

INTRODUCTION

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1. The principal operational function of the Rover Airborne Auxiliary Power Plant Mk. 10201 is to provide hydraulic pressure, d.c. electrical power for main engine starting, ground operation of the aircraft rear loading doors, and ground servicing. A secondary function is to provide hydraulic pressure for emergency operation of the aircraft rear loading doors in flight.

2. The motor power is provided by a Rover single shaft gas turbine which drives an Integral Type 180 hydraulic pump and a 9kW 24 volt d.c. Rotax generator through an auxiliary gearbox integral with the engine auxiliaries mounting plate. The generator is also used in conjunction with the aircraft batteries to start the power plant.

3. The engine, complete with its auxiliaries, is suspended by its sideways facing air intakes within a fabricated stainless steel hoop. The hoop in addition to being the main structural member of the power plant, also serves as the engine air intake ducting and provides a mounting for the input and output connections of the engine driven auxiliaries. Two stainless steel covers secured to the mounting hoop by locking peg fasteners completely enclose the engine unit to form a fire-proof box.

4. Basically the engine consists of a single sided centrifugal compressor driven by a single stage axial turbine mounted on a common shaft supported in two bearings. Air is admitted from the underside of the power plant and ducted through side intakes to the compressor rotor where it is compressed and passed to the single reverse flow combustion chamber. Fuel is injected by a Lucas air-assisted Simplex burner and the resultant mixture is initially ignited by the igniter plug fitted in the side of the combustion chamber. Combustion gases pass from the chamber downwards through a volute to a fixed nozzle ring assembly which directs them against the blades of the turbine rotor. The combustion gases are then exhausted to atmosphere through a fabricated exhaust cone and cylinder assembly via the jet pipe and shroud attached to the rear panel.

5. The auxiliaries mounting plate and gearbox on the front end of the engine provide a mounting for all engine driven auxiliaries. The fuel pump, hydraulic pump, generator and blower unit are secured to the gearbox cover, and the oil pump is carried on the rear face of the auxiliaries mounting plate. All five units are driven from the high speed pinion on the compressor shaft by a train of nine helical spur gears secured to the auxiliaries mounting plate.

6. The fuel system, consisting of a Rover Mk. VIII multi-piston fuel pump and governor, a temperature control unit, a Lucas air-assisted burner, and a motorised air pump, is designed to control the supply of fuel to the engine at one predetermined speed and does not therefore require a throttle valve, the fuel flow being metered automatically by the governor and temperature control units. A high pressure air tapping, from the compressor side of the engine, to the burner, supplemented during starting by the motorised air pump, ensures good atomisation down to very low flows. The supply to the fuel pump is taken from the aircraft fuel tank via a booster pump in the aircraft.

7. Engine lubrication is provided by a gear type pressure pump which draws its supply from an oil sump formed by the lower half of the compressor housing. The sump is equipped with an immersion heater and thermostat to assist starting at low temperatures. The engine oil cooler and generator are supplied with cold air ducted from the mounting hoop via a high efficiency blower unit driven through the auxiliaries gearbox.

8. The area inside the nacelle is protected by a Gravinier fire-wire detection system which, in the event of fire, will energise a warning device in the aircraft. A methyl-bromide bottle mounted in the aircraft can be discharged into the power plant through two nozzles in the mounting hoop.

