

DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

THE OFFICIAL VOICE OF DRAGONFLYERS ALL OVER THE WORLD

VOLUME 74

NOVEMBER - DECEMBER 1997



Ted Givins and Gary Gutsche on display at this years Monreal Airshow of Canada

DIRECT DRIVE ALTERNATOR SYSTEM

Following the mechanical failure of

the built-in alternator I was forced to engineer a new system since replacement parts were not available.

The smallest/lightest alternator which I could locate at the auto wreckers was the Suzuki alternator. It is used in the Sprint and also the Firefly. The

output is rated at 55 amps and the unit, with built in regulator weighs 6.5 lb. After removing the internal alternator system the net weight gain was approximately 2 lbs.

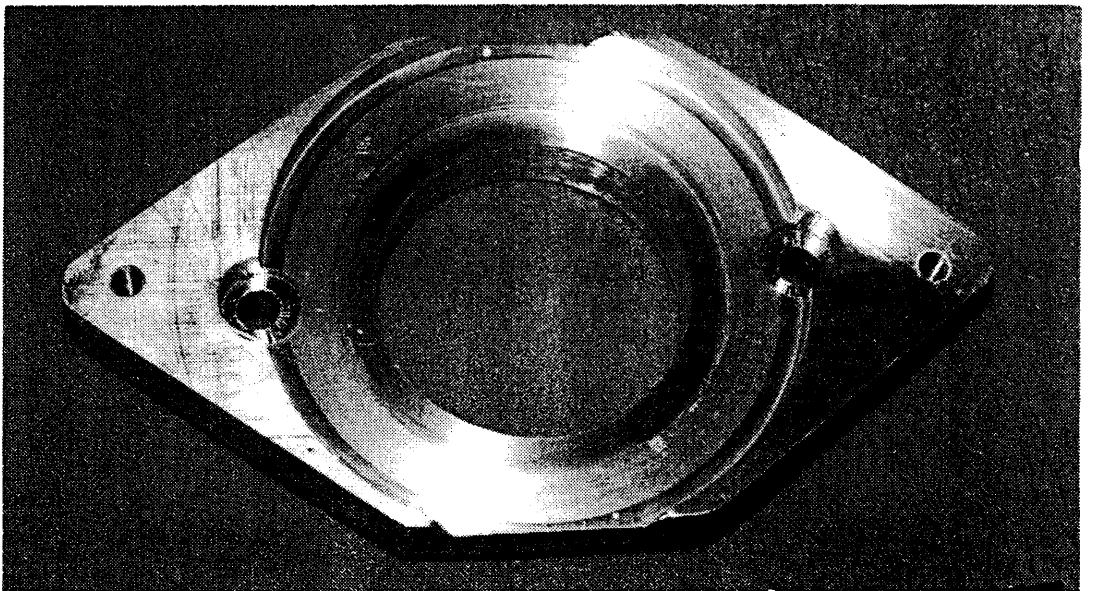
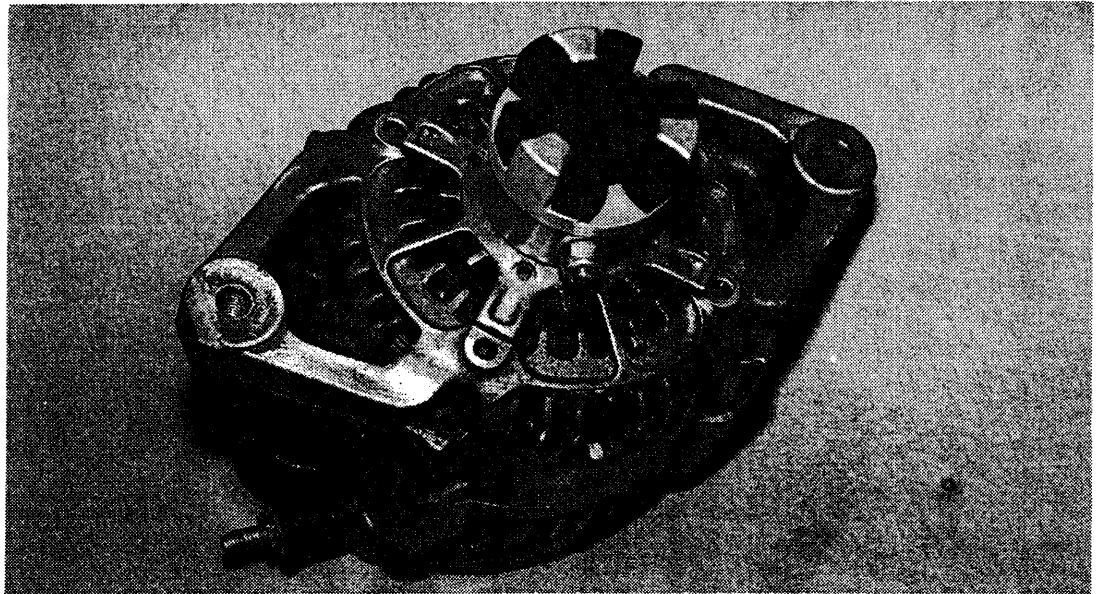
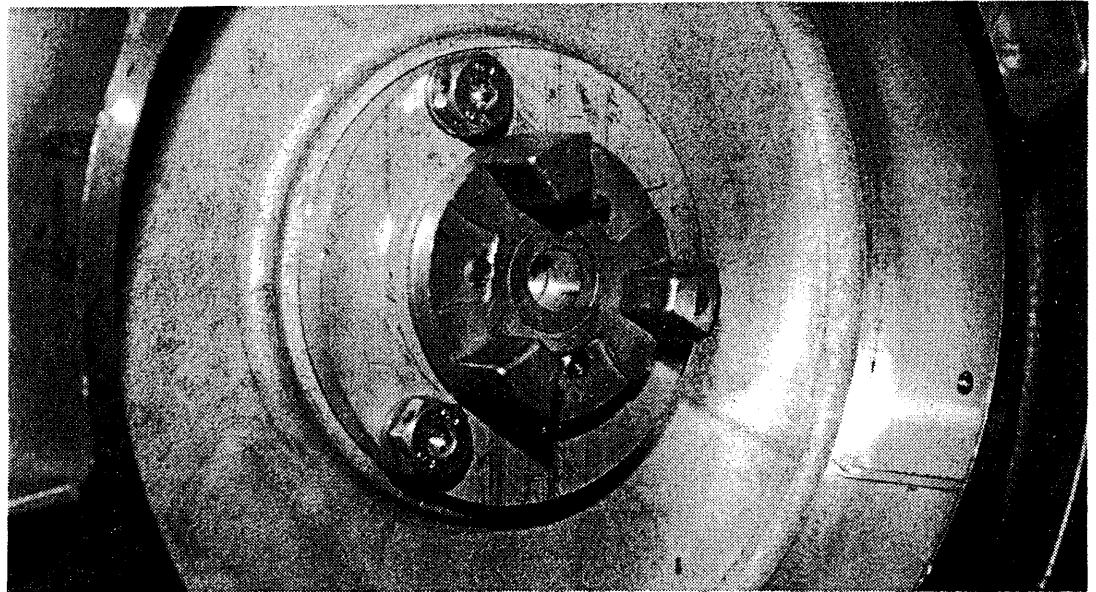
In order to minimize the installed weight I decided to direct drive the alternator thus eliminating the need for pulleys and extra brackets. A flexible couple was used to connect the alternator shaft to the crank.

