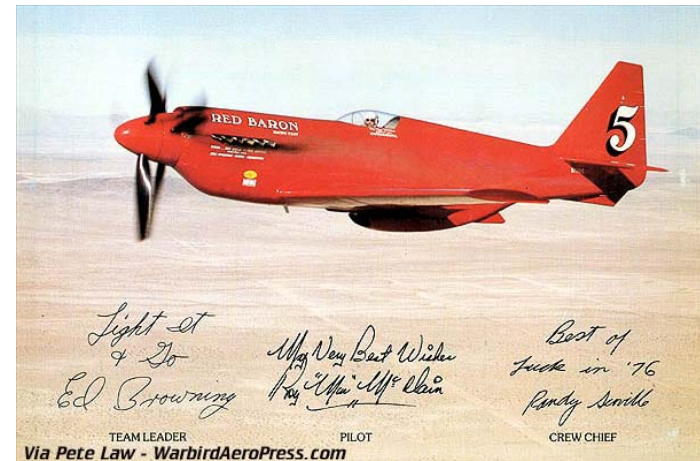


ENGINEERING RENO'S UNLIMITED RACERS

BY PETER LAW & DAN WHITNEY



Dan Whitney – Engineering Support for Warbirds

Professional Mechanical and Nuclear Engineer

- MSME - Stanford University

Served in USAF, 1965 – 1969

- Chief of Aircraft Maintenance, C-130E

Retired from electric utility industry

Author of: *Vee's for Victory!* The Story of the Allison V-1710

Author of many articles in aviation magazines and journals

Author of Aviation Museum Books, Aviation photographer

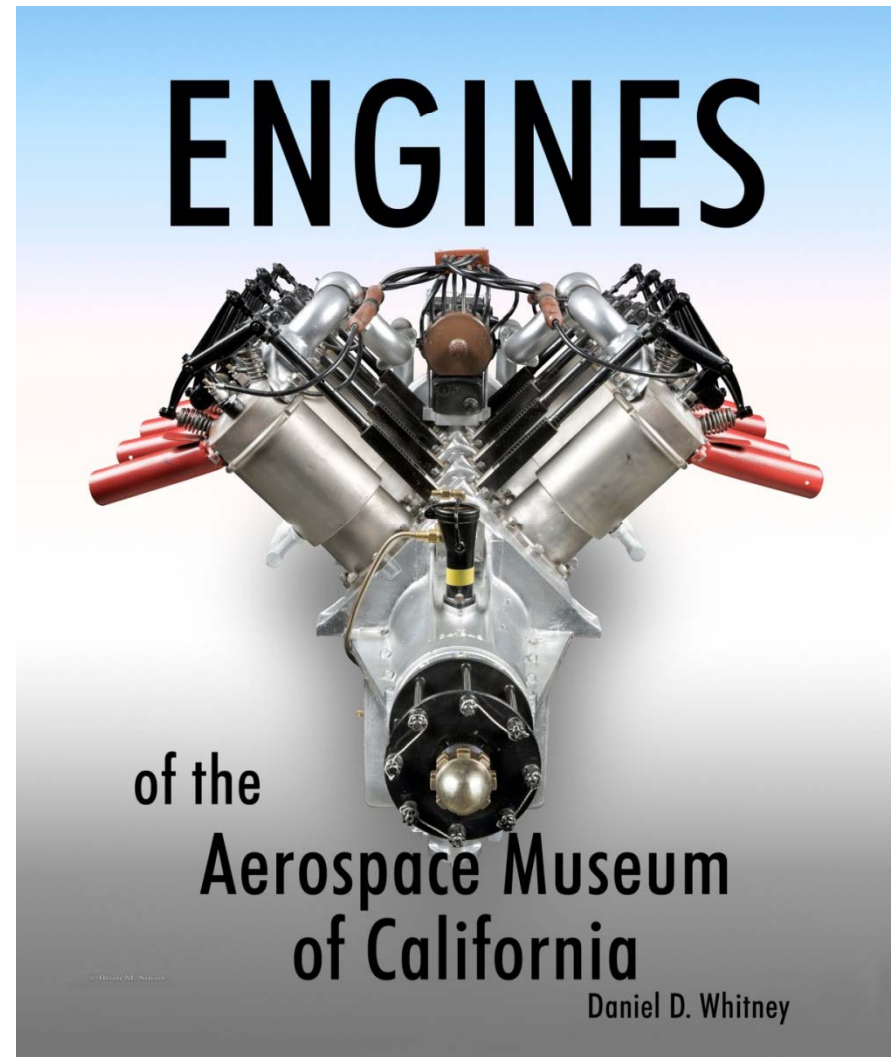
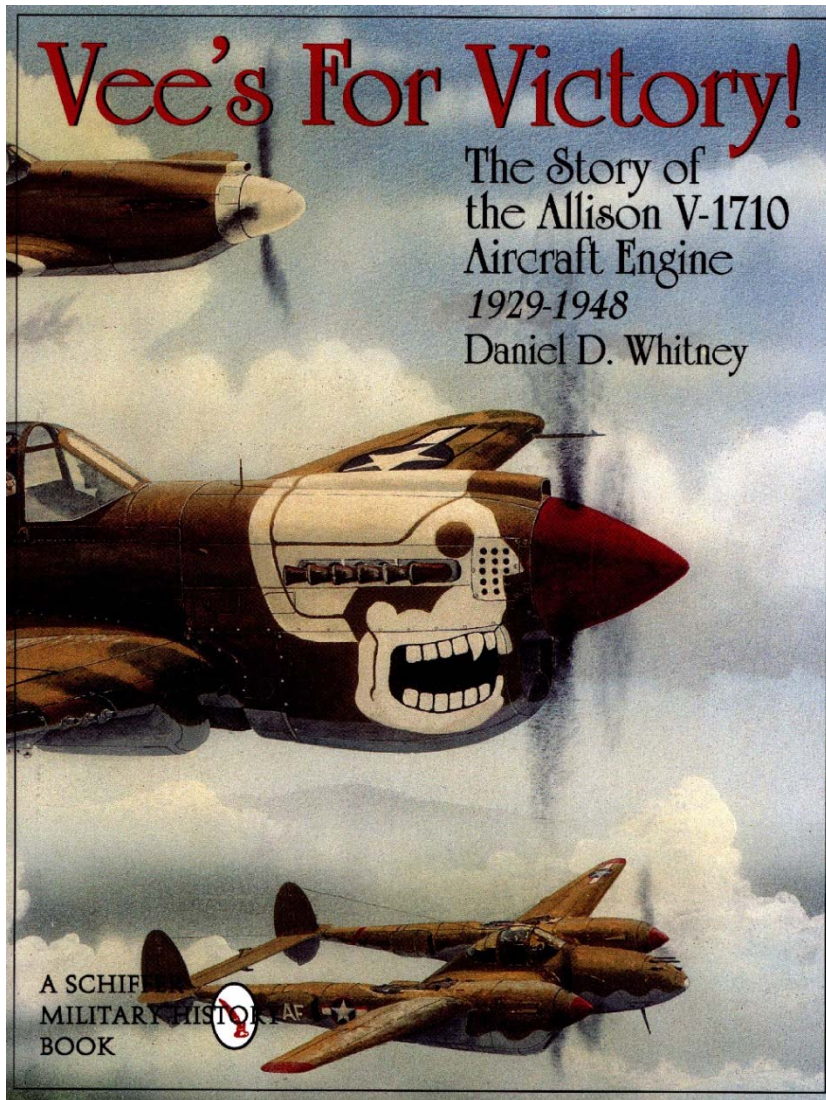
Aircraft Engine Historical Society (AEHS) – Vice President

