

Anyone who has propped a VW until it felt as though your arm was a hunk of lead will appreciate the primer system shown below. Bill Defreze reports he has installed it on his KR-2 and it now takes only one flip of the prop to start his engine.

The article was printed in the EAA Designee Newsletter.

Posa or Lake-type of injector carburetors, particularly when installed in an up draft induction system, need a primer system for cold weather operation. Injector carburetors do not atomize the fuel as conventional carburetors do. Rather they inject liquid fuel into the induction air stream to find its way, as best it can, to the cylinder intake ports. In warm weather, and/or with a hot engine, there is sufficient heat to readily vaporize the fuel. During cold weather, the fuel does not vaporize readily, consequently it takes a lot of cranking and fuel to get enough fuel to the cylinders to fire the engine. The excess fuel which doesn't make it to the cylinders, runs down the inside of the carburetor and onto the ground if an overboard opening is provided in the cowl. This presents a fire hazard. Worse yet, if the cowl doesn't have a hole below the carburetor throat, as many installations do not, the fuel collects inside the cowl to drain where ever it can find a way out. Think what would happen if the engine whould back-fire during the start in such a situation! In this issue, Harry Homebuilder presents a primer system for the VW engine. This will remove the fire hazard and greatly decrease the hand propping on a cold day.

BELOW IS THE BLOCK DIAGRAM OF THE PRIMER SYSTEM. FUEL IS ROUTED FROM THE GASCOLATOR TO THE PRIMER MOUNTED IN THE COCKPIT AND FROM THE PRIMER TO ELBOWS FITTED IN THE LH AND RH INDUCTION MANIFOLDS

FIREWALL
INTAKE MANIFOLDS
PRIMER
GASCOLATOR

SHOWN BELOW ARE THE DUAL AND SINGLE PORT INDUCTION MANIFOLDS THAT ARE USED WITH THE POSA CARBURETORS. HOLES ARE DRILLED AND TAPPED TO ALLOW INSTALLATION OF THE MS20822-2D ELBOWS

DUAL PORT MANIFOLD
SINGLE PORT MANIFOLD

THE MS20822-2D ELBOWS INSTALLED IN THE INDUCTION MANIFOLDS ARE MODIFIED AS SHOWN. THE PIPE THREAD END IS WELDED SHUT THEN DRILLED THRU THE CENTER WITH THE SMALLEST DRILL SIZE PRACTICAL, HERE A NUMBER 60 DRILL. (THE SMALLER THE DRILL SIZE, THE BETTER WILL BE THE ATOMIZATION OF THE INJECTED FUEL)

DRILL SMALL HOLE (No. 60)
HELI-ARC WELD PIPE THREAD END OF ELBOW SHUT
MS20822-2D ELBOW

ALL LINE CONNECTIONS ARE 1/8" COPPER LINE. A SHOCK COIL WILL BE REQUIRED JUST FORWARD OF THE FIREWALL. LINES SHOULD BE SECURED WITH CLAMPS AND BRACKETS AS REQUIRED. FIREWALL FEEDTHRU IS AN AN832-2D BULKHEAD UNION WITH AN 924-2D NUT

AN824 TEE IS USED TO SPLIT LH & RH MANIFOLDS
SHOCK COIL
CLAMPS & BRACKETS AS REQUIRED
FIREWALL

BELOW IS A SKETCH OF A TYPICAL VOLKSWAGON ENGINE INSTALLATION WITH A PRIMER INSTALLED

INTAKE MANIFOLD
ELBOW
PRIMER FUEL LINES
SHOCK COIL
PRIMER
FIREWALL
GASCOLATOR
POSA CARBURETOR

UNLIKE OUR FRIEND BELOW, YOU WILL FIND WINTER STARTING IS MUCH EASIER AND SAFER WITH A PRIMER SYSTEM AS WE HAVE DESCRIBED INSTALLED IN YOUR VW POWERED BIRD

99, PANT, WHEEEZE, 95, 96, GASP, 97, 98, 97, PUFF PUFF, CHOKE 100, 101, GASP

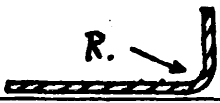
AA Com'on Airplane!

