drive train development contract.

- Conceived and managed the development of an all-hydraulic hybrid including: an all new engine, capable of doubling truck fuel economy.
- Program manager of an all new electric power generator project aimed at producing the most power dense and efficient power device possible.

#### GENERAL MOTORS CORPORATION

(1968-1998)-RETIRED

#### **Manager Propulsion System Integration:** General Motors Powertrain Group

(1997-1998)

- Conceived an all new, low cost integrated engine/transmission/AWD system that could be shared between RWD trucks and FWD cars.
- Conceived a hydraulic hybrid AWD system with conventional engine demonstrating a 40% increase in fuel economy with no increase in cost. Defined system, sourced hardware and software. Proposed system, designed and ordered parts, and supervised build of September, 1998 demonstrator.
- Conceived hydraulic hybrid AWD system utilizing unusual engine concept with goal of 25% less cost plus double the fuel economy, based on proposed partnership with another corporation for co-development of system. Directed the overall exterior package design of engine; provided experimental castings, and vehicle performance simulations; negotiated a working contract between the two corporations.

#### **Powercube Project Technical Manager;** GMPTG

(1994-1997)

- Led Phase 00 technology development, process, completion, and vehicle application.
- Prepared project for transfer to Launch Center

#### **Lead Powertrain Design Engineer – Powercube Concept – GMPTG**

(1991-1994)

*All new, integrated engine and transmission powertrain of 4, 5, and 6 cylinder engines.*

- Conceived and managed all aspects of concept, including:
  - General arrangement
  - Integral lost foam case
  - Accessory drive
  - Design staff coordination
  - Packaging
  - Vehicle integration
  - Durability calibration
  - Fuel economy/emissions calibration

#### **Lead Engineer-High Value Six Program – Chevrolet Pontiac Canada/GM engines**

(1987-1991)

*Program which introduced all new family of L4, L5, L6, V8 and V12 engines*

- Conceived and developed concept; led team that designed hardware, built prototype vehicle and conducted tests.
- Created engine packaging that was key enabler for Vision 2000 corporate styling program

#### **Lead Engineer-Manhattan Engine Program – Pontiac product Engrg./CPC**

(1983-1987)

*An advanced engine program developed to “leap-frog” competition and replace Pontiac’s 2.5 L4 cylinder. Program embodied numerous technologies (new to GM and industry), which ultimately were incorporated into many GM engines.*

- Led teams which developed these emerging new concepts:
  - Lost Foam integral block head
  - Cam-driven power steering pump
  - Roller element OHC rocker arms
  - Reverse flow cooling
  - Vacuum cast thin wall engine components  
(resulted in joint venture with Hitchner – M.C.T.)
  - Suction side thermostat
  - Lost core composite plastic inlet
  - Thin wall magnesium covers
  - Gear-driven balance shaft
  - Director fire ignition
  - Torque axis engine mounting

#### **Lead Engineer – L4 Engine – Pontiac**

(1982-1983)

- Contributed to development of secondary force balancer and distributor less ignition system, and industry first.

#### **Lead Engineer – Pontiac TBI (Throttle body fuel injection) – Pontiac**

(1979-1982)

- Conceived concept and oversaw development of the first production L4 TBI system, later duplicated worldwide.
- Maintained responsibility for developing:
  - ECM and system definition
  - Software Definition
  - Initial closed loop control algorithms
  - Closed loop idle control and altitude compensation
  - Hot and cold transient fuel
  - 50K emission durability
  - Production calibration

#### **Project Manager/Lead Engr.-1978 California Closed Loop Emission Control System-Pontiac**

(1977-1979)

- Developed first closed loop carbureted system produced in the United States and the world.
- Completed project from concept to production in 12 months.

**Engineer – Dynamometer Lab Development – Pontiac** (1974-1977)

- Conceived and developed first low cost, common runner single plane inlet manifold (for Pontiac V8)

**Engineer – Pontiac** (1970-1974)

- Designed and developed first production high volume EGR system

**Engineering Student – Pontiac** (1968-1970)