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ORGANIZATION Sq. 601 DATE COMPLETED

QUESTIONAIRE FOR B-17F AERIAL ENGINEERS

AIRPLANE GENERAL

1. How would you determine that landing gear is fully extended? Tail Gear? Test With Crank
2. What locks the landing gear down? Bumper
3. Can a safe landing be made with main gear stuck partially down? Tail Gear?
4. Where are the landing gear and flap cranks and extensions located? Where used? Located On Forward Side Of Bulkhead #6 In Camera Pit And At Tail Wheel Gear
5. Upon landing severe tail wheel vibration is felt. What is probably cause? Correction? Anti Shimmy Device Is Out Of Adjustment - Tighten Spring To 420 lbs.
6. What is maximum air speed for lowering flaps? 147 m.p.h.
7. What is maximum diving speed? What part do the de-icers play in maximum speeds? Max. Div. Speed = 220 m.p.h.
8. How are the ailerons locked? Rudder and elevator? Ailerons Locked On Control Column. Rudder And Elev. Lock Control On Floor Between Pilots
9. Should landing gear be retracted as soon after take-off as possible? Yes - After Making Sure Plane Is Airborn
10. Why should landing gear be left down on practice take-offs and landings? To Cool Brakes And To Save Batteries And Elec. Sys.
11. Where are the emergency exits? Left Side Below Pilots' Compartment Right Side Near Tail
12. How are the bomb bay doors opened in an emergency? Pilot Pulls Control. Another Control On Bulkhead #4
13. How are the bomb doors closed after emergency operation? Crank Screws Down Until They Engage Doors - Then Raise Electrically
14. Explain how bomb bay tanks may be released. Bomb Salvo Control
15. If you carried one bomb bay tank and one bay of bombs, how can you be sure the tank will not be released when the bombs are dropped electrically? Cut Switch Operating Bomb Bay Tank Side
16. What is the weight of an airplane empty? 33000# Maximum weight loaded? 66,000#
17. Explain how surface de-icers are inflated and deflated.
18. What compartment is most desirable for storing weight regarding center of gravity? Bomb Bay
19. Can a turn be made while taxiing with the tail wheel locked? Yes Up To 15°

PROPELLERS
(Hamilton Hydromatic)

1. Is oil pressure required to hold the propeller in the feathered position? Yes
2. If the propeller continued to windmill after feathering cycle was completed up to point where feathering button kicked out, what is the probable cause? Button Kicks Out Too Soon - Prop. Isn't Completely Feathered
3. How are propellers synchronized on short local flights? Long cross country flights? Listen or Set Tachometers. — Visually From Nose In Line With Props.

4. How is anti-icing accomplished? How many pumps? Where located? ____

5. Where is the anti-icing fluid tank located? Give capacity. ____

6. What specification anti-icer fluid is used? ____

7. Give steps in feathering propeller. a. Practice b. Emergency c. Unfeathering. ____

8. Why must feathering switch be held closed manually in unfeathering? ____

9. If propeller feathering switch is accidentally hit, how can the feathering operations be stopped immediately? ____

10. If propeller feathering switch sticks in, causing propeller to go through full feather and back to unfeather, what is trouble? How corrected? ____

11. Why should anti-icer pumps be operated daily? ____

12. What is the pumping capacity of the anti-icer pumps? ____

AIRPLANE INSTRUMENTS

1. How many vacuum pumps are used to operate Gyro instruments at any one time? ____

2. What is the source of power for de-icer inflation and deflation? ____

3. On what engines are the vacuum operated? ____

4. Where is the vacuum selector valve located? ____

5. What instruments are vacuum operated? ____

6. What pressure should be indicated on the de-icer gage when the de-icers are operating? ____

7. Where is the de-icer control located? ____

8. If the artificial horizon "spilled" shortly after feathering #3 engine, what was the probable cause? Correction? ____

9. What instruments depend on pitot static tube for operation? ____

10. How can the pitot static heaters be checked for operation on the ground? Will heater elements in pitot static burn out if left in the "on" position for any length of time on the ground? Why? ____

