



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Washington, D.C. 20594

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**Attachment 19 – B-17 Checklist {Excerpt}**

# **OPERATIONAL FACTORS**

**ERA20MA001**

## Propeller Feathering Checklist

### m. PROPELLER FEATHERING.

#### PILOT

#### COPILOT

##### (1) TO FEATHER A PROPELLER.

- |   |  |
|---|--|
| (a) Notify copilot to stop engine affected.   | (a) Move mixture control of affected engine to "ENGINE OFF."           |
| (b) Turn automatic flight control equipment switches "OFF."   | (b) Stop the booster pump if running.                                  |
| (c) Notify copilot to press proper feathering switch.   | (c) Press proper feathering switch.                                    |
| (d) When propeller stops, turn proper ignition switch to "ENGINE OFF."  | (d) Close cowl flaps of engine affected.                               |
| (e) Close throttle.   |  |
| (f) Adjust trim tabs as required.   |  |
| (g) Turn automatic flight control equipment switches "ON."  |  |
| (h) If the engine is not to be restarted, order engine fuel transferred to other tanks as required.   | (h) Assist aerial engineer to transfer fuel from the dead engine tank. |
| (i) When No. 2 engine is affected:  |  |
| 1. The glycol pump is inoperative. If cold air is not desired in the cabins, shut off heating and ventilating system by moving control handle fully aft.  |  |
| 2. When one vacuum pump is inoperative, (engine No. 2 or 3): Set vacuum pump selector ("GYRO INSTR.") valve to the <u>other</u> vacuum pump. (De-icer pressure will thus be reduced and de-icer vacuum will not be available. De-icer system will, therefore, operate inefficiently.) |  |

## Engine Failure During Takeoff Checklist

### J. ENGINE FAILURE DURING TAKE-OFF.

#### PILOT

- (1) Failure of an engine during take-off may not be noticeable immediately except for a resultant swing. If, therefore, a swing develops, and there is room to close the throttles and pull up, this should be done.
- (2) If it is necessary to continue with the take-off, even though one engine has failed, hold the airplane straight by immediate application of rudder. Gain speed as rapidly as possible. See that the landing gear is up, or coming up, and feather the propeller of the dead engine. Re-trim as necessary.

#### COPILOT

- (1) Press proper propeller feathering switch when ordered by pilot.

### K. CLIMB. (Refer to climb chart, Appendix II.)

#### PILOT

- (1) Reduce manifold pressure with supercharger controls.
- (2) Reduce rpm as required for climb.
- (3) Make a visual check of engines 1 and 2.
- (4) Adjust trim tabs as required.
- (5) Order copilot to set carburetor air filter switch to "FILTER OFF" at 8000 feet unless dust conditions are found above that altitude.

#### COPILOT

- (2) Adjust cowl flaps as required to maintain proper cylinder head temperature.
- (3) Make a visual check of engines 3 and 4.
- (5) When ordered by pilot, move switch to "FILTER OFF."

#### WARNING

Switch must never be left in the "FILTER ON" position above 15,000 feet.

### L. LEVEL FLIGHT.

#### PILOT

- (1) Refer to Cruising Control Charts, Appendix II.
- (2) Use full throttle and set power with turbo regulators at all altitudes.

#### COPILOT

- (2) Set mixture controls to "AUTOMATIC LEAN," below 2100 rpm, 30 inches Hg manifold pressure.

#### CAUTION

Do not exceed 30 inches Hg manifold pressure below 2100 rpm.

#### CAUTION

Instantaneous load factors above the allowable can be reached very easily with rough elevator control movements. Inturbulent air or in combat maneuvering, corrections should be made very smoothly.

### Engine Failure during Takeoff Checklist continued

PILOT	COPILOT
	(3) Adjust cowl flaps as required to maintain proper cylinder head temperatures.
	(4) Stop booster pumps until needed (which will be above 15,000 feet).
	(5) Begin flight performance log and make entries in Form I as required.

### Collings Foundation Engine Failure Checklist

#### ENGINE FAILURE IN FLIGHT<sup>1</sup>

Mixtures.....AUTO RICH  
Power.....AS REQUIRED  
Flaps and Gear.....AS REQUIRED

#### Failed Engine

Throttle.....CLOSED  
Prop.....LOW RPM  
Mixture.....IDLE CUT OFF  
Feather Button.....FEATHERED  
Vacuum Selector.....AS REQUIRED  
Cowl Flap.....CLOSED & LOCKED  
Boost Pump.....OFF  
Mag Switch.....OFF

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## Engine and Accessories Ground Test Checklist

### g. ENGINE AND ACCESSORIES GROUND TEST.

#### PILOT

- (1) Direct gunner to secure lower turret with guns pointing rearward.
- (2) Set altimeter.
- (3) A.F.C.E. switches "OFF," all knobs on control panel, "POINTERS-UP," turn control, "CENTERED."
- (4) Set propeller controls for high rpm and lock.

#### COPILOT

- (1) See that all doors and hatches are closed.
- (2) Hydraulic pressure should be 600 to 800 pounds per square inch on each gage.
- (3) With ignition and battery switches "ON," hydraulic switch in "AUTO," warning and indicator lights should be:
  - Tail wheel unlocked - On (red)
  - Landing gear - On (green)
  - Hydraulic pressure: Service - Off,  
Emergency - Off.
  - Vacuum - Off.
- (4) Check all fuel quantities.

## Engine and Accessories Ground Test Checklist, continued

### PILOT

- (5) Turn command radio on.
- (6) Flight controls unlocked. Move them to the limits of their ranges to insure free operation.
- (9) Contact control tower for clearance.
- (10) Signal ground crew to remove wheel chocks.
- (11) With mixture controls in the "AUTOMATIC RICH," check ignition at 1900 to 2000 rpm.

