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Transverse Section View of 1600 Engine

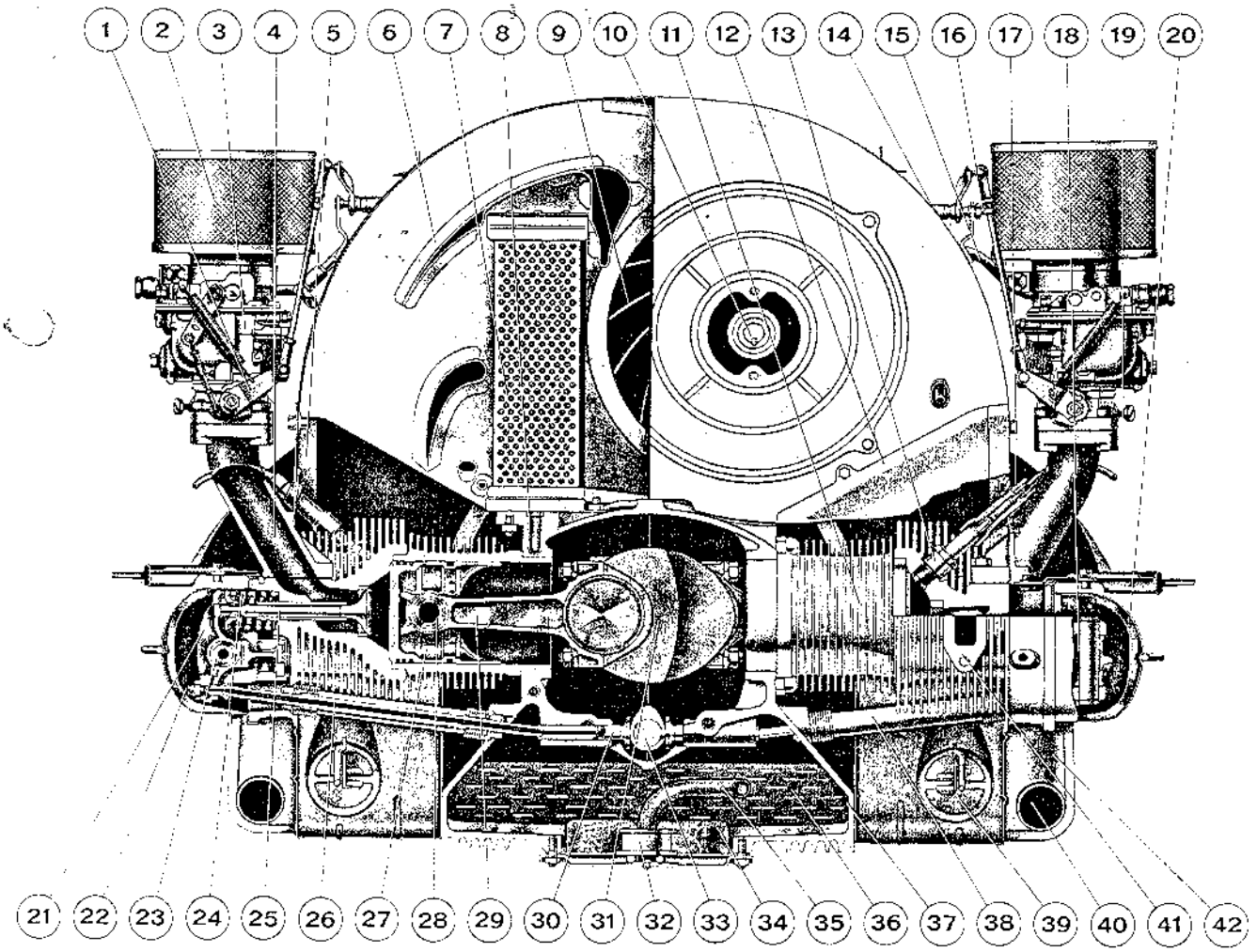

Fig. 5

① Throttle lever
② Metal mesh air filter
③ Dual throat downdraft carburetor
④ Intake manifold
⑤ Side cover plate, vertical
⑥ Fan housing
⑦ Oil cooler
⑧ Passage from oil cooler to crankcase
⑨ Blower impeller
⑩ Generator shaft
⑪ Cylinder
⑫ Cylinder cover plate
⑬ Spark plug
⑭ Throttle linkage
⑮ Fuel line
⑯ Throttle connecting link
⑰ Spark plug terminal
⑱ Exhaust rocker arm spindle
⑲ Cover plate
⑳ Rocker box cover
㉑ Intake valve rocker
㉒ Valve adjusting screw
㉓ Intake rocker arm spindle
㉔ Valve spring
㉕ Intake valve
㉖ Push rod
㉗ Pitson
㉘ Piston pin
㉙ Connecting rod
㉚ Tappet
㉛ Crankshaft
㉜ Magnetic oil filter
㉝ Camshaft
㉞ Oil strainer
㉟ Oil suction pipe
㊱ Oil sump
㊲ Crankcase
㊳ Push rod tube
㊴ Lower air guide (heat exchanger)
㊵ Exhaust pipe
㊶ Exhaust port
㊷ Heater junction box

Longitudinal Sectio

① Gland
② Flywhe
③ Oil sea
④ Air gui
⑤ Cooling
⑥ Engine
⑦ Blower
⑧ Fan ho
⑨ Metal
⑩ Engine
⑪ Oil fille
⑫ Genera
⑬ Genera
⑭ Small V
⑮ V-belt
⑯ V-belt
⑰ Large V
⑱ Air gui
⑲ Engine
⑳ Heater

