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VW Kübelwagen in detail

František Kořán, Jan Moštěk

German WWII Pkw.K1 Kübelwagen Typ 82 in Czech private collections

PHOTO MANUAL FOR MODELERS

SPECIAL MUSEUM LINE

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Acknowledgements:
This publication would never have been completed without the help of Mr Michal Zajíc from Úvaly, Prague-East, Czech Republic.

NEXT ISSUE IN RED LINE SEPTEMBER 2000

Front cover: The picture on the title page was taken during trial organised to commemorate 1938 Czechoslovak mobilisation near infantry bunker "Březinka" on 22nd Sept. 1995.
Photo by Michal Zajíc.
Rear cover: The picture shown on the back cover was taken during meeting of Prague Club of Military History members in Děčín, 1995.
Photo by Michal Zajíc.

Reference and source material:
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Photo manual for modelers **and** **in detail**
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VW Kübelwagen in detail®
© RAK, 2nd edition, Prague, September 2000
published by RAK - František Kořán

Contact address: RAK, P. O. Box 35
170 06, Prague 7, Czech Republic
e-mail: wwp.rak@iol.cz

ISBN 80-86416-03-8

Exclusive distribution in the North America:
4+ PUBLICATIONS N.A.
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VW Kübelwagen Type 82

Famous German WWII car in Czech private collections

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PHOTO MANUAL FOR MODELERS

VW Kübelwagen Type 82 model 39

All photos on both pages by Michal Zajic

In the 1930 certain Ferdinand Porsche set up small automobile design company which later became known as the Porsche Büro. In 1931 Porsche designed streamlined sedan for Zündapp motorcycle company, but this project was never realised. In 1933 Porsche then designed another streamlined car for NSU. This car looked very similar to the Czechoslovak Tatra V570. No wonder - Hans Ledwinka, who was designer-in-chief of Tatra, was very close friend of Ferdinand Porsche. Nevertheless, even this project was dropped.

Later in 1933, Porsche happened to meet Adolf Hitler and discussed with him the idea of Volkswagen, or people's car. This was an opportunity for Porsche to push his idea of a small car forward, as was it to help Hitler get a real people's car for the citizens of Reich.

During the years 1935 and 1936 Porsche built several prototypes of Volkswagen which were extensively tested. Construction of KdF (Kraft durch Freude or Strength through Joy) car factory began in 1938. In 1939, when the pre-production VW38 cars were introduced, Hitler changed the VW to KdF Wagen. After occupation of Czechoslovakia in March 1939, Porsche was ordered to develop military version of the VW. The production of civilian car, which however never progressed behind the pre-production stage, was postponed and all the effort was concentrated to war production, KdF Type 82 known as Kübelwagen. The new vehicle was given the military nomenclature Kfz. 1 or leichter Personenkraftwagen K1 Typ 82. Series production of KdF 82 Kübelwagen was ordered to started in February 1940, but the KdF factory in Wolfsburg was not equipped for complete series production yet and body panels had to be pressed in Berlin.

Right picture shows spare wheel carrier typical for the 1939 version, compare with picture shown on the page 10.

VW Kübelwagen Type 82 model 43

Kübelwagen utilised the same engine like VW38, petrol flat four cylinder air cooled four stroke 985 cm3 engine giving 23,5 HP by 3000 rpm, having 70 mm x 64 mm bore x stroke. Maximum speed of the vehicle was 80 kph (50 mph) and maximum gradient was 24 degrees. Transmission has 4 forward and one reverse gears with two wheel drive. Since March 1943, the KdF 82 has been fitted with new engine having bore increased to 75 mm resulting in the overall volume 1131 cm3, which increased power-to-weight ratio.

Front axle, one of Porsche's masterpieces, consists of two transversal tubes containing seven torsion leafs and two trailing arms on each side. This concept of independent front wheel suspension was much lighter than most other common types of suspension.

Rear driven swinging axles are suspended by two torsion bars. One of many advantages was reduction gear located in the rear wheel hubs giving 80 mm higher ground clearance. This, and also the flat bottom of the body, gave the vehicle excellent cross-country ability comparable with four wheel drive vehicles. The light simple four-door body with canvas top was developed in Berliner coachwork ABP (Ambi-Budd-Presswerke) in the end of 1939. Weight of the car was 685 - 750 kg depending on installed accessories, the vehicle maximum overall weight was up to 1160 kg. The vehicle is equipped with 6V electrical equipment, on the radio-equipped vehicles the electrical installation was shielded with aluminium armature.

The KdF 80 was used by all arms of the Wehrmacht and more than 52 000 vehicles (52 018 according to some sources) were completed by the end of the war. These vehicles were perfectly suited in desert conditions as well as the vast Russian steppes. Due to its low weight the vehicle seldom got bogged down in sand dunes or mud and when it turned over it could be put back on its wheels by only two men. Kübelwagen was used in many roles during the war. The most common was probably staff and light reconnaissance car, often armed with Mg 34 gun. Other roles of this versatile car were light ambulance, ammunition carrier, radio transmitter, light repair car and also some special versions appeared like f. e. Typ 155 Raupe, fitted with tracks instead of rear wheels.

Walk Around

Front registration number plates were always painted on the nose of the body, despite the body colour and production year, see left bottom picture on the opposite page. In the early years of the war the rear registration number was painted on the sheet metal plate fixed on the engine cover, see page 2 on the bottom. In March 1943, the engine cover was modified shortening two left mouldings and since that moment also the rear registration number plate was painted on the cover directly.
Note also the tire pressure values located on the mudguards. Tire pressure marking was 1,4 Atü at the front and 1,8 Atü at the rear where Atü means atmosphere. If the low pressure 690-200 sand tires were used the front tire pressure was 0,8 Atü and the rear was 1,2 Atü. Tire pressure marking was usually white on dark grey body or black on sand or dark yellow body.


