

NETS CARTS SHRIFT

January 2004



Steve Crispin's Mk 2 Golf

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TULZ - Part Twelve

The Fridolin

and much more....



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during reasonable hours.**

2004 VW Nationals Easter - April: Saturday 10th & Easter Sunday 11th Sydney Australia

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Monthly Club meetings are held at Greyhound Social Club Ltd., 140 Rookwood Rd, Yagoona, on the third Thursday each month at 7:30 PM. All members and visitors are most welcome.
All mail should be addressed via the Secretary,
c/- 14 Willoughby Cct Grassmere NSW 2570
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VW Nationals 2004

Easter Saturday 10th April

Drag Racing at Western Sydney International Dragway 10 am — 4 pm

1/4 mile
Grudge Racing
Bracket Racing
Powder Puff
King of the Hill

Western Sydney International Dragway will be open for all makes and model cars, both street and racing.

Gene Berg Trophy for the fastest street registered VW will be awarded.

Racing from 10am. Bracket racing is a test of endurance and skill, not how powerful your car is.

Easter Sunday 11th April

Show Day at Fairfield City Showgrounds

9am-3pm Car Show assembly
9am-3pm Volkswap
9am-11am Car Show judging
2.30pm Engine Blow
3pm Trophy presentation
4pm Raffle draw

VW Nationals 2004 Show & Shine is at Fairfield City Showgrounds, Smithfield Road, Prairiewood.

Huge undercover area for Show & Shine and Dealer Displays with space for up to 200 show cars undercover. On site catering available with plenty of everything.



Roll up for NRMA Motorfest!

The National Roads and Motorists' Association Limited (NRMA) is delighted to once again sponsor the NRMA Motorfest as part of Australia Day Celebrations.

2004 will celebrate 19 years of NRMA Motorfest, the largest event of its type in the Southern Hemisphere.

When: Monday 26th January, 2004

Where: Macquarie and College Streets, Sydney City.

Come along and join with our club members in celebrating Australia Day. Our will situated at the northern end of Hyde Park, on St James Road.

Participation in this event is FREE.

Volksday 2004

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SUNDAY 15TH FEBRUARY 2004

BULLI RACING COMPLEX PRINCES HIGHWAY, BULLI NSW

\$1000 in prize money and trophies

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\$50 and trophy for runner up

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Show car entrant's set up from 8.00am

General admission from 9.00am

Show car judging cut off at 11.30am

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Presidents Report

I hope everyone is kicking back and relaxing over the Christmas and New Year break, that's if you were lucky enough to have time off. Santa brought me some great Chrissie presents which I can play with for some time to come? only hope there's not too much water on the next golf course I attend.

Our December meeting was well attended, with the main meeting being kept short in order for everyone to have some Christmas cheer and socialise. Our monster Xmas raffle was a festive one with all prizes being gift wrapped, to add a bit of Xmas mystery.

Our next event will be that Annual NRMA Australia Day 26th January display, in and around Macquarie Street in the city. Unfortunately if you did not get a entry card you can not take your car along, however you can come along and have a look. Our cars will be in the St James Square area, thanks to Ray Black for organizing all the VW clubs together in one place.

Précis of Committee and General meetings:-
55 members attended, VW Nats, Club phone line, Weekend away to Port Stephen's, Vintage Registration Renewals, Trophies for Nats.

Please note that all events listed in the Zeitschrift Calendar or on the Club web page are sanctioned by the club and its Committee.

KeeponKruzin



Club Calendar

2004

January:

Thursday 8th:- Committee Meeting & Magazine assembly night at the Greyhound Social Club, 140 Rookwood Rd., Yagoona

(right next to Potts Park). This is the permanent venue for all future meetings.

Thursday 15th:- CLUB VW MONTHLY MEETING at the Greyhound Social Club Ltd., 140 Rookwood Rd., Yagoona (right next to Potts Park). Get the latest VW news and views, plus VW socialising, drinks, films, trivia, and plenty of prizes. **Lots of fun, all welcome. 8:00 p.m.**

Monday 26th:- NRMA Motorfest.

February:

Thursday 5th:- Cut-off date for articles, letters, for sales etc to go in the next issue of Zeitschrift.

Thursday 12th:- Committee Meeting & Magazine assembly night at the Greyhound Social Club, 140 Rookwood Rd., Yagoona (right next to Potts Park). This is the permanent venue for all future meetings.

Sunday 15th:-Volksday 2004

Thursday 19th:- CLUB VW MONTHLY MEETING at the Greyhound Social Club Ltd., 140 Rookwood Rd., Yagoona (right next to Potts Park). Get the latest VW news and views, plus VW socialising, drinks, films, trivia, and plenty of prizes. **Lots of fun, all welcome. 8:00 p.m.**

March:

Thursday 4th:- Cut-off date for articles, letters, for sales etc to go in the next issue of Zeitschrift.

Thursday 11th:- Committee Meeting & Magazine assembly night at the Greyhound Social Club, 140 Rookwood Rd., Yagoona (right next to Potts Park). This is the permanent venue for all future meetings.

Thursday 18th:- CLUB VW MONTHLY MEETING at the Greyhound Social Club Ltd., 140 Rookwood Rd., Yagoona (right next to Potts Park). Get the latest VW news and views, plus VW socialising, drinks, films, trivia, and

plenty of prizes. **Lots of fun, all welcome. 8:00 p.m.**

April:

Thursday 1st:- Cut-off date for articles, letters, for sales etc to go in the next issue of Zeitschrift.

10th & 11th VW Nationals 2004.

Thursday 8th:- Committee Meeting at the Greyhound Social Club, 140 Rookwood Rd., Yagoona (right next to Potts Park). This is the permanent venue for all future meetings.

Thursday 15th:- CLUB VW MONTHLY MEETING at the Greyhound Social Club Ltd., 140 Rookwood Rd., Yagoona (right next to Potts Park). Get the latest VW news and views, plus VW socialising, drinks, films, trivia, and plenty of prizes. **Lots of fun, all welcome. 8:00**

For Sales

Classifieds are free to Club VeeDub Sydney members and \$10.00 for non club members, adds will appear for two months, longer if requested.

In addition to appearing in the club magazine all adds will be appear on our club website www.clubvw.org.au Photos can be included on the website but not in Zeitschrift.