11. Which pitot static tube operates which instruments? ____

12. What should the vacuum be for gyro instruments? ____

13. If air speed indicator fails to function, what is probable cause? ____

HYDRAULICS

1. What two means of pressure regulation are included in the B-17F hydraulic system? ____

2. What is the purpose of the hand pump? ____

3. How is air bled from the cowl flap and brake lines? ____

19. When landing gear is operated manually, should electrical assistance be given?

20. What three ways can pilot attract crew attention?

21. Name electrical circuits controlled by master bar between ingition switches?

22. If magneto connector plug is removed from fire wall, will magneto operate?

23. If all autosyn instruments go out, what normally would be the difficulty?

24. What units furnish current for the autosyn instruments? What voltage?

25. How are the batteries switched on and off?

26. Briefly describe the use of the inverters?

27. Where are the inverters located?

28. How often during flight should inverters be switched?

29. How can the landing gear warning horn be tested for operation?

30. If landing gear warning horn fails to operate, what is probable cause?

31. If both inverters run simultaneously in either position of the switch what is the probable cause?

32. Is there a fuse in the genefator circuit?

33. Can transfer pump be operated with one valve in off position?

34. What must be done if landing light fails to go off when switch is shut off?

MISCELLANEOUS

1. Where are the life rafts carried? Give capacity of each?

2/ Where are the raft releases located and how operated?

3. Where are the engine CO2 controls located?

4. Where are the landing flares carried and how released?

5. Name steps taken to extinguish fire in nacelle when starting engine.

6. Where are the hand fire extinguishers located? Give type at each location?

7. Can bombs and/or bomb bay tanks be released with bomb bay doors closed?

8. Describe procedure to be followed for emergency water landing.

9. What are the various normal design bomb loads?

10. What are the limits of the center of gravity location expressed in percentage of MAC?

11. What precautions are observed with heater during warm weather operation?

12. What is capacity of heater tank?

13. How often should cune be turned?

14. How often should heater system be flushed?

15. How often should heater cune be cleaned?

16. Why is there a by-pass relief valve in heater?

17. What is usual cause of heater malfunction?

18. Why are air filters required to be installed?

10. When is the oil dilution used? Explain operation? _____

11. What is usual cause of runaway supefcharger? _____

12. What system furnished oil pressure to operate supercharger regulator? _____

13. What is nurmal fuel capacity? Capacity of each tank? Maximum capacity? _____

14. Trace fuel flow from tank through each unit to carburetor? _____

15. Can fuel be transferred from left bomb bay tank to #1 engine? _____

16. If electric transfer pump fails, is it possible to transfer fuel by any other means? _____

17. Explain use of Tokyo tanks. _____

18. Why are fuel gages less accurate in this type fuel system? _____

19/ Explain function of fuel shut-off valve. Can the valve be kept in the off position after master switch is off? _____

20. Why must priming handle be locked after termination of priming? _____

21. Give oil tank capacity. Give expansion capacity. _____

ELECTRICAL

1. What fuses cannot be replaced in flight? Where located? _____

2. If starter meshing fuse burns out each time starter is meshed, what is most probable cause? How corrected? _____

3. Which fuse box, or boxes, affect flap operation? _____

4. Where are the flap solenoids located? How can they be checked for operation? _____

5. Give location of all fuse boxes. _____

6. Give main fuses in each. _____

7. What voltage system is used? Single or two wire? _____

8. If all temperature gages are out at once, what is probable cause? _____

9/ If all fuel content gages were inoperative but all other autosyns were operating what would you suspect? _____

10. If the flourescent lights are inoperative on both inverters, what would be first trouble you would suspect? _____

11. If the flourescent lights are inoperative on normal inverter but operates on alternate inverter, what trouble do you suspect? What other equipment is also inoperative? _____