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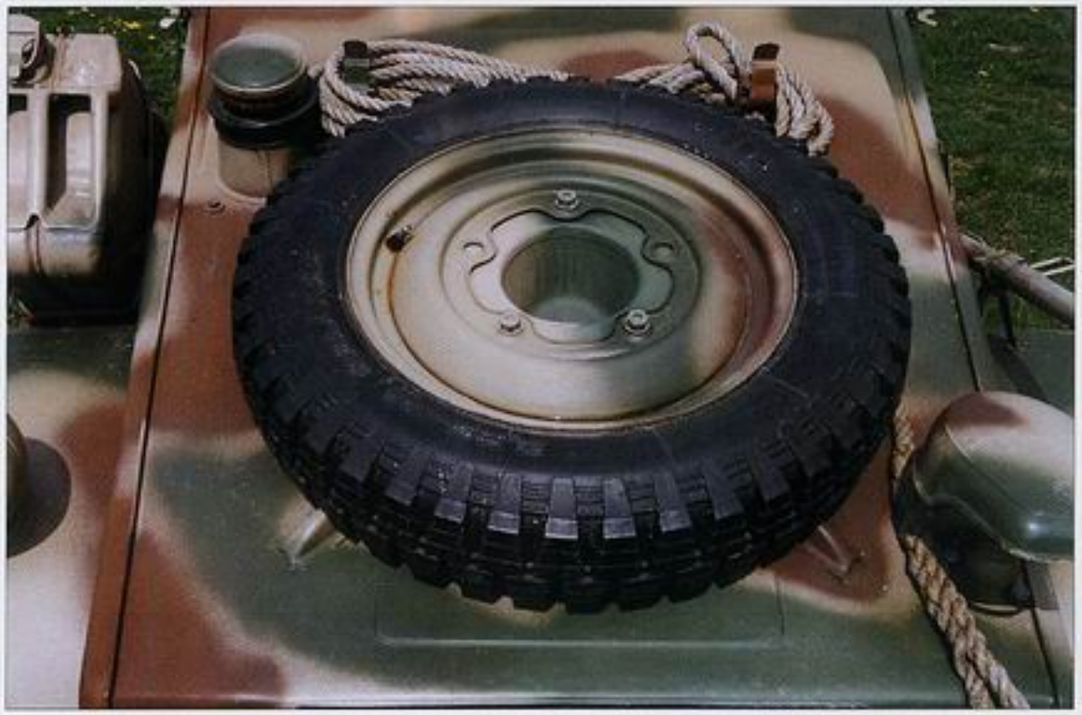
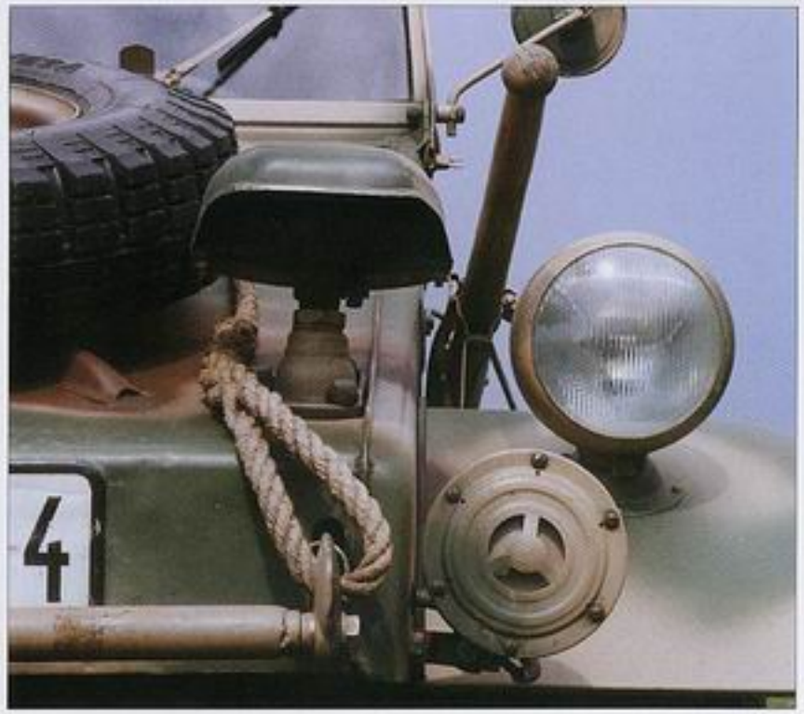
Camouflage colours shown where were used mostly on the Eastern Front. Camouflage pattern did not have any exact rules and location and shape of different fields was up to painter's fantasy.

Registration number and marking on the door are reportedly original. The division and tactical marking located in one common black field on the front door is typical for the second half of the war. This particular marking indicates that this Kübel belonged to 4th Battery of 152nd Artillery Regiment, 7th Division Skijäger.

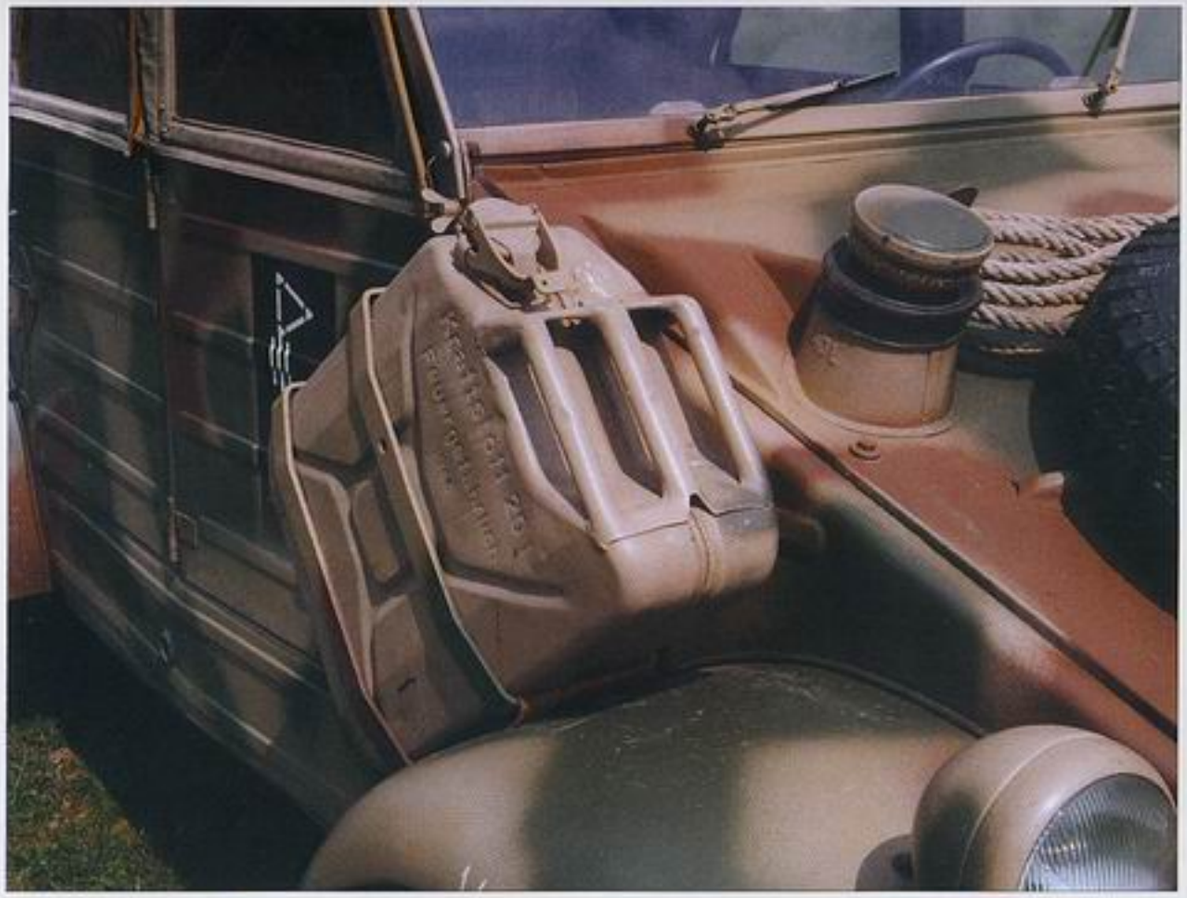
Walk Around & Exterior Details





Spare wheel carrier shown here was used since March 1943, left bottom picture as well as the horn, shown on the right pictures. This horn has the front cover made of pressed sheet metal and the body made of brown bakelite while the early one was completely made of bakelite. Note also head lights made by Bosch. Electrical cable is connected to the rear part of the light body by means of screw connector.