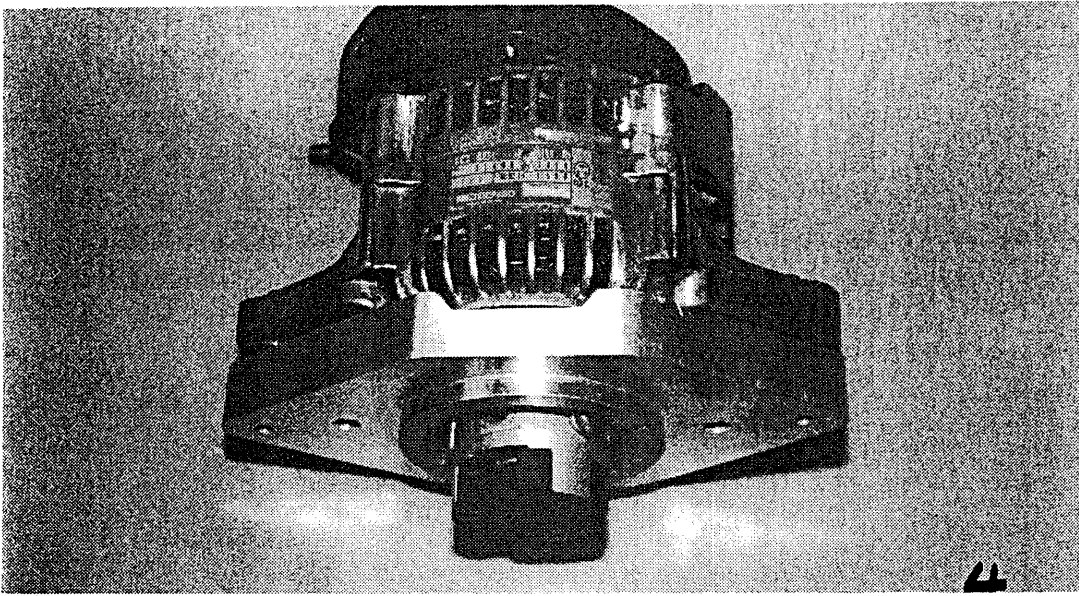
The first step involved the removal of the magneto coupler from the flywheel and machining an adapter plate and reducing the height of the flex couple. Photo 1 shows the adapter plate and flex couple half installed on the flywheel.

The remaining half of the flex couple was drilled and tapped to match the threads on the alternator shaft. Once installed the flex couple and alternator shaft were drilled and an AN-3 bolt installed to prevent any slippage.

The third step was the design and machining of an adapter plate to fit the Magneto drive hole in the accessory case and to fit and position the alternator centred on the crank. The adapter plate was machined to take advantage of the alternator case design. Two bolts hold the plate to the accessory case and two bolts mount the alternator. Photo 3 shows the adapter plate, alternator side and Photo 4 shows the plate with the alternator and flex couple installed.

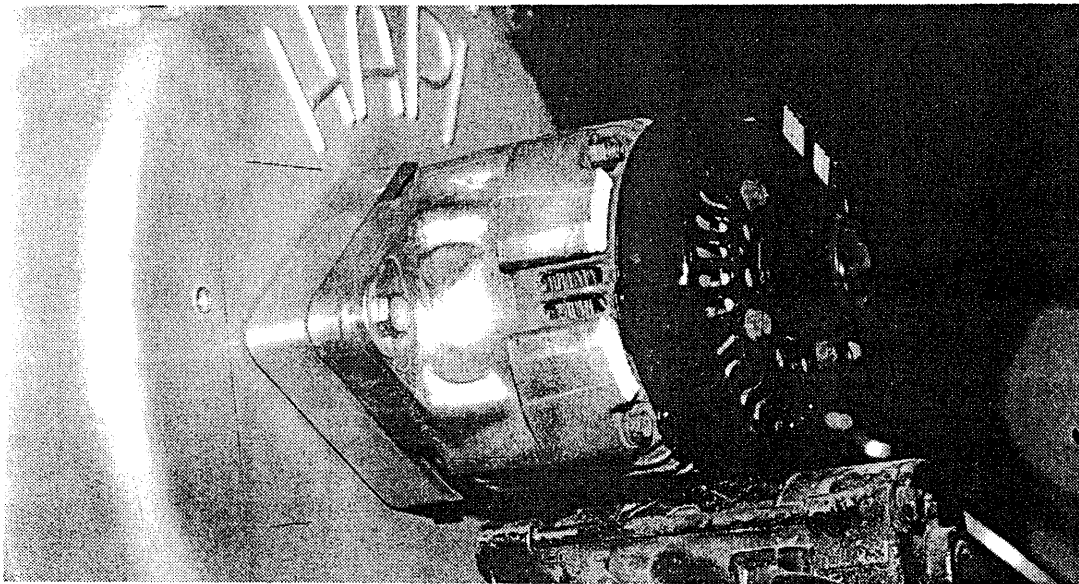
The result is an neat installation as shown in Photo 5. The total weight of the com-





plete alternator, adapter plates and flexible couple is approximately 7.0 lbs. The old system, magnet ring, coils, regulator and rectifier weighed slightly less than 5.0 lbs.

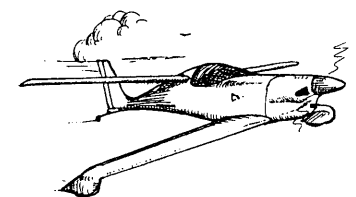
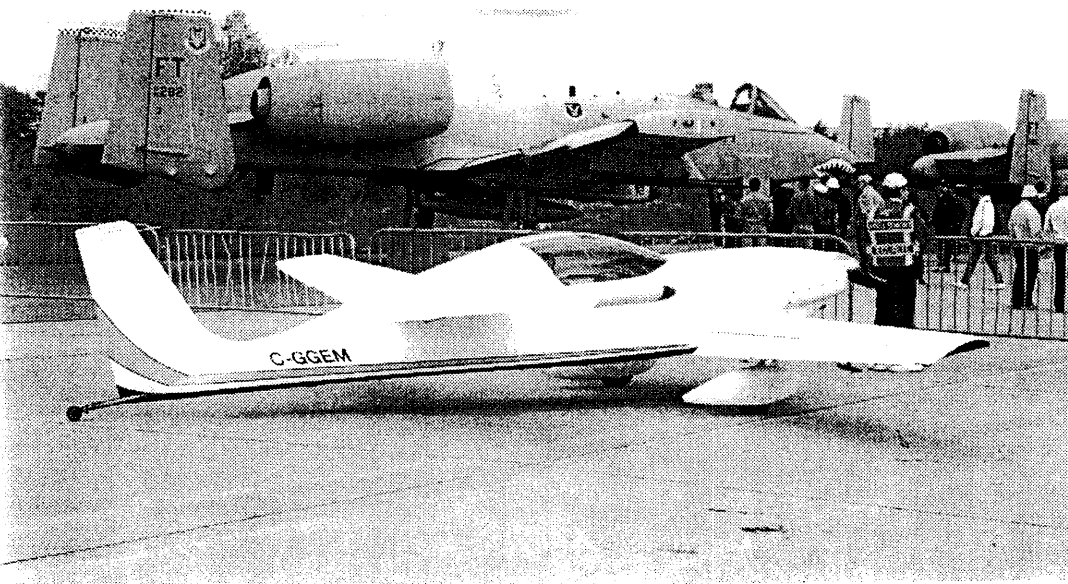
Below 1100 rpm the alternator does not produce any significant power. At 1200 rpm the output is approximately 12.5 - 13 volts and above 1500 rpm the alternator is putting out full power. To date I have logged approximately 35 hours on the system and the rubber insert in the flex couple looks like new.



The exact dimensions will vary slightly with each engine/alternator so I have not include any drawings. I also found that alternators with the same part number have minor differences in the cases. The first alternator for the wrecker was marginal so I traded it in for a rebuild which was slightly different. If there is enough interest I could produce them with approximate dimensions.

All the machining was done using a friends bench top lathe. I must thank Nigel Field (Vari Eze/Soob) for the use of his lathe and is assistance in machining some of the parts. In total it took an afternoon to make the parts.

Ted Givins, PEng
C-GGEM



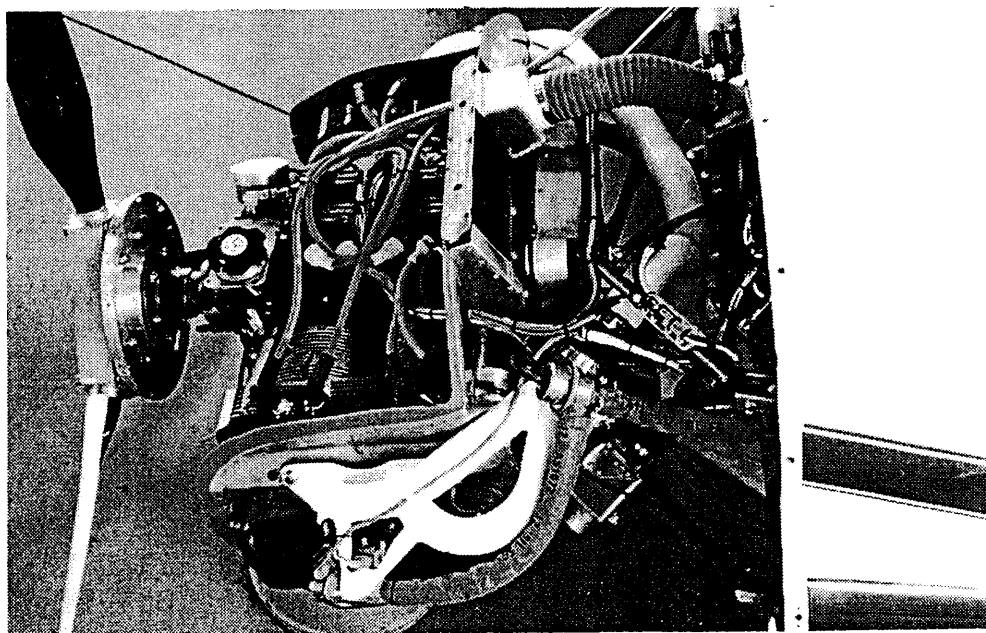
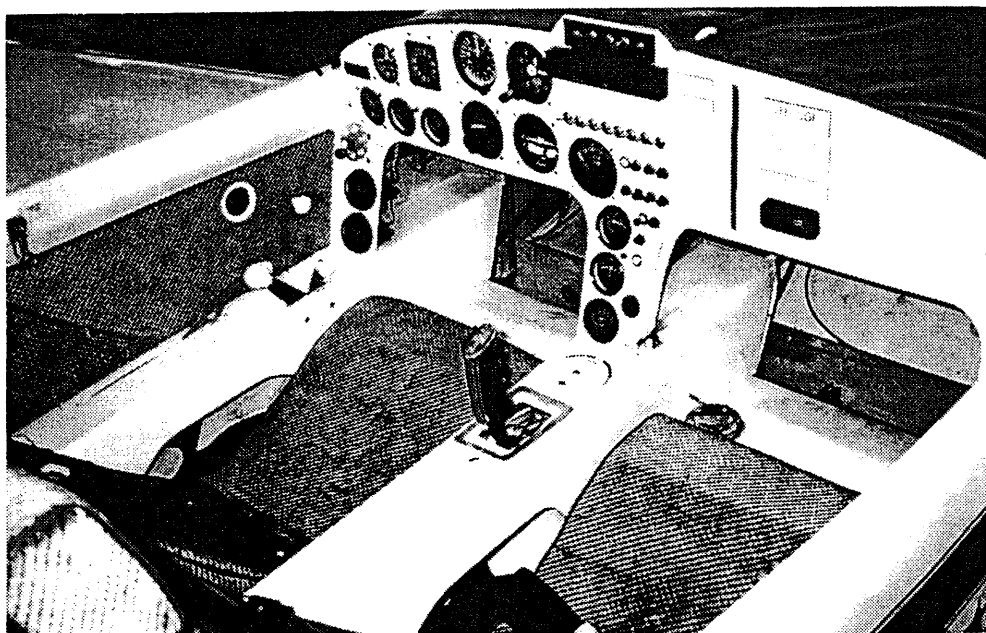
Type IV in a Dragonfly

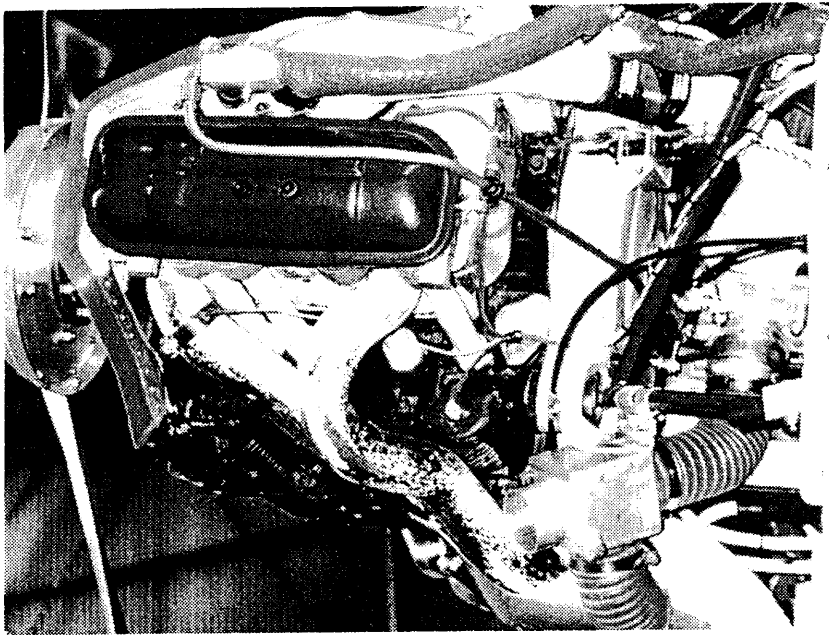
Graeme J. Davey
Australia

Dear Spud

My Dragonfly is complete and ready to fly, but I tell you something Spud, the British may have invented Bureaucracy but the Australian Civil Aviation Authority have perfected it. I have been waiting three months to have an Electrical Drawing approved (two pages) and four months for an Engine/Propeller installation approval. A document of approx . 40 pages I have put together to prove it won't fall apart. They are unbelievable, the sooner we get an Experimental Category the better. The Type 4 2500cc engine runs like a clock. I used a Bosch L-Jetronic Injection with an aftermarket E.C.U. and Surefire 11 ignition, it starts first piston up every time and idles so smooth you can almost count the blades going round. I've used a Warp Drive 58" Dia. 3 blade Prop. I haven't flown it but it sure accelerates up when taxiing, it certainly feels like it want's to go flying.

My Aircraft is fitted with Aileron Reflexer and Landing Brake, I still fell I made a good choice with the Engine, I believe a Type 4 can be built to give reliability and performance, without the added weight of radiator and hoses etc. Subaru's are very reliable but, at a price. of a lot heavier weight and complexity, cooling problems are not automatically solved with liquid cooling either. A properly built, and set up V.W. Engine will keep your installation simple, keeps weight down and will give reliability and performance. I have included some photos and notes on the construction of my engine, and note such things as head gasket seals, and oil spray bar for valve guides. Balancing crank





and rods and cc matching of heads, certainly helps in getting a smooth running engine. I sure hope it fly's as well as I feel it want's to.

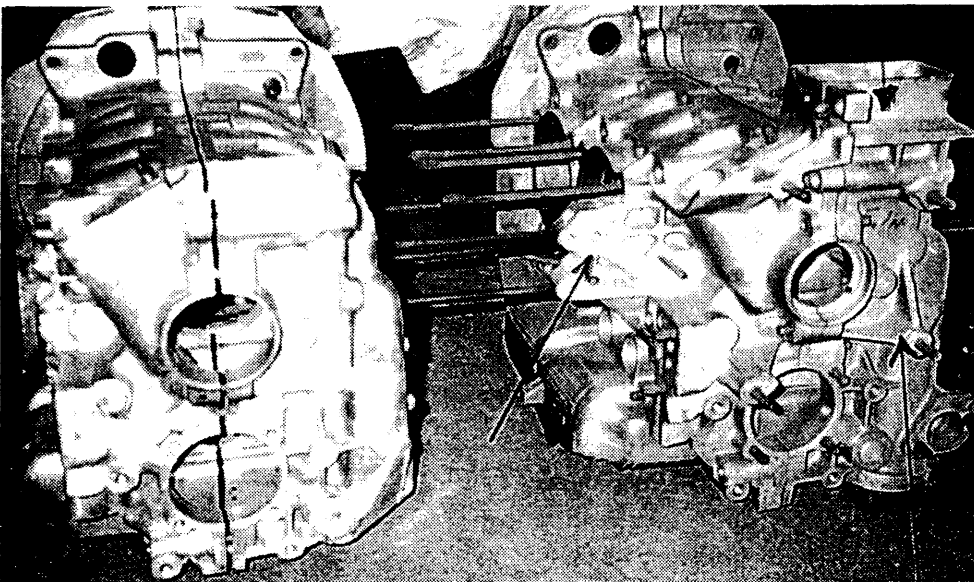
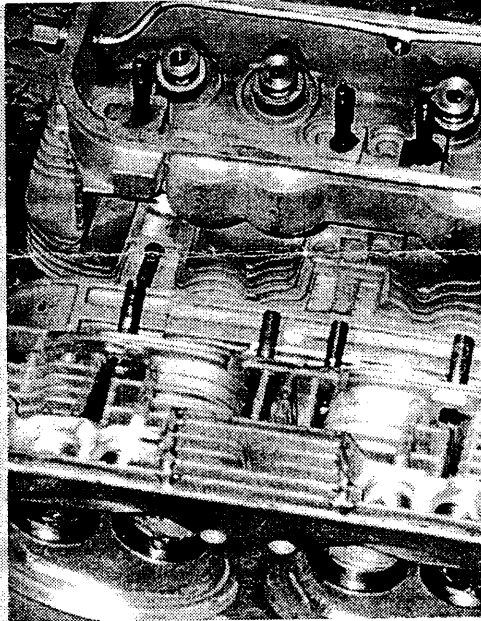
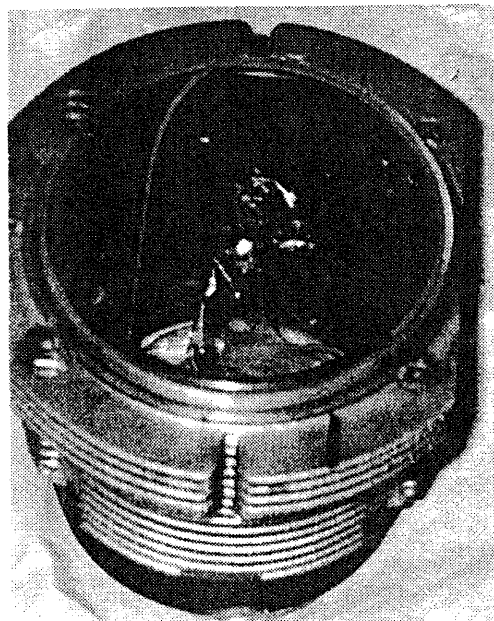
I've included some construction notes on my engine installation.

Par 1.1 Type 4 VW Engines are 4 cylinder horizontally opposed air-cooled engines, built from the early seventies to the mid eighties, used in the VW sedans, wagons, transporters, and the Porsche 914. All models 2000cc and larger were fuel injected, the standard engine was almost identical to a standard Type 3 engine but with some major differences:

Par 1.2 The crankcase is pure aluminum, not magnesium as with type 3. Aluminum does not have the problems of work hardening, flexing and finally cracking that magnesium cases have when subjected to larger bore sizes. The cylinder heads have larger finned areas, have better flow through porting and are more adaptable to fitting dual spark plugs. The disadvantage is a lime extra weight. All other components and assembly procedures are typical of the basic VW Aero Engine

Par 1.3 As with all auto engines, the major area of conversion work is in the adaptation of the propeller hub. This engine is direct drive and is fitted with a much larger crankshaft produced from a billet of 4340 steel by Akrasa Pty Ltd in Germany. The propeller hub is manufactured for Great Planes Aircraft Supply" in USA and sold as their "Force One Hub" (See GPAS Book). The crank and hub are machined to matched tapers, the crank is also deep drilled and threaded for a longer hub attach bolt.

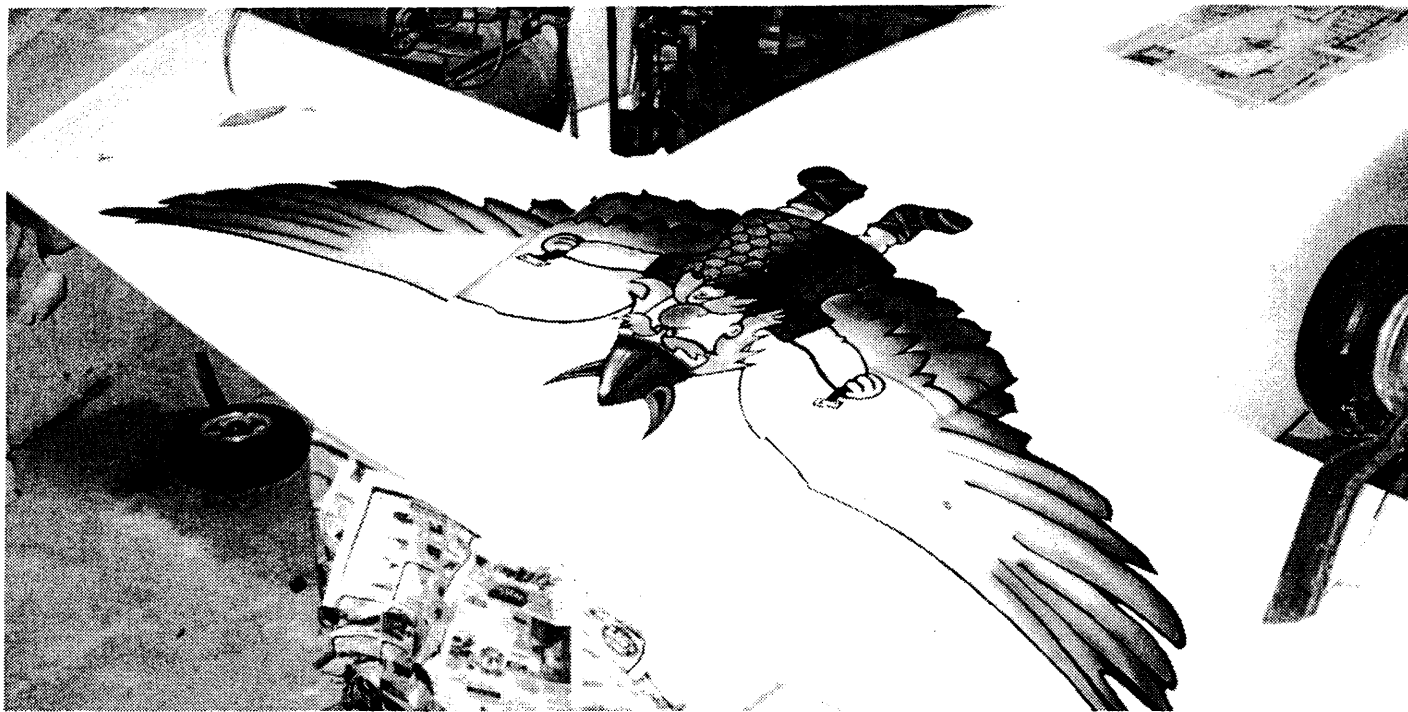
Par 1.4 The hub has then been "Heat Shrunk" in place, making a complete assembly much stronger than the original, in fact stronger than any type 3 engine can be built. The front bearing and seal runs on the propeller hub and is some five times the surface area of the original bearing, the front of the crankcase is line bored to take the larger bearing. The type 4 case is stronger and heavier than the type 3., in this area leaving more metal for support alter machining. The fitting of larger front bearings is common practice



for VW conversion manufacturers, eg: Revmaster, Aeropower, and Hapi engines to name some.

metal, brackets, lugs from around the front of the engine (originally used to mount the fan housing on the original vehicle installation) to

plug hole, with consideration to the angle required of the new plug, and the space between the two, an extra spark plug hole was machined. Both



Par 1.5 The original VW engine uses one main bearing as a thrust bearing for end loading of the clutch operation. Because of the extra loading of the propeller being direct drive, we decided to use two thrust bearings, one on the rear main bearing and one on the centre. This is also common practice for manufacturers

Par 1.6 The crankshaft and the crank case being different materials have different expansion rates, so to make best use of the two thrust bearings, the case and shaft were heated up to normal engine operating temperatures - 180 degrees Celsius, before shimming to the required tolerances.

Par 2.1A 6041 grade aluminum flywheel was specially machined to suit VW ring gear and to house the Great Plains Aircraft Supply Co.'s built in alternator unit. (Same as Aeropower). The rear main oil seal contact surface area on the aluminum flywheel was metal sprayed (steel) and machined to eliminate "Grooving by the oil seal.

Par 2.2 Other modifications to the crankcase were mainly to remove unwanted

reduce weight and improve cowling clearances, and also to reposition the oil cooler, which has been removed from the front right hand side of the engine to a position on top at the rear of case. This is standard practice for all VW engine conversions.

Par 2.3 Pistons and cylinders are light weight 100mm bore size and are assembled as per standard VW procedure with exception of the head seals. Standard Type 3 do not have head gaskets, Type 4 uses a gasket ring, in this engine standard Gaskets would not fit, in preference to using Type 3 procedure alone, we machined a groove in the top edge of the cylinder barrels, to allow the fitting of a high pressure, high temperature silicone seal, as used in many high compression racing engines.

Par 2.4 The cylinder heads have been machined to accept an extra 14 mm standard VW spark plug per cylinder for dual ignition. A small amount of finned area was machined away adjacent to the original spark

plug provisions for each cylinder have been strengthened by the addition of a steel thread insert. This machining has been carried out in an approved Volkswagen workshop by a qualified VW engineer with some 30 years of VW experience

Par 2.5 The ignition system was chosen for its reliability and many hundreds of trouble free hours, low maintenance and simplicity, almost no moving parts. This dual electronic system that I used was originally designed and marketed by Rex Taylor of Hapi Engines USA. and was called "Surefire II". This system is fitted to several aircraft in Australia including Len Dysons Dragonfly. VH LSD, which has flown nearly 450 Hrs. with the Surefire II ignition system reporting excellent performance at all times. Total Engine Concepts" in Florida now market this system. Aeropower also use a copy of the this system on their engines here in Australia. Using a converted VW distributor based timing module which houses two separate hall effect timing circuits for the two totally separate ignition systems. The four

"Rear Drive" from GPASC

12 volt ignition coils, two per system, run at 10 volts to reduce heat loads and are triggered by two solid state modules. This is commonly known as a "Waste Spark" system.

Par. 3.1 An oil line has been fitted each head, via a low pressure cut off valve, with a spray bar to ensure adequate lubrication to the exhaust valve guides, a problem with most low revving horizontally opposed engines. Extra oil is also pumped to the larger front main bearing via an external oil line as is standard practice with most commercially built VW engines.

Par 3.2 Volkswagen used the Bosch L-Jetronic gasoline fuel injection system as standard equipment in many of their type 3 and type 4 engines.

Type 4 engines, in particular were used in their Transporter and Vanagon models, Porsche used the type 4 engine in the 914 most of which were fuel injected with the L-jetronic system. The majority of this L-jetronic system was retained in this installation

Par 3.3 The fuel system is per original Dragonfly plans until the fuel leaves the gascolator. From there, two Bosch high pressure injection pumps, mounted in parallel, so one is a standby, pump fuel through a large fuel filter via the injector circuit to a fuel pressure regulator, unused fuel is then returned to the fuel tank.

Apart from the addition of this standby pump, and the substitution of a more advanced ECU, manufactured by HALTEC inc. the fuel injection system used in this installation is standard equipment for VW engines. The HALTEC ECU was chosen after consultation with VW qualified engineers and also electronic fuel injection workshops, for its reliability, ruggedness, and better fuel mixture control.

Par 3.4 The injectors are mounted in the manifolds adjacent to the inlet valve ports and are controlled and timed by the electronic control unit (E.C.U.) along with normal engine considerations and functions. This unit allows for outside air

temperature, density and pressure, to achieve the correct fuel/air mixture at all times.

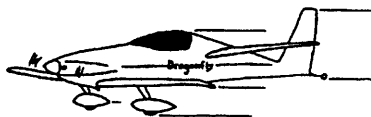
Par 3.5 The crankshaft, piston rods and bolts have been magnafluxed and the engine has been assembled in accordance with VW service and repair manuals with regards to clearances and tolerances etc. Camshaft drive gears have also been crack tested.

Par 3.6 At this point the engine has been fitted to the aircraft and after fuel system flow tests, fuel and oil pressure tests, ignition timing etc. The engine has been started, and has been running for approximately 2 hours, not continuously. During which, some minor adjustments were made. All engine instrumentation were checked, a laptop personal computer was plugged in to monitor and adjust the program of the E.C.U. in conjunction with an exhaust gas analyser, to achieve the correct injector timing and fuel flow the engine is now running very smoothly with good response and no hesitation.

Spud please note our new address above to send the D.B.F.N. Please keep up the great work you do with the news letter, it's the only way we can keep in touch with what's going on, with you guy's over there. ATTA-BOY.

P.S. Brad Hale was over here on business recently, we spent some time with him, and enjoyed his company. He's a really nice guy and he brought us up to date with things that are happening in his part of USA

Graeme & Sandy Davey
6 Thomas Street
Culcairn 2660
N.S.W.
Australia



● "Flywheel End" Rear Drive

We are getting quite a few requests for additional information in regards to our new "rear drive system" that we are developing for homebuilt aircraft applications. I would like bring everyone up-to-date on components that will make up the system, testing plans and the advantages of the drive system.

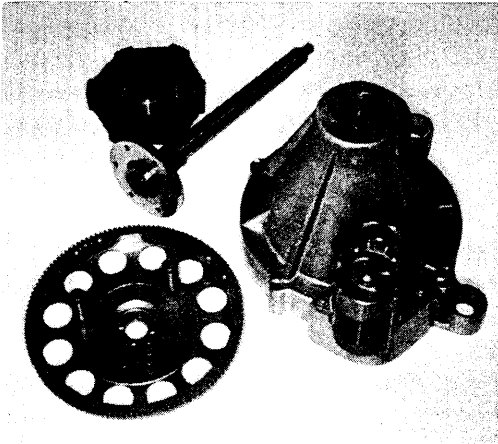
We currently have two adapter we are going to be testing They are identical with the expectation of the material they are made from One is made from A356 aluminum and the other is made out of Tinzalloy. We had hoped to be well into testing by this time but we are being delayed by about 6 months. The engine and drive unit are 100% done. The problem lies with the test bed we are using to test the engine and drive unit on. We use Airboats to test various products out on. We had planned on purchasing an airboat hull to test the 2074cc VW and drive system on. but could not find one that weighed less than 300 lbs. just for the hull.

We learned from over 300 hours of airboating over the last years that' in minimally powered airboats, weight matters just as much as it does in homebuilt aircraft. Our design empty weight of the airboat we need is less than 500 lbs. including the engine So in the true homebuilders fashion, we built one. Anyway by the time you read this, the airboat. engine and drive system are ready to go but we need warmer weather and at best that's called late March of 98 in Nebraska We will have the systems tested any bugs hopefully worked out by then so we can go get 200 hours on as soon as possible .

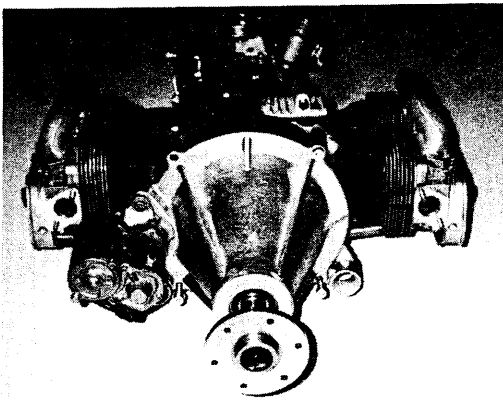
● Drive Systems Components

The drive system is made up of 5 major components. The bell housing, housing,

flywheel, dampener and a taper lock bushing. The following photos show the components as they are mounted.



The drive shaft has 3 large drive lugs that are threaded into the machined and lightened flywheel. The dampener has three female bushings that slip over the lugs that bolt to the flywheel. The dampener actually floats on the bushings and is not physically attached. 90 degrees to the drive lugs are three large bolts that compress the dampener down around an aluminum cylinder that has the taper lock bushing inside of it. The taperlock bushing clamps on the drive shaft. At the back end of the drive shaft the shaft is supported in the flywheel gland nut needle bearings. On the front end of the drive shaft the shaft is supported by a large thrust bearings end play is set by the tube that goes over the shaft and held in place by the retaining nut at the flywheel.



End play must be set at the flywheel for the engine. The dampner is set on the drive shaft and clamped in place by the

More on the Copper State Dash !

The Copperstate Dash was held Friday the 10th of October this year. From a Dragonfly perspective it was interesting. But first let me tell you a little about the race which is sponsored each year by Aircraft Spruce.

The race starts at Apple Valley, California, and ends at Coolidge, Arizona, a small airport about 40 miles southeast of Williams-Gateway where the big Phoenix fly-in is held. The distance is about 305 NM over some of the worst desert country in the Southwest.

There were three horsepower categories in the race; each category was further divided into the experimentals and store-bought ships to leave a little incentive for the latter. Our Flys competed in the experimental group of the lowest HP category (ships of less than 75 HP).

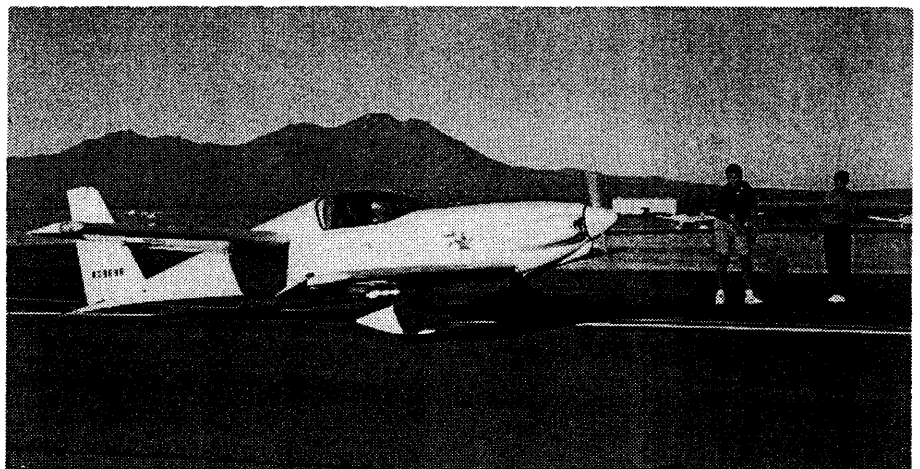
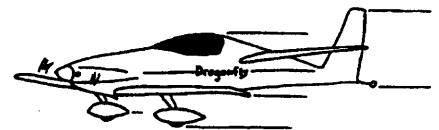
Three Flys and three other acft ran in the 75 HP experimental group. John Mason from Orange Cove, California, Larry Brown from Mesa, Arizona, and the writer were all in there with their Dragonflies. Regrettably we were all skunked by a slick little one-off single seater called Cosmos. That little rascal was small, very slippery, and had a C75 which turned about 2900 RPM (really putting it out of our 75 HP limit). At any

rate John Mason smoked to finish second. Behind him by less than a minute was Larry Brown. (The Brown-Mason affair was a real race of its own.) Our friend Dave Carlson cut me out of fourth with his 2180 Q-2.

The race was great fun and comradery. But I believe that it was interesting because it showed that the old friendly Flys can still do darn well. Darn well! The only ship that was fast enough to beat us might as well have been built to a formula to win the race; it was even pushed to the start line. Snivel. Snivel.

After landing at Coolidge, fueling and draining pilot's tanks we headed up to Williams-Gateway for the fly-in. Brad Hall and Stan Moleski joined us there later Friday in Brad's beauty. We had lots of fun and spoke with a whole gang of Dragonfly builders and other interesting persons at the show. Most of the great Phoenix gang was there.

Nathan Rambo



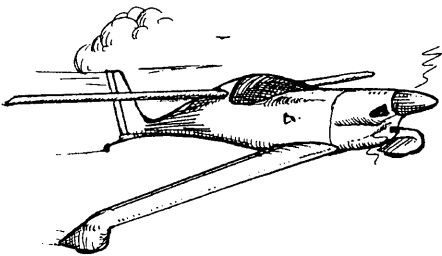
News from old friends, RV Friends!

taper lock bushing so that there is not preload on the engine and all propeller thrust and radial loads are taken up by the bearing and dampener, with minimal transmission back to the engine. The dampener actually floats between .125" and .250" away from the fly-wheel.

We also will have for sale as part of the rear drive kit A top mounted cast aluminum intake manifold and plenum that will accept Ellison or RevFlow carbs.

So by now you are probably asking yourself "What are the advantages of a rear drive system"? Clearly the single largest advantage is not transmitting torsional vibration to the engine. The added benefit however is the potential for a great increase in horsepower via larger displacement engines. Right now we are limited in our opinion to 76 hp in the dependable 2180cc type 1 engine. With the rear drive system we can easily go up to almost 2600cc on the type 1 using the aftermarket engine cases and (94 x 94 x 90 x .0031416) and up to 3200cc using type 4 components. By having the carb mounted on top of the engine we gain additional horsepower yet. The other major advantage regardless of engine displacement or type is that we really hope that you will be able to use any of the new propellers now available in the marketplace that are "other than wood". (Warp Drive etc...)

Steve Bennett
Great Plains Aircraft Supply
Boystown, Nebraska



Hi Spud

Got the newsletter the other day and as I filed it away after reading it, I compared it to your first issue #32.... I'm impressed. I can't believe you've been doing the newsletter since Oshkosh 1990, time flies! After I sold my Dragonfly it's like I died, don't hear from anyone any more, I miss that! Saw the Dragonfly page on the net the other day, it looks great!

I guess I will always have a warm spot for the Dragonfly. I've enjoyed my RV, but the Dragonfly was the neatest plane I've owned. Oh I hear the guys talk about the RV's performance and all that, but the Dragonfly is in a class by itself! Anyway, take care and say hello to the gang.

Tim Gibbs
Woodbridge, VA.

G'Day Spud

Let me introduce myself. I am the president of the local RV builders group, (Oh No! not another letter complaining about the "David vs Goliath" article for DBFN #54.) EAA and SAAA member, Tech Counselor, but most important, I built one of the first Dragonflies in Australia (see "Dragonflyer #29).

After three years of flying my Mark I Dragonfly I found myself posted to one side of Australia leaving my beloved Dragonfly on the other. After some time I lost my sense of reality and sold her to a very lucky guy who went on to fly her all over the place. I went on to building RV's trying not to mourn the loss of my first homebuilt aircraft.

Then one day the phone rang: "Dave, I had to crash land her, I'm OK, but she's in a bad way" as it turned out a broken crankshaft

caused a forced landing in a road that wasn't made to take a Dragonfly. four foot was torn from the wing, both wheel pants torn off, and other minor damage. The canard took a lot of punishment and came through with only gravel rash, not bad for a plane built unmodified spar.

For the next three years I lost track of the wreck. It went north someplace, I only hoped it went to a good home. I never stopped thinking of what happened to her. When I went to my friend Len Dyson's place, we both would spend a lot of time talking about our Dragonflies. (Len's first homebuilt was a Dragonfly and then sold it to start on a F.E.W. Mustang).

It all got to be too much! I had to find out what was going on with my baby. After a bit of hunting, I found a phone number. The phone call went something like this: - Hi! I built the Dragonfly you have, will you sell her back to me??

The truck just left. My long lost baby is now tucked away in the workshop she was born in. A year of work is front of me, and I haven't felt as good as this for years!! All I have to do is explain to my RV why I won't be working on here for the next year or two (also I'll have to explain this to my RV buddies).

If you wish I can give you a periodical update on what's going on "Down Under". I know how hard it is at times to dill in the lines at times. Maybe a builder profile with photo's?? What do you think? I be sending photo's with my renewal very soon.

David Howse
10 Galvin Road
Werribee
Victoria



Great Plains Aircraft Holiday Sale!!

THE CLASSIFIEDS

Sale Prices good thru January 9, 1998

1. Take 5% off any 1600 - 1915 Long Block Engine Kit and 5% off our 2180 Long Block Engine Kit.
2. Take 5% off Accessory Packages 1, 2, or 3 and 10% off Accessory Packages 4, 5, or 6.
3. 1835 to 2180cc Upgrade Kit. Retail for \$1,349.95. Sale priced at \$1,249.95 plus freight. Improve your Dragonflies rate of climb and shorten your takeoff distance, adds slightly to airspeed. Need an additional \$150.00 of machine work to cam, rods and case.
4. Engine Case Package. Includes new engine case, dowel pins, case kit, cam plug, gasket kit, rear seal, dipstick and lock nut kit. Holiday Sale for \$399.95 plus freight (a \$436. value). Case can be machined for additional fee.
5. Stock 69mm Forged Crankshaft with Standard Tapered Prop Hub. Crank is tapered and deep drilled. A retail value of \$309.90. Save at \$269.95 plus freight.
6. Take 15% off --- Stock or Stroker Connecting Rod Sets.
7. Great Plains Cam Combo, includes Camshaft for either 1835 or 2180, lifters, rocker arms and U-build pushrod set. Get your valves a rocking for only \$1 86.95 (a \$211.80 retail value).
8. Take 10% off any Piston and Cylinder Kits. Only the best brand for 92 are used Cima/Mahle. 85.5 are Cofab.
9. Great Plains OEM 040 Cylinders Heads machined for 92mm cylinders and drilled for dual ignition (10mm plugs). Get twice the fire for only \$489.95 (a \$549.95 value).
10. New Oil Cooler and Adapter Plate. A \$99.90 retail value. Keep cool for a Holiday price of \$87.95. Freight Included.
11. Force One Prop Hub Kit. Includes Force One Hub, Main Bearing and Seal Kit. Put the maximum prop hub on your stock or stroker crank for \$289.95 (a retail value of \$330.85), freight included.
12. 4316 Slick Mag and Harness Combo. If purchased separately they have a retail value of \$605.90. Purchase for \$498.95, receive the harness FREE.
13. Great Plains Hi-Torque Starter. Often imitated but never equaled. This starter has set the standard since 1991. Holiday Special at \$109.95.
14. Take 10% off Dragonfly Spinner Kits. Must include spinner, front plate and back plate.
15. Engine Mount. Makes it easy to assemble you engine. Bolts to a workbench and rotates a full 360 degrees. Retail is \$32.95. Holiday sale priced for only \$25.95.
16. Three Books and a Freebie Combo. Order any of the following "How to Rebuild a VW", "How to Hot Rod, a VW", "Auto Math", "Welding Handbook", Electrical Handbook" for the discounted price of \$41.95 and we will throw in our Type I Engine Assembly Manual for FREE.
17. Fuel System Kit, includes model 18/21 carb, electric fuel pump, and gascolator. Sale priced for \$275.00 (a retail value of \$312.85).
18. 12 volt Strobe light Trio Kit, includes 3 each of our world famous 12V adjustable rate strobe light kit. Kits retail for \$32.95 each. Buy three for \$83.95. freight included.

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For Sale: Health problem forces decommissioning my MK II. Will sell engine or entire FWF package. 110 hours Since major on 2180 VW by Gene Evans. Great Plains bottom end, Gene Evans custom top. Dual ignition, heavy-web flywheel/alternator, geared starter, hydraulic lifters, large oil cooler and filter, Ellison TBI. \$2500 firm. I prefer to demonstrate engines performance prior to removing from aircraft. Buyer will need to pick up at Camarillo, CA. Nate Rambo 805-482-3702.

For Sale: Prefab Dragonfly Kit - \$5,500.00. Fuselage assembled with tail fin, rudder, fire wall, motor mount angles, upper-lower seat back, intercostal-tail bulkheads, fuel tank & consoles installed. Pre-cut canard and wing cores, fiberglass cloth, some carbon fiber, engine cowling, Mark I wheel pants, some hardware. Wayne Ulvestad, Volga, SD work (605) 627-9291 home (605) 627-5365

FOR SALE: Mark II Dragonfly, HAPI 82hp, Ellison Carb, Dual electronic, Steel legs, Cleveland's, Full Panel, Vacuum system, Engine driven fuel pump + Standby, Aux. fuel tank, King GPS + Radio + Transponder, Narco Nav/Com, CHT/ELT, Reflexors, and

Continued on next page

"THE CLASSIFIEDS" Continued

much more. A real "10", Hangared East Coast, Foto cover newsletter 69, \$16,500, Phil Williams 2090 Joy Creek Lane, Henderson, Nevada 89012 (702) 269-5725

For Sale: Dragonfly Mark II, 128 TTSN, 20 STOH, 1835 HAPI engine, dual ignition, new carburetor, new tires, new brake and fuel lines, new automotive battery, micrometer throttle control, basic instruments plus portable nav/Com, no damage history, always Hangared. Rated a 9 in and out, \$12,500, (864) 458-1887 or (864) 942-0025 after 5:30 p.m. EST.

For Sale: Dragonfly Mark I, 68 HP Limbach engine with mechanical fuel pump, Sterba Prop, 4 gallon header tank, forward hinged canopy, Hurst/Airheart disk brakes, 5:00 X 6" tires, Whelan strobes, Escort Nav/Com, Loran, Elec. turn coordinator & R.O.C., True airspeed and chronometer. Will only sell to experienced DF pilot. Make reasonable offer and/or will consider for Ultralight, boat or travel trailer. Ron Price, Schaumburg, IL (847) 925-9251

N4422K is still for sale! This well constructed bird has been flown about 69 hours, and needs only fairly minor work to get back in the air. Asking \$8,900 but must sell soon, so all serious offers will be considered. For more information, you can call John at (415) 604 - 5384 or send e-mail to jbunnell@mail.arc.nasa.gov

For Sale: 1991 Dragonfly Mark II, N64TM, VW 2165, 471 HRS TTAF, 014 HRS STOH, 3 blade Warp drive prop, Terra Com, Mode C, '94 Best Overall Dragonfly. Bill Masons' original DF \$16,500 OBO (or best offer) (512)-749-4230

For Sale: VW Type IV engine parts: engine case and bolts, connecting rods (2.0 liter) and crankshaft (71 mm), rebuilt heads and hardware, flywheel, pushrods, oil pump, oil cooler, oil filter bracket, plus

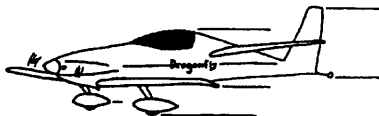
other parts. Call Steve at (308) 485-4764

Inboard Mark II "Hoop Style" Gear Plans - Full size hoop gear template drawings for making the mold and instructions on how to mount to the fuselage. \$14.00 (\$18.00 outside of U.S.) Mail your checks to: Bill Spornitz, 1112 East Layton Drive, Olathe, Kansas 66061-2936

Wanted: Your extra materials, looking for canopies, 5" carbon fiber (for spar caps), bi or uni cloth, blue foam, Instruments, etc. Spud (913) 764-5118

"New Release" 1997 "Field of Dreams" OTTAWA FLY-IN VIDEO: Over 51/2 hours of workshops, interviews, Fly-bys and the Awards Banquet. VHS. \$26.00 (FREE SHIPPING). DBFN INDEX: 84 pages, 8-1/2x11", spiral bound. Index of ALL DBFN newsletters to date, sorted by Subject, Author, Type and Issue #. Over 5000 entries. \$15.00 (FREE SHIPPING). Purchase both for \$40.00 and receive a Free DFLY Cap Checks: Stewart Instruments.; P.O. Box 11929; Prescott, AZ 86304 MC or VISA: (520) 778-6988

For Sale: HAPI 1835 cc W/new float bowl carb (60 HP @3200 RPM), complete with motor mount & 56X28 wood prop w/ flange. 67 hrs recorded on engine log. Make an offer to Ron in Virginia (804) 693 5186 or E-Mail phantom11@juno.com



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E-mail DBFNSPUD@AOL.COM

**Merry Christmas and
Happy New Year to
All!
"Kris & Spud"**

Just when you thought you had heard it all...

My pilot friend Doc Brown came up to me at my hangar today. He said "Nate, did you hear the latest about the FAA?" His face was unsmiling.

"No, what's up, Doc?"

"Well it seems that our friends the Feds got a tip of an improperly certificated pilot flying commercial sky-diver ops." Now about this time my mind is running away and thinking about the idiot that flew the 7 jumpers in the 210 about a week ago killing the whole bunch 'cause he was out of CG.

Doc continued his story, never smiling. It seems that acting on the tip an FAA rep went out to the local sky-diving center last weekend and proceeded to "card" a pilot loading up jumpers. All the airman could produce was a student permit. Well, the Fed knew that he had this guy dead-to-rights on a really flagrant violation. None-the-less he was most polite in informing the aviator that he was in violation of the FARs and appropriate action was forthcoming.

"Oh, excuse me, sir. You don't understand", said the student. "You see, I usually haul 6 jumpers. Okay? Well, the 6th guy out the door is always my instructor. I am signed off to solo the airplane. All I do is take the ship back and land it."

Respectfully submitted for everyones enjoyment, Nate Rambo - Camarillo, California

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Bill "Spud" Spornitz - Editor/Publisher

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