Tatra 600 - Tatraplan

A Mass-Produced Teardrop Car

mail@tatraplan.co.uk

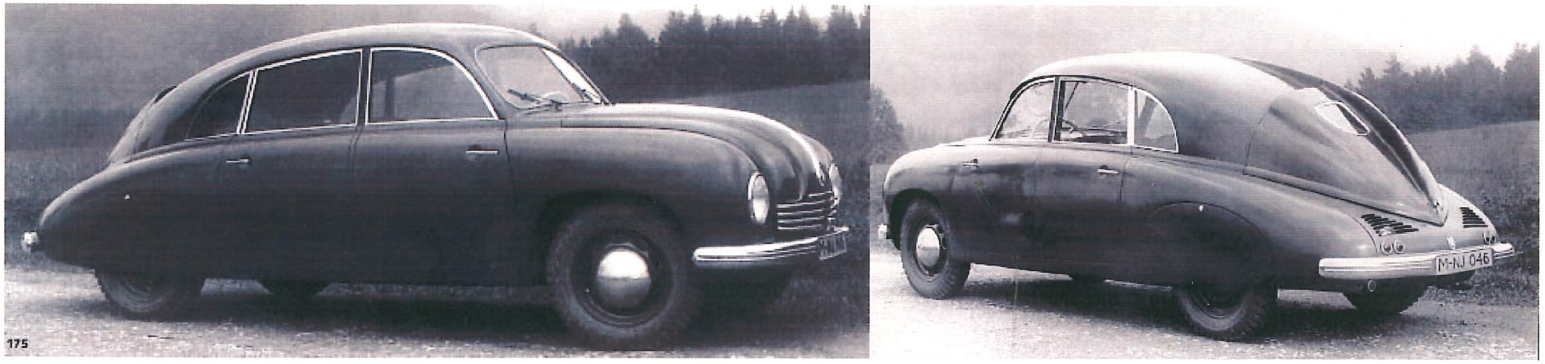
Manufacturer: Tatra, národní podnik, Kop•ivnice, Moravia, Czechoslovakia

Design: Josef Chalupa, Vladimír Popelá•, Hans Ledwinka

Prototypes: 1946-1947

Serial manufacture: 1948-1951 in Tatra, Kop•ivnice, 1951-1952 in Škoda, Mladá Boleslav

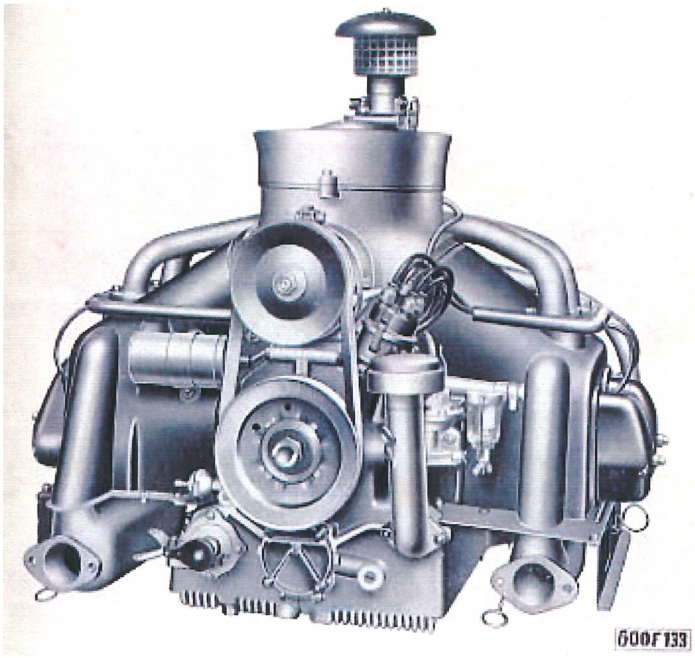
Number made: 6,342 (4,242 in Kop•ivnice, 2,100 in Mladá Boleslav)

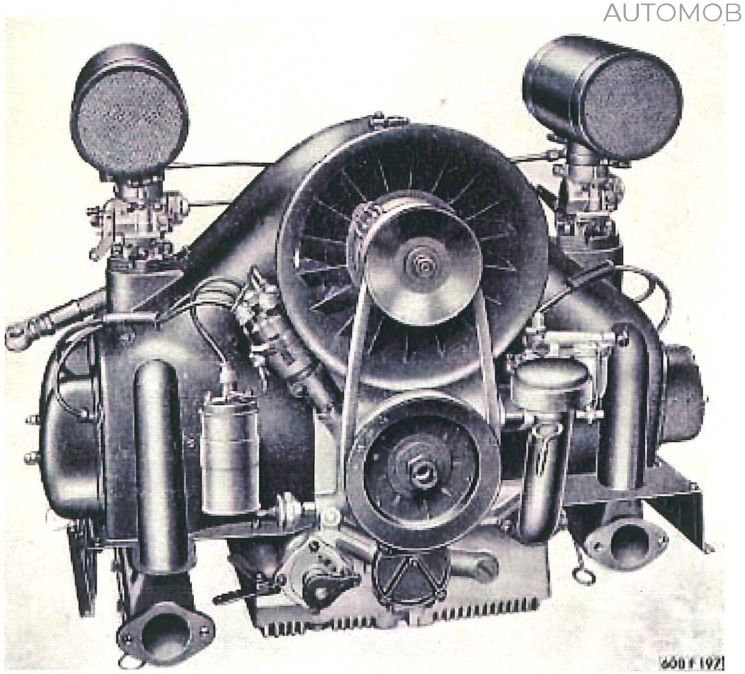


First Series body numbers: 70.027 – 70.876

Subsequent Series: up to 24th: 70.877 – 75.126 (Kop•ivnice), 25th to 29th: 179.001 – 181.100 (Mladá Boleslav)