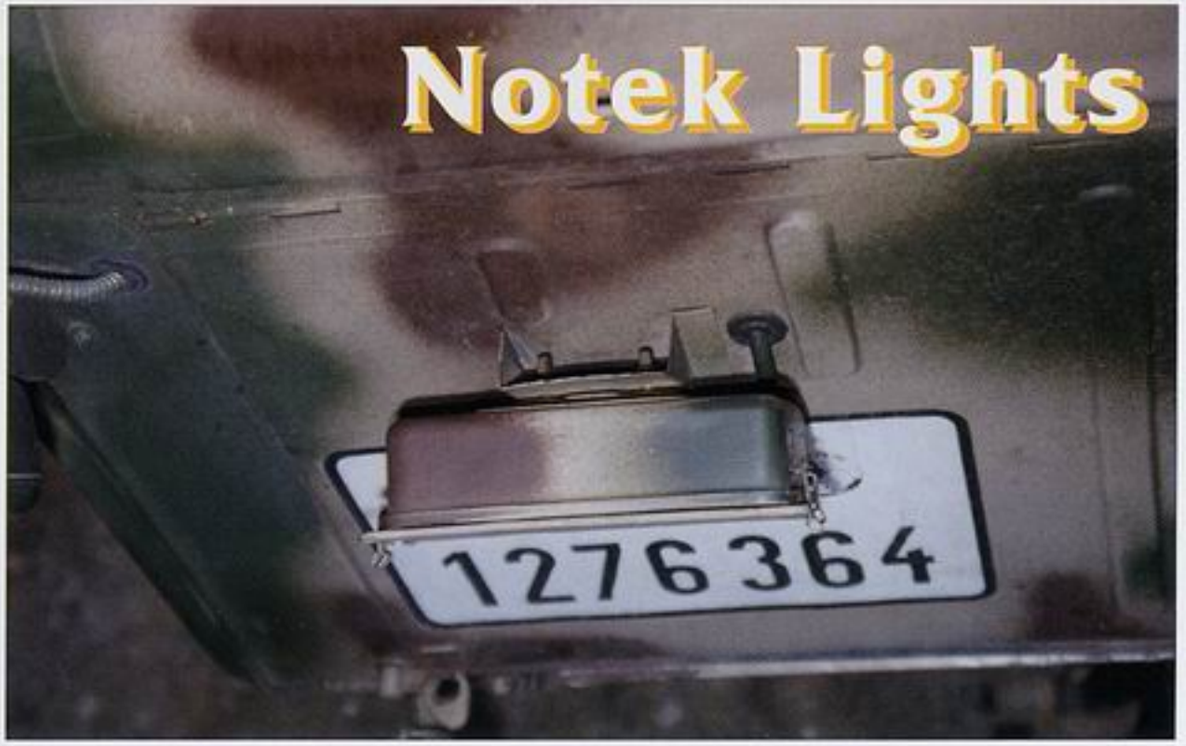
The universal field shovel shown on the bottom left and top right pictures is bearing the stamp REICH TEPLITZ 1945. The rear view mirror shown on the top left picture is not original and was reconstructed according to the available reference materials.



No jerrycan holder was factory installed and if there were some, it was always field modification. The holder shown on upper pictures was reconstructed according contemporary war pictures.
Bottom pictures show the air intake located on the rear part of engine cover. It enables the air to be sucked off the cab compartment. The two clamps are used for fixing the folded cab frame.

So called Notek lights, typical feature for most German vehicles having been used during the war, were used in black out conditions. Intensity of the front light could be adjusted using rheostat on the dashboard. The rear light consisted of two group of lights.
The upper 4 green lights were used when driving in column. If the driver was in correct distance to the vehicle going in front of him he saw those four lights as two dots.

When he saw all four green dots, he was too near and when he saw all four as one dot only, he was too far. Lower red light is rear position light and the yellow one is brake light. The lower light could be covered with the folding flap showing only brake light through the 6mm opening. Note also the stamps on the rear licence plate.

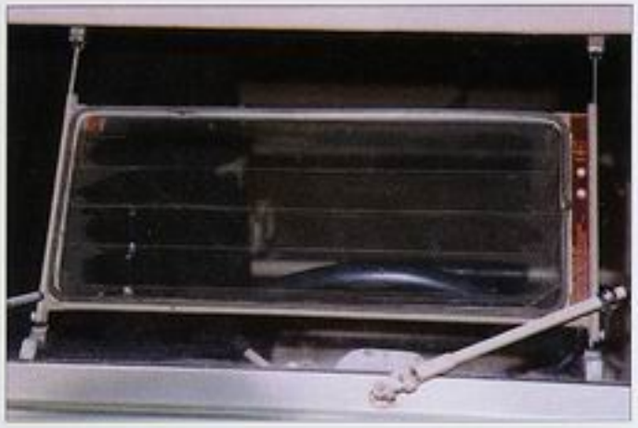


Windshield Details

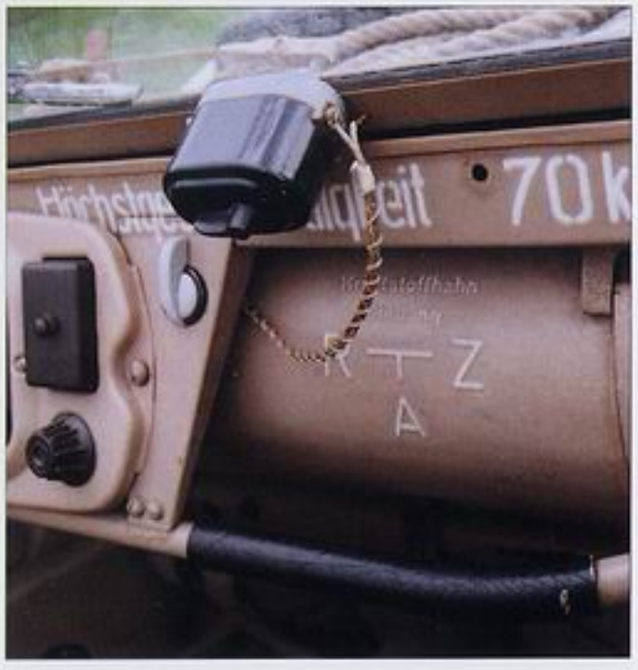
Pictures on this page show the folding windscreen. It was folded especially to increase the visibility during night blackout conditions or to reduce the overall height.

The part of each vehicle accessory was canvas cover which not only protected the folded windscreen but also reduced glare.
The folded windscreen was fixed in position by means of two spring clamps, picture top right. In the upper position the windscreen was fixed by two wing nuts, picture bottom right.

To protect the windscreen against freezing the universal heating frame could be installed just putting its four clamps behind the rubber window sealing. The frame is connected with electrical system by means of cable and standard connector on dashboard. On the left side of the frame there is the main switch and 6/12 V switch. This frame could be seen on many German vehicles.