H476

** For whats what in turbo-charging, get this book...TURBO CHARGERS
 by Hugh MacInnes. Write or phone H.P. BOOKS, P.O. Box 5367 Tuscon, AZ
 85703 PH. 602-888-2150

There are always times when you need a special part to do a particular job. There probably isn't any extra material in the aluminum kit you ordered, so you have to make this part from scratch. Aluminum can be bent if a few simple rules are followed. Use this table as a guide.

NEVER!!! Bend any aircraft structural part on a sharp corner.
 Or.....bend a piece, straighten it out, then rebend. Throw it away!
 Or.....scratch a line across metal to be bent. Use felt tip markers.

		ALLOWABLE BEND RADIUS (minimum)					
		ALUMINUM ALLOYS			STEEL		
MATL. THICK.	FRACT. DEC.	5052-0 5052-H32 6061-0	2024-0 5052-H34 6061-T4	6061-T6	2024-T3	1010,1020 1025 Carbon	4130 Chromoly condition N
1/40	.025	1/32	1/32	1/32	1/8	1/16	1/16
1/32	.032	1/32	1/32	1/16	1/8	1/16	3/32
1/20	.050	1/16	1/16	3/32	3/16	3/32	1/8
1/16	.063	1/16	3/32	1/8	3/16	1/8	5/32
3/32	.093	3/32	5/32	3/16	3/8	3/16	1/4
1/8	.125	1/8	7/32	9/32	1/2	1/4	5/16

YEILD STRENGTHS (pounds per square inch) for aluminum alloys.
 5052-0...14,000 5052-H32...26,000 5052-H34...29,000
 6061-0... 8,000 6061-T6 ...40,000 2024-T3,T4.46,000

Source of article is NASA's drafting manual. Aluminum alloys, -0 (pronounced oh, not zero) means dead soft, -H32 is quarter hard, -H34 is half hard and -T3, -T4 & -T6 means heat treated to maximum strengths.

Ed Smith of Tampa, FL

Darrell Bosely (see ad section) is using douglas fir to construct his KR-2. Anticipating questions from the FAA inspectores, Darrell worked out the test weights for each size stringer and spar being used in his KR.

The test procedure and weights were formulated from information in the Dec. 61 Sport Aviation, pge. 15. Below is the numbers applicable to KR-1 and KR-2 construction. (With weights shown test piece should not break.)

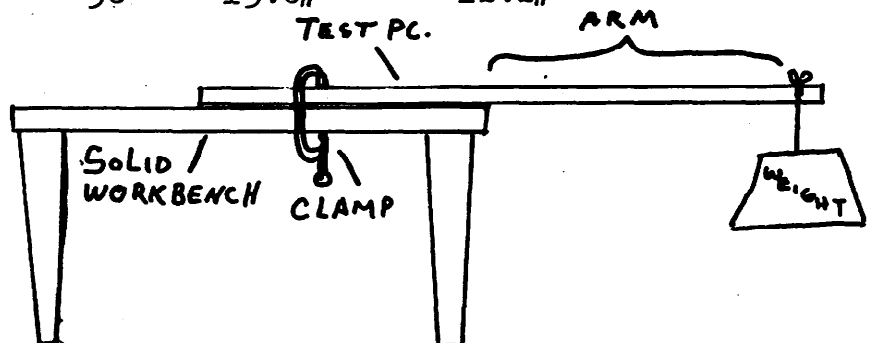
Fuselage pcs.	ARM	FIR	SITKA SPRUCE
5/8"x5/8" test pc.	12"	16.9#	13#
	24"	8.4#	6.5#
	36"	5.6#	4.4#

You can reduce the fir to 19/32 x 19/32 and test to Sitka spruce wts. (It will actually test some higher)

Hor. & stab ele. spars	ARM	FIR	SITKA SPRUCE
5/8" x 1 7/8"	24"	25.3#	19.7#
	36"	16.9#	13.1#

Vert. and rudder spars	ARM	FIR	SITKA SPRUCE
5/8" x 1 3/4"	12"	47.8#	36.8#
	24"	23.7#	18.4#
	36"	15.8#	12.2#

To test spruce or fir for strength (to eliminate defective pieces) use this set-up.