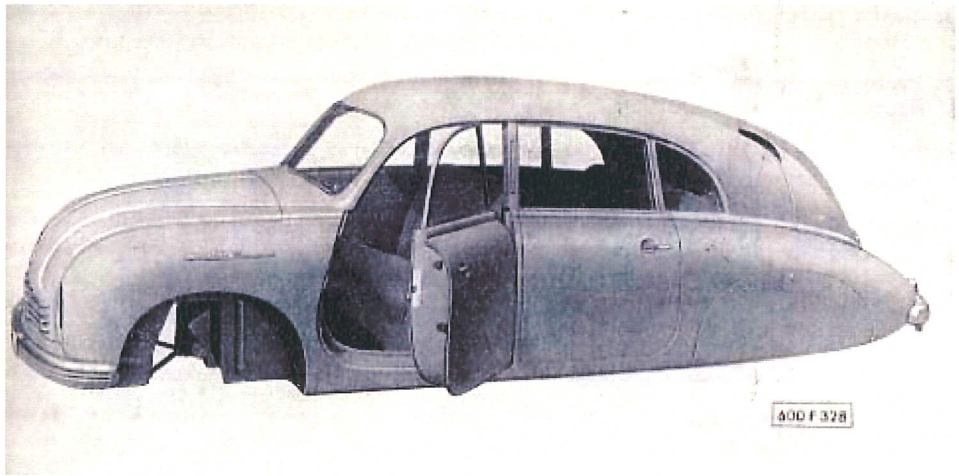
First Series engine numbers: 600.1.85.48 – 600.850.85.49 (engines with axial fan on vertical shaft and one carburetor, from body number 70.877 engines had horizontal fan and two carburetors.)



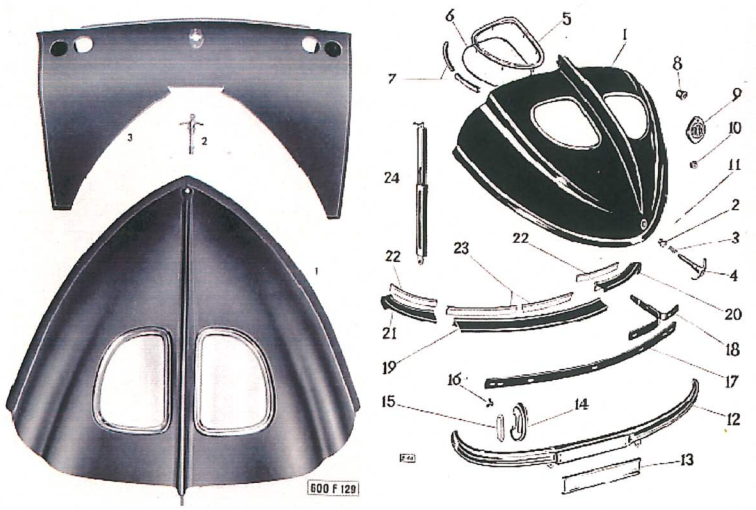


Body: streamlined self-supporting steel monocoque

Body types: saloon (Tatra 600, rear engine), ambulance and pick-up (Tatra 201, front engine)



Rear bonnet lid: pointed with small portholes, from 1951 rounded with larger portholes



Engine: flat four cylinder (boxer) OHV air-cooled, petrol, at rear

Bore: 85 mm

Stroke: 86 mm

Capacity: 1,952 cc

Power output: 52 bhp

Compression ratio: 6:1

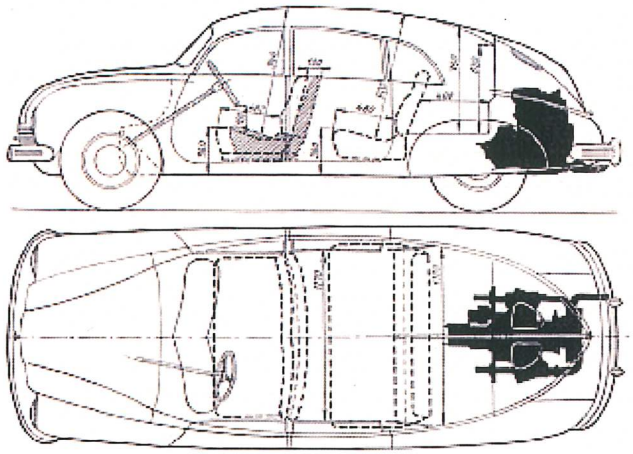
Maximum revs: 4,000 1/min

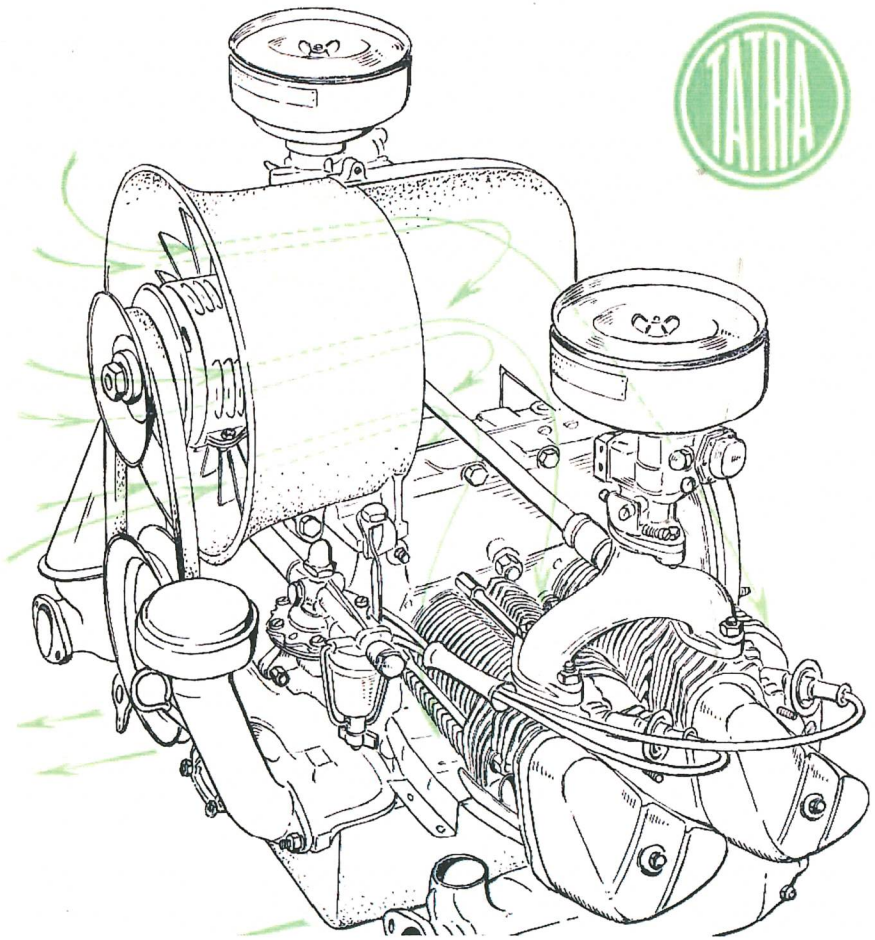
Valve clearance: 0,1 mm 0,15 mm

Carburetor: Zenith IMF / Solex 32 UBIP 2no.