Aerospace Museum of California - Past President

Provides engineering support for *Merlin & Allison* engines

- Engineering engine support systems: oil, coolant, ADI
- FAA Approved modifications and replacements for:
 - Propellers, Pistons, Rings, Bearings, Plating, Seals, Gaskets
 - Valves, Valve Springs, Liners, Ignition Systems, Sparkplugs

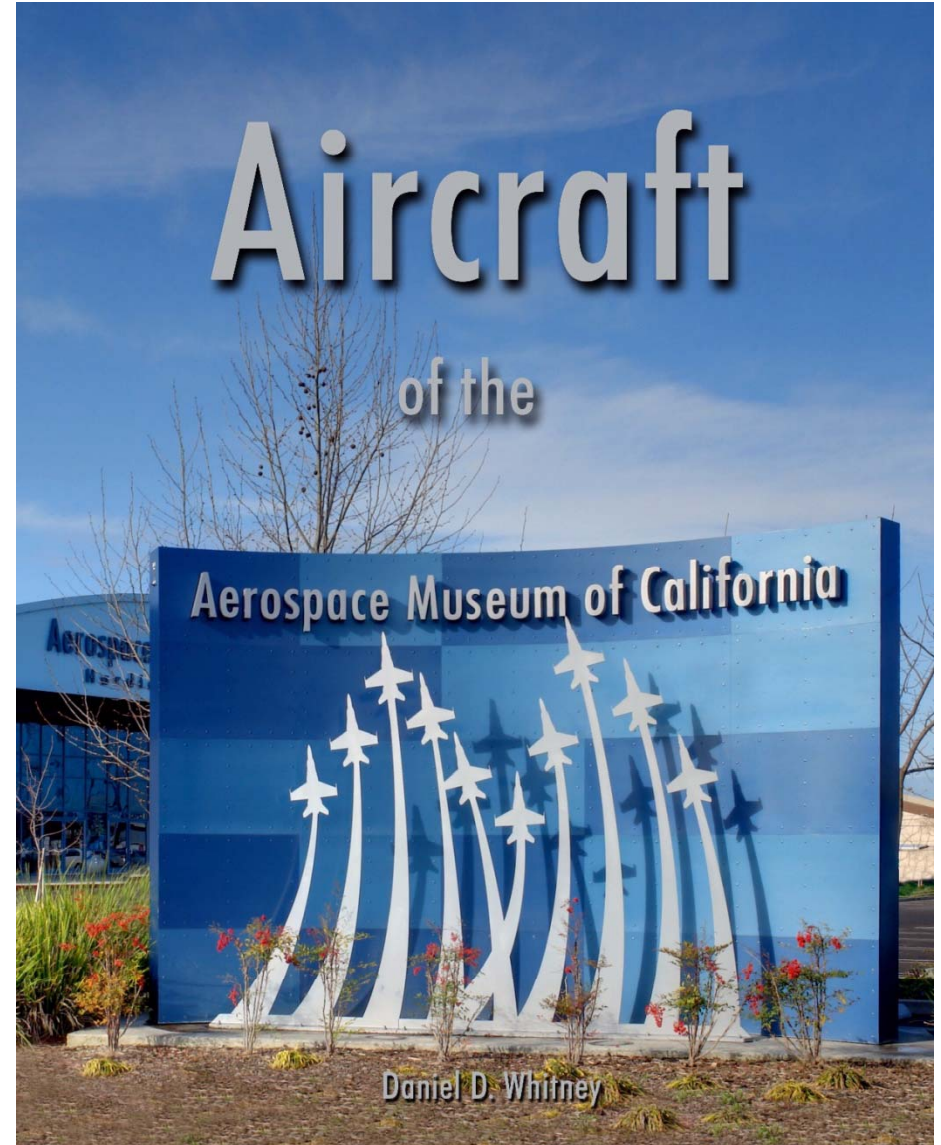
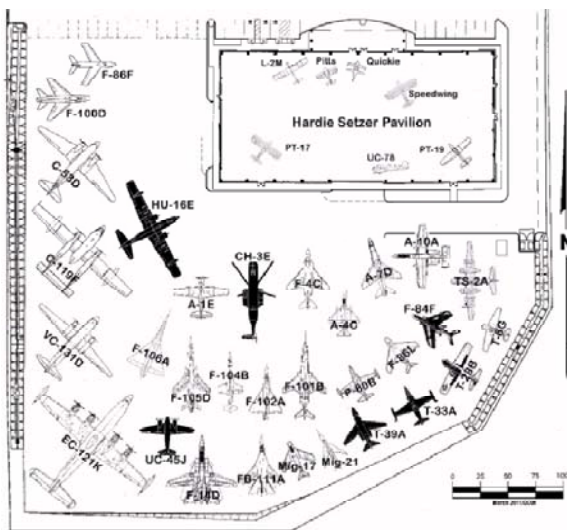
Dan Whitney's Books