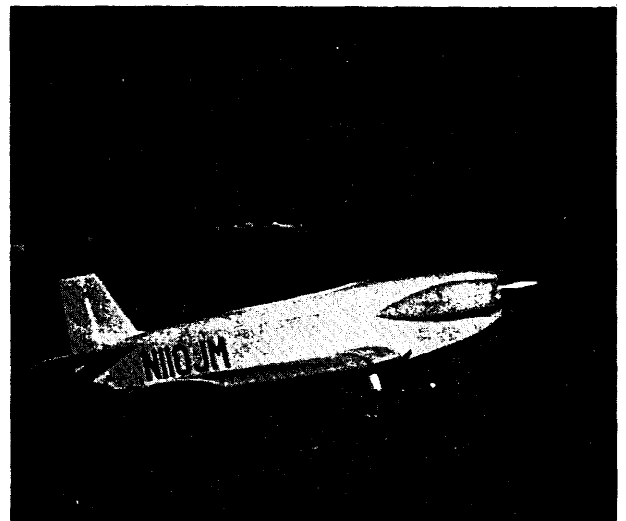


QUESTIONS & ANSWERS

- Q. Has anyone come up with a suitable engine driven fuel pump for the VW conversion?
- A. The conversions I've seen with an engine driven pump have used a stock VW unit.
- Q. What temperature should foam, dynel and epoxy be stored at? What temperature should they be used or worked at?
- A. 70°F. is optimum in all cases, especially for storage. Lengthy storage time is not recommended (over 1 yr.)
- Q. Where can I get a good book of instructions on use of foam, epoxy, resin & dynel fabric?
- A. The KR plans and past KR Newsletters are the most up to date instructions available.
- Q. I understand Revmaster is phasing out the 1700 & 1834 series engine. I've heard and read that 2100cc is pushing the VW engine to the limit and may not be safe, is this true?
- A. Revmaster is concentrating on the 2100 and 2500 VW. Current plans are to get FAA certification for these engines so I'm sure capabilities are being thoroughly investigated.
- Q. Does anyone make a KR-1 type bubble canopy for the KR-2?
- A. No, not specifically for the KR-2, but any bubble the right width can be tailored to fit by using the foam/dynel/epoxy method.
- Q. How many inspection plates are required and where are they located?
- A. Inspection plates aren't required but should be used. Any moving part should be accessible for service and inspection.
- Q. How come so much variation in cruise and top speeds in KR's using the same engine?
- A. Weight, frontal area and most importantly the propeller, contribute to variation in speed.
- Q. Where should the vent be installed on the KR-1 main fuel tank? I'm using a metal tank with an unvented cap.
- A. Vent the tank at the top, 2 to 3 inches aft of the fwd side.
- Q. Should the fin of the KR-1 be diverted to one side to offset torque? How about the engine?
- A. Rand says an offset fin is not required. Larger VWs might require a shim under one side of the engine mount but flight characteristics should be checked first.
- Q. What qualities does the wing tip design shown in the plans give to the flying characteristics of the aircraft? What might be an alternate design?
- A. The tip design was selected for being lowest in drag. Any other wing tip will be OK but Rand recommends the design described in the plans.

This is a picture of my KR-1, N110JM.
Started Feb. 74 and completed Dec 29, 76.
First flight was on the first day of Jan. 1977. Temp. was 23° and when I moved it outside, two cracks appeared in the wing root fillets & one in landing gear opening. It was built to plans except for minor mods. to MPR. mount & wings. Empty wt. is 415 lbs. & gross is 610 with 9 gal. fuel. Top speed is 160 mph cruise 145mph. Rate of climb is 1200 FPM. Engine is 1600cc with 52-40 prop. To date I have only 4 hrs on the KR but it flies perfect with no bad habits at all.

James McCanles
Butler, MO



TIPS FROM OTHER BUILDERS

The 3-piece center section rib drawing in the KR-2 plans is incorrect and should not be used. Bill Lee of Tavernier, Fl., has been sending out correct rib patterns for those builders that didn't know how to draw their own. Rand/Robinson has corrected drawings now, so send them a S.A.S.E. (business size) if you need the RAF 48 airfoil drawing. Address is Rand/Robinson Engineering 5842 'K' McFadden Ave. Huntington Beach, CA 92647.