PLEASE NOTE; All classifieds will first appear in our club magazine to give our club members a chance to see them, then they will be transferred to the club website on the 3rd Thursday of the month. Non members can post a cheque or money order for \$10.00 to: Club VeeDub Sydney Inc. c/- 14 Willoughby Cct Grassmere NSW 2570. Adds with photos can be emailed to the webmaster@clubvw.org.au

For Sale:- 1971 Superbug, White in colour, low mileage beetle on reconditioned engine, travelled 63,400 miles, Rust free example. New rear shocks, new tyres, registered until June 2004 and regularly serviced. My Son is

overseas and has issued instructions for the sale of this beetle, which is in very good condition. Asking \$6750.00 ONO contact John on 9970 6828

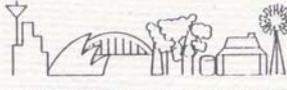
For Sale:- 1970 Porsche 914 LHD. Restored rolling body (no engine or gearbox) painted from the inside as per photos, brakes done, new carpets, new sports steering wheel, sports seat runners, new 914 muffler, new door trims. Needs seats, bumpers and roof panel. Situated in Riverwood. \$4000 the lot, call Tony 0418 407 620

For Sale:- approximately 30 other VW factory service manuals service bulletins body crash repair manuals etc also 1963 Transporter Workshop Manuals. Mostly 1967 up to 1970s including Beetle Super Bug Golf Scirocco and Audi 100. contact Roger Williams Phone 03 6334 6721 After hours or Email helro@bigpond.net.au

For Sale:- Air-conditioning unit to suit Bay window Kombi complete system, including excellent overhead consol, both new but complete and in very good condition asking \$750.00 ONO contact Mark Wrigley on 0439 846 237

For Sale:- After much debate in our home we have decide to sell our much loved and widely admired 1969 Turquoise blue beetle, This car is a multi award winning beetle with trophies awarded for the best modified beetle over the past 4 years. This vehicle has had complete body off restoration and was completed in 1999, powered by a Stan Pobjoy 1916cc engine, fully detailed engine and engine bay, powder coated HPC alloy coated and braided lines adorn this engine, 4 wheel disc brakes with braided lines, fully adjustable front end, polished Empi 8 spoke alloy wheels with triple spinners and Italian wood grain steering wheel, Empi quick shifter, tinted windows, west coast metric rubbers throughout. We have owned this vehicle since 1993 having enjoyed 20,00Kms travelling to and from VW shows and club events, we have been fortunate to have won trophies at Valla, Volksday, Shannons All German day, VW Shootout and the VW Nationals. We sadly offer this

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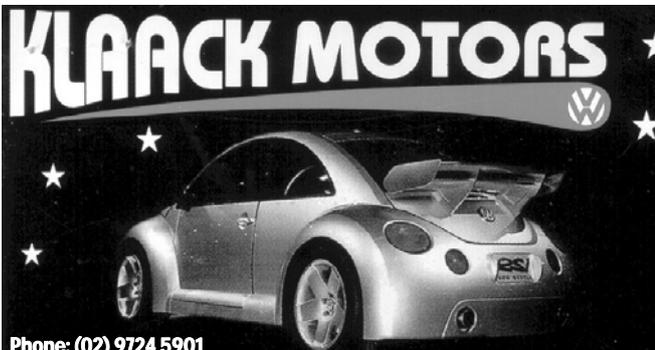
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wonderful beetle for sale, asking \$16,000 ONO. Please contact Mark Wrigley on 0439 846 237 any inspection invited to genuine purchasers

For Sale:- :1977 Passat GLS 2 door hatchback. Genuine reasons for selling. Second owner. I have owned this car for 12 years. In excellent condition. Serviced by C&S Autos. Recently resprayed. Frequently treated with fish oil to keep the rust at bay. Rego until September 2004. \$1250. A lot of car for not much money. Ring Graeme on 0408 756 034

Wanted:- Upholstery for 1970 1500 Beetle. Require original vinyl upholstery for the squab section (the bit you sit on) for front seat. Coloured bright red with basket weave top with smooth sides. Contact Gary on 9875 2554.

For Sale:- 228 mm clutch & pressure plate, suit 2.1 WBX Transporter, used for a short time only. \$100. Call Steve 02 9153 6782

For Sale:- VW Kombi 1979/80 Campervan, 2 litre, As new versatile factory fit out, including inside/outside stove unit, table, fridge and dual batteries. As new free standing annex, body carefully maintained, mechanically maintained by expert VW enthusiasts, log books, travelled 224,000 Km, New heads (unleaded) and rings. Immaculate condition- looks great and runs beautifully, rare vehicle, registered until Oct 04, Asking \$9900.00 Contact Paul on 43 96 5606

For Sale:- 1971 Super Beetle (ANR 28D) - Reconditioned 1600 twin-port engine, new carby, new brakes, all new rubber, POR-15 treated throughout, absolutely no rust, reconditioned petrol tank, BMW Sea Green, with brushed aluminium running boards, beaut interior, Stereo/cassette deck & Rego until 26.6.04- \$5500. Photos on the web at www.hermes.net.au/cjb/1302.html. Contact Annie or Chris in Medlow Bath on (02) 4788 1315 or 0421 836 370 or Email annie@hermes.net.au

For Sale:- 1972 Kombi Micro Bus, fitted with hand reconditioned Subaru (Boxer) engine EA81, Crankshaft reground, crankcase bored out to 2 Litre capacity, new parts include pistons fitted with chrome rings, main bearings

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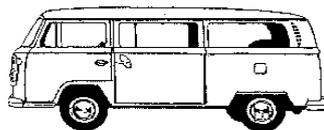
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New location, 19 Hobart Street
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Wanted

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The cost for 11 months is \$100,
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VW Nationals program.

Contact Steve on (02) 9153 6782

big and small ends, camshaft bearings, new camshaft, timing gears, oil pump, and associated gaskets etc, valves, seats to heads, carburettor kitted, running on unleaded fuel 25 mpg at 100 Kph, engine run in to 2500 Klms.

Holden VH cooling system, new radiator mounted within chassis rails with thermo fan temp control regulator switch, header and over flow tanks, hoses and clamps etc, runs at 85% under all conditions with airflow shroud in front of radiator to the rear of the front axle.

Running gear, new wheel bearings front and rear, steering, track rods and ball joints torsion rubbers through out. Brakes reconditioned, linings and pads replaced rotors and drums skimmed, master cylinder reconditioned with oil flush and change through out system.

Transmission reconditioned with new bearings to gearbox and differential, new yoke to selector rod and new C V joints with rubber boots all round. Clutch and pressure plate, spigot bearing and cable renewed.

Electrics, starter and alternator reconditioned, fuse box fitted with new fuses through out, new head light reflectors fitted with 100W globes, driving lights with 100W globes connected to high beam switch, all with relays fitted, new modern radio tape deck, temperature, voltage gauges, air horns included.

Wheels 14 inch polished aluminium mags fitted with Khumo 195 x 75 x 14 8 ply tubeless steel radials, 2 steel wheels with tyres as spares.

New paint, Turki green, Alabaster white Acrylic with tinge of pearl included, new rubbers fitted to all doors and windows, front cabin seats replaced with Holden Calais style, 3 speed heater water plumbed to cabin area for added comfort, full chrome bumpers fitted front and rear everything else original VW Kombi.

The vehicle as you see it with its modifications has been engineered, inspected and certified at the Regency Road, Government Garage. All reputable workshops suppliers and receipts to value approximately \$20000.00 are available for

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perusal to interested enquires no tyres kickers, a realistic and negotiable sale price if a purchase is in mind.

Asking price \$12,500.00 negotiable. Registered in South Australia till July 2003. Phone Max Burgess on 08-8263-2803 or mobile 0419-846-599.

For Sale:- Number plates, they say "DUBBIE", asking \$3990 ono for them. Call 0421910469

For Sale:- 1971 VW Beetle 1600 Superbug with around 150,000 miles on it. I have owned it for 13 years and its been serviced every 6months (if not more) since I have owned it and honestly - a little old lady owned it before me !