Dan Whitney's Books



Aerospace Museum of California
McClellan Field, Sacramento, CA

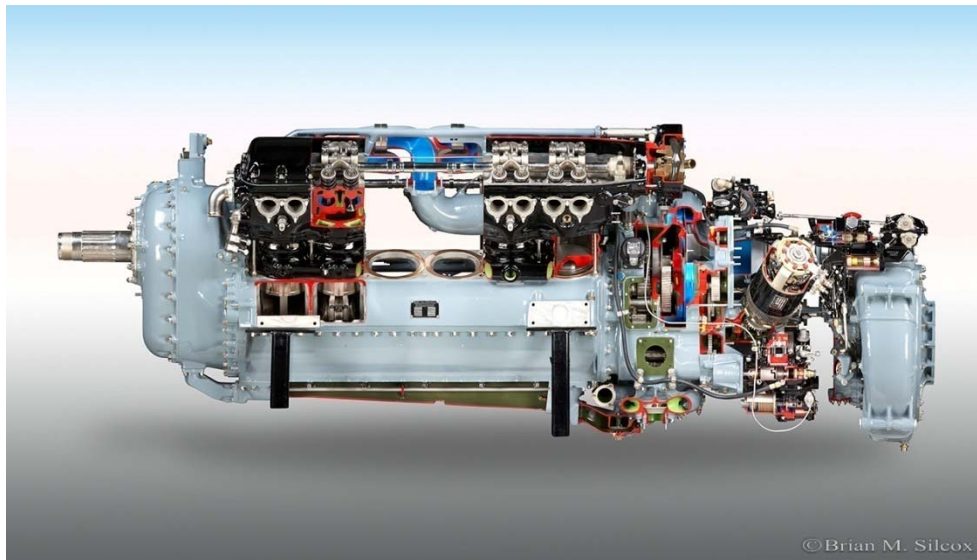


Daniel D. Whitney

Some of Dan Whitney's Projects



MT Propeller 4-blade P-82 prototype on P-51A



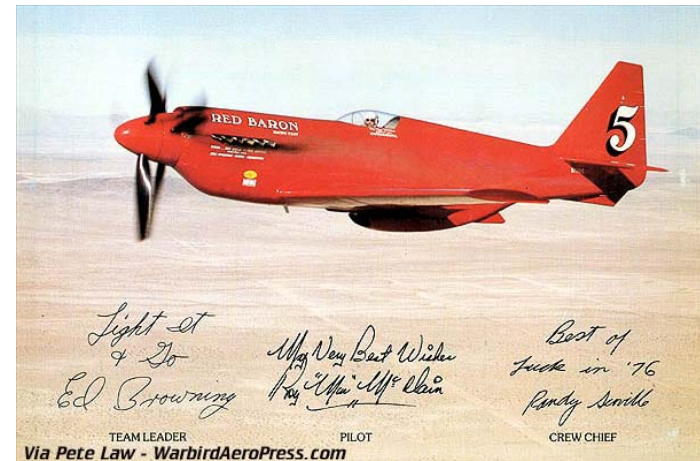
©Brian M. Silcox

2-Stage V-1710-G6 for P-82E

- By *Allison Competition Engines*
- Engr. for Speed Density Carb
- Calibration with all new soft parts
- 110-hour Propeller Cert Test Prog.
- Demo new pistons, liners, valves

ENGINEERING PAST & PRESENT UNLIMITED RACERS

BY PETER LAW



Peter Law – Who is He and Where Did He Work?

