-CHAPTER 7 -

FUEL AND OIL SYSTEM

7.1 Fuel System (Plate 7.1)

7.1.1 Description

Fuel is contained in two "Pliocel" synthetic rubber fuel cells located in the "D" nose at the wing root. Each cell has a capacity of 13-1/2 Imperial Gallons (61 litres). The maximum which may be carried in Series -2 aircraft with two crew, and full military equipment is limited to a value stencilled on the aircraft.

Each cell has a filler cap and a float type, mechanically operated fuel contents gauge, flush mounted on the upper surface of the wing. The gauges show in large white figures the tank contents when the aircraft is in flying position and in smaller green figures the contents in the "tail down" attitude. The cells are filled independently and cannot drain into one another. Each tank contains a sump and drain plug, the latter projecting below the lower surface of the wing for accessibility.

The fuel tank vent orifices are located on the upper surfaces of the wings. These ensure that the fuel cells are always pressurized to the extent of the dynamic pressure on the orifice created by the airspeed of the machine. The fuel cells are thus distended to prevent any possibility of collapse. A ball check valve is incorporated in the vent assembly to seal the vent when the aircraft is inverted.

The complete fuel system is shown diagrammatically on Plate No. 7.1 with alternative methods of control. Both systems are manually operated by interconnected levers which project from the control box in front of each control column. In the current production aircraft the control levers operate a selector valve, which allows fuel to be drawn from the selected tank to the engine-driven DH.AC fuel pumps, Type A-10-1A. Alternatively, on early models fuel may be drawn from the tanks simultaneously. In the latter case, an "on-off" cock is operated by the pilot's control lever, and fuel leaving the tanks passes through non-return valves to a common "T" junction, then via the cock to the pumps on the engine. In either system an additional fuel filter, Type C-1A may be installed in the pipe line to the dual pumps.

7.1.2 Servicing

It is recommended that fuel having a rating not inferior to 80 octane, and not having more than 4 c.c. T.E.L. per gallon be used.

Caution: Do not use alcohol blended fuel. Alcohol is a solvent of the material from which the "Pliocel" fuel cells are made.

7.1.2 (cont'd)

The fuel cell sump is drained by removing the wire locked plug, AGS 566/B (1/4 BSP), with DHC 55/2 aluminum gasket. This plug is located immediately outboard of the wing root fillet and just forward of the spar. If it is not desired to drain the fuel cell completely, it should only be necessary to allow a small quantity (about 2 or 3 fluid ounces) of fluid to drain out before replacing the plug. The plug must be wire locked using 18 SWG locking wire.

Only the fuel cells can be drained at these points. To drain the fuel in the pipe lines it is necessary to disconnect the Hose A1516 at the banjo joint to each sump (when a fuel selector valve is fitted) or the DHS.36/12 coupling to each non-return valve (when the system employs an "on-off" cock). Wing fillets must be removed to accomplish this.

A fuel filter, if installed, will be mounted on the port engine bearer. It is drained by opening the drain valve in its lower casing. This valve rotates left hand to open and right hand to close. It must be wire locked. For cleaning or replacement slacken off the wing nut and clamp and remove the lower casting. The wing nut must be wire locked on reassembly of the unit.

The fuel flow through the fuel system should be at the rate of at least 19 Imperial Gallons (86 litres) per hour.

It is important that the fuel cell vent assembly be clear. It is possible to check this by blowing through the vent air intake orifice.

In the event of damage to the Pliocel fuel cell, repairs can be made by using the Pliocel Field Repair Kit which is available either from the de Havilland Aircraft Co. or the Goodyear Tire & Rubber Co.

7.1.3 Dismantling Procedure

To remove Pliocel flexible Fuel Cell from wings:

a) Drain fuel cell by removing the AGS 566/B drain plug and DHS 55/2 gasket.
b) Remove wing root fillet.
c) Remove the special banjo fitting part number 01850, from the fuel cell sump, part number 01849. This is done by removing the AGS 1135/C banjo bolt and the two DHS 55/4 gaskets. One gasket is fitted to each face of the banjo.
d) Remove the four AS 1885/5B (4 BA) bolts which secure the sump to the bottom skin of the wing.
e) Remove the fuel tank filler opening cover plate, part number 01913, by removing the six AS 1885/5B (4BA) button head bolts.
f) Remove the eight AGS 249/22 (4BA) countersunk head screws surrounding the wing opening for the cover plate. This allows the cell to partially collapse into the tank bay.
g) Remove the cover mounting plate, part number 01912, wide gasket, part number 01911, and narrow gasket, part number 01909. These will be left loose by operation "f"

