



RYAN FALCONER V-12 POWERPLANT

ENGINE: The Falconer V-12 engine was developed by Ryan Falconer Industries. The engine has been used in racing boats, specialty race and streetcars, trucks, airboats, and now airplanes. This engine incorporates the latest splayed-valve cylinder head technology and the highest quality internal components developed for racing, such as Carrillo rods and JE hypereutectic pistons. The Falconer V-12 airplane engine was developed by RFI (www.falconerengines.com) especially for the Thunder Mustang with specific unique features which include: special long-runner, electronic, sequential, tuned-port injection system with end-entry plenums for narrow width; 10.9 to 1 compression ratio, special grind hydraulic roller cam for low rpm horsepower and torque, and additional bosses on the drive end of the crankcase to provide greater clamp up area for the gearbox. It is interesting to note that the exhaust port spacing is almost exactly 3/4 of the Rolls Royce Merlin which powers the North American Aviation P-51.

Ryan Falconer's history in engine development began while working for Andy Granatelli building the Novi engines for the Indy 500. For the past 29 years his company has built engines for numerous racing teams that have won the Indy 500 and other prestigious races. Roger Penske, Andy Granatelli, and Galles Racing have also been among his Indy customers. In 1973 Ryan began development work for Chevrolet. He has supplied engines to many of the top racing teams in Can-Am and Trans-Am.

In 1980 Ryan was asked by Chevrolet to develop the first V-6 Chevrolet Indy engine, which qualified and completed the 500. In 1984 development began on the Chevrolet GTP Corvette which gained considerable notoriety. At the completion of the V-6 GTP project, he was developing over 1200 HP from the 3.0 liter V-6 engine. It was during this time that Ryan decided to look build a V-12 engine.

GEARBOX: Developed for the Thunder Mustang, this project was headed by B. J. Schramm. Final design and analysis was done by Mr. Oswald Webb of England (now retired), who worked on the original Merlin engine reduction and was Chief Design Engineer for GKN, the largest gear works in Europe. The unit is designed to endure up to 1500 HP, pulling 13.5 g's, doing one second snap rolls for more than 400 hours! We expect some owners to hop-up the engine and go racing, and we want the gearbox to last. The reduction ratio is 2.8 to 1. It is a straight cut spur gear arrangement with a quill shaft between crankshaft and drive gear.

PROPELLER: The propeller is an 8 foot diameter, constant-speed, 4-blade, manufactured by MT Propellers. Extensive engineering was applied to ensure the optimum design of each component of this system. With the V-12 turning 4500 rpm, the gear box ratio of 2.8:1 turns the prop at 1607 rpm for the best prop efficiency and high speed. The 100 lb. propeller is of composite construction utilizing a wood core, which is self-dampening and non-fatiguing. This saves weight compared to metal propellers and reduces the gyroscopic effect of the prop on take-off.

ACCESSORIES: Developed and designed so that each of the two ribbed, serpentine belts will drive the entire five pumps and prop governor, should one belt fail. A third belt drives the alternator only. Supercharger development, for high altitude or higher horsepower applications, is in final testing.



Engine Specifications

Engine type	90° V12, RFI (all Aluminum)
Cubic displacement	601 cid
Horsepower	640 hp @ 4500 rpm
Torque	700+ft./lb @ 4000 rpm
Compression ratio	10.9:1
Bore	4.125 in.
Stroke	3.750 in.
Fuel	100 LL Avgas
Heads	Cast aluminum with splayed valve design
Cylinders	Steel sleeved
Main bearing size	Same as 400 cid Chevrolet
Rod bearing size	Same as 350 cid Chevrolet
Cam bearings	Similar to Chevy small block
Rods	Forged, Carrillo Industries
Pistons	Forged aluminum, J.E.
Valve train	Dual spring
Valves	Stainless, 2.190 intake / 1.610 exhaust
Rocker assembly	Investment cast stainless steel, 17-4
Roller tappets	AC Delco
Pushrods	Smith Brothers
Manifold	RFI, with end entry plenums and 70mm butterflies
Ignition	Delco Direct Fire (no distributor), with dual computers
Freeze plugs	Threaded with o-ring
Port runners	Pre-machined for better flow
Crankshaft	Bryant
Head gasket	Special, Fel-Pro
Dry oil sump pump	RFI custom
Damper	Fluidampr
Length	55.5 in.
Width	24.25 in
Weight	980 lb (firewall forward, includes: accessories, batteries, gear reduction unit, hoses, propeller, etc.)