I need to sell it as I am starting a family and need a bigger car with air-con ! Please let me know if you can help as I want "Victor" to go to a loving home. Call Kylie on 02 9966 5996 or 0417 228 172

For Sale:- VW. Beetle 1970, Red two pack paint, New brakes, Shocks, Kill switch, Custom interior, Fibre glass body kit, Twin carbys, Lowered, Radio - cassette, Deep-dish Alloy rims 7" in on front P235/60 HR and 8" in on the rear P245/60 HR Bridgestone Rubber. Nice looking unit good condition. 0404 886 321

For Sale:- Alloy VW Generation Golf Wheels Continental 195 x 15 tyres NEW. Ph: 02 4736 4693 Best Reasonable Offer.

For Sale:- Genuine VW Generation Golf 2003 factory seat trim - New full set. 02 4736 4693 Best Reasonable Offer

For Sale:- 1973 VW Kombi, red postie van, original condition with tare weight markings and 1600 motor. New rear wheel cylinders, new clutch kit, machined flywheel and main seal. Recently unregistered easy reregister best offer. Please call Tony - 97573743 or mobile 0402560054.

For Sale:- 1976 VW Beetle 1600, white, second owner, new velour upholstery includes carpet throughout, reconditioned gearbox and motor.



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VW'S For Sale:-

72 Beetle roadworthy no rego goes well

73 Kombi panel van double sliding cargo doors complete

70 Kombi panel van no motor

70 Kombi- van cab damage cut off remainder ok.

65 Fastback straight motor runs ok.

71 Fastback motor runs rough.

74 Kombi panel van meat wagon fell over motor gearbox very good.

74 Kombi van 1600 motor blown some broken glass spares available.

74 Double-cab pickup seats have been changed middle panel cut motor out half built.

36 hp motor & gearbox in cut down floor-pan genuine parts in motor goes well.

65 Kombi split screen van some rust straight **40hp motor** blown.

1300 floor-pan gearbox, front-end damage.

72 Floor-pan gearbox axles wheels good for a trike etc.

40hp floor-pan only.

72 Beetle front body floor-pan damage nil motor good for cut & shut or trike low mileage.

40hp Beetle floor-pan front-end low mileage with a 63 body on top. Pan rusty spare as above. Please contact Allan Apps on 02-4822-3454 or email appsee2000@hotmail.com

For Sale:- 1970 Classic Type 3 Wagon, white in good condition, restored 4 years ago, very reliable, driven daily, with full service history, new tyres, and 6 months registration. Reluctant ant sale as recent addition to family requires a car with four doors. A few spots of rust and a cracked dash pad are the only flaws, a very much loved car looking for a good home. Asking \$1700.00 ONO. Please contact Anne on 0410 574 531

My Golf GTI and a GTI



overview Steve Crispin

As I travel around shows, it becomes increasingly obvious to me that cars of my era are a little maligned by other VW enthusiasts because:

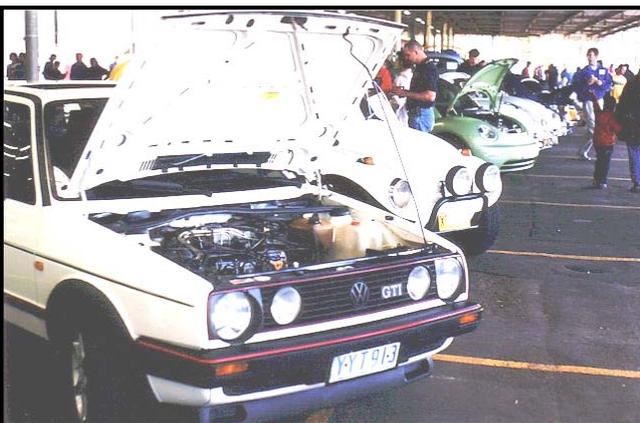
1. they are water-cooled
2. they were made at a time when no VWs came to Australia other than Kombis, and
3. they are too new to be considered classic.

The Golf had a remarkably different reception in Europe. In the 70's, the Golf single handedly revived VW as a financially solvent company, whose dogged reliance on the success of the 40 year old Beetle was causing sales woes in Wolfsburg. The Sport Golf was a concept which did not receive company support for until it was shown as a concept at the Frankfurt Motor Show. Until then it was a group of dedicated mechanics exploring the possibilities with their new platform. After huge interest at the show, VW decided to run with it and gave it the final designation. In 1976, the Golf GTI was released to rave reviews from international motoring press, and a legend was born. The GTI represented dazzling yet frugal



performance in an era when oil prices were skyrocketing and larger capacity engines were unviable and frowned upon. In its day, the GTI could stick it to a naturally aspirated 911 on the right roads, and humiliate bigger performance cars with larger capacity engine with blistering acceleration and nimble confident handling. It was the Mini Cooper S of its day, only faster. By the early 80's, the GTI was an automotive icon, with other manufacturers borrowing the formula, and the designation in an attempt to keep up. Meanwhile, VW was well into developing the Mk2 Golf.

The Mk2 Golf was a huge step forward in refinement, however its increased size and weight dulled down the performance in the GTI. The 8 valve model shared the same engine as the runout model Mk1 GTI, but put on an extra 100kg. By this time competitors were matching the Mk1s performance, in an effort to stay ahead of the game, VW introduced the 16 valve in 1986. This car remained the quickest GTI made by VW until they supercharged the 8V to make the G60 in 1989, and the recharged 147kw anniversary GTI of 2002. (not forgetting the supercharged AWD Rallye of 1988 and the



G60 Limited of 1990 with AWD and a supercharged 16V engine and 210bhp) Subsequent GTI's got heavier and bigger and despite getting increased power, did not get any quicker.

Australia never got any real GTI's because the Deutschmark was too high to import the performance model. The DM was so high that by the time VW pulled out of the Australian market in 1981, the Golf was only \$300 less than a Commodore. We didn't see any more Golfs until 1991, when a Mk2 GTI arrived which weighed more than the early Mk2s, and put out a paltry 90bhp sourced from the Japanese market.

So, what makes my Golf different? Reuters in London purchased mine in 1985 as a company



car. Factory options were a sliding sunroof and the VW commissioned Pirelli made alloys colloquially called P-slots because of the P shaped cut-outs around the edge of the wheel. The engine generated 112 bhp, with huge amounts of torque available from only 1700rpm. This, combined with a close ratio gearbox, ensured excellent performance for its day, and it's handling, with stiffer suspension and sway bar carried on the tradition from the Mk1. One advantage over the Mk1 was its brakes, which were discs all round Braking was the originals only flaw especially in RHD guise as the servo was operated by a lever and remained on the left side of the car.

I have recently had the opportunity to pitch my car, with 125,000 miles on the clock, against some standard and modified Mk4 GTI's on the

track and was surprised by the results. To 90km/h the cars were side by side until I changed to third. After this, the turbos pushed the heavier cars along a little better and I started dropping off. Handling comparisons saw my car more than match the newer models through corners much to the other driver's surprise. I am overjoyed to know that there are only a few naturally aspirated hot hatches which can boast better performance than my car, and nearly 20 years on it still receives curious looks from other motorists with visually more sporting pretension.

