

OT so long ago, men drove cars instead of cars driving men.

Those were the days when your car didn't do your thinking for you, by deciding when to shift, how much to steer, how hard to hit those brakes—in short, by taking over your driving functions.

A car then was a clean, simple collection of basic engineering and mechanical equivalents —functional to the core—and you were in control of it at all times. You had to be.

This bantam Volkswagen reminds us of those days. It's a carnot a mobile lounge studded with pushbutton controls. Its beauty lies, not in its lines, but in its performance. That

40 miles-per-gallon it delivers will give your transportation dollars a handsome stretch, and it has the reputation for going 75,000 miles before a major overhoul. The construction quality we saw would make this a good bet (and a good contrast to many domestic models addicted to a relatively high percentage of "lemons"

in every production run).

Volkswagen's ministure size and responsive
maneuverability make parking and around-town
traffic handling as easy as it can be these
crowded days. It also has a pothole-eating indi-

vidual wheel suspension that calms down even the cobbliest roads.

Nor will anyone accuse you of blocking traffic because it takes you 114 seconds to get from

Nor will anyone accuse you of blocking traffic because it takes you 1.14 seconds to get from standstill to up to 40 mph. In fact, if you haven't forgotten the fine art of shifting gears, you may surprise some owners of domestic

Volkswagen makes a braking stop—but where's the dip? Tests showed nose dive was only 2°, less than domestic cars tested so for. Hydroulic brakes on this DeLuxe imported model were excellent, showed negligible fade.

# How the Surprising VOLKSWAGEN Performs



dash space is generous because of rear engine mounting.

speedsters, who are lulled into complacency by your pint-size appearance. But be ready to dedge! We whomped by one luxury wagon at 15 mph (there was a tallwind), and learned some large car owners resent a small car passing them so much, that they will even try to edge it on to the shoulder. This question of size is, of course, the first one

raised by anyone looking at a Volkwagen.

Actually, there's a surprising amount of room
inside the Volkwagen. Locating the engine in
the rear produces lots of under-the-dish legroom for the average driver or passenger, and
two satills will fit into the reas est condictably
with the front seats pushed forward. When the
offer a 6 ft or taller driver, however, rear seat
knee-room behind the driver is virtually nonexistent. Sut there is generous buggage space.

behind the rear seat and some briefcase room under the hood. This means that the family of four can travel in this car—if the youngsters are kindergarten-size or very little larger. Head and hat room are more than ample.

are more than ample.

What can you do on gas
mileage? The test results
ahow that the little Volksalow that the little Volksdouble the fuel mileage of
most American cars. But don't
be carried away by the 495mpg economy figure at 20
mph. This figure is for 4th
gear (an overdrive gear), and
20 mph in the Volkswagen 4th
is not the smoothest ride.

Most people would choose to stay in 3rd gear at this speed, and settle for 42 mpg. Even at 60 mph, however, the mileage is

a nice fat 30 mpg. The secret of obtaining good acceleration from the Volkswagen is to "make mit der revolutions." We did, and you may therefore wonder how come a slow 0-60 true mph time of 45 seconds? Well, in order to bring you test (and not guesstimated) results, we have to pack test equipment and two engineers on every test run. That 425 lb. total carried weight is a heavy penalty for a little car, and it would be still higher if we didn't travel light on gas, and with spare tire and rear seat removed to lower the carried weight. (Maybe we should use little engineers for little cars and big engineers for big cars?) If you want a more realistic acceleration figure with driver alone and no heavy equipment, figure 37.2 seconds for 0-60 mph true. Can you improve the Volkswagen acceleration? By replacing the Volkswagen engine with a Porsche engine, we were able to come up with



Volkswagen 4-cylinder air-cooled 1192 oc engine: (A) oll-bath air cleaner.
(B) carbureter, (C) distributor, (D) fuel pump, (E) generator, (F) fan housing.



Space behind gas tank in front will take a briefcase or small overnight bag.