Firing order: 1, 4, 3, 2

Sparking plugs: PAL 14/175, Champion I 10 con, Bosch 175 T1

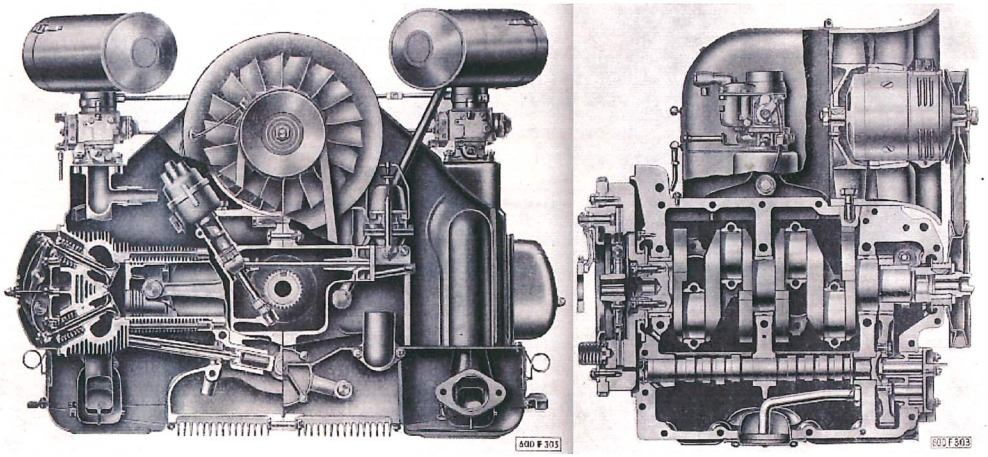




The petrol engine has aluminium cylinder heads and hemispherical combustion chambers. Valves are not inclined as much as in the Tatra 87 and are actuated by crossed rockers and operated by aluminium rods from a single camshaft placed in the aluminium crankcase below the crankshaft. The crankcase is split in the plane of the crankshaft. Both halves in which the main bearings are mounted are bolted together. The camshaft is driven from the front end of the crankshaft through gear pinions and the ignition distributor through worm gears. The distributor shaft incorporates a fuel pump drive cam.

The lubricating oil pump is driven by the front end of the camshaft, the supply of oil being stored in the finned crankcase. Oil is forced from the pump through the oil cooler mounted in the front part of the car and, through a multi-edge cleaner to the lubricated parts. By-pass pressure valves are provided at the cooler and cleaner.

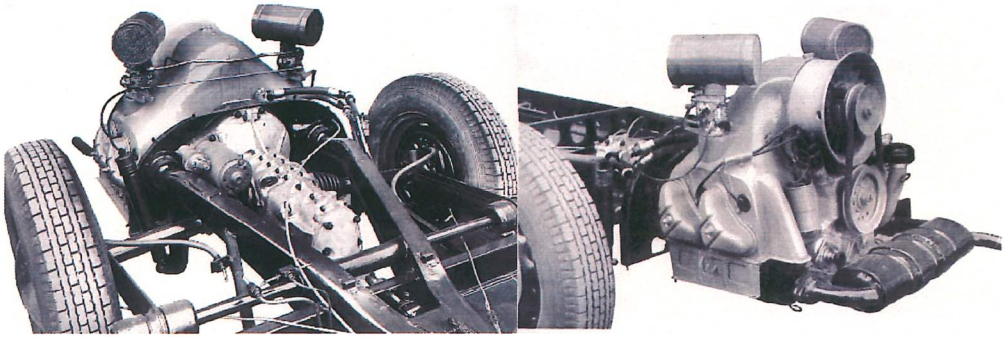
The short-stroke engine develops 26 bhp per litre which is the same specific output as that of the Tatra 87 (8 cyl, 2,958 cc, 75 bhp). Originally the engine had an axial fan with a vertical shaft driven by a bevel gear. On the later design a horizontal fan was mounted directly to the dynamo shaft driven by a V belt. The long manifold piping of the original design was eliminated by using two carburetors and performance increased to 52 bhp.



Clutch: dry one-plate

Gear shift: steering column mounted

Gear box: mechanical 4-speed



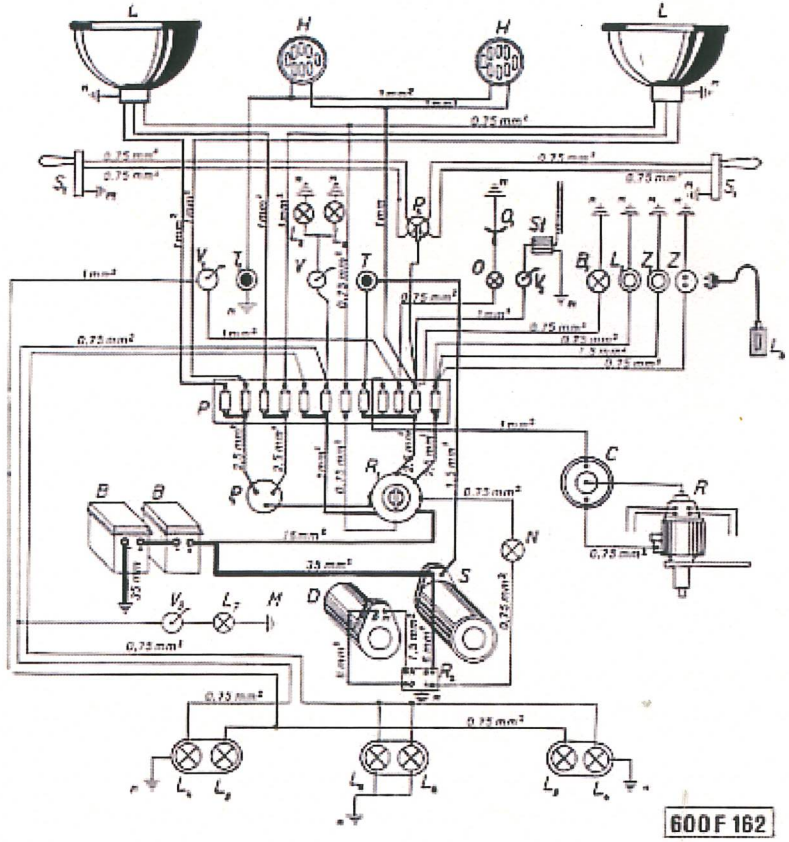
Gears: four with synchronization on 2, 3 and 4 plus reverse