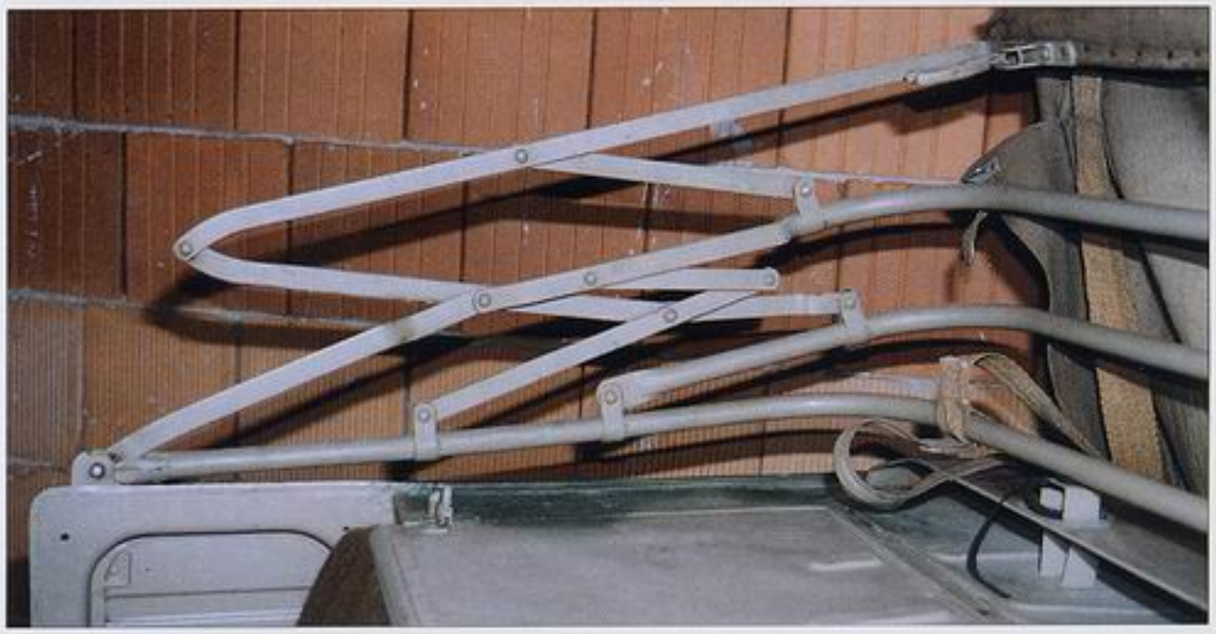


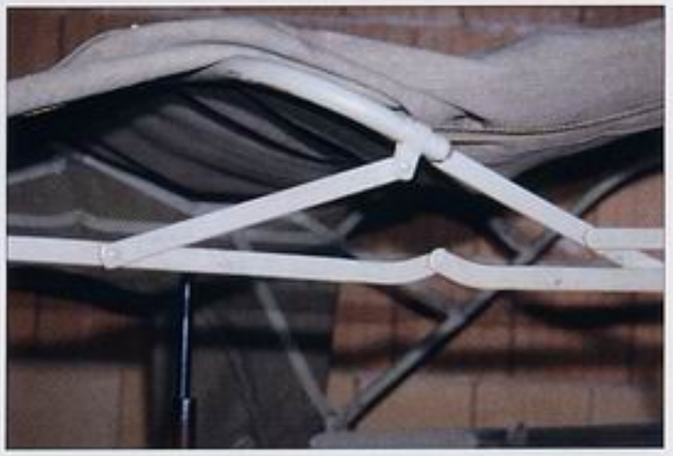
The windshield frame was connected with the canvas top frame by two clamps, pictures on the left. The shown windshield wiper engines, right bottom picture, are as installed in factory, painted with black enamel, with bakelite switch lever. Because of the high gloss enamel the cover were often repainted with body paint. The pressed letters on the fuel tank belong to the fuel main and indicates position of main fuel cock (Kraftstoff–hahn Stellung or fuel cock adjustment). R is for Reserve (spare), Z means Zu (closed) and A means Auf (open). Tank capacity 40 litres, giving the range of 400 - 450 km. For the fuel cock detail see also page 28.

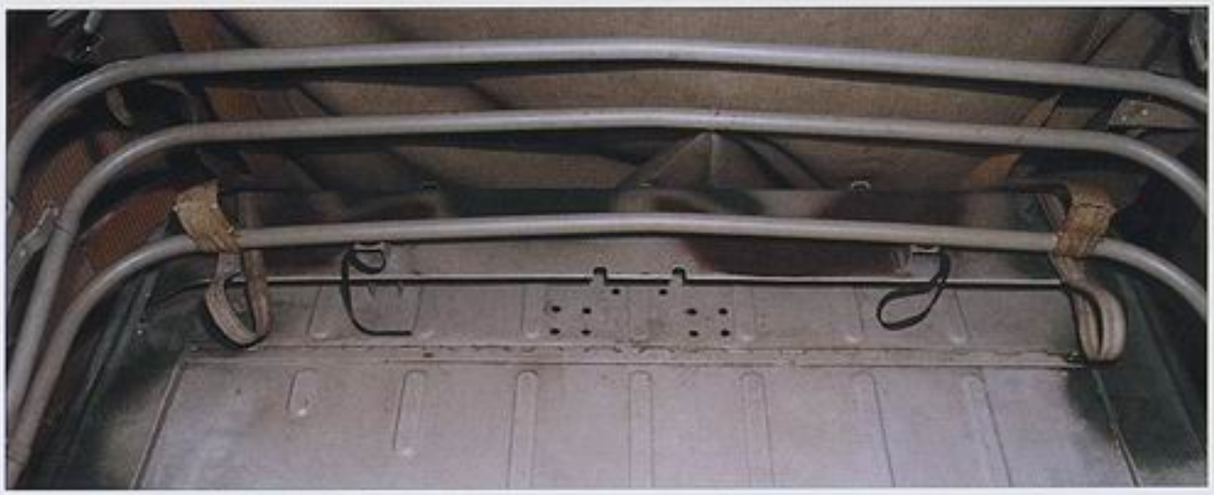


Canvas Top Frame

Pictures on this page show several stages of folded canvas top frame. Three main bows indicate that the vehicle was built in the second half of the war, the older Kübels have the middle bow not installed.





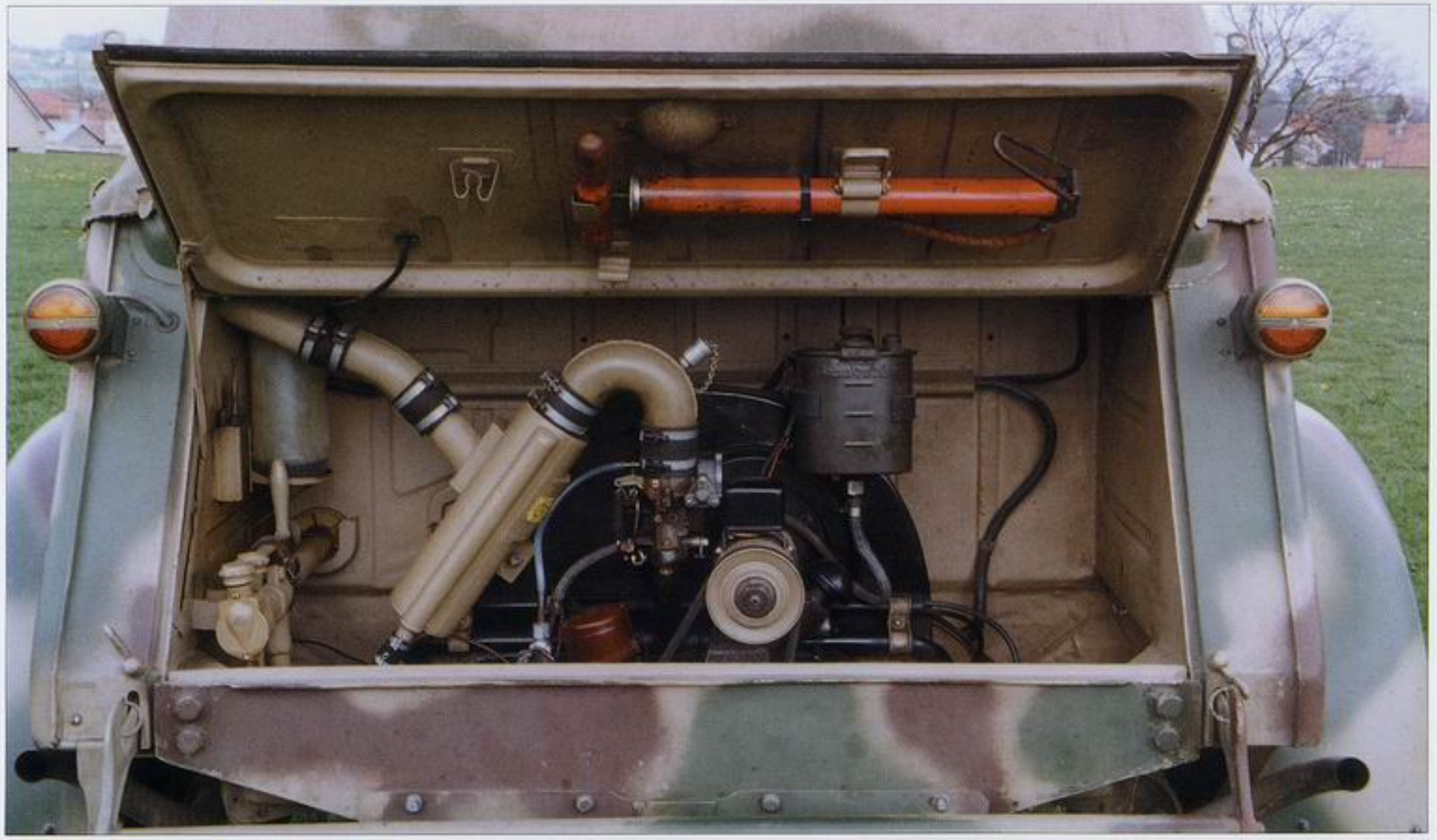


Baggage Compartment

Retaining rod of baggage compartment cover, upper left picture, is the same like the one on engine cover, enabling to fix the cover in two position. Side lockers are used for storing of removable side windows.