### Driver's Observations—Volkswagen

ROADABLITY: Super any on the control of the control

RIDING AND DRIVING COMFORT: Sauhs down humps with an ease that should be the envy of American model designers. Engine quite noisy or shifting speeds but body is exceptionally silent, tight, solid, and finished with German precision and care. Takes some maneuvering of the sects to fill car full of long-learned wissen neighbile, through forothered for prompting the present of the present of amount noods. We wissel now the mount noods will not the present of white when quantities and of the previewed and the present of the preton of of the p INSTRUMENTS AND CONTROLS. You could help but reach the control and control help but reach the control could have made and the second help but reach the control and the second help but reaches a second help but reaches will select the second help but reaches will be reached the second help but reaches will be reached the second help but reached help but reache

MISCELLANEOUS: Car finish, trim and weather-proofing top rate. Engine readily accessible for servicing, as is battery under rear seat of car.

|           | Science at the Wheel Volks  | wagen Deluxe Sedan  |
|-----------|---|---|
|           | MODEL: Volkswagen, 4 cyl. Deluxe (2-door) Sedan.<br>TEST DATES: 3-19-55 through 3-28-55.<br>GENERAL ROAD CONDITIONS: Portland concrete, dry<br>and generally level.   | TOP SPEED AND SPEEDOMETER-ODOMETER CORRECTIONS: Odometer distance 10.00 miles; true distance 9.67 miles; documenter error at 32 mph 0.13 (pius) miles, Multiplication factor and % of error 0.987 and + 1.3%; (Odat for 4th quar)   |
|           | MILEAGE AT START OF TESTS: 4111; MILES COV-<br>ERED: 475.<br>GAS USED: Reguler: OIL: SAE 20.  | NPW   True & Error Engine   MPH   True & Error Engine   SpeedConstant Speed SpeedConstant |
|           | CURB WEIGHT (with 10 gal gas): 1610 lb 42% on<br>front; 58% on roar whoels.<br>TIRE PRESSURE: 16 pai front; 23 pai rear.  | LATERAL SWAY TEST OF CORNERING ABILITY: At 40 mph on 235-ft radius circle, side tilt angle recorded was 3°.   |
| 100       | SPARK SETTING: 3° bTC at idle rpm.  REAR AXLE GEAR RATIO: 4.4:1 (overall ratio 3.6:1 in 4th gear).  | BRAKE FADE TESTS (Repeated applications of brake<br>from 50 mph to 30 mph at deceleration rate of 7.2<br>ft/sec?): As indicated below, pedal effort did not<br>double in 12 test stops.   |
| 8         | TEST DATA   | 2 [ ] ] ]   |
|           | GASOLINE MILEAGE (checked with fuel volume flow<br>meter and 5th wheel. Temperature 40° F; relative<br>humidity 50%; barometer 20.2 in. Hg).  | 97) 550   |
| 100000    | LEVEL ROAD FUEL CONSUMPTION (carried weight 710 lbs. Average of two or more runs made in opposite directions over same road in 4th goar unless other-   | 30 2 3 4 5 6 7 8 9 10 11 12   |
|           | Wise noted):         Committer         Ton Miles           Free Scood (the Whole) per Califor (the Whole) p   | NUMBER OF STOPS   |
| 8         |   | LONGITUDINAL DIP ON BRAKING: At a deceleration rate of 21 ft/sec*, body nose diving angle was 2*.   |
| 1         | 50 83 81 82 82 82 82 82 82 82 82 82 82 82 82 82   | PARKING BRAKE TEST: When brake was applied hard<br>and suddenly from 20 mph true speed, our braking<br>distance was 40 ft. Left wheel locked; right wheel   |
|           | Simulated traffic pattern of city driving—stops, accel-<br>eration, braking:  True toth discrete MFG Inter Tan MFG MFF MFF  | did not lock.  CHASSIS DYNAMOMETER HORSEPOWER (tests made by Jock Dezell, Clark Automotive Service, Chicago):   |
| 3         | 26.9 27.2 11.A 22.5 22.9  | Jack Dezell, Clark Automotive Service, Chicago):<br>Temperature 65° F; relative humidity 40%; barometer 29.8 in. Hg.  |