Front springing: independent, by two transverse leaf-springs

Rear springing: independent, by torsion bars

Steering: rack and pinion

Ignition: coil, PAL 1.8, 12 volt battery



Tyre size: 6,00 – 16

Rim size: E 4,00 – 16

Front and Rear Track: 1,300 mm

Wheelbase: 2,700 mm

Overall length: 4,540 mm

Overall width: 1,670 mm

Overall height: 1,520mm

Fuel consumption: 11 litres / 100 km (26 miles per gallon)

Weight: 1,200 kg

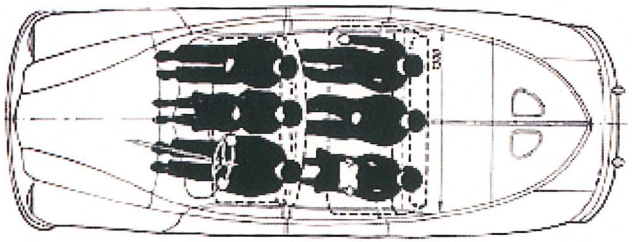
Top speed: 130 km/h (80 mph)

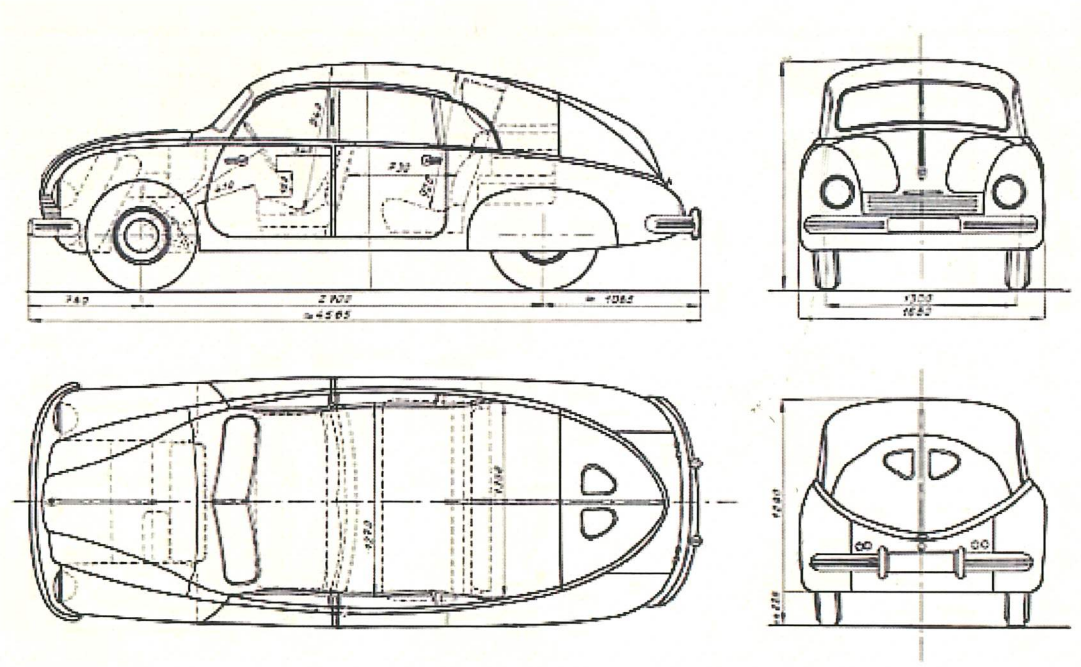
