Why I Chose A Subaru-based Engine For My GlaStar
My Eggenfellner 2002 2.5L H4
My Reasons **For** Choosing An Automobile-based Powerplant:

- Modern engine reliability
- Modern engines built better
- Modern engines built in huge numbers
- High power/displacement ratio
- Reduced noise/vibration/harshness
- Simple controls (single lever/single knob)
- Reduced pilot workload
- Benefits of Electronic Ignition & Fuel Injection
- Higher compression ratio
- Similar fuel efficiency
- Ability to use auto fuel (92 or 87 octane)
- Low maintenance costs
- Low oil use (no oil added between 100 hour changes)
- Quiet operation
- Liquid cooling for safer/better cabin heating
- Ability to descend quickly (4000 fpm demonstrated)
My **Concerns** In Choosing An Automobile-based Powerplant:

- Reliability at high power settings
- High RPM operation
- Expense of Constant Speed Propeller
- Electrical system dependence
- Very few examples flying
- Future factory support
- Cooling design issues
- Fuel system design issues
- Lack of availability of a vacuum system
- Resale value
- Difficulty finding auto fuel in the short term
Efficiencies:
Subaru vs. Lycoming

- Liquid cooling - better temp control
- Geared operation - Higher torque
- E.F.I. - better fuel metering
- E.I. - better ignition control
- Lower vibration levels
- Lighter constant speed propeller
- Simpler propeller control
- 1 lever & 1 knob control of power

- Air cooling - better thermal efficiency
- Direct drive - lighter weight
- Simpler fuel system
- Less complicated electrical system
- Simpler cooling system
- Simpler constant speed propeller
Critical Elements to an Auto Conversion:

- **PSRU (Propeller Speed Reduction Unit):** belt, chain, gear (spur, planetary, idle shaft)
- **Radiators:** location; brass, aluminum; auto, A/C core, oil cooler
- **Fuel system:** single/double pump; header tank; filters
- **Electrical system:** single/dual/triple battery, dual alternator, dual buss, essential buss, breakers, polyfuse
- **Cowling:** modified stock, custom, cowl flap
- **Coolant:** 50/50, Evans (propylene glycol, non-aqueous), pressurized, non-pressurized
- **Exhaust:** straight, muffler, turbo
- **Induction:** air filter, turbo, turbo-normalized, supercharged, intercooled
PSRU evolution (Eggenfellner G1,2,3)
PSRU: belt (SubieLyc)
PSRU: other belt
PSRU: planetary gear (Ross)
PSRU: another planetary
Cooling solutions
Cooling solutions (Eggenfellner)
Fuel solutions
(Eggenfellner)
More fuel solutions (GlaStar)
More fuel solutions (low wing)
Another necessary fuel item
Electrical Systems
Auto Specific components
Eggenfellner recommended panel
More panels etc.
Still more panels
Dual battery locations
Cowling
RV-10 Eggenfellner cowl
RV-10 Eggenfellner cowl flap
RV-10 Eggenfellner cowl flap motor
Supercharger
50 to 80 hp engines
160 hp, Eggenfellner 2.5L H-4
200 Hp, Eggenfellner 3.0L H-6
220 hp, Eggenfellner 3.0L H6 Turbo-normalized+ (30”mp)
# RV-10 Performance data

<table>
<thead>
<tr>
<th></th>
<th>10,000 FEET DA</th>
<th></th>
<th>14,000 FEET DA</th>
<th></th>
<th>18,000 FEET DA</th>
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<tbody>
<tr>
<td><strong>TAS KTS/MPH</strong></td>
<td>IO-540</td>
<td>E6-TI</td>
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<td><strong>GPH</strong></td>
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<td>12</td>
<td>10</td>
<td>12</td>
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</table>

10,000 FEET DA: IO-540 TAS is 164 KTS/189 MPH, MAP is 21.5, RPM is 2450, GPH is 12.

14,000 FEET DA: IO-540 TAS is 155 KTS/178 MPH, MAP is 18.5, RPM is 2450, GPH is 10.

18,000 FEET DA: IO-540 TAS is Not yet available, MAP is 15, RPM is 2450, GPH is Not yet available.
The Future: ??? Hp