| No.       | CITY-COUNTRY FUEL CONSUMPTION (miles covered on 5 gal. gas): Tree Wileage Odgmeler Wileage Tree MPG Yros Average MPS 1274 4 1835 25.7 37.7 31.7   | Speed MPH         Lingine RPM         Aide Horsepower           25 (3rd gear)         1500         17.5           34         2540         23.0           44         2200         26.0 (max)   |
|           | OVERALL FUEL AND OIL consumed during test:  | HORSEPOWER AT REAR AXLE (writing coloniated from  |
| 1000      | Total Total Total True Odometer OI Mirage Gal. Fuel Oil MPG MPG MPG MPG 479 19.8 10 pint 23.8 26.0 1900   | acceleration data with allowances made for effi-<br>ciencies and rotational inertia):   |
| Section 1 | Overall efficiency in using field to move cur's mass<br>against road friction and air resistance, calculated<br>by translating constant speed miles-per-gallon re-<br>sults into a factor which takes into account both<br>weight and frontal area of cur: 15.5% at 50 mph;<br>22.7% at 60 mph.   | WPH True  |
| 100       | TRICK DRIVING: Maximum claim that can reasonably be made for our fwith slow acceleration and coast-   | tear wheels: 79%.   |
|           | ing): 60 odometer mpq.  | PERFORMANCE FACTORS   |
| 50        | ACCELERATION—LEVEL ROAD (timed with 5th wheel;<br>carried weight 425 lb; temporature 34° F; relative<br>hymidity 60%; barometer 28.7 in. Hg; spark 3° bb;<br>awarge of two or more runs in opposite directions  | 77 mph (true) at maximum advertised horsepower. En-   |
|           | same road):   | rpm. Average piston speed at 60 mph (clao, ft/mile) 1200 ft/mia. Ca ft per minute of mixture at 60 mph (clao, cu ft/mile) 61. Maximum engine horsepower (adv) per ton of car (curb weight) 44.5. Maximum  |
|           | Mark   Land   Mark   Land | engine horsepower (adv) per cubic inch displacement 0.495. Power performance factor (a weighted average of CR, piston displacement, and curb weight): 69.   |
|           | 50000 Lo to 10 mph; 2nd<br>0.40 to 30 mph; 2nd to 11.7 20.60 3rd 6 Win pears 41.4   | wengang 65.   |
| -         | 50e0d Lo to 18 mph; 2nd 0-50 to 18 mph; 2nd to 22.5 speed   | Above data and signed certification are reproduced from test reports.   |
| 27        | Minimum acceleration time for 0-50 mph (true) over level road with no wind, best spark setting, premium   | CERTIFICATION   |
| 0000      | level road with no wind, best spark setting, premium fuel and driver alone 37.2 seconds.  ACCELERATION FACTORS:   | I certify that the test results in this report are<br>the actual findings obtained in tests, conducted<br>in strict accordance with good engineering prac-  |
| 100       | True MPS Gear MPH per sec FL/sec* 10 Ltd 4.3 6.3 6.3 29 2nd 2.2 4.7 30 2nd 2.2 2.2 3.2 2nd 2.2 2.2 3.2 2nd 2.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2  | conditions specified.   |
| 1         | HILL CLIMBING (calculated from acceleration data with allowances made for rotational inertia):  | Edw F. Chet   |
|           | Appea NPS Ceer Grade to Pull in 10 10 10 10 10 10 10 10 10 10 10 10 10  | Momber, Society of Autorative Engineers, American<br>Society of Mechanical Engineers, Discour, Automotive<br>Rowarch Laboratories, Professional Engineering Con-<br>sultants, 1294 Noyes Street, Louiston, Illipsis.  |



Wiper ares overlap to eliminate center blind spot. Operation is extremely quiet. Note clean, simple dash arrangement.

performance that parallels American cars, as the accompanying story on this conversion shows. Incidentally, the gear ratios in each gear are: 3.60 in 1st; 1.88:1 in 2nd; 1.23:1 in 3rd; and 0.82:1 in 4th-all with the 4.4:1 rear axle ratio supplied with the car. With the synchromesh transmission, by the way, you can downshift easily without double-clutching.