.ongitudinal Section View of 1600 Engine

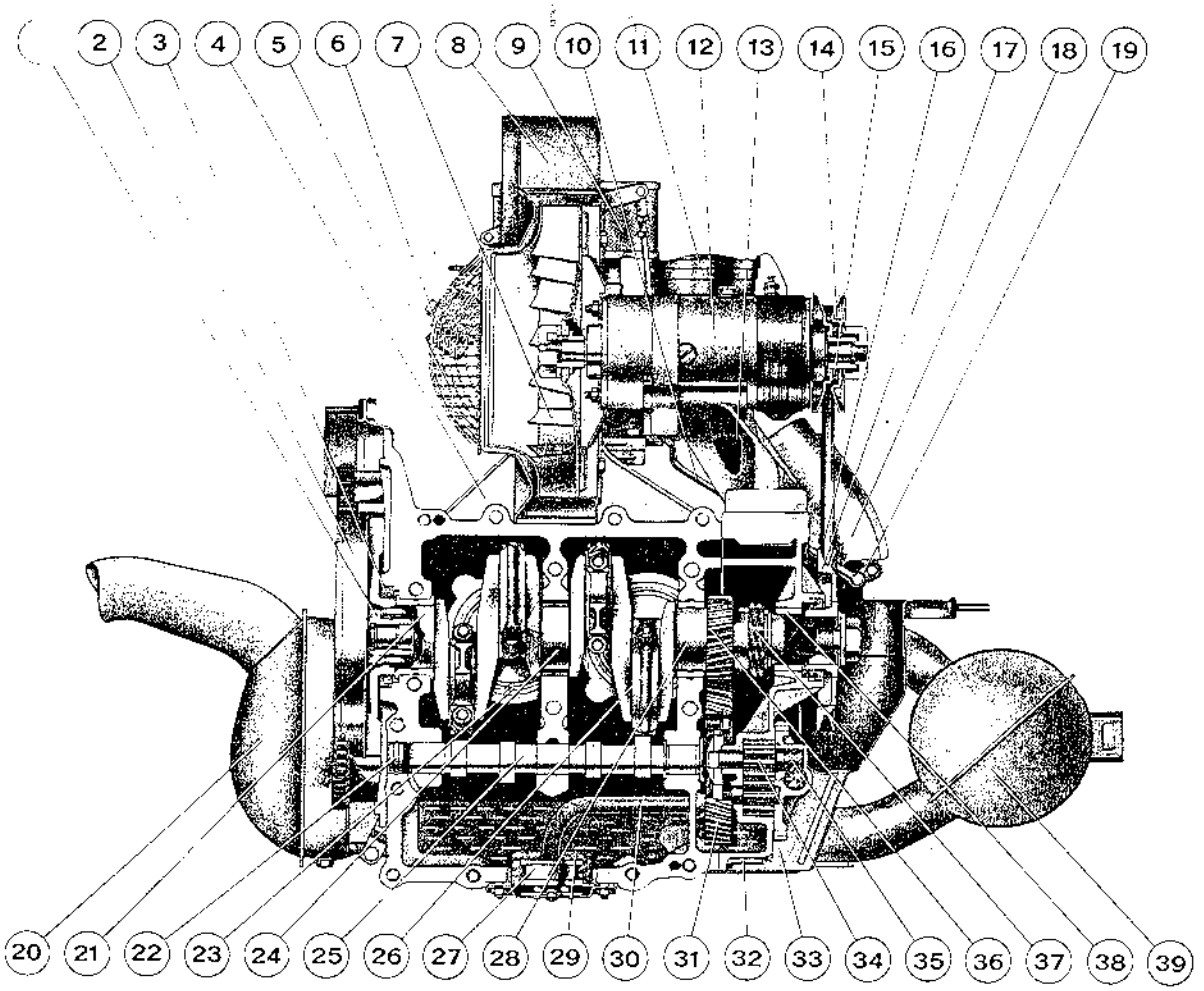

Fig. 6

① Gland nut
② Flywheel
③ Oil seal
④ Air guide plate
⑤ Cooling air inlet
⑥ Engine compartment heater thermostat
⑦ Blower impeller
⑧ Fan housing
⑨ Metal mesh air filter
⑩ Engine compartment heater control linkage
⑪ Oil filler cap
⑫ Generator
⑬ Generator bracket
⑭ Small V-belt pulley
⑮ V-belt tension adjusting spacers
⑯ V-belt
⑰ Large V-belt pulley
⑱ Air guide duct for engine compartment heating
⑲ Engine compartment heater control lever
⑳ Heater junction box (heat exchanger)
㉑ Main bearing journal No. 1
㉒ Camshaft end plug
㉓ Piston and cylinder
㉔ Main bearing journal No. 2
㉕ Camshaft
㉖ Connecting rod bearing cap
㉗ Magnetic oil filter
㉘ Main bearing journal No. 3
㉙ Oil strainer
㉚ Oil suction pipe
㉛ Camshaft timing gear
㉜ Timing case cover
㉝ Lower air guide (heat exchanger)
㉞ Gear oil pump
㉟ Tachometer drive pinion
㊱ Timing pinion
㊲ Distributor drive pinion
㊳ Main bearing No. 4
㊴ Muffler

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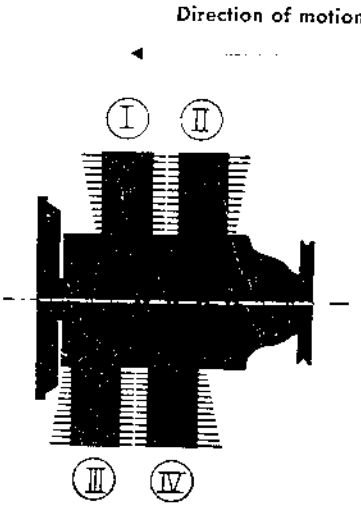
Numbering of Cylinders and Main Bearings

Cylinders



Viewed in direction of motion

Cylinder I: front, right side
Cylinder II: rear, right side
Cylinder III: front, left side
Cylinder IV: rear, left side

Fig. 4

21 22

Main Bearings

No. 1 main bearing: internal dia. 50 mm (1.968 in.), solid with shoulder (flywheel end)
No. 2 main bearing: internal dia. 50 mm (1.968 in.), split
No. 3 main bearing: internal dia. 50 mm (1.968 in.), solid
No. 4 main bearing: internal dia. 40 mm (1.575 in.), solid (pulley end)

The flywheel and starter ring is attached to the crankshaft by a gland nut (which contains the pilot bearing) and eight dowel pins. The timing and distributor pinions are held by a woodruff key. The V-belt pulley is attached to the crankshaft by a central bolt and a woodruff key. There are oil seals at both the flywheel and V-belt pulley ends of the crankshaft. The crankshaft bearings of the connecting rods are replaceable lead-bronze inserts. The piston pins are supported in bronze bushings.