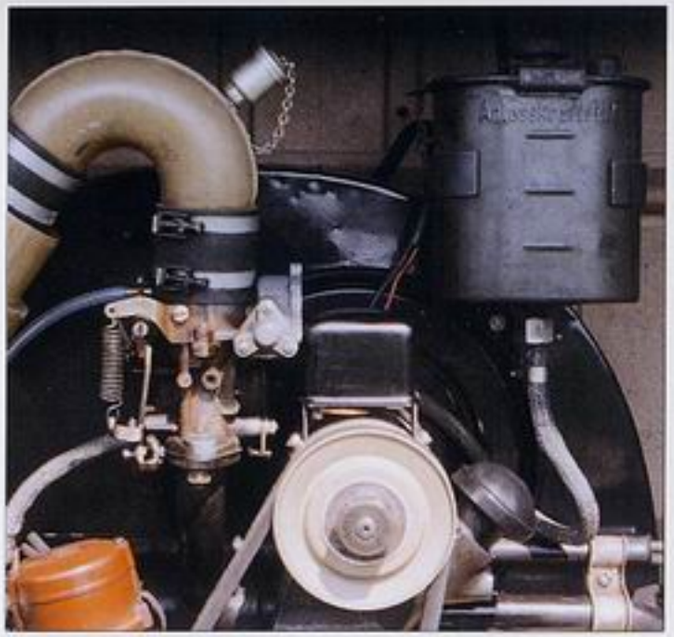
Pictures on this page show the baggage compartment behind the rear seats. Removable cover on the bottom of baggage compartment enables removing of the engine starter, the oblique cover in the rear wall is used for better access to coil. These cover were not installed on vehicles made before March 1943.

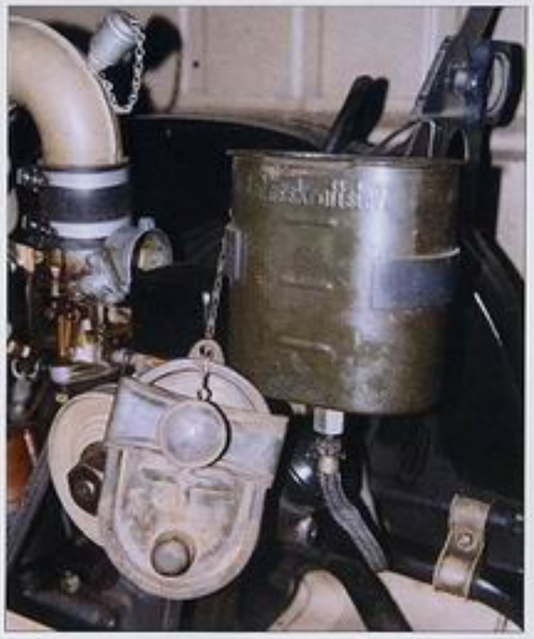
Engine Details



Basic vehicular tool set includes also hydrometer, opposite page bottom right, and tire pump, opposite page top. The empty clamps located on the cover of engine compartment were used for fixing the starting crank which is unfortunately not in this particular vehicle inventory.

The engine compartment is used also for storing the spare oil can and jack, top left picture. The tool looking like oiler located next to the spar oil can is dropper containing engine fuel and is used for starting the engines in desert conditions, see also the next page.



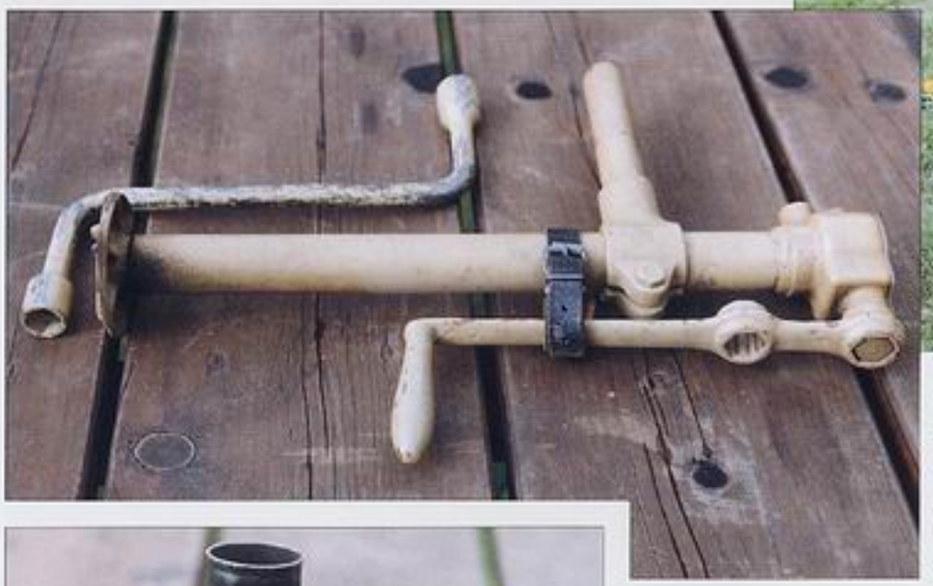


Dry centrifugal air filter shown on pictures above was typical feature of KdF equipped for desert use, as well as a small can on intake manifold knee. This can contained engine fuel and helped to enrich to mixture of air and fuel in the hot weather. The can was filled using the dropper shown on the previous page.

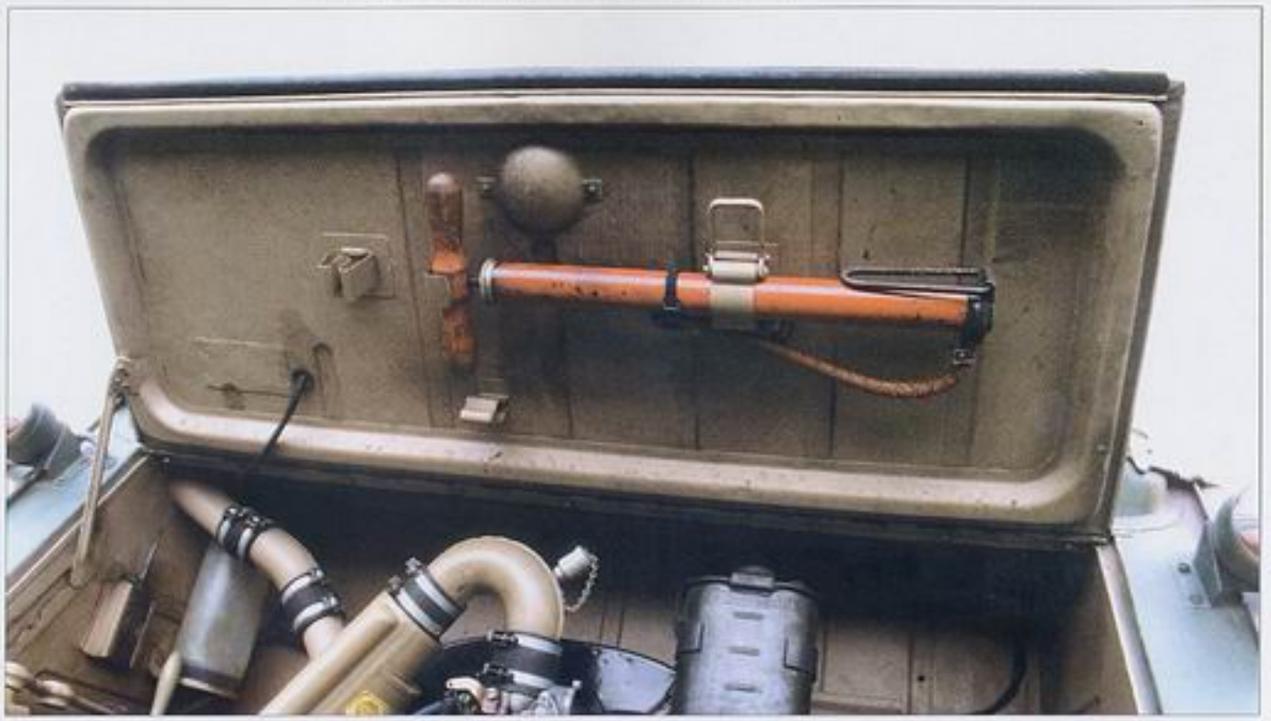
The KdF engine is also fitted for winter starts. For this purpose there is a shiftable can, shown here right to the carburettor, containing light engine fuel or ether. The fuel level was adjusted shifting the can downwards or upwards and ether was mixed with fuel using the mixing cock located above the fuel pump.