The Volkswagen body is extremely rugged, noiseproof, and drum-tight at the seams. Our water tests uncovered only one very slight leak -the driest record of any car to date. Those vent slots above the engine compartment may, however, take in enough water during a heavy downpour to cause some stalling. Its belly pan (see drawing) screens this low slung car's underside well, and may add a mile or so to your

speed and fuel economy at high speeds. One thing is misleading. When you pound the fender with your fist, you would swear it was at least 12-gage metal. But micrometers show the metal to be the same gage as American cars. It's the small panel size that gives added stiffness. Volkswagen's flat 4-cylinder engine is aircooled-and such a nice design job it qualifies

for a special discussion in the Tech Talk copy accompanying this, story.

As a cold-weather car, the Volkswagen should work well -with 58% of the curb weight on the rear wheels providing good traction, a hand choke for easy starting, and no anti-freeze required for its air-cooled engine. On the other hand, clearance at the door handles and between floor pedals is slight enough

## VOLKSWAGEN DELUXE 2-DOOR SEDAN SPECIFICATIONS

ENGINE: 4-cylinder, air-cooled, Bare 3.031 in. or 77mm; stroke 2.520 in. or 64mm. Advertised maximum brake horsepawer rated 36 hp at 3700 rpm. Taxable horsepawer 14.7. Compression ratio 6.6 to 1. Piston specified: Regular. Piston displacement 72.7 cu in. or 1192 cc.

TRANSMISSION: 4 speeds forward (3.60.1; 1.88:1; 1.23:1; 0.82: 1; reverse 4.63:1); Rear axie ratio: 4.4. STEERING: Turning circle 18 ft, curb to curb. Torque to turn 12 ft lb statio: 2.4 turns lock to lock.

EXTERIOR: Wheelbase 94.5 in. Overall length 160 in. Overall width 61 in. Overall height 59 in. Curb weight 1610 in (with 10 gal gas; cil and water). Minimum road clearance 6 in. at year shock.

INTERIOR: Headroom front seat 381/2 in.; rear seat 34 in. front seat 42-50 in.; rear seat kneercom 2-14 in. Hiproom, front seat 46 in., rear seat 52 in. Total front seat adjustment at floor

K in, forward or back: O in, up or down VISIBILITY: Windshield area 400 sq in. Rear window area 220 sq in.; from eye of 5 ft 8 in. driver to road over left front fender 15 ft 4 in. Over head center 18 ft 1 in.; over right front fender 19 ft 3 in.

EQUIPMENT: Battery, Deta; 6-velt, 70-amp, located under rea-seat. Tires Continental ply 5; recommended pressure 16 psi front, 20-23 psi rear, cold. Springing, front torsion bar, rear torsion bar; independent wheel suspension.

CAPACITIES: Fuel tank 10.6 gal. Crankcase 5.3 pt. Differential

## TECH TALK --



THE air-cooled engine has four cylinders arranged in a flat plane. Crank arms 1 and 4 are 180° from cranks 2 and 3. Cylinders I and 2 make up the right bank and are opposed by cylin-ders 3 and 4. This is a beautiful 1, for example, is balanced or counteracted by the motion of ing couple (see shaded arrow in drawing) present since cylinders 1 and 3 are not exactly opposite. Because of