Tank capacity: 55 litres

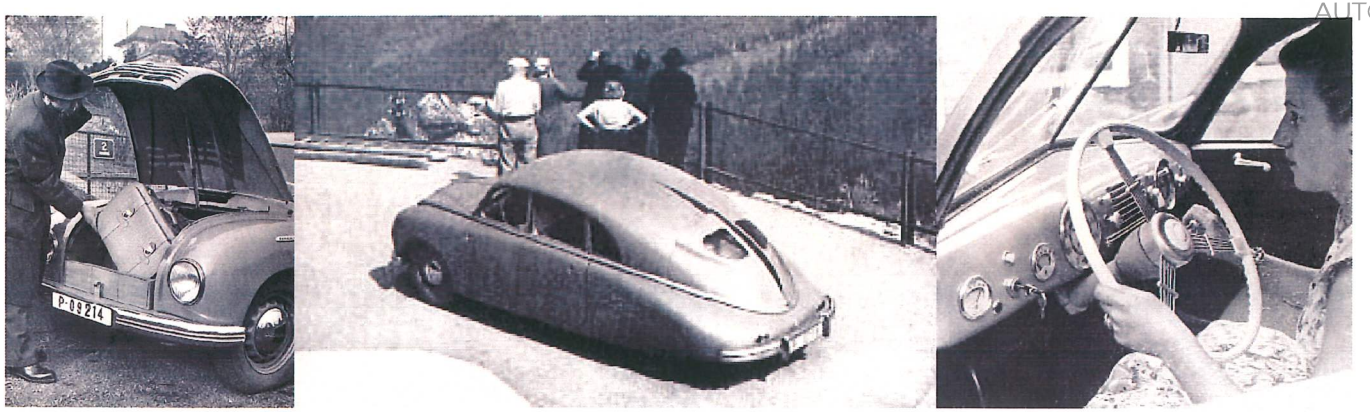
Brakes: hydraulic on all four wheels

Road clearance: 230 mm

Number of seats: 6



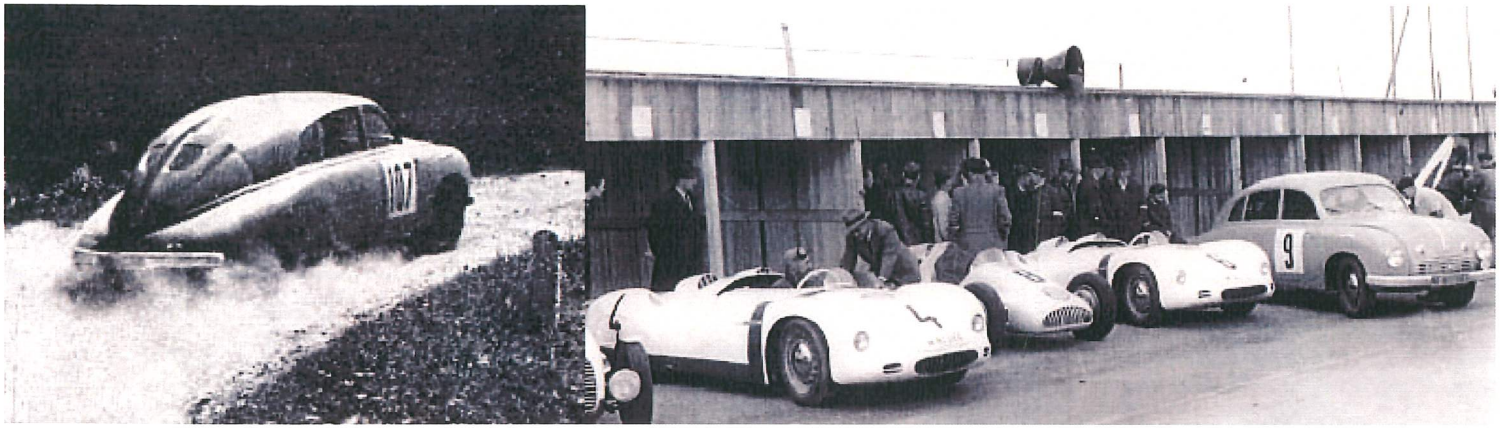




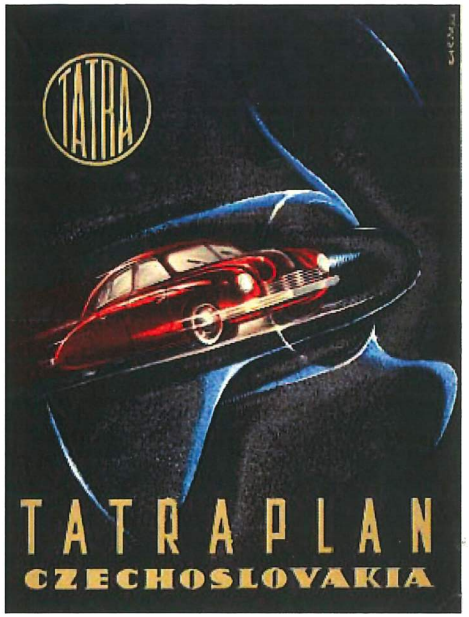
Competitions:

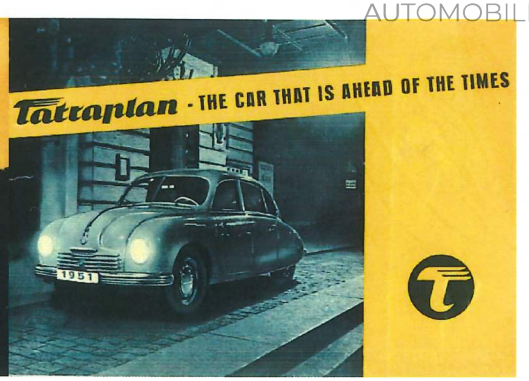
1949 Internationale Österreichische Alpenfahrt : first four places out of 22 cars in 2,000 cc class

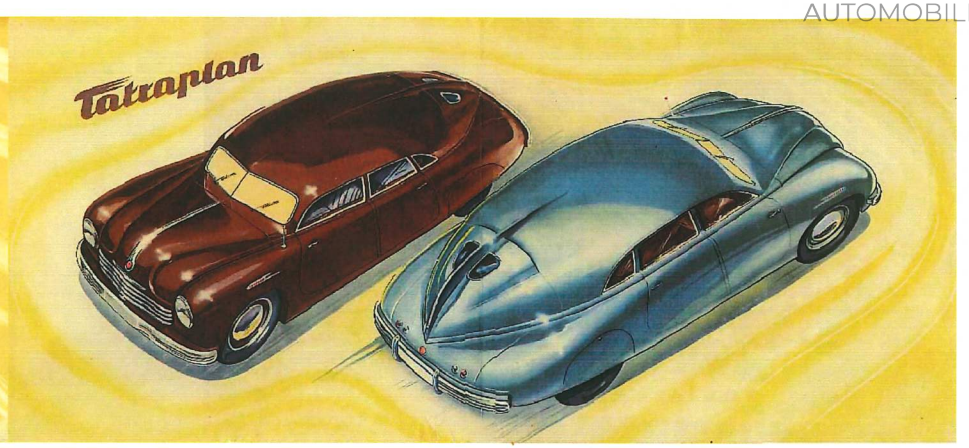
1951 Larga-Larga Gilgil, Nairobi: winner of its class, equal time to the fastest