Pistons

The pistons are light alloy and have three rings in the 1600 S engine and four rings in the 1600 engine; the bottom ring being an oil scraper in both cases. The piston pins are full floating and are secured by lock rings.

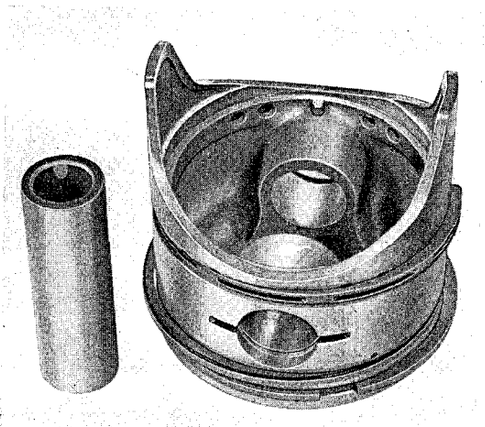


Fig. 10

Cylinders

The cylinders of the 1600 S engine are cast light alloy with hard chromed bores.
The cylinders of the 1600 engine are cast iron.
The cylinders of both engines are provided with cooling fins to effect air cooling.

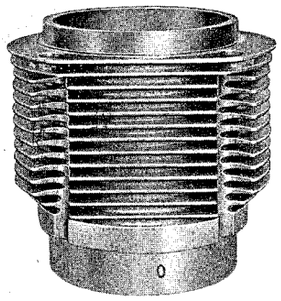


Fig. 11

Cylinder Heads

Each pair of cylinders is provided with a common heavily finned cylinder head of cast light alloy. These heads have pressed in valve seats and guides. The spark plug sockets have Heli-Coil thread inserts. The valves are overhead in a "V" pattern. No gasket is used between the cylinders and heads.

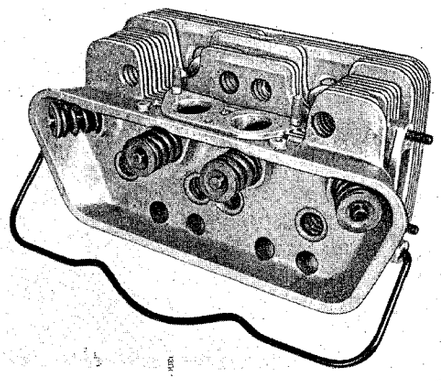


Fig. 12

Timing Gear

The camshaft is supported in three bearings directly in the light alloy crankcase without bushings. The camshaft is driven by a helical light alloy gear. The valves are lifted by the cams by way of tappets, push rods, and rocker arms. Each cam operates alternately a valve in each of two opposed cylinders. The exhaust valves are coated with high grade chrome-nickel steel.

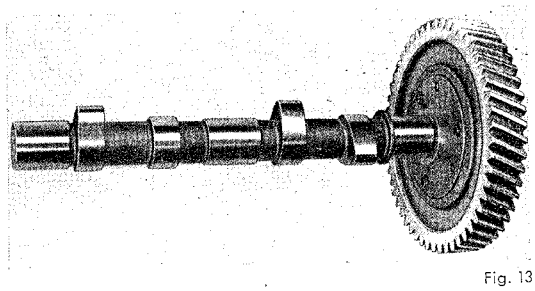


Fig. 13

Cooling System

The engine is cooled by blower circulated air. The blower impeller is mounted on an extension of the generator shaft and is driven from the crankshaft by means of an adjustable V-belt. The blower draws air through an opening in the housing and forces it over the cooling fins of the cylinders and cylinder heads. The cooling air is guided by ducts and guide plates to the cylinders.