- BSME – Stanford University, 1958. Majored in Thermodynamics
- MSAE – University of Southern California (USC), 1965
- Registered Professional Mechanical Engineer in California & Washington
- Member SAE and AIAA
- Thermodynamics Engineer at Lockheed-Burbank & Palmdale since January 1959; Entire Career of 42.5 years at Lockheed
- Transferred to Lockheed *Skunk Works* in July 1961
- *Skunk Works* Thermodynamics Department Manager from 1980
- Retired from Lockheed July 2001 after 40 years at *Skunk Works*
- Worked on *F-104, A-12, YF-12A, SR-71, M-21, D-21, U-2, F-117A, F-22, JSF(X-35)*, and many other Classified Projects
- Did internal and external Heat Transfer and Thermodynamics, Structural Thermal Analysis, Cooling System Design, and Internal Subsystem Thermal Analysis, including hydraulics, fuel, and other systems
- Involved in Piston Engine Aircraft Racing since 1964
- Involved in Unlimited Hydroplane Racing since 1970

Peter Law - *What Does He Do?*

- Involved in Unlimited Racing since 1964
- Started with Darryl Greenamyre, Lockheed A-12 & SR-71 Test Pilot, in 1964 after First Reno Races
- Involved then and since with Bruce Boland
- Boiled ADI Fluid to Cool Oil & Reduce Drag on Darryl's Bearcat Starting at Reno 1965
- Built Water Injection Systems for P-51s & other Aircraft since 1970 through Al DiMauro & Aircraft Carburetor
- Flow Check & Adjust Carburetors for most Unlimited Aircraft Since 1978, when Aircraft Carburetor Terminated
- Design & Build Spray Bars for Oil & Engine Cooling, plus other Engineering since 1970

Peter Law - *What Has He Worked On?*

- **Started with Darryl Greenamyer's Bearcat**
- **Worked with Bruce Boland on several more**
 - Dave Zeuschel P-51 & *Miss America* P-51 in 1,000 Mile Races
 - *Candace* (Cliff Cummins), *Jeannie* (Mac McClain)
 - *Red Baron P-51, Merlin & Griffon*
 - *Ciuchetton, Cloud Dancer, Georgia Mae, Ridge Runner*
 - *Dago Red, Original Strega, Stiletto, Super Corsair*
 - *Tsunami, Risky Business, Huntress III & More*
 - Help on *Rare Bear, Dreadnought*
- **Unlimited Division Contributions**
 - Rules Committee - Coordinated New Rules 1980
 - Division Secretary-Treasurer for 2 years
 - Division Newsletter for Several Years (with Joanne)
 - Records Keeper & Pilot's Qualification Secretary
 - Unlimited Hydroplane Involvement

Pete with
Bruce Boland,
designer of
the *SUPER-
CORSAIR*





Darryl Greenamyer running-up his *Smirnoff* Bearcat



Darryl pointing out the additional sponsors of his Championship *Smirnoff* Bearcat



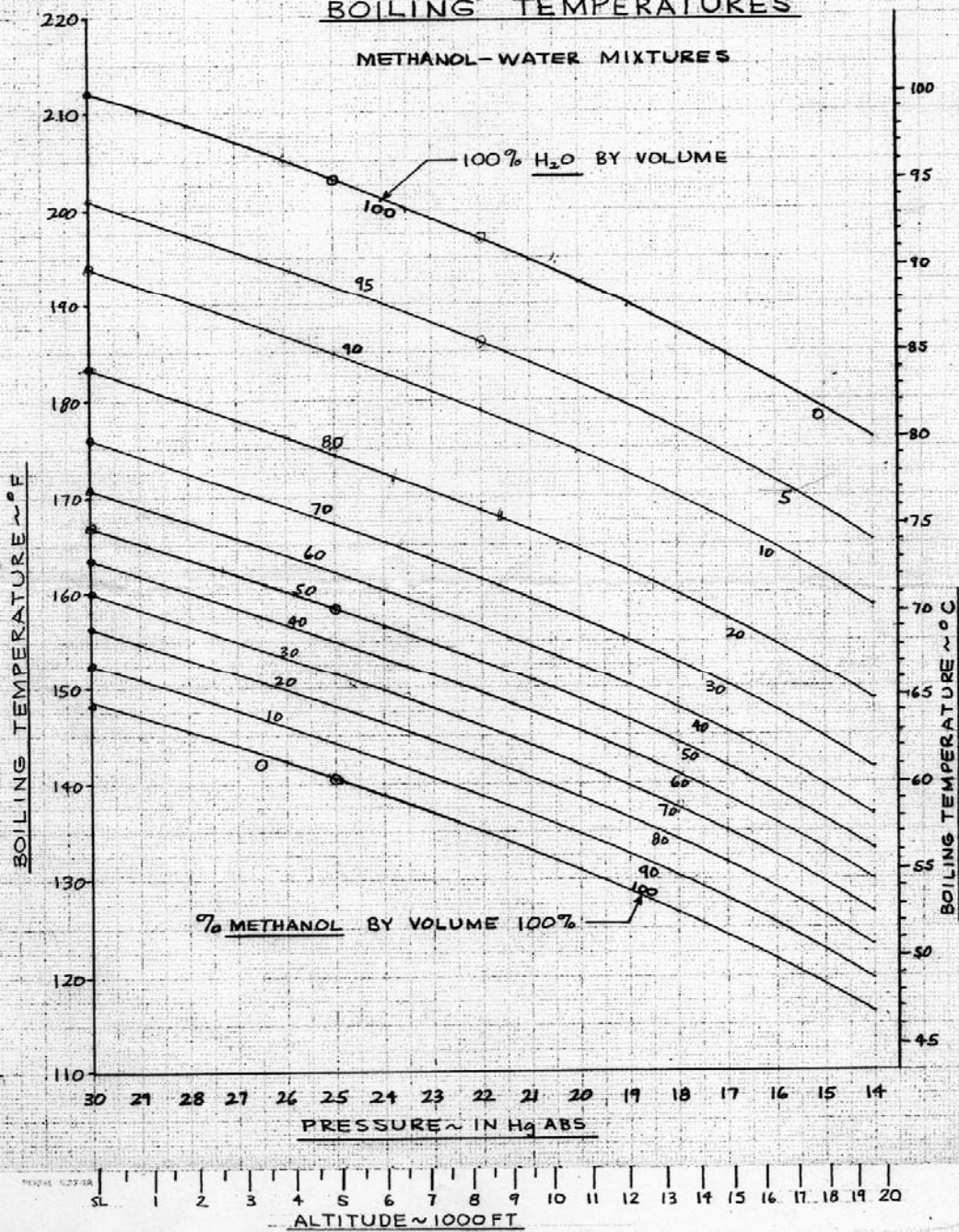
October 1969 - Darryl being congratulated on setting the new World Record of 483.041 mph by the previous holder Fritz Wendel (469.22 mph in 1939), along with Lockheed's Tony LeVier