h) In order to support the filler opening sump to assist further disassembly, replace temporarily the screws removed in operation "f".
i) Remove the fuel gauge, General Electric number 57697-3, and the gasket, part number 01914, by removing the five AGS 247/17 (2 BA) cheese head bolts and three AGS 247/15 (2BA) cheese head bolts. The shorter bolts are for the three holes adjacent to the filler neck.
j) Remove the eleven AGS 247/22 (4 BA) cheese head bolts and AGS 162/B spring washers, and the four AGS 249/22 (4 BA) countersunk head bolts which retain the filler neck and cap assembly, part number 01907, and remove this assembly together with gasket, part number 01906.
k) Remove the screws replaced temporarily in operation "h".
l) Remove the four AGS 249/22 (4 BA) countersunk head screws retaining the fuel tank vent air intake to the upper surface of the wing. Support the vent body from inside the fuel cell during this operation taking care to remove and retain the check ball from the vent body and the two gaskets, part number 03203, which are located between the vent body and wing skin and between the wing skin and air intake.
m) Unfasten the four dome fasteners holding the fuel cell to the roof of the tank bay.
n) Push the fuel cell drain sump up into the tank bay until it is well clear of the root rib.
o) Withdraw the fuel cell, part number 01920 (left hand) and part number 01930 (right hand) complete with drain sump, vent body and filler opening sump, through the filler assembly wing opening.

NOTE

On reassembly, all contacting surfaces of gaskets, etc. and all screw threads should be coated thinly with Parker "Sealube" or a similar approved sealing compound.

To remove fuel cock assembly:
a) Drain complete fuel system.
b) Remove the portion of the control box cover immediately forward of the front control column. This panel, part number 01282, is retained by eleven AGS 245/22 (4 BA) round head screws with AGS 160/B washers. The Parker Kalon screws securing the control column sock to this panel should also be removed.
c) Disconnect the rod assembly, part number 01859, from the fuel cock lever arm by removing the AGS 166/2 split pin and SP4/D6 pin.

IMPORTANT

Do not disturb the length of this rod assembly. In the event that a new rod assembly is installed, it must be adjusted so

7.1.3 (cont'd)

c) (cont'd)
that the fuel cock is fully off when the cockpit levers are in the "Off" position.

d) Remove the six AGS 605/00 (Jubilee type) clips at the fuel cock. The two clips adjacent to the fuel cock secure the cock to the mounting bracket, part number 01883, and should be removed last.

e) Slide the hose couplings, part number 01894/2, away from the cock and remove the fuel cock assembly, part number 01890, complete with two pipe assemblies, part number 01888.

7.2 Oil System (Plate 7.2)

7.2.1 Description

The oil tank, of 2-2/3 Imperial Gallons (12.0 litres) oil capacity, plus 1 gallon (4.5 litres) air space, is mounted on the forward face of the firewall. Cooling air is scooped in on the port side cowling, ducted around the oil tank and exhausted through a louvre on the starboard side.

Access to the combined filler cap and dip-stick is gained through a quick release panel in the oil tank cooling shroud at the starboard side.

A Koehler drain cock, part number K.16258, is fitted under the port side of the tank. This cock is spring loaded open or closed and does not require wire locking.

An Auto-Klean pressure oil filter and a suction filter are incorporated in the engine. These components are described in detail in the Gipsy Major 1C or Major 10 Handbook.