### NOTE

The rpm drop should not exceed 100 when switching from two magnetos to one.

- (12) Check propeller governor at 1500 rpm by moving control to low rpm. When rpm decreases to approximately 1100, return control to high rpm position and lock.
- (13) Run up each engine individually and adjust supercharger regulator control stops for 46 inches Hg manifold pressure at full throttle and 2500 rpm.

### IMPORTANT

This adjustment must be made as quickly as possible and must not exceed 1/2 minute for each engine.

- (14) Set trim tabs in neutral.
- (15) Check flight controls.

### WARNING

Operate to full extent of their ranges to insure free and proper movement.

- (16) Close window.

### COPILOT

- (5) Set intercooler controls to "COLD" unless icing conditions exist.
- (6) Cowl flaps should be open. Check visually.
- (7) Wing flaps up. Switch in neutral.
- (8) Tail wheel unlocked. Locking handle should be in up position.

- (11) Check the following during ignition check:

Fuel Pressure: Desired - 12 to 16 lb/sq in.  
Maximum - 16 lb/sq in.  
Minimum - 12 lb/sq in.

Oil Pressure: Desired - 75 lb/sq in.  
80 lb/sq in.  
70 lb/sq in.

Oil Temperature: Desired - 70°C (158°F)  
Maximum - 88°C (190°F)  
Minimum - 60°C (140°F)

Cylinder Temperature: 205°C (401°F)  
Maximum

- (13) Notify pilot if any temperature or pressure reading is not satisfactory.

- (15) Turn all fuel boost pumps "ON."

- (16) Close window.

## Starting Engines, checklist

### d. STARTING ENGINES.

#### PILOT

- (1) If the engines have stood for over 2 hours, have the propellers turned over three complete revolutions by hand. Be sure ignition switches are "OFF."
- (4) Cabin heat control in "OFF" or "COLD" position.
- (5) Move turbo controls to "OFF."
- (6) Post fire guard.
- (7) Open all fuel shut-off valves.
- (8) Crack throttles (approximately 1000 rpm).
- (9) Direct copilot to open carburetor air filters.
- (10) Set propeller controls for high rpm.
- (11) Turn magneto switch for engine affected to "BOTH."
- (13) Direct copilot to start engines. Recommended starting order is 1-2-3-4.

#### COPILOT

- (2) Order flight engineer to open manual shut-off valve and set selective check valve to "SERVICING" position.
- (3) Check hydraulic pressure, both gages (600 to 800 pounds per square inch). Order flight engineer to close manual shut-off valve. Set selective check valve to "NORMAL" position.
- (4) Open cowl flaps and return valves to "LOCKED" position.
- (5) Fuel transfer valves and pump switch should be "OFF." Have flight engineer check them.
- (6) Set fire extinguisher selector valve (if installed) to engine being started.
- (7) Move intercooler controls to "COLD."
- (8) Turn carburetor air filters "ON" when directed by pilot.
- (9) Move mixture controls to "ENGINE OFF."
- (10) Set primer to "OFF" position.
- (11) Start No. 3 fuel booster pump for primer pressure. It should be 6 to 8 pounds per square inch.
- (12) Start fuel booster pump for engine affected.
- (13) Start engines when directed by pilot.
  - (a) OLD-TYPE STARTER.
    1. Move starter switch of engine affected to "START" position and hold for approximately 30 seconds.
    2. While starter switch is in "START" position, unlock primer, set to engine affected, and expel air from line by pumping until a solid charge of fuel is obtained.
    3. When directed by pilot, move starter switch to "MESH" position.
  - (b) NEW-TYPE STARTER.
    1. Throw "START" switch to engine affected and energize for 12 seconds.

## PILOT

- (14) When the engine fires, move the mixture control to "AUTOMATIC RICH."

### CAUTION

Do not advance the throttles as lean mixture and backfire hazard will result.

- (18) If no oil pressure is indicated within 1/2 minute after starting, direct copilot to stop engine with mixture control. Cut ignition and investigate.
- (19) In case of fire in the exhaust system, run up the engine in an attempt to blow out the fire. If this fails, direct copilot to stop the engine.
- (20) Close cowl flaps if the fire is in nacelle 1 or 2.
- (21) If fire is not smothered by closing the cowl flaps, close fuel shut-off valve, stop booster pump, and direct copilot to pull fire extinguisher, both charges if necessary.
- (22) Before resuming operations after fire, be sure that CO<sub>2</sub> cylinders are replaced.

## COPILOT

2. Throw "MESH" switch while "START" switch is held on.
- (14) When the starter is meshed, prime with quick strokes (to atomize the primer charge) until the engine fires.
- (15) If necessary to prevent engine from quitting due to lack of fuel, pump primer with several slow strokes.

### CAUTION

Return primer to "OFF" position.

- (16) Shut off booster pump if fuel pressure from engine pump remains steady.
- (17) If engine stops, return mixture control to "ENGINE OFF" immediately, cut ignition switch and repeat the starting procedure.
- (18) After engine starts, check for indication of oil pressure. If no pressure is indicated within 1/2 minute, notify pilot; move mixture control to "ENGINE OFF" when directed by pilot.
- (19) When directed by pilot, stop engine by moving mixture control to "ENGINE OFF."
- (20) Close cowl flaps if the fire is in nacelle 3 or 4.
- (21) Pull fire extinguisher charges (if available) at command from pilot.

### NOTE

If engine accessory cowling is not installed, it is unlikely that the fire can be extinguished by the CO<sub>2</sub> system. External fire extinguishers must, therefore, be used.