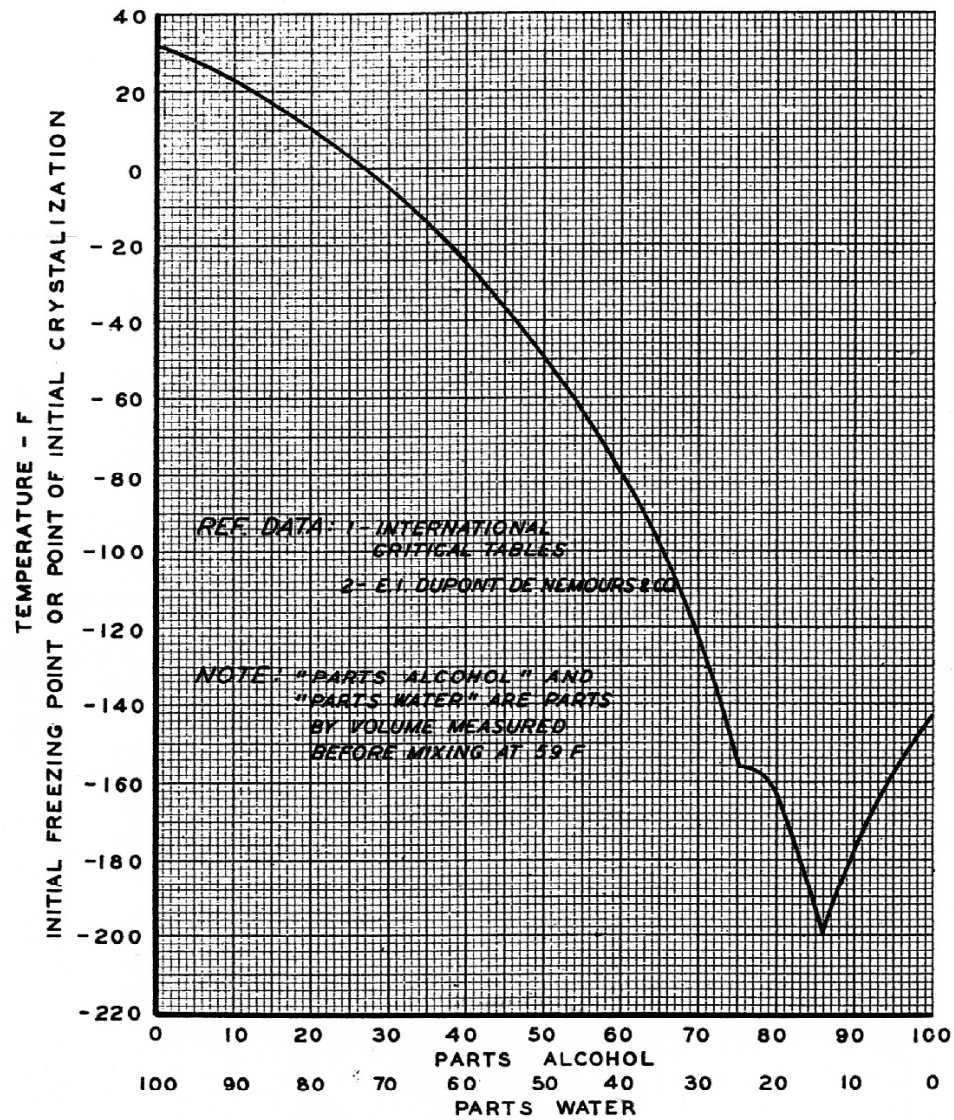
DATE 7/12/66

REV. 8/19/92

BOILING TEMPERATURES

METHANOL-WATER MIXTURES



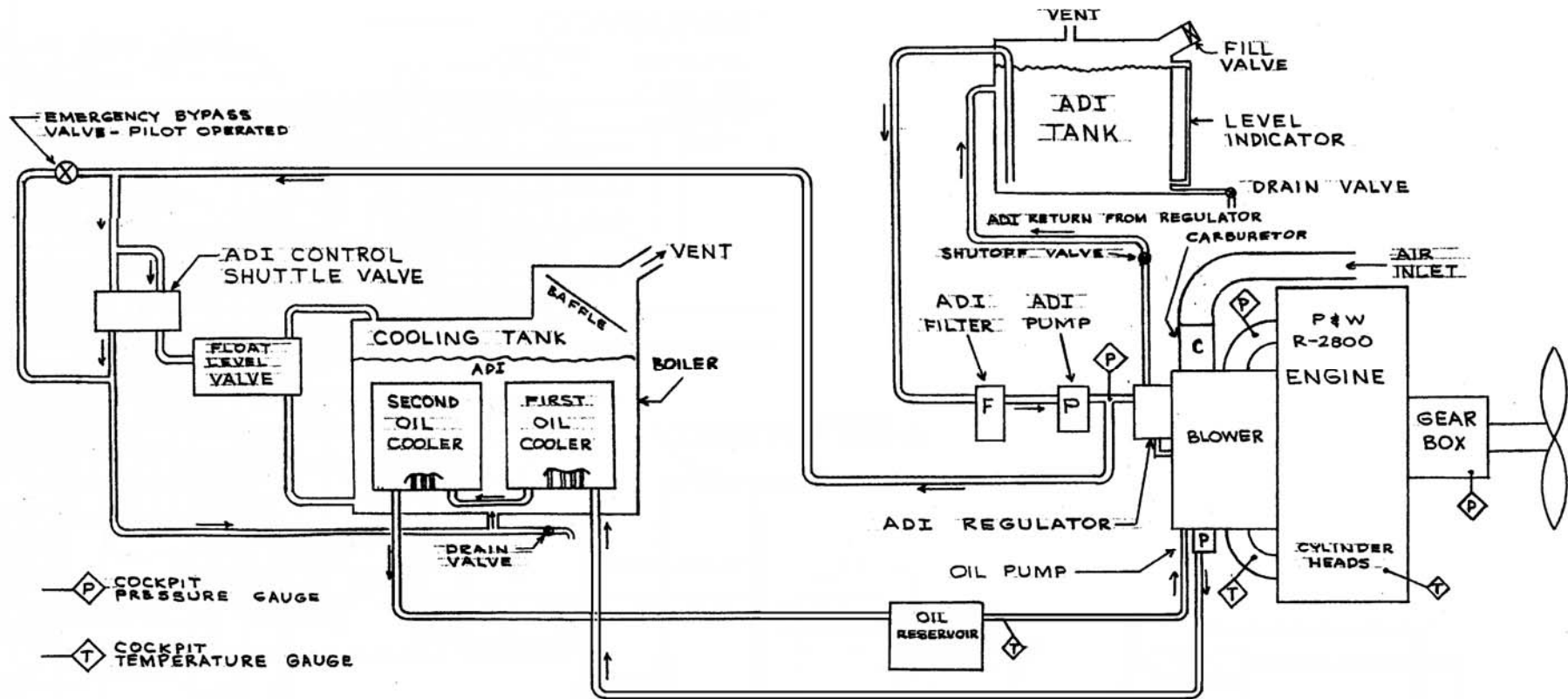


FREEZING POINTS FOR MIXTURES OF METHYL ALCOHOL AND WATER