The other thing that makes it special is its originality. Other than the alloys (which are optional genuine BBS alloys commissioned by VW for the Mk2 GTI), stereo (which uses all factory apertures), and rear muffler (which isn't my fault!), the car is standard. I intend to keep it this condition on its way to becoming a classic in a few years time.

A short history of Puma sports cars



The genesis of Puma was the DKW-Malzoni, a front wheel drive sport prototype model with a DKW engine that first appeared in 1964. These cars were made in Matão, a small city in São Paulo state, by a farmer named Rino Malzoni. Rino was a great enthusiast of automobiles and automobile racing. The early DKW-Malzonis were made strictly for competition purposes.



1971 Puma Coupe used 1584 cc VW engine in the rear.

The DKW-Malzoni used a highly prepared two stroke, 1100 cc, three cylinder engine that made around 100 horsepower. With a light fibreglass body, the car was very fast and agile, and enjoyed great success racing against Willys Interlagos (a model based on the Renault powered Alpine A-108) and Carreteras (modified 1930's American five window coupes, equipped with Corvette or Ford



A DKW-Malzoni duals with two Willys Interlagos in a 1966 race.

Thunderbird engines).

Rino Malzoni recognized that the car had commercial possibilities. In order to produce more cars and bring them to market, Rino joined with three other auto enthusiasts (Luís Roberto da Costa, Milton Masteguín, and Mario César Camargo Filho) and founded the company "Sociedade de Automóveis Luminari." At this time, about 35 cars were being sold each year. In 1967, the company was renamed "Puma Veículos e Motores." Shortly thereafter, it was transformed into an open capital society named "Puma Indústria de



Although built for racing, this Malzoni is legal for street use.

Veículos S.A."

Production quickly increased almost four times. In 1967, the body of the DKW-Malzoni was slightly modified, and the car was renamed as the Puma DKW. The new car had a small rear seat, more glass area, and new wheels, bumpers, head lights, and rear lights. It was

also slightly longer. However, the biggest changes would come in the closing months of 1967. Vemag (the company that made DKWs in Brazil) was bought by Volkswagen, and all DKW cars and engines were discontinued. This meant that Puma needed a new heart if it was to continue. It was decided to use the Brazilian Karmann-Ghia platform, with a 1493 cc air cooled engine that made 52 hp. This wasn't a simple change. The Puma DKW was a front engine car, and the new model needed to receive a rear engine. The chassis of the first VW powered Puma was almost the same as the Karmann-Ghia, except that it was made a few inches shorter. The body was slightly smaller, glass area was again modified, and the front



Puma GTB used 4100 cc Chevrolet engine in the front.



The Puma "kit" sold in the U.S. required the owner to install front suspension, engine, transaxle, wheels, tires, and battery.



DKW heritage is evident in this front view of the Malzoni.

egg crate grille was removed. By 1970, an open roadster version, the GTE Spyder, had been placed into production. The Spyder had a fibreglass hardtop and a conventional convertible soft top. During the early 1970's, Puma cars began to be exported to North America, Europe, and South American countries. Although some cars were exported in "kit" form, Puma cars were only sold completely assembled in Brazil. At this time, the basic engine was the 1584 cc aircooled VW motor, but an optional 1800 cc engine was also

offered. About this time, the Puma GTB, was developed. It also had a fibreglass body, but was built on a special chassis, and was powered by an in-line six cylinder Brazilian Chevrolet engine displacing 4100 cc. The GTB was not exported to North America or Europe.

Before long, the VW based Pumas had to be changed again. The Karmann-Ghia was discontinued. The VW Brasilia platform was used as a replacement, keeping the same 1584 cc engine. By this time, an assembly line had



After the Karmann Ghia was discontinued, the VW Brasilia platform was used for rear engine Pumas.

been established in South Africa. VW based Pumas received body changes in 1977. Coupes added rear quarter windows, and an updated dash and interior were introduced. More extensive modifications were made in 1981. The front and rear of the car were

restyled, with relocated parking lights, and much larger tail lights. The new models were called GTC (convertible, replacing the GTS) and GTI (coupe, replacing the GTE). Both were offered with an extensive list of optional items, including special engines and transmissions, power windows, etc. The following year, the P-018 was launched, with an IRS rear axle, 1584 cc engine standard, and optional 1700 cc, 1800



DKW-Malzoni interior was finished to a high standard.



An early VW powered Puma Coupe on the track

cc, and 2000 cc engines.

The economic crisis of the 1980's was devastating to the Brazilian speciality car industry. Sales that in the late 1970's were about 150 per month began a steady decline. In 1985, the Puma brandmark was sold to "Araucária S.A.", a small company in Paraná state, that made few cars. Two years later, Araucária sold the production rights to a company named "Alfa Metais." Alfa Metais tried to maintain the Puma brandmark, creating two new air cooled models, AM-1 (coupe) and AM-2 (roadster), both for export. The company

also made a few Puma AM-3, with a rear water cooled VW straight four engine, only for Brazil. The final model appears to have been the AM-4, also water cooled. But the 1990's were coming, and the Brazilian market was opened to imported sports cars. This effectively sealed Puma's fate. Production of Puma cars



Kit Pumas are often designated by the year they are first titled. This "1994" GTC convertible may be the world's newest Puma.

ceased completely around 1992.

the number of Pumas that were exported from Brazil between 1969 and 1980. These figures are for complete cars only. They do not include cars brought into the U.S. in kit form.

1969 -- 20

1970 -- 15

1971 -- 3

1972 -- 59

1973 -- 401

1974 -- 13

1975 -- 11

1976 -- 28

1977 -- 174

1978 -- 44

1979 -- 110

1980 -- 157

Total complete cars exported 1969 through 1980 --1,035

Road tests at the time reported a 0—60 mph (96.6 kph) time of 9.9 seconds with a stock



This is reported to be the only Puma in Australia. Owner: Carl Bruce

1600.

TULZ - Part Twelve

CARBS

A carburettor is a fuel-metering device. It meters out a pound of fuel for every fifteen pounds of air, or thereabouts. The 'thereabouts' comes about because 'Air' is a generic term. Hot air is different from cold air and wet air is different from dry air and air that is full of dusty chicken feathers, pollen, smoke and stray bullets is different from nice, clean, bunny-soft oh-so-perfect air.

Metering the mixture of gasoline to air is not a trivial task. Fifteen pounds of air is a chunk about six feet on a side. A pound of gasoline is a chunk about three and a half INCHES on a side.

Buncha air. Itty-bitty gasoline. Super-easy to get the mixture off by a tad. I'll have more to say about that in a minute.

When air is squeezed through a venturi (lookup --- and no, it ain't in your spell-checker, you gotta crack a book :-)) it's velocity increases AND it's pressure drops. How much depends on where you are. If you're in Mexico City, almost half a mile higher than Denver, the nominal air pressure is different than if you're drag-racing in Long Beach, California, with an average elevation of six inches or so :-)) (Bogotá is even worse - over 10,000 feet above sea level. Brawley, California is better; it's more than a hundred feet BELOW sea level. Nice thick air in Brawley.) So what's your elevation? Or, more importantly, what's your air density? Wanna find out? Go ask the fuel in the float bowl. The float bowl is open to the atmosphere; whatever the air pressure (and therefore its density) happens to be, the Float Bowl Knows.