Tatraplan in Prague

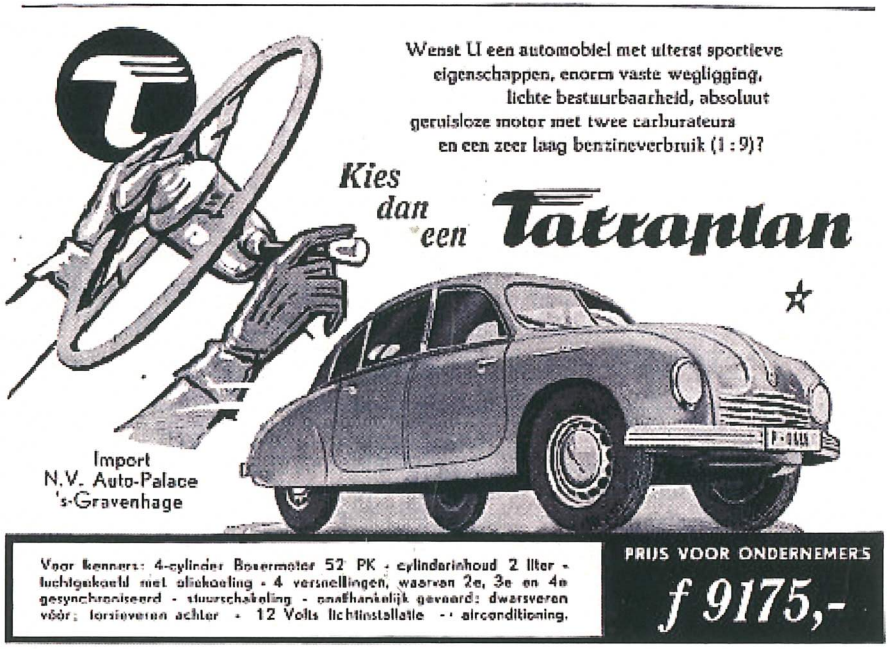






Tatraplan

AUTO PALACE



Wenst U een automobiel met uiterst sportieve eigenschappen, enorm vaste wegligging, lichte bestuurbaarheid, absoluut geruisloze motor met twee carburateurs en een zeer laag benzineverbruik (1 : 9)?

Kies dan een **Tatraplan**

Import
N.V. Auto-Palace
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Voor kenners: 4-cylinder Boxermotor 52 PK - cylinderinhoud 2 liter - luchtgekoeld met oliekoeling - 4 versnellingen, waarvan 2e, 3e en 4e gesynchroniseerd - stuurschakeling - onafhankelijk gevoerd: dwarsveren vóór; torsieveren achter - 12 Volts lichtinstallatie - airconditioning.

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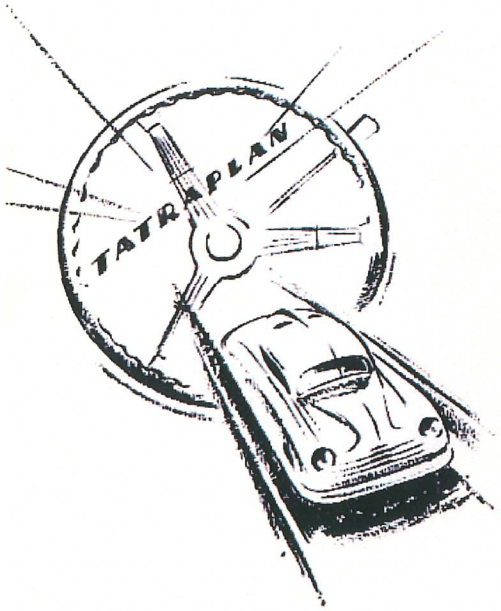


Tatra 600 - Tatraplan

A Mass-Produced Teardrop Car

Ivan Margolius

TATRAPLAN

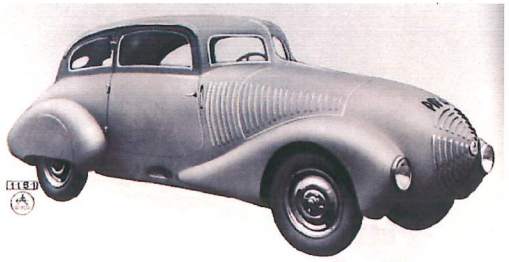
'A new horizon appears. A horizon that will inspire the next phase in the evolution of the age.' Norman Bel Geddes, *Horizons*, 1932

Take yourself back fifty years. Think of a car. Contemplate streamlining. Imagine a perfect teardrop form, the form of least resistance, on wheels. The only mass-produced automobile that fits that description would be a Tatra 600 - Tatraplan.

Tatra is the oldest automotive manufacturer in the world. It started in 1850 in the small Moravian town of Nesselsdorf (Kop•ivnice) making a variety of horse-drawn and later railway coaches. Then the factory was called Schustala & Co and from 1897, Nesselsdorf automobiles were built there. Twenty-two years later their products were re-branded with a Tatra badge and presently, innovative trucks, that have been victorious in six Paris-Dakar Rallies, are still produced there.

Why is the Tatraplan so memorable and such a milestone in automotive design evolution? It came as the end result of a line of revolutionary developments in streamlining that Tatra so bravely attempted and had an innovative monocoque body construction. Encouraged by the progress in Zeppelin airship design, early Junkers and Dornier aeroplanes, studies of natural forms by D'Arcy Wentworth Thompson in his book *On Growth and Form* and new expression in Constantin Brancusi's art and architecture of Erich Mendelsohn, the science of aerodynamics became established. In developing automobile design it was realized that in order to consume less fuel and achieve greater speed and power it was necessary to consider improvement of air penetration.

Hungarian, Paul Jaray, the main advocate of aerodynamics, who lived and worked in Switzerland obtained several patents for streamlined car bodies in the 1920's. In 1931 the Czech company Wikow produced a car called Kapka (Drop) that attempted a streamlined form.



For racing and experimental cars progress was accelerated and streamlining was applied in a number of cases. However, the general public taste was adverse to such a radical departure from the established cubic forms of vehicles and it was only in the mid 1930's that car manufacturers attempted to market streamlined cars. The Czech Tatra was such a pioneer.

In 1897, Hans Ledwinka (1878-1967), an Austrian by birth, began to work in the Nesselsdorf factory and his bold approach soon led him to the directorship of the automobile division. He introduced swing axles attached to central tubular chassis that was powered by a front air-cooled engine. This arrangement provided a very flexible framework that became proven and successful on the rough Central European roads.