INST 14389
DATE 3-18-49
REV. 7-15-54

OIL COOLING SYSTEM SCHEMATIC

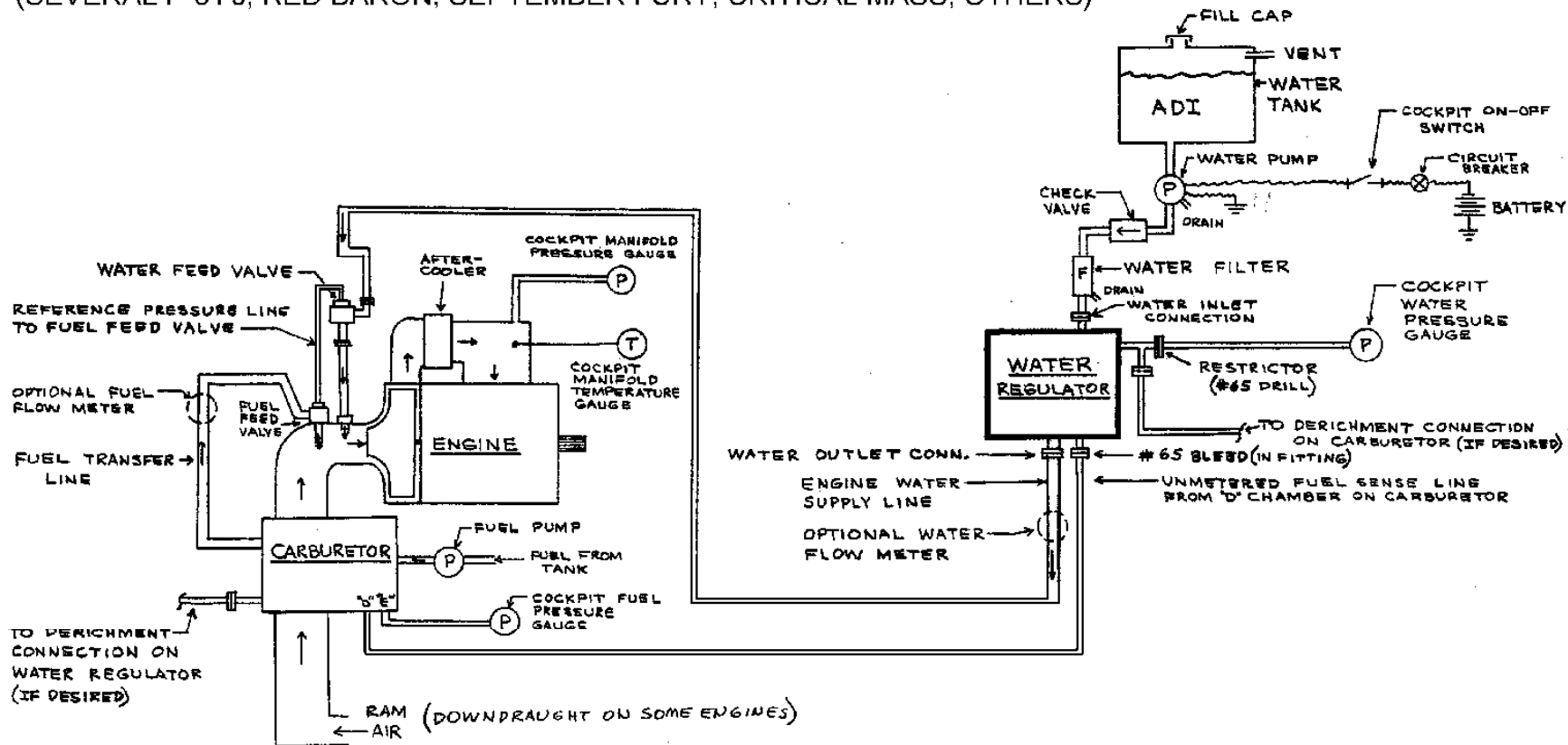
RACING F8F BEARCAT - CONQUEST



TYPICAL WATER BOILER SYSTEM FOR RADIAL ENGINE APPLICATIONS

