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No. 427 SQUADRON FLIGHT ENGINEER SECTION

DRILL FOR USE OF FUEL TANKS

It is essential that all of the fuel tanks in the Lancaster aircraft are tested within a short time of take-off, to see that fuel can be drawn from either the No. 1 or No. 2 tanks. To ensure that this is done the appropriate drill as set out below is to be carried out on all flights.

- A. For No. 1 and No. 2 tanks in use.
- B. For No. 1, No. 2 and No. 3 tanks all full.
- C. For No. 1, No. 2 and No. 3 tanks, and the long range tanks all full.

A. With For No. 1 and No. 2 tanks in use.

1. Take-Off

- (i) Selector cock on No. 2 tank
- (ii) No. 1 and No. 2 pulsometer pumps ON
- (iii) If petrol failure occurs on take-off, the Flight Engineer immediately turns the selector cocks to No. 1 tank.

2. When Airborne

At 2,000 feet switch off pulsometer pumps.

3. In Flight

- (i) When 120 gallons of fuel have been used from each No. 2 tank, Flight Engineer informs Captain and changes selector cocks from No. 2 to No. 1 tanks. (This will be approximately 1 hour after take-off)
- (ii) Fly on No. 1 tanks for one hour. Check that fuel is being used from No. 1 tanks by observing petrol gauge readings.
- (iii) After one hour Flight engineer informs Captain that fuel system is correct and changes bank to No. 2 tanks.
- (iv) Continue to draw fuel from No. 2 tanks until each No. 2 tank has approximately 100 to 150 gallons left by fuel gauge readings, then the Flight engineer informs Captain and changes selector cocks back to No. 1 tanks.
- (v) The 100-150 gallons left in No. 2 tanks is only to be used for emergency.

B. No. 1, No. 2 and No. 3 tanks all full.

1. Take-off

- (i) Selector cock on No. 2 tanks
- (ii) No. 1 and no 2 pulsometer pumps ON
- (iii) If petrol failure occurs on take-off, the Flight engineer immediately turns the selector cocks to No. 1 tanks.

2. When airborne

At 2,000 feet, switch off pulsometer pumps.

3. In Flight

- (i) When 120 gallons of fuel have been used from each No. 2 tank, Flight Engineer informs Captain and changes selector cocks from No. 2 to No. 1 tanks. (This will be approximately 1 hour after take-off)
- (ii) Flight Engineer then switches on No. 3 tanks pulsometer pumps, transfers fuel from no. 3 tanks to No. 2 tanks. Flight Engineer checks that fuel is being transferred by watching No. 3 and No. 2 tank gauges. Flight Engineer also checks that fuel is being used from No. 1 tank by checking gauges.
- (iii) When No. 3 tanks are empty, switches off No. 3 pulsometer pump, switches and changes selector cock from No. 1 tank to No. 2 tanks. Continue to use No. 2 tanks until 100 to 150 gallons are left in each No. 2 tank. When flight Engineer informs Captain and switches selector cocks back to No. 1 tanks for the remainder of the flight.
- (iv) The 100-150 gallons left in No. 2 tanks is only to be used for emergency.

C. No. 1, No 2 and No 3 tanks and the Long range Fuel tanks

1. Take-Off

- (i) Selector cock on No. 2 tanks
- (ii) No. 1 and no 2 pulsometer pumps ON
- (iii) All master fuel cocks on.
- (iv) If petrol failure occurs on take-off, the Flight Engineer immediately turns the selector cocks to No. 1 tank. Pilot make immediate landing at his base after lightening the aircraft to 5,,000 lbs.

2. When Airborne

- (i) At 2,000 feet switch off immersed fuel pumps,
- (ii) After thirty minutes flight change to No. 1 tanks.
- (iii) When sufficient fuel has been used from No. 1 tanks to equal the amount carried in the long range tanks (i.e. if the two tanks fitted are 400 gallons must be used from each No. 1; if one long range tank if fitted 200 gallons must be used from each No. 1 tank, then changes No. 2 tanks.
- (iv) Having changed to No. 2 tanks start pumping the contents of the long range tanks into the No. 1 tanks. The correct sequence of this is:
 - (a) Turn on both long range fuel cocks situated behind the front spar.
 - (b) Switch on the pump switches and fuel contents gauges
 - (c) When the pulsometer are switched on the petrol immediately starts to flow into No. 1 tanks and it will take approximately 60 minutes to transfer the whole fuel load either the 400 or 800 gallons.
 - (d) During the pumping process a careful watch must be maintained on the fuel contents of the gauges on No. 1 tanks to ensure that the petrol is being transferred evenly to both No. 1 tanks. In the event of one No. 1 tank being filled before the other the long range fuel tank cock to No. 1 tank that is filled first is to be turned off, thus allowing the flow to go to the other No. 1 tank.
- (v) While the fuel is being transferred from the long range tank to No. 1 tanks, the aircraft will be flying on its No. 2 tanks and as the fuel transfer will take at least 60 minutes the No. 2 tanks will be sufficiently empties to all for the transfer of the No. 3 (outer) tanks to the No. 2 tanks. Accordingly, as soon as the long range tanks are emptied the petrol is to be transferred in the normal manner from the No. 3 to No. 2 tanks. This means that after the aircraft has been airborne for 5 to 5 1/2 hours the No. 1 tanks will be full and the No. 2 tanks will be topped up from the No. 3 tanks, i.e. after 5 1/2 hours the aircraft will have full No. 1 and No. 2 tanks.