A.P. 4744B, Vol. 1, Book 1, Cover 2, Sect. 3, Chap. 7

CHAPTER 7

PNEUMATIC SYSTEM

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Chapter 7 PNEUMATIC SYSTEM

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General

1. Compressed air is tapped from the engine air bleed system (*Chap.* 13, *this Cover*) to supply the following:-

- (1) Main fuel tanks pressurization.
- (2) Fuel jettison system purging (Mod 880 and 1091).
- (3) Fuel/no-air valves operation.
- (4) Wing tanks pressurization.
- (5) Bomb bay tank pressurization.
- (6) Flight refuelling pod pressurization.
- (7) Fuel system recuperators operation.
- (8) General services hydraulic system reservoir pressurization.
- (9) C S D U oil reservoirs pressurization (pre-Mod 1719).

This air, initially taken from the primary ductcircuit of the engine air bleed system, is routed through a heat exchanger in the radio bay air conditioning system, where its temperature is suitably reduced, before passing to the various services. The supply duct from the heat exchanger divides in the radio bay, one branch supplying air to the pressurization system of No. 5 to 8 fuel tanks and the other branch extending forward into the bomb bay to form a distribution pipe for the remaining services described in this chapter.

Main fuel tanks pressurization

2. To ensure an adequate supply of fuel to the engines and prevent the fuel boiling at high altitudes, the main fuel tanks are pressurized by air tapped from the engine air bleed system distribution pipe extending from the

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heat exchanger in the radio bay. The air supply is reduced in pressure to between 5.25 and 5.75 p.s.i. before entering the tanks, which remain pressurized while either engine is running. Information on this system is in Chap. 13 in this Cover and also in Cover 3, Sect. 4, Chap. 2.

Fuel jettison system purging

3. On post-Mod 1091 aircraft, a supply of air is tapped from the engine air bleed system distribution pipe in the bomb bay and fed into the fuel jettison system piping downstream of the starboard aft jettison valve. This air, which is continuously exhausting to atmosphere at the fuel jettison outlet, serves to purge the jettison pipelines of fuel after completion of a jettison operation. Further details are in Chap. 13 in this Cover and in Cover 3, Sect. 4, Chap. 2.

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Supply to fuel/no-air valves

Two fuel/no-air valves are located in the 4 base of each master fuel tank, their operation being controlled by float switches fitted in the tanks. When the level of fuel in the tank is insufficient to support the float, a contact is made and a solenoid energized to allow air, tapped from the engine air bleed system distribution pipe in the bomb bay, to close the valve. As a safety facility, Mod 930 introduces four override switches on the pilot's starboard console, by means of which the solenoids can be energized, and thus the fuel/no-air valves closed, independently of the float switches. Full details of this system are contained in Cover 3, Sect. 4, Chap. 2 and the air supplies are illustrated in Chap. 13 in this Cover.

Supply to wing tanks

5. The range of the aircraft can be extended by fitting a slipper-type fuel tank to the underside of each inner plane. Fuel from these tanks is transferred into the main fuel tanks by pressurizing the wing tanks with air tapped from the engine air bleed system distribution pipe in the bomb bay, the air supply being controlled by a single on-off switch on the observer's auxiliary panel. More information on this subject is in Chap. 13 in this Cover and in Cover 3, Sect. 4, Chap. 2, Appendix 1.

Supply to bomb bay tank

6. Air, for pressurizing a fuel tank which may be fitted in the bomb bay, is taken from the engine air bleed system distribution piping at a four-way junction in the accessories bay rear compartment. The supply pipe, which is blanked off when the tank is not installed, extends rearwards into the bomb bay to the pressurization system mounted at the forward end of the tank, full details of which are contained in Cover 3, Sect. 4, Chap. 2, Appendix 2. An on-off switch located on the observer's auxiliary panel controls the air supply (Chap. 13, this Cover).

Supply to flight refuelling pod

To pressurize a flight refuelling pod, 7. which may be fitted on a pylon beneath the starboard inner plane in place of the wing tank, a supply of air is tapped from the starboard wing tank pressurization pipe. When the pod is not installed, the supply pipe is blanked off flush with the undersurface of the wing. The air supply is controlled by valves fitted in the pylon to which the pod is secured, although the wing tanks pressurization system must be switched on before air is available. Details of the air supply are also in Chap. 13 in this Cover and the operation of the flight refuelling pod is described in Cover 3, Sect. 4, Chap. 2, Appendix 3.

Supply to recuperators

8. Two recuperators are fitted to the aircraft to automatically maintain the fuel supply during inverted flight or negative g conditions. To operate these recuperators, an air supply is tapped from the engine air bleed system distribution piping at the four-way junction on the starboard side of the accessories bay rear compartment. The pressure of the air supply is reduced to approximately 20 p.s.i. before reaching the recuperators (Chap. 13, this Cover and Cover 3, Sect. 4, Chap. 2).

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Hydraulic system reservoir pressurization

9. The general services hydraulic system reservoir is pressurized by air tapped from the engine air bleed system distribution piping at the four-way junction in the rear accessories bay. Before entering the reservoir the air is reduced in pressure to between 15 and 20 p.s.i. (Chap. 6 and Chap. 13, this Cover).

CSDU ail reservoirs pressurization (pre-Mod 1719) 10. A supply of air, taken from No. 1 to 4 fuel tanks pressurization piping in the bomb bay at a point after the pressure reducing valves, is used to pressurize a constant speed drive unit oil reservoir mounted below the front end of each engine (*Chap.* 13, *this Cover* and Cover 3, Sect. 4, Chap. 1). On post-Mod 1719 aircraft, non-pressurized types of oil reservoirs are fitted, the redundant pipe lines are removed and the tapped air supply beneath No. 2 fuel tank is blanked off.