12. Can the tail wheel be retracted electrically if the shear bolt is broken? Why? _____

13. Where are the generator switches located? What happens to the power circuit when they are cut off? _____

14. How do you check the voltage of each generator? _____

15. If the generator output shows 28.5 voltage but 0 amperage on per-flight check, give most probable cause. _____

16. What type of instrument lighting is used? _____

17. Why is it important that master switch be turned off before leaving airplane? _____

18. Should more than one starter be started simultaneously? _____

4. How is the Hydraulic pump primed? ____

5. How are the parking brakes set? What is minimum safe pressure to park airplane? ____

6. What hydraulic check is made prior to landing? ____

7. Where are the accumulators located? ____

8. Describe complete procedure for servicing the hydraulic supply reservoir? ____

9. What air pressure is required in the accumulators? ____

10. How may air pressure in the accumulators be checked during the pre-flight by using pressure gauge on instrument panel? At other times with hand pressure gauge? ____

11. What fluid is used in the hydraulic system? How identified? ____

12. Give pre-flight requirements on hydraulic system, including brakes. ____

13. Why shouldn't the brakes be applied with the wheel removed? ____

14. What could cause the hydraulic pressure to fluctuate rapidly? ____

15. In what Technical Orders would you expect to find information on hydraulic system pumps, switches, brakes, etc. used on the B-17? ____

16. Why is the outlet to the electrical driven hydraulic pump taken from the side of the reservoir instead of at or near the bottom of the tank? ____

17. Name two functions of the "Brake De-Booster" or "Return Booster", as it is sometimes called. ____

18. Where is the hydraulic cuno located? How often should it be turned? ____

19. How can pressure be bled from both the emergency and service system? ____

20. What is the correct position for the selective check valve in flight? ____

21. When the emergency system pressure drops, how can the system be re-charged? ____

22. What means is provided to divide the main or service system from the emergency system?

23. What is the function of the shuttle valve? Where is it located?

24. Give the pressure settings for the following:
(a) Pump cut in pressure _____
(b) Pump cut out pressure _____
(c) Relief Valve setting _____
(d) Warning light for main system: On_____: Off_____
(e) Warning light for service system: On_____: Off_____
(f) Cowl flap relief valve setting _____

25. What equipment does the main hydraulic system operate? The emergency system? ____

26. What are the ground test connections and where are they located ____

27. Describe the hydraulic panel and explain how it can be removed. ____

28. What is the function of the accumlators and where are they located?

29. If the electric driven pump fails to put the warning light out on the emergency system, what is wrong? How can the light be put out?

ENGINE OPERATION

1. What should the following be on run-up prior to take-off?
   a. Cylinder head temperature?
   b. Oil temperature?
   c. Oil pressure?
   d. Fuel pressure?
   e. Vacuum?
   f. Cowl flap position?
   g. Mixture?
   h. Manifold pressure & RPM for checking magnetos?
   i. Generator voltage?

2. If in flight, engine becaume rough, manifold pressure dropped, what is most probable cause, assuming no controls were moved?

3. In what order should engines be started?

4. How is oil temperature regulated? If running too hot, what correction can be made?

5. What auxiliary equipment is lost by failure of #1 engine? #2? #3? #4?

6. Why should manifold pressure be reduced before reducing RPM, especially after the take-off?

7. Why shouldn't throttles be "pumped" when starting?

8. How should engine be started? Stopped?

9. How is the supercharger regulator set for take-off?

10. What is the maximum take-off manifold pressure? RPM? Cylinder Head temperature? (100 Octane)

11. What procedure would you follow in case of a run-away turbo?

12. Give maximum cylinder head temperature for take-off, climb, cruising.

13. Give engine RPM and manifold pressure for climb and high speed. Maximum cruising. Take-off and desired cruising.

14. If with supercharger off, engine ceased to operate in flight due to fuel pump failure, what indication will be noticed, if any, on instruments? In case of ignition failure under the above (that is, with the fuel pump okeh), what indication, if any, will be noticed on the instruments?

15. How are superchargers and propellers set for landing?

16. How long should engine be idled before stopping?

FUEL AND OIL SYSTEM

1. What changes in engine operation are advisable to decrease possibility of carburetor ice?

2. What indicates the presence of carburetor ice?

3. Name the four positions of the mixture control. When are they used?

4. What type carburetor is used?

5. What type fuel booster pumps are used? Why?

6. When are fuel booster pumps used? Why?

7. Why is it important to have the mixture control in idle cut-off with booster pump on and engine not running?

8. How is the oil quantity measured?

9. Does the oil temperature gage give inlet or outlet temperature?