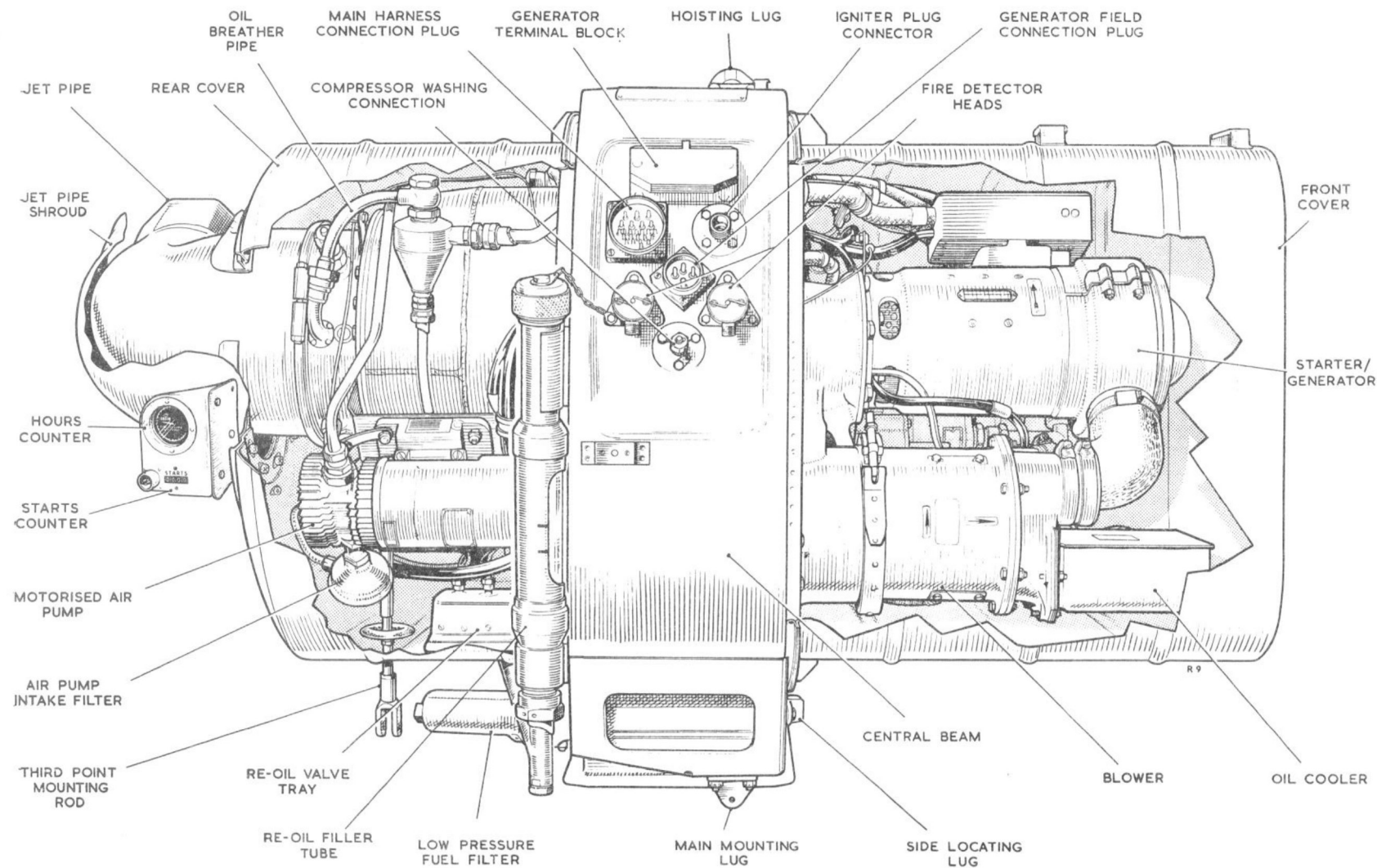


Fig. 1. Rover a.a.p. Mk. 10201 (starboard side)