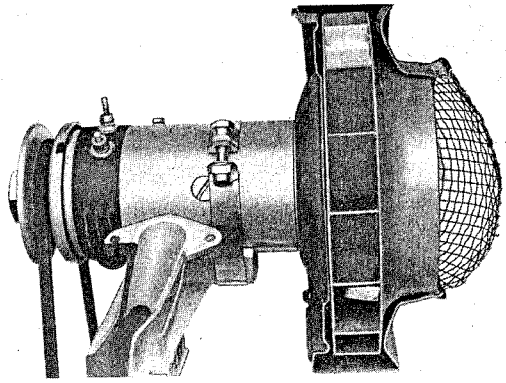


Fig. 14

Oil Circulation System

Lubrication is by a pressure oil system having a full flow oil cooler.

The gear type oil pump is located in the timing case cover and is driven by the camshaft. The oil is drawn from lowest point in the crankcase and is forced through the oil cooler into the oil passages. Part of the oil passes through the crankshaft main bearings into the drilled crankshaft and lubricates the connecting rod bearings. Another portion of the oil lubricates the camshaft, while a third passes through the hollow push rods to the rocker arms, lubricating the rocker arm bearings and valve stems. The cylinder walls, pistons, and piston pins are splash lubricated. The oil flowing from the various lubrication points returns to the crankcase where it passes through a strainer and magnetic filter before re-entering the system from the lowest point in the crankcase. An oil filter is provided in a by-pass oil circut for additional cleaning.

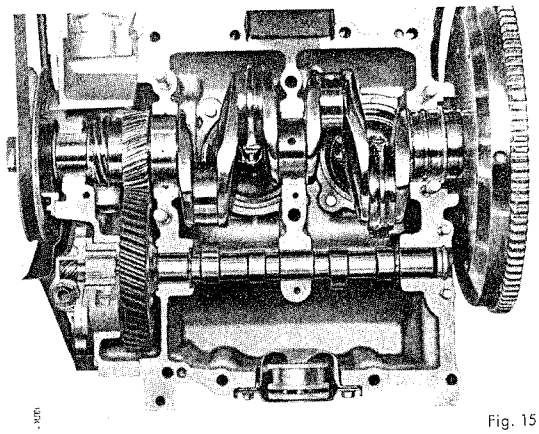


Fig. 15

Oil Cooling System

The oil cooler is located on top of the crankcase in the fan housing, and is cooled by the air from the blower. The oil system is arranged so that the oil must pass through the cooler before proceeding to the lubrication points. The cooling insures that the oil retains its lubrication quality even in warm weather at sustained high engine speeds. In cold weather when the oil is thick a pressure relief valve allows part of the oil to by-pass the oil cooler and flow directly to the oil passages.

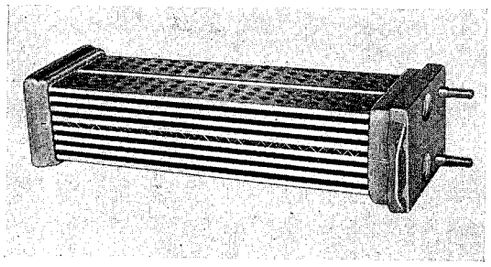


Fig. 16

Oil Pressure Indicator

A pressure actuated switch is connected to the oil line between the pump and cooler. In the closed position it lights a green lamp on the instrument panel. At pressures greater than 0.4 to 0.6 atu (6 to 9 psi) the switch opens interrupting the current to the green lamp which lights only when the ignition is on and there is low or no oil pressure.

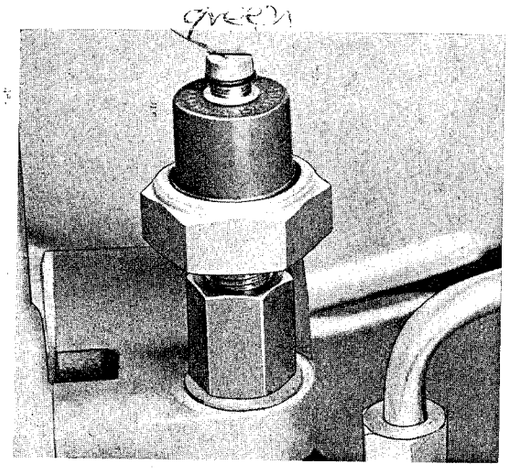


Fig. 17