Know how a siphon works? (You'd better, if you wanna understand your carb.) Go flush your toilet. Or use your Okie Credit Card to siphon water out of a bucket. (No, you can't use it to siphon gasoline no more. Read the find print. Modern-day gasoline is toxic; you shouldn't even get it on your skin, let alone in your mouth.)

Suck air through your venturi, the drop in pressure will cause some gasoline to be siphoned out of the float bowl. How much? That depends on the magnitude of the pressure drop and the size of the opening - the 'jet' -- the gasoline flows through.

The 'jet' term is a big, big mistake. It got started because of a poor translation of the term 'siphon fountain' back in the early days of internal combustion engines, which just happened to coincide with the introduction of the siphon toilet. Both toilet and carburettor shared space in the technical journals of that era. When the French term for 'siphon fountain' appeared in English-language technical journals it was translated as 'jet.'

No jet. It's just a hole. Siphon action sucks gasoline through the hole to a level higher than the level of the fuel in the float bowl, premixes it with some air in the aerator tube then sprays it into the throat of the carburettor.

Doesn't really matter. Call it what you want. You've probably got the wrong size anyway. Why? Because of all those Instant Experts. "You prolly need to re-jet yer carb," they say pontifically when they haven't got a clue why your ride is running so bad. Re-jetting the carb sounds like the epitome hi-tek kewl so it's gotta be good, right? Ummm. mebbe.

But what works in Brawley will cause you to run rich in Bogotá. I'd rather go by the manual and all those cryptic Service Bulletins that lists the jets according to engine size, the type of carb AND THE ALTITUDE. For a given geographic region running a stock carb on a stock engine, the fuel metering system is virtually bullet-proof; nothing to adjust and, with regard to the jet & emulsion tube, nothing to go wrong, assuming both are clean. For that reason, after making sure the RIGHT jet is installed, I eliminate all other possible problems before even considering a change in jet size. And one of those possible problems is the fuel itself. Modern, clean-burning 'gasoline' has about 15% less energy per pound than the old fashioned stuff. In many cases the engine system is working fine, the problem is in the fuel itself, for which there is no easy fix.

The metering jet and the aerator tube work with the pressure drop across the venturi. ('across' meaning from end to end, inlet to outlet, rather than side to side. which wouldn't make much sense). across the venturi to determine how much fuel gets sucked down the throat of the carb and I'll tell you right off the bat, it's not a perfect system.

Your carb can only provide a stoichiometric mix across a very narrow range of airflow rates. Sorry Charlie, but there it is. (And if 'stoichiometric' has you scratching your head, lookitup. Like 'venturi,' you won't find 'stoichiometric' in the typical spell-checker, most of which are tailored for about a sixth-grade reading comprehension level. [And you thought computers were way kewl, right?] :-)

At lower rates of flow, such as when the engine is running at a slow speed, the mixture will tend to be too rich. At flow rates ABOVE the stoichiometric 'window,' you'll be too lean. People who design carburetors know all this stuff and have done everything they can to widen the window, such as causing the accelerator pump to act as an auxiliary jet at high air-flow rates and designing a separate, leaner burning circuit for low speeds. Unfortunately, with Volkswagens the Instant Experts trash all that by using the wrong distributor, altering the low-speed air-flow characteristics by riveting shut the bleed-hole in the throttle plate and then hogging out the jets to some ridiculous size that guarantees you'll be running rich virtually all the time. Which is probably what they want, since running rich means the engine wears out faster. Built-in job security.

Running 'on stoke' means a perfect ratio of fuel to air. It also means minimum emissions, maximum performance, highest mileage and lowest wear. With 'ideal' air and 'ideal' fuel the ideal stoichiometric ratio is something like 14.7:1

Here comes the Big Joke: Your engine will run on any mixture between a super-rich black-smoky 8:1 all the way up to a welding torch

blue-flame 20:1. The majority of engines I see in cars owned by kiddies are over-carbed and running way too rich. Now read that again. Note that I said 'run,' not 'run well.' In fact, due to a number of limitations imposed by the design of the Volkswagen engine, most of which have to do with its ability to cool itself, your best mixture is going to come in somewhere between 13.3 and 13.8:1. and here's the punch line for the Big Joke: What's YOUR air/fuel ratio? No, don't tell me; I don't wanna know. If you're getting between 28 and 32 miles per gallon in a VW sedan, running light at a steady 50 mph, you're doing okay. But if you're not.

MAKING IT MO' BETTA

By their nature, passenger cars require a variable-speed engine. (The alternative is a constant-speed engine with an infinitely-variable gearbox.) Most other internal-combustion engine applications, such as airplanes, water pumps, boats or racing cars use engines optimized for a narrow range of rpm and use a carb matched to that stoichiometric window. But if you want a car you can DRIVE, the carb must have a fairly wide stoichiometric range, a feature lacking on virtually all single-barrelled carbs.

So how do you widen the window? One method is to add more barrels to your carb, each optimized for a different rpm range. That's why all modern carmakers used dual-barrel progressives. The primary barrel provides an ideal mix up to a certain rate of flow. Above that, the secondary begins to open up, extending the stoichiometric window well beyond what can be achieved with a single-barrelled carb, no matter how many bells & whistles you hang on it. (Of course, that can't be right since the 'technical editor' of one of the VW-specific magazines couldn't get his Weber to work. with his centrifugal-advance distributor and after-market exhaust system. Gotta be the carb's fault, right? :-)

If you want perfect stoichiometry across your engine's entire rpm range you gotta toss the carb and go to some form of fuel injection,

something folks started doing in the late 1800's as soon as they understood the limitations of carburetors. It worked pretty well for Diesels but lightweight engines using gasoline presented some serious problems. By the mid-1930's they had come up with solutions but they were more expensive than a simple carburetor. Practical fuel injection systems for gasoline fuelled engines didn't arrive until we added a computerized combustion management system to the equation; the so-called 'EFI' (electronic fuel injection). This has improved both fuel efficiency and engine durability; one econo-box gets nearly 80 miles per gallon (!) and a quarter of a million miles of service from a fuel-injected engine is commonplace. This latter fact should give you some idea of what it costs to run rich all the time. (As a point of historical interest, Volkswagen was the first auto maker to introduce an electronic fuel injection system in a production vehicle. back in 1965.)

In Part Thirteen I'll tell you about a couple things you can do that will improve your mileage, make your engine last longer and allow you to grow long, silky blond hair all over your body. But for now, let's give your carb a bath.

CLEANING YOUR CARB

Go buy a gallon of carb cleaner. It's expensive but it's reusable. Read the warnings on the can. Carb cleaner contains methyl chloride. If you get it on you it will cause you to have two-headed babies, act strange and die young. In the meantime you'll smell bad and girls will avoid you. (Darwin was right.) Go down to Home Depot or whatever and buy a gallon of paint thinner. It should say 'Mineral Spirits' on the can. Cheap. Get yourself an empty three-pound coffee can. Got an air compressor? Okay, howzabout pumping your spare tire up to about sixty pounds and using one of those hose-adaptor thingees? No? Then swing past Office Depot or a computer store and get yourself a couple of cans of 'Dust-Off' or whatever.