In 1933 Ledwinka with Erich •belacker designed the model T77, a large fully streamlined rear air-cooled engine car that created a sensation when it was exhibited at the Berlin Autosalon. Its rear single stabilizing fin became a Tatra trademark. In the next year mass-production followed and additional streamlined models, the T77a (1935), T87 (1936) and T97 (1937) came on the market.

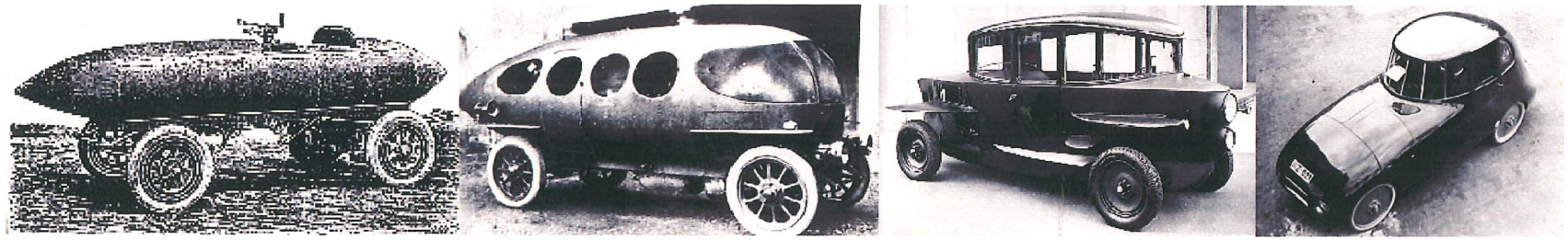
These designs were, however, a step back from a full streamlined form as they expressed the front wings separately from the main body. This is where the post-war Tatraplan succeeded. Its body, a teardrop form, fully enclosed the chassis and the wheels, wide at the front over the wheels, with a sloping split-windscreen and the back dissected by a small, almost symbolic, fin sweeping to the pointed rear lid.

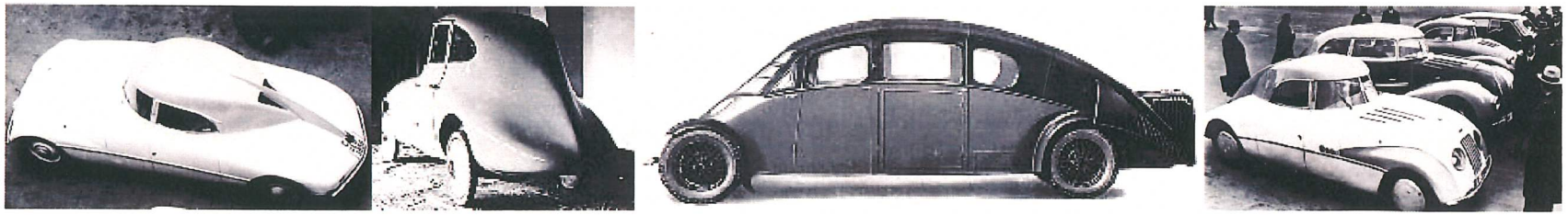
The Tatraplan had a stormy and adventurous beginning. After the Second World War Tatra wanted to bring a new design on the market that would continue the tradition of streamlined models and at the same time achieve greater improvement of comfort. The goals were to lower the overall weight, distribute it evenly over the chassis, increase the interior space, design a body with smallest drag coefficient, improve operational economy and introduce an all-metal body. The new model was to be based on the pre-war Tatra 97, designed by Hans and Erich Ledwinka of which only 508 cars were built before the occupying Third Reich stopped its production because of its closeness to the KdF-Wagen (Volkswagen).

With Hans Ledwinka in prison, gaoled for alleged and unproved collaboration during the war, (Ledwinka was released in 1951 and fully rehabilitated in 1992) the factory was left without a strong designer. The chief engineer, Julius Mackerle, who replaced Ledwinka, appointed engineer Cvetnic to

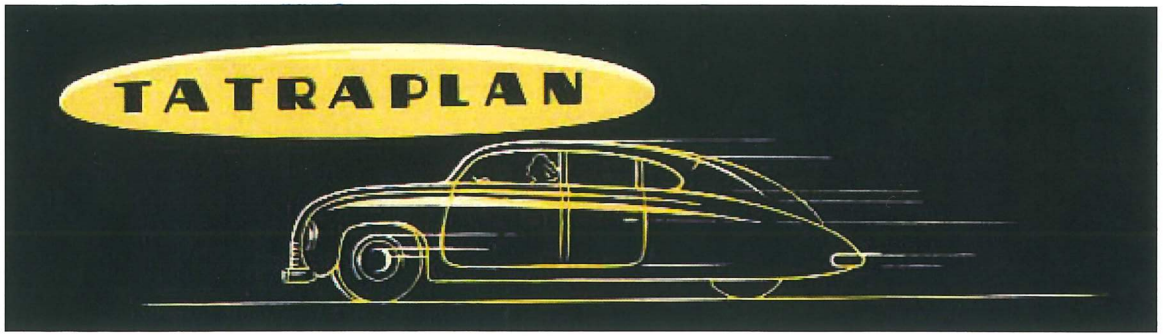
take on the role. Initially Cvetnic proposed to modernize the T97 model. This was not accepted. Then came Professor Sou•ek under whose leadership a new car began to emerge. Josef Chalupa, director of the body design department, proposed the concept of a self-supporting steel monocoque streamlined body (years ahead of the world development) with a flat punt-type frame with perforated welded box side members and a central rib that forked into a Y-form at the rear to accept a new air-cooled horizontally opposed four-cylinder engine mounted on two radial silentblocs. The first prototype was completed in December 1946. However, the tests, which followed found bad stability, inadequate power, poor engine cooling and interior heating. The second prototype, made in spring 1947, did not solve any of these problems and Sou•ek departed. Engineer Korbel, assisted by Vladimír Popelá•, was asked to build five prototypes for the 1947 Prague Autumn Autosalon. To find the best way forward Popelá• and Chalupa, through Ledwinka's former chauffeur, arranged a meeting with Hans to obtain his advice. In May 1947, at midnight, the visitors came to see Ledwinka in his prison cell bringing all the drawings of the new car with them. Ledwinka welcomed them with opened arms and after two and half hour consultation gave his views. He liked the form of the car but suggested enlarging the engine capacity, redesigning the engine fan-cooling arrangement and rear axle assembly, moving the headlights from the bonnet to the edge of the front wings, introducing roof cooling vents and keeping the traditional Tatra rear fin which was missing on the prototypes.