this design, the engine is said to be force-balanced for the 1st. 2nd, and 4th harmonics and only a rocking couple is transmitted to the chassis from unbalance. The engine is quite "oversquare" with its 3.03 in, bore and 2.52 in, stroke, or a 1.2 ratio. Compare this with the high American value of 1.25 for the Buick. The rpm at 60 mph is similar to American practice: 2900 rpm (versus 2750 rpm for Chevrolet, Plymouth, and Ford). The piston speed at 60 mph (1200 ft/min) is somewhat lower than for Chevrolet (1375 ft/min). The big reason for the Volkswagen's economy is indicated by its CFM at 60 mph value of 216 for Ford). Its reasonable but unbombastic ac-celeration is indicated by the hp/ton value of 44.5 wheels. If the gear train is assumed to have an efficiency of 90%, this means the engine puts out 88% of its advertised horsepower. On domestic cars about 65-72% of the advertised power is supplied to the

Although the ton-mpg is frequently used as a meas-Although the ton-mpg is frequently used as a measure of efficiency, it gives undue advantage to heavier cars; the overall efficiency (see test chart description) is a better measure. Note that the high values for the Volkswagen of 15.85% at 30 mph and 21.7% at 60 mph are not reflected by the ton mpg value of

Both the Volkswagen's own engine and the Porsche engine-equipped Volkswagen were quite noisy when cold with some piston slap but when warmed up, noise level was acceptable. Engine compartment is well coated with a black impregnated fibrous material.

to make working them difficult with gloved hands and galoshes on the feet.

The independent wheel suspension of all wheels on the Volkswagen is the main reason for the Volkswagen's ability to skim over bumpy roads without wheel fight, control loss, or skittering. Independent wheel suspension reduces the unsprung weight (that's the weight of car components not supported on springs) and so improves the

ride quality. Many American cars have this feature for the front wheels, but the rear wheels are usually tied together with a heavy differential

assembly which is weight. A bad road iar on one wheel must lift or move all of this unsprung weight, and in addition.

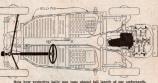
the jar is transmitted to the other rear wheel. Independent springing allows each wheel to follow the road

contour, thus maintaining better contact and better roadability.

Will independent rear wheel springing be adopted for American cars? Probably not, because our heavy "living rooms on wheels" with their giant power plants, would require an extremely rugged construction of the rear-axle

Porache engine installed in Volkswaggen; (A) gir cleaners, (B) carbureters

(C) distributor, (D) fuel pump, (E) fan housing, (F) oil filler pipe.



Note how protective belly pan runs almost full length of our underneath

flexible mountings. On the other hand, the Cord front wheel drive accomplished this and, with today's power steering, we'd like to see it again. The Volkswagen heater consists of a manifold running down the middle of the floor from the engine fan to ports on each side of the front passenger compartment. A screw valve between the two front seats controls the amount of hot

#### What Will a Porsche Engine Do for the Volkswagen?

For readers who like their cars small but their coeleration competitively hot, we tested a regular acceleration competitively hot, we tested a regular Volkswagen Sun-hoof sedan in which the Volkswagen Volkawagen Sun-Root seeden in which the Volkawagen engine had been replaced by a stock 1480 c. Perturbe, with a VW comshaft for smoother follow, Specifications for the Percente engine one: Bern 3.144 in, for 80 min) meet 81 ca. in.

As tables below show, the resulting conceleration was close to results we obtained for First, Charyotte and Pymouth and the Yeal occopies to see the control of the percented of the

Seccuse engine rpm and overall gear ratio are not too well maked, too speed is disappointing. Car ac-colerated rapidly to 70 or so maph but, when shift was made to 4th gear, not much was left. If 4th week a direct drive, it would probably have added another 10 mph.

Volkswagen with Porsche Engine TOP SPEED: 91 MPH Speedometer: 845 MPH 3 Speed at 4100 engine rpm. Speedometer error + 7.7% at top speed down to + 7.1 at 30 mph. OVERALL FUEL AND OIL CONSUMPTION DURING TESTS: 20.5 True MPG or 6.4 total gallons feel dur-ing total mileage of 131 miles. LEVEL ROAD FUEL CONSUMPTION: Checked with fuel volume flow meter. Curb weight 1680 lb; curried wright 710 lb, temperature 70 F; reletive humidity 40% between 23.3 in. Her odometer mileson. 1044. 40%; barometer 29.3 in, Hg; odometer mileage 1044; regular gas and SAE 20 cil used: 3.6:1 in 4th gear).