Service Accessories

The standard jack made by Bilstein was delivered with two different cranks, both shown on the picture below.



Note the tire pump installation on the on the cover of engine compartment, the empty clamps next to the pump should fix the starting crank.
Bottom left picture shows the fuel dropper and original oil can while on the bottom right picture there is still plasticnbottle with spare oil used on current drives.



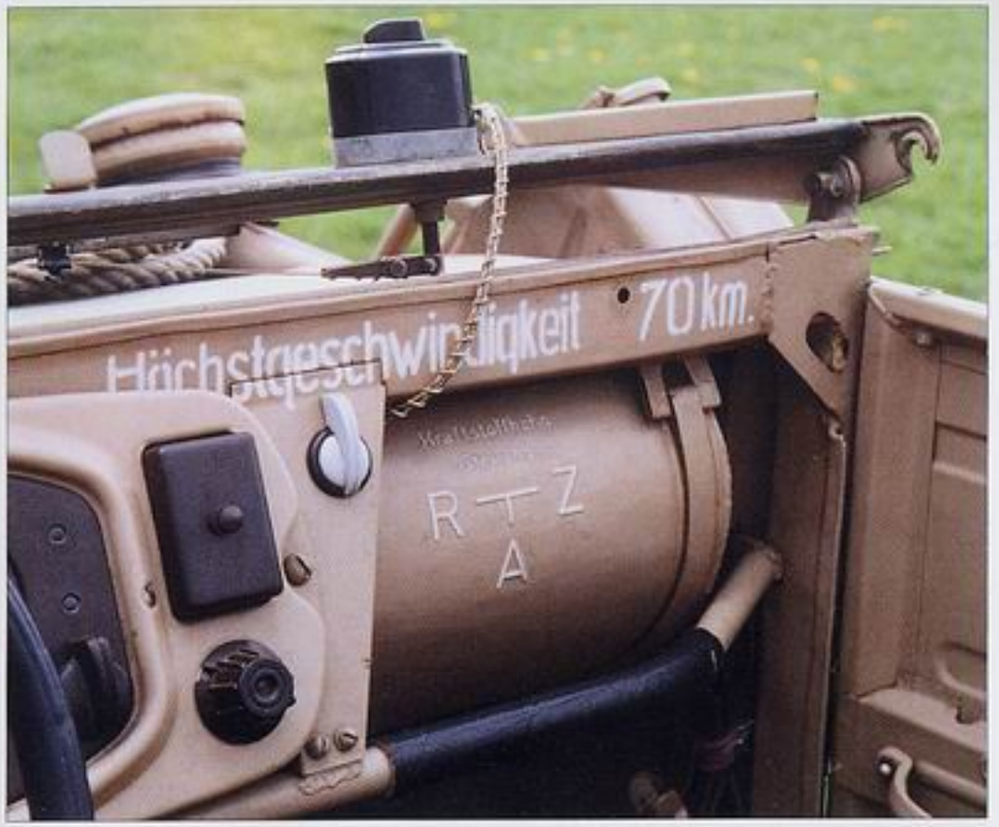
Interior Details

Pictures on these two pages show the Kübelwagen interior. The seats are fixed by two wing nuts each and could be easily removed. The seat cushion of the front seats has 16 coil springs, the rear back rest has 6 vertical struts. The room under the seats was used for storing the personal kits of the crew members. Driver had his kit in the floor locker in front of gearshift while the room under his seat was used to store the kit of crew member seating on the rear seat behind him as there was accumulator located under the back rear seat.

Left pictures show rear and front door on the right side. The handles inside are the same like outside. When the inside handle is in vertical position the door are locked against opening.

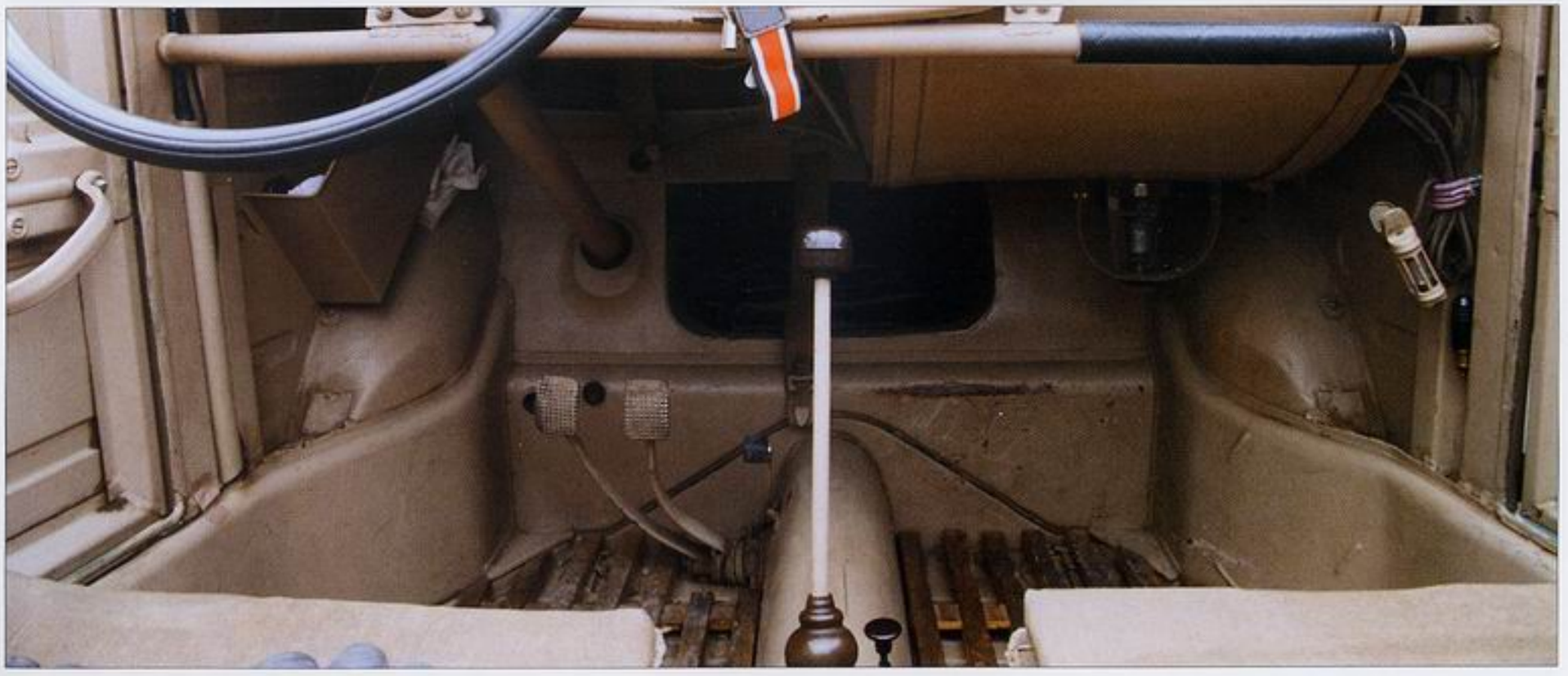
The ball handle on gearshift lever is made of bakelite and bears the Volkswagen emblem used during the war period, similar emblem is located also in upper part of speedometer gauge. Two bakelite boxes on the dashboard sides, left and right to the speedometer, contain fuses. Light switches are located in the lower corners of central bakelite shield with speedometer. The knob in the lower right corner is Notek light rheostat, in the left lower corner there is starter knob and accessory socket.