The new cars were delivered to the Autosalon within hours to spare and to a widely acclaimed success. When tested in a wind tunnel the Tatraplan, its name implying a connection to a contemporary two-year economic 'plan' as well as its streamlining inspired by aeroplanes (Colloq. Czech: ero'plan') had an impressive 0.32 drag coefficient. The Tatraplans were triumphant in a number of rallies, especially in 1949 •sterreichische Alpenfahrt where they gained the first four places. By the beginning of 1953 6,342 units were produced, a third of which were exported into 17 countries but not into the UK.





Tatra was the only company faithfully embracing streamlining principles and bringing them first into mass-production. Individual experiments carried out by others such as Jenatzy's La Jamais Contente (1899), Conte Ricotti's Alfa Romeo by Castagna (1913), Rumpler's Tropfen-Auto (1921), Jaray's Ley (1922), Audi (1923) and Dixi (1923) and Burney's Streamliner (1930) paved the way for Tatra's achievement. The line of Tatra teardrop streamlined cars created a benchmark for the future development of the automobile design.



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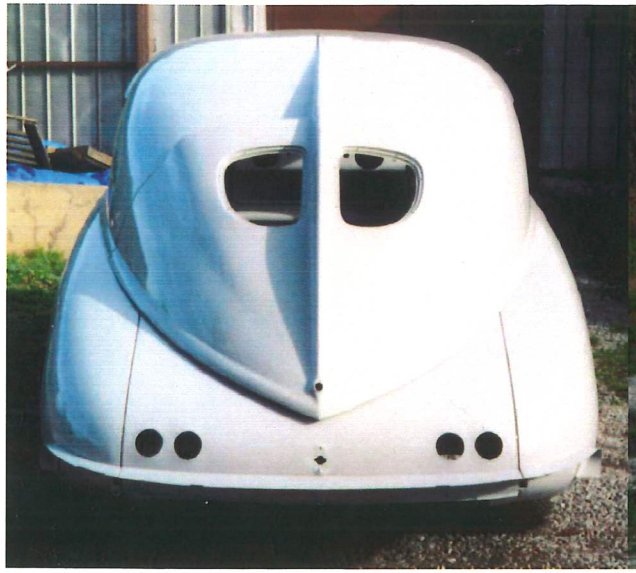
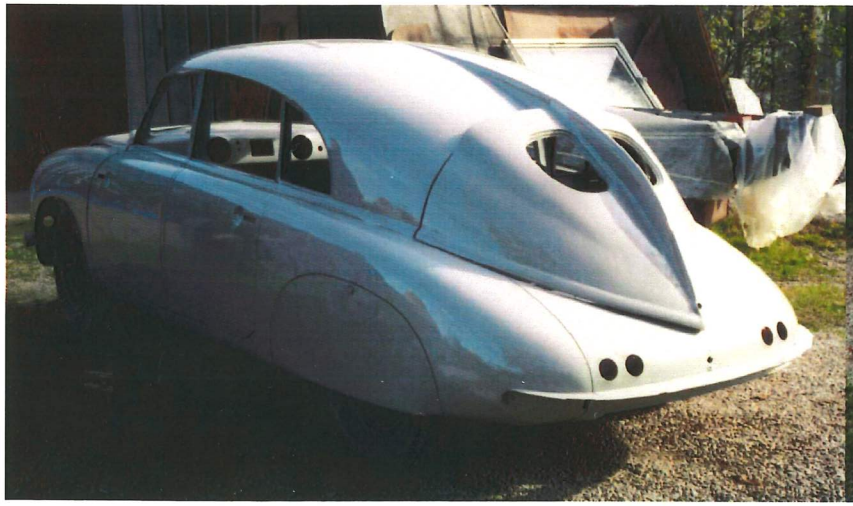
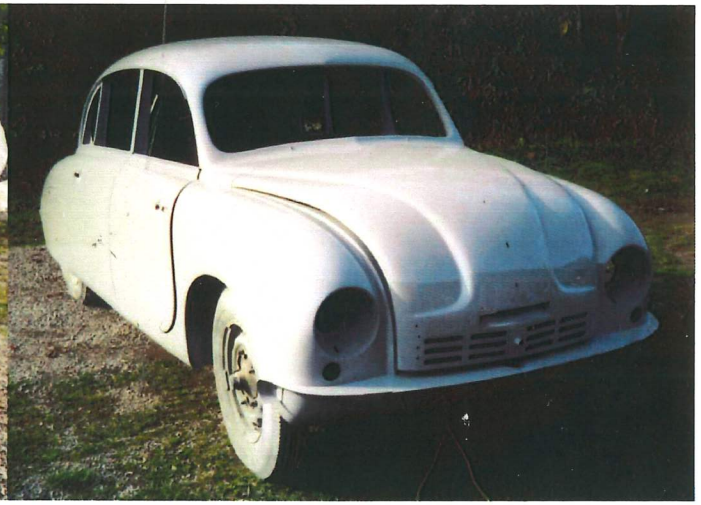
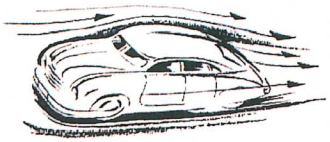
Tatraplan

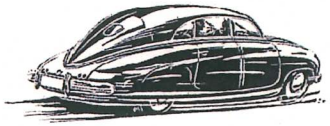
Tatra 600 - Tatraplan body number 70.208 1949 under restoration





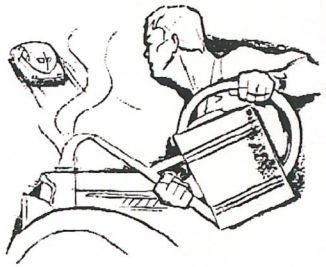






'Very informative!' *Classic & Sports Car*

Last updated 21 December 2004



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