7.2.2 Servicing

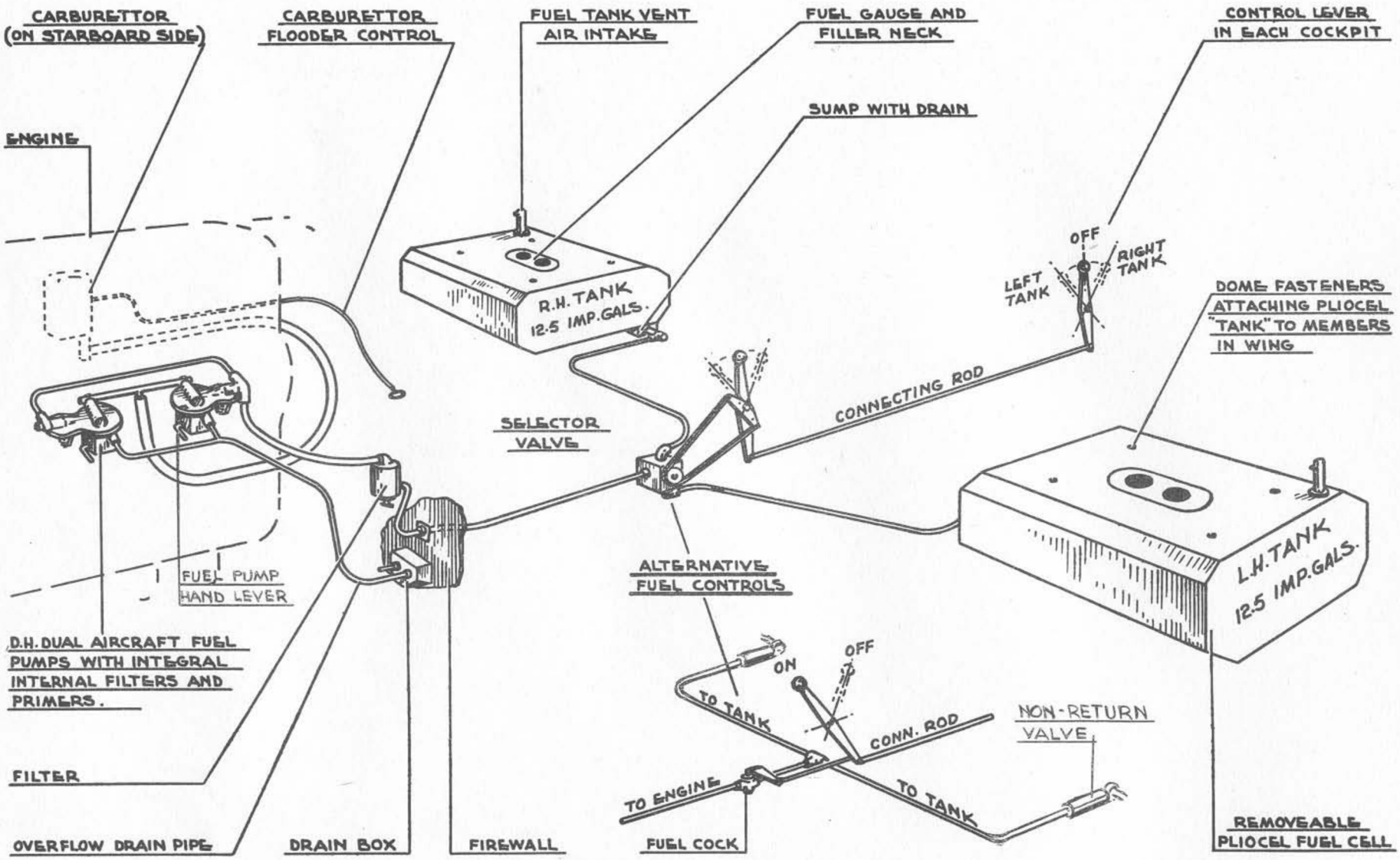
Engine oil conforming with Canadian Government Purchasing Standards Committee Specifications 3-GP - Series, British D.E.D. 2472 or AN-O-8 (Reference - Chapter 11, para. 11.3.5) may be used. The following grades are recommended under the conditions stated:

Condition	Viscosity
Tropical	120
Temperate	100
Winter	80
Arctic	60

7.2.3 Dismantling Procedure

To remove Oil Tank:

a) Drain oil tank, remove lower engine cowling panel.
b) Disconnect the oil return pipe, part number 01108, at the oil tank by removing one of the two AGS 605/1 (Jubilee type) clips at that point.
c) Disconnect the oil inlet pipe, part number 01107, at the oil tank by removing one of the AGS 605/1 (Jubilee type) clips at this point.
d) Disconnect the oil tank vent, part number 0601, at the oil tank by removing one of the AGS 605/0 (Jubilee type) clips at this point.
e) Disconnect the crankcase lower breather pipe, part number 01099, at the drain box (below the oil tank) and at the first joint forward of the drain box, by removing one of two AGS 605/1 (Jubilee type) clips at each point, and remove the pipe.
f) Remove the induction drain pipe, part number 01716, by removing one of the two AGS 605/00 (Jubilee type) clips at the drain box and undoing the union nut at the induction manifold on the engine.
g) Remove the fuel pump lower drain pipe, part number 02841, by removing one of the two AGS 605/00 (Jubilee type) clips at the drain box and also at the first joint forward of the drain box.
h) Unfasten the two safety pins, part number H20387, and withdraw the two hinge pins, part number 0519, from the piano hinges at the top and bottom of the oil tank cooler cover. Remove this cover, part number 0501.
i) Remove the six AGS 245/21 (4 BA) round head screws, with AGS 160/B washers, which retain the inlet and shroud assembly (port side) to the firewall.
j) Detach the bracket from the DHS 31/39 clip on the engine bearer, by removing the S400/BA1 (4 BA) stop nut, AGS 160/B washer and 6A1/1B bolt, and remove the oil cooler inlet and shroud assembly, part number 0522.
k) Slacken off the oil tank mounting cables, part number 0563, by removing the lower pair of A16Y/CS (2 BA) slotted nuts with AGS 166/3 split pins and AGS 160/C washers. These are located on the aft face of the firewall in the cross support channel.
l) The oil tank, part number 0550, can now be withdrawn downward and forward and removed from the aircraft.