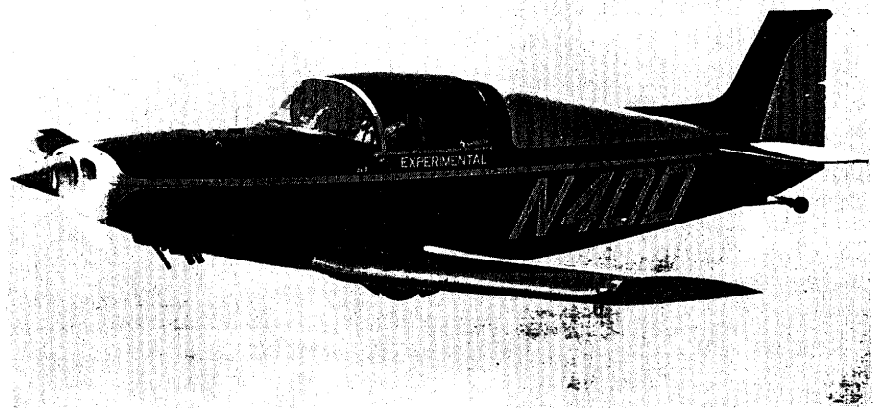
"You can get maximum contact at wood/plywood glue joints by sanding! Get some 3" x 24" sanding belts, glue them to a rigid piece of wood that is approx. 1' longer than the widest piece of work to be sanded. Lightly pencil mark all surfaces to be glued, then sand across until all pencil marks are gone. This will leave all areas level and will provide for 100% contact of wood/plywood. You will be surprised by how much pieces are out of level before sanding.".....Darrell Bosely.

"I'm experimenting with a new fire-wall material to go with R/R .005" stainless steel. "Ceramic Paper," looks like blotter paper but is made from ceramic fibers, 3 times better insulator than asbestos at about 1/3 the weight. Melting point is 3200° F.! It is available in 8 sq.ft. kits along with a 4 oz. jar of adhesive. Price is \$15.95 ppd. from Edmund Scientific Co. 155 Edscorp Bldg. Barrington, NJ 08007"....Larry Zepp.

"Since my plane has about 140 hours flying time and the weather has been rather cold for flying, I pulled my engine down for inspection. Everything was fine except a wrist pin retainer had broken. The broken retainer, bouncing up and down in the cavity at the side of the piston, caused erosion of the piston to the point that the oil ring siezed and was causing that cylinder to burn oil. In order to eliminate this possibility of retainer breakage, I'm installing wrist pin button type retainers, similar to those used in regular aircraft engines. These buttons can be purchased through Dynamite Products, 12943 South 122 East Ave., Broken Arrow, OK 74012.".....Dan Diehl.

COMING EVENTS...big news locally and in western states is the coming of the 3rd annual EAA Regional Fly-in Convention. The fly-in has outgrown Corona Municipal Airport where it was previously held. This year it is to be at Chino Valley Airport on April 29,30 and May 1st. Featured will be daily aerobatic shows, several free forums given by experts in the field of building, testing, flying and maintaining your own airplane. Several aviation interested Hollywood celebrities have been invited to attend. Campgrounds have been arranged for both on the airport and just a few miles down the road at the Prado Regional Park. For more info contact Guy Veasey, 23276 Buckland Ln. El Toro, CA 92630

**Porterville Fly-in is March 27



Dan Diehl's sharp looking KR-2!

The KR flight reports in the recent newsletters have received much favorable comment. The fellows still in the construction stage are learning what to expect from their own KR on the first flight.

The following isn't exactly a flight report but I'm sure everyone will get some useful info from it.

KR-1 ACCIDENT REPORT

James Manento RD #1

Pen Argyl, PA 18072

I finally finished my KR-1 after one year and 11 months of construction. I took it to a friends' private grass strip (2000') for ground testing before having the final FAA inspection. My experience with a tail dragger was nil, with this in mind you can see how I got myself in trouble.