You also need some cardboard. Or newspaper. Something to cover your table or desk. (Methyl

Chloride is the active ingredient in paint stripper. DON'T get it on your mom's table, okay?) Plus an egg carton, saucer, ashtray or whatever. It's to hold the screws & stuff so they don't get away from you. Paper towels. Can of WD-40. Some silicone lubricant. Good lighting.

The overhaul kit for your particular carb. This is the important part because THE INSTRUCTIONS ARE IN THE KIT!

From this point on it's a no-brainer. You take the carb apart, soak it in the carb cleaner for twenty-four hours OR MORE, rinse it in the coffee can half-filled with mineral spirits, inspect it for wear then put it back together using the new parts from the overhaul kit, which is just the float valve, the two diaphragms, a couple of springs and some gaskets.

But if it's so easy who do so many people have trouble with it? The most common error is failure to let it soak long enough. Some of the internal passageways are really tiny and if they're gunked up the carb cleaner can only attack the end of the gunk. That means it can take three or four days for the carb cleaner to dissolve all the gunk, after which you rinse and blow until you're sure ALL of the internal passageways are clear and the check-valves - those balls you'll hear rattling around - are in fact rattling around and not corroded, gunked or rusted shut. (Shake it; listen for the rattle.)

How do you tell if the passageways are clear? You squirt WD-40 through them. Squirt it in here, watch for it to come out there, pretty good evidence the passageway is clear. Be sure to squirt in the proper direction; you want to push the ball-type check-valves off their seat.

How do you know about the passageways? You read the manuals! And the instructions that come with the carb kit.

(Why does it get gunked up? Two main reasons: Not being driven enough and using modern gasoline. Modern gasoline contains lots of WATER along with other chemicals that are

very corrosive. Your carb is made from a zinc-aluminium alloy called Kirksite, often called 'pot metal.' As metals go, its pretty good stuff, almost as strong as mild steel. But what makes it really useful is its low melting point and near zero coefficient of expansion; it casts beautifully, machines easily and holds up rather well. It also corrodes like a bitch in the presence of water. Modern gasoline contains alcohol and other hygroscopic chemicals; it ABSORBS water. Leave it sit in your carb for any period of time and the volatile components will evaporate [remember, the float bowl is open to the atmosphere] leaving you with a nice layer of water and sediment to gunk up your carb.)

Another common problem is that having cleaned the carb, a lot of folks don't bother to inspect it. Carbs got moving parts; they DO wear out. If you detect any play in the throttle shaft it will have to be re-bushed, otherwise you'll be sucking too much air at low speeds, never get your idle right.

Carb cleaner totally destroys grease. (And paint. And old Levis, leather and most other stuff.) After soaking & rinsing your carb you gotta replace the lubricant on the moving parts. And WD-40 is NOT a lubricant (actually, it is a 'water dispersant' - that's what the 'WD' stands for). To lubricate the carb, use the silicone stuff. You let it wick into the throttle-shaft bore and the choke-plate bore and any place else that needs lubrication, such as the shaft from the vacuum diaphragm that opens the choke when you accelerate (or the vacuum piston if you got an old carb).

Probably the most common carb-related error is failure to replace the gasket between the carb and the manifold. Although the manual sez to replace it only if hardened or cracked, in fact it's pretty much a one-time-use gasket. Once the carb has been torqued down, the gasket's life is over. If you remove the carb, you gotta replace the gasket. Otherwise you'll get vacuum leaks. (Yeah, I know; nobody replaces it; they just tighten it down more. Why do you think the studs are always coming out?)

Or they use the WRONG gasket. See the notches? Some carbs tap-off manifold pressure at the gasket flange for use in the low-speed circuit or for relieving the choke. What's 'relieving the choke'? When the choke is on, it limits the amount of air that can be sucked down the throat. Once the engine starts it will create a very strong vacuum under the throttle-plate. The choke's vacuum diaphragm senses that negative pressure and OPENS the choke accordingly. ALL Solex carbs use manifold pressure for choke relief. Early carbs tap into the throat below the throttle plate but the later models tap-off the vacuum at the mounting flange. Use the wrong gasket, the carb doesn't work properly. This is one of those funny ones because even when you SHOW them the difference in the gaskets there's a lot of people who insist that such a little notch couldn't be very important. and go ahead and use the wrong gasket. (It's kinda like an IQ test :-)

WHAT IT'S ALL ABOUT

Your Volkswagen doesn't run on gasoline. It runs on nitrogen. Hot nitrogen. You only use the gasoline to get the nitrogen hot. (This is all Bobby Boyle's fault so blame him, not me.)

Your engine sucks. Air, mostly, if you got a good air cleaner. The carburettor adds a little gas to the air. Not much, just a tad. For every fifteen pounds of air or thereabouts that gets sucked in, the carb adds a pound of fuel.

Stoichiometric balance. That's when you add EXACTLY the right amount of gasoline so that when it's ignited there's nothing left over. Perfect combustion. Maximum power.

Most folks don't understand these things. When you don't understand the fundamentals you become a Victim-in-Waiting; you are a 'mark,' someone easily conned.

Take air cleaners, for example. Your engine needs clean air. If each cubic foot of air carried just one particle of dust it's enough to wear out your rings & valves in about 20,000 miles. But a cubic foot of air usually carries THOUSANDS of particles of dust. So you

gotta use an air filter. An EFFECTIVE air filter. The oil bath type is one of the most effective air filters ever designed.

What's the worst? Those gauze & window-screen jobbies they sell to all the kiddies. Followed by those nifty foam thingees. The poor air filters provided with the typical after-market carb kit is the main reason you don't see everyone running dual carbs or centre-mounted progressives. They guarantee the engine gets dirty air and that causes it to wear out long before it should.

A modern car is a transportation appliance. Just jump in and go, no thinking required. Computers do all your thinking for you, right down to turning on a little sign that sez 'Engine Service Required.' But an antique Volkswagen is not a modern car. And YOU are the Mechanic in Charge. You need to know some science and engineering and math and words of more than one syllable (like 'stoichiometric'). Knowing this stuff gives you a big advantage when you're trying to keep your antique running right.

Bob Hoover

Golf V - Preview and First Impressions

Our first hands-on look at the Golf V



By: Jamie Vondruska

It doesn't seem that long ago that Volkswagen introduced the fourth generation Golf, but the reality is six years have passed us by since it was first shown in Frankfurt of 1998. Back then it was lauded for its fit and finish, detailing, materials and standard features - it brought luxury features down into the compact class



and forever changed the expectations of consumers as a result.

Now Volkswagen has launched the fifth generation A-platform (A5) Golf. Like the Golf IV before it, the new Golf V has moved forward - or laterally anyway - with the progression of the now familiar Golf shape. As happened when the Golf IV was first introduced, initial opinions are split on the overall look of the new Golf V. Change never comes easy to VW enthusiasts and while some really like the new design, others aren't so enthusiastic about it. We should point out that most enthusiasts here in North America have not seen the new Golf V in person yet, relying instead on photos which don't always convey what the car really looks like in the metal - so the final verdict for most on this side of the pond will have to wait.

