



CURRICULUM VITAE
**DOUGLAS J.
McILWRAITH, P.E., ACTAR**
Mechanical Engineer

**d.b.a.
AVANTI Engineering**

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SUMMARY:

Mr. McIlwraith has over twenty seven years experience as an automotive and mechanical forensic analyst following a career as a mechanic within the automotive service industry. Mr. McIlwraith primarily performs examinations for insurance companies and law firms. He is qualified to testify in the Superior Court for the State of California.

AREAS OF EXPERTISE:

Root cause determination of mechanical failures in automobiles and household appliances. Diagnosis of engine, transmission, axle, brake, suspension and steering system problems. Repair (including machining) of automotive major components and sub-systems such as ignition, carburetion, fuel-injection, of passenger cars and trucks. Determination of vehicle fire origins and causes. Applications of shop standards. Seat belt, ABS, SRS, PCM, ECS, TCM diagnosis/testing/evaluation. EDR and ECM imaging (downloads). Damage consistency. Determination of speeds and directions of vehicles involved in impacts. Lamp filament analysis. Tire separations and failure analysis.

EDUCATION:

- 1987 B.S. Mechanical Engineering, Design Option, San Jose State University, San Jose, CA
- 1981 Apprenticeship Program, Automotive Technology, DeAnza Community College, Cupertino, CA
- 1988 Accident Reconstruction I - Scene Investigation, Garrett Engineers, Inc., Los Angeles, CA
- 1988 Accident Reconstruction II - Technical Evaluation, Garrett Engineers, Inc., Los Angeles, CA
- 1992 Automotive Fire Investigations, C.C.A.I. & Lee Cole & Assoc., Fresno, CA
- 1993 Chrysler Driveability Diagnostics, MAC Automotive College, Milpitas, CA
- 1994 Anti-Lock Brake Systems, Diagnosis and Repair, MAC Automotive College, Cupertino, CA
- 2001 Fire/Arson Investigation, California Conference of Arson Investigators, San Luis Obispo, CA
- 2002 Fire/Arson Investigation, California Conference of Arson Investigators, Seaside, CA
- 2009 CDR-1 (Crash Data Retrieval), Technician Course, Garrett Engineers, Inc., Fairfield, CA
- 2010 Accident Reconstruction I - Scene Investigation, Northwestern University, Evanston, IL
- 2011 CDR-1&2 (Crash Data Retrieval), Technician Courses, Rimkus Consulting Group, Tampa, FL
- 2011 ECM (Electronic Control Module), Technician Course, Rimkus Consulting Group, Tampa, FL

PROFESSIONAL EXPERIENCE:

- 2010-2011 RIMKUS CONSULTING GROUP, INC. Pensacola, FL. *Senior Consultant*. Perform failure analysis of mechanical systems: Plumbing, HVAC, appliance, automotive and truck. Image Event Date Recorders (EDR) and Electronic Control Modules (ECM). Accident scene documentation. Accident reconstruction. Provide written reports to insurance companies for claims resolution, assistance to attorneys for legal preparation, as required.
- 1995-2010 INTER-CITY TESTING & CONSULTING, Sacramento, CA. *Mechanical Engineer*. Investigate causes and effects of automobile and truck, mechanical and electrical malfunctions and fires. Seat belt analysis and vehicle handling characteristics. Reconstruct accidents from measurable evidence: Skids, deformations, related damage. Provide written reports to insurance companies, assistance to attorneys for legal preparation, arbitration and trial. Testify at arbitration, deposition and trial, as required.
- 1988-2010 GARRETT ENGINEERS, INC., San Francisco, CA. As above.
- 1997-2006 FORENSIS GROUP, Pasadena, CA. – As above.
- 1992-1999 O’CONNOR ENGINEERS, INC., Sacramento, CA. – As above.
- 1991-2004 EXPERT TECHNOLOGIES, INTERNATIONAL, Thousand Oaks, CA. – As above.
- 1985-1988 RPM AUTO MACHINE, Mountain View, CA. *Mechanic*. Diagnose, remove, assemble and re-install automotive engines for rebuilding.
- 1984-1985 LITZ ENGINE SUPPLY, Palo Alto, CA. *Mechanic*. Remove and re-install automotive engines for rebuilding.
- 1982-1983 ALS AUTOMOTIVE SERVICE, Mountain View, CA. *Mechanic*. General repair. Tune-ups, brakes, electrical and minor engine work.
- 1981-1982 JIM RAINS BUICK, Mountain View, CA. *Mechanic*. Diagnose and repair computer controlled emission system components, carburetors, tune-ups, electrical, warranty repairs and recalls.

DESIGN PROJECTS:

- **Developing/Testing Engineer:** U.S. Patent No. 4,945,866 A.P.T. (Altered Piston Timing) engine concept – Now employed in Honda Insight, Civic, Toyota Prius, Echo, Camry, Rav4, BMW, Chrysler & others.
- **Consulting Engineer:** U.S. Patent No. 5,409,332 - Flexible drive coupler
- **Lead/Student Project with Ford Aerospace:** Solar Panel Stowage/Release mechanism for satellites employing NiTiNOL wire spring
- **Lead/Student Project:** Clutch Adaptation kit for automatic transmission utilizing power steering pump for hydraulic pressure (for drag racing applications)

QUALIFICATIONS:

CA Registered P.E. Certificate # M 34976, 1/5/2010. E-I-T CA Certificate Lic: XE089969. Accreditation Commission for Traffic Accident Reconstruction (ACTAR), # 2407, 4/30/2011. Automotive Service Excellence (ASE) Automobile Technician Certificate, # ASE-5378-5670 – (5 subject areas).