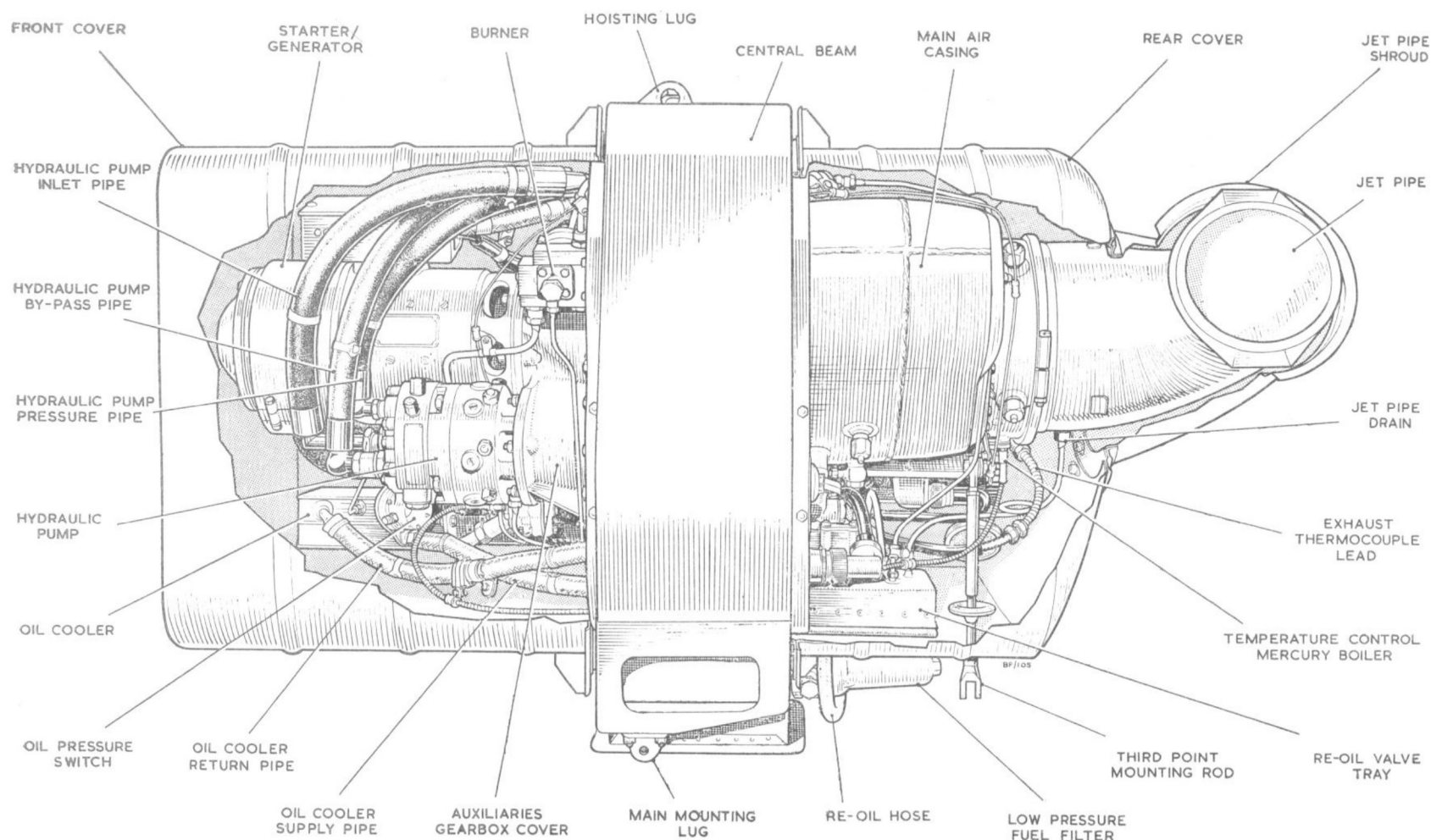


Fig. 2. Rover a.a.p. Mk. 10201 (port side)

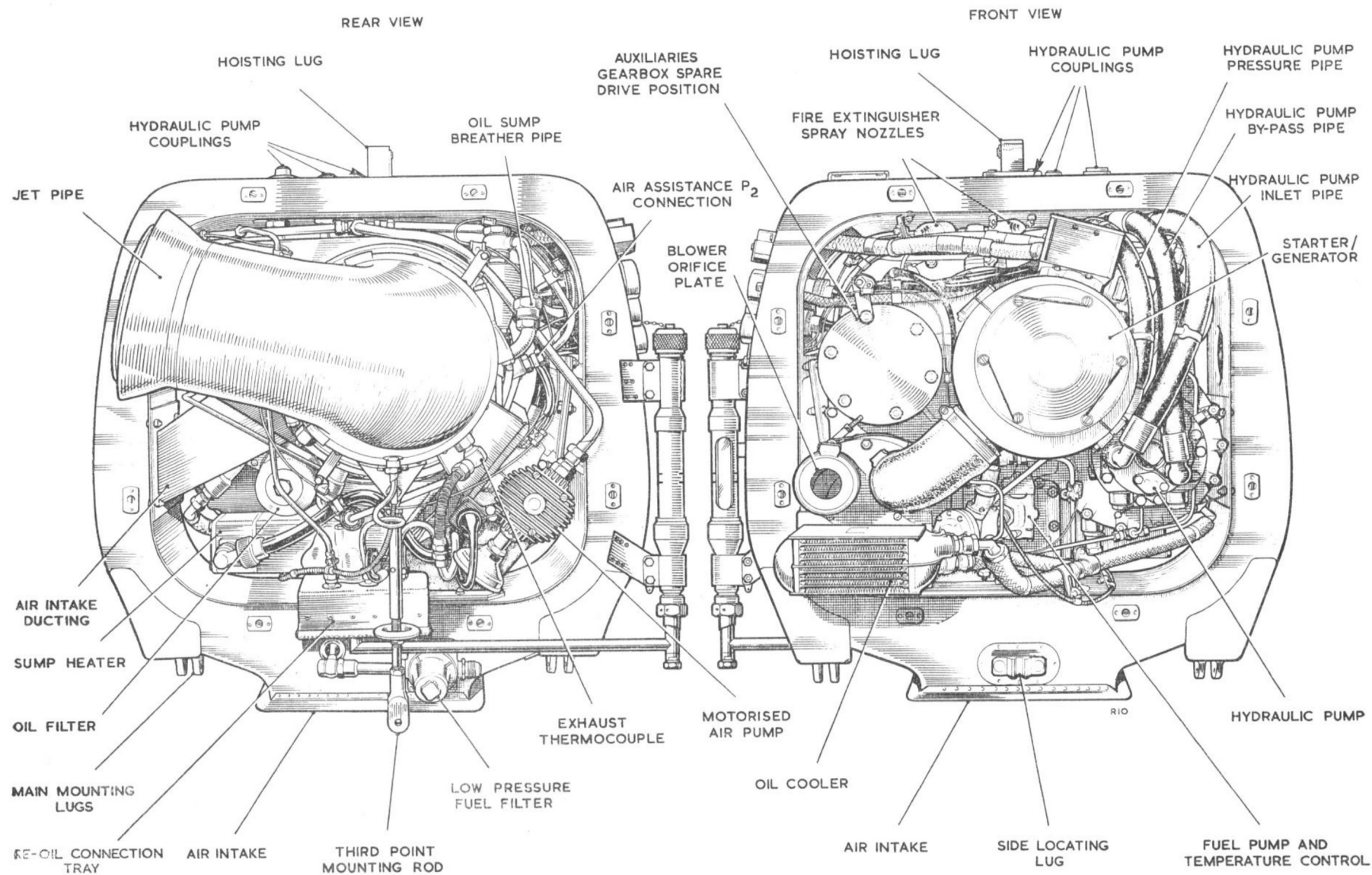


Fig. 3. Rover a.a.p. Mk. 10201 (front and rear)