We recently had a chance to drive a German-market Golf V four-door in Highline (think GLS/GLX) trim level equipped with a 1.9l 100hp PD-TDI with Volkswagen's new DSG transmission. Simply opening a door gives the immediate impression that this new Golf is yet another level above the outgoing model. It feels considerably bigger on the inside with plenty of room for my six-foot frame to fit in the rear seats with another six-footer in front - in fact my knees don't even touch the front seats. Overall the interior has an even more upscale feel than the outgoing Golf IV with loads of detailing. Materials inside are a mix of good and better with a few things feeling a little cheaper than the Golf IV. The leathers on the seats are a huge improvement with a beautiful nap and softness, but the rings around the HVAC controls are loose and a little "cheap"



feeling for instance. The new HVAC controls are easy to adjust though and work perfectly, with dual-zone Climatronic giving the driver and passenger their own separate temperature controls. In the end the new Golf V imparts a strong sense of fine detailing and is still ahead of its competitors in the "dash-stroking" game and should make any current VW owner more than happy with their surroundings.

As far as we're concerned, Volkswagen can skimp a little on the interior though for the chassis is an unbelievable improvement. As soon as you pull away and drive down the street you notice a huge difference. First the Golf V is unbelievably tight and rigid. The car is eerily quiet on the Autobahn with virtually no wind noise, plus the structure is amazingly stiff and solid - Volkswagen claims chassis rigidity is up 80% over the outgoing model, which was no slouch to start with. The car feels "German" again - little to no dive and squat and roll is very controlled, especially compared to the Golf IV. The ride is firm, but not harsh and is very compliant over bumps and dips. The first off ramp we attacked would have had any current Golf IV owner diving for something to grab on to, yet the Golf V had us smiling as it simply turned-in with no fuss, very little roll and with nice feedback through the steering wheel - no theatrics and very controlled. The new revised front strut and all-new four-link fully independent rear suspension are to be credited for the newfound athleticism. If a "standard" Golf such as the one we drove goes this well, we'll be VERY curious to see how the GTI model handles.

The DSG (direct shift gearbox) is simply revolutionary and we like it more and more

every time we drive it. In the TDI it works especially well optimizing performance and economy. The latest programming is impressive, giving the car some forward creep when you let off the brakes, almost as if it has a torque converter. Shifts are blazingly fast and downshifts make you sound like Michael Schumacher - this is the new yardstick for how all of these auto/manual slush boxes should be. The 100hp 1.9l PD TDI engine, particularly when equipped with the DSG transmission is an impressive performer with seamless and abundant torque - this is a fun car to drive.

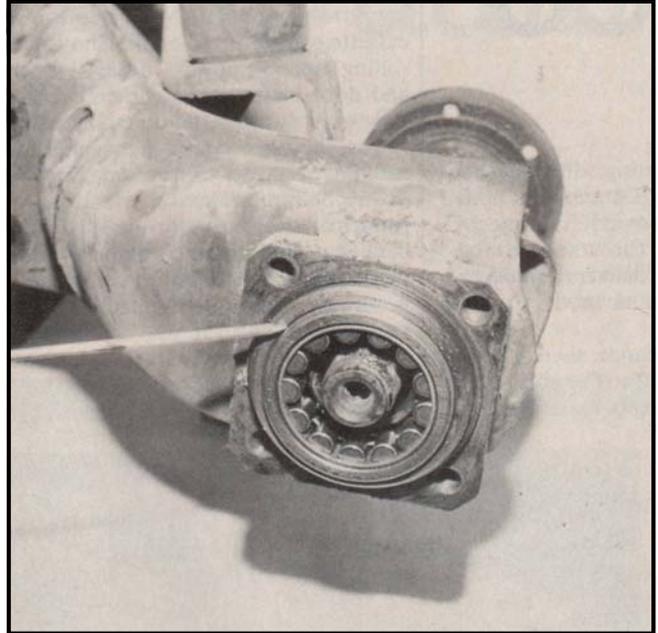
Talking to Volkswagen executives and engineers reveals a bit of nervousness around Wolfsburg these days - rumour has it Dr. Pischetsrieder will put someone's head on a platter if the quality of this new Golf V isn't damned near perfect. From top to bottom all new quality assurance programs have been put in place that now include suppliers brought directly into the development process, a board member now in charge of Quality Control, a whole slew of new people hired both in Germany and here in America who's sole responsibility is to track and fix problems immediately. Even the new diagnostic tools now in dealers as part of the Phaeton and Touareg launch tie back to a central database that can now track problems on a world-wide level very quickly. Overall good signs that VW is serious about improving their recent woes.

Here in North America, we'll see the new Jetta V and Golf V GTI introduced first at the beginning of 2005 with the 4-door Golf following in late 2005. The base engine in our cars will be an all-new 150hp 2.5l inline-5 cylinder. The up rated engine that will be



standard in the GTI and GLI and other upper trim levels will be a 200hp 16v 2.0l 4-cylinder turbo. Six-speed manual and six-speed Tiptronic will be available in the Golf and Jetta. DSG will be offered as a second choice to the six-speed manual in the GTI and GLI models.

Overall we like the Golf V. The car looks far better in person and has an upscale look to it that just can't seem to be captured well in photos. It also has a tendency to make the Golf IV look a bit dated, especially when you see them on the street together. We'll have to hold off on complete impressions till we have an opportunity to drive the U.S.-spec version in another year, but what we've seen so far is very good.

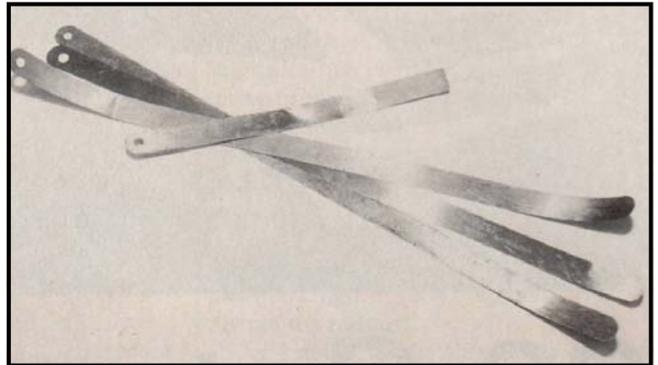


How to take play out of IRS rear wheel bearings

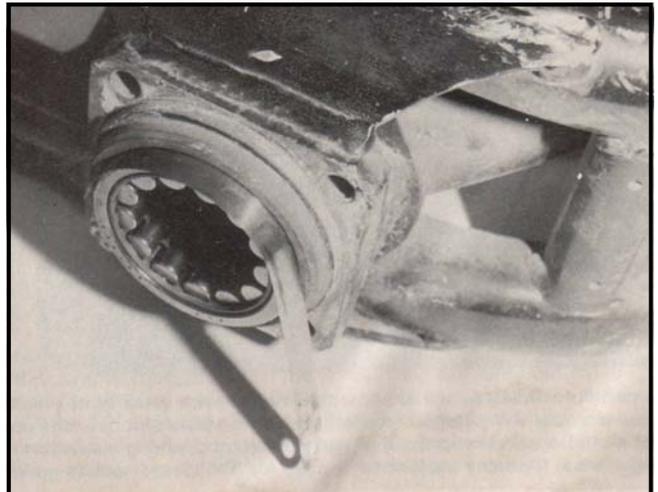
Owners of IRS (4 joint) rear end equipped VWs take note. If you've recently changed your rear wheel bearings and still noticed rear wheel play when the car's jacked up, here's a very simple fix.

The rigors of time will eventually pound out the outside wheel bearing housings so the bearing and race no longer fit snugly. This slop in the outside roller bearing puts a lot of stress on the inner ball bearing, drastically shortening its life. To tighten up the outside bearing, put feeler gauge between the race and the housing. Feeler gauge strips are available at any good auto parts store and are available in thicknesses from .001 to .030-inch. Use your feeler gauge to determine the correct thickness, then cut a strip of feeler stalk long enough to go around the race. Check out these photos, a picture is certainly worth a thousand words, especially the way I describe it.

Above right, is a stock VW trailing arm, the same as you might have in your Bug or Type 3. The rigors of high mileage can pound out the outside bearing housings. Installing new wheel bearings won't cure this, only replacing the trailing arm entirely, or using feeler gauge to shim the race.



Above, most good auto part stores stock feeler gauge strip from .001 to .030-inch.



Above, feeler gauge strip is cut to fit around the bearing assembly, race and all. The appropriate thickness will snug up the bearing assembly in the oversized bearing housing, with this fix you need not buy new trailing arms.

The Fridolin

By Chris Morley

No, it's not a backyard custom ... VW actually sold these!



Is this: (A) A mutation from a mad scientist that worked for I Volkswagen, (B) The results of a computer mix-up, (C) The remains of a collision between a Squareback and a bus, or (D) None of the above?

Well, if you picked "D," you were right. This unusual car is called a Fridolin and has a designation number of Type 147. It was built for the Bundespost (German Post Office) from

1964 through '73. It performed so well for them, that later the Swiss Postal Service bought some, too. In fact, over 700 of these were built.

In the early '60s, the Bundespost asked VW to design a car for them. They needed a small van that had easy entry and exit, and was also able to carry small packages and mail bags. The VW Buses were felt-to be too big for urban use and were also thought not suitable for mail delivery to mail boxes on postal routes. VW designed the Fridolin on the wider Karmann Ghia chassis and used the economical 1200cc, 40-horsepower engine through the entire production. The interior was, as you can imagine, sparse. Simple pull switches, black three spoke steering wheel, and speedometer were all the driver saw as he sat on the single seat. A fold-up passenger seat was optional, but rarely seen, as this space was needed for mail.

The body design was simple. A VW family resemblance can be seen with the Type 3 styled front and the Transporter style rear. Under the front hood was the fuel tank, spare tire, and on most models, an Eberspacher gas heater. But the most interesting feature was the sliding doors. These allowed easy loading and unloading and could also be locked in the open position for mail delivery.

This particular Fridolin is owned by Michael Cryns, of Nuth, Holland.



Above, these Fridolins are strange creatures, huh? They use parts from just about every VW ever made, and then some for Fridolins only. For example, rear bumper is a bus bumper that's cut and narrowed, but the front is "Frid" only. The taillights are bus, but



the rear hatch is Fridolin only. Imagine buying one of these stripped and then have to locate stuff like that!

Inside they were very sparse with the only gauge being the speedometer. Even the steering wheel is off a standard Beetle. These things don't even have a padded dash to worry about cracking.

All of the German Post Office "Frids" came in yellow, but this Frid's owner, Michael Cryns of Nuth, Holland, decided to go with this VW grey. Probably the thing that people like and notice first about these vehicles is the fact that they have dual sliding doors. I guess they wanted those mailmen to be able to hustle in and out of these cars.

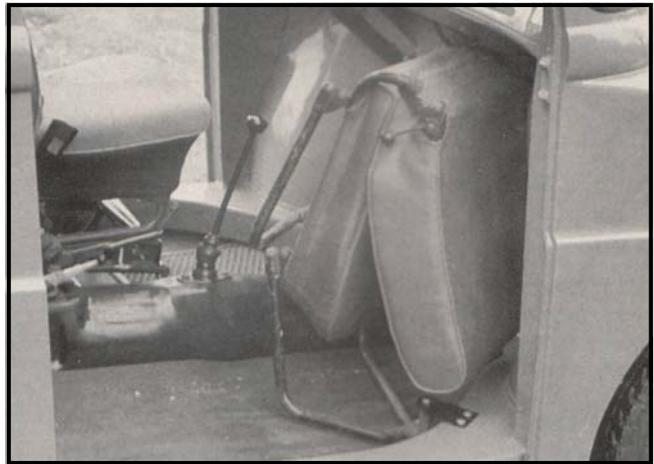
VW put a 1200cc, 40-horsepower motor in them from the start, and that never changed in the 11 years that they were in production. The engine compartment resembles a bus, but there is no removable apron for easy engine extraction. Under the hood, things were fairly tight, unlike its cousins the Type 3s. This particular one has a gas heater installed, but I'm not sure if all of them did. The hood hold-up latch looks to be from an early Beetle.

Michael bought it at a post office auction in Köln, Germany. It's a 1971 model and when he got it, it had seen more than its share of abuse. Michael stripped it down and started to rebuild it. But here's where he ran into some problems. Since only a small number of these creatures were built, spare parts are very hard to come by. But with much help from the German Fridolin Club, Michael was able to get the needed parts. Once all parts were located, Michael began the time-consuming task of restoring the body. Since the German letter carriers also believe in the motto: "Neither snow nor sleet..." this Fridolin had seen its share of bad weather and had the rust to prove it. Michael had to hand make some of the

sheet metal parts himself, since some rust repair panels were never made. Once the bodywork was finished, Michael painted it Bundespost Grau (grey). Originally, they were painted a mustard yellow, but Michael preferred this colour.

One last note, at the time of manufacture, all of VW's plants were running at full capacity (those were the days, huh guys"), so VW contracted with Westfalia to produce the Fridolin right alongside the VW Camper conversions. And as a twist of fate, the reason Fridolins are rarely seen now in Europe is because in the early 80s, Fridolins were cheap transportation for college students. And you know what they did with 'em? You guessed it outfitted them as mini camper,

It's too bad we don't have a few of these running around here. They would be great swap meet parts haulers . . . except the front blinkers would have to go; they look like Triumph refugee parts! In the back, this is what you get . . . nothing. That's so more mail could be hauled around. And the neat thing about mail is, it



doesn't care if it's comfortable or not.

Here you get a great view of how this accessory seat works. First, it folds up out of the way, then it swivels on that pin on the floor and pushes even further out of the way. This is definitely an 8.5 on the cool factor scale. Congratulations to our friend from Holland, Michael Nuth, for doing such a good job restoring this Frid, and thanks for letting us check it out!

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