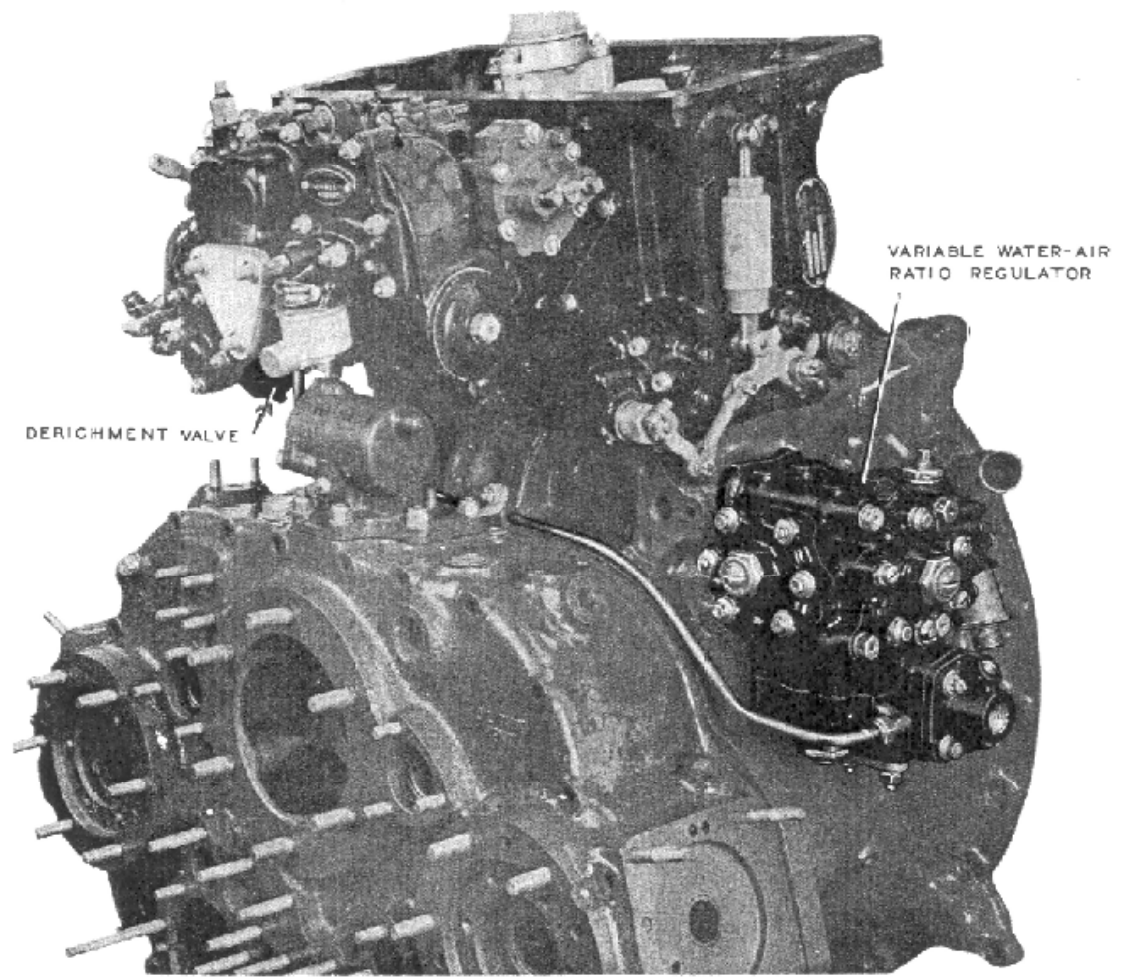
WATER REGULATOR SYSTEM SCHEMATIC

SYSTEM FOR MERLINS, GRIFFONS, AND SOME R-3350's
(SEVERAL P-51's, RED BARON, SEPTEMBER FURY, CRITICAL MASS, OTHERS)