Pictures on the opposite page show the dashboard and the space below it. The open compartment in front of gearshift lever was used for storing driver's belongings and its dimensions allowed to put in the standard 20 l jerrycan.
On the left body side there is a 260 x 80 x 160 mm box for storing driver's and vehicle's documents.



Windshield vipers engines are connected to electrical system by means of cables allowing to fold the windscreen,
see also page 15.


70 km.



Compare the original oval dashboard, picture above, used on the first series of Kübelwagen with the newer one, installed during the second half of the war, picture on the top. The newer square dashboard is identical with the one installed on KdF type 166 Schwimmwagen.

The first aid kit locker is above the steering wheel column, picture above. Cab floor is reinforced by grid made of integral beech wood laths, picture below.
The circular plug in the front part of the floor is user to eliminate water, bottom right picture.

photo by Jan Mostek

Picture above shows the installation of clutch, brake and accelerator pedals. Bakelite roller on the top of accelerator pedal improves the throttle actuating when driving in rough terrain.

photo by Jan Mašlák

KdF is equipped with mechanically operating brakes. Manual parking brake is mechanically connected to service brakes and controls the brakes by means of steel cables. the small picture on the right shows wingnuts and brackets used for fixing front seats on the floor.

Air vents below door are a part of heating system and lead the warm air from the engine compartment to the cab. Heating has, however, very low efficiency and the warm air is hardly able to warm up the driver¡s boots. Note also the sheet metal box for storing documents located on the body side left to the steering column.

This particular vehicle is fitted with rifle holder for 4 rifles Mauser M 98k. Four clamps are located on the tubular strut just behind the front seats, brackets for holding the rifle gunstocks are located on the cab floor next to the central tunnel.

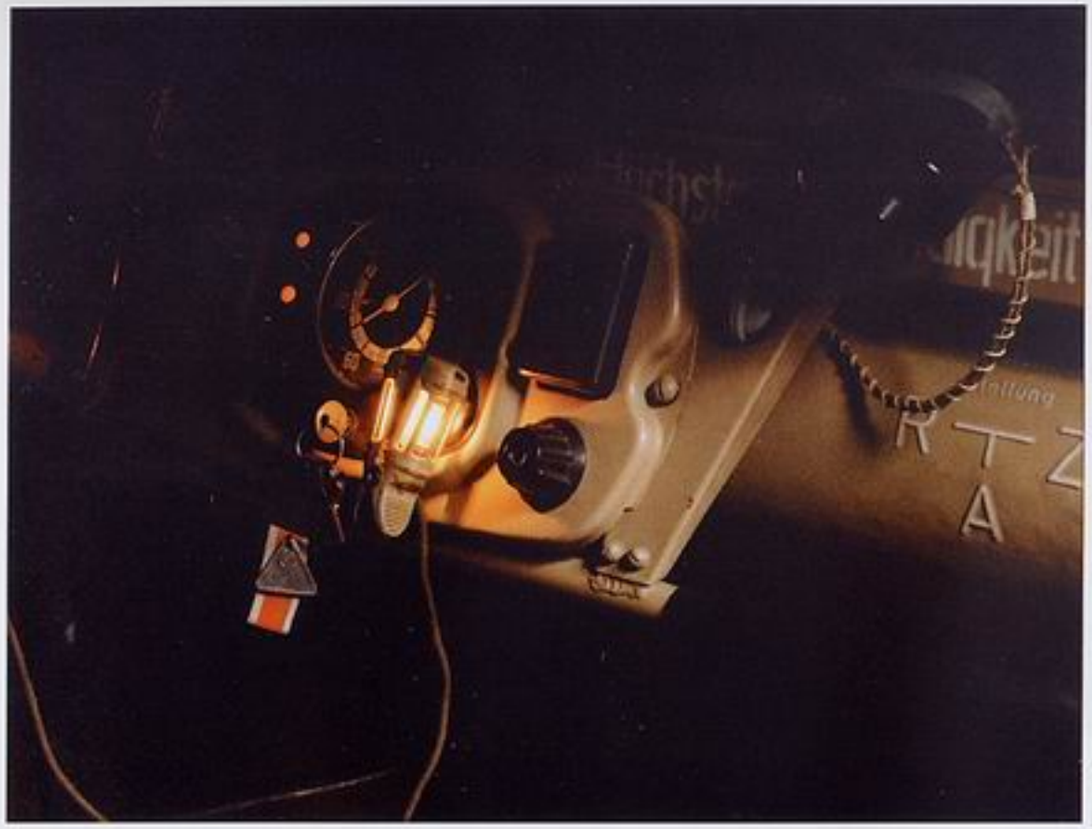
Lower left picture shows detail of the fuel cock and its protection against breakage.

Gun Holders

Pictures on this page show parts of battery winterising kit. Battery was located in wooden box. This box was connected with warm air duct by a piece of tube (see rounded opening on the bottom left picture) which heated the battery when the engine was running. When the engine was stopped the battery was heated by gasoline burner shown on the left top picture. Note also the original lettering on the box lid and operation manual.

Battery Winterising Kit

Interior Accessories



Clamp lamp with two bulbs, made by HELLA, picture above right, was a part of standard vehicular accessories. I could be connected by Bosch plug to the socket on the dashboard. The keyring with VW logo is original.

Bottom left picture shows standard first aid kit. The box having dimensions 340 x 180 x 100 mm contains pressure bandages, plaster bandages, bandage for bur-ups and gunshot wounds, three-tip shawl, splint, scissors, scalpels, tweezers, tincture of iodine, and talcum powder disinfectant.

The 5 litre bottle for drinking water, picture above, was not a part of vehicular accessories but being in original condition it is a nice example of contemporary gear.

Wheels

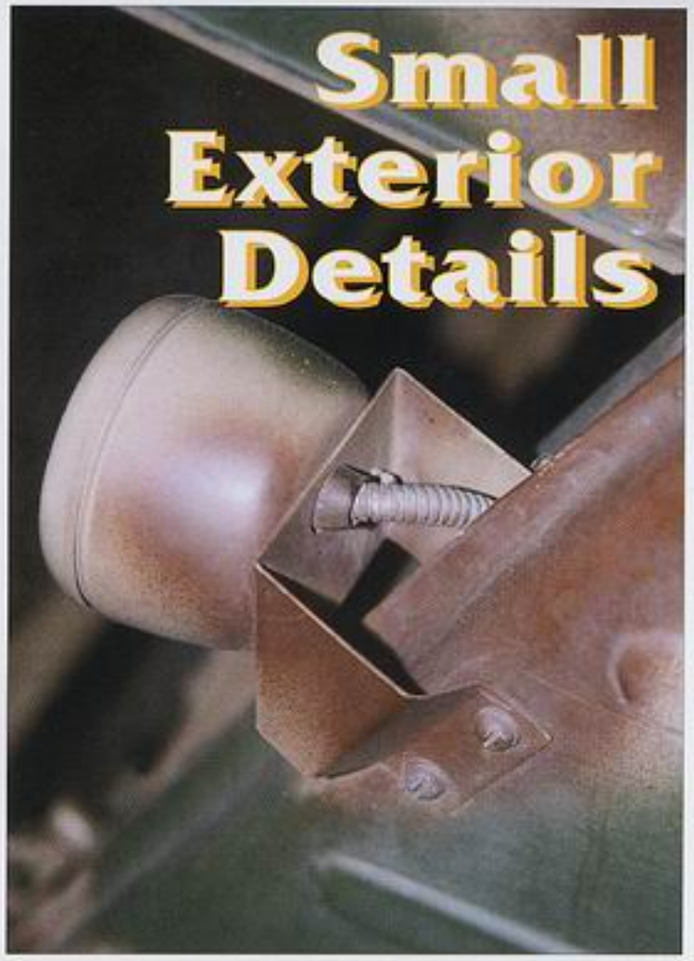
Pictures on this page show KdF wheels. Note the difference between front (top left and bottom right pictures) and rear wheel hubs.

