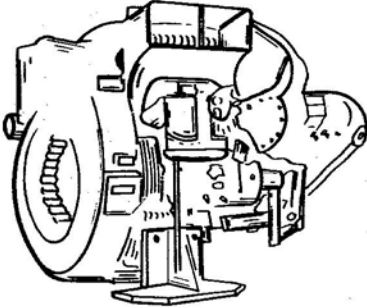


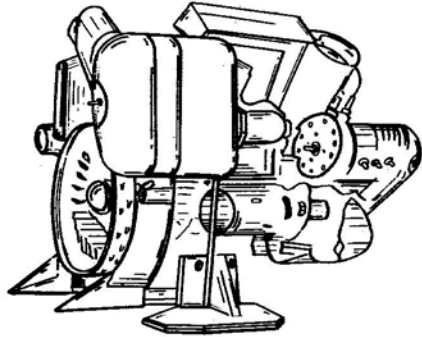
SUPPLEMENT 1.

1: Separate Lubrication System (Subarumatic)

(A): General



Subaru Sedan Deluxe
Subaru Custom



Sambar Truck
Sambar Van

In the past, practically all 2-cycle engines for automobiles used a mixed fuel of gasoline and oil. Recently, however, to eliminate the inconvenience of using mixed fuel and to compensate the disadvantages inherent in 2-cycle engine, new methods in which gasoline and lubricating oil are supplied to the engine from two separate tanks are being adopted.

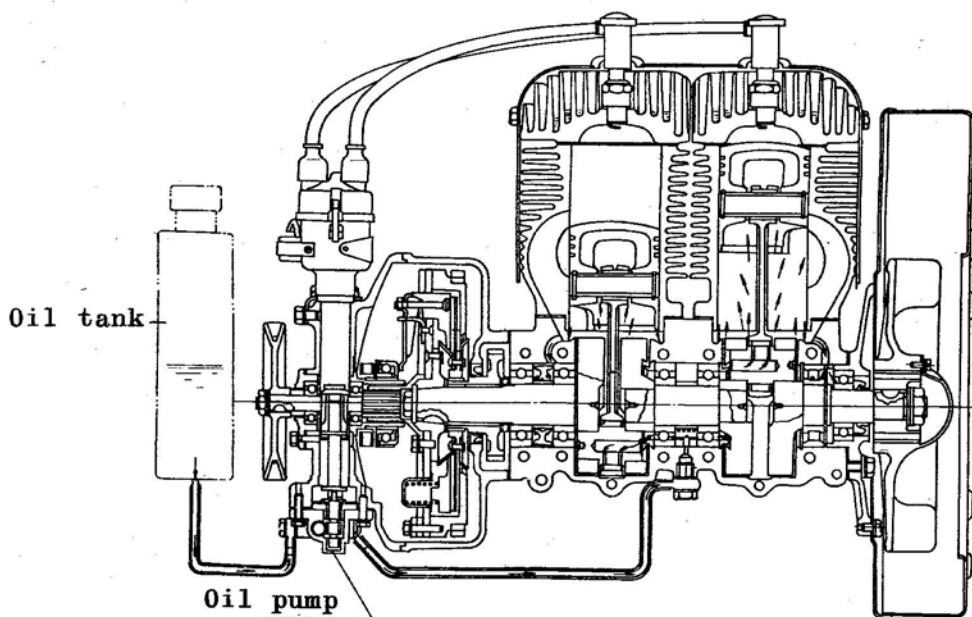
However, these methods are not very much different from a conventional fuel system; for example, in these methods, either gasoline and lubricating oil are mixed in the carburetor or the lubricating oil is spouted inside the suction tube and then the oil is sent inside the engine with the suction gas.

The separate lubrication in the Subaru (Subarumatic) is completely different in essential respects from the methods described above. The use of separate tanks for gasoline and lubricating oil is the same as in the cases of the above methods. In the Subarumatic method, however, the oil is sent directly to the crankshaft bearings by an oil pump for an adequate and positive simultaneous lubrication of the bearings, crank pins, large and small ends of the rods, pistons and cylinders with fresh oil not diluted by gasoline.

Because of the above, the Subarumatic methods has the following advantages:

- (a): The trouble of using mixed fuel is eliminated, making the fuel supply simple.
- (b): Because fresh oil of high lubricability, undiluted by gasoline, is always supplied to the principal parts of the engine, the life of the engine is prolonged and it exhibits high durability and efficiency in continuous high-speed running.
- (c): Exhaust smoke which is regarded as a disadvantage of the 2-cycle engine is decreased; the amount of carbon that adheres to the combustion chambers of the cylinder heads, exhaust ports, piston heads, spark plugs, exhaust tube and muffler, etc., is kept down to a minimum, practically eliminating the troubles due to accumulation of carbon on these parts and the necessity of maintenance.
- (d): Since the proper amount of oil is always supplied to the engine according to the engine revolution and load variation, there is no wasteful consumption of oil and fuel cost is much less than in the case of mixed fuel.
- (e): Unlike a 4-cycle engine, there is no necessity of changing oil, thus simplifying the lubricant control.

(B): An outline of Subarumatic.



An outline of the separate lubrication method (Subarumatic) is described below.

First, gasoline is supplied from the tank which was used for mixed fuel. Oil is supplied from a tank provided in the engine room. The oil tank is attached to the engine room right side fender apron with brackets and supporters. It is made of white translucent polyethylene; its capacity is 2.5 (5.28 U.S. pts, 4.40 Imp. pts.).

The oil pump is Mikuni Kogyo's Model 1P-7D-2, is mounted below the clutch housing cover and is driven by the same method as the distributor. Oil pump pressure-feeds oil from the oil tank into the central part of the engine crankcase through a check valve. Here, the oil diverts; some lubricates the bearing of the central part of the crankshaft; some oil splashed by an oil slinger collects in the oil groove provided on the crank web and flows into the crank pin sections. This oil also lubricates the large end of the rod and bearing; then it is splashed by the revolution of the engine and lubricates the small end of the rod, bearing, cylinder and piston, etc.

A part of the splashed oil and the oil which drips down from the lower side of the cylinder collects in an oil collecting groove provided on the case below the cylinder, flows into the crankcase and lubricates the bearings on both ends of the crankshaft.

The above is an outline of the path of the lubricating oil. (See the cross sectional drawing) Also, the oil supply is controlled by both the engine revolution and load. The oil pump is a plunger type which performs reciprocating movements while rotating and since it is driven by gears, its actuation is proportional to the revolution of the engine.

On the other hand, the reciprocating movement is a variable stroke type and regulates the stroke of the carburetor throttle valve movement through a Boden cable.

Consequently, the amount of oil increases when either the engine revolution or the opening of the carburetor throttle valve increases.

Also, to facilitate oil supply, a float and an electric transmitter which interlocks with the float are provided in the oil tank; when the oil in the tank drops to 0.8 ℓ (1.69 U.S. pts, 1.41 Imp. pts), the oil warning lamp of the combination meter in the driver's compartment starts to flash. When the oil is reduced to 0.5 ℓ (1.06 US pts, 0.88 Imp. pts), the oil warning lamp lights continuously to indicate the need for replenishing oil.