WATER REGULATOR MOUNTED ON SIDE OF R-2800 ENGINE

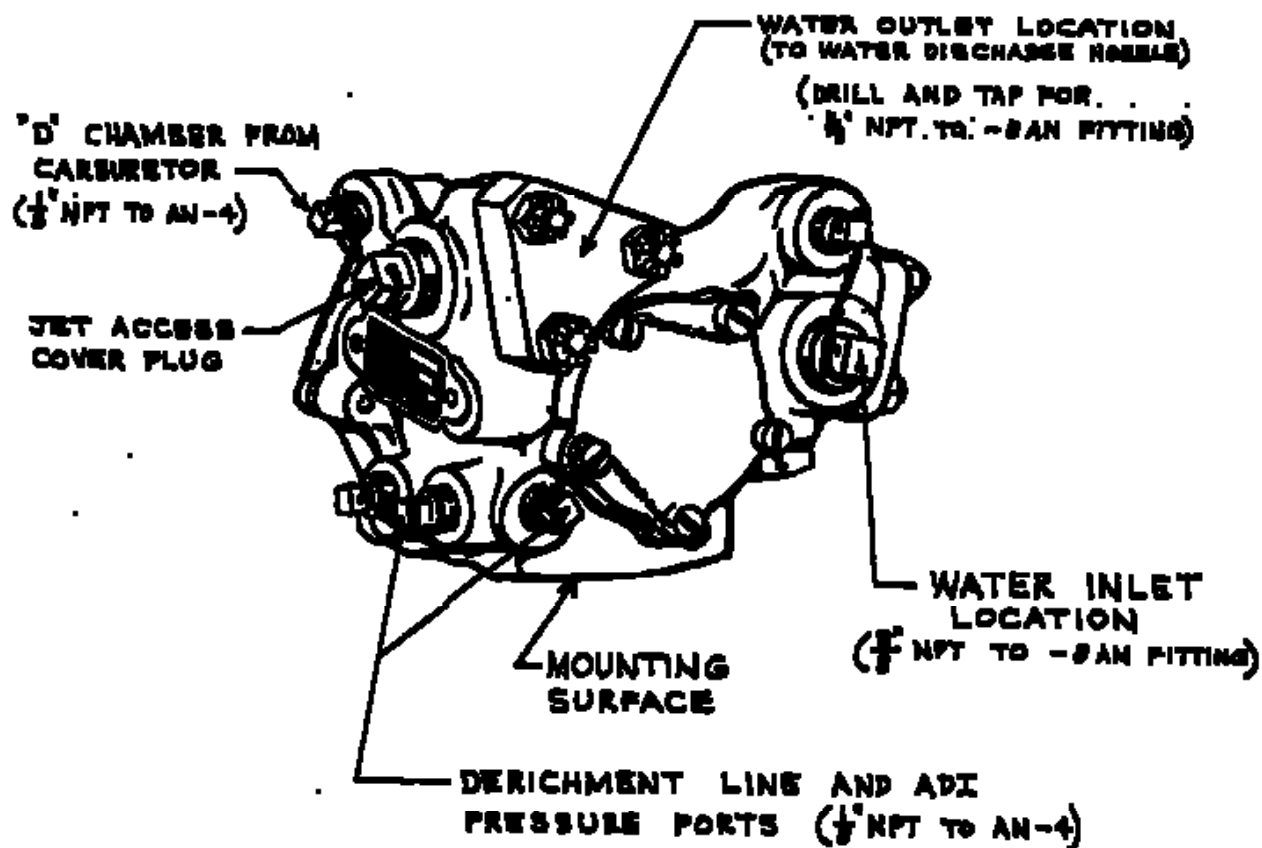
PRATT & WHITNEY AIRCRAFT



MOCK-UP OF THE DOUBLE WASP CA SERIES ENGINE WATER INJECTION SYSTEM

WATER REGULATOR CONNECTIONS

ISOMETRIC REPRESENTATION SHOWING STANDARD CONNECTIONS
(USE ON MOST AIRCRAFT OTHER THAN P&W ENGINES)



Pete Law at Reno





Graham White and Pete Law at Reno 2002



Miss Candace #69



Jeannie #69, Reno 1982



THE GALLOPING GHOST



R-R Griffon Powered Red Baron #5, Reno 1977



NORTH AMERICAN P-51D-30-NA MUSTANG



Strega #7



R-4360 Powered *Super Corsair*



R-4360 Powered *Dreadnought* #8



R-4360 Sea Fury *Furias* #15, Reno 1984



Furious, Reno 2011



Stiletto #84, Reno 1992 Water Boiler Cooling

Sport Aviation

December '86



Tsunami #18 In Flight



Tsunami #18 at Reno



Rare Bear, 2011



R-3350 Powered Sea Fury *Critical Mass* #10



R-3350 Powered *September Fury* #232, Reno 2004



September Fury #232, Reno 2008



SteadFast, Reno 2011

RED BARON RECORD TEAM



Punch a Hole Thru
a Cloud

My Very Best Wishes

Cheers and
Good Luck!

Ed Browning

[Signature]

Roger Davies

TEAM LEADER
Ed Browning

PILOT
Darryl G. Greenmyer

CREW CHIEF
Roger Davies



Darryl Greenamyer's Record Setters:
F-104 *Starfighter* (988.26 mph) and
F8F *Bearcat* (483.041 mph)

Pete Law
Lifetime Achievement
Award
from
Unlimited Division
2011