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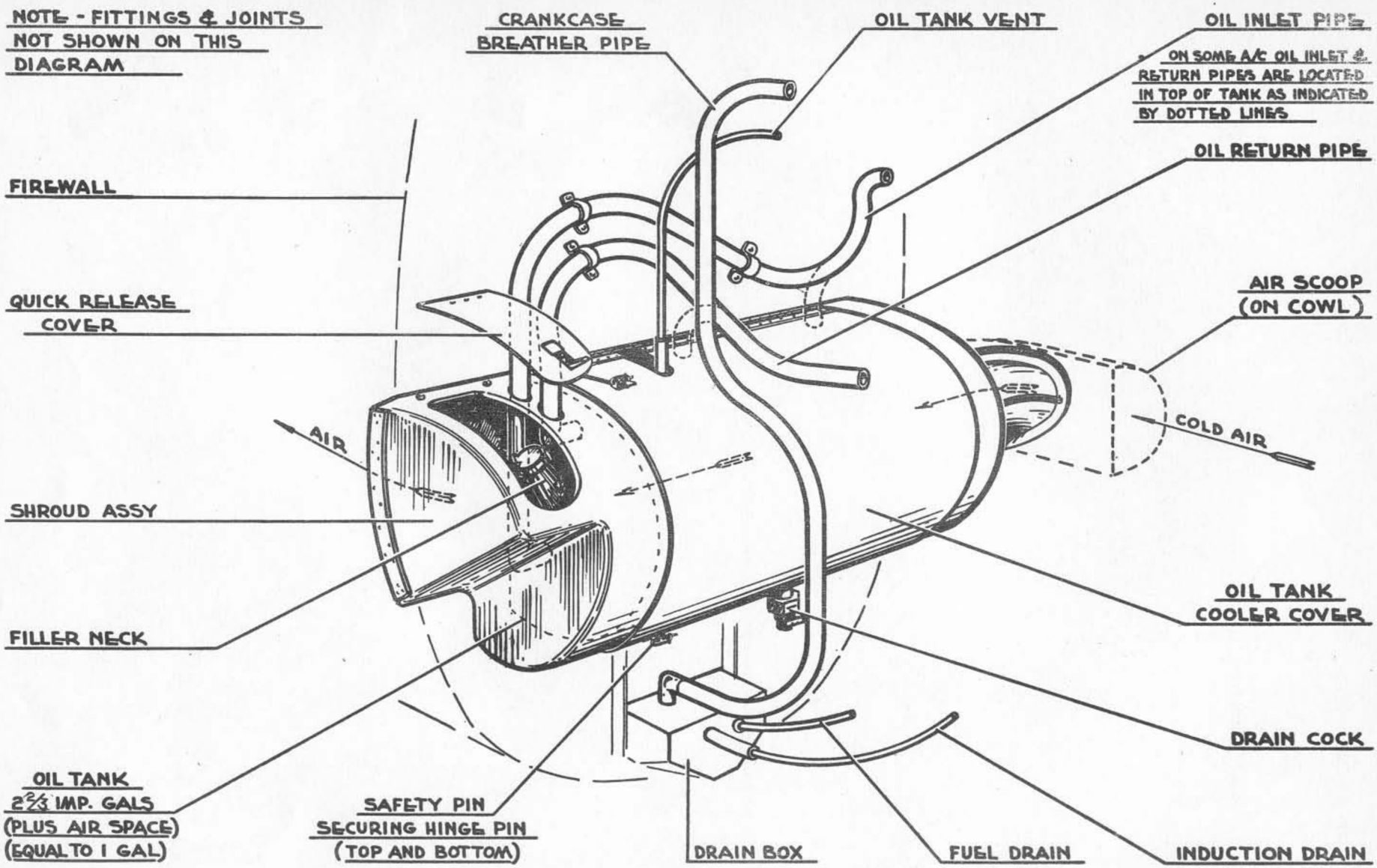
DHC 1-CHIPMUNK··· FUEL SYSTEM PLATE № 7.1

AMENDMENT № 1



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DHC 1-CHIPMUNK ··· OIL SYSTEM

PLATE Nº 7.2