Irse Speed (5th Wheel) ACCELERATION-LEVEL ROAD: Timed wi CCELERATION—LEVEL ROAD: Timed with 5th wheel. carried weight 460 lb; temperature 60° F; relative humidity 45%; barometer 29.3 in. Hg; spark 3° bTC.

Average Trus

## For Women Only

American cars, the Volkswagen seems quite barebut far less confusing. I can see and reach all the dash instruments-even the glove compartment on the far right—without stretching and splitting a seam. The front is easy to get into and quite roomy, with individually adjustable seats so that I can get the leg distance I want. Although seats are constortable and large, remember to keep any voluminous petticoats Like many women, I never notice the gasoline gage and, when I do, I assume there is enough gas to take

me home. In the Volkswagen, which has no gage, you turning a little gadget, an additional supply is there (1.3 gallons, to be exact),

Speaking of seats, we devised a dandy arrangement for this car. By removing the back seat (a half min can be lifted without straining. This made the car ideal for around-town shopping chores, and still left the luggage shelf behind the rear seat for the children

to sit on (when we could get them to sit).

When parking my husband's car, I was always turning too sharply, and scuffing his precious white-



entire side for tire changing.

walls against the curbing. When steering this little Volkswagen, it seemed much easier to judge correctly because you're so close to things. And I found could park without, praise be, backing in. A goo thing, too, because that tiny rear window doesn't give you much backing-up vision. Maybe you have never had to change a tire. If so,

you won't be able to appreciate the jacking arrange-ment. Although the jack looks like a toy, you can slip it into a slot in the frame just in front of the rear wheel (no worries about balancing), pump the handle a few times, and the whole side raises up easily.

air entering the car rather than the temperature. defrosters are connected to the same hot-air manifold, so the available hot air is split between warming the passenger's feet and defrosting the windshield. Not too adequate Although the original Ger-

a heater, in our opinion. man Volkswagen design called for mechanical brakes, export model Volkswagens brought into this country today have hydraulic brakes. They are excellent. After 12 panic stops, pedal effort hadn't increased enough for even the most sensitive foot to notice. And the low center of gravity and excellent suspension resulted in @ a braking dip of only 2°-the lowest we have yet recorded. As a road hugger on curves, this car also ranks with the best of them-showing a side tilt angle of only 3° at 40 mph

on our 285 ft radius test circle. Many Americans have hesitoted to buy imported (and even some domestic cars) because of limited countrywide facilities for servicing. The Volkswagen importers are meeting this objection headon with a program that has created a rapidly expanding list of over 260 authorized dealers in the U.S. and 120 in Canada. You'll find them in



front seats.



vent over-riding due to lower height of Volkswagen bumpers.

the larger cities, of course, but also scattered across the U. S. in such towns as Harrod's Creek, Ky.; Kutztown, Pa.; Bothell, Wash.; Hoopeston, Ill.; Albany, Calif.; and Warehouse Point, Conn.

When you add this increasing ease of servicing to the low cost good resale, dependable construction, adequate performance, and fine maneuverability, you come up with the main reasons why the Volkswagen is currently the hottest-selling imported car in the United States. In fact, from the point of view of economical transportation, this is the type of car the majority of Americans probably should own-but won't. Instead, more Volkswagens are sold to the very upper-bracket boys and girls who can afford to spend a lot more than the \$1616 or so this Deluxe Volkswagen will cost them delivered, with taxes, heater, turn signals, and a smooth-merging

synchromesh transmission. To compare this price with American suggested factory retail prices, this Volkswagen lists at \$1495 Port of Entry, but it comes fully equipped except for an optional \$63.50 radio and-if you're addicted to red colors-\$10 extra for upholstery in that color.-Enp.