All these wheels are wearing very accurate copies of original tires. This tire pattern appeared in the second half of the war. The spare wheel shown on the central picture has the wheel cap which was typical for the first KdF production series.

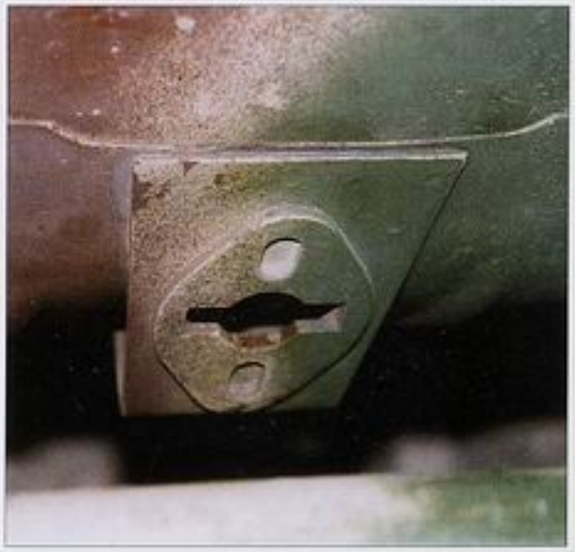
Small Exterior Details

Rear towing hooks are connected by rod forming rear bumper, picture above. Note also hinged reflector.

Front mudguards are reinforced by pressed brace shown on the picture above in frog view.



Rear position light with its bracket is shown on the picture above.



Detail shown above is the opening for starting crank located on the rear part of engine compartment.

Picture above shows the cab door hinge, viewed from inside.

Detail of external door handle is shown on the picture above. The handles themselves were the same like internal ones.

Spare Wheels Details

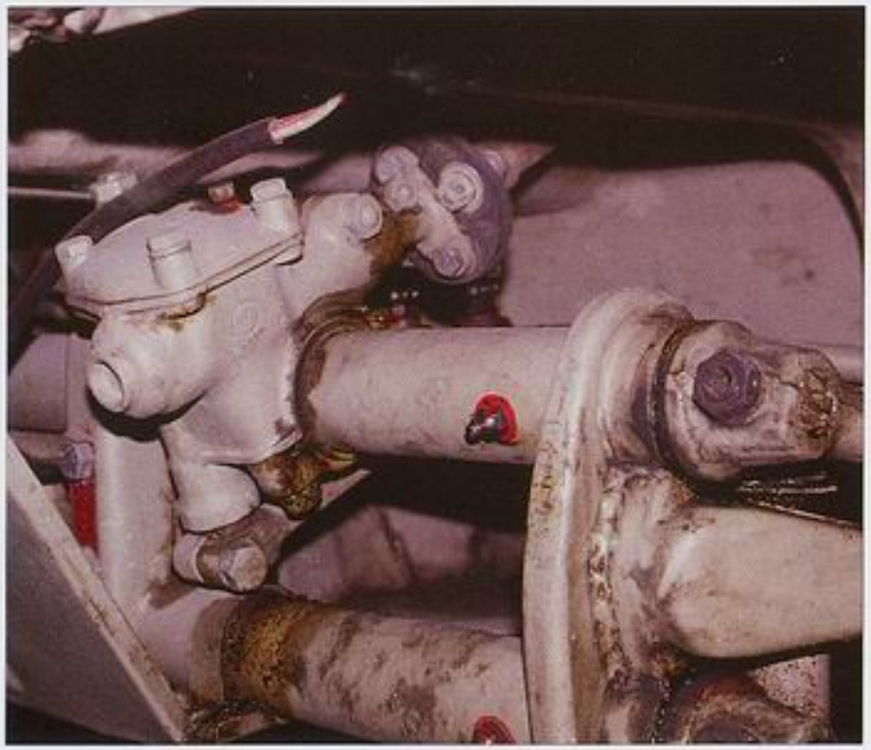
The spare wheel shown on the picture below is wearing a brand new tire which is a copy of the original one.
Top right picture shows the inner side of wheel disc. These discs with riveted rims were made by manufacturers Kronprinz or Hering.

Because of rather low load on the front axle the front shock absorbers are rather small and only 140 mm long, bottom left picture.
The front end could be easily hoisted manually when necessary.

Front Axle Details

Front Axle Details

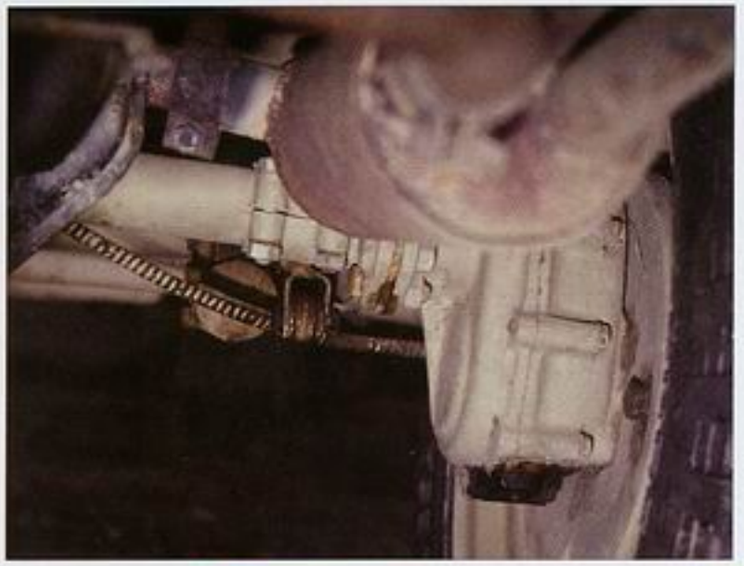
Steering worm and sector gearbox is installed directly on the axle transversal tube and is the same like on the KdF 166 Schwimmwagen. Note the trailing arms, radius rod connected to steering arm and bowden actuating brake.

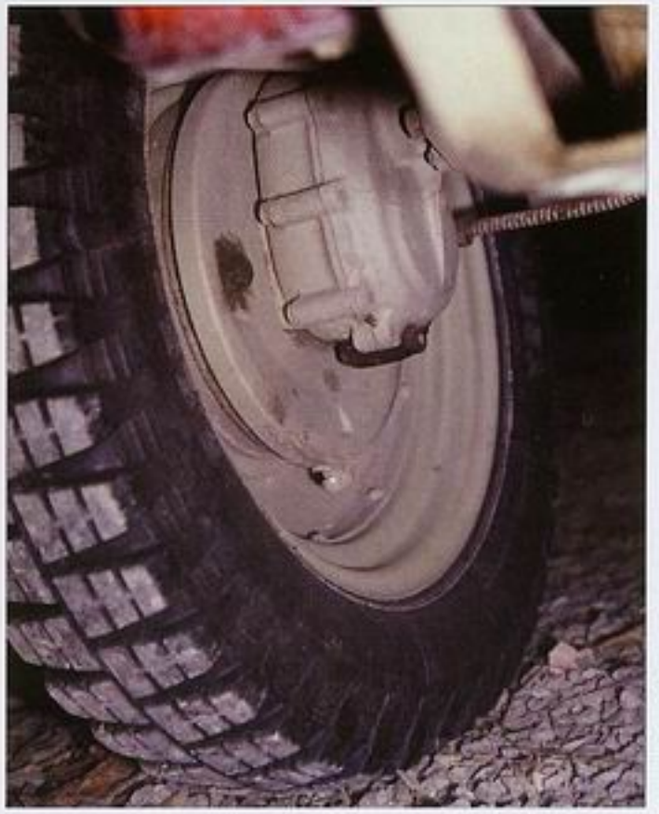


Rear Axle Details

Top and bottom left pictures show frog view of the rear part of the body and engine. There are two exhaust silencers, one on each engine side. Left silencer tube is connected with injector sucking dust and sand from centrifugal filter installed on air intake.

Bottom right pictures show the rear axle trailing arm and wheel hub reduction gear. Giving higher ground clearance the reduction gear improve the cross-country ability remarkably.





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