SAT: Wings were put on, made about 10 taxi runs. On one I had a lift-off of about one or two feet for a distance of maybe 50'. Quit for the day.

SUN: Started out with about 8 or 10 runs reaching speeds of 50 to 60 mph. The engine started to overheat so I stopped for a while to let it cool. We pulled the cowling, checked the oil level and the spark plugs for mixture. The engine had cooled down enough so I started my taxi runs again. The first felt real good. I made three runs, breaking ground each time but backing off with plenty of time to stop on the runway. On the fourth run I must have felt I really had it. The first three runs went beautifully which really built up my confidence. Starting out with full power, I raised the tail and held it to about 50 mph keeping a little back pressure on the stick. I felt it start to lift but didn't realize I was off the ground. At this point I pulled the stick a little further which caused the plane to climb very quickly. I realized I had pushed it a little too far. Speed was around 60 to 70 mph. I chopped the power and the plane banked to the left. I corrected to the right but I must have released the back pressure on the stick because the nose dropped causing the plane to hit the ground on the right gear and snapping it off. At the time, I didn't know the gear was broken off, for the plane was firmly on the ground traveling in a slight right turn. It continued to turn until at the end of the slide it was going side ways. The last 20' of the slide was too much for the left gear and it snapped off doing about 99% of the damage.

The following is what I got out of this:

1. The KR-1 is very quick and fast.
2. The distance traveled from point of start to first contact with the ground was 500'. When power was cut plane was up to 10' to 15' A.B.G.
3. The left bank after power was cut must have been due to torque of engine 1500cc 87 mm cyl. 53 x 38 prop.
4. The right gear leg snapped on contact with the ground. The lightening holes cut in the legs might have helped the cause.
5. I used $\frac{1}{4}$ " shear nuts to bolt on the gear legs. The left gear collapsed after stripping the nuts from the bolts.
6. The small wheels performed very well on the grass.

I now have the new gear castings which seem more hefty than the older style. Repairs are going very well. With winter here now, I guess spring will be the next attempt. Only after getting some experience in a tail dragger will I make an attempt at it. All in all the short time I had with it, I was very much impressed.

I hope the next report will be better.

R/R UPDATE....Rand/Robinson is adding to their list of parts & supplies available again. They now carry, in stock, KR-2 fiberglass cowlings. Price is only \$95.00. Included is baffle & firewall templates.

The KR-1b was rolled into the sunlight. Not ready for that initial flight, just for some engine run ups. The long wings (27') were not attached, so the craft didn't look different from any other KR-1. If the flight characteristics prove acceptable, plans for the long wings & with spoiler/flap system will be available.

BUY-SELL-TRADE

I would like to buy an 1834D Revmaster, low time, with electrics. Starter not necessary. John Reid, 457 Milltown Blvd., St. Stephen, B.C. Canada

KR-2 fiberglass cowlings plus baffle and firewall templates...#125.00.
Tail wheels for KR-1 and KR-2, very durable...\$14.00 Dan Diehl, 4132 E. 72nd, Tulsa, OK 74136.

Spar drilling jig and long drill bit to loan, \$12.00 for two weeks. Return for refund except postage and #2.00 handling charge. Liquid 2-part foam (Newsletter #11,14, & 18) Dual stick & all metal toe-brake rudder pedals. Eight pages plans \$1.25 (Newsletter #). 5/8" fir or spruce for longerons. cross pieces, tail spars, rear wing spars or laminated (only) front spars. Save about 50%. Verne Lietz, Box 234, Peshastin, WA 98847. Ph. (509) 548-7504 eves.

For Sale...KR-1 Project - Basic fuselage completed. Wing spars, hor. stab. and elevator signed off. Steel tube retractable landing gear designed by Bob Ladd for Taylor Monoplane. Gear design featured in Sport Flying, Summer of 1976. Hydraulic brakes. Foam and dynel from Wicks...\$800.00. Philip Harris, Palmyra, IL 62674 Ph. 217-436-2253.

Full sized cardboard patterns for all fittings in control system. Will send anyone a set of them for \$5.00. (10 pcs. total including a pattern for the fin nose rib. Darrell Bosely, Rte. #4, Marietta, OH 45750.

